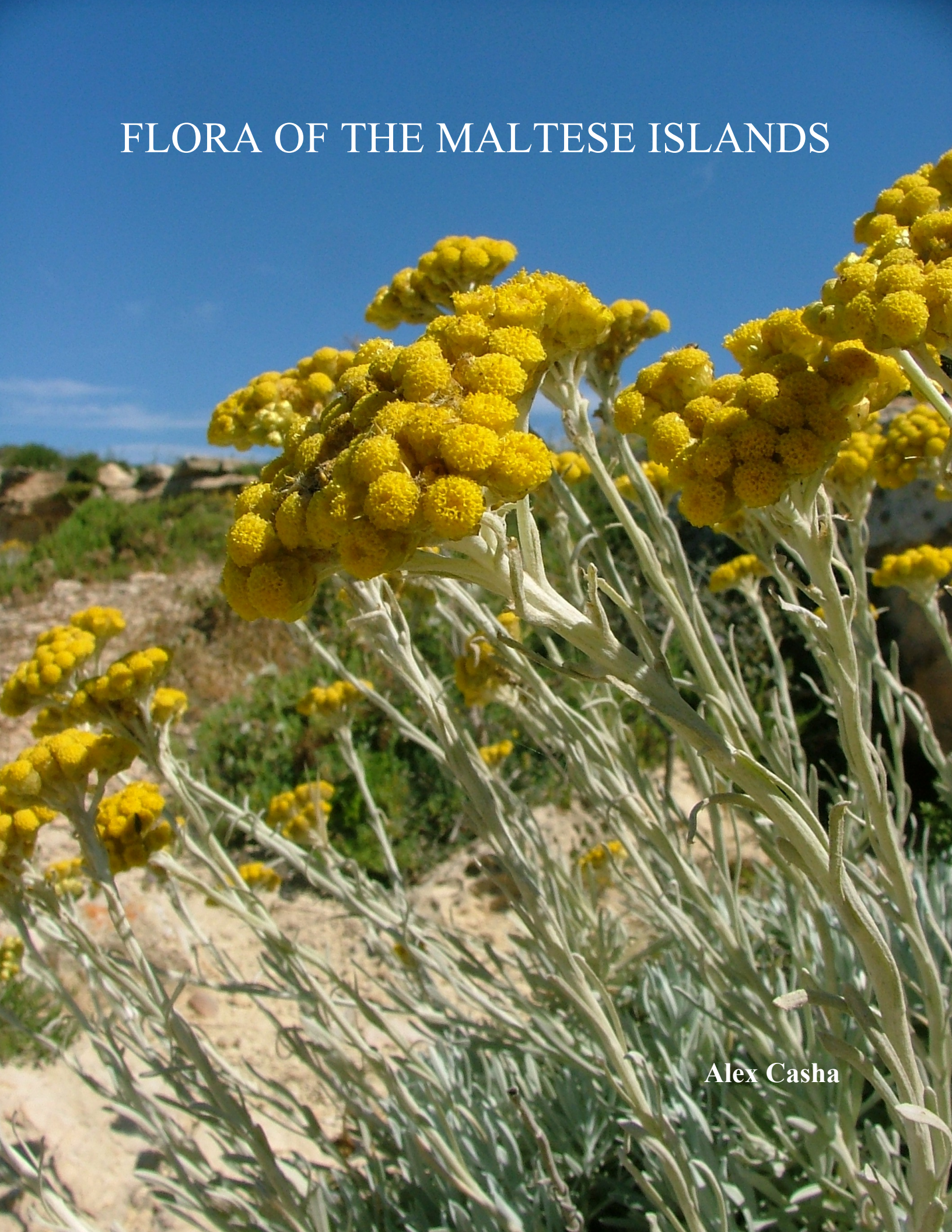
FLORA OF THE MALTESE ISLANDS



Alex Casha

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Alex Casha

Foreword

The Maltese Islands are blessed with a great variety of wild plants. Their flowers colour and adorn the countryside - the blue of the pimpernel, the red of the poppy, the yellow of the marigold, the violet of the thyme... Some flowers are small and un-noticeable e.g. the flowers of the Maltese Dwarf Garlic, others showy and noticeable e.g. the flowers of the Acanthus. They all have one purpose - to produce seeds. Locally some wild plants are common, others rare with some close to extinction. A number of them are endemic or sub-endemic while others are found growing also in other parts of Europe. Some have even come from far away regions, introduced deliberately or not by man. While the greatest blooms may be found in late winter and spring other seasons have also their charm in respect to wild flowers. A stroll on a rocky ground in June reveals the violet carpets of the aromatic Mediterranean Thyme, and also the blooms of the Mediterranean Stonecrop and the Silvery Ragwort. In autumn after the rains and when the weather is still warm and conditions are favourable species like the Autumn Narcissus and the Autumn Lady's Tresses together with some "spring-flowering" plants open their flowers.

Each wild plant is a champion of evolution, the result of countless generations that have lived and shaped themselves against all odds. Today wild plants, some of them at least, face their greatest challenge to survive through rapidly changing environments by the hands of man. The rapid rise in human population has brought great pressures on the environment such as construction, degradation, recreational activities, and pollution. Ignorance is another factor that harms wild plants, the locals often considering them as "ħaxix ħazin" ("bad plants"). Changes in agricultural practices have also resulted in a loss of wild flowers. We need to take into account wild flowers (and all nature) in what we do, if we want wild plants to survive and in healthy populations. Wild plants deserve to be protected and respected as part of our natural heritage.

It is a delight to observe a mingle of colours and species of wild flowers. They come for free, watered by the rains. Humans use wild plants in several ways, and many of us also see an aesthetic value in their beauty. Wild flowers are also important in providing animals with shelter, food and habitat. They are also important in protecting the soil from erosion by rain and wind. The smallness of the Maltese Islands means that several different habitats with different flora can be reached in a short time. Malta is indeed a botanical paradise, though this bounty of wild plants never had the attention and respect it deserves. When you go out in the countryside have a better look at the wild flowers. Observing and understanding wild plants go a long way in our appreciation towards them. To save wild plants we need to be able to appreciate their beauty and also to protect first and foremost their habitats.

Alex Casha
Mosta, Malta
July 2015



A landscape of Tree Spurge *Euphorbia dendroides* in bloom. Picture taken in Ta' Ċenċ area, west Gozo in March.

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Picture shows Giant Orchid *Himantoglossum robertianum* growing on rocky ground in the North-west of Malta, December

Front cover picture shows the Maltese Everlasting *Helichrysum melitense*
Back cover picture shows the Maltese Rock-centaury *Palaeocyanus crassifolius*

Note: Great care has been taken in writing this book and to be as accurate as possible. The author cannot be held responsible for any consequences arising from the use of the information contained in this book.

This book is dedicated to my family especially to the memories of my dear father Carmelo and my dear mother Antonia

The contents of Flora of the Maltese Islands

Photographs: All photographs in the book are taken by the author except for a few including *Rosa gallica*, *Convolvulus tricolor*, *Ophrys apifera*, *Ophrys fuciflora* subsp. *lacaitae* and *Ophrys bertolonii* by Raymond Galea, *Sagina procumbens* by Bernt-Gunnar Østerkløft and *Iris xiphium* by Darren Saliba. Plants were photographed in the wild, except for a few species including seeds/fruits that were photographed under a hand lens. All plants were photographed in the Maltese Islands, except nine species. This is shown in the text for the species.

References: Nowadays the number of botanists/plant admirers in the Maltese Islands have increased and several papers/notes can be found written in journals such as the Central Mediterranean Naturalist (Nature Trust, Malta), as well as in online information about local flora, such as www. maltawildplants.com by Stephen Mifsud. Much of the less recent references in this book come from Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927). One must also mention the important pioneer work of books, papers, notes and other contributions that former botanists gave in the past towards the study and knowledge of plants in the Maltese Islands, dating back to the 1600s. Among them are Boccone, P (in the year 1674), Dr. Stefano Żerafa (1827-1831); Dr. G. C. Grech Delicata (1849-1853); Dr. Gavino Gulia (1869-1877), J.F. Duthie (1871-74); Dr. A. Caruana Gatto (1890); Dr. Stefano Sommier (1906-1911); Dr. Stefano Sommier & Dr. A Caruana Gatto (1915); and Kramer & Westra (1972). Currently Edwin Lanfranco is Malta's leading botanist.

Plant names: The English name is given in bold, and is followed by the scientific name in italics, then by the Maltese name. Some scientific names are changed over time by botanists. Sometimes there are debates over the scientific names of plants. It is also worth noting that the study of the flora of the Maltese Islands, as all other flora, is a dynamic subject; there are changes in time with new information to add. So what is a species today might be changed to say an endemic or a sub-endemic one, or else its genus or species changed as it is found to be a different species after careful studies. The status of a species may change over time, for example from common to rare or it becomes extinct, or a new alien plant found to be growing wild in the countryside.

Measurements: Measurements are generally not given, and included only where it is really necessary. It is the scope of this book to eliminate measurement and make plant identification possible without the use of measuring them. The scale of graphs in the pictures is 2mm x 2mm unless otherwise stated.

Flowering times: These are given in the species description, e.g. "scarce to frequent in garigue, maquis and valleys from late January to March"- description of *Anemone coronaria*, where the *flowering season* is late January to March. It must be said that plants flower when conditions are right, and not tight to any particular human calendar and can be found flowering outside their main flowering period.

Habitat: The general habitat/s for each plant is given. Plants grow in areas that they find suitable, and may have different habitats and habits.

Technical terms: A glossary at the back of Volume 4 explains some technical terms. Technical words are kept to a minimum, and some are explained also in the text.

Presented in the publication : Over 730 species are described in full with text and original colour photographs; over 260 species are described briefly or mentioned.

Abbreviations

c. = circa (about)
ed. = editor
eds. = editors
e.g. = example
et al. (et alia) = and others; when there are more than 2 authors, replaces the names of co-authors except the first
i.e. = that is
NGO = non-governmental organisation
pers. comm. = personal communication
pl. = plural
s.l. = sensu lato (widest sense; sensu= in the sense of)
sp. = species
sq. = square
s.s. = sensu stricto (strict sense; sensu= in the sense of)
ssp. = subspecies
subsp. = subspecies
var.=variety

Acknowledgements – I am deeply indebted to Mr. Edwin Lanfranco for his great help in many useful comments exchanged in emails during several years, as well as for his help in identification of some species including *Lamprothamnium papulosum*. Great thanks go to my eldest brother Joseph, who made botanical literature available, and for his never-ending support. He has been instrumental in my positive interest and knowledge in plants and other wildlife and in the making of this book. I am also deeply grateful to Ms. Charmaine Attard, often a field companion on my botanical trips, for her patience and help. The following persons have also been of great help in showing me particular plants in the field or telling me about their presence, and are here named in alphabetical order - Joe Attard, Matthew Borg-Cardona (especially for informing and showing me *Anacamptis papilionacea* after his excellent find on the eastern side of Malta), Dr. Joseph Buħagiar, Dr. Louis F. Cassar, Annalise Falzon, Desiree Falzon, Victor Falzon, Raymond Galea, Charles Galea Bonavia, Mario V. Gauci, Paul Mifsud, Stephen Mifsud, Dr. Bernt-Gunnar Østerkløft (especially *Sagina procumbens* photo), Adin Vella, Jeffrey Sciberras, Joe Sultana and Timothy Tabone (especially for *Plantago bellardii*). Also shown in this Flora are photographs of three rare species of orchids – *Ophrys fuciflora* subsp. *lacaitae*, *Ophrys apifera* and *Ophrys bertolonii* kindly supplied by Raymond Galea all of which were taken in Malta.

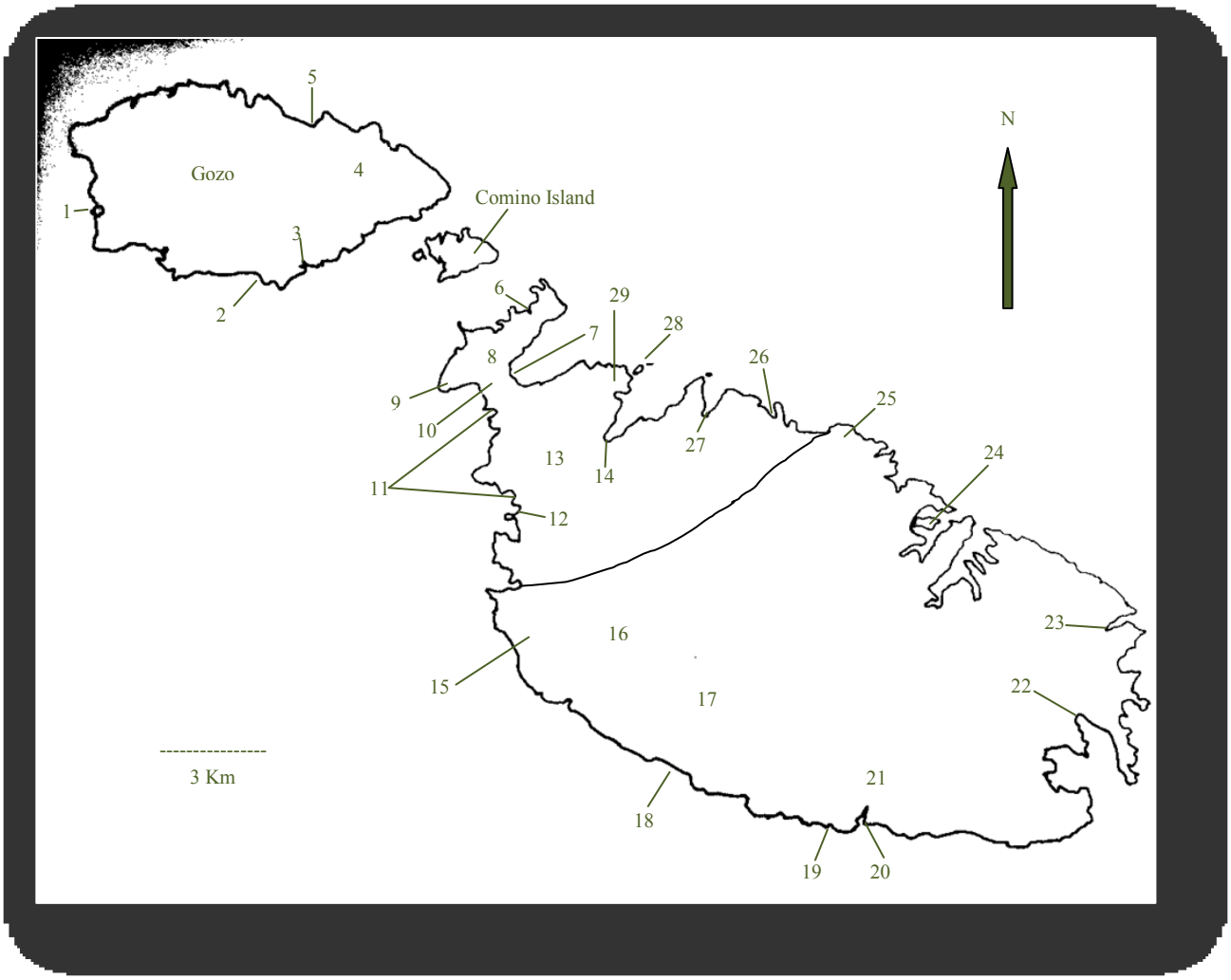
Where and when to go

The Maltese Islands are small but their topography is interesting and there are several places where to look for wild plants. Especially rich in wild flora are rocky plateaus, rocky valleys, coastal cliffs and associated rdum habitats as these hold a profusion of species, and are among the "wildest" of our places. The climate of the Maltese Islands favours the growth of plants in the rainy season, and by summer much of the vegetation is dry and brown. The richest diversity of flowers is to be found from February/March to May. Nonetheless a good number of plants particularly those living in maritime areas such as sea cliffs have their flowering season in summer (and autumn). Plants that have their major flowering season in spring can also be found flowering in autumn, though often with less vigour. The warm autumn weather together with the fresh rains provides an ideal flowering period for plants. Spring, especially late spring can at times be very hot and dry, so be careful to take necessary measures and precautions, like taking enough water. Summer is even hotter with very high temperatures especially during the best parts of the day. Winter can be warm at times, but can also be chilly especially during northerly winds. When walking safety precautions are to be taken at all times, and one should keep to paths when these are present, and not enter into private property. For safety reasons one should also note current bird hunting laws (one can check with BirdLife Malta - birdlifemalta.org, tel. + 356 21347645/6). It is disheartening to note that hunting of migratory birds in the Maltese Islands is currently permissible in spring, when the countryside is at its best. Bird trapping season is generally from October to December; one of several negative implications of this is that patches of land are turned into trapping sites, destroying native vegetation, including rare and endemic species.

Some few sites that can be mentioned here to look for wild plants include:

- **Il-Majjistral** Nature and History Park in the north-west region of Malta (look further on site www.majjistral.org), a mainly coastal area of 2.5 square kilometres with garigue and rdum habitat, and a sand dune remnant at Golden Bay (Ramla tal-Mixquqa); remnants of sand dunes can also be found at **Armier** bay and other small bays along that coastline (beaches here very populated in summer!)
- **Għajn Tuffieħa** area with coastal clay slopes
- Close to the small wetland of Ghadira nature reserve lies the **Red Tower** area and **Qammieħ**; to the west of the reserve lies the garigue area of **Il-Biskra** and **Iċ-Ċumnija**. Visiting the Ghadira small bird reserve, as well as that of Is-Simar at Xemxija might be worthwhile (if not for plants for some birds at least!), but opening times are weekends November to May. See www.birdlifemalta.org
- **Dingli Cliffs**
- **Chadwick lakes**, a part of a river valley system that includes the Mosta valleys of Tal-Isperanza and Għasel; further west continues into Fiddien valley
- **Buskett**, a semi-natural wood, invaded by people on Sunday afternoons in winter and spring
- **Għar Lapsi** area
- **Comino island** (Kemmuna), an island of about 2.8 square kilometres that has garigue habitat, rocky steppe, a sand dune remnant and cliffs. Some arable land is still found. The ferry can be reached from Marfa or Ċirkewwa. There are no shops there, so take food and water and adequate clothing. Not much shade from sun or rain, as the island is exposed.
- Gozo has several areas to explore. Among the sites are **Dwejra** and **Ta' Ċenċ**, **Mġarr ix-Xini** valley, Il-**Qortin tal-Magun** and the sand dunes of **ir-Ramla l-Ħamra** at the back of a popular sandy beach. These sand dunes are the best preserved on the island.

Note: From the above sites mentioned Comino, Buskett and the reserves of Għadira and Is-Simar are areas where bird shooting is prohibited while Ramla l-Ħamra is a sandy beach.



Map of the Maltese Islands with some of the localities mentioned in this book

1 Dwejra
2 Ta' Ċenċ
3 Mġarr ix-Xini valley
4 Il-Qortin tal-Magun
5 Ir-Ramla l-Ħamra
6 Armier
7 Għadira nature reserve
8 Red Tower (St. Agatha's Tower)
9 Qammieħ
10 Ta' Biskra and Ċumnija
11 Il-Majjistral Park coastal area
12 Għajn Tuffieħa
13 Miżieb
14 Is-Simar nature reserve
15 Baħrija
16 Chadwick Lakes (Wied il-Qlejgħa)
17 Buskett
18 Dingli Cliffs
19 Għar Lapsi
20 Wied Babu
21 Il-Maqluba
22 Il-Ballut saltmarsh (Marsaxlokk)
23 Il-Magħluq saltmarsh (Marsascala)
24 Manoel Island
25 Pembroke
26 Għadira s-Safra
27 Is-Salina
28 Selmunett (St.Paul's islands)
29 Mistra

Line from west to east represents the Great Fault

Photographing wild plants

Today many people are capturing the beauty of nature by means of photography. Nature photography is a positive way of appreciate nature. Digital photography has made it possible to capture several images by a digital camera and save them on a computer, without the need to print the photographs and enter into extra expenses. Plant photography is a popular and a beautiful subject. One has to bear in mind that when photographing a plant its surrounding vegetation should also be noticed and taken care, and not trampled or removed. Extra care should be taken when photographing rare plants. The photographer has always to be responsible, whether focusing on a plant or other subject of nature. If a plant needs to be identified, several shots can be taken including leaves, flowers and also fruits. To make up for a difficult background, a graph paper can be set against the plant or parts of it. A 10x hand lens is also essential, either for identification or for admiring the small parts of flowers, fruits, vein patterns of leaves or other small details.

The Maltese Islands

The Maltese Islands are small islands situated in the central Mediterranean region. They are also one of the most densely populated regions. The whole archipelago consists of 3 main islands - Malta (Malta), Gozo (Għawdex) and Comino (Kemmuna) and a number of islets. The largest island is Malta, 27 Km long and 14.5 Km wide with an area of about 246 square Km; Gozo is about 14.5 Km long and 7.2 Km wide with an area of about 67 square Km, and Comino is about 2.70 Km long, 2.2 Km wide and has an area of about 2.8 square Km. The smaller islands include Fungus Rock, Cominotto, St. Paul's Islands and Filfla. The total shoreline of the Maltese archipelago is around 192 Km long. The Maltese Islands are located in the middle region of the Mediterranean, some 93Km south of Sicily and around 290 Km east to Tunisia.

Geology - The Maltese Islands are formed from marine sedimentary rocks and have been formed by deposition of sediment at the bottom of the seabed. The rocks of the Maltese Islands are filled with fossils (the remains of plants and animals preserved in sedimentary rock). Our sedimentary rock, known as limestone, is said to be an organic sedimentary rock owing to its formation from the remains of dead organisms. These dead organisms where rich in lime, mainly calcium carbonate. The exposed rocks of the Maltese Islands are divided into five layers, not all of them present everywhere: the oldest of these is the **Lower Coralline Limestone**. This is found exposed as cliffs facing the sea such as the majestic Ta' Ċenċ cliffs in Gozo, rising vertically up to 150 metres. The Lower Coralline Limestone found inland forms rugged rocky lands and valleys. Resting on this layer is the **Globigerina Limestone**, a yellowish and softer rock that is more easily weathered and eroded (broken and carried off) by nature. This can be seen at certain coastal sites and also inland, like the west of Gozo and in central and south Malta. At the coast darker layers in this limestone can be seen, and these are the pebble layers (**pebble beds**) which are harder than the globigerina itself and contain pebbles and also fossils, like teeth of fish. In some coastal sites the globigerina is eroded but the harder pebble layer remains as a rocky beach filled with holes, as for example at Qammieħ. Above it is the **Blue Clay**, too often slipping off beneath the overlying rocks to form **clay slopes** of varying thickness and cover the rocks below. Exposed to the weather clay becomes greyish-bluish in colour and so is called blue clay. The Blue Clay forms characteristic slopes below the upper coralline plateaus in Malta and Gozo. A thin orange-brown layer above the clay is the **Greensand**. Finally the youngest of all rocks is the **Upper Coralline Limestone**, found mostly to the W and NW of Malta, on the eastern side of Gozo, and on the whole island of Comino. Once again this rock forms rocky lands with rugged surfaces when found as plateaus, but also forms cliffs and valleys. The Upper Coralline is absent from the eastern side of Malta. It rises to the highest part of the Islands at Dingli Cliffs (Rdum Dikkiena), 253m above sea level. The highest point of the Maltese Islands reached c. 340 m above sea level 20, 000 years ago, when the whole Maltese archipelago was connected (Micallef *et al*., 2013).

When the Maltese Islands rose above sea level, weathering and erosion processes started acting on the exposed rocks. Weathering is breaking and erosion is transporting the weathered material away. Weathering and erosion are natural processes that take place by natural elements like rain, heating by the sun and cooling at night, wind and wave action. Biological weathering also take its toll, such as the roots of plants entering and bursting more open the cracks and fissures. Much of the upper coralline limestone plateau could have been weathered and eroded away during the last ice age (Borġ, 1936). During this age (2 Million to 10,000 years ago) much of Northern Europe was covered with thick ice sheets. The temperatures of the Maltese Islands were lower and the amount of rainfall was much higher. The rivers and other water bodies that existed at that time froze, or were subjected to alternate freezing and thawing, perhaps several times during the same winter (Borġ, 1936). Water percolating the fissures and cracks in the limestone would account for further weathering of the stone when it froze, since water expands on freezing. This must have broken up and removed large parts of the upper coralline limestone over the greater parts of Malta and Gozo (Borġ, 1936). It must be said that the land above sea level was much larger than at present and the Maltese Islands were once a land bridge connecting Malta to Sicily, and perhaps even to Africa. Micallef *et al*. (2013) state that 450 square Km of land were submerged by the resulting sea level rise after the end of the last glacial period (ice age). They continue that this submerged landscape has been shaped by the same processes that shape the present landscape of the Maltese Islands.

The coastal areas are especially subjected to weathering and erosion processes; in some coastal areas with cliffs, deep fissures can be seen at the cliff edges, as blocks of coralline limestone are cut away from the mainland. In some areas the collapse of chunks of rock is recent or relatively recent.
Limestone also forms **caves.** These are formed by the action of the rainwater; rainwater contains carbon dioxide gas that forms carbonic acid and this acid dissolves and erodes away the calcium carbonate. And water dropping downwards from the top of the cave builds up a **stalactite** at the top, and a **stalagmite** at the bottom. As water droplets fall from the top to the ground, dissolved calcium carbonate left behind as the water evaporates eventually builds up these structures and over great lengths of time these two connect together to form a **column**. The ceiling of a cave may also collapse by dissolution of limestone (e.g. at Maqluba in Qrendi; the word Maqluba means "upside down"), forming what is known as a **doline**.

Around hills and the coast, formation of clay slopes occur. Clay is soft and easily erodes. This leaves the upper coralline limestone and the greensand with no support, and blocks of limestone tumble down and form coralline **scree**. At coastal sites such habitats are referred to as **rdum**, where a habitat of cliff, clay slopes, and boulders that have fallen down forms. The boulders that come to rest along the shoreline at the bottom of the rdum helps in protecting the beach from the weathering and eroding effects of the waves. **Springs** may also be the result of the blue clay - it is impervious to water (it does not allow water to pass through), unlike limestone, and so groundwater collects above it. Where this water above the clay reaches the surface, say in the face of a slope, water flows down and forms a spring. There are also a lot of **valleys** in the Maltese Islands. Valleys are formed by water cutting the rocks over which it is passing. Throughout the years the rocks are eroded deeper forming a valley. Eventually this forms a **River Valley**, where seasonal rainwater passes. One such example is the Wied il-Qlejgħa valley system. Dry in the summer months, there can be a torrent of water passing after heavy rains. These valleys have formed at a time when the climate of the Maltese Islands was much wetter than at present, during the Pleistocene epoch. The formation of these valleys by the heavy flow of rain was aided by the nature of the rocks, and also by the direction of the descent of the surface of the ground; the south-western coast of the Islands is high, rising to up to over 200 metres above the sea level, but then the surface descents to lower grounds towards the north east and east coast. So the flow of rainwater proceeded from the high S-SW ground to the lower E and NE ground, weathering and digging the valleys as are seen today (Borġ, 1936). Other valleys were formed by the result of a land that subsided, leaving a ground between two higher lands. This is the result of faulting. A fracture in the Earth's crust causes a (usually) vertical motion, producing a crack known as a **fault**. This faulting relieves stress from rocks. At the fault, the surrounding land can sink or rise. The Maltese Islands have several faults running parallel to each other, from the north-east to the south-west. The great fault, in Maltese called *Ix-Xaqq Il-Kbir*, (where the Victoria Lines pass) runs from Madliena to the other side at Fomm ir-Riħ, dividing the Island. Several other faults run across Malta, mostly in the North, and faults also occur in Gozo. For this reason various valleys and hills are found as a result of faulting as blocks of land have moved down and others rose. If a cross-section of the Maltese islands is taken a series of high lands and low lands can be seen, in which the layers of rock occupy different levels. For example Comino rests as a block of upper coralline limestone, and then the land between Comino and Marfa has subsided to below sea level, forming the channel between Malta and Comino. Marfa is the next hill, then the Għadira valley, the Mellieħa hill, Miżieb Valley, and so on. It can also be noticed that the Maltese Islands are tilted from one side, resulting in higher grounds at one side (the west and south-west) and lower grounds at the other (generally north-east and east). This is due to a major fault that runs from the north-west to south-east, called the Magħlaq fault. At this fault the sea floor is diverging away from each other, pushing upwards the block of land on which Malta stands. This rift in the sea bed called the **Pantelleria Rift**, formed in the Miocene epoch and gives the islands a NW inclination (Schembri & Baldacchino, 1992). In the Maltese Islands **sandy beaches** are also found. Sandy beaches are the result of waves carrying fine grains of rocks back onto the shore. Waves can also erode the shore, but they also transport back material onto it. Wind then blowing onshore carries the sand further inland and form a **sand dune**. Such a habitat is then stabilised by plants adapted to live in it.

Some other types of rock and soil deposits were formed by rivers during the last two million years when the Maltese Islands were above sea level. These are termed **Quaternary deposits** and were created by rivers depositing their load (material which the river carry), when the climate of these islands was much wetter than at present. These deposits contain fossils that shed light on the wildlife that used to inhabit these islands during this time. Such deposits are found at Wied Magħlaq, Għar Dalam and other sites.

Climate - The Maltese Islands have a **Mediterranean climate**, which is described as cool and moist in the winter and arid and hot in summer. This is brought about by meteorological conditions, with a high pressure belt in the hot months and low pressure in the colder ones. High pressure air systems, or **anticyclones**, generally bring settled weather. Clear skies and warm weather is typical in summer. Low pressure brings cold and rainy, unsettled weather. The climate of the Maltese Islands is dictated by their position in the Temperate region, above the Tropic of Cancer. The average annual rainfall for the Mediterranean is between 300mm to 750mm (Briggs *et al*., 1997), for the Maltese Islands around 500mm, generally between August-October to March-April. The first autumn rains in the Maltese Islands (August–October) may come down in heavy outbursts, causing flooding. This average however is not constant for every year, and

there can be dry years with very low rainfall. This variability of rain, together with summer drought is unfavourable for plant growth. The dry season is considered to be from April to August/September, the wet season from October till March. March is generally the last month with sufficient rainfall for growth of plants in shallow soil but can also be dry. In open and exposed areas such as in rocky habitats the soil surface can already be dry in the first few days of March. Even when it rains in spring, the exposed soil at the surface
on the coralline ground dries and cracks shortly afterwards. The high summer temperatures are responsible for high levels of water evaporation from the soil and moisture in the soil falls rapidly in March/April to remain very low till the next rainy season. In the dry season the Islands look parched and arid. With an average rainfall of 520mm of rain, the Maltese Islands lie in the semi-arid region (Role, 1998). One important source of water for plants in the dry season is dew. Haslam *et al*. (1977) describes dew as particularly heavy in the dry season. This is due to the high air temperature since the hot air is more capable of holding water vapour than a cold atmosphere. The vapour then condenses to dew when the temperature falls at night. The Maltese Islands are also very windy. Spring and winter are more windy than the other months, with most windy days occurring in April. Much of the wind comes from the North West, (*Majjistral*). The dry cold North-easterly wind (*Grigal*) is also frequent. Hot and humid southerly winds are also frequent, such as the Southwest (*Lbiċ*) and the Southeast (*Xlokk*). Such southerly winds blow from over the Sahara, picking up dust from over the desert. As it crosses the Mediterranean Sea it becomes moist. On reaching the Maltese Islands these winds are thus hot and humid, too often depositing red dust that brings fresh nutrients to the soil. Given the smallness of the Maltese Islands, no place is farther away than a few Km from the sea, the most is about 6 - 7 Km. Thus sea spray can be blown on all vegetation on the Islands according to weather conditions, and so all species must be more or less salt-tolerant (Haslam *et al.,* 1977). In coastal areas salt can be seen in the pockets of soil as the sea-water evaporates, leaving behind a thin white film of salt. Wind and sunshine take their toll on plants as they both increase transpiration (loss of water from plants). Another effect of wind is that it shapes vegetation; on exposed areas such as coralline plateaus or on hills, plants are bent by the main winds and/or kept low and become contorted. The hours of peak sunshine are in summer when cloud cover is minimal. July is the month with the longest hours of sunshine and December with the shortest period of 5 hours (Schembri & Baldacchino, 1992; Azzopardi, 1995). In July, out of 13.4 hours of daylight, 11.8 hours are sunshine (Azzopardi, 1995). The temperature over land is also influenced by the nearby sea at different seasons of the year. Sea breezes during the day and land breezes during the night are also common on the warmer days. The **Greenhouse Effect** (warming of the planet due to "greenhouse gases" like carbon dioxide) is expected to lead to **climatic changes** in the future over the Mediterranean area. Predictions of changes due to global warming show an increase in precipitation in the central and eastern areas of the Mediterranean in the autumn (King *et al*., 1997). A Climate in Malta report issued by the National Statistics office in October 2011 shows that the average air temperature over Malta has risen by 1.1 degrees Celsius since 1951.

Soil - Locally there are 3 main types of **soil**. These kinds of soil are mainly the product of climate, the parent rock and also human interference (Azzopardi, 1995). The oldest and most fertile is the **terra-rossa** (red) soil and the younger soils are the **Carbonate Raw** and **Xerorendzina soils**. The terra-rossa soil was formed in the Pleistocene, 1.6 Million to 10,000 years ago, during a wetter climate (Schembri & Baldacchino, 1992; Haslam *et al*., 1977). These soils owe their reddish colour due to iron oxides. In drier soil climates, especially those of the summer months, dehydration (drying) of the oxides of iron takes place and this imparts a reddish colour to the soil. This reddening of the soil is called **rubefaction** (Briggs *et al*., 1997). Under an evergreen Oak woodland Mediterranean soils are brown, rich in organic content. As degradation of the vegetation progresses to maquis and to garigue, the soil contains less organic content and is also eroded, and the soil tends to evolve from the Brown Mediterranean Soil into Red Mediterranean Soil (Briggs *et al*., 1997). Terra-rossa soil is found mostly on the coralline limestone. The other soils are of more recent origin and contain less organic matter, more calcium carbonate and are still forming (Schembri & Baldacchino, 1992). The organic content in uncultivated Xerorendzina soils may however be high (Haslam *et al*., 1977). Disturbed soils are common nowadays, as soils are transported from one place to another, as happens in the reclamation of agriculture from the garigue. Since the Maltese Islands are formed from calcareous rocks (i.e. containing calcium carbonate) the soils usually contain a rich content of calcium. The flora of the Maltese Islands has thus adapted for such alkaline soils. The terra-rossa soils contain less calcium than the others because through its greater time of existence rain water has decomposed the calcium and carried it down through the soil profile. Every year, especially after heavy rains great quantities of soil are lost to the sea through erosion. Much of this erosion comes through agriculture and other disturbance to natural or natural-like ecosystems. In a natural system, the soil is protected by the vegetation cover from wind and rain. When the vegetative cover of the soil is removed, the soil is left exposed to the elements of nature. In this way soil is carried away by wind and rainwater. Improper protection of the soil at the edges of fields such as the absence of a vegetation cover, lack of or destroyed rubble walls are among the main reasons for the loss of soil. Deep and wide channels (**gully erosion**) can be seen in fields, especially in tilted lands, after heavy rainfall. Soil is also lost by ploughing the land on windy days especially when the surface of the soil is dry. Driving vehicles off the road also causes soil erosion, and damage to the flora, fauna and the habitat itself. In the autumn, when warm weather meets colder air, storms can occur. These autumn storms also wash away the bare and dry soil. In summer the soil usually has little cover, and on windy days the fine soil is easily blown away to over the sea. However wind may also help in increasing the soil; the south and south-east winds coming from over the Sahara deposit red Saharan dust with rain. Surfaced roads and buildings also

impede the water from being absorbed by the soil, and this larger amount of water has greater potential to carry soil. Roads in valleys for example increase water runoff and in coastal areas much soil is wasted away to the sea every year. The Maltese Islands once had forested areas, and deforestation of these forests several hundred years ago caused much loss of soil by erosion. The (Mediterranean) soil is also threatened by (the frequent forest) fires during the summer drought (Role, 1998). The soil loses its protective cover of vegetation, leaving the soil exposed to the coming torrential autumn rains, causing erosion (Role, 1998). Intense fires generate enormous heat which can alter soil properties, reduce infiltration, increase runoff and promotes erosion (Kutiel and Inbar 1993). Fires do occur in the Maltese Islands but since the natural cover of woodland or shrubby species is not that heavy, fires are usually relatively small. In the past however when woods were present fires would have been larger bringing about major effects on both the vegetation and the soil. One of the major effects of erosion is that when the topsoil is removed much of the soil's water-holding capacity and much of its nutrients are being lost. This makes it harder for plants to grow. So the land remains more barren, so less protection is afforded to the remaining soil. Once again erosion carries off soil… and the cycle continues.

Malta as an island and as part of the continent - The occurrence of fossils of animals like bears, wolves, foxes and elephants in the Quaternary deposits suggest that Malta was once part of Europe or Africa, or connected to both. Borġ (1910) says that when the Maltese Islands rose above sea level they were connected with the mainland and later they separated from Sicily and North Africa by the submerging of land. Around 6-7 million years ago the narrow straits at Gibraltar in the western Mediterranean closed (King *et al*., 1997; Azzopardi, 1995; Schembri & Baldacchino, 1992). This was caused by the movement of the African continent. The crust of the Earth is not solid, but is made up of a number of "pieces" called plates. These plates are not static but move very slowly. This movement is made evident by the earthquake activity and presence of active volcanoes in the Mediterranean. The African plate moves towards the Eurasian plate; it is this movement that caused the closure of the straits. This closure meant that Atlantic sea water no longer flowed in the Mediterranean. Consequently the Mediterranean dried out, and the sea bed became exposed land over which animal life could migrate and plants could colonise.

Some authors like Haslam *et al*. (1977) and Borġ (1936, 1910) believe that the Maltese Islands were connected to both Sicily and North Africa. According to Borġ, Malta was part of a land bridge that connected Sicily to North Africa, and the Maltese Islands became separated first from Sicily in the Pliocene ("or at most , towards the beginning of the Ice Age in the Pleistocene or early Quaternary") and then in the early Quaternary from Africa. Schembri & Baldacchino (1992) note that the sea depth between Malta and North Africa is very deep (more than 1000 m in certain sites) and as such Malta might have never been connected to Africa. No fossilised remains of animals that existed solely in Africa have ever been found, and those of the Hippos and Elephants belong to species that at that time inhabited Europe (Schembri & Baldacchino, 1992).

The Islands became islands again in the Miocene or early Pliocene epoch by the opening of the straits (once again due to movements of the African plate) some 5 to 5.5 Million years ago, and Atlantic water refilled the Mediterranean (Schembri & Baldacchino, 1992). Azzopardi (1995) mentions that the thawing of ice at the end of one of the last Ice Ages around 5 million years ago caused the level of the Atlantic Ocean to rise and water entered through the straits of Gibraltar, and so in this way Malta have become separated from Sicily. Hsu (1972) also proposed a "giant marine waterfall" that flowed through the straits in latest Miocene. However in the last Ice Age much of the water that evaporated into the atmosphere precipitated as ice. The Ice Age was a period of time during which the climate was colder and many parts of Northern and Central Europe were covered by masses of ice; the last one occurred in the Pleistocene epoch from about 2 million to 10 thousand years ago. Water no longer flowed to the oceans but was locked in ice, and the sea level dropped. Once again Malta might have reconnected again to Sicily (Azzopardi, 1995; Schembri & Baldacchino, 1992), and if so happened then once again plants and animals of Europe mingled with Maltese wildlife. During the Glacial Epoch (20,000-15,000 years ago) the climate in the Mediterranean was cool and dry, but farther north the climate was harsh with glacial conditions (Briggs *et al*., 1997). At this time the Mediterranean must have become a refuge for European species which were unable to cope with the harsh conditions of Europe.

The Origins of Maltese Flora

When the Maltese Islands rose above sea level some 10 Million years ago, the exposed rocks must have been at first devoid of life. However seeds of plants could colonise the islands by travelling with the wind from neighbouring lands, or brought by migratory birds. They could have also reached here by eventually colonising the land bridge that connected the islands to other parts of the Mediterranean, or being involuntarily carried by the animals that crossed over.

There is evidence that some of our flora has inhabited the islands for thousands of years. Fossils, pollen grains or other remains indicate that species like Aleppo Pine, Hawthorn, Judas Tree, Field Madder, Bay Laurel, Olive, species of Scorpiurus, species of Plantain and also members of the Asteraceae (daisy family) have been here since ancient times. The following dates and records come from Trump (1966) and Schembri & Baldacchino (1992): remains of Hawthorn, Judas Tree and Ash come from 7200 to 6500 years ago; at about the same time wooden roofing of prehistoric temples belonged to the Olive; pollen grains of the Pine, Olive, Scorpiurus species and Plantain species were found in a bronze

age cistern, 4500-3500 years ago. Leaves of the Bay Laurel were found in Quaternary deposits by G. Żammit-Maempel (1977); these deposits of the Bay Laurel have not been dated exactly and could be 1.7 to 0.1 million years old (Stevens & Baldacchino, 1998). In Quaternary deposits species of *Quercus* (Oak species) were also found (Hunt, 1972). Neolithic remains from Skorba include the presence of species of *Fraxinus*, *Crataegus*, and *Cercis* (Metcalfe, 1966); in remains from the Chalcolithic (Copper) Age were found Olive and *Phillyrea* species (Renfrew, 1972). The Olive existed in the Maltese Islands even during the Tarxien Phase, c. 3000-2500 BC (Metcalfe, 1966). Other species found in remains (from Stevens & Baldacchino, 1998) - species of *Rubus*, found as pollen grains in Quaternary deposits (Hunt, 1997); species of *Rhamnus* from Quaternary deposits (Hunt, 1997). Species found in deposits but no longer occur in the wild in the Maltese Islands include species of *Corylus*, *Cedrus*, *Ostrya*, *Alnus*, *Carpinus*, *Tilia*, *Betula* and *Podocarpidites* (Hunt, 1997). *Podocarpidites* is extinct altogether, not only from Malta.

Today we regard our flora as mainly Sicilian/Italian in character, especially to the Hyblean region (South-eastern part) of Sicily (Lanfranco, 1992; Lanfranco -paper; Thake, 1990; Borġ, 1936), though there are species with affinities to both west and east parts of the Mediterranean and to North Africa. The majority of plants (and animals) that still survive today have come from Sicily or Italy during the last two periods of the Ice Age as a result of a land bridge that connected them together (Thake, 1990). Other species were here from much more before - the Maltese Rock-centaury has travelled here during the first connection with Sicily. This is considered as a primitive species of the Tertiary Period (Lanfranco, 1996). In **Traces of the Quaternary Ice Age in the Maltese Islands**, Borġ (1936) writes:

"The Flora of the Maltese Islands, like the Flora of Italy and Sicily, is a compromise or an overlapping of the Flora of the western basin of the Mediterranean, with that of the eastern, and has been described as, and is in reality, mainly Italian in character. But our Flora includes also a few species, now almost verging on extinction, which are markedly African in character and point out to an influx of African vegetation in the Pliocene or very early in the Ice Age".

However, earlier on, Borġ (1910) considered that the Maltese Flora include species of great antiquity, the survivals of the extinct flora of the Miocene and Pliocene, coming mostly from the African mainland; that these Islands have many flora species in common with North Africa; that a number of ancient species exist that must be the survivors of the Quaternary and Prehistoric flora of Malta and North Africa, and of the "submerged land between our Islands and the African coast"; and that the flora of these Islands is not mainly Sicilian in origin. Borġ (1910) states that it is mostly from the African mainland that plants (and animals) came over to our territory, and our flora and fauna are therefore mainly African. He continues by saying that since our climate did not change since prehistoric times, our flora would essentially be African, had it not been for the destructive effects of humanity including the importation of flora from Sicily and the Levant, mostly for commercial purposes. According to Borġ there are many species in common with those of North Africa, and indeed some common species considered native today were originally aliens. Borġ attributes this by giving examples of some floral species namely:

- The Sandarac is native to North Africa. It also occurs in an isolated locality in SE Spain (Haslam *et al*., 1977). Formerly it was common on the Island (Ciantar Abela, 1772). Borġ states that the seeds of this species is not properly equipped to travel long distances by the wind and is also not eaten by birds. So it is presumable that this tree found its way into Malta when the Island was connected to Africa.
- The Egyptian St. John's-wort is another species native to North Africa, another remnant of the "ancient Malta - African flora". The seeds cannot travel on water for long distances, neither are they eaten by birds. So the only way it could be found here is assumed by Borġ in the same way as for the Sandarac.
- The Maltese Rock-centaury is our national plant and is endemic. Borg attributes this species as an only survivor (together with *Melitella pusilla*- see below) of a "peculiar flora essentially local." This species is a primitive species, probably from the tertiary period, and likely to be related to the genus *Centaurea* and *Serratula* (Lanfranco, 1996).
- The Spanish Broom is another species that according to Borġ has found its way when Malta was connected to mainland Africa. This is native to South Europe and North Africa, "especially common in Spain and Algeria".
- The Malta Fungus is a rare plant found on Fungus Rock and opposite cliffs in Gozo and at Dingli Cliffs in Malta, and is found on several Mediterranean Islands (Lanfranco, 1996). According to Borġ, the original home of this plant was most probably North Africa, the Maltese Islands and the land between Malta and Africa now submerged.
- The Yellow-throated Crocus is a rather rare and localised plant in the garigue, found at Dingli and limits. "The Crocus is an old genus of plants, and our ("Maltese") variety points to the long continued existence of this species as native of these Islands".

Note: The *Melitella pusilla* referred to by Borġ has been transferred to the genus *Crepis* by German botanist Merxmuller in 1968, and has been recorded in several foreign countries including in Australia (Lanfranco, 1996).

Dr. A Caruana Gatto (1910) stated that he did not agree in Dr. Borġ's conclusions about the (African) origin of our flora, but that the flora of Sicily and the Maltese Islands had a common origin. When the Maltese Islands were formed the surrounding land area was covered by subtropical vegetation (Haslam *et al*., 1977). Relics ("remainder") of this age are

trees like the Fig, Carob, Judas Tree, Myrtle and the Malta Fungus (Haslam *et al*., 1977). Lanfranco (1996) however state that the Carob is probably native of the eastern Mediterranean and introduced into Malta in ancient times, and that the Fig was also introduced here by the first human settlers. Blamey and Grey-Wilson (1993) state that many typical Mediterranean plants like the Carob, Olive and Judas Tree are relicts from before the Tertiary Ice Ages. Other relicts from the Ice Age that survive here include the White Poplar, species of Willow (*Salix* sp.), and Hawthorn (Haslam *et al*., 1977). Another effect of this age was that flora that could not cope with such a cold climate died away from northern Europe covered in glaciers, but kept on living in the south. As such Islands in the Mediterranean must have been a last refuge where floral species that live in warm temperatures could survive. This accounts for some of the endemic species found in the Maltese Islands, like the Maltese Rock-centaury (Schembri & Baldacchino, 1992). This plant favours the southern and south-west cliffs where sunshine is at its most, and sheltered from cold northerly winds. These cliffs are their last remaining stronghold. According to Haslam *et al*. (1977) 66% of our flora is Mediterranean species; some of these are North African species with a limited European distribution. The remainder is made up of cosmopolitan species. Some of the 66% are restricted to islands and dry coasts with a dry season of up to 6 months, and species common in the Maltese Islands include the Egyptian St.John's-wort, Azure Stonecrop, Shrubby Kidney Vetch, Maltese Savory, Maltese Fleabane and the Southern Star Thistle; other rare species include the Sandarac (Haslam *et al*., 1977). Haslam also identified only one endemic species (the Maltese Rock-centaury) and this was "demonstrating the relatively recent isolation from the mainland". Guido Lanfranco (1969) identified around 8 endemics. Lanfranco (1996) identified over 20 species as endemic/sub-endemic. Some are endemic to the Maltese Islands only, while others are sub-endemic, i.e. found in the Maltese Islands and in a few other nearby Mediterranean Islands, e.g. Lampedusa (see table of endemic and sub-endemic species below by Lanfranco & Lanfranco, 2003). Left in isolated islands, and cut from others of same species, plants become adapted to the special local environmental conditions and themselves evolve into endemic species or subspecies/varieties. Some 10 million years ago in the late Miocene, when the Maltese Islands were above sea level, the new land provided a habitat that plants and animals could eventually inhabit. Some species may have found the conditions on the islands favourable and became established, but others didn't and died out. Later on still with the arrival of mankind, other plants found their way here as man brought them with him to use them for his food. Nowadays many exotic species have been accidentally or deliberately introduced and escaped into the wild. Essentially our flora must contain a mixture of:

1) Plants that have found their way here naturally by colonising the land bridge (connection to Sicily)
2) Plants that have found their way here naturally from the surrounding or far away land mass with vectors like wind and migratory birds
3) Plants that after reaching here adapted to the new environment and became endemic
4) Plants that have been deliberately or accidentally introduced by man and escaped into the wild

It must be said that at first the new rocky land could not support all plant forms. The bare rocks without soil must have been colonised at first by simple plant forms. These must have paved the way for slightly more complex flora, and these must have again prepared the ground for higher plant forms, and so on. Each community of plant form contributed to the organic content of the soil, by adding fallen leaves, etc. They also contributed to protect the developing soil from erosion by rain and wind. Gradually and in great lengths of time as the soil layer deepened and as its organic content increased, the water retaining capacity of the soil also increased and this made it possible for higher plant forms to survive.

The native flora of our islands today consists of species that are also found wild in other parts of the Mediterranean, and some species found also in North Africa. Lanfranco (1992) considers our flora most similar to Sicily especially the south-eastern part to which the Maltese Islands were once connected.



The White Willow *Salix alba* is considered a survivor from the last ice age

Endemic and sub-endemic plant list (source: Lanfranco & Lanfranco, 2003)

Family	Species
Amaryllidaceae	*Allium lojaconoi* *Allium melitense*
Asteraceae	*Anthemis urvilleana* *Chiliadenus bocconei* *Helichrysum melitense* *Hyoseris frutescens* *Palaeocyanus crassifolius*
Brassicaceae	*Matthiola incana* subsp. *melitensis*
Chenopodiaceae (Amaranthaceae)	*Cremnophyton lanfrancoi* *Darniella melitensis*
Euphorbiaceae	*Euphorbia melitensis*
Iridaceae	*Romulea melitensis*
Orchidaceae	*Anacamptis urvilleana* *Ophrys melitensis*
Orobanchaceae	*Orobanche ramosa* subsp. *melitensis*
Plumbaginaceae	*Limonium melitense* *Limonium zeraphae*
Potamogetonaceae	*Zannichellia melitensis*

Table 1- Endemic plant species (source: Lanfranco & Lanfranco, 2003)

Family	Species	Found in Malta and-
Elatinaceae	*Elatine gussonei*	Lampedusa
Plantaginaceae Asteraceae Apiaceae	*Linaria pseudolaxiflora* *Filago cossyrense* *Daucus lopadusanus*	Pelagic Islands.
Poaceae	*Desmazeria pignatti*	Hyblean region of Sicily
Asteraceae Orchidaceae Iridaceae	*Senecio pygmaeus* *Ophrys caesiella* *Iris sicula*	Sicily
Asparagaceae	*Scilla sicula*	Sicily and Calabria.
Lamiaceae	*Micromeria microphylla*	Sicily and Puglia region (Italy)

Table 2- Sub-endemic plant species (source: Lanfranco & Lanfranco, 2003)

Note: *Allium melitense* is "possibly endemic or "may just be a dwarf variant of *Allium commutatum*" (Lanfranco, 2015), or another species altogether, *Allium polyanthum* (Mifsud & Mifsud, 2018). *Romulea melitensis* is "doubtful" and *Romulea variicolor* is a new sub-endemic (Mifsud, 2015). *Orobanche ramosa* subsp. *melitensis* (*Phelipanche mutelii*) is no longer justified as endemic (Lanfranco, 2015). *Filago cossyrense* is "endemic to the Maltese Islands and Lampedusa and may be just a local variant of *Filago pyramidata*" (Lanfranco, 2015). *Daucus lopadusanus* "may be an extreme variant of *Daucus carota*" (Lanfranco, 2015). *Ophrys caesiella* has also been described from North Africa (G.I.R.O.S.), and from Southern Sicily (Delforge, 2006), and is now regarded as a synonym of *Ophrys fusca* by Kuhn *et al*. (2019). Lanfranco (2015) describes the geographical range of *Iris sicula* as the Maltese Islands, Sicily, Lampedusa, Egadi Islands and possibly also Isola di San Pietro in Sardinia. Lanfranco (2015) places *Darniella* as *Salsola*, and *Chiliadenus* as *Jasonia*. Other descriptions on endemic and sub-endemic species can be found in the text describing the species. Of further note we can here include: Lanfranco & Lanfranco (2003) describe local *Orobanche densiflora* plants as in an endemic form *melitensis*; however these plants could be *Orobanche sanguinea* (Domina & Soldano, 2009); the Shrubby Kidney Vetch as endemic *Anthyllis hermanniae* subspecies *melitensis* (Brullo *et al*., 2006); *Iris pseudopumila* is a sub-endemic with Sicily and southern Italy (Lanfranco, 2015, 2007); *Calendula sicula* is restricted to south-east Sicily and the Maltese Islands (Lanfranco, 1989); *Euphorbia exigua* var. *pycnophylla* may represent a Pelago-Maltese endemic (Lanfranco, 1989); *Jacobaea maritima* is considered a sub-endemic *sicula* (Passalacqua *et. al*, 2008). Mifsud (2009) described small-flowered forms of *Ophrys bombyliflora* as var. *parviflora*, and originally thought to be endemic; however these have also been found on Sicily and possibly elsewhere (Kuhn *et al*., 2019). In 2018 Brullo *et al*. described the Common Ferule as a new endemic species *Ferula melitensis*. *Antirrhinum siculum* is a sub-endemic (Siculo-Maltese) - Lanfranco, 2015. *Urginea pancration* has a Central Mediterranean distribution (Lanfranco, 2015).

The Habitats

Woodland (*Bosk*) - This habitat is rare in the Maltese Islands and only a few remnants of original woodland exist, formed by small woods of Holm Oak, an evergreen tree of the climax Mediterranean vegetation. Some of these trees are found at Wardija (Ballut tal-Wardija).This population of Holm Oak in the area probably represents the oldest oak trees in the Maltese Islands. These trees form one of the four Maltese forest remnants that date back more or less 1,000 years ago (MEPA, 2011d). The other 3 Holm Oak remnants occur at l-Imġiebaħ in the limits of Mellieħa, Ta' Baldu/Wied Ħaż-Żrun in the limits of Rabat (Malta), and at Buskett. According to Borġ (1933) large Holm Oak woodland once existed that stretched from Wardija to the west towards Mosta (Ġebel Għawżara) to Ballut ta' Ras il-Ġebel (limits of Għajn Tuffieħa). The Aleppo Pine is another major tree in Maltese woodlands. A main woodland ecosystem is found at Buskett, a semi-natural wood established in the 17th Century under Grandmaster Lascaris (1636-1657) where the

dominant trees are Aleppo Pine and Holm Oak. Other trees represented at Buskett include Italian Cypress, Carob, Olive, and Bay Laurel. Along the watercourse at Wied il-Luq there are English Elm, Narrow-leaved Ash and White Poplar among the **riparian** wood (see later). A number of shrubs and smaller trees occur; the most common are Hawthorn, Mediterranean Buckthorn, Lentisk, Bramble, Honeysuckle, and climber plants of Ivy, Smilax, Wild Madder and Spiny Asparagus. In parts of Buskett the growth of shrubs occurs where their seeds have been dispersed by vectors such as birds. These shrubs and other flora growing beneath the larger trees result in a wooded environment important for a number of wildlife species. Trees like Aleppo Pines and Italian Cypress are also growing on their own at Buskett on the coralline ground, while Narrow-leaved Ash grows naturally in the abandoned fields, their seeds transported by the wind. Several Holm Oak saplings can also be seen growing beneath the mature trees. Threats to Buskett (and other woodlands) include lack of proper management, degradation and also deliberate burning, e.g. in summer 2011.

At Selmun, a large and ancient Aleppo Pine, believed to be hundreds of years old and very probably of true indigenous stock was destroyed by deliberate burning in December 2009. The tree is survived by numerous Aleppo Pine trees that are growing naturally from its seeds. The Aleppo Pine was an important member of the Maltese woodland, as can be seen from its pollen grains found in ancient remains (Evans, 1971; Żammit-Maempel, 1982; Hunt, 1997) and written evidence such as those by Al-Ħimjari in the 14th Century, as well as place names such as Wied Żnuber and Għajn Żnuber indicating the once presence of these trees (Stevens & Baldacchino, 1998). Today the Aleppo Pine is one of the commonest tree found planted in afforestation and other sites including urban, and also generates naturally especially on coralline ground. Many of the Aleppo Pine trees found in the Maltese Islands have been planted from the 1950s onwards (Borġ, Joe, 1998). Some however have been grown earlier from seeds brought from Għajn Żnuber; the origin of the Aleppo Pine trees at Buskett is thought to be from Għajn Żnuber (Borg, J. -1915, 1922, 1927; Baldacchino, 1984; Baldacchino *et al*., 1990 a, b). Much of the original native stock is thought to be extinct, and many trees found in afforestation areas are of imported origin. Sommier & Caruana-Gatto (1915) wrote about the destruction of Aleppo Pine trees from the Maltese Islands at the end of the nineteenth Century. Al-Ħimjari describes the Maltese trees in the Arab period (870-1054 A.D.) as the Aleppo Pine, the Sandarac and the Olive (Brincat, 1995). Wood of the Sandarac trees growing in Malta could have been used for furniture in the Roman period (Lanfranco, 1998). Jean Quintin d'Autun (Quintinus) wrote in 1536 about the Date Palm *Phoenix canariensis* and that they didn't produce fruits; he mentions also Cotton, Thyme, but also the aridness and the lack of trees (Lanfranco, 1998). As in most Mediterranean countries, olive tree cultivation and the production of olive oil were widespread in Malta, especially during Roman times. Over the years this activity declined especially when cotton cultivation became popular around 200 years ago. However old Olive trees are still found nowadays and are among the old plantations in Malta and Gozo and now forming semi-natural woods. The trees at Bidnija are estimated to be 900-1000-2000 years old ("several years old"-Lanfranco, 1989) and according to Borġ (1933) is a wood remnant from the Roman period (Stevens & Baldacchino, 1998). Several afforested areas of different sizes are also spread throughout the Islands, and although these are not natural they also have a value for wildlife, especially if they are managed properly and/or left to develop as natural woodland. An appreciable afforestation woodland site is found at Miżieb where the Aleppo Pine is well represented. During the 60s and 70s alien trees like species of Acacia and Eucalyptus were included in afforestation in the Maltese Islands. Nowadays importance is being given to native trees as well as native shrubs. When the trees are small they first form a kind of maquis habitat and then after time they form woodland. Also as the trees and shrubs grow they will offer habitat for birds that will bring the introduction of plants through the seeds found in their droppings or when regurgitating them. For this reason birds are important in the dispersion of plants and in the formation of maquis/woodlands. In a woodland, where trees are dense their leaf litter and less sunlight allows for only a small amount of undergrowth flora to grow; where the trees are more open more sunlight reaches the floor and a greater amount of flora grows beneath them.

Riparian wood (*Bosk tan-Nixxigħa*)- Woods along watercourses are rare in the Maltese Islands, and much of them have been destroyed or largely degraded. The fertile and humid areas are used for agriculture, and alien species of trees like Castor Oil Plant, species of Acacia and Eucalyptus, and other vegetation have taken their place in many areas. The native trees of this habitat are deciduous, their leaves falling off during autumn to remain leafless in winter. The White Willow and the Mediterranean Willow, White Poplar, Narrow-leaved Ash, Hoary Elm and Chaste Trees are trees of these woods. These are all rare and endangered, with the White Poplar the most numerous and widespread of all.

Maquis (*Makkja*) - Locally can be found mainly along the slopes and bottom of valleys, or in sloping rocky ground. The slopes of valleys are sheltered from the wind, and in the past also from goats, and this lead to the formation of a more dense and shrubby flora than that on the garigue plateaus. In the Mediterranean's ecological succession the garigue can regenerate into maquis. The maquis community is amongst the most typical Mediterranean vegetation. Usually this habitat is defined by evergreen shrubs and trees higher than 1-2 metres up to 3 metres. It is usually the result of the degradation of woodland, or regeneration of garigue. Species to be found locally include young/short trees of Aleppo Pine, Carob and Olive; shrubs of Lentisk; and climbers like the Spiny Asparagus, Smilax, and Wild Madder. Some trees/shrubs forming the maquis are called **archaeophytes** - these are species introduced in antiquity by man because of their uses (fruits, timber, etc.) and now form part of the "natural" environment. The Carob and Fig are two archaeophytes for example. Since grazing, browsing and collection of plants for fuel has considerably decreased, maquis

is very likely to increase. The Lentisk is a rapidly spreading plant, re-colonising back the open rocky spaces, laying the foundations for the formation of secondary maquis habitat. Its dispersion is mostly brought by birds feeding on its fruits. Another rapidly spreading shrub is the Wolfbane. This shrub is dispersed by the wind. Another maquis component - Evergreen Traveller's Joy - is increasing. The Black Bryony can also be found in the maquis, mostly in the cliff and rdum communities, twining around vegetation for support. Other species that are found in the maquis include the Tree Spurge, Honeysuckle, Mediterranean Heath, Hawthorn, Olive-leaved Buckthorn, and to a lesser extent the Mediterranean Buckthorn, which is well represented at a few sites like for example at Buskett. Rare components of the maquis include the Myrtle, e.g. at San Martin, the Bean Trefoil, e.g. at Wied Anġlu (Għargħur), and Sandarac, e.g. at Mellieħa. The Phoenician Juniper is native to dry regions of the Mediterranean and grows in the wild e.g. at Ballut tal-Wardija, but these originated from cultivation. It is however missing from maquis communities, and could be one of those listed as "missing species" (Lanfranco, 2002) that have for a reason or another gone extinct in the wild from the Maltese Islands. Sommier (1916) remarked that the Phoenician Juniper, Strawberry Tree and the Privet (*Phillyrea latifolia* s.l.) have become extinct from the Maltese Islands because of the activities of man. *Phillyrea latifolia* s.l. has since been re-discovered by Edwin Lanfranco in the seventies (Stevens & Baldacchino, 1998). A multitude of annuals and herbaceous plants are also found in the maquis (and in the woodlands) including Alexanders and Bear's Breeches, the latter can be very common where it occurs. It must be said that there is no clear separation between the flora species of garigue and maquis, and many species of plants can be found in both habitats.

Garigue (*Xagħri*) - One of the most characteristic landscapes of the Islands is the limestone rocky ground with a rugged surface, the **Karst**. The vegetation community of this habitat is often the garigue with a number of shrubs growing in pockets of terra-rossa (red) soil. The Karst forms by the action of water percolating down through the porous rock. Water contains dissolved carbon dioxide, a gas which is present in the atmosphere and extremely important for plants. This forms an acid in the water (called carbonic acid) which dissolves away some of the limestone. By time this forms the rugged rocky landscape. Much of this landscape formed at a time when the rocks had a thicker soil cover than at present. This would have retained the water for a longer period and so help its action on the limestone, dissolving away its calcium carbonate content. The garigue habitat is usually defined by shrubs up to 1-1.5 m in height, with many of them aromatic (smelly). Several flora species are found including the Maltese Spurge, Olive-leaved Germander, and Mediterranean Thyme, the latter often a dominant plant in some plant communities, and under the hot early summer sun it displays its flowers, turning the garigue into violet colour. Rare components of this habitat include the Hoary Rock-rose. In summer much of the shrubs are dormant, reducing their leaf cover or even become leafless and wait for the autumn rains. The garigue landscape looks parched in the dry season, and green in the wet season. Several herbaceous (non-woody) plants also thrive in the garigue and include orchids, irises, squills, crocus and annuals.

Steppe (*Steppa*) - Both the garigue and maquis habitats can form steppe wherever they are degraded. Sea Squill, Asphodel and other bulbous plants, species of grass, thistles and members of the carrot family are plants that can be found in this habitat. Some of these plants are resistant to grazing. Natural steppe habitat is formed on clay slopes, made up mostly of the Esparto Grass. Clay slopes are found around the coast or around hills capped by the upper coralline limestone.

Caves (singular *Għar*, pl. *Għerien*)– There are a number of caves in the Maltese Islands formed by the action of the rainwater dissolving and eroding away the calcium carbonate, or those at the coast helped further by the action of waves splashing on the rocks and bringing about weathering and erosion. These cave habitats often have unique fauna e.g. bats, and may also harbour moist and shade-loving species such as ferns.

Coastal habitats - The coastline of the Maltese islands is c. 192 Km long. Several different types of habitats can be found including **rdum** (*Rdum*) and vertical **cliffs** (*Sisien*). In these coastal areas and along the edges of cliffs some important component of the Maltese flora are found and include endemic species like the Maltese Salt Tree, the Maltese Rock-centaury, Maltese Cliff-orache, the Maltese Stocks, Maltese Everlasting and Maltese Sea-lavender. Rdum habitats are formed when chunks of rock fall down due to erosion of clay. Then an interesting habitat of cliff, and clay slopes, with boulders of limestone resting on the clay and at the bottom, forms the rdum habitat. The boulders that fall down can collide and come to rest with each other forming cave-like formations; these places offer good habitat for ferns and other moisture-loving and shade-loving plants. In coastal flat or gently sloping rocky areas, the land near the sea is subjected to splashing by the waves or to sea spray. Here the surface can be highly eroded and the garigue/steppe community gives way to other plants that resist high salinity levels. Plants that live in these areas close to the sea include Zerafa's Sea-lavender, Glaucous Glasswort, Hairy Catchfly, Golden Samphire, Sea Samphire, and sometimes also Esparto Grass. During the winter cliffs and other coastal habitats are too often battered by storms, waves and spray, limiting the growth of such maritime communities during this season, so much of the growth of these plants occur in summer. **Saltmarshes** (*Bwar Mielħa*) form in the shallow coastal areas where during the rainy season freshwater runs into them from the surrounding hills and out of them into the sea. Much of these areas have however been destroyed by roads, buildings and agriculture and so today these are rare and/or fragmented/degraded. The major area is represented by Għadira nature reserve and by Is-Simar nature reserve. Is-Simar is less saline and holds a reed-bed formed by the Common Reed.

Evaporation of water in the dry, rainless summer months results in the water becoming very saline but still certain plants (halophytes) are adapted to such habitats, including the Golden Samphire, Twiggy Glasswort, Annual Seablite, African Tamarisk and rushes e.g. Sharp Rush and Hollow-leaved Rush. In shallow parts of the water grow *Ruppia drepanensis* and *Ruppia maritima*. Other plants are also adapted to live in the **sand dunes** (*Għaram tar-Ramel*) which today exist only in a few sandy beaches and are degraded. The best example is at Ir-Ramla l-Ħamra in Gozo. Typical sand dune plants, some of which are rare/endangered and/or localised, include the Sea Daffodil, Spiny Echinophora, Sea Holly, Sea Rocket, Sea Spurge, Sea Medick and the Sand Couch. The sand blown inward from the shore by the wind is stabilised by these flora and forms mounds on which they grow. African Tamarisk also grows at the back of these mounds.

Small **freshwater pools** (*Għadajjar*) and seasonal **watercourses** (*Nixxigħat*) - These can be found in the winter in **valleys**. Characteristic vegetation includes the Great Reed, but several other plants also inhabit these areas including Round-headed Club-rush, Water Plantain, Clustered Dock, Water Speedwell, Three-leaved Water Crowfoot, Pennyroyal and Creeping Loosestrife. The bottom of valleys can hold luxuriant vegetation, and even in summer it can be green owing to the moisture of the valley bottom and to the several evergreen shrubs that might occur, often forming maquis communities. Trees such as those of Carob and Fig, find shelter and moisture, and can grow relatively large. In the dry beds of river valleys in summer, too often choked with rubble and gravel carried by flowing water in the rainy season, there can be found plants of disturbed ground. These include Fat Hen, Fennel, White Henbane, and Common Heliotrope. Valleys that have rocky sides are inhabited by a multitude of plant species, and can hold garigue and/or maquis communities, or communities of plants growing in once-cultivated soil.

Rock pools (*Għadajjar tax-Xagħri*) – These form on the garigue, maquis and other rocky ground and harbour species like the Stonewort, Sanicle-leaved Water Crowfoot, Pennyroyal, Mediterranean Star fruit, Crassula, Maltese Waterwort, and in shallow pools the Annual Daisy. Freshwater pools also form in winter and spring on clay since clay is impervious to water, with species like sedges and rushes growing in these habitats.

Disturbed ground - is abundant, e.g. agricultural fields, public gardens and recreational countryside areas. These places harbour a number of wild plants including some alien species e.g. the Narrow-leaved Aster, South American Fleabane and the Cape Sorrel. Some plants grow well in fields that are worked, others in those left fallow for a period of time, or in abandoned ones. There are different types of fields - those that are left fallow in the dry season, others that are irrigated and worked all year round, those with deep soil, others with poor soil, fields in valleys or other sheltered sites, others on exposed hills, etc. The diversity of plant species that grow in disturbed ground often grow fast and flower and seed in a short time. These opportunistic plants readily cover the ground when an area is disturbed. Roadsides are other disturbed areas; in country roads especially, these verges can be full of flowers in late winter and spring, and plants can also be seen growing out of rubble walls.

Disturbance to habitats

With the long history of man on the island the primary vegetation has disappeared and natural habitats have been altered and there is left very little space where the original environment has not been touched. This means that almost all of our habitats, even those called "natural" are not truly natural at all since they were subjected to change by man. Virtually all land that was able to be cultivated was exploited and farmed. For thousands of years the landscape of the Mediterranean has been altered by man, from a natural one into one shaped by mankind. The present natural environment of the Mediterranean can be regarded as the degraded remnants of a landscape which was once dominated by mixed evergreen and deciduous forests; and that this situation has been brought over by climate and anthropogenic (human) influence on the landscape (Briggs *et al*., 1997). The Maltese Islands are no exception; the first settlers arrived some 6000 years ago (Haslam *et al*., 1977) or even earlier, c. 7000 years ago (Schembri & Baldacchino, 1992; Renfrew, 1972) and remains around their settlements show that these were already farmers. It is possible that some of the terracing around temple sites may have originated in prehistoric times (Haslam *et al.*, 1977). They cleared the land for their fields, and used wood for fire and to build their homes. They also brought domestic animals like sheep and goats. Trees growing on the islands such as those of Olive and Pine were also cut and used to roof the temples, and by 1600 BC wood must have been already scarce (Haslam *et al*., 1977). Trees in the Maltese Islands were destroyed in large quantities during the Turkish Invasion, especially during the Great Siege of 1565; trees were cut for the invaders' needs and also to deprive the locals from firewood and shelter (Balbi, 1568; Bradford 1961). During difficult periods the Maltese people themselves turned to trees for firewood, as happened in world wars 1 and 2 (Lanfranco, 1998). G. N. Godwin writes in his Botanical Notes (1880) that "Gozitans were formerly in the habit of destroying all trees along the roads lest their roots should lessen the yield of cotton from the adjacent fields". In 1904 60.5 square miles were under cultivation in the Maltese Islands, with wheat and barley, potatoes, grapes and cotton were the chief produce of the land (Kendall, 1910). Cotton, or *Coton* from the Arab *Qutun* (Maltese: Qoton) used to be widely cultivated in the Maltese Islands.

So throughout the centuries of human occupation on these islands, the land was exploited for one need or another. The natural landscape was altered as generation after generation used the land. Agriculture on the islands must have been intense and even today we can see many abandoned terracing and rubble walls of former times, in virtually all the

countryside that is left, including hill slopes, in rdum areas and on garigue plateaus. Arid rocky areas lie with rubble walls surrounding rocky land with very little soil, and abandoned slopes often have rubble walls collapsed or otherwise with the result that terracing is not well defined. In all these places modification of the natural environment has taken place. On rocky land the natural vegetation slowly forms back again with many low and hardy shrubs. Connected with degradation is the removal of soil through erosion processes, and so regeneration into maquis and later on to wood can be a very slow, and not always a possible, process. This entire abandoned land stands as a monument showing that this land was once farmed or used by the farmers' livestock for grazing and browsing, and so its original natural cover has been destroyed. The vegetation has also suffered through fire. One should also note that in former times, plant material including dry vegetation used to be collected as fuel for burning. Today that grazing and browsing has decreased the garigue vegetation should make a comeback and grow larger, and eventually after several years (and if undisturbed) turn into maquis.

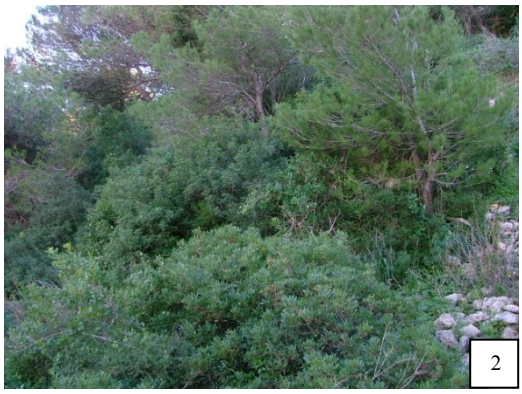
Today much of the surface area of the Maltese Islands is built up. This means that a number of habitats important for plants and other wildlife have been sacrificed for development. Building encroaches over the edges and slopes of valleys. Coastal sites are destroyed by tourist development, destroying important ecosystems. Development near sandy beaches, often illegal (but have become "legal" through time!), "cleaning" beaches from vegetation, and the exodus to the beaches in summer time resulted in sand dune habitats mostly destroyed and degraded and several plants of this habitat are threatened/endangered or became extinct. Quarries turn garigue sites into holes and generate dust which settles onto surrounding vegetation. Thousands of existing trapping sites degrade the garigue, as patches of land are cleared from native vegetation (note: finch trapping has been banned for 5 years, but re-introduced in 2014!). Planting of exotic alien trees especially species of Eucalyptus and Acacia has been a common practice for a number of years. Eucalyptus trees take up huge amounts of water through their roots, and can thus lower groundwater. Their leaves that are shed on the ground contain toxins that inhibit the growth of plants. Valley beds are frequently nowadays bulldozed in summer (!) as a measure to clear the waterway, resulting in the elimination/decrease of typical species. The watercourses are instead often infested by plants of disturbed ground instead of being inhabited by their original watercourse vegetation, and by the rapidly spreading Castor Oil Plant. Watercourses are also subject to pollution by pesticides and herbicides from agriculture. These chemicals in agriculture pollute the environment and end up in the water table. Agriculture also takes up natural habitat and helps in soil erosion when soil is left unprotected. The increase in built up areas and roads increase the rate of flow of rainwater, and this together with the collapsing rubble walls surrounding fields help rainwater to carry soil to the sea, thus resulting in loss of soil. Soil is also transported from one place to another on rocky areas supporting garigue habitats to be reclaimed for agriculture, destroying the garigue habitat community. Off-road vehicles trample on wild vegetation damaging habitats like valley beds and clay slopes, causing erosion. Works on roads produces gravel and stones that eventually are carried by rain water into the valley systems, clogging the bottom, smothering vegetation and favouring the growth of plants of disturbed habitats. In winter and spring on Sunday and public holidays mostly in the afternoon a large mass of people go out in the countryside. This results in enormous pressure on the countryside, and popular public places e.g. Buskett are crowded with people. Trampling of vegetation is one result. One effect of disturbance is the proliferation of alien plants, like the Cape Sorrel and the Castor Oil Plant, which impose a serious threat to the native vegetation. Cars are also parked under trees and onto vegetation which results in the degradation of the habitat - the control of vehicles is one of the active actions that can be taken to control degradation of natural habitats by closing entries with bollards or walls. Flowers like the French Daffodil are collected, either to be admired in private homes or sold, and this has also led to the near extinction of some wild flowers like the Pheasant's-eye and in the decline of others. Within these last 100 years more than 80 species of plants became extinct from the Maltese Islands (Schembri & Baldacchino, 1992). Stevens and Lanfranco (1995) state that in the last century 136 plants became extinct; 3 of these were endemic plants; over 300 other species of plants "are seriously threatened and most may disappear very soon unless some action is taken". Lanfranco (1989) lists about 80 species that have gone extinct in the last 100 years. Another big problem is litter. The introduction of plastic bottles has made the situation worse. In some recreational spots in the Maltese countryside one can encounter litter such as plastic bottles, drink cans and paper, and in other areas even large items such as a mattress or a fridge!



Tracks of a motorcycle left behind at il-Fiddien valley system. This off-road driving in valley bottoms and other countryside areas is common. No effective control takes place to stop this damaging practice

Habitats:
1=garigue 2= maquis 3=woodland 4=disturbed ground 5=cliff and boulders
6=cliff and clay slope 7= saltmarsh 8= freshwater rock pool


1


2


3


4


5


6


7


8

9= sand dune 10 = cliffs rising vertically from the sea 11= fields
12 = riparian woodland of White Poplar along a river valley system 13 = cave
14 = rocky valley with maquis habitat 15 = gently sloping rocky beach 16 = steppe of Esparto Grass on clay slope


9


10


11


12


13


14


15


16

Survival Strategy in the Dry Season for Wild Plants

The Mediterranean Climate has a strong influence on the growth and survival of plants. The dry season in the Maltese Islands presents a difficult time for many wild plants, and many have adopted different strategies for survival.

The most obvious form for survival is for plants to grow only in the favourable season, set seed and then die in the harsh time. This strategy is followed by many annual plants that charge the ground with seeds that will survive the heat of summer, and then respond to the rains to give another generation. There are many examples of such **annuals,** like the Blue Pimpernel, Common Poppy, Annual Daisy, Love-in-a mist, the Red Campion and species of Fumitory. Some species are also **ephemeral** - they will have a short life cycle and produce seeds in a very short time. In the same year these ephemeral plants will have more than one generation.

Others survive underground in the form of food-storage organs such as bulbs (example-Tassel Hyacinth), corms (example-Field Gladiolus), tubers (example Italian Lords-and-Ladies) or rhizomes (example-Pennyroyal). In the dry season, the leaves shrivel and are dry and brown, but the plant is still alive underground, with food reserves that it has gathered in the favourable season stored in underground organs. In this way it escapes the unfavourable season, and then it emerges again in the rainy season. This strategy is followed by plants that are called **geophytes**. There are many of this type, like the Branched Asphodel, Tassel Hyacinth, Narcissus, Sea Squill, Autumn Squill, and species of crocus, iris and orchids. Other plants are tough and resist the harsh summer season. Such plants are termed **Xeromorphic**, i.e. they have a structure adapted to dry conditions, like those shrubs found in the garigue and maquis. The leaves are small, hard and tough, and with a thick cuticle (a layer that covers the outside of leaves). These plants characteristic of dry places are also called **sclerophyllous**. The term sclerophyllous refers to plants of dry places that have hard, tough and small leaves with a thick cuticle. Some plants even produce different smaller leaves in the dry season. Having such small leaves is in fact a characteristic of many Mediterranean plants. A smaller surface area is presented to the external environment, so less water is lost through transpiration. This is clearly seen for example in Mediterranean Thyme, Mediterranean Heath, Olive-leaved Germander, Yellow Germander, Egyptian St. John's-wort, Shrubby Kidney Vetch and the Hoary Rock-rose. The Spiny Asparagus have new fleshy shoots at first, but by the summer season it has thin and hard spikes, which apart from helping in water conservation aid also in defence against herbivorous animals. The thorny structure and aromatic substances of garigue and maquis shrubs also serve for this defensive purpose. The aromatic oils lower surface temperatures, and the pale colour of some plants increases sunlight reflectivity (Briggs *et al*., 1997). Some plants fold their leaves in dry conditions to reduce their surface area, e.g. the Silvery Ragwort. Sclerophyllous plants may also lose some or all of their leaves in the dry season to conserve water; the Tree Spurge, the endemic Maltese Spurge, Spanish Broom, and Bean Trefoil lose them all, and many others like Wolfbane and Olive-leaved Germander reduce their numbers, or sometimes even lose them all. These leafless dry shrubs and the absence of other plants in the dry season give the rocky landscape a parched look that will turn green again by the autumn rains. On the contrary some shrubs may be in their best in the dry season, e.g. the endemic Maltese Fleabane. Some species have deep roots by which they can tap deep underground water. In others the roots are swollen and store food, and in this way the plant is more able to survive the dry season.

Tamarisk trees are able to live in salty areas around the coast. Besides having small leaves the Tamarisk has salt-secreting glands and is able to expel salt from its leaves. This enables the Tamarisk to live in salty areas such as in sand dunes and saltmarshes. Fleshy leaves and stems also play their part in conserving water. Such plants include the Golden Samphire, Rock Samphire, Smooth-leaved Saltwort, and Mediterranean Stonecrop. In their shoots these plants store water which enables them to survive the dry season. Storing water in the tissues of plants also helps in diluting salts and thus enables the halophytic plants to tolerate and inhabit salty conditions. Some of these plants not only survive the dry season but have the best of their growing season in the hotter, dry months.

Transporting pollen from flower to flower-Pollination

Flowers are the parts of the plants that are specialised in bringing about reproduction by the transport of pollen from the anther to the stigma of the same species. The transfer of pollen is called **pollination**. When it occurs in the same flower or between the flowers of the same plant it is called **self-pollination**, and if it occurs in different plants of the same species **cross-pollination**. The pollen grains contain the male gametes (male sex cells), which must reach the ovum (female gamete or egg cell; plural ova) in the ovule for **fertilisation**, and a seed develops. The pollen grain attaches to the stigma and it then germinates to produce a tube through the style to reach and fuse with the female gamete (ovum) in the ovule. An embryo forms that develops into a seed.

In self-pollination that occurs on the same flower, the pollen may just fall onto the stigma below. In other cases plants need a vector that will transport these pollen grains. This can be done by the wind, water and by animals. In wind pollination, there is a larger number of pollen produced than in plants that are pollinated by animals. The most common animal vectors are insects, including ants, beetles, bees, flies, wasps, butterflies and moths, but there are also birds and mammals that disperse pollen. Insects come to feed and collect nectar or pollen. Pollen grains are then transferred from one flower to another as the insect moves on in its search for food. Flowers which rely on insect pollination are usually

brightly-coloured and scented. The scent is not always sweet; sometimes the flowers produce a smell like rotting flesh or dung and this attract insects like flies. The scent acts as a chemical message; this informs its pollinators that food is around. The petals may have bright lines or spots that act as guides, pointing the way to the store of nectar; these guides are called **nectar-guides**. Orchid flowers of the genus *Ophrys* resemble a female bee or wasp or a fly; and this together with their chemical scent attract male bees and wasps that presume that the flower is a female of their own kind and try to mate with it! In so doing pollen grains adhere to their surface and these are then transferred with the insect. Generally in insect pollination mechanism both partners get something in return - the insect gets food and the plant has its pollen grains transported to another flower. This, like seed dispersal by an animal, is an advantageous relationship to both, a relationship that has evolved since the first flowering plants appeared on Earth over 140 million years ago in the late Jurassic period. Flowering plants then came to dominance in the Cretaceous period.

Dispersal strategies of wild plants

One of the most important survival strategies for wild plants is their ability to reproduce and disperse widely. Different species of plants have evolved different dispersal mechanisms. Wind, bird or mammal, and even insects like ants can all be agents of seed dispersal, either in a kind of co-operation or by chance, carrying their seeds further away from the parent plant. Plants can also disperse their seeds without any help at all from neither animal nor wind. Some shed their seeds just underneath, or have an ability to disperse them by an explosive mechanism. Several plants solve this dispersal mechanism by increasing the surface area of the seed or fruit. In this way the motion of the seed falling down to earth is slowed down and is carried away by air currents. A common mechanism is the "**parachute**" type, a plume or feathery attachment. We see this in many flowering plants, like for example in the Sticky Fleabane, Maltese Fleabane, the Maltese Rock-centaury, the Perennial Hyoseris, Wolfbane and Smooth Sow-thistle. Seeds or fruits may have a kind of a **wing**, like the seeds of Aleppo Pine and Sandarac, and the fruit of the Ash. When the seed or fruit is falling from the plant, its greater surface area helps it to fall less slowly to the ground and to be carried further away from the parent by the wind. In other plants the seeds are in a fruit and are discharged through holes when the plant swings with the wind, such as in the Snapdragon and Poppy. This is called **censer mechanism**. The tiny seeds are shaken out through the pores of the capsule when the wind blows. Minute seeds like those of the poppy and orchids are very light and can be transported great distances by air currents. In others, there is what we can call an **explosive mechanism**. The fruit surrounding the seed dries unevenly and it bursts open, shooting out the seeds. The seed pods of the Acanthus "explode" and the seeds are shot a distance away. One can frequently hear such "explosions" during a walk in areas where there are dry flowering stalks of Acanthus. The seeds of the Squirting Cucumber are also dispersed explosively. Some species of plants that live in water or near water produce fruits that are able to float on water and in this case moving **water** is the dispersing agent. Other seeds or fruits are **carried involuntarily by animals** and also by humans. The hooks or barbs or any other features they have catch in the fur or wool of the animal, or clothes of people. At a later stage when these irritate the animal, it scratches them off. In this way, seeds are carried from one place to another and the plant covers new ground. This occurs for example in the genus *Medicago*, in the Spiny-fruited Buttercup, the Blue Hound's-tongue, and Animated Oat among many other species.

Yet still others are in an association with animals to disperse their seeds. This association is beneficial to both, the animal by getting food and the plant by dispersing its seeds. This association is one of many **mutual relationships** found in the natural world. A mutual relationship is one which is of benefit to both. Several shrubs make fruits which are eaten by birds for example, and then the seed is regurgitated, emerges out with the faeces, or carried away by the bird to feed on. In this respect these plants may have two kinds of catering animals - first those that have helped it to carry its pollen grains from flower to flower, then an animal that disperses its seeds. In the Maltese Islands there are several examples of shrubs making fruits as food for birds and in turn their seeds are dispersed by the birds that feed on them. By August some shrubs have fruits ready for the south-moving migratory birds to feast on, including the Wild Madder, Lentisk and Terebinth. The fruits of these plants usually have a bright colour that can easily attract the attention of those birds that feed on them. The fruits of Lentisk are feasted upon by many birds; for example not less than 6 birds of 3 different species (Robin *Erithacus rubecula*, Black Redstart *Phoenicurus ochruros* and Stonechat *Saxicola torquata*) were once noticed visiting a single Lentisk shrub to feast on its fruits on a winter's day. In Ivy thickets full of ripe black fruits there will surely be many Blackcaps *Sylvia atricapilla* feasting on the plenty of food. Ivy thickets must be an important source of food for these and other birds in winter and in their return spring passage from Africa to Europe. Other fruits found in late summer and autumn provide food for birds this time moving into Africa. Hawthorn shrubs have fruits turning red by September, and these plants are often adorned with these hanging "small apples" and without leaves in winter. Birds that feed on them include thrushes. So the plants provide food and energy for birds and in turn the birds disperse their seeds widely.

Defence mechanisms of wild plants

Plants are eaten by a variety of animals. From the tiny organisms like aphids, to larger ones like rabbits, many depend directly on plant matter. Indeed all animals ultimately depend on plants for their food. Animals that feed directly on plants are termed **herbivores**; those that feed on herbivores are called **carnivores**. The sugars that are manufactured by plants as food in the process of **photosynthesis** are a source of food for animals. The cells of plants are also made up of

a thick layer that contains a carbohydrate (sugar) called **cellulose**. Cellulose is mostly indigestible and the animals that feed on plants have an association with bacteria to digest it. Rabbits, for example, have bacteria in their stomach that digest cellulose. Plants employ many defences, from physical to mechanical and even chemical, to try to deter predators. On the other hand animals have throughout their history of evolution evolved mechanisms to combat these defences. This predator vs. prey struggle is called the "arms war" between the animal and plant. Sharp pointed structures such as spines are devices to deflect browsing animals. The Bramble has curved prickles and the Hawthorn has straight spines. The Spiny Asparagus as its name suggest is spiny; it has groups of thin needle-like stems called cladodes. Shrubs growing on dry coralline grounds like the Shrubby Kidney Vetch and the Olive-leaved Buckthorn have pointed ends of their stems to act as spines. Several plants have spiny-tipped leaves, some also aided by spiny structures on their stems. Flower heads may also be protected by a ring of spiny bracts. Some like the grasses have small glassy structures made up of silica which can cut flesh. Nettles have hairs made up of silica which are filled with a poison; the slightest touch can cause the hair to break, its pointed tip cuts the skin and poison squeezes out. Some plants such as the spurges also manufacture poisonous latex. These toxic substances are avoided by many animals.

Photosynthesis

Plants are special. Unlike animals they have the ability to synthesise their own food (organic substances). They are capable of doing this by absorbing water from their roots and carbon dioxide from the air. The energy for this process is derived from sunlight. Carbon dioxide and water are combined, sugars are built and oxygen is released.

Carbon dioxide + water + sunlight ⟶ *sugar + oxygen*

This process is known as **Photosynthesis** (Photo = light, synthesis = manufacture). The energy of sunlight is trapped in a green pigment called **Chlorophyll**. Chlorophyll is found in structures within the cells of plants, called **Chloroplasts**. In photosynthesis plants release oxygen, a gas which is so vital for life on Earth. Indeed throughout their evolution, plants changed the composition of the atmosphere and made life on Earth as we know it today possible.

All other organisms, with the exception of a few micro-organisms, rely on plants for food, directly or indirectly. In releasing oxygen and taking up carbon dioxide plants recycle gases and maintain an atmosphere rich in oxygen. That is why forests are very important - they are not only beautiful and filled with a rich diversity of life forms, but they are also a biological machine, pumping up huge quantities of oxygen into the atmosphere. They are also important for the climate. The destruction of huge forests in Europe, Africa, Asia and South America can result not only in the extinction of several organisms but also in the modification of the climate of the world with all the consequences that this brings, including melting of glaciers and flooding of low coastal places.

Fire and plants

Mediterranean flora throughout its evolution has become adapted to survive the onslaught of frequent fires. Plant adaptations take several forms - trees and shrubs like Holm Oak, Bay Laurel, Fig, Carob, Honeysuckle, Mediterranean Buckthorn, and Dwarf Fan Palm re-grow after fire, as do grasses. Others that are killed by fire regenerate quickly by their seeds; the seeds of the Aleppo Pine are stimulated by fire and germinate in the nutrient-rich ash. Although fire may be considered as a serious threat to the survival of natural communities, vegetation is not destroyed and re-grows back, sometimes with great vigour. Maquis and garigue plants recover quickly. After a fire, the following rainy season sees a flourishing number of species that thrive due to the moisture, light and nutrients. Fire in fact maintains a mixed community of plants, increasing the richness of flora in garigue and maquis communities. However wild fires, like those started deliberately, can be a particular hazard for vegetation as thousands of acres of Mediterranean forests and maquis are completely burned every year. Many Mediterranean plants contain flammable (ignitable) substances such as oils and resin. In the heat of the summer the occurrence of a fire is aided by these substances. Some authors like Mutch (1970) suggest that some plants evolved mechanisms to increase their flammability, thus encouraging fire. Fire must have played a part in the formation of flora communities in the Maltese Islands, together with browsing and grazing by livestock. Throughout the history of Mediterranean plants, many that were not able to survive fire died out, but those that re-grow back in one way or another, like those having underground organs, or their seeds sprouted after a fire, survived.

The water cycle and plants

Plants also take part in the **water cycle**. The water cycle, also called the **hydrologic cycle**, basically consists of water falling down to the ground such as in the form of rain, hail or snow, and water going upwards again into the atmosphere as water vapour. In this way water is recycled. The fate of water falling down to the ground has three possibilities- it either runs off the ground, moving to lower grounds (surface run-off); it can infiltrate the ground; or it evaporates back from the surface of a saturated ground or water body back into the atmosphere. When water falls to the ground and infiltrates the soil it can be absorbed by plants through their roots. This water moves in vessels through plants, and some of it is lost to the air by evaporation from the surface of the leaves or other parts of plants. This loss of water from a plant is called **Transpiration**. Water is also a basic constituent of the body of plants. It helps to support a plant, acting

like a skeleton, and deprived of it many plants will soon wilt. Water is also important because it transports nutrients like nitrogen and phosphorus derived from the soil through the plant.

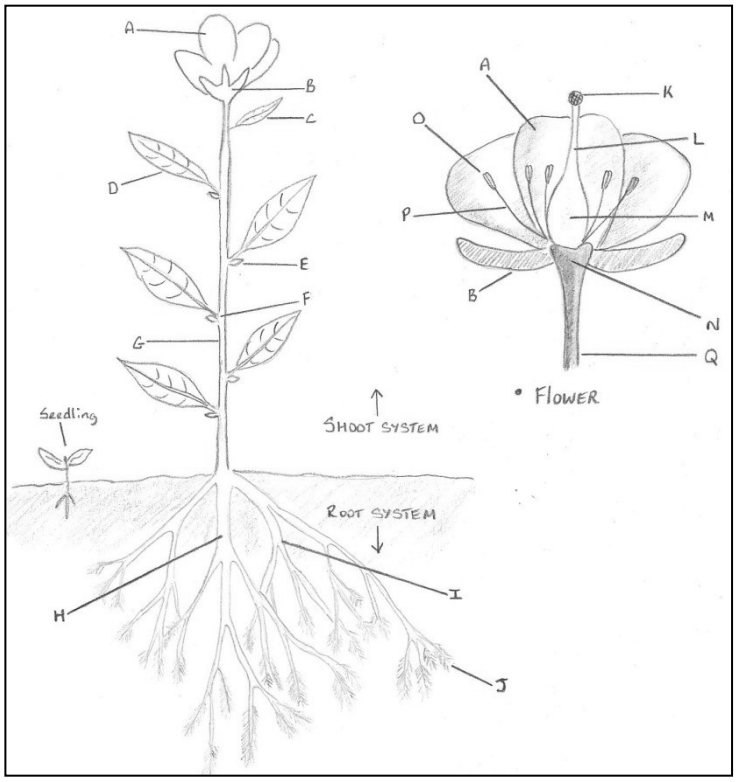
The movement of water through the ground

Coralline limestone although hard, allows water to pass through it. When rain falls onto limestone, it percolates down (moves down under gravity). Water will keep on moving until it reaches clay, since it is impervious to water. Here water collects in the limestone above the clay. This water is called **groundwater**, and its upper surface is referred to as the **water table**. Limestone is referred to as an **aquifer** because it is porous and permeable to water. This groundwater move through the aquifers and if it finds an opening through it water exit to form a seep or a spring. In the areas where clay is absent, rain water will fall onto the lower coralline limestone, percolates through and comes to rest over salt water, since freshwater is less heavy and floats above the saline water.

The plant structure: shoot and root system

Plants can be divided into 2 parts - the part above the ground called the **shoot** system, and the part below ground, the **root** system. The shoot system contains the stems, leaves and flowers; the root system contains the roots together with the microscopic root hairs through which water and dissolved substances are absorbed. The roots are also important for anchoring the plant into the ground. The stem is usually the part of the plant above the ground, although modified stems occur underground as rhizomes for example. The stem bears buds, leaves and flowers. Water absorbed through the roots is important in supporting the plant by acting as a water skeleton. Many plants contain a high percentage of water in them. Water is also important in that a number of substances dissolved in it are transported through the plant.

Different plant species may have different growth habits, and some may grow with a main vertical stem, while others may have stems that grow horizontally over ground. Living close to the ground on a windswept sandy beach provides some shelter and protection for the plant rather than being vertical and exposed. Some climber plants have stems that twine around support including other plants to reach for light. These climber plants often have modified leaves or roots to help them climb and clamber about. They can have curved prickles (example the Bramble), leaves modified into tendrils (example the Yellow Vetchling) or special roots (example Ivy) which anchor the plant to their support. One has to bear in mind that the local environment conditions also shape the growth habit of plants. Thus a plant that usually grows prostrate (stems lying more or less flat along the soil) might be found to grow in a more or less vertical habit if it is growing among dense vegetation, the plant obviously trying to reach for light. So although different species might have different growth habits, local environmental conditions including shade and competition from other plants, will affect growth conditions.



Plant and flower structure -

Shoot system (above ground) - A= petal (all petals form the corolla); B= sepal (all sepals form the calyx); C= bract; D= leaf blade; E=stipule (not always present); F=node (internode= distance between 2 nodes); G=stem; Note: A+B= perianth.

Root system (below ground) - H= main (primary) root; I= secondary root; J= root hairs.

Flower- K= stigma; L= style; M=Ovary (contains one or more ovules, and consists of one or more carpels); N=receptacle; O= anther; P=filament; Q=peduncle (main stalk of flower); Note: K+L+M= carpel (female); O+P= stamen (male).

A collection of carpels in a flower is called the **Gynoecium**; a collection of stamens in a flower is called **Androecium**. A carpel can be defined as the unit of the gynoecium. Carpels can be fused together (**syncarpous**) or free (**apocarpous**).

Stoneworts, Pteridophytes and Spermatophytes

Stoneworts - Green Algae

Fossils of these algae have been found in the late **Silurian** period, over 400 million years ago. These live in freshwater (some in brackish) and are attached to the bottom by thread-like structures called **rhizoids**. Stoneworts are also known as **charophytes**. Their body contains calcium carbonate. The green algae are in the division **Chlorophyta**.

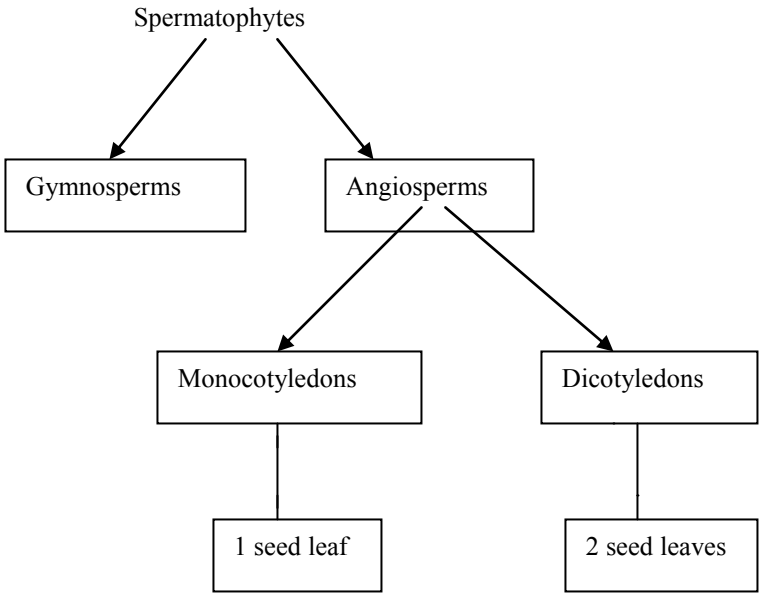
Pteridophytes

These are vascular primitive and flowerless plants and reproduce without the means of seeds. They have 2 alternating generations, producing spore-bearing generation and a sexual generation. The non-sexual (spore) generation is relatively a large plant with roots, stems and leaves. The sexual generation produces relatively small plants and bear male and female sex organs on same or different plants. Examples of pteridophytes include ferns, horsetails and clubmosses. Ferns appeared more than 350 million years ago, in the **Devonian** period. During this period horsetails also occurred.

Spermatophytes; Dicotyledons and monocotyledons; angiosperms and gymnosperms

A **dicotyledon** plant is a flowering plant that generally has 2 seed leaves (cotyledons) when it germinates. A **monocotyledon** plant has generally only one cotyledon. The floral parts of a dicot are generally arranged in whorls of 4 or 5; those of the monocots are in parts of 3. The leaves of monocots have parallel veins and usually sheath the stem; the dicot leaves have a distinct vein in the middle of the leaf (the **midrib**). The root system of dicots and monocots are different - in a dicot there is a primary root with branches, while in the monocots there is no primary root and in most species there is what is called a fibrous root system. The dicotyledons and monocotyledons group together all the flowering plants–the **Angiosperms**. Angiosperms are the most highly evolved of all plants, and have the seeds enclosed by fruits. Flowering plants evolved in the late **Jurassic** period and became dominant in the **Cretaceous** period over 100 million years ago. Orchids, irises, squills, daffodils, tulips and grasses are examples of monocotyledon plants. The majority of the plants are dicotyledons-example the daisy family, pea family, rose family and poppy family.

The **Gymnosperms** are plants that produce seeds that are not enclosed within the fruit, so called naked seeds. The gymnosperm group contains the highest number of non-flowering plant species. It includes conifers such as the Aleppo Pine. These plants evolved in the **Permian** period, around 275 million years ago. Angiosperms and Gymnosperms are **spermatophytes** - plants that have seeds.



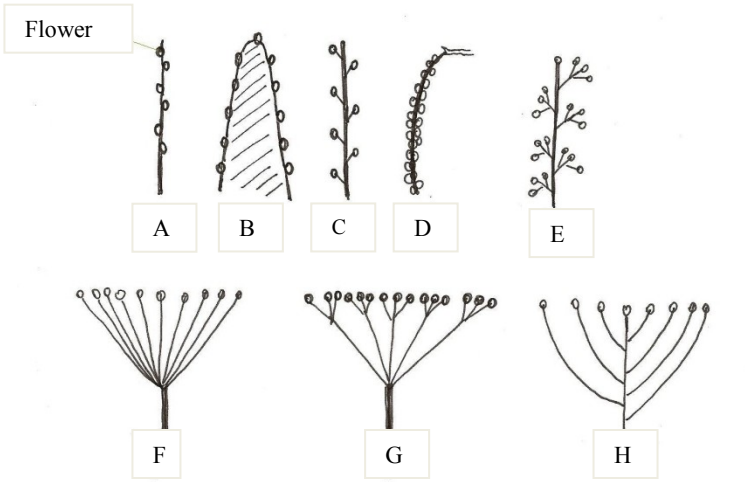
Pteridophytes and spermatophytes are **vascular plants** - these have roots, stems and leaves and vessels that transport water (**xylem**) and nutrients (**phloem**). Vascular plants are grouped together as **Tracheophytes** (Division **Tracheophyta**).

The Flowers

Several wild plants produce beautiful and scented flowers, others inconspicuous and greenish especially those that are wind pollinated. Flowers usually contain both male and female reproductive parts (**hermaphrodite** flowers). However there are several plants that produce unisexual flowers, i.e. flowers that are either male or female. Sometimes the male and female flowers are found on the same plant (**monoecious**), but other species may have male and female flowers borne on separate plants (**dioecious**). The Lentisk is one example of a species that have male plants and female plants. The male parts in the flower are called **stamens**. These are made up of two parts, the head or **anther** and the stalk or **filament**. The anther contains the **pollen** grains. The female part of the flower is called the **carpel** (collectively the **pistil** or **gynoecium**). This is made up of an **ovary,** a top part called a **stigma** that is sticky and collects the pollen grain, and beneath is the **style**. The **ovules** in the ovary develop into **seeds** after fertilisation.

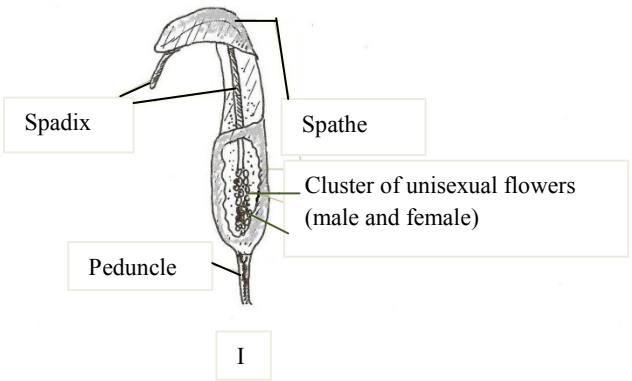
The male and female parts are often accompanied by segments, an outer whorl or **sepals** (that form the **calyx**) and an inner one the **petals** (that form the **corolla**). These together form what is known as the **perianth**. When a sepal or petal cannot be clearly differentiated the segment is called a **tepal**. Sepals or petals can however be absent. The sepals protect the petals when the flower is still a bud. Petals are often brightly coloured and scented to attract insects. They may also have markings called **nectar guides** to direct insects to the nectar that the flower produces. Petals can be free or joined into a tube, or united at the base. A petal can also be whole or with a cut at the top. Flowers can be borne singly or in groups. In the daisy family (Asteraceae) several flowers are grouped together and these appear as one flower. These small flowers are called **florets** that form the head or **capitula**. In these plants, the **involucral bracts** replace the calyx surrounding the capitula.

A flower can be held directly on a main stem (sessile). Several types of flower groupings occur; this is termed **inflorescence**. Among the simplest examples of inflorescence are the **spike** (flowers held on a main flowering stem but they themselves are sessile), **spadix** (sessile flowers on flattened axis), and **raceme** (as in spike but flowers stalked). A **catkin** is a spike inflorescence of unisexual wind pollinated flowers usually drooping. A **panicle** is a branched raceme (but widely used for any branching (compound) inflorescence). An **umbel** is a raceme inflorescence in which the flower stalks arise from the same point to form a flower head. A **Corymb** is a branched inflorescence where the stalks are unequal but the flowers lie at the same level (flat or dome).



Inflorescences-

A= spike; B=spadix; C= Raceme; D= catkin; E= Panicle; F=Umbel; G= compound (branched) umbel; H= corymb; I=Spadix (*Arisarum vulgare*, Arum family). Note: In H (corymb) the middle flower is the youngest. If the middle flower is the oldest then the inflorescence is called a cyme (oldest flower is terminal on the main axis).



The leaves

The shapes of leaves vary a lot, and several botanical terms are used. In this context only a simple explanation follows. Each species of plant has its own kinds and shapes of leaves. Sometimes the leaves of one species may themselves be variable, or they vary in different seasons. For example the leaves of some shrubs growing on dry rocky lands will produce smaller leaves in summer for water conservation. Leaves can be arranged differently, for example in alternate fashion along the stem, in opposite pairs, or in a whorl. **Simple** leaves are leaves that are whole and not cut in leaflets, but can be lobed; **compound** leaves are divided into separate secondary leaves (leaflets). These leaflets may themselves again be cut in leaflets. Leaves that are deeply toothed or lobed (but not cut in separate leaflets) can be said to be dissected leaves. The margin around the leaf can be wavy and with or without lobes or teeth. The margins can also be folded upwards to form a channel, or folded down (**revolute**).

A leaf is made up of a flat part, the **blade** or **lamina**. Its outer skin is called the **epidermis**. The middle rib or "vein" that runs from the bottom to the top part of the leaf is called the **midrib**. From this central rib other smaller "veins" branch out. This is a typical leaf of the dicotyledons; in monocotyledons, the veins run parallel (or nearly so) to each other. The typical leaf of a dicot is referred to as nettle-veined or reticulate-veined; those of monocots are called parallel-veined leaves. Veins are the **vascular tissue** of the leaf, containing **xylem** and **phloem** that transport fluid and nutrients within the plant. Short projections or saw-like teeth can be present on the margin of simple and compound leaves. In this case, the margin is toothed (**toothed** leaf). An **entire** simple leaf does not have teeth or lobes on the margin. There are also different shapes of teeth, and when rounded the teeth are described as **crenate**. A leaf can be attached to the stem by means of a leaf stalk (**petiole**), or can be without a leaf stalk (**sessile**). A pair of **stipules** can be present at the base of the petiole. Stipules can be permanent (persistent) or fall down after some time. These appendages can be free or adnate (attached) to the base of the petiole (leaf stalk). Sometimes the 2 stipules unite to form a sheath around the stem called **ochrea**, as found for example in *Polygonum*. When a leaf does not have stipules it is said to be **exstipulate**.

When the base of 2 opposite leaves unite around the stem the leaves are said to be **connate**, such as the upper leaves of the Honeysuckle *Lonicera*. When a sessile leaf has its base completely encircling the stem and the stem appears to be passing through it, the leaf is said to be **perfoliate**, like for example in Hare's-ear *Bupleurum*. **Peltate** or shield-shaped leaves are generally rounded in outline and the leaf stalk is attached to the centre (or near) of the lower surface and not to the base, as for example in Garden Nasturtium *Tropaeolum*.

As regards the number of cotyledons, occasionally a dicotyledon seed germinates with 3 and not 2 seed leaves. Plants like some conifers e.g. *Pinus* and *Tetraclinis* however have 3 or more cotyledons as a general rule.

Among the more common shapes of leaves are lanceolate, ovate, elliptical (elliptic), diamond-shaped (rhombic), spatulate, rounded, heart-shaped; and pinnate, pinnately-lobed and palmate. A leaf is said to be palmately-lobed if the finger-like divisions are not cut into separate leaflets; or palmate-pinnate if the divisions are cut into leaflets. In the case of pinnate, the leaflets themselves may again be cut into leaflets (bi-pinnate, tri-pinnate, etc.). A leaf may also be divided into 3 separate leaflets, and in this case the leaf is said to be trifoliate. A leaf may also be described as elongate, meaning that its length is longer than its width. The following pictures demonstrate some shapes used in the book.



Fig. 1 Simple dicot leaf

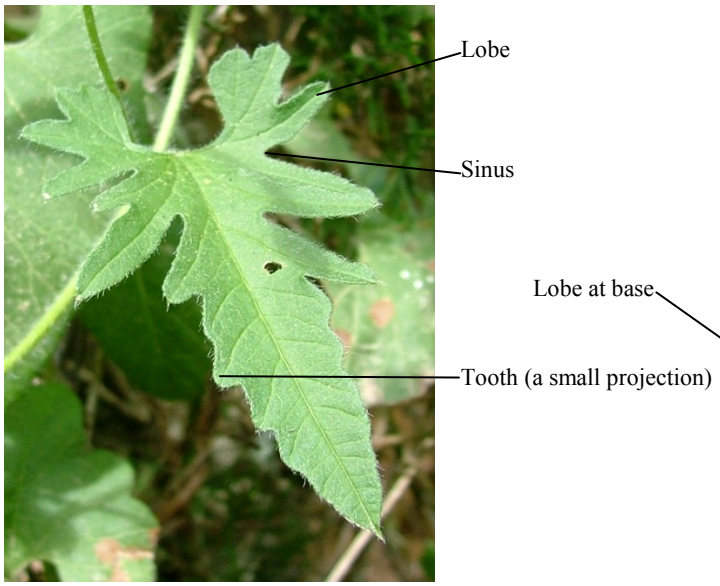


Fig. 2 Simple dicot leaf



Fig. 3 Simple monocot leaf

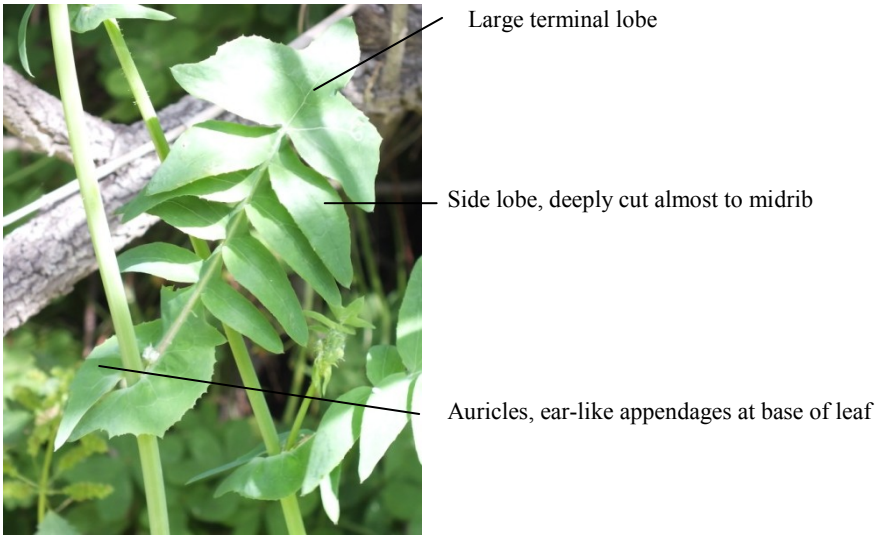


Fig. 4 Simple dicot leaf (pinnately-lobed)



Fig. 5 Compound dicot leaf (pinnate)

A: Simple leaves –













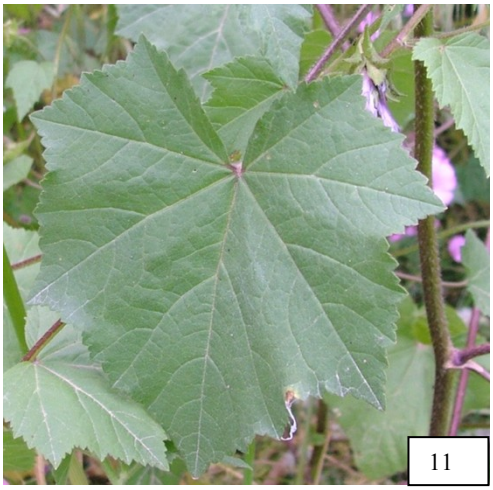


1, 2 = elliptical 3 = lanceolate leaves; in this case, these are curved and are sickle-shaped
4 = ovate with toothed margin 5 = rhombic (diamond-shaped)
6 = ovate-rounded 7 = spatulate (spoon-shaped) leaves









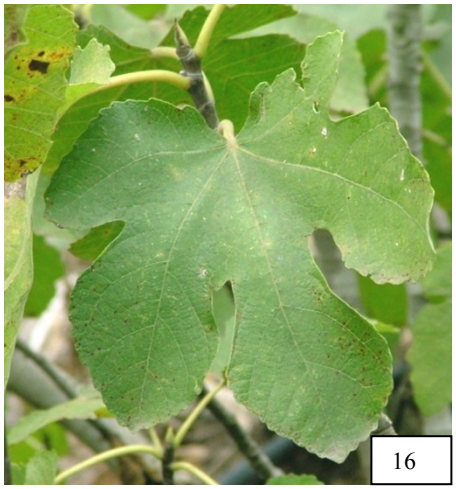








8 = elongate-spatulate
9 = linear, margin entire
10 = linear and toothed
11= rounded leaf with shallow lobes, the margin toothed
12 = pinnately-lobed
13= pinnately-lobed, lobes deeply cut almost to midrib
14 = linear or cylindrical leaves
15= tough cylindrical leaf with spiny tip, as in some *Juncus*


16


17


18


19


20


21


22

16= palmate (palmately-lobed) 17= rounded (orbicular) palmately-lobed leaf, the lobes lobed /toothed
18, 19, 20 = heart-shaped (or arrow-shaped or spear-shaped); 18 and 19 are also known as hastate or halberd-shaped, since the lobes at the base are pointing outwards
21= sword-shaped leaves as in *Iris* 22 = elongate leaf with a channel in the middle (channelled)





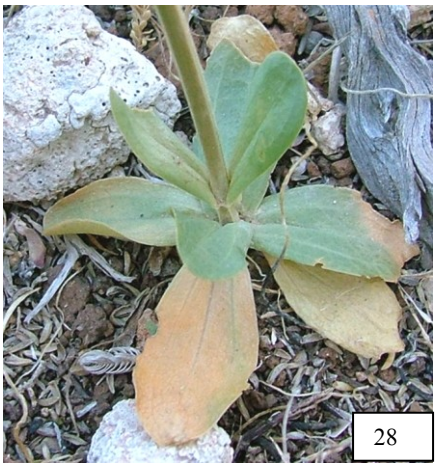




Leaves of conifers 23 and 24 –
23 = long and slender leaves of *Pinus* (referred to as needles)
24= scale-like leaves of *Cupressus*

Leaf margin –
25 = toothed 26 = wavy







Leaf arrangement –
27 = basal rosette of elongate toothed leaves
28 = basal rosette of entire leaves
29 = leaves in clusters along the stem

B: Compound leaves -


30


31


32


33

30 and 31 = pinnate; when a terminal leaflet is present the leaf is called odd-pinnate or imparipinnate. When absent the leaf is even-pinnate or paripinnate
32 = palmate-pinnate (digitate), margin of leaflets toothed
33 = pinnate leaf with a tendril at the tip in place of a leaflet


34


35

34 and 35 are pinnate leaves where the leaflets have been divided again to form bi-pinnate, tri-pinnate or as the case may be

An illustrated note on the Asteraceae (see also note on family page 57)



The members of the Daisy Family have several small flowers called **florets** packed together in a flower head called **capitulum**, and looking like a single flower.

The genus *Sonchus* has only one kind of florets - ray florets (ligulate). In this case the florets have the petals fused into a strap-shaped ray, toothed at the tip.

Ray floret





This flower of the Sow-thistle *Sonchus* is showing the 2 curved branches of the style (far left picture). At the base of the flower head there is an involucre made up of bracts called involucral bracts.

Tomentum (white woolly hairs, cotton-like) at base of involucre



The flowers of the Annual Daisy *Bellis annua* resemble a single flower with a yellow centre and white “petals”; the yellow centre is made up of disc florets and the “petals” are the ray florets.



The Syrian Thistle or Horse Thistle *Notobasis syriaca* is another member of the Asteraceae. The flower head is made up of tubular florets.

Tubular florets

Involucral bracts

A celebration of some endemic and sub-endemic plants

A plant (or animal) is described as endemic if it is native to and found only in one particular geographical region. Islands are great places to find endemic species; the sea surrounding them provides a barrier that excludes or limits species from mixing with plants of same species from other geographical areas. In isolation, and if plants become colonized they can by time become endemic by shaping themselves and adapting to local environmental conditions. Some flora of Malta are said to be endemic, as these are found only in the Maltese Islands; a number of them are also found in other neighbouring islands, and these are termed sub-endemics. Endemism in the Mediterranean is aided by the region's diverse habitats, and also by the climate. In the past many plants found refuge in the Mediterranean during the Ice Age and have continued with their evolution. The following 14 pages illustrate some endemic and sub-endemic plants of the Maltese Islands. This should be correlated to Table 1, Table 2, and the Note on page 12, as well as to the text of these species described in this book.

A: Endemic plants





Maltese Dwarf Garlic *Allium lojaconoi* pictured in late May (far left picture) and in early June. It is a small inconspicuous plant





Maltese Leek *Allium melitense* growing on a rock in late May on dry rocky ground, and a flower head pictured in mid-May



Maltese Sea Chamomile *Anthemis urvilleana* growing on dry terrarossa soil, late March





Maltese Fleabane *Chiliadenus bocconei* in late September





Maltese Everlasting *Helichrysum melitense* at Dwejra, Gozo. The plant is easily recognised from a distance by its greyish look and showy yellow flower heads. Picture taken in early May



Maltese Everlasting *Helichrysum melitense* at Dwejra, Gozo, early May





Maltese Hyoseris *Hyoseris frutescens*
growing in moist shady area in Gozo, late March




Purple flower heads of the **Maltese Rock-centaury** *Palaeocyanus crassifolius* growing on the sunny western coast of Malta, mid-June




Maltese Spurge *Euphorbia melitensis* in bloom in late January at a coastal area and close-up of its tiny flowers




Maltese Spurge *Euphorbia melitensis* in full bloom in late March, and almost leafless in late May





Maltese Stocks *Matthiola incana* subsp. *melitensis* growing on the eastern side of Malta, early February





Maltese Cliff-orache *Cremnophyton lanfrancoi* growing on the south-west cliffs of Malta, mid-July





Maltese Salt-tree *Salsola melitensis* with flowers in late June





White and pink flowers of the **Maltese Pyramidal Orchid** *Anacamptis urvilleana* pictured in March





Dark flowers of **Maltese Spider Orchid** *Ophrys melitensis* on a dry rocky landscape in mid-March and early April




White-flowered specimens of **Dwarf Broomrape** *Phelipanche mutelii* pictured in early April amongst its host *Oxalis pes-caprae*




Dense-flowered Broomrape *Orobanche densiflora* form *melitensis* growing amongst its *Lotus cytisoides* (yellow flowers) host plants, mid-March (left photo) and early April



Two similar species of Sea-lavender are classified as endemics to the Maltese Islands – **Zerapha's Sea-lavender** *Limonium zeraphae* and **Maltese Sea-lavender** *Limonium melitense*. Sea-lavenders grow in coastal areas



Pictures show **Zerapha's Sea-lavender** *Limonium zeraphae* growing in an rdum in mid-January (top picture) and in flat coastal rocky ground in mid-September





Limonium growing at coastal areas, early January (above) and in early July



This **Sea-lavender** is growing on globigerina limestone by the sea, pictured in early December. A fossil can be seen embedded in the limestone at the top right of picture




Among the vascular flora of rock pools is the **Maltese Horned Pondweed** *Zannichellia melitensis*, pictured in early March



When not in flower the **Maltese Shrubby Kidney Vetch** *Anthyllis hermanniae* subsp. *melitensis* looks a dark shrub (left picture, taken in December). The plant turns yellow at the height of flowering in April and May. The flowers are fragrant




B: Sub-endemic plants





The small **Maltese Toadflax** *Linaria pseudolaxiflora* with flowers in early March growing on rocky coastal area





The **Filago** *Filago cossyrense* is a prostrate greyish low annual covered with white woolly hairs, here growing in the middle of a track, mid-March





Pignatti's Fern-grass *Desmazeria pignatti* in mid-April, inconspicuously growing among small stones in rdum



The **Maltese Waterwort** *Elatine gussonei*, a small unnoticeable plant often forming carpets at the bottom of freshwater rock pools. The leaves are spatulate. Left picture taken in early April.







The Maltese Savory *Satureja microphylla* is a small often unnoticeable plant. Picture with flowers was taken in early April.





Pygmy Groundsel *Senecio pygmaeus* growing in rdum habitat, early January

Lampedusa Carrot *Daucus lopadusanus* (above picture), a form of *Daucus* that grows prostrate. Picture taken in mid-April





Maltese Brown Orchid *Ophrys caesiella* growing in garigue, photographed in early May. These orchids are however considered as variants of *Ophrys fusca*





Sicilian Squill *Scilla sicula* pictured in mid-March





Sicilian Iris *Iris sicula* on Comino in late April, with long flowering stalks





Several populations of the **Southern Dwarf Iris** *Iris pseudopumila* are found scattered in Malta and Gozo, particularly the purple-coloured form. The yellow-flowered plants are smaller and generally bloom earlier. Both colour forms have variations in their colour intensity and markings





The small **Dwarf Spurge** *Euphorbia exigua* pictured in mid-March



The showy yellow flower heads of **Sicilian Marigold** *Calendula sicula* – endemic to Malta and Sicily – pictured in mid-April

Conservation strategy

A good conservation strategy for wild plants and nature in general adopted on a national level can include-

- Protection of flora (and fauna) species from persecution and over-exploitation by proper legislation and its enforcement.
- Protection of the countryside from development.
- The setting up of an Enforcement section within the Police Unit that deals only with environmental matters. This section has to be equipped with all necessary resources, financially and human. Their work would also include patrolling.
- An increase in nature reserves and other protected areas.
- The proper management of protected areas.
- Conservation of all natural habitats - protection of the wider environment, since wild plants are found throughout the whole countryside not only in nature reserves.
- Introduction of nature (wildlife) corridors that link together protected areas or other important habitats.
- Restoration of fragmented unique natural habitats like saltmarshes, watercourses.
- Nature-sensitive agriculture, including leaving land fallow or managed for wildlife, for example with hedges, field borders and planting of indigenous trees and shrubs; lack of chemicals.
- Collection of seeds of rare/endangered plants, to be grown and the resulting plants introduced/re-introduced in proper habitats.
- Educating the general public about wild plants and the natural environment to instil a sense of awareness, respect and responsibility towards nature.
- Active conservation - turning words into actions, and acting actively not passively, taking all the steps necessary in the field to conserve habitats and species.
- The inclusion of locals to support nature conservation projects.
- The will of the Government and all other authorities concerned to genuinely protect natural habitats with all the flora and fauna.



A Swallowtail (*Papilio machaon*) larva feeding on Fennel *Foeniculum vulgare*. Wild plants provide food, shelter and a breeding place for animals. When wild plants are destroyed animals also perish by loss of habitat.



The countryside needs protection from over development.

Note: Several Algae, Lichens and Mosses are found in the Maltese Islands, and these are not described with the exception of 2 algae species (*Chara* and *Lamprothamnium*, page 64). Fungi including mushrooms, of which several species are found in the Maltese islands, are not plants and are not described in this book.



Peacock's Tail *Padina pavonica* Denb il-Pagun, a common marine alga that grows at the surface, here seen exposed at low tide.





Several species of mushrooms are found growing in the Maltese Islands. Pictures show Pine Boletus *Suillus* sp. pictured in December at Buskett.





Lichens are an association between an alga (or cyanobacteria) and a fungus, where the association benefits both. The picture above on the left shows Ramalina *Ramalina durieui* that grows at Buskett and limits. These lichens grow on the branches of trees. The orange lichens pictured above are growing on rocks.

Families of plants described in book. Page number is shown on right hand side

Characeae	Green algae that can be found in fresh and saline waters. Often resemble higher plants. Frequently encrusted with calcium carbonate. Main stem has branches arranged in whorls.	64
Selaginellaceae	Small plants look like moss, with branching stems and numerous small 1-veined leaves in dense numbers, appressed and overlapping. Has root-like organs called rhizophores that grow downwards and produces roots on reaching the ground. Reproduces by means of spores; mega spores ("female spores") and microspores ("male spores"). These spores are produced at the tip of branches in strobili ("cones"). The large spores grow into a gametophyte that produces the egg cells (female), while the small spores grow into a gametophyte that produces sperm cells (male). Reproduction involves alternation of generations (see under ferns). Single genus *Selaginella* with most species found in moist conditions.	64
Equisetaceae	Plants of moist places, with rhizomes, stems ribbed and with silica, and hollow except at the joints. Leaves small, scale-like at the stem nodes, and branches occur in whorls. Reproduction is by spores found in strobili (singular strobilus, "cones") found at the tips of stems. Reproduction involves alternation of generations (see under ferns). Single genus *Equisetum*.	65
Adiantaceae Gymnogrammaceae Aspleniaceae Dryopteridaceae Polypodiaceae	Ferns. Perennial, living on the ground, on rocks or on tree branches, most in moist areas. Leaves entire, lobed or pinnate and known as fronds. Most ferns have circinnate development of the leaves (leaves unroll as the leaf expands). Reproduction by spores found in spore cases called sporangia; in most ferns these sporangia are in clusters called sori (singular sorus) and found on the underside of the leaf. These appear as brownish dots/streaks. Mature spores are released from the sporangia and in suitable conditions the spore germinates into a tiny heart-shaped plantlet, the gametophyte (or prothallus). This gametophyte has both male and female reproductive organs on its underside. If moisture is present the male reproductive (sperm) cells swim through a thin film of water towards the female egg cells on the same or adjacent gametophyte and fertilisation takes place, producing a zygote that grows into an embryo and develops into the large sporophyte plant. Fern reproduction is known as an alternation of generations, as there is the asexual generation (sporophyte) and the sexual generation (gametophyte). Other means of fern reproduction is through rhizomes and by the production of small ferns at the tips of the leaves that take root on contact with the ground.	65-67
Pinaceae	Conifers that bear both male and female cones. Female cones woody housing the seeds, with spirally arranged scales. Leaves linear, in pairs or fascicles. Generally evergreen and with resin. Seeds winged.	67-68
Cupressaceae	Evergreen conifer trees or shrubs with scale-like or needle-like leaves, the needle-like leaves sometimes at young stage only. Seeds in female cones that are woody or berry-like. Generally with resin and aromatic. Male cones and female cones on same or separate plant.	68-69
Araucariaceae	Family of coniferous trees that are large, tall and evergreen. Male cones among the largest of conifers, female cones large; male and female cones on same or different tree. Leaves needle-like to broader and ovate.	69
Ephedraceae	Plants with scale-like leaves and thin jointed stems occurring in whorls at the nodes. Fruit berry-like, coloured, seeds 1-2. Includes one genus, *Ephedra*.	69
Lauraceae	Trees (mostly), shrubs or climbers, typically aromatic. Leaves evergreen, Dioecious or monoecious. Flowers small, greenish or yellowish in clusters. Fruits berries or resembling drupes.	70
Aristolochiaceae	Herbaceous or woody and climbing, with rhizomes. Leaves alternate. Flowers solitary or in clusters, tubular. Flowers with both male and female reproductive parts and often adapted for fly pollination smelling of carrion.	70
Papaveraceae	Mainly annuals or herbaceous perennials. Poppies, includes also the Fumitories. Plants often have latex, white or other colour. Leaves alternate or whorled, bracts can be opposite or whorled. Flowers regular or irregular and often showy and has both male and female reproductive parts (bisexual). Petals often crumpled in bud. Fruit generally a capsule that dehisces to release the seeds.	70-73

Ranunculaceae	Mainly herbaceous plants, some annual, or shrubs or climbers (*Clematis*). Leaves usually basal or alternate, and compound, opposite in *Clematis*. Flowers solitary or in clusters and usually have both male and female reproductive parts. Flowers of many species are formed by the calyx (sepals), 3-5 or many, but in *Ranunculus* there are both petals and sepals. Fruit an achene or follicle.	74-78
Frankeniaceae	Herbaceous or shrubs. Halophytic plants, leaves simple, small and opposite, often with revolute margins and commonly with salt-excreting glands. Flowers small solitary or in clusters, sepals fused into a tube. Petals equal in number to sepals. Fruit a capsule that dehisces longitudinally.	78
Tamaricaceae	Trees or shrubs, deciduous to semi-deciduous. Includes the *Tamarix*, with numerous flowers in spike-like or racemose inflorescence sometimes resembling catkins and borne on woody stems or on young shoots, and with salt-secreting glands. Flowers bisexual and small. Leaves minute, scale-like and alternating. The 4-5 petals are inserted on a nectar-secreting disk. Fruit a capsule.	79
Polygonaceae	Herbaceous, shrubs, trees or climbers. Includes Polygonaceae, where plants have a membranous sheath surrounding the stem and uniting the stipules (ochrea). Flowers usually bisexual. Flowers small, fruit a triangular nut or achene.	79-82
Plumbaginaceae	Herbaceous plants, shrubs or climbers. Many members live in sandy soil (psammophytes) or are halophytes (live in saline soil). Leaves often in basal rosette, and entire, and often with glands that exude water or salts. Flowers actinomorphic and bisexual, the 5 petals free or fused only at the base or fused to form a tube. The 5 sepals are fused to form a tube. Includes the *Limonium*; these have salt glands that secrete sodium chloride (salt) and are able to live in saline soils.	83-85
Caryophyllaceae	Mainly herbaceous, leaves opposite or (rarely) alternate and entire. Stems often swollen at nodes. Stipules generally absent. Petals 0 or 4-5 and free, notched or cut at the apex. Fruit a capsule or more rarely a capsule or utricle.	85-90
Chenopodiaceae (this family has now been included in Amaranthaceae)	Many species are herbaceous, stems and leaves often succulent. Leaves absent in some e.g. *Salicornia*. Flowers inconspicuous, with overlapping tepals, wind pollinated. The flowers are usually bisexual in dense clusters and generally with 5 greenish or membranous tepals, united at the base only or fused. Stamens usually in same number as tepals. Includes plants with mealy texture, or with glandular hairs on the leaves and salt-tolerant. Fruit generally a nut, small and round. Of economic importance includes *Beta vulgaris* (food) and ornamentals. Often grow in disturbed areas.	90-95
Amaranthaceae	Annual or perennial herbaceous plants, or rarely shrubs and trees or climbers, mostly non-succulent. Stipules absent. Leaves generally entire, opposite or alternate and the regular flowers are usually bisexual. The flowers are solitary or in dense clusters often inconspicuous with 3-5 dry and scarious tepals. Inflorescence with bracts and bracteoles often showy or bristly.	95-96
Aizoaceae	Succulent herbaceous plants or small shrubs adapted to arid conditions, with entire opposite or alternate leaves. Flowers regular (actinomorphic) and bisexual, solitary or in clusters. These are often showy with numerous 'petals'. Fruit a berry or capsule. Plants include those resembling stones or pebbles, and the invasive *Carpobrotus*.	96-98
Phytolaccaceae	Herbaceous or shrubs, trees or climbers. Leaves entire and generally alternate, and with petiole, flowers regular with 4-5 tepals, usually bisexual. Fruits are generally berries or nuts, sometimes a capsule that splits longitudinally.	98
Nyctaginaceae	Herbaceous plants, trees, shrubs or climbers, with swollen nodes. Leaves can be opposite, alternate or whorled and the flowers generally bisexual. These flowers are sometimes surrounded by coloured conspicuous bracts e.g. *Bougainvillea*. Sepals are petal-like and tubular, petals absent. Fruit an achene, often enveloped by the persistent base of the tube of the calyx that assists in dispersal.	99
Cactaceae	Xerophytic plants, succulent and mainly leafless/leaves reduced and mostly with tufts of spines. Have areoles and sometimes glochids present too. Photosynthesis carried out in young stems. Flowers actinomorphic, solitary, generally sessile and bisexual, and often showy. Fruit a berry, juicy or	99-100

	leathery often with spines or bristles and contains many seeds.	
Portulacaceae	Mainly succulent and herbaceous or shrubs. Leaves usually fleshy, opposite or alternate, with margins entire. Flowers are mainly bisexual, generally actinomorphic, sepals and petals present and separate. The flowers are solitary or in clusters. Fruit a capsule or a nut.	100
Santalaceae	Semi-parasitic herbaceous plants, shrubs or trees. Leaves alternate or opposite, stipules absent. Flowers often small and inconspicuous, regular and contain 3-6 fused tepals, and unisexual or bisexual. Fruit a nut or drupe.	100
Cynomoriaceae	Fleshy reddish-brown to purplish plants, with rhizomes. Parasitic, attaching to the roots of several plant species by means of rhizomes that have specialised structures called haustoria; these haustoria (singular haustorium) draw water and nutrients from the roots of the host. Flowers are minute with small scale-like leaves. Flowers both unisexual and bisexual. Fruit a nut.	100
Crassulaceae	Mainly succulent, herbaceous perennials or small shrubs. Leaves mostly entire, often in rosettes, or alternate or opposite. Stipules absent. Flowers regular, solitary or in clusters, with distinct petals and sepals. The fruit is a follicle. Fallen leaves can develop into new plants.	101-103
Saxifragaceae	Perennial herbaceous evergreen or deciduous plants, leaves generally simple and alternate. Flowers generally regular and bisexual. Sepals and petals equal in number. Fruit usually a dehiscent capsule.	104
Vitaceae	Mainly climbers with simple or branched tendrils. Leaves alternate, simple, entire or palmately-lobed, or compound and flowers regular, usually bisexual and small, in leaf-opposed or terminal clusters. Calyx of fused sepals, petals free. Stamens equal in number to petals. Fruit a berry with few seeds. Includes *Vitis vinifera*, its berries are the famous grapes.	104
Geraniaceae	Herbaceous mainly perennial, or small shrubs. Leaves alternate or opposite and often stalked, entire or lobed or divided. These are often covered with glandular hairs, and in some species are scented. Stipules present. Flowers bisexual, usually in clusters, with petals and sepals. Fruit a schizocarp with 1-seeded mericarps. On maturity the styles coil elastically causing the mericarps to bend up and away from the ovary axis and the seeds forced out the mericarps. Includes *Pelargonium*, frequently grown as ornamentals.	104-107
Onagraceae	Mainly annuals or perennial herbs, few shrubs or trees. Leaf shape is entire or margin toothed or lobed, and leaf arrangement varies, basal rosette often present. Flowers axillary, solitary or in clusters. Flowers bisexual, occasionally unisexual, regular to weakly irregular, and hypanthium often present. Fruit a capsule, berry or nut.	107
Lythraceae	Herbaceous or shrubs or trees. Leaves generally opposite, sometimes alternate or whorled. Flowers solitary or in clusters, inflorescence terminal or axillary. Flowers usually bisexual, regular or irregular. Hypanthium present. Sepals joined at the base, petals often brightly coloured. Epicalyx commonly present. Fruit a berry or capsule.	107-108
Myrtaceae	Trees or shrubs. Leaves often opposite and dotted with glands, aromatic. Flowers generally regular, bisexual or unisexual and with 4-5 sepals and petals that are often reduced, stamens well-developed and conspicuous. Sepals and petals are fused into an operculum in *Eucalyptus*. Fruit usually a berry or capsule that splits longitudinally.	108-109
Zygophyllaceae	Annuals or herbaceous perennials, shrubs or trees, many species living in dry or saline areas. Leaves opposite, alternate or fascicled, often pinnately-lobed. Leaves of different size may be present such as in *Tribulus*. Stipules present, sometimes spiny. Flowers solitary or in pairs or clusters. The flowers are regular and generally with 5 petals and 5 sepals, petals sometimes absent. Flowers are bisexual or unisexual. Stamens twice the number of petals. Fruit generally a capsule or schizocarp (a dry fruit of 2 or more carpels).	109-110
Salicaceae	Trees and shrubs generally deciduous and with flowers in catkins. Catkins generally appear before the leaves develop. Leaves simple, entire, serrate or somewhat lobed. Flowers unisexual, male and female flowers occur on separate plants. Fruit a capsule, seeds with plume of hairs. Flowers reduced, subtended by a bract.	110-111
Violaceae	Herbaceous plants, trees, shrubs or climbers. Leaves generally alternate and simple, margin entire or toothed. Stipules present, minute or leafy. Flowers	111

	regular (actinomorphic) or irregular (zygomorphic), and bisexual or unisexual. Sepals 5 and petals 5. Fruit generally a capsule or berry.	
Passifloraceae	Climbers with tendrils, or shrubs or herbs. Tendrils occur in leaf axils. Leaves alternate, simple or lobed, rarely compound, stipules present. The regular flowers are generally bisexual. There are generally 5 overlapping sepals and generally 5 petals, when present overlapping. Inflorescence generally axillary. Corona often present. Fruit indehiscent, berry or capsule. Some are cultivated for their showy flowers or for their edible fruits.	111
Linaceae	Annual or perennial herbaceous plants, shrubs or trees. The usually sessile leaves have entire margins, and are opposite or alternate. Flowers regular and bisexual, sepals and petals in 5 parts or 4 parts (pentamerous or tetramerous). Sepals, petals and stamens equal in number. Fruit a capsule or schizocarp.	112-113
Clusiaceae	Annual or perennial herbaceous plants, shrubs or trees that may have milky or coloured sap. Evergreen or deciduous. Leaves simple and opposite, rarely alternate or whorled and with oil glands. The regular flowers are bisexual or unisexual and have many stamens in 2 whorls. Plants can have flowers with both male and female reproductive organs (bisexual); male flowers and female flowers on different plants; or bisexual and unisexual flowers can be found on same plant. Fruit often a capsule, sometimes dry or fleshy berry, or a drupe.	113-114
Elatinaceae	Annual to perennial herbaceous plants, or small shrubs. Often found in wet habitats. Leaves are simple, and opposite or whorled, and with stipules. Leaf margin entire or toothed. The small and inconspicuous flowers are regular and bisexual, solitary or in clusters in leaf axils. Fruit a capsule.	114
Phyllantaceae	Herbaceous plants, shrubs or trees, a few are climbers. Leaves are simple, rarely compound or absent and usually with entire margins. Stipules present. Flowers are regular and generally unisexual (plants monoecious or dioecious). Petals can be absent. Fruits schizocarp, drupe or berry, and can be dehiscent or non-dehiscent.	114
Euphorbiaceae	Annual to perennial herbaceous plants, shrubs, trees or climbers. Plants often have latex. Leaves simple or compound, or toothed to deeply lobed. Stipules generally present. Some species are succulent and leafless and have spines resembling cacti. The inflorescence of *Euphorbia* is characteristic, often consisting of a branched umbel-like one. The stalks (rays) of the umbel carry raylet-leaves (bracts), greenish or yellowish. At the base of the main rays are the ray-leaves. These ray-leaves are usually in the same number as the rays of the umbel. Some species also have solitary rays coming out from the leaf axil. The flowers of the spurges do not have petals and sepals, and consist of cup-like structures (involucre) in which are a single female flower (with hanging ovary), several male flowers (each with 1 stamen) and shiny nectar glands to attract insects. These glands are often deeply lobed and form like a pair of horns. The fruit is a dehiscent 3-lobed capsule that “explodes” to disperse the seeds.	115-120
Oxalidaceae	Annual or (usually) perennial herbaceous plants, shrubs, small trees or climbers. Plants often have underground storage organs (bulbs, tubers, fleshy roots), and also often stolons. Leaves alternate, generally compound. Leaflets often fold downwards in adverse weather or in the evening and night. Leaf - like petioles (phyllodes) replace the leaves in some species. Flowers are frequently showy and in clusters and generally with both male and female reproductive organs (hermaphrodite =containing both stamens and pistils). Fruit a capsule. Many plants are in the genus *Oxalis*.	120-121
Polygalaceae	Herbaceous annual or perennial, shrubs, rarely trees or climbers. The simple leaves do not have stipules, and are opposite, alternate or whorled. Inflorescence terminal or axillary. The bisexual flowers are generally irregular. Flower generally with 3 petals and 8 stamens. Fruit a capsule, drupe, nut or samara.	121
Fabaceae	The Pea Family contains a large number of species of flowering plants, some of which are important as food crops. Others are cultivated for ornament. The family comprises trees, shrubs, climbing plants and annuals. The flowers are described as “butterfly-like”, made up of five petals (zygomorphic-irregular); a large erect petal called the standard, 2 lateral ones called the wings, and 2	122-145

	lower ones joined along their lower margins forming the keel. Calyx of 5 sepals often united into a tube with 5 teeth (upper part of calyx tube cut in narrow divisions) that can be equal or not. The fruit is a pod (legume) that is usually dehiscent (splits up when ripe to release the seeds). The leaves are often pinnate or trifoliate and stipules are present. The roots of many species have root nodules - these are structures in the roots (developed through infection by bacteria) that have bacteria able to fix (convert) nitrogen in a way that can be absorbed by the plant. Some species of this family are used as crop rotation to increase the nitrogen content in the soil.	
Rosaceae	Herbaceous perennials, shrubs, trees or a few climbers, evergreen or deciduous. Some herbaceous species with stolons. Thorns or prickles are present on some genera. Leaves alternate, rarely opposite, and generally with stipules. Flowers solitary or clustered, regular (actinomorphic) generally with 4-5 free sepals and petals and numerous stamens at the centre of the flower. They are generally bisexual and showy. Nectar disk is present in many genera. Epicalyx usually present. Fruits are achenes, fleshy drupes, follicles or pomes. Many species are cultivated for their fruits.	145-150
Rhamnaceae	Trees and shrubs, some with twining stems. Leaves simple, generally alternate, margins entire or toothed. Spines and stipules often present. Flowers in clusters, axillary or terminal. Flowers regular and inconspicuous with 4 or 5 sepals, petals 4-5 or absent. They are generally bisexual. Fruits mostly fleshy drupes, berries or nuts; berries and drupes dispersed by birds and mammals.	150-151
Ulmaceae	Trees or shrubs, evergreen or deciduous. Leaves are simple, generally alternate and often asymmetrical. Margin is generally toothed. Flowers small, usually unisexual with male and female flowers found on same plant, sometimes bisexual. Flowers regular and have 4-8 perianth lobes, and occur in dense clusters, and are wind-pollinated. Nectaries absent, pollen abundant. Fruit a samara, drupe or small nut.	152
Moraceae	Trees or shrubs, sometimes climbers, rarely herbaceous plants. Latex present. The leaves are generally simple and with entire or toothed margins, and usually alternate. Stipules present. Flowers are minute, unisexual and tightly aggregated. Plants can be monoecious or dioecious. Fruits are achenes or drupes that are often attached to or enclosed in the fleshy receptacle. Includes plants that produce edible fruits like *Ficus carica* and *Morus* spp.	153-154
Urticaceae	Herbaceous annuals or perennials, trees or shrubs, some species possessing stinging hairs. The simple leaves are opposite or alternate, and the margins toothed or entire. Stipules generally present. Flowers greenish and inconspicuous, generally unisexual where plants are monoecious or dioecious, or occasionally bisexual, and clustered. The flowers have a perianth of (3-) 4-5 segments, stamens equal to the number of segments. Fruits achenes or drupes.	154-156
Cucurbitaceae	Herbaceous perennial climbers, sometimes annuals, stems often weak. A few species are shrubs or trees. Leaves alternate and vary in shape, often with rough hairs. The flowers are regular and generally unisexual where plants are monoecious or dioecious. Petals and sepals generally 5, petals often joined at base. Hypanthium present. Fruit a berry, or a dehiscent or non-dehiscent capsule. Some species like *Ecballium* have explosive dehiscent capsules. Many are important food plants.	156
Fagaceae	Evergreen or deciduous trees, rarely shrubs, with simple leaves. Leaves alternate, entire or lobed. Stipules present. Flowers unisexual, with 4-7 perianth segments, and often found in catkins of flowers of one sex (male or female); some species have catkins with female flowers below male flowers. Plants monoecious. Fruit a nut with a cupule (small cup) at base, and is dispersed by animals.	156-158
Juglandaceae	Trees with pinnate leaves, stipules absent. Generally deciduous, leaves often aromatic and alternate, on rare occasions opposite. Flowers unisexual on same plant and occur in spikes (female flowers) or catkins (male flowers) and are wind pollinated. Bracts present. An important family for edible fruits (walnut, Pecan nut) and also for timber.	158
Casuarinaceae	Mainly trees, some shrubs, with small, scale-like leaves in whorls along the	159

	slender grooved stems. Flowers small, usually unisexual, male and female flowers on same or different tree. Fruit a one-seeded nut resembling a samara, enclosed in a hard woody bracteole; these fruits are in aggregates and resemble a pine cone.	
Tropaeolaceae	Herbaceous often succulent plants with twining leaf stalks. Stipules absent. Leaves have long stalks and are peltate (leaf stalk attached to the centre of the underside), entire or palmately to deeply lobed, and alternate on the stem. The showy flowers have 5 petals and 5 sepals and are bisexual, with stalk and generally in singles in the leaf axils. Upper 2 petals are smaller than the lower 3, and one of the sepals is modified to form a nectar spur. Fruit is a schizocarp with 3 one-seeded mericarps.	159
Resedaceae	Generally herbaceous plants (annuals, biennials, perennials), a few species are shrubs. Leaves alternate, entire or lobed, stipules present. Flowers irregular, generally bisexual and in clusters of long spikes or racemes, and with bracts. Petals sometimes absent. Petals clawed and often cut at the tips. Fruit usually an indehiscent capsule with carpels often remaining open at their tips to give a fruit capsule open at the top, and contains several small seeds.	160
Capparaceae (Capparidaceae)	Mainly shrubs or small trees with alternate simple or compound leaves. Stipules present or absent, sometimes spiny. Flowers regular or irregular, generally in racemes or borne singly in the axils of leaves and usually have 4 petals and 4 -6 or more stamens. Ovary generally on a stalk. Fruit usually contains many seeds. Flower buds of *Capparis orientalis*/*C. spinosa* are pickled and eaten (the capers).	160
Brassicaceae (Cruciferae)	Mainly herbaceous annuals or perennials, but several other forms occur (e.g. shrubs, small trees, climbers, and aquatic species). Petals 4 in a cross, sepals also 4. Flowers in racemes, often the flowers crowded and the flowering stem elongates in fruiting. Flowers generally bisexual. Leaves usually alternate, simple and entire or lobed, or compound. Leaves sometimes dissimilar on same plant. Fruit varies in shape, usually a capsule with 2 compartments and usually dehiscent, called siliqua when long and thin, or silicula when broad and shorter than three times its width. Several species are important food crops, e.g. *Brassica oleracea* and its cultivars.	160-169
Cistaceae	Mainly shrubs, sometimes annuals or herbaceous perennials. The simple entire leaves are alternate or generally opposite, and stipules often present. Flowers regular, bisexual and often showy, solitary or clustered. Sepals 3 or 5, petals often 5, stamens numerous. Fruit a small non-fleshy capsule that splits longitudinally. Some are grown as ornamentals due to their showy flowers often covering and adorning the plant at best of flowering season.	170-171
Malvaceae	Mainly herbaceous, a few shrubs or trees. Have stellate (star-shaped) hairs and often simple (unbranched) hairs. Leaves simple, rounded but often lobed to palmately-lobed, and alternate. Flowers bisexual, in axils of leaves or terminal. Many genera have an outer calyx (epicalyx). Sepals 5 and petals 5. Stamens numerous at the centre of the flower, their bases united into a column surrounding the style. Fruit a capsule or a schizocarp consisting of a ring of nutlets (mericarps). Cotton is derived from *Gossypium* species. Some are cultivated for their showy flowers, e.g. species of *Hibiscus*.	171-174
Rutaceae	Mainly aromatic shrubs or trees, sometimes with prickles or spines. Leaves usually alternate, simple or often compound and dotted with glands, stipules absent. Flowers in clusters. The flowers have 4-5 petals, sepals often 5, inflorescence variable, in the axils of leaves or terminal. Flowers often bisexual and generally regular. The fruit is also often aromatic and glandular, and is a berry, drupe, schizocarp or a capsule; or a hesperidium (a berry with a leathery rind outside and a juicy inside) in some genera e.g. *Citrus* like oranges and lemons. The latter genus is grown economically to produce the edible fruits.	174-175
Meliaceae	Generally trees with an aromatic bark. The alternate leaves are compound. Flowers regular in clusters, bisexual or unisexual. Sepals and petals are joined at the base. Fruit a berry, capsule, drupe or a nut, and the seeds can be winged or fleshy. Some genera are important for timber.	175
Simaroubaceae	Trees or shrubs, with simple or compound leaves, usually alternate. Flowers regular, often unisexual, in clusters. Sepals mostly 5, petals generally present	175

	and 5. A disc is often present within the stamens. Fruit is a capsule, drupe, berry, or a samara as in *Ailanthus altissima*.	
Anacardiaceae	Trees, shrubs or climbers, with resin. Leaves alternate and mostly pinnate and without stipules. Flowers regular and mostly bisexual. When flowers are unisexual plants are dioecious (male and female flowers on separate plants) e.g. *Pistacia lentiscus*. Fruit generally an indehiscent drupe, but fruit diversity is high. Some genera are grown for the production of tannins; or for fruits, e.g. Pistachio nuts from *Pistacia vera*.	176-177
Primulaceae	Annuals or herbaceous perennials. Basal leaves often forming rosette; stem leaves are alternate, opposite or whorled. Stipules absent. Flowers regular and bisexual, petals generally in parts of fives and usually joined into a tube at the base, sometimes petals almost free and joined only at the very base. Sepals free or joined into a bell-shaped or tubular calyx. Stamens attached to the petals. Flowers solitary or in clusters. Fruit a capsule.	178
Ebenaceae	Trees or shrubs. Leaves mostly alternate and with petioles, and are simple and with an entire margin. Stipules absent. Flowers regular and usually unisexual, with many species having separate male and female plants. The sepals and petals are fused. Fruit a berry. Many species of *Diospyros* produce the black hard timber ebony.	178
Ericaceae	Mainly evergreen shrubs or small trees, a few are climbers. The leaves are simple and leathery, alternate or sometimes opposite or whorled, and in some species are revolute. Many have xeromorphic leaves. Stipules absent. Flowers regular to somewhat irregular and occur mainly in clusters. Sepals free, mostly 4-5, petals mostly 4-5 and fused. Fruit is a capsule, drupe or berry with small seeds, rarely a nut. Some are widely grown for their flowers or as crops e.g. Cranberry.	179
Boraginaceae	Herbaceous annuals, rarely shrubs, climbers or trees. Generally with coarse hairs, rarely hairless. Leaves simple, usually alternate or sometimes opposite. Flowers in clusters often borne in cymes, or sometimes solitary. Flowers regular or irregular. Calyx has 5 teeth and the corolla has 5 petal lobes and is trumpet-shaped or bell-shaped. Fruit usually a schizocarp that splits up into four 1-seeded nutlets, or less frequent a drupe.	179-182
Rubiaceae	Trees, shrubs, climbers and herbaceous annuals or perennial plants, with simple and opposite or whorled leaves. Stipules present. Spines and prickles sometimes present. Flowers generally bisexual, petals and sepals 4 or 5, and corolla tubular. Fruit dehiscent or indehiscent, including berry, drupe, or capsule, and the seeds may be winged. A large family that includes the genus *Coffea* (Coffee) which is a very important economic plant.	183-186
Gentianaceae	Hairless annuals or herbaceous perennials, sometimes woody or trees. Leaves generally opposite and entire. Stipules absent. Flowers mainly bisexual, often 4-5 parted, regular or sometimes irregular, and often in clusters. The corolla is shaped into a tube, a bell or funnel, or is rotate (shaped like a wheel, with the petal-lobes spreading). Stamens equal in number to petal lobes and epipetalous (attached to the petals). Fruit a non-fleshy capsule or a berry.	186-188
Apocynaceae	Trees, shrubs, climbers, annuals or herbaceous perennials. Plants may be fleshy and contain latex. The simple leaves are mostly entire, opposite, alternate or whorled. The bisexual flowers are regular, with 5 petal lobes. A central corona may be present as in *Periploca*. Stamens attached to the corolla. Fruit is a follicle, drupe, berry or capsule. Seeds can have hairy tufts.	188-189
Oleaceae	Trees or shrubs, some are climbers or herbaceous. Leaves simple or compound, and generally opposite. The regular flowers are generally bisexual and found in clusters, and often sweetly-scented. Sometimes flowers lack petals, and stamens typically 2. Fruit is a berry, drupe, capsule or a samara. The Olive *Olea europaea* has been cultivated for thousands of years for the famous olive fruits and olive oil.	189-190
Plantaginaceae	Annual to herbaceous perennials, a few are shrubs or trees. Some are aquatic, e.g. *Callitriche*. Leaves are simple or compound, Flowers small and generally irregular and 2-lipped or flat. These are bisexual in the genus *Plantago*. Flowers variable, flowers with 4 -5 -8 sepals and petals. Stamens generally 4, sometimes 2, rarely 5. Fruit a capsule that opens longitudinally, a nut or a berry. Today a number of diverse species of many genera are included in Plantaginaceae (not	191-198

	only 3 genera as was the case). Included in this family are the *Antirrhinum*, *Verbascum* and other plants that are cultivated for their showy flowers.	
Verbenaceae	Annuals, herbaceous perennials, shrubs, trees or climbers. Includes species that are aromatic, and with 4-angled stems. Leaves generally opposite or whorled. Flowers irregular and bisexual. The sepals are fused into a tube, or are bell-shaped, often 2-lipped, and persist in fruit. The corolla is irregular with petals fused below, and is tube-shaped or trumpet-shaped, and often 2-lipped. Fruit usually a drupe, capsule, or sometimes 4 nutlets. Among the ornamental plants in this family are *Lantana* and *Duranta*.	198-199
Lamiaceae (Labiatae)	Annuals, herbaceous perennials, shrubs, trees, or rarely climbers. Stems 4-angled, leaves simple and usually opposite. Stipules absent. Flowers zygomorphic (irregular), calyx often with 5 "teeth" at the top, or 2-lipped; corolla tubular, and 5-lobed, bilabiate (2 lips) with the upper 2 lobes forming the upper lip and the lower 3 lobes forming the lower lip; or else the lower lip only developed. Stamens 2 or 4 (2 short, 2 long). Flowers are perfectly suited for bee pollination. Inflorescence often in whorls (verticillasters, or false whorls) and bracts frequently present. Fruit made up of 4 nutlets with 1 seed each. Family contains many aromatic species, and contains plants that are important for aromatic oils, and culinary and aromatic herbs e.g. *Thymus*, *Salvia*, *Mentha*.	200-206
Acanthaceae	Annuals, herbaceous perennials, shrubs or climbers, rarely trees. Leaves opposite and without stipules. Flowers bisexual and irregular, with 4-5 fused petals and sepals. They are often 2-lipped or upper lip lacking (e.g. in *Acanthus*). Inflorescence bracts are often conspicuous and coloured. Fruit a capsule. Several species are grown as ornamentals due to their showy flowers.	206
Scrophulariaceae	Generally annuals or herbaceous perennials. Leaves opposite, alternate or sometimes basal. Stipules absent. Flowers variable, irregular and principally with 5 petals, sepals and stamens. Petals have their bases fused into a tube. Fruit a capsule. Formerly included several other genera that have been transferred to other families e.g. Plantaginaceae.	206-207
Orobanchaceae	Herbaceous plants that are parasitic and lack chlorophyll. They feed by means of threads called haustoria (singular haustorium) that attaches to the roots of plants (the hosts). Water and nutrients are transferred from the host to the parasite. Some are parasitic only on one specific species or genus. Leaves reduced to scales or absent. Flowers bisexual and irregular with a bilateral symmetry, often in spikes or racemes. The sepals form a tubular calyx, and the petals form a 2-lipped corolla, an upper lip of 2 lobes and a lower lip of 3 lobes. The flowers are also often showy and pollinated by insects. Fruit a capsule with numerous seeds dispersed by the wind.	207-210
Convolvulaceae	Annuals, herbaceous perennials, shrubs, trees or climbers. Climbers have no tendrils. The genus *Cuscuta* is parasitic and without leaves. Leaves alternate, simple or compound. Flowers regular and generally bisexual and are often bell-shaped or funnel-shaped or shaped as a tube with a flat face. They have 5 sepals, 5 petals and 5 stamens; petals fused, or fused into a tube and with 5 petal lobes. Mid-petaline bands present on corolla. Two bracts often subtend the flower. Fruit is characteristically a dehiscent capsule. Among ornamental plants of this family are *Ipomoea* and *Convolvulus*. The tubers of the Sweet potato *Ipomoea batatas* are used for food.	210-214
Solanaceae	Annuals, herbaceous perennials, shrubs, trees or climbers. Leaves usually alternate, variable in size and shape, often hairy and aromatic. Flowers usually regular and generally bisexual, bell-shaped, tubular or flat. Stamens usually attached to petals. Petals fused below to form a tube, and with free petal lobes above. Fruit is usually a capsule or berry. Of major economic importance are Potato *Solanum tuberosum* and Tomato *Lycopersicon esculentum*. Tobacco plants *Nicotiana tabacum* are grown to produce leaves of tobacco for smoking.	215-217
Araliaceae	Herbaceous plants, shrubs, trees or climbers with aerial roots for attachment (e.g. *Hedera helix*). Leaves usually alternate, usually compound. Flowers small, regular and often greenish or whitish and with 3-5 or more petals and 4-5 reduced sepals and are usually found in branched umbels. They are unisexual or bisexual. Stamens equal in number to the petals and are attached to a nectar disc. Fruit is a drupe. Ginseng comes from the roots of trees in this family	218

	(genus *Panax*).	
Pittosporaceae	Shrubs, small trees or climbers. Plants often aromatic. Leaves generally entire and leathery. They are usually entire, and alternate or sometimes opposite or whorled. Stipules absent. Flowers solitary or clustered, and usually regular. Petals, sepals and stamens 5. Stamens attached to sepals. Fruit a berry, or a capsule that opens longitudinally along "lines of weakness" (suture or midrib) of each segment). In *Pittosporum* the seeds within a capsule are coated with a sticky substance.	218
Apiaceae (Umbelliferae)	Annuals, or herbaceous biennials or herbaceous perennials, a few are shrubs. The Carrot family consists of several members (over 3,000 species) that form flowers in umbels. Below the umbel there is often a whorl of bracts. Secondary umbels are often present, these with or without secondary bracts (bracteoles). The flowers are 5-parted, (stamens, sepals and petals 5; sepals usually small or absent) with separate petals, often notched and their tips incurved (bent inwards). The outer flowers in an umbel may have the outer petals larger than the others (flowers radiate). Styles generally 2 and their base is often swollen (stylopodium). This stylopodium is a nectar-secreting organ that attracts insects. Leaf stalks (petioles) often have sheaths at their bases that sheath the stem. The leaves are alternate and compound, usually once, twice or more pinnate, cut into narrow sometimes fine segments, but entire leaves can also be found. Aromatic oils are present on leaves, stems, flowers and fruits. The fruit is called a schizocarp and splits apart into 2 single-seeded sections (mericarps), that remain attached for some time before separating at maturity. Some of these plants are of economic importance and used for food and flavouring, and also as ornamental plants – e.g. The Celery *Apium graveolens*, Wild Parsley *Petroselinum crispum*, Carrot *Daucus carota* subsp. *sativus* (a major food crop) and the Coriander *Coriandrum sativum* are all cultivated for food or for flavouring.	218-226
Campanulaceae	Annuals, herbaceous perennials or climbers, shrubs or trees (but primarily a herbaceous family), usually having a milky sap (latex). The leaves are simple and usually alternate, and stipules are absent. Flowers are regular or irregular, generally bisexual and in clusters. Flowers have different shapes and may be large and showy. Petals and sepals often 5. Stamens are in equal numbers to the lobes of the corolla (petal lobes). Fruit generally a capsule or a berry.	226
Asteraceae (Compositae)	The Daisy Family is the largest family of flowering plants in the World. The flowers are small, called florets and clustered into a head called a capitulum. This capitulum looks like a single flower and often 2 kinds of florets can be distinguished - the actinomorphic (regular) ones at the centre and forming the disc (disc or disk or tubular florets), where the petals are fused to form a tube and with 3-5 apical teeth; and the outer zygomorphic (irregular) ray florets where the petals are fused into what looks like one petal and in the form of a strap-shape or ligule (hence also called ligulate florets) with 3-5 apical teeth. These ray florets are often brightly coloured and resemble the petals of other flowering plants. Florets can also be bilabiate (i.e. 2-lipped). The flowerheads in the Asteraceae can be of 3 different kinds: Radiate, with disc (tubular) florets at the centre and ray florets around the periphery, e.g. the Daisy *Bellis.* Ligulate, with ray florets only, e.g. the Sow-thistle *Sonchus*; and Discoid, with tubular or disc florets only, e.g. Horse Thistle *Notobasis.* Many members in this family have anthers that are fused into a tube that surrounds the style. The style branches in 2 divisions. The head of flowers sit on what is called a receptacle, the flattened tip of the stem, and surrounded by an involucre with 1 or more rows of bracts called involucral bracts (also called phyllaries, singular phyllary). These sometimes have spiny tips. The fruit is one seeded and indehiscent (called cypsela) often with scaly or hairy tufts (pappus) and dispersed by the wind. This pappus is the reduced calyx. Several plants are cultivated in gardens for their beautiful flowers.	226-257
Sambucaceae	Herbaceous perennials, shrubs or trees with deciduous leaves. Stipule-like appendages often present. Leaves opposite, once or twice pinnate. Inflorescence a terminal panicle or corymb, large and branched. Flowers with small bracteoles and are regular and often fragrant. Petals fused below into a short tube and with free lobes often 5. Stamens equal in number to the number of petal lobes. Fruit a	257-258

	berry-like drupe.	
Viburnaceae	Deciduous or evergreen shrubs or trees. Leaves stalked and mostly opposite or less often in whorls of 3. Leaf margin is entire or toothed. Flowers in clusters and bisexual, and with 5 petals and sepals. They are tubular, bell-shaped or funnel-shaped, and white or pink. Outer flowers in inflorescence sometimes larger and sterile. Sepals small and reduced. Fruit a drupe with a 1-seeded stone (pyrene).	258
Caprifoliaceae	Herbaceous perennials, shrubs, small trees or climbers. The leaves are opposite or whorled, and sometimes connate, and may have stipules. Inflorescence generally a cyme. Flowers tubular or funnel-shaped and often 2-lipped. Petal lobes generally 5. Sepals 2-5. Stamens 4 (2 long, 2 short) or 5. Fruit a capsule, berry or drupe.	258
Dipsacaceae	Annuals, herbaceous perennials or low shrubs. Leaves opposite or in a whorl, entire or divided. Stipules absent. Flowers in a terminal compact flower head (capitulum) that is surrounded by involucral bracts. Each flower in the flower head has a small bract. Flowers bisexual, regular or slightly irregular, and those on the outside of the capitulum often larger than inner flowers. The corolla tubular or trumpet-shaped with 4-5 lobes, and the calyx is a cup or in the form of stiff hairs. Stamens 4. Fruit is single-seeded, indehiscent and hard, called cypsela.	259
Valerianaceae	Annuals, herbaceous perennials or climbers, sometimes woody at the base. Leaves generally opposite, simple or compound, stipules absent. Flowers generally small, cymose (cyme-like) to umbellate (umbel-like) with axis of inflorescence sometimes swollen. Flowers regular to slightly irregular and generally bisexual. Petals with 3 or up to 5 lobes, fused below, and corolla tubular to trumpet-shaped and sometimes weakly 2-lipped. Calyx usually absent or reduced, e.g. teeth or pappus. Number of stamens varies, but often 3. Fruit dry and indehiscent and with 1 seed called cypsela. Fruit may have pappus formed by calyx.	259-260
Araceae	Herbaceous plants with a unique inflorescence consisting of a fleshy axis (spadix), male and female flowers and a sheath (spathe). Some are climbers. Flowers unisexual or bisexual, and often have a smell of rotten meat to attract flies. Tepals absent or present. Fruit a berry. Several species used as ornamentals. The Duckweeds are also included in this family and these are aquatic with a reduced flowerhead.	260-262
Alismataceae	Aquatic annuals or herbaceous perennials. Leaves generally entire and simple, found at the base, and sometimes 2 forms exist - the submerged leaves are narrow, and the floating or emergent (above the water) leaves are broad. The leaf stalk has a sheath. Flowers have 3 petals and 3 sepals, and are regular. Sepals often remain present in fruit. Fruit is an achene, and in *Damasonium* a follicle.	262-263
Juncaginaceae	Aquatic or marsh annuals or perennials with rhizomes. Leaves basal forming tufts, often linear and sheathing at the base. Flowers small and usually regular, tepals usually present, 1-6, and greenish. Bracts generally absent. Inflorescence is erect, spikes or racemes. Fruit a schizocarp that splits into carpels.	263
Posidoniaceae	Rhizomatous perennials that grow submerged under the sea, forming large meadows. Lower part of its creeping rhizome is covered with the remains of leaf bases. The leaves are flat, strap-like and in clusters. Flowers regular and without tepals, clustered. Fruit is somewhat fleshy. Pieces of leaves and rhizomes are often carried to the beach by strong currents, forming what are called banquettes and are important in protecting the coast from erosion. The sea currents also combine them into rounded ball-like structures that can be found on the sandy shore. Both the underground Posidonia meadows and the banquettes on shore are a rich habitat for different species of fauna.	264
Ruppiaceae	Herbaceous plants living submerged in water (usually brackish or salty) and generally annual. Stems slender like threads, leaves simple and linear, opposite or alternate. The leaf base has a sheath. Inflorescence stalk eventually elongates and sometimes becomes coiled. The tiny flowers are hermaphrodite (bisexual) and lack tepals. Inflorescence terminal. Only 1 genus, Ruppia.	264-265
Potamogetonaceae	Aquatic herbaceous plants mainly in freshwater, and mostly are perennial, and with rhizomes. Stems flexible. Leaves can be opposite, alternate or in clusters, and have a sheath at the base. These are simple and the margin entire. The leaves in water are	265

	thinner than the floating leaves (when present). Flowers small, generally bisexual.	
Dioscoreaceae	Mainly twining and scrambling herbaceous perennials, with tubers or rhizomes, and often with heart-shaped leaves. Leaves generally alternate and entire, and stalked. Plants can be monoecious, dioecious, or hermaphrodite. Flowers small and regular, male or female or bisexual, and clustered in spikes, racemes, or panicles. Male and female flowers can occur on different plants (dioecious), e.g. *Tamus communis*. Tepals 6 in 2 whorls, can be fused below into a short tube. Fruit a capsule or berry.	266
Colchicaceae	Herbaceous perennials with corms or rhizomes. Leaves entire, at the base or on the stem. Flowers bisexual, solitary or clustered in cymes, racemes or umbels. The flowers have 6 tepals generally in 2 whorls, and can be fused at the base, and 6 stamens. Fruit a capsule. Sometimes included in Liliaceae. Some species are cultivated for ornament.	266
Smilacaceae	Generally evergreen perennial climbers, stems and leaves often prickly. With tendrils, or leaf stalks act as tendrils, coiling around support. Leaves entire, mostly opposite and leathery. Flowers male or female, in different plants (dioecious), and not so conspicuous. They have 6 tepals in 2 whorls, greenish-white to yellowish. Fruit a berry.	266
Liliaceae	Herbaceous perennials often with rhizomes or bulbs (geophytes). These plants have showy flowers, and are regular and usually bisexual. Flowers have 6 tepals in 2 whorls, tepals usually similar. Fruit generally a capsule or berry. Many species are cultivated for ornament or for producing fresh flowers for decoration, e.g. Tulips and Lilies.	267
Orchidaceae	Herbaceous flowering perennials with rhizomes or tuberous roots (root-tubers). The irregular flowers generally have a petal that is larger than the other petals, called the labellum. The seeds are tiny and very numerous in the capsule, dispersed by the wind. The orchid family make up about one third of the monocot families and is considered the largest family of flowering plants in the number of species (after the Asteraceae). Orchids occur in a wide variety of habitats, and they can also grow on trees as epiphytes. Epiphytic orchids have dangling aerial roots that absorb moisture. European orchids are terrestrial (geophytes). See also note on page 267.	267-283
Iridaceae	Generally herbaceous perennials with corms, rhizomes or bulbs. Leaves basal or found on the stem. Flowers solitary or in clusters, inflorescence variable. The flowers are often showy and bisexual, and regular or irregular. They have 2 whorls of 3 tepals, sometimes inner whorl reduced or absent. The tepals are free or joined at the base into a tube. The style is cut in 3 and often look like tepals. Fruit a capsule. The spice saffron is made from *Crocus sativus*, and several members of this family are cultivated for ornament.	284-287
Xanthorrhoeaceae	Previously a small family but now expanded and it includes many genera of diverse plants, herbaceous or woody, or succulent. Leaves in basal rosette, and flowers on a leafless stalk (scape). Fruit a berry or capsule.	288
Amaryllidaceae	Generally herbaceous perennials with a solitary bulb or clustered bulbs, or rhizomes. Leaves basal and entire, persisting or withered before or during flowering. They can be circular in cross-section and hollow (e.g. in *Allium*). Flowers solitary or clustered into umbel-like inflorescence or into a rounded head held on a leafless stalk (scape). They are bisexual, and can be regular or irregular, and tepals often in 2 whorls of 3 and showy. Flowers may have a corona. Fruit a capsule. The family now includes *Allium* species which are grown commercially as vegetables or for ornament. Many other species in the family are grown for ornament.	289-294
Asparagaceae	The family contains several genera of diverse plants, from small fragile ones (e.g. *Muscari parviflorum*) to large robust ones (e.g. *Agave americana*). Perennials with bulbs, rhizomes or less often tubers. Leaves basal, herbaceous or not, sometimes extremely large. Spines can be present. Leaves may be inconspicuous and membranous, and replaced by short, spiny needle-like or leaf-like specialised stems called cladodes (phylloclades). Flowers in singles, or in clusters e.g. a raceme, and can be unisexual or bisexual, and plants can be monoecious or dioecious. The inflorescence of *Agave* is very huge and can reach almost 15 metres in some species. Fruit a berry or capsule. Asparagus plants are widely cultivated for their edible young shoots, while *Agave* plants are widely used for landscaping though they are invasive.	294-299

Arecaceae (Palmae)	This family is characterised by the palm trees, however it also contains shrub-like plants and also climbers. Stem is solitary or in clusters. This family contains several economic important members, such as the Coconut Palm (coconuts) and the Date Palm (dates). Palms are also well known as ornamental plants. See also note on page 300	299-301
Typhaceae	Rhizomatous herbaceous perennials with long linear leaves, generally growing in shallow freshwater. Flowers individually inconspicuous, clustered at the top of a long simple stem, cigar-shaped or globose. Male and female flowers separate but on same plant, female flowers below male flowers. Fruit an achene or a drupe.	301
Juncaceae	Generally rhizomatous perennials, rarely annuals, occurring in wet habitats including saline/brackish. Often form tufts. Stems round and solid or hollow, sometimes flat. Leaves have sheaths and are long and narrow, and are circular in cross-section, or channelled or flat. Flowers small and inconspicuous, usually bisexual, and regular with 2 whorls of 3 tepals, clustered or solitary. Fruit a capsule.	301-303
Cyperaceae	The Sedge family is a large family of grass-like species often with solid and leafy triangular culms (stems) and with rhizomes. Culms can also be terete (circular in cross-section). They are mostly herbaceous perennials and can form tufts. The leaves are basal and linear with sheathing leaf bases, and contain silica. The flowers are small and often separate as male or female on the same plant, or sometimes a flower is both male and female. The male flowers are generally at the top of the inflorescence, the female flowers lower down. The male flowers have 2 or 3 stamens, and the female flowers have a stigma divided in 2 or 3 branches. Sepals and petals are absent, or represented by scales, bristles or hairs. These small flowers make up what are called spikelets, each flower subtended by a scale (bract) called glume. These spikelets together form the inflorescence that is terminal and can be simple or branched, example spikes, panicles, condensed heads, or even a single spikelet. The flowers are wind-pollinated. In the genus *Carex* the fruit is bladder-like and one-seeded called utricle (utricle is also defined as the wall surrounding the fruit in *Carex*). This is often crowned by a beak through which the stigma-branches project. These plants are often found in valleys and other damp areas, but locally 2 species can be found in garigue and maquis habitats. The general name in Maltese for the Sedges is Sogħda, for *Cyperus* is Bordi.	304-308
Poaceae (Gramineae)	A large family of annuals or herbaceous perennials. Most have rhizomes or stolons, and can form tufts. The leaves are often long (linear), broad or thin, flat or with rolled margins, and pointed at the tip and with a sheath at their base. Stems (called culms) are circular or somewhat flattened in cross section, and often hollow, except at the nodes. Grasses have small flowers without perianth (petals and sepals) and consisting of 3 stamens, an ovary with 2 feathery stigmas, and tiny membranous scales, and are wind pollinated. These small flowers are enclosed between 2 bracts, an outer (lower and larger) one called lemma, and an inner (upper) bract called palea, forming what is known as a floret. These florets are arranged into spikelets; at the base of this spikelet are 2 bracts called glumes. Spikelets often carry long stiff hairs, straight or bent, known as awns produced from the lemma. The fruits are generally dry (mostly a caryopsis-the wall of the fruit fused to the seed, or in some genera a nut) and contain 1 seed and have different dispersal appendages - example plumes, awns, hooks, barbs. Grasses grow erect or geniculately ascending – the lower nodes abruptly bend resembling a knee joint. The leaves are arranged in 2 rows and alternate (distichous arrangement). There is 1 leaf to a node. The leaves have a free blade, and a basal sheath that encircles the stem; where the sheath ends at the top to form the blade there is usually a ligule, a small whitish membranous structure. This ligule faces the stem and can sometimes be reduced to hairs. Grasses are very important for human society by providing food crops, as well as important industrial crops. Grasses are distributed throughout the world.	309-337

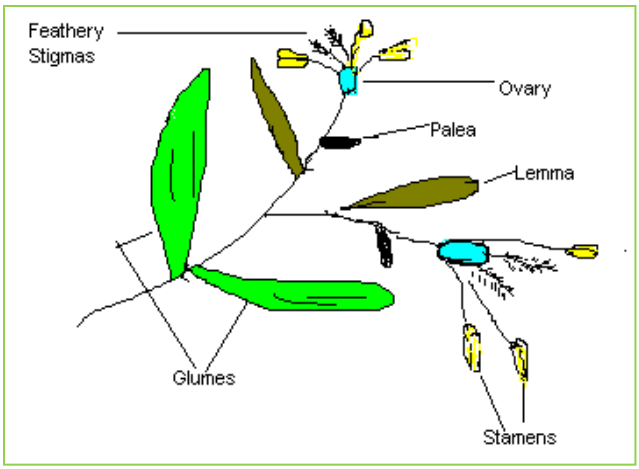


Poaceae: Grasses

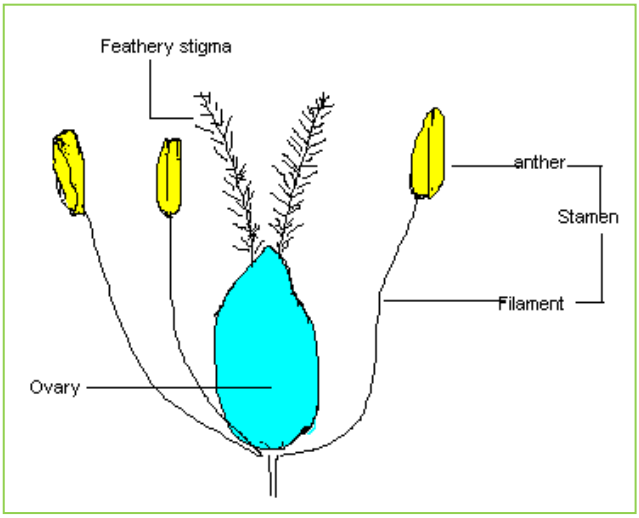
Leaf blade (lamina) of grasses

Ligule- a small and thin membranous projection from sheath

Sheath



A theoretical explanation of a spikelet of grasses. A spikelet is made up of one or more florets and of a pair of bracts called glumes. It has a thin primary axis called rachilla. Each floret usually has 2 feathery stigmas (female) and 3 stamens (male). The lemma and the palea are 2 bracts that contain and protect the floret. A pair of bracts (glumes) is found at the base of the spikelet. The number of florets can be determined by counting the number of lemmas.



Floret, without lemma and palea.

Colour guide to flowers…

This colour guide is meant as a simple guide to the wild plants encountered in the countryside during flowering. A flower can be placed in more than one box of colour. Flowers however can appear different in different light conditions and on some occasions it may be difficult to distinguish the flower colour, especially the shades of blue, violet, purple and pink. and so these colours have been put together in one colour box. Caution has to be expressed sometimes as flowers can be different from their usual colour, e.g. the Fan-lipped Orchid normally has purplish/reddish flowers, but on occasions the flowers can be whitish. The last colour box is for trees and shrubs, some included also by their flower colour. The rushes, sedges and grasses have been placed in the greenish and/or inconspicuous box (pages 301-337).

Flower colour	Page numbers
White	72, 73, 75, 79-81, 85, 86, 88, 97, 108,124-127, 138, 146, 148-150, 160, 162-165, 167-170, 178, 179, 188, 190, 193, 195, 200-203, 206, 207, 209, 210, 212, 214, 216-220, 222-225, 241, 257, 261, 266, 274, 285, 286, 288, 291-296
Yellow	72, 75-77, 98-101, 103, 110, 112-114, 118-121, 123-125, 128-136, 138-144, 148, 150, 156, 159-161, 163-168, 170, 171, 173, 174, 186, 191, 192, 194-196, 201, 203, 206, 209, 216, 217, 221, 223, 224, 229- 231, 235-239, 243-256, 267, 279, 281, 284, 286, 288, 299, 300
Yellow and white	77, 78, 96, 142, 216, 226, 227, 233-235, 252, 294
Blue/violet/purple/pink	70, 72-75, 78, 80, 83-85, 88-90, 98, 99, 101, 103-109, 111-114, 121, 122, 126-128, 130, 136-138, 144-147, 161, 167, 170-175, 178-184, 187-189, 191-195, 198-200, 202-215, 218, 226, 239-247, 250, 258-262, 266, 274-278, 280-282, 284, 285, 287, 289, 294, 296
Red	71, 97, 108, 115, 124, 128, 137, 141, 142, 144, 159, 174, 178, 260, 286, 290
Brown	100, 189, 274, 279, 280-282, 301, 304, 306-308
Parti-coloured	125, 159, 180, 191, 192, 196, 199, 202, 206, 210, 212, 215, 258, 279-281, 284
Green, greenish-white, greenish-yellow , yellowish-white and/or inconspicuous	64-69, 79-82, 86, 87, 90-96, 98, 100-102, 104, 109, 114-120, 122, 126, 139, 147, 151-159, 169, 175-177, 179, 183-186, 189, 190, 191, 195-198, 214, 218-220, 222, 224, 227, 228, 232, 233, 235, 237, 246, 255, 257, 260, 261-266, 289, 290, 297-299, 301-337
Trees and shrubs	67-70, 75, 79, 83, 84, 90, 92-94, 98, 104, 108-111, 113, 115, 118, 119, 121, 122-125, 129, 136, 141, 142, 147-154, 156-160, 170, 171, 174-179, 183, 189, 190, 199-202, 204, 205-207, 211, 215, 217, 218, 228, 229, 230, 236, 247, 257, 258

The Species pages 64 to 348

- Algae ..... Pg. 64
- Clubmosses..... Pg. 64
- Horsetails..... Pg. 65
- Ferns..... Pgs. 65-67
- Conifers (Gymnosperms)..... Pgs. 67-69
- Joint Pine (Gymnosperms)..... Pg. 69
- Flowering Plants (Angiosperms) - Dicotyledons..... Pgs. 70-260
- Flowering Plants (Angiosperms) - Monocotyledons..... Pgs. 260-337
  (from *Arisarum vulgare*)
- Addenda..... Pgs. 337-348



Annual Maidenhair *Anogramma leptophylla* growing out of a rock

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About me...

My passion for wild plants and nature in general started at an early age. I have studied environmental and science subjects and hold a diploma in Environmental Science. I was a volunteer for several years with environmental NGOs and officially as a warden in nature reserves for 12 years. I currently work in the field of environment protection and research.



Stonewort *Chara vulgaris* Kara

A freshwater fast-growing aquatic green alga. Stems slender and have short branches in whorls at intervals. Frequent and found in valleys and rock pools in winter. Lanfranco (1996) describes *Chara vulgaris* var. *longibracteata*; Henwood (2007) mentions also var. *papillata* as a new record for the Maltese Islands. Another Stonewort species - ***Chara globularis*** - is also mentioned from il-Qattara pool in Gozo (Cassar *et al*., 2004) and also from Dwejra, Gozo (Lanfranco, S. & Cassar, www.dwejra.org/ecology/Ecology.html). Many species of Stoneworts produce a coating of calcium carbonate over their surface.

Stonewort family Characeae

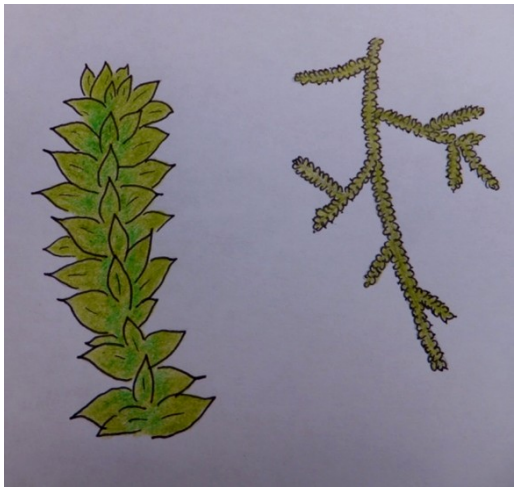




Foxtail Stonewort *Lamprothamnium papulosum* (*Lamprothamnus alopecuroides*)
Kara tal-Għadira

An aquatic annual alga growing in shallow salty water, anchored to the sediment by small fine thread-like structures (rhizoids). The main stem has whorls of slender branches each with several whorls of small spine-like leaves. The branches become contracted at the top, forming bushy heads reminiscent of a fox tail (hence its name Foxtail Stonewort). Rare and vulnerable, known only from Għadira nature reserve. The author found the plant growing in one area at Għadira nature reserve in early June 2011. It was identified by Edwin Lanfranco. Both authors agree that its introduction is by birds coming from other wetland areas, and as such it is a natural introduction. The plant is thus not considered an alien species. Għadira nature reserve holds brackish to very salty waters, with a high percentage of salinity levels more or less equal to the sea water salinity levels in winter but much more saline in summer. In 2011 the plant was found in only one area (south) of the reserve. It was growing with *Ruppia drepanensis* and with *Althenia orientalis* (Potamogetonaceae). In 2012 the author noticed the plant in other parts of the reserve and quite plentiful.

Stonewort family Characeae



Toothed-leaved Clubmoss/Mediterranean Clubmoss *Selaginella denticulata* Selaġinella

A small herbaceous pale green creeping plant with flattened stems, leaves less than 3mm and scale-like in 4 rows. The leaves are finely pointed and are unequal with the smaller leaves appressed to the stem. Reproduction is by spores (special cells that can give rise to new plants). These spores are found in sporangia in the fertile stems. Occurs in shaded areas in valleys and is rare.

Tabone (2008) records the species in a few valleys, with the population at Wied Ħanżir abundant and “possibly the largest population in the country”.

Clubmoss Family Selaginellaceae



Branched Horsetail *Equisetum ramosissimum* Denb iż-Żiemel

Perennial with rhizomes. The jointed and grooved green stem is hollow and contains silica. Branches are put out in whorls as are the small leaves. The leaves have sheaths at the bases and are toothed. The Branched Horsetail is the only one species to be found in the Maltese Islands. A scarce plant confined to damp places along watercourses and also in rubble walls. Horsetails are primitive plants. Reproduction is achieved by spores that are found in terminal cones called strobili (singular strobilus). *Equisetum* is the only Horsetail genus still surviving in the world.

Horsetail Family Equisetaceae



Maidenhair Fern *Adiantum capillus-veneris* Tursin il-Bir

Rhizomatous perennial too often found clinging from cracks in limestone rocks from where water seeps. Leaves are bright green, with lobed and toothed mostly fan-shaped leaflets, on thin blackish stalks. This is the most frequent to common fern species in the Maltese Islands and can be found in damp shady places including caves, cliffs, wells and also sometimes in holes in rocky ground, and in the "air holes" of cellars. Ferns are among the most primitive of plants. The leaves of ferns are called fronds. The frond is divided into a number of bright green leaflets or pinnae. Reproduction is not by seeds but by spores housed underneath the leaf. A spore is made up of one cell and can give rise to a new organism. Spores are produced in sporangia; a group of sporangia in ferns is called sorus (plural sori).

Maidenhair Fern Family Adiantaceae





Annual Maidenhair *Anogramma leptophylla* Tursin ir-Riħ

An annual small fern. Leaf stalk is shorter than leaves. The delicate leaves are divided into leaflets that are again lobed. The lobes at the tips are often rounded to fan-shaped. Found in shady and moist areas. Infrequent but could be unnoticed due to its small size and nature of its habitat.

Gymnogram Family Gymnogrammaceae




Rusty-back Fern *Asplenium ceterach* (*Ceterach officinarum*) Felċi tal-Ħajt tas-Sejjieħ - Rhizomatous perennial with dark green, thick and elongate leaves. These are pinnately-lobed and have brown scales underneath. The lobes have rounded tips. In the dry season the leaves are rolled, exposing the scales. Very rare in rocky valleys, e.g. Wied il-Għasel.

Spleenwort Family Aspleniaceae



Common Spleenwort *Asplenium trichomanes* Felċi

A rhizomatous perennial, leaves pinnate and dark green, linear in outline. Leaflets more or less rounded to elliptical, with small teeth mainly in the upper half. The stalk of the leaf and the axis between the leaflets (rachis) is dark brown to black. Sori are linear. Found on shady and moist walls in valleys, also in caves and among boulders in rdum, rare. The similar **Sea Spleenwort** *Asplenium marinum* Felċi tal-Baħar also occurs in the Maltese Islands. Recent sightings of this species come from crevices near the sea at Ras il-Griebeġ Malta and Mistra Rocks in Gozo (Lalov, Sekingova & Sultana, 2008). Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) also recorded the species from humid and shady places in valleys and as very rare. Its leaves are more robust with a lanceolate outline and divided in larger leaflets (pinnae), up to 4cm long.

Spleenwort Family Aspleniaceae



Mule's Fern *Asplenium sagittatum* (*Phyllitis sagittata*) Felċi tal-Bir

A rhizomatous perennial with elongate-lanceolate shiny leaves. Leaves stalked and with "ear-like" lobes at base, rounded on young plants then becoming triangular. Margin of leaf is wavy. Underneath the leaves are conspicuous brownish sori. Occurs in moist, shady or dark caves and shafts formed by boulders in rdum and is rare. **Hart's-tongue Fern** *Asplenium scolopendrium* (*Phyllitis scolopendrium*) is also recorded as rare in the same places by Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927). This is similar but the leaves are generally larger and do not have lobes at the base. Lanfranco (1989) state that records of this species are not confirmed.

Spleenwort Family Aspleniaceae



Ferns of the genus ***Cyrtomium*** (Holly Ferns) in the family Dryopteridaceae have been found naturalised (Lanfranco, pers. comm., 2012). Naturalised plants were found by the author (Casha) at Għajn tal-Mellieħa and on a damp wall in an urban area at Mosta. On both occasions these grew with *Adiantum capillus-veneris*. When young, these ferns resemble *Asplenium*. These ferns are not native to the Maltese Islands, and the genus contains about 15-20 species. They have dark green and glossy fronds. Left picture shows a naturalised *Cyrtomium* Fern plant. The plants at the bottom of the picture are Pellitory-of-the-wall *Parietaria judaica*



Sori underneath the frond (leaf) of *Cyrtomium*

Wood Fern Family Dryopteridaceae

The fern ***Polypodium vulgare*** subsp. ***melitense*** has been recently described from Gozo (Peroni *et al*., 2013)

Polypod Ferns Family Polypodiaceae





Aleppo Pine *Pinus halepensis*
Żnuber/Siġra taż-Żnuber

An evergreen coniferous tree with a silvery greyish to reddish-brown bark and needle-like leaves. Seeds are borne in woody structures called cones. These female cones mature after about 3 years and open in hot temperatures to release the seeds. The male cones are small and temporary, and in clusters, produced around January/February, and last till March - April. Common in the wild and easily grows on its own from seed especially on coralline ground. Much of the trees are thought not to be of native origin. Found also planted in gardens, plantations, afforestation sites and as a street tree.

Pine Family Pinaceae



Calabrian Pine *Pinus brutia* Żnuber tal-Lvant

The Calabrian Pine or Eastern Pine is similar to and often considered as a subspecies of the Aleppo Pine *Pinus halepensis.* The cones usually hang horizontally and not downwards as in Aleppo Pine. Stems have silvery-grey bark and are smooth at first, but become reddish-brown and fissured and peels off, (often more fissured/peeling than those of *Pinus halepensis*). The tree has horizontal branches and is generally with less dense foliage. Its "needles" are longer. Seeds black and have a wing. The Calabrian Pine is an alien introduction along with *Pinus halepensis* in afforestation projects.

Pine Family Pinaceae





Stone Pine *Pinus pinea* Żnuber tal-Umbrella

This tree usually has an umbrella-shaped crown. Needles are in pairs, emerging from dwarf shoots, and are thicker than those of the Aleppo Pine *Pinus halepensis*. They also have a somewhat spiny tip. Ripe male cones are found in spring, around February to May. Seeds are contained in a thick hard shell (pine kernels), without wing or with a short wing. Has sticky resin. The Stone Pine is not-native and is found planted in gardens, and also by roadsides and other places.

Pine Family Pinaceae





Italian Cypress *Cupressus sempervirens* Ċipress/Siġra taċ- Ċipress

An evergreen tree that grows tall in a columnar shape, or with spreading, horizontal branches. The stems are usually greyish-brown. The leaves are dark green, small and scale-like. Female cones are rounded, containing many seeds that have a small wing. The small and temporary male cones shed pollen dust from February to April. Has sticky resin. Frequently planted, the columnar form found in many cemeteries. Also naturalises in the wild.

The Italian Cypress is probably native to the eastern Mediterranean region.

Cypress Family Cupressaceae





Sandarac *Tetraclinis articulata* Għargħar/Siġra tal-Għargħar

An evergreen tree with greyish to reddish-brown bark. Young shoots often bluish. The leaves are very small and scale-like. Female cones solitary, eventually woody and are split in four. They contain small, winged seeds. Male cones are small and brown, found at the terminal tips of stems. The female and male cones start developing from around August onwards. From September to December pollen dust from male cones is shed on windy days. The female cones take about one year to develop, and are ripe July/August or later on. These fruits open up to release the seeds. Rare in the wild and known only from a few sites, e.g. Mellieħa, Mġarr, Wied il-Għasel and at il-Maqluba (Qrendi). The largest native population is at Mellieħa on a rocky hill and in the valley below which holds several specimens growing in a maquis habitat. Some old trees are found in public gardens, and nowadays more are being planted in gardens, schools, other public places and afforestation sites. The Sandarac is also found as a planted tree on Comino, where the first 2 trees were planted in 1995.

The Sandarac was declared the national tree of Malta on the 16 January 1992. It must have been more common in former times. Quoting from Haslam *et al*. (1977) " This is the Juniper tree referred to by Ciantar Abela in 1772 as

formerly being common on the island and still occurring over a large area including Birkirkara, Sliema and St. Julian's. Place names such as Għargħur indicate the former existence there of this tree" (Though the name Għargħur could be coming from Girgor and not Għargħar- Stevens & Baldacchino, 1998). In Europe the Sandarac occurs only in Malta and Southern Spain; it also occurs in North Africa (Morocco, Algiers, and possibly Tunisia) and is introduced in Israel and Cyprus (Lanfranco, 1998).The name Għargħar or Arar comes from its Arabic name Arar.

Cypress Family Cupressaceae



Phoenician Juniper *Juniperus phoenicea*
Ġniepru/Ġnipru/Ġniepru tal-Feniċi

This conifer occurs in dry Mediterranean regions but is not (considered) indigenous to the Maltese Islands. It grows in the wild (from planted specimens) at Il-Ballut tal-Wardija. Two small trees are also found naturalised at Mellieħa ridge. The Phoenician Juniper has rounded fleshy berry-like cones that ripen to reddish-brown. These cones are eaten and thus dispersed by birds. The leaves are small and scale-like in the adult stage but the young leaves are thin and sharply pointed. The Phoenician Juniper is missing from local maquis communities, and could be one of those listed as "missing species" (Lanfranco, 2002) that have for a reason or another gone extinct in the wild from the Maltese Islands. Note: The Arabic name (and Maltese name in Semitic) for both the Sandarac and the Phoenician Juniper is Għargħar - for this reason it is unclear on what species did earlier botanists referred to (Stevens & Baldacchino, 1998).

Cypress Family Cupressaceae





Norfolk Island Pine *Araucaria heterophylla*
Awrikarja Kbira

An unmistakable large tree with spreading branches and dense leaves. The leaves are slender and pointed at tip on young shoots, and ovate on older shoots. Found planted in public and private gardens, e.g. Buskett. Not native to the Maltese Islands.

Araucaria Family Araucariaceae





Shrubby Horsetail
Ephedra fragilis Efedra

A shrub with thin and jointed, flexible stems, branches are mostly opposite and bear scale-like leaves. Male and female parts occur on separate plants (dioecious). The fruit is berry-like with fleshy reddish/orange scales and contains 2 seeds. Flowers in spring, March-April. Recorded from Wardija by Grech Delicata (1853). Found planted at Argotti and Ta' Kenuna botanical gardens. Extinct in the wild.

Ephedra (Joint Pine) Family Ephedraceae




Bay Laurel *Laurus nobilis* Randa/Siġra tar-Rand

An evergreen tree or shrub with dark and smooth bark. Leaves are leathery, aromatic especially when crushed. The stalked alternate leaves are elongate and pointed at tip, somewhat elliptical. The margin of the leaf is often slightly wavy. Flowers male or female, greenish-yellowish or whitish, found in clusters in leaf axils. They have 4 perianth segments. The rounded berries turn black by the autumn. Scarce and often found as a planted tree, in shady and damp areas, but also grows in more open areas from seeds dispersed by birds. The plant also grows suckers. Flowers are found around February to April (though the buds can be found much earlier). Sometimes a few flowers are also found in autumn. The fresh or dried leaves can be used in flavouring food. The largest native population of Bay Laurel occurs at Wied Qirda (MEPA, 2011b).

Laurel Family Lauraceae




Aristolochia *Aristolochia clusii* Aristolokja/Papra Selvaġġa

Tuberous greyish-green herbaceous perennial with narrow angular scrambling stems and alternate, stalked heart-shaped leaves with wavy margins. The flowers are axillary and solitary on short stalks. The flower is tubular with a "mouth" the inside of which is yellowish and with brownish stripes, hairy. The flowers have a swollen base. Fruit an oval capsule that opens up (dehisces) to release the seeds. Rare in valley bottoms and rocky valley slopes, known only from a few locations, e.g. Wied il-Għasel and Wied Ħoxt. Flowers from March to May. Pollination of *Aristolochia* is effected by flies that are trapped inside the tube by means of down-pointing hairs. These hairs relax and allow the flies to escape after pollination.

Birthwort Family Aristolochiaceae




Poppy of Troy *Papaver setigerum* (*Papaver somniferum* subsp. *setigerum*) Xaħxieħ Vjola/Pepprin Vjola

A greyish-green erect and bristly-hairy annual with toothed or pinnately-lobed leaves, upper ones clasping stem. The lobes or the teeth have a bristle-like hair at their tip. The underside of leaf mid-rib has white hairs. Flowers are large with 4 pale violet petals having a dark purplish centre. The solitary flowers occur on long, hairy flowering stalks. Stamens are numerous with yellow anthers at the centre of the flower. The 2 hairy sepals fall off when flower opens. Fruit a rounded capsule with openings at the top. Seeds are small and numerous, black. Frequent in disturbed habitats, March to May.

Poppy Family Papaveraceae




Common Poppy *Papaver rhoeas*
Pepprin/Pepprin Aħmar/Pepprin Komuni

A hairy to somewhat bristly, erect and branched green or greyish-green annual. Leaves divided (pinnately lobed to pinnate), lower ones with stalk, upper ones sessile. Flowers solitary, bright orange to red, with four petals, crumpled at first and occur on long stalk generally with spreading hairs. The petals may have a black blotch at base. The dark bluish anthers are numerous and surround a central stigma disk. The two sepals fall off early after the flower opens. The fruit is a somewhat round hairless capsule; its length is less than two times its width, and has openings at the top through which the tiny seeds exit. Common, in fields, along tracks, roadsides, flowers found from February-March to June. The Maltese name Pepprin can be written as Peprin. See also page 341.

Note: Subspecies *strigosum* (*Papaver intermedium*) has appressed hairs on the upper stems and flower stalks, and the petals do not have a dark centre. This subspecies is mentioned by Borġ (1927) as form *intermedium* and given as "also met with frequently in fields".

Poppy Family Papaveraceae




Mediterranean Poppy *Papaver pinnatifidum* Pepprin tal-Istami Sofor

A hairy to somewhat bristly erect annual with pinnately-lobed leaves. Flowers are orange and have dark filaments and yellow anthers. The flower stalks have hairs that are pressed close to the stem, at least on the upper parts. The seed capsule is elongate and hairless, about 3-5 times as long as wide. Common in fields and other disturbed places and flowers from January to May.
The **Long-headed Poppy** *Papaver dubium* Pepprin tal-Istami Vjola/Pepprin tal-Frotta Twila is a hairy to somewhat bristly annual, similar to the Mediterranean Poppy *Papaver pinnatifidum,* but the flowers have violet (- dark greenish-brown) anthers. Stamens are generally shorter than the ovary. Hairs on flowering stems are appressed (lying flat along the stem). The fruit (capsule) is up to twice as long as wide. In fallow and cultivated fields, March to May, frequent.

Poppy Family Papaveraceae




Bristly Poppy *Papaver hybridum* Pepprin tal-Lanżit

A bristly-hairy erect annual with pinnately-lobed leaves, the pointed lobes of the leaf have bristle-like hairs at their tips. Lower leaves stalked. The 4 dark red petals have a dark blotch at base. The flower stalk has hairs that are pressed close to the stem. The anthers are bluish. The seed capsule is rounded and ribbed and has pale bristles. Common in fields, other disturbed sites, January to May.

Poppy Family Papaveraceae



Yellow Horned-poppy *Glaucium flavum* Pepprin Isfar/Pepprin tal-Qrun

A greyish-green herbaceous biennial to perennial plant with ascending to erect, branched hairless stems that contain latex. Leaves hairy, the lower ones are long and pinnately-lobed with toothed to lobed segments. The lower leaves are stalked, the upper are smaller and sessile. The flowers are solitary, yellow, with 4 petals surrounding the yellow stamens in the centre. The seeds are contained in a long, often curved hairless capsule (the fruit), which splits from the top along its length to release the small dark seeds. Frequent and usually found at the coast on sandy and rocky areas, including disturbed sites. Flowers from April to around September or later.

Poppy Family Papaveraceae



Italian Fumitory *Fumaria gaillardotii* Daħnet l-Art Kbira

One of the larger flowered with flowers measuring around 10-14mm long. They are pale pink with the tips of the inner petals and the tip of the upper petal dark purplish. Lower petal is often spreading down. Upper petal has more or less a pointed tip. Raceme with 10 -15 (20) flowers and can be shorter or longer than the peduncle. The bracts are equal to or less than the stalk of the fruit. Fruits rounded and more or less pointed at tip, wrinkled when dry and with a slight keel. Common in fields, gardens and other disturbed ground, December to May-June. Sommier & Caruana Gatto (1915) recorded the similar **Field Fumitory** *Fumaria agraria* Daħnet l-Art tal-Għelieqi as common especially in cultivated and fallow fields. Lanfranco (2015) describes it as less frequent than *Fumaria gaillardotii*.

Poppy Family Papaveraceae





Ramping Fumitory *Fumaria capreolata* Daħnet l-Art Bajda

The Ramping Fumitory has creamy-white to pinkish flowers with the tip of the upper petal and tips of inner petals dark (blackish-purple). The raceme is shorter than the peduncle and holds up to 20-25 flowers, at first on erect stalks (pedicels) then recurved. The fruits hang on recurved stalks. The fruits are smooth and indistinctly keeled. Not frequent, flowers winter to spring (December to March).

Note: The word *Fumaria* comes from the Latin word *Fumus terrae* meaning smoke of the earth, translating in Maltese "Daħnet l-Art".

Poppy Family Papaveraceae





Dense-flowered Fumitory *Fumaria densiflora* Daħnet l-Art

Annual, the finely divided leaves with deeply-lobed segments. One of the smaller-flowered Fumitory species, with length of flowers between 6-7mm long. Flowers dense, in a raceme with 20 (15) to 25 flowers, purplish-pink with darker tips. The raceme is much longer than the peduncle, which can be absent (the stalk has flowers the whole length). The sepals are relatively large, and toothed, generally wider than the corolla. Bracts exceed the pedicels (stalks of the fruit). The fruit is spherical with a slight point at the tip, has a keel and is wrinkled when dry. Flowers from February to May and is scarce-rare.

Poppy Family Papaveraceae





Common Fumitory *Fumaria officinalis* Daħnet l-Art Medja

The flowers of the Common Fumitory are pinkish-purple with a dark tip (inner petals tipped blackish-purple) and about 7-9 (-10) mm long. The erect racemes are longer than their short stalk (peduncle). The bracts are almost equal to or less than the stalk of the fruit. Sepals have irregular teeth and are narrower than the corolla. Fruits rounded and flattened at the top, without a distinct keel. Frequent, fields and other disturbed ground, December to July.

Poppy Family Papaveraceae



Fine-leaved Fumitory *Fumaria parviflora* Daħnet l-Art tal-Weraq Fin

A small-flowered Fumitory. The leaves are finely divided and with channelled (grooved) segments. The flowers of this species measure between (4-) 5 to 6mm in length, whitish or pale purplish with a darker tip. The raceme has between 6 to (15) 20 flowers, and is much longer than the peduncle (inflorescence almost sessile). The bracts are equal or longer than the stalk of the fruit. Fruits rounded with short point and with a distinct keel, and with a wrinkled surface when dry. Common in disturbed ground, January to May. Other Fumitory species recorded for the Maltese Islands include the **Southern Ramping Fumitory** *Fumaria flabellata*, the **Two-coloured Fumitory** *Fumaria bicolor*, **Tall Ramping Fumitory** *Fumaria bastardii*, and the **Common Fumitory** *Fumaria muralis*. Mifsud (2008) also describes *Fumaria reuteri* from Santa Venera in Malta, in abandoned fields and margins of fields with cultivated wheat.

Poppy Family Papaveraceae





Love-in-a-mist *Nigella damascena* Sieq il-Brimba

Annual with leaves cut into thread-like segments and solitary pale bluish-white to white flowers. The flowers have numerous stamens. The uppermost leaves (flower bracts) are just below the flower, and are also finely divided and similar to the other leaves. The fruit is an inflated capsule in the middle of the flower. Common in garigue, rocky valleys, rocky steppe, also disturbed rocky ground, March to around May.

Buttercup Family Ranunculaceae





Winged Larkspur *Delphinium halteratum* Sieq il-Ħamiema Vjola/Pedidalwett Salvaġġ

A hairy annual with ascending or erect stalks. Lower leaves are palmately-lobed, the lobes with further small lobes, upper leaves elongate and narrow (linear-lanceolate), usually undivided. Flowers bluish-violet, in erect racemes, and have an upturned spur. Scarce to frequent on disturbed ground like fields, roadsides and paths, flowering from around May to September. The **Short-spurred Larkspur** *Delphinium staphisagria* Żerriegħet il-Qamel is also listed for the Maltese Islands (Lanfranco, 1989; Haslam *et al*., 1977; Lanfranco, G. 1969; Borġ, 1927). It is described as rare, and "now nearly extinct" (Lanfranco, 1989) occurring in a few places. Its native status is doubtful "since it appears to have been cultivated as a herbal remedy" (Lanfranco, 1989). It is a hairy annual (-biennial) plant with palmately lobed leaves and large deep blue flowers in racemes which bloom in spring. The **Larkspur** *Consolida ajacis* (*Consolida ambigua*) Pedidalwett is also described by Haslam *et al*. (1977) and Borġ (1927) as occurring as a cultivated and naturalised plant. One plant was found in April 2020 by John Rapinett in a field growing among wheat at Mrieħel, picture of plant was shown to me for identification (Michael Sammut, pers. comm., April 2020).

Buttercup Family Ranunculaceae





Crown Anemone *Anemone coronaria* Kaħwiela/Qaħwiela

A hairy herbaceous perennial with rhizomes and long-stalked basal leaves divided in 3 segments (leaflets), the segments with deeply cut lobes. Flowers conspicuous, solitary and has long stalk, deep violet with many dark anthers in the middle. The flowers have a single whorl of petal-like segments. The flower bracts (stem leaves) are similar to the basal leaves but smaller and occur below the flower in a whorl. Scarce to frequent in garigue, maquis and valleys from late January to March. The **Broad-leaved Anemone** *Anemone hortensis* Anemoni/Kaħwiela Ċara is given as possibly extinct by Lanfranco (2015, 1989).

Buttercup Family Ranunculaceae




Evergreen Traveller's Joy/Spanish Traveller's Joy *Clematis cirrhosa* Kiesħa/Bajda

A woody climbing evergreen perennial, with shiny green leaves. Leaves are simple with toothed margin, or with 3 lobes, or divided in three segments. The plant produces many large and nodding bell-shaped, yellowish/greenish-white flowers. The stalked flowers have 4 tepals and occur in clusters. The achenes (fruits) have a kind of a plume (feathery attachment) that serves for wind dispersal. Scarce to frequent and on the increase, growing in maquis, valleys and rdum, also on rubble walls, too often climbing or spreading on nearby vegetation, using leaf-stalks as tendrils for support. Flowers from October to around January.

Buttercup Family Ranunculaceae




Pheasant's Eye *Adonis microcarpa* Għajn is-Serduq/Għallet is-Serduq/Ħenna

An erect hairless annual, leaves finely divided with narrow segments. Lower leaves stalked upper ones sessile. Flowers are solitary and cup-shaped, shiny bright red with a dark centre, on a stalk. They close during the night. Sepals are purplish, curving towards the petals. Achenes (fruits) with beak, clustered in an elongated, erect head. The beak of the fruit is dark green or blackish. Formerly frequent now rare in open places like fields and garigue, e.g. Comino, Selmun, Nadur (Malta) flowering from late January-February to around April.

Buttercup Family Ranunculaceae




Large-leaved Buttercup *Ranunculus macrophyllus* Ċfolloq Kbir

A hairy herbaceous perennial with spreading or erect hairs, and ascending to erect stems. Lower leaves long stalked, each with 3 segments that are lobed and toothed. Upper leaves cut into narrow segments. Sepals are hairy, eventually reflexed (bent down). Flowers yellow on long stalks, solitary. Achenes are hairy or hairless with tiny curved beak. Frequent in humid areas such as watercourses, flowering in April and May. The **Hairy Buttercup** *Ranunculus sardous* Ċfolloq Muswaf is recorded as possibly extinct by Lanfranco (1989), and as rare in Lanfranco (2015) . It is given in Weber *et al*. (2006) as rare in rocky sites and damp places in valleys. Lanfranco (2015) states that it is "perhaps not native since it tends to occur in man-made habitats".

Buttercup Family Ranunculaceae





Bulbous Buttercup *Ranunculus bulbosus* subsp. *aleae* Ċfolloq tal-Werqa

Herbaceous perennial, stem not swollen or scarcely swollen at base. Leaves have 3 segments which are toothed/lobed again. The central segment is stalked, a distinguishing feature of this subspecies. Upper leaves are smaller. Flowers yellow, sepals reflexed. Fruits are a head of smooth beaked achenes. Flowers from (January-) February to May. Scarce in valleys, also roadsides near valleys, recorded from several areas, e.g. Wied Qirda, Wied il-Għasel.

Buttercup Family Ranunculaceae





Spiny-fruited Buttercup *Ranunculus muricatus* Ċfolloq tal-Frott Xewwieki/

An annual, mostly hairless buttercup, with stems branched at the lower part. Leaves have three main lobes with rounded teeth on the margins. The lower leaves are long-stalked. Some of the upper leaves may be entire. Flowers are solitary with 5 yellow petals that exceed the 5 reflexed green sepals. The achenes (fruits) are "spiny" in rounded heads. Common found usually in damp places in valleys and cultivated areas, flowering from February to May. The **Corn Buttercup** *Ranunculus arvensis* Ċfolloq tar-Raba' also occurs (Haslam *et al*., 1977; Borġ, 1927) and is described as frequent but not common in cultivated and waste ground especially on clay. Lanfranco (2015) states that it is rare and grows mainly in fields with clay soil. Tabone (2008) gives two records from Il-Girgenti and l-Imtarfa among his list of rare plants.

Buttercup Family Ranunculaceae





Jersey Buttercup/Fan-leaved Buttercup *Ranunculus paludosus* (*Ranunculus flabellatus*) Ċfolloq Żgħir/Ċfolloq tax-Xagħri

Generally a small herbaceous perennial with erect hairy stems and stalked leaves. Leaves closest to the ground are fan-shaped, toothed, and can also be 3-lobed, those higher up are deeply divided into narrow segments. Flowers stalked, yellow, sepals are hairy, pointed, spreading not reflexed. Fruit head dense, achenes hooked. Frequent to common in garigue, maquis, rocky valleys, March to May.

Buttercup Family Ranunculaceae




Lesser Celandine
Ranunculus ficaria
Fomm il-Għeliem

A herbaceous tuberous perennial, with broad rounded to heart-shaped stalked dark green glossy leaves. Flowers are bright yellow, long-stalked and solitary and can be seen from around January to April. Formerly frequent but has decreased and is now scarce-rare, in humid and shady areas in valleys.

Buttercup Family Ranunculaceae




Autumn Buttercup
Ranunculus bullatus Ċfolloq

A herbaceous low and hairy perennial with basal, stalked, wide and rounded to ovate leaves spreading over ground. The leaves have a toothed margin. The stalked bright yellow flowers occur in singles. Sepals are greenish, hairy. A common plant in garigue, maquis, and rocky valleys flowering from October to around January-February

Buttercup Family Ranunculaceae




Sanicle-leaved Water Crowfoot *Ranunculus peltatus* subsp. *fucoides* (*Ranunculus saniculifolius*) Ċfolloq tal-Ilma

Annual, leaves at the surface are wide, mainly three-lobed, and help the plant to keep afloat. The leaves under water are thin and finely segmented. Flowers are small with 5 white petals and a yellow centre. Scarce to frequent in water pools formed by the rain on rocky ground flowering from around November to May.

Buttercup Family Ranunculaceae





Three-leaved Water Crowfoot *Ranunculus trichophyllus* Ċfolloq tal-Wied

A herbaceous perennial with finely segmented leaves (does not have wide leaves as is found in the Sanicle-leaved Water Crowfoot *Ranunculus saniculifolius*). Flowers are white with a yellow base. Found in a few watercourses, e.g. Wied il-Qlejgħa, usually frequent-common where present, flowering from around December to May. Lanfranco (1993, 1989) mentions the **Adder's Tongue Spearwort** *Ranunculus ophioglossifolius* Ċfolloq Tal' Lsien is-Serp from Għajn Riħana, which he considers now extinct. Also recorded by the same author (1989) and as possibly extinct are the **Eastern Buttercup** *Ranunculus chius* and the **Three-lobed Buttercup** *Ranunculus trilobus*.

Buttercup Family Ranunculaceae





Annual Sea-heath *Frankenia pulverulenta* Frankenja

A small, prostrate to ascending or sometimes erect hairy annual. Plants can also form mats over the ground. Leaves and flowers only few mm long. Leaves are stalked and more or less rounded to spatulate, broadest above the middle. They are flat at first, but margins get curved down especially in dry conditions. Flowers are violet with 5 petals. Scarce-frequent, occurs in sandy and rocky habitats around the coast, April to around June.

Sea Heath Family Frankeniaceae





Hairy Sea-heath *Frankenia hirsuta* Erba Franka

A prostrate hairy and branched herbaceous perennial, often with pinkish stems, and forming mats on the ground. Leaves are small, elongate and with revolute (rolled down) margins, looking linear. They occur in clusters along the length of the stem. Flowers pale purplish-pink in dense leafy clusters at the top of stems. Frequent to common in coastal areas, sandy and rocky and also on clay, February-March to July.

Sea Heath Family Frankeniaceae





African Tamarisk *Tamarix africana* Bruka/Siġra tal-Bruk

A shrub to a small tree with dark bark. Older stems have fissured bark, younger stems smooth. Leaves minute, only a few mm long. They are pointed and overlapping at first, eventually becoming alternate, and fall or are reduced in winter. Leaves have a semi-transparent border. The flowers are clustered in racemes resembling catkins, white or pale pinkish-white, with 5 petals and scented. They are usually produced on woody stems (last year's growth). Bracts generally exceed the sepals. The seeds are tiny and with hairs, and are dispersed by the wind. Tamarisk trees are tolerant of salty conditions, and they have glands in their leaves that secrete and exude salt. For this reason Tamarisk trees often have salty water on their leaves. Native and found in coastal localities, including clay slopes in rdum, sandy areas and at the back of sand dunes, saltmarshes, and also planted for ornament. Native population e.g. as at Comino, Mġiebaħ, Għadira, is considered scarce, since much of the trees that occur in many places have been planted. Flowers in spring, at the same time or before the new leaves appear, from February to April/May.

Tamarisk Family Tamaricaceae





Common Tamarisk/French Tamarisk *Tamarix gallica* Bruka Roża

A hairless shrub or tree, similar to the African Tamarisk *Tamarix africana* but usually flowers later in the season, and flowers are pinkish, produced on stems of the current year. The bracts do not generally exceed the calyx. Flowers from April/May to June, also later on in summer. Occurs mostly planted. Not native.

Tamarisk Family Tamaricaceae





Sea Knotgrass *Polygonum maritimum* Lewża tal-Baħar

A low greyish-green perennial with spreading and prostrate stems woody at base. Leaves are numerous, elliptical with revolute margins, and alternate. The ochrea is silvery and semi-transparent at the top, veined and deeply cut, and with a reddish/brownish base. It usually exceeds the short internodes. Stem is nearly covered with ochrea. Flowers are solitary or in small clusters, with 5 white or pinkish tepals on a thin short stalk, in the axils of the leaves. Fruit is a three-angled dark brown and shiny nut. Rare in coastal areas including beaches and sand dunes, e.g. Sta. Maria bay at Comino, April to November. Sighted also at Ramla tal-Mixquqa and Għadira s-Safra in recent years by the author.

Dock Family (Buckwheat Family) Polygonaceae





Common Knotgrass *Polygonum aviculare* Lewża tar-Raba

A prostrate to ascending annual, sometimes with erect stems. The leaves have a sheath encircling the stem at leaf base (ochrea), silvery and semi-transparent, and veined, with a brownish base; the upper part is deeply cut. Leaves alternate, elongate (elliptic to linear-elliptic) and very shortly stalked. The leaves on the main stem are much larger than those on the branches. The flowers are small, whitish or pinkish and solitary or in small clusters in the leaf axils. The flower segments (tepals) are wide and overlapping. Flowers from February to around November and can be found in fields and other disturbed habitats including wet areas.

Dock Family (Buckwheat Family) Polygonaceae





Willow-leaved Knotgrass *Persicaria salicifolia* (*Polygonum salicifolium*) Persikarja tal-Baħrija

Herbaceous perennial with prostrate or ascending stems. Leaves narrow and soft, pointed, with short stalk. Their margins have minute teeth. The ochrea have relatively long and thin divisions at the top. Flowers are small with pinkish-white tepals on an elongate and slender flower stalk (spike). Fruit a shiny black nut. Rare in watercourses e.g. Baħrija and it flowers in summer-autumn from July-October, sometimes later on in winter. "Only occurs where water flows all year round. Very rare, except at Baħrija", Lanfranco, 1996. Known only from 2 areas with permanent springs (Lanfranco, 1989). The **Wild Buckwheat** *Fallopia convolvulus* is another member of the Polygonaceae. It is recorded by Tabone (2008) from a number of sites in Malta. The author states that it "grows in cultivated fields with deep soil".

Dock Family (Buckwheat Family) Polygonaceae





African Persicaria *Persicaria lanigera* (*Polygonum lanigerum*) Persikarja Roża/Persikarja Muswafa

An aquatic plant with conspicuous pinkish flowers in a spike. The soft-hairy leaves are elongate, soft and pointed, and have sheaths at their bases surrounding the stem (ochrea). The stems of the plant are adapted to an aquatic life and can float on water. Rare in watercourses, ditches and reservoirs, April to July or later. Its introduction is very possibly a natural one by means of migratory birds of wetlands.

Previously recorded as **Tropical Persicaria** *Persicaria glabra* (*Polygonum glabrum*) Persikarja tal-Fjuri Roża/Denb il-Wiżgħa (Lanfranco, 2015; Mifsud, 2012a).

Dock Family (Buckwheat Family) Polygonaceae




African Water-pepper/ Southern Water-pepper *Persicaria senegalensis* (*Polygonum senegalense*) Persikarja tal-Fjuri Bojod/Denb il-Gremxula

This perennial has conspicuous white (sometimes pink) flowers in dense spikes, purplish stems, and soft leaves with pointed tips. It is found at Wied il-Għasel and a few other valleys, ditches and ponds. It flowers from around March to July. The African Water-pepper is an African plant; its introduction into the Maltese islands could be a natural one by migratory birds that favor wetlands. According to Lanfranco (2015) it is a relatively recent introduction and is scarce. Mifsud (2012a) gives two forms of this species occuring in the Maltese islands: forma *senegalensis* and forma *albotomentosa*.

Dock Family (Buckwheat Family) Polygonaceae




Clustered Dock *Rumex conglomeratus* Qarsajja tal-Ilma/Lapazju

An erect herbaceous perennial, leaves large, lanceolate and stalked. Margin of leaf is wavy. Upper leaves are smaller. Flowers small clustered in whorls along the slender flowering stem, greenish, later on turn reddish. Inflorescence is leafy and branched. Whole plant dries and turns dark brown in summer. Fruits enclosed in structures called valves, without teeth on the margins. Common, flowering from April to June, in watercourses, other humid places.

Dock Family (Buckwheat Family) Polygonaceae




Fiddle Dock *Rumex pulcher* Qarsajja Vjolin

A herbaceous perennial with grooved ascending to erect stems, similar to the preceding species, the Clustered Dock *Rumex conglomeratus*, but with the basal leaves that are often restricted at the lower parts. Stem leaves smaller than basal leaves, alternate, lanceolate and have pointed tips. The inflorescence carries widely spreading thin branches, with flowers in whorls, subtended by one leaf (bract); these bracts are reduced upwards. The stems of the inflorescence are in a zig-zag fashion at the upper parts. The fruits are three-angled nuts enclosed in structures called valves. These valves have a toothed margin. Scarce to frequent, flowers from April to June and occurs in damp places such as watercourses, rock pools and sides of paths in marshy ground, and also in drier areas. The **Broad-leaved Dock** or **Bitter Dock** *Rumex obtusifolius* Qarsajja tal-Werqa Kbira also occurs, formerly common but now rare (Lanfranco, pers. comm., 2005).

Dock Family (Buckwheat Family) Polygonaceae





Greek Dock *Rumex cristatus* Qarsajja Kbira

Robust herbaceous perennial with erect stem branched above. Basal leaves are large, lanceolate (to elongate-lanceolate) and stalked. Margin of leaf is entire or weakly waved. Inflorescence is terminal and dense, erect but often bending, with straight or curved branches. Flowers are small and have short pedicels, and occur in whorls along the stem. Fruits enclosed by rounded valves that have a finely toothed margin. Inflorescence and fruits are greenish, eventually turning reddish-brown. A naturalised alien and found in valleys such as Wied Għasri and Marsalforn. Flowers in spring, April to May or later.

Dock Family (Buckwheat Family) Polygonaceae





Red Dock *Rumex bucephalophorus* Selq Ħamrani

An ascending to erect reddish annual with alternate and small, variable leaves, spatulate to elliptic, upper ones narrower. The thin stems carry stalked flowers in small clusters in a long inflorescence. The flower stalk can either be short and cylindrical, or longer and flat. The reddish fruits have teeth and hang on curved stalks. Frequent, December to May in garigue, rocky steppe, fields, roadsides, sandy areas. Lanfranco (2015) describes the subspecies *gallicus* for the Maltese Islands. The **Tree Sorrel** *Rumex lunaria* is recorded in Haslam *et al*. (1977) as "cultivated for ornament and sometimes naturalised such as at Buskett (Borġ)". This was recently seen at Buskett hence it is still extant there (Stephen Mifsud pers. comm., Aug 2016). *Rumex lunaria* is native to the Canary Islands.

Dock Family (Buckwheat Family) Polygonaceae





Spiny Dock *Emex spinosa* Selq Xewwieki

A prostrate to erect hairless annual with stalked more or less ovate leaves. Flowers are male or female on same plant, with six segments, inflorescence of clustered flowers in whorls, axillary and terminal. The female flowers are found below the male flowers. The fruit is spiny. Scarce to frequent. Found in valleys, fields, roadsides and other disturbed habitats, and sandy places, January to May.

Dock Family (Buckwheat Family) Polygonaceae





European Plumbago
Plumbago europaea
Pjombina Selvaġġa

Herbaceous perennial with branched angular stems. Leaves are alternate, mealy (powdery) beneath, entire or toothed. Lower ones are stalked, upper ones elongate-spatulate and clasp the stem with 2 end lobes, uppermost leaves smaller. The leaves may have a wavy margin. Flowers with 5 violet petal-lobes joined at the base into a narrow tube, calyx is tubular and densely sticky (glandular). Fruit a capsule, enclosed by the calyx. Flowers from June to November and is scarce to rare, e.g. Siġġiewi. Described as "not rare" on the southern side of Malta by Sommier &Caruana-Gatto (1915).

Thrift Family Plumbaginaceae





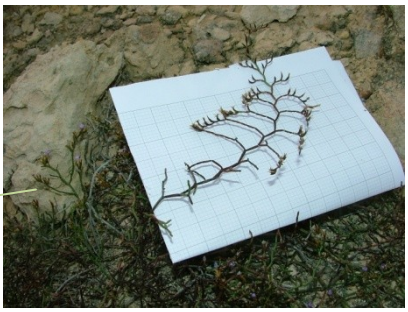
African Plumbago
Plumbago auriculata
Ċelestina/Pjombina tal-Ġonna

Evergreen shrub. Frequently planted as an ornamental in gardens and sometimes naturalises. It is native to South Africa and has pale blue flowers that are larger than those of *Plumbago europaea*. Its leaves are somewhat mealy from below.

Thrift Family Plumbaginaceae







Zerafa's Sea-lavender
Limonium zeraphae Limonju ta' Żerafa

A perennial with stems arching down to the ground. The angles of the segments are wide. The flowers are mostly in singles and also in 2s or sometimes in groups of 3. Found mainly on low coastal rocky ground, but also on edges of cliffs and high coralline ground close to the coast.

Named after Maltese botanist Stefano Żerafa (Lanfranco, 1996). First described by Italian botanist Salvatore Brullo in 1980 (Lanfranco, 2007). Endemic.

Large squares in picture 10mm x 10mm.



Note: Several species of Sea-lavender (also written as Sea Lavender) occur in the Mediterranean region. Many of these are perennial and herbaceous with a basal rosette of spatulate leaves, and with thin branches carrying flowers in singles or in small groups on one side. These flowers have small membranous bracts. The branches do not carry leaves, and sterile ones (i.e. branches without flowers) can also occur. The flowers have 5 violet notched petals, pale yellow or whitish stamens, and a tube, and the persistent sepals are fused into a funnel-shaped tube, often membranous. The Sea-lavenders are frequent to common in the Maltese Islands and found in coastal areas, and their flowering season is mainly in summer and autumn. However flowers can also be found in winter. They grow on rocky shores close to the shore with other salt-tolerant plants such as the Golden Samphire *Limbarda crithmoides* and the Glaucous Glasswort *Arthrocnemum macrostachyum*, and also in cliffs and rdum. The plants have a woody base and when they are without both leaves and flowers are not very noticeable. Some plants can be found without leaves in both winter and summer. Some of the branches and leaves also acquire a reddish colour. It is not always easy to separate the 3 native wild species found in the Maltese Islands as specimens can show similar characteristics. The general Maltese name for the Sea-lavenders is Limonju but they are also called Leħjet ix-Xiħ.

Thrift Family Plumbaginaceae





Maltese Sea-lavender
Limonium melitense
Limonju ta' Malta

The Maltese Sea-lavender grows into a small shrub with many upright branches and the segments form narrow angles. Flowers are generally in singles or in 2s and the calyx tube is more or less straight. Frequent to common in coastal grounds, mainly edges of cliffs, rdum and clay slopes. Endemic. First described in 1988 by Italian botanist Salvatore Brullo and old records of *Limonium cossyrense* (endemic to Pantelleria) probably refer to this species (Lanfranco, 2007). Seems to be the commonest of the Sea-lavenders in the Maltese Islands, and grows also in saline marshes (Lanfranco, 1989).

Thrift Family Plumbaginaceae





Violet Sea-lavender
Limonium virgatum
Limonju tal-Baħar

The Violet Sea-lavender has upright/ascending branches and can grow quite tall to over 70cm. Leaves spatulate and generally present during flowering. When in flower, the branches usually become horizontal. The segments are wide. Flowers are mostly in clusters of 2-5, sometimes more. The membranous calyx (formed

by the fused sepals) has the top part semi-transparent and wide, lower down (i.e. the tube) brownish. The inner bract is curved and has a very narrow semi-transparent margin and pressed tightly against the flowers. Found in saltmarshes and low coastal rocky areas. It is described as uncommon by Lanfranco (2015) and that the var. *majus* (*Limonium dubium*) is also found. *Limonium serotinum* occurs at Pembroke. This Sea-lavender has wide leaves and flowers mainly in summer. The **Cut-leaf Sea-lavender/English Statice** *Limonium sinuatum* is a common ornamental plant in public and private gardens, and sometimes found naturalised.




Cut-leaf Sea-lavender growing wild at a coastal site in Gozo, pictured in March; above right picture shows a cultivated Cut-leaf Sea-lavender with flowers.

Thrift Family Plumbaginaceae




Woody Sandwort *Rhodalsine geniculata* (*Minuartia geniculata*) Ramlina Għawdxija/Arenarja Roża

A glandular-hairy herbaceous perennial, with stems thickened at the joints. Stipules are absent. Leaves are opposite, others in whorls, elongate-elliptical. Flowers with 5 pink petals and 10 stamens that have yellow anthers. The petals are about 4mm long, and the narrow sepals are more or less equal, and also hairy. Sepals are green or purple. Flowers occur on a stalk, spreading or reflexed when in fruit. Seeds are minute (less than 1mm) and kidney-shaped, fruit a capsule. Occurs in coastal sandy and rocky areas and is scarce-frequent. Flowers can be found in spring, from April to June, and also in the autumn. Lanfranco (1989) describes the **Mediterranean Sandwort** *Minuartia mediterranea* as possibly extinct.

Pink Family Caryophyllaceae



Greater Chickweed *Stellaria neglecta* Ħarira Bajda Skarsa

Annual to herbaceous perennial with prostrate or erect stems that have a single line of hairs. Leaves are opposite, more or less ovate, lower ones long-stalked and upper ones sessile. Flowers white with 5 deeply cut petals, on erect stalks often becoming reflexed. Number of stamens is generally 10. The petals are equal to or exceed the sepals. The sepals are hairy (glandular-hairy), their segments 5mm or over. Fruit a capsule, seeds rounded and small, brownish and rough. Occurs in valleys, dry areas, also fields, January to June, mostly scarce to rare. The similar **Common Chickweed** *Stellaria media* Ħarira Bajda Komuni is also recorded for the Maltese Islands and is common; this has petals that are shorter than the sepals, and sepals generally measuring less than 5mm. Subspecies *media* has stems with single line of hairs, subspecies *cupaniana* (*Stellaria cupaniana*) with stems hairy all round. Number of stamens is generally less than 10. Lanfranco (2015) gives the status of *Stellaria cupaniana* as uncommon.

Pink Family Caryophyllaceae





Lesser Chickweed *Stellaria pallida* Ħarira Ħadra

Annual with prostrate and much-branched slender stems. Stems with 1 line of hairs, leaves more or less ovate and all have a short stalk. Flowers with minute petals, or petals absent, and on short stalks (pedicels), spreading to erect in fruit. Sepals are hairy. Stamens 1-3 (-5). Capsule exceeds sepals, and seeds rough (with swellings), brownish (yellowish-brown or reddish-brown). Flowers from January to June, in fields, gardens, and also in sandy areas. Frequent to common.

Pink Family Caryophyllaceae





Broad-leaved Mouse-ear *Cerastium glomeratum* Widen il-Ġurdien Idellek

A hairy and somewhat sticky (glandular) annual, stems ascending or erect and may be purplish below. Stems branch in two (dichotomous). Leaves opposite. Lower leaves are stalked and spatulate (-like), while upper leaves are sessile and can be pointed at tip. Flowers white on a short stalk, with cut (notched) petals, not so conspicuous, and clustered in compact head. Sepals are green and with pointed tips, shorter than petals. Usually frequent, along paths and other sunny areas, also in valleys, flowering from January to April. The **Grey Mouse-ear** *Cerastium brachypetalum* and the **Large-flowered Mouse-ear** *Cerastium ligusticum* are possibly extinct since they have not been recorded for several years (Lanfranco, 1989).

Pink Family Caryophyllaceae





Sea Pearlwort *Sagina maritima* Ġawhra tax-Xatt

A small and inconspicuous hairless branched annual, with prostrate, ascending or erect stems. Leaves are thin, linear-lanceolate, blunt at the tip or with a short point (but without a proper arista). Upper leaves are smaller. Flowers are small with 4 sepals, on erect thin stalks. Sepals have rounded tips, upright at first, then becoming horizontal in fruiting in the shape of a cross. Sepals slightly larger than or equal to the capsule. Petals are absent or very small. Seeds are minute, dark. Flowers from February to May, in open areas including coastal sandy and rocky areas, sides of paths. Scarce to frequent.

Pink Family Caryophyllaceae





Annual Pearlwort
Sagina apetala Ġawhra

A small and inconspicuous prostrate and ascending or erect annual, only a few cm above ground. Basal leaves in a small rosette. Leaves are linear, ending in a well-marked arista. Two sub-species occur, *apetala* and *erecta*. The leaves are hairy, but are devoid of hairs in the subsp. *apetala* (or hairy on the margin only). The solitary greenish flowers are held on long thin stalks that are erect and remain so even after flowering, and have 4 sepals. Petals are minute or absent. Seed capsule contains several minute seeds. Flowers from February to April along paths and other open areas. "Petals minute, often falling early, rarely absent"- Haslam *et al*., 1977.

Pink Family Caryophyllaceae





Procumbent Pearlwort
Sagina procumbens
Ġawhra Perenni

Perennial with prostrate branches that give off roots, unlike the other two *Sagina* species described above. It forms mats on the ground with a basal rosette of leaves. Its flower stalks are hairless and petals minute or absent. It was recorded by Borġ (1927) as frequent. It has recently been sighted at Madliena by Norwegian botanist Bernt-Gunnar Østerkløft, who also supplied these photographs taken at same place.

Pink Family Caryophyllaceae





Hairy Rupture-wort *Herniaria hirsuta* Ħernarja

A prostrate and hairy annual with small leaves, opposite at the lower parts and alternate at the upper parts. The small flowers are sessile and in dense clusters. They have 5 hairy sepals but no petals. Flowers from April to August in valleys, disturbed areas. Scarce-frequent.

Pink Family Caryophyllaceae





Boccone's Sand-spurrey *Spergularia bocconei* (*Spergularia bocconi*) Arenarja ta' Boccone

A low prostrate or ascending annual to herbaceous biennial (-perennial). Leaves are elongate and narrow (linear), pointed or with short arista at tip, somewhat fleshy and opposite, others in clusters. These leafy clusters occur at the joints at one side only. Stipules are membranous, silvery and triangular. Flowers with 5 petals, pink with a white base, sometimes white. Calyx is glandular-hairy. The fruit is a capsule that exceeds the calyx and the seeds are minute, light brown, and without an appendage (not winged). Flowers from February to June and is common in coastal areas including rocky, sandy and marshy localities (including saltmarshes). Flowers can also be found in the autumn.

Pink Family Caryophyllaceae





Sand–spurrey *Spergularia rubra* Arenarja Roża

A sticky (glandular) hairy annual similar to *Spergularia bocconei.* Stem at base is somewhat woody. Leaves not fleshy, and are opposite and most of them in clusters. They are linear, soft and with a bristle-tip. The flowers have 5 pink petals on short stalks in a dense inflorescence. Fruit a capsule equal to or slightly exceeding the calyx. Seeds are dark brown and all without an appendage (wing). Found in paths, country roadsides, dry open ground, February to June, frequent-common. Other species that are recorded from the Maltese Islands are the **Greater Sand-spurrey** *Spergularia media* Arenarja Kbira, the **Southern Sand-spurrey** *Spergularia diandra* ,and the **Lesser Sand-spurrey** *Spergularia marina* (*Spergularia salina*) -Weber *et al*., 2006; Pignatti, 2002; Haslam *et* al., 1977, Lanfranco, G., 1969, Borg 1927 - *Spergularia purpurea* (alien). The genus *Spergularia* is a difficult one. These small plants occur in a wide variety of habitats, from disturbed ground in the countryside like paths, to saltmarshes and other coastal ground, and also occur in urban environments. The name "Sea-spurrey" can also be used instead of "Sand-spurrey". See also note on page 342.

Pink Family Caryophyllaceae



Bladder Campion *Silene vulgaris* Qasqejża

A greyish-green herbaceous perennial. Leaves are opposite, narrow or broad and triangularly-shaped (lanceolate to ovate or linear). The lower leaves are stalked, upper ones without a stalk. The flowers are bright white, with deeply cut petals. They occur in loose stalked clusters. The sepals are in the form of an inflated tube forming the "bladder". Frequent in fields including abandoned ones and also in roadsides and other disturbed sites. It flowers from (January-) March to June, but flowers also appear in the autumn. The Bladder Campion is a variable plant and several subspecies have been described.

Pink Family Caryophyllaceae





Red Campion S*ilene colorata* Lsien l-Għasfur/Sieq l-Għasfur/Sieq iz-Zakak

A hairy annual with prostrate and ascending or erect stems. Leaves are opposite, lower ones more or less spatulate and stalked, upper ones are smaller, sessile and elongate. Flowers with 5 bright pink and showy petals, divided almost the whole length. White flowers can sometimes be found. The sepals are in the form of a cylinder (as in all other *Silene* species), striped brownish/purplish. Common in various habitats especially coastal, such as sandy areas, rocky sites and along cliffs; found also in disturbed localities including roadsides and abandoned fields, flowering from November to June. The Red Campion has probably originated in sandy areas (Lanfranco, 1996). Variable and probably an aggregate of more than one species (Lanfranco, 2015). Coastal fleshy plants have been classified as endemic species (Brullo *et al*., 2017). See page 342.

Pink Family Caryophyllaceae





Hairy Catchfly *Silene sedoides* Lsien l-Għasfur Irqiq/Lsien l-Għasfur tal-Baħar

A small and branched, sticky (glandular) and hairy annual, with erect stems; the stems can however be prostrate and ascending. The leaves are fleshy, lower ones elongate-spatulate to elliptical, upper ones smaller and linear. Leaves eventually turn reddish. The flowers are small and not conspicuous, with 5 pink (occasionally white) slightly notched (cut) petals in a branched inflorescence. Frequent to common in rocky coastal areas including rdum, March to May.

Pink Family Caryophyllaceae







Night-flowering Catchfly *Silene nocturna* Lsien l-Għasfur ta' Bil-Lejl

An ascending to erect annual with spatulate lower leaves, upper ones elongate (linear-lanceolate). The leaves have a hairy margin. Flowers are pale pink with deeply cut petals, mostly in singles and stalked, in a raceme-like inflorescence that can be branched. The flowers are held close to the stem (appressed). The calyx is veined, with or without purplish colour. The cylindrical seed capsules contain many small grooved seeds. Flowers from February to June. Scarce to frequent in fields, gardens, roadsides.

Pink Family Caryophyllaceae







Shrubby Campion/Woody Catchfly *Silene fruticosa* Lsien L-Għasfur tal-Blat

Perennial shrub with spatulate leaves, pointed at tip, upper ones narrower. Leaves numerous, and have fine hairs along the margin and occur in clusters. Flowers are relatively large, pale white to pink, with protruding styles, in branched inflorescence. The 5 petals have a deep notch. Calyx is glandular-hairy. Flowers close during the day. Fruit a capsule. Very rare, flowering from April to July, in rocky valleys. Was recorded by Sommier and Caruana-Gatto (1915), by Borġ (1927) and Wolseley from Mġarr ix-Xini valley in Gozo, where the species can still be found (Jeffrey Sciberras, pers. comm., 2013). It was also recorded from the valley of Xlendi in Gozo by same authors and by Duthie (1870s).

Pink Family Caryophyllaceae

The **Water Chickweed** *Myosoton aquaticum* is a prostrate and ascending perennial and resembles the Common Chickweed but has its 5 white petals divided to the base almost in two parts. Leaves are sessile and ovate. Stems are hairy and weak. They are held on stalks that are reflexed after flowering. Fruit is a capsule with numerous rough seeds. Pignatti (2002) gives its flowering season (for Italy) as from May to July. Haslam *et al*. (1977) describes it from only 2 places (Għargħur and Wied Balluta) as very rare in humid areas including ponds. The **Silvery Paronychia** *Paronychia argentea* (also known as Nail-wort [Nailwort] or Whitlow-wort) is a small perennial herb with prostrate, much-branched stem, woody at base. Leaves small, opposite and pointed and the stipules are conspicuous and silvery. Flowers occur in dense clusters with silvery bracts. Fruit an achene. It is described as rare in coastal sandy places and also inland in dry places e.g. Wied Ħoxt (Haslam *et al*., 1977; Borġ, 1927). According to Lanfranco (1989) the Silvery Paronychia is extinct, "the last authenticated record dating back to 1934 (Borġ, 1935) ". It flowers from February to June (Haslam *et al*., 1977); March to August (Borġ, 1927). The **Capitate Paronychia** *Paronychia macrosepala* is possibly extinct (Lanfranco, 1989). The flower bracts greatly exceed the flowers, and conceal them. The **Corn Cockle** *Agrostemma githago* is an erect hairy annual with elongate, narrow leaves pointed at tip. The flowers are purple and carried on a stalk. The calyx tube has 5 long teeth that exceed the flowers. Flowers can be found in April and May. Haslam *et al.* (1977) and Borġ (1927) gives its status as rare and state that it is found in cultivated areas, e.g. Girgenti, Attard and Buskett. Lanfranco (1989) gives it as extinct since there are no records for many years. He continues that the species is in decline throughout its range due to changing agricultural practices.

Pink Family Caryophyllaceae





Sea Beet *Beta vulgaris* subsp. *maritima* Selq Selvaġġ

A variable hairless or hairy and somewhat fleshy annual to herbaceous perennial. Stems are often purplish. Leaves stalked, more or less ovate to diamond-shaped with a winged petiole, lower ones larger than the upper. They may have wavy margins. Flowers are small with 5 segments, yellowish-green, solitary or in small clusters forming leafy spike-like inflorescences. Common in fields, other disturbed ground, also coastal areas. Flowers from March to around June.
Note: Family Chenopodiaceae is now included in the Family Amaranthaceae.
Fat Hen Family Chenopodiaceae




Nettle-leaved Goosefoot
Chenopodium murale Għobbejra Bajda/Għobbejra Ħadra

An erect and branched annual. Stem is grooved, sometimes reddish, and only slightly powdery (mealy). Leaves are alternate, diamond-shaped to ovate and deeply toothed, resembling the leaves of a nettle. Flowers are small and greenish, in clusters. Inflorescence branched, terminal and axillary. Seeds black. Flowers from January to December. Frequent in disturbed habitats including fields.

Fat Hen Family Chenopodiaceae




Fat Hen *Chenopodium album* Għobbejra Bajdanija

An erect and branched, green or greyish-green variable annual. Stem is grooved, green or reddish and 5-sided (angular). The stem and leaves are powdery (mealy). Leaves alternate and are stalked, rhombic (diamond-shaped) to ovate, with a toothed margin. Upper leaves are smaller, lanceolate, mostly or almost entire. The leaves are longer than wide. Flowers inconspicuous, clustered along the flowering stem emerging from leaf axils and also terminal. Inflorescence is leafy at the base. Seeds are minute, black and shiny. Common in disturbed habitats such as fields, field margins and roadsides, flowering mainly from (January) April to October, but flowers can be found all year round. The Fat Hen is probably not native, and has become widespread in these last 20 years (Lanfranco, 1996). *Chenopodium giganteum* (*Chenopodium amaranticolor*, *Chenopodium album* subsp. *amaranticolor*) is similar but larger. It has young leaves and inflorescence reddish-purple. Borġ (1927) mentions it as cultivated in pots and became naturalised in gardens such as at Argotti and San Anton. The **Grey Goosefoot** *Chenopodium opulifolium* Għobbejra Griża is similar to *C. album* but the leaves are only a little longer than wide or as long as wide. It is frequent in similar habitats.

Fat Hen Family Chenopodiaceae




Stinking Goosefoot *Chenopodium vulvaria* Għobbejra Tinten

A greyish-green prostrate and ascending powdery (mealy) annual, rarely biennial. Plant has a foetid decaying fish odour. Leaves stalked, ovate or diamond-shaped and may have a small tooth on the margin at each side. Flowers are tiny and in clusters. Inflorescence is axillary and terminal. The small seeds are blackish-brown. Frequent, fields and other disturbed areas, April to November.

Two specimens of **Oak-leaved Goosefoot** *Chenopodium glaucum* were seen by the author in 2005 at Għadira, one in a nursery pot. These were verified by Lanfranco (pers. comm., 2005). Other species of *Chenopodium* occur and are mentioned by Haslam *et al*. (1977) and Borġ (1927). These include the **Mexican Tea** *Dysphania ambrosioides* Għobbejra Tfuħ Te Falz (see page 338), the **Upright Goosefoot** *Chenopodium urbicum*, and the **Broad-leaved Fat Hen** *Chenopodium suecicum* (*Chenopodium album* subsp. *viride*). All are mentioned from a few places.

Fat Hen Family Chenopodiaceae




Shrubby Orache *Atriplex halimus* Bjanka

A greyish-green branched woody shrub with leathery leaves on a short stalk. Leaves are more or less ovate to triangular to diamond shaped. The tiny yellowish flowers, male or female, are carried in clusters in an elongated and branched, spike-like inflorescence. Female flowers have 2 small bracts, male flowers with 5 stamens. Planted in gardens and in coastal sites as a hedge, flowering from July to October. Its stems can take root on contact with the ground. The **Rosy Orache** *Atriplex rosea* used to grow in several coastal areas but not recorded for several years and possibly extinct (Lanfranco, 1989).

Fat Hen family Chenopodiaceae




Halberd-leaved Orache/Spear-leaved Orache *Atriplex prostrata* Selq il-Baħar

An erect or prostrate and ascending green or greyish-green hairless branched annual. Leaves are alternate and with stalk. The lower leaves are spear-shaped, upper ones narrower (linear or lanceolate). Flowers are yellowish-green, in clusters in an elongated and branched inflorescence. Small bracts of female flowers are triangular to diamond-shaped (rhombic). Male flowers have 5 stamens. Frequent in wet ground, coastal and inland including valleys, saltmarshes, and also in disturbed ground, flowering from July to October-November.

Fat Hen family Chenopodiaceae





Sea Purslane *Halimione portulacoides* (*Atriplex portulacoides*) Bjanka tal-Baħar

Greyish-green to silvery and powdery (mealy) shrub. Leaves are fleshy, more or less elongate-elliptical and mostly opposite. The branches often emerge roots and the plant commonly forms mats on the ground. Flowers small and clustered, greenish-yellow occurring in an elongate branched inflorescence. Scarce to rare in coastal areas flowering from July to November. The Sea Purslane has been successfully introduced at Għadira nature reserve, and its increase is a threat to *Salicornia ramosissima*. Borġ (1927) remarked that the Sea Purslane was one of the species that served as host to the Malta Fungus *Cynomorium coccineum*.

Fat Hen family Chenopodiaceae





Maltese Cliff-orache *Cremnophyton lanfrancoi* (*Atriplex lanfrancoi*) Bjanka tal-Irdum

An endemic greyish-green branched woody shrub with pale brown stems. The narrow leaves are somewhat fleshy, elongate (broadest above the middle, and narrowed at base). Flowers are small and inconspicuous, in clusters, inflorescence leafy and branched. Inconspicuous flowers are found from around July to October. Fruit has 2 small bracts enclosing the seed. Rare in coastal cliffs and other coastal rocky ground, especially South West Malta and West Gozo. Occasionally planted, e.g. at Għajn Tuffieħa. There is only this lone species in the genus *Cremnophyton*; it is very primitive probably near to the ancestors of the *Atriplex*. Described only recently in 1987 by Brullo and Pavone (Lanfranco, 1996).

Fat Hen family Chenopodiaceae





Glaucous Glasswort *Arthrocnemum macrostachyum* (*Arthrocnemum glaucum, Salicornia macrostachya*) Almeridja tal-Blat

A succulent hairless shrub, the stem holds small scale-like leaves. The green stems turn yellowish or reddish. Prostrate stems can take root. Flowers inconspicuous. In winter the shrubs are mostly dry, or with green and red branches. The Shrubby Glasswort is very tolerant to salty conditions and grows in coastal areas. It is frequent to common, flowering from May to around August or later. The similar **Shrubby Glasswort** *Sarcocornia fruticosa* (*Arthrocnemum fruticosum*) Almeridja also occurs in same habitats but is rare (Lanfranco, 2015).

Fat Hen family Chenopodiaceae





Twiggy Glasswort *Salicornia ramosissima* Salikornja/Almeridja

Usually branched and erect (or ascending) green to yellowish succulent annual. Plants can also be un-branched and small. Branches are opposite. Eventually turns reddish. Leaves small and flowers inconspicuous. Scarce, flowering from June to October in saltmarshes, especially in areas that are flooded in winter, such as at Għadira nature reserve. Lanfranco (1996) records it also from Salina and Ballut ta' Marsaxlokk. It is scarce at Għadira nature reserve, and threatened by the vigorous growth of *Atriplex portulacoides* and *Arthrocnemum macrostachyum*.

Fat Hen family Chenopodiaceae





Maltese Salt Tree *Salsola melitensis* (*Darniella melitensis*) Xebb/Siġra tal-Irmied

An endemic woody shrub, too often found clinging to sea cliff faces. Leaves are green and fleshy, narrow and cylindrical, in dense numbers and often have a hint of greyish, especially younger ones. Inflorescence is elongate with tiny, aromatic flowers in leaf axils, with protruding yellowish stamens. Flowers appear in summer, June to around August. Grows mainly in coastal localities such as cliffs and rdum, sometimes more inland, and is frequent to common. The genus *Darniella* is only represented by this species in Europe (Lanfranco, 1996). First described in 1976 as *Salsola melitensis* by Russian botanist Viktor Petrovich Botchantzev (Lanfranco, 2007).

Fat Hen family Chenopodiaceae





Annual Seablite/Common Seablite *Suaeda maritima* Swejda/Swejda tal-Baħar/Għobbejra tal-Irmied

A greyish-green, prostrate or erect, and branched succulent annual, eventually turning reddish. Stem is striped. Leaves elongate and narrow (semi-cylindrical), pointed at the tip. The tiny greenish flowers occur at the leaf axils in an elongate and branched inflorescence. Frequent to common, found in saltmarshes and rocky coastline, flowering from July to around October (-December).

Fat Hen family Chenopodiaceae





Shrubby Seablite *Suaeda Vera* Għobbejra tal-Irmied/Swejda

A woody shrub with a dense number of small, sessile and pointed greyish-green leaves. The leaves are fleshy, semi-cylindrical. Flowers have 5 tepals, inconspicuous in singles or small clusters in the leaf axils. Seeds black. Occurs in coastal rocky areas, where it can be frequent, (e.g. Delimara) but is less frequent and widespread than Common Seablite *Suaeda maritima.* Occurs also at Salina. Flowers from June to October, also earlier and later.

Fat Hen family Chenopodiaceae




Smooth-leaved Saltwort *Salsola soda* Ħaxixa tal-Irmied

A fleshy hairless annual with green stems and greyish-green leaves clasping the stem. Eventually grows into an erect and branched, rounded bush, often becoming reddish. Lower leaves and branches are opposite, the others alternate. Leaves are narrow, linear, pointed at tip and not spiny. Flowers are tiny, yellow with 5 stamens and occur in leaf axils. Frequent - common in marshy and drier areas around the coast including rocky ground, also in sand dunes, and in disturbed ground by the sea. Flowers from July to October-November. After flowering and fruiting the plant dies and is dislodged and carried by the wind (rolling over the ground). In this process its seeds are dispersed.

Fat Hen family Chenopodiaceae




Prickly Saltwort *Salsola kali* Ħaxixa tal-Irmied Xewwikija

A prostrate or mostly erect spiny annual, similar to the Smooth-leaved Saltwort *Salsola soda*, with inconspicuous yellowish flowers in the axils of spiny leaves (bracts). Leaves are spiny-tipped. Fruits winged, the wing developing from the sepals. Found in coastal habitats including sand dunes and rocky areas, flowering from July to October-November, but flowers can also be found in other months. Scarce.

Fat Hen family Chenopodiaceae




Green Amaranth *Amaranthus viridis* Denb id-Dip Ħadra

Annual with hairless stems and stalked alternate diamond-shaped leaves. Flowers small and numerous, and clustered in spikes. Fruits wrinkled and contain glossy black seeds. Naturalised alien, common in disturbed areas.

First record from Malta was in 1972 (Lanfranco, 2015).

Amaranth Family Amaranthaceae




Prostrate Amaranth *Amaranthus blitoides* Denb id-Dip tal-Fjuri Ħamranin

The Prostrate Amaranth has prostrate or ascending stems, and usually branched from the base. The clusters of flowers are often reddish and come out from the leaf axils. A naturalised alien, especially in disturbed habitats. Flowers from late spring to winter. ***Amaranthus graecizans*** also occur and is similar to *A. blitoides*

– *Amaranthus blitoides:* Leaves spatulate or lanceolate with a white margin; tepals 4; stems prostrate.

- *Amaranthus graecizans:* Leaves elliptic to rhombic (diamond-shaped), without a white margin; tepals 3; stems erect (Pignatti, 2002).

Amaranth Family Amaranthaceae




Common Amaranth *Amaranthus retroflexus* Denb id-Dip Xewwikija

A hairy erect annual. Leaves are stalked, ovate to diamond-shaped (rhombic) with whitish veins underneath. Inflorescence is terminal or axillary, consisting of spikes that are short and dense. Terminal spikes a little longer than the lateral (side) ones. Flowers are male or female. Female perianth with 4-5 membranous and dry segments, their top generally obtuse or cut abruptly and with a short and sharp terminal point. The flowers are subtended by small bracts that have little "spines" and longer than the perianth segments, giving the inflorescence a somewhat spiny appearance. The fruit is a capsule and has a dry membranous wall and shorter than the perianth. It dehisces (opens) transversely by a lid. Seeds round, shiny and black. Found in fields, roadsides and other disturbed ground, generally scarce. Naturalised alien. Other species of Amaranths can be found naturalised e.g. *Amaranthus deflexus*.

Amaranth Family Amaranthaceae




Lesser Crystal-plant *Mesembryanthemum nodiflorum* Kristallina Komuni/Kristallina tal-Blat

A succulent annual, spreading over ground, and slightly glistening with cells filled with water. The fleshy leaves are elongate (linear-cylindrical) and the flowers solitary and small with numerous narrow white "petals" having a yellow base. These are shorter than the sepals. Plant turns reddish in summer. Fruit a woody capsule opening up in rain to release the seeds. Common near the sea, sometimes forming mats, in sandy and rocky places, and also on clay in rdum, flowering from April to July.

Aizoon Family Aizoaceae




Crystal-plant/Ice Plant
Mesembryanthemum crystallinum
Kristallina
Kbira/Kristallina tar-Ramel

A succulent shiny annual, spreading over ground, leaves broad and spatulate-ovate with glistening crystalline papillae. The flowers are pale yellowish/whitish, with the numerous narrow "petals" longer than the sepals. Fruit a woody capsule that opens up in rain. Rare, but may be frequent where it occurs, found at the coast, March to June. "Native status doubtful" – Lanfranco, 1989.

Aizoon Family Aizoaceae




Red Ice Plant *Malephora crocea* (*Mesembryanthemum croceum*)
Kristallina Ħamra

Perennial trailing succulent. Stems give off roots at the nodes where they touch the ground. Leaves are elongate and triangular in cross-section. The leaves get more succulent as the dry season progresses and turn bronze-purple. Flowers solitary borne on short stalk and have numerous orange to red/purple narrow "petals". The centre of the flower is yellowish. Flowers open in the sun. Fruit a capsule. Native to South Africa, grown as an ornamental plant and occasionally can be found naturalised in coastal sites, e.g. at Ċumnija (Mellieħa). Flowers can be found mainly during the warmer seasons of spring and summer-autumn. *Malephora lutea* is found naturalised in 2 places in Gozo (Mifsud, 2019).

Aizoon Family Aizoaceae




Aptenia spp. *Aptenia spp.* Aptenja

Aptenia is a small genus of perennials native to South Africa. They have glossy succulent leaves and small pinkish to red flowers. They are found in cultivation with different cultivars. Among the species are *Aptenia cordifolia* and *Aptenia lancifolia*. The leaves of *Aptenia lancifolia* are sessile; those of *Aptenia cordifolia* have a short petiole. Sometimes these plants can be found naturalised, and form carpets on horizontal ground or can be seen growing on walls.

Aizoon Family Aizoaceae





Pictures show purplish and yellow flowers of *Carpobrotus edulis*, and leaves.



Hottentot Figs *Carpobrotus* spp. Hottentot Figs are succulent woody perennials with prostrate stems, covering patches of ground and forming mats. The leaves are angled, triangular in cross section. Two similar species are described for the Maltese Islands-

Hottentot Fig/Kaffir Fig *Carpobrotus edulis* Xuxet San Ġwann, Swaba tal-Madonna/Tapit tad-Dnubiet

The Hottentot Fig has leaves that are regular in cross section and gradually narrow towards the tip. The margins also have fine teeth at the upper edges. The flowers have purplish, pinkish or yellowish "petals" and the stamens are yellow.

Glaucous Hottentot Fig/Red Hottentot Fig *Carpobrotus acinaciformis* Xuxet San Ġwann

The Glaucous Hottentot Fig has purplish "petals" and purplish stamens. The leaves are not regular in cross section and are thickest at or above the middle and narrows abruptly to the pointed tip. Lanfranco (pers. comm., October 2016) states that the *Carpobrotus* plants he examined in the Maltese islands were all *edulis*. However Mifsud (2019) states that *Carpobrotus edulis* is very rare in Malta and found in gardens and other planted areas, and that the invasive species in the Maltese Islands is *Carpobrotus acinaciformis*. Note: These plants are aliens to the Maltese Islands and native to South Africa. They are found growing mostly as planted specimens around the coast. These plants are however aggressive and harm native species, especially small and fragile ones, and invade sand dunes and other habitats. Care should be exercised as to where these plants are planted (or better still not planted at all in coastal habitats), and control is suggested where they have grown so much that they are wiping out native plants.

Aizoon Family Aizoaceae




American Pokeweed
Phytolacca americana
(*Phytolacca decandra*)
Russett/Għeneb id-Dip

A large hairless and herbaceous perennial shrub, woody at base and stems are often purplish. Leaves are elliptical, alternate and stalked. Flowers occur in erect racemes that bend down during fruiting. The flowers are greenish-white and have 5 perianth segments. The fruits are fleshy and rounded, and shiny purplish-black when ripe. These are said to be poisonous, although the fleshy part is used to colour wine. An alien species that is native of North America, naturalising in gardens, abandoned fields, field margins, and other places, June to December. The **Tree Pokeweed** *Phytolacca dioica* is a tree with pendulous racemes. It is native of South America and it is planted for ornament in the Mediterranean. In the Maltese Islands it occurs as a planted tree but sometimes can be found naturalised.

Pokeweed Family Phytolaccaceae




Four O'Clock Plant/Marvel of Peru *Mirabilis jalapa* Ħummejr

Herbaceous perennial with a tuberous taproot, opposite leaves and flowers that can be of different colours. The flowers are fragrant, and have a long and narrow tube with 5 lobes. These coloured lobes are the sepals. The 5 stamens have long filaments and emerge out of the flower. The flowers are mostly found from spring to autumn. They open in late afternoon and throughout the night up to morning. It is native to South America and is a popular ornamental in gardens. It can sometimes be found naturalised, e.g. in waste ground, roadsides, gardens, and valleys.

Four O'Clock Family Nyctaginaceae





Prickly Pear *Opuntia ficus-indica* Bajtar tax-Xewk /Bajtar ta' Gindja/Ċuplajs

A succulent plant, with wide, flattened and fleshy jointed stems, somewhat woody at the base. These stem segments are armed with yellowish hooked bristles (glochids) that arise from spots called areoles; these areoles are whitish and may also bear 1 or 2 straight spines. The flowers are yellow, and the fruits can be yellow, orange, or red, and are also armed with bristles. They contain lots of seeds. Previously widely grown for its edible fruits, and also planted around field borders serving as an impenetrable wall and to shelter crops from wind. The stems are also used as animal fodder. Common and also found naturalised in several areas. The segments will readily take root and grow. Common, flowers are found from May to July, after which the fleshy fruits are produced. Native to Tropical America.

Cactus family Cactaceae




Prickly Pear *Opuntia dillennii* Bajtar tax-Xewk Skars

A densely spiny cactus with the areoles on the stems having clusters of short and long spines. Flowers are yellow and the fruits small and purplish. Cultivated as an ornamental plant and occasionally naturalising. Lanfranco (2007) records *Opuntia dillennii* (and also *Opuntia vulgaris*) naturalising in Gozo.



The similar **Erect Prickly Pear** *Opuntia stricta* Bajtar tal-Linka also occurs as a naturalised alien. It has fewer spines. The stems of *Opuntia dillenii* and *O. stricta* are smaller than those of *Opuntia ficus-indica*. Mifsud (2019) reports *Opuntia streptacantha* from Wied tax-Xlendi, Gozo, and *Opuntia lindheimeri* from Wied Qirda.

Cactus family Cactaceae





Bunny Ears /Golden Bristle Cactus *Opuntia microdasys* Widnejn il-Fenek

This cactus lacks spines but full of yellowish, white or reddish-brown glochids. Flowers are yellow with yellow stamens. A commonly cultivated cactus, occasionally found growing wild. Native to Mexico.

Cactus family Cactaceae





Purslane *Portulaca oleracea* Burdlieqa/Bislejquna/ Lgħab ix-Xiħ

A fleshy and hairless annual. Stem prostrate and ascending, often purplish at least at base. The leathery and shining leaves are elongate-spatulate, and flowers yellow in singles or small clusters among the top leaves or where the stems fork. Fruit a capsule. The seeds are minute, black and numerous. Flowers from May to October, in fields, uncultivated areas, gardens, plant nurseries, urban areas. Polymorphic.

Purslane Family Portulacaceae

The **Field Bastard-Toadflax** *Thesium humile* is an ascending to erect annual, with somewhat fleshy narrow leaves and long branches. Inflorescence spike-like and bracts exceeds the flowers. Flowers small and have 5 white segments. It flowers in March and April. The Field Bastard-Toadflax is a root-hemiparasite (hemi = partly). Tabone (2007) records it from a number of places in Malta and Gozo. Lanfranco (1989) states that this plant is scattered in a few localities in Malta, Gozo and Comino and appears to be on the decline. Described as rather rare in fields and uncultivated dry places (Haslam *et al*., 1977; Borġ, 1927).

Bastard-Toadflax or Sandalwood Family Santalaceae





Malta Fungus *Cynomorium coccineum* Għerq Sinjur/Għerq il-Ġeneral

A parasitic herbaceous perennial with rhizomes, stems fleshy and dark reddish-brown to purplish-black. Leaves are small, scale-like, triangular or ovate, pointed. The minute flowers occur in the upper part of the stem. Flowers have 1 stamen each. The flowers are dense and subtended by small deciduous bracts. Rare, recorded on cliffs - Dingli Cliffs in Malta, and in Gozo it grows on the islet of Il-Ġebla tal-Ġeneral (Fungus Rock) and in the cliffs in the area of this rock. Sciberras & Sciberras (2010) record it also from Il-Haġra Ta' Bejn il-Kmiemen il-Kbira (Large Blue lagoon Rock). In the past regarded as having medicinal properties. The plant was strictly

guarded against collecting in the times of the Grand Master of the Order of St. John. Anyone caught gathering the plant from Il-Ġebla tal-Ġeneral was sent to the galleys (Lanfranco, 2007; Lanfranco & Lanfranco, 2003).

Malta Fungus Family Cynomoriaceae





Crassula/ Narrow-leaved Mossy Stonecrop *Crassula vaillantii*
Krassula

A hairless annual, with prostrate and ascending slender stems and small, opposite elongate leaves. Stems and leaves often purplish, and somewhat succulent. Flowers pink, only 1 or 2 mm long, with 4 petals, stalked, in small clusters at leaf axils. This tiny plant grows in shallow rock pools and is not very noticeable. Details are best seen under a hand lens. Frequent, flowering from February to April. The **Mossy Stonecrop** *Crassula tillaea* occurs but is rare.

Stonecrop Family Crassulaceae





Narrow Navelwort *Umbilicus horizontalis*
Żokret l-Għaġuża/Żokret ix-Xiħa/Żokret il-Far

An erect herbaceous perennial with rounded and fleshy basal leaves, toothed at the margin. The long leaf stalk is attached to the centre of the lower surface of the leaf. These leaves have a depression on the upper surface at the centre (leaves described as peltate). Leaves on flowering stem are smaller and narrow (many are linear). Flowers are yellowish-green, tubular and horizontal, in a raceme. Flower stalk is shorter than the bract. Scarce to frequent in crevices of limestone rocks, shady parts of valleys and on old rubble walls, coastal and also inland. Flowers from March to May. The **Wall Navelwort** *Umbilicus rupestris* is also mentioned by Lanfranco (2015), Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) as occurring on rocks and old walls and as not frequent. The Wall Navelwort has drooping, not horizontal flowers on the raceme, and the bract subtending each flower is much smaller than the bract of *Umbilicus horizontalis*.

Stonecrop Family Crassulaceae



Aeonium *Aeonium arboreum*
Ejonjum/Kalluwa/Siġret il-Kalli

Erect and branched perennial with stem showing scars of fallen leaves. Leaves are shiny green, in rosettes at the top of stems, spatulate and pointed at tip. Leaves can be brownish/purplish (var. *atropurpurea*). Margin of leaves have minute teeth. Flowers yellow with free petals in a dense branched inflorescence (panicle). Native to Morocco. Cultivated and sometimes found naturalised. Flowers from December to February-March.

Stonecrop Family Crassulaceae





Mediterranean Stonecrop/Rock Stonecrop *Sedum sediforme* Sedum - A succulent hairless perennial with greyish-green elongate and pointed leaves. Leaves alternate, arranged spirally on the stem. Leaves progressively fall off from the flowering stems as the plant is flowering. Flowering stems erect, carrying greenish-white/yellow flowers with yellow anthers in a dense inflorescence. The flowers have 5-8 narrow petals. The sepals are ovate and pointed. Flowers do not have bracts. Plant often develops a reddish-brown tinge in summer. Common on rocky ground such as garigue, rocky valleys, cliff edges, and on chunks of coralline rock in rdum, flowering from late May to July.

Stonecrop Family Crassulaceae




White Stonecrop *Sedum album*
Sedum Abjad/Beżżul il-Baqra Bajda

A small perennial plant with rather woody stems that give out roots. The leaves are fleshy and alternate, elongate (linear-cylindrical) to egg-shaped and with rounded tips. Inflorescence branched with flat-topped clusters of flowers. The flowers have short stalks. They are white to pale pink/red and have 5 petals. As with other *Sedum* species, these plants can attain a reddish colour when exposed to strong sunlight. Rare in rocky valleys, coastal garigue, cliff edges, e.g. Dingli, May-June/July. Described as a new endemic sub-species by Mifsud *et. al* (2015). See page 340.
Stonecrop Family Crassulaceae




Starry Stonecrop *Sedum stellatum*
Sedum tal-Istilla

A small hairless annual with ascending or erect stem. Leaves are shortly-stalked, spatulate to rounded, with blunt teeth at the margin. The lower leaves are opposite and the upper ones alternate. Flowers are pinkish in flat-topped clusters, and generally with 5, sometimes 4, petals. Fruits are star-shaped. Very rare in rocky valleys, April to May. Tabone (2008, 2007) records the species from Wied il-Għasel and Wied Ħesri. Haslam *et al*. (1977) listed it as rare from Wied il-Għasel and Wied Ħas-Saptan. Pictures taken in Sicily.

Stonecrop Family Crassulaceae




Coastal Stonecrop/Sea Stonecrop *Sedum litoreum*
Sedum Isfar/Beżżul il-Baqra Safra

A small annual with erect or ascending stems. Leaves are alternate, elongate-spatulate, and flattish above. Flowers pale yellow eventually becoming whitish, with 5 pointed petals, on short stalks. Fruits erect to spreading, pointed. Scarce to frequent in coastal rocky areas such as cliffs and rdum, April to May.

Stonecrop Family Crassulaceae




Red Stonecrop *Sedum rubens*
Sedum Aħmar

A small glandular-hairy greyish-green annual with erect stem branched above. Leaves are elongate, semi-cylindrical (flat at the upper surface). These are alternate and eventually become reddish. Flowers have 5 white/pinkish petals with a pinkish middle vein, in a leafy inflorescence. The petals have a pointed tip and are glandular-hairy on the outer side. Fruits are also hairy, pointed at tip, star-shaped. Scarce to frequent in garigue and arid rocky ground, rdum, valleys, April to May. The similar **Caespitose Stonecrop** *Sedum caespitosum* Sedum Żgħir/Beżżul il-Baqra Żgħir also occurs but is less frequent. It is similar but hairless and the leaves are ovate to egg-shaped and smaller.

Stonecrop Family Crassulaceae




Azure Stonecrop/Blue Stonecrop *Sedum caeruleum*
Beżżul il-Baqra /Demm il-Madonna/Għeneb tal-Madonna

A small annual reddish plant branched above and with succulent alternate cylindrical leaves. Flowers pale bluish-white/bluish-violet, in a branched, lax inflorescence, usually with 7 petals. Common, too often easily noticed when many plants grow together in a patch. Flowers in spring from March to May in garigue, rocky steppe and rocky valleys.

Stonecrop Family Crassulaceae

From the Family Saxifragaceae is described the **Rue-leaved Saxifrage** *Saxifraga tridactylites*, first recorded by Borġ (1927) from the Żebbuġ side of Wied Inċita; it is considered extinct (Lanfranco, 1989). However it is a small plant that easily goes un-noticed.

Saxifrage Family Saxifragaceae



Grape Vine *Vitis vinifera* Dielja - A climbing deciduous shrub with woody stems and tendrils, and leaves are stalked and alternate. The leaves are palmately-lobed to heart-shaped or rounded, and have teeth on the margin. Flowers are small and aromatic, dense, in branched clusters opposite to the leaves or terminal. Petals are small, greenish, falling off at flowering. Fruits are rounded berries (grapes), blackish or greenish with few seeds inside. Commonly cultivated and several cultivars exist. In cultivation the plants are regularly pruned. Cultivated plants normally produce relatively large berries; where plants are abandoned or naturalised the berries produced are generally small. Flowers in spring, April to May. The wild vine is *Vitis vinifera* subsp. *sylvestris* (*Vitis sylvestris*) and can be found growing native in parts of Europe including the Mediterranean. Its flowers are either male or female. Male plants have leaves that are more deeply lobed than the leaves of female plants. The cultivated form is *Vitis vinifera* subsp. *vinifera*. This plant has long been in cultivation for its fruits and for the production of wine. In 1536 Jean Quintin d'Autun (Quintinus) wrote about the presence of *Vitis vinifera* in the Maltese Islands (Lanfranco, 1998). At the time of Professor Borġ there were over 140 cultivars of *Vitis vinifera*, of which 40 were local (Haslam *et al*., 1977). *Vitis vulpina* has become naturalised in a number of areas, e.g. Ramla, Gozo. This American vine is utilised for grafting (Cassar & Stevens, 2002).

Vine Family Vitaceae





Dove's-foot Cranesbill *Geranium molle* Ġeranju Komuni

A hairy annual with spreading and ascending sometimes erect stems. The leaves are rounded and palmately-lobed with long leaf stalk and a toothed and lobed margin. Upper leaves have a shorter stalk or sessile. The sepals are also hairy. The flowers are purplish-pink borne in two's, with 5 notched (cut) petals on a short main stalk. Fruit is short and beak-like and opens apart from the base when mature to release the seeds. Common in open areas including fields, paths, roadsides and other disturbed habitats, also in valleys, flowering from December to April.

Geranium Family Geraniaceae





Round-leaved Cranesbill *Geranium rotundifolium* Ġeranju tal-Weraq Tond/ Ġeranju Bellusi

Annual, similar to Dove's-foot Cranesbill *Geranium molle* but the petals are not notched. The stems are often reddish and densely hairy (including glandular hairs), prostrate to ascending. The rounded leaves have 5 lobes with toothed margins. Upper leaves more deeply lobed. Lower leaves have long stalk. Stipules present. Sepals have a short bristle at tip. Scarce to frequent and occurs in rocky valleys and other habitats, flowering from February to April.

Geranium Family Geraniaceae




Cut-leaved Cranesbill *Geranium dissectum*
Ġeranju Mqasqas/Ġeranju tal-Ilma

A hairy annual with spreading and ascending or erect stems. The palmate leaves are on a long stalk and deeply divided into segments, the segments themselves lobed. The upper leaves are opposite and less divided. The main flower stalk (peduncle) is shorter than the leaf during flowering. This lengthens at fruiting time. Flowers usually in twos, each on a secondary stalk (pedicel), and are purplish-pink with cut (notched) petals. The hairy sepals are bristle-tipped and exceed the petals. The hairy fruit has a short beak, similar to other *Geranium* species (the fruit is a collection of 5 fused portions called mericarps, and these spring apart from the base upwards when ripe). Scarce to frequent to common along watercourses, valleys, shady areas and also fields, February to April.

Geranium Family Geraniaceae




Little Robin/Purple Herb Robert *Geranium purpureum*
Ġeranju tal-Istami Sofor/Ġeranju Roża

Hairy foetid annual with prostrate and ascending stems. Leaves palmate, stalked and deeply divided into 3 or 5 segments, the segments lobed. Flowers are small and with 5 pink petals, and anthers with yellow pollen. They occur in twos and are stalked, the stalk eventually exceeding the leaves. Sepals are hairy. The fruits are in the form of a beak. Plant eventually turns reddish. Common on rubble walls and on rocks in valleys, rdum, and also found along tracks, mostly in shady areas, flowering from March (or earlier) to May.

Geranium Family Geraniaceae




Herb Robert/Stinking Robert/Red Robin *Geranium robertianum*
Ġeranju tal-Istami Oranġjo

Annual to biennial foetid herbaceous plant, similar to *Geranium purpureum* but the anthers have orange pollen. Recorded as frequent in valleys and shady areas by past authors, e.g. Borġ, 1927. These photographs of *Geranium robertianum* were not taken in the Maltese Islands.

Geranium Family Geraniaceae




Glandular Storksbill/Soft Storksbill *Erodium malacoides*
Moxt/Ħalq l-Għarnuq/Sieq l-Għarnuq/Difrejn il-Qattus

A hairy, often glandular erect or low and spreading annual or biennial plant. The stalked leaves are wide and lobed, sometimes pinnately-lobed, with a toothed margin. Upper leaves toothed, smaller. Flowers are purplish-pink with 5 petals in stalked umbels. Umbels have semi-transparent whitish bracts, more than two. The sepals are star-shaped, white and green. The fruit is a collection of mericarps (achenes). The beak (in fact the style) becomes spirally twisted at maturity, as in other *Erodium* species. Common in disturbed ground including field margins, gardens, tracks, roadsides, also in valleys, garigue and rdum, flowering from December to May.

Geranium Family Geraniaceae




Common Storksbill *Erodium cicutarium* Moxt Żgħir

A small hairy annual, leaves pinnate, leaflets deeply cut. Flowers are pale violet to pinkish-purple with dark purplish anthers, in a few-flowered umbel. Fruits have a long beak. Flowers from November to May. Common, found in garigue, open areas with short vegetation, paths and other disturbed habitats.

Geranium Family Geraniaceae




Musk Storksbill *Erodium moschatum*
Ħaxixa tal-Misk/Ġeranju tal-Misk

An often prostrate or ascending but can also be erect, hairy annual or biennial with pinnate leaves, the leaflets ovate to elliptical with a toothed margin. Leaflets have shallow teeth and are not deeply cut as in the Common Storksbill *Erodium cicutarium*. Flowers are pale violet or purple, in a stalked umbel, later forming beaked fruits. Bracts are membranous. Common in cultivated and abandoned fields, roadsides, paths, other disturbed ground, flowering from November to May.

Geranium Family Geraniaceae




Sand Storksbill/Cut-leaved Storksbill *Erodium laciniatum*
Moxt tar-Ramel/Miskta tar-Ramel

A hairy prostrate to ascending annual. The hairs on both the leaf stalks and stems are backward-pointing. Leaves ovate with tooted margin, lobed and cut especially upper (stem) leaves that often consist of narrow segments.



Flowers in an umbel, purplish-pink, and beneath the umbel are 2 semi-transparent bracts, more or less with a brownish tinge. Fruits the usual "storksbill". Rare and localised to sandy areas including disturbed, e.g. Għadira nature reserve, Ramla tat-Torri, and Ramla l-Ħamra in Gozo. Flowers from January to May. Plants growing in Malta are different from the ones found in Gozo at Ramla l-Ħamra. The Gozo plants have deeply cut leaves with narrow segments.
The **Alder-leaved Storksbill** *Erodium alnifolium* Ħaxixa tal-Misk tal-Werqa Kbira was recorded at Wied ir-Riħana, but has gone extinct some years after its discovery due to habitat disturbance (Lanfranco, 1993, 1972). This species is confined to West Africa, Sardinia, Sicily, and Southern Italy (Lanfranco, 1989). The **Stemless Storksbill** *Erodium acaule* was recorded as rare by Borġ but is considered extinct. Old records of **Mediterranean Storksbill** *Erodium chium*. for the Maltese Islands are not reliable; however there is a record from Wied Marsalforn (Kramer *et al*., 1972 in Lanfranco, 1989). Species of *Pelargonium* (Sardinell) are commonly cultivated and occasionally found naturalised.

Geranium Family Geraniaceae




Square-stalked Willowherb *Epilobium tetragonum* Epilobjum

A tall herbaceous perennial with a weakly square stem and a basal rosette of leaves. Stem leaves are elongate–elliptical, toothed and alternate or opposite, with clusters of leaves in the axils. Flowers have 4 petals purplish pink in a branched inflorescence. Petals slightly exceed the sepals. Calyx has glandular hairs. Fruit an elongate narrow capsule and the seeds are small, greyish with tufts of hairs. Scarce along watercourses and in shady areas, e.g. Buskett, Wied il-Qlejgħa, flowering from April to October. The subspecies *tournefortii* is listed for Malta by Lanfranco (2015) and Pignatti (2002). This has the stigma set above the anthers. The **Hoary Willowherb** *Epilobium parviflorum* is very rare, recorded by Borġ (1927) at Mtaħleb, Buskett.

Willowherb Family Onagraceae




Creeping Loosestrife *Lythrum junceum*
Litrum tal-Ilma

A hairless prostrate to ascending or erect herbaceous plant, usually perennial, often branched from the base. Stems square. Leaves are mostly alternate, but also opposite at base of plant, and sessile. The lower leaves are usually elliptic to oblong, the upper ones becoming more narrow and linear. Flowers are solitary in the axils of the upper leaves, with 6 pinkish-purple petals, having a pale base. Stamens 12, some of them protrude out of the flower. Epicalyx present and its segments are equal to the teeth of the calyx. Hypanthium has reddish spots on the lower part and tapers gradually towards the base. Fruit a capsule. Frequent along watercourses, flowering from April to June, or later when water is still present.
Loosestrife Family Lythraceae




Hyssop Loosestrife/Grass-poly *Lythrum hyssopifolia*
Litrum tal-Għadajjar

An annual with prostrate to ascending, sometimes erect stems. Leaves alternate, upper ones narrow. The flowers are small, pinkish-purple, with generally 4-6 stamens not protruding and have the epicalyx segments relatively much larger than the calyx teeth (in Creeping Loosestrife *Lythrum junceum* are all similar). Fruit a capsule with numerous small seeds. Common, grows in rock pools in the garigue and found also in marshy ground including saltmarshes, and flowers from April to June when the water has dried.

Loosestrife Family Lythraceae




Pomegranate *Punica granatum*
Rummien/Siġra tar-Rummien/Siġra tal-Bullar

A small deciduous somewhat spiny tree, with smooth shining leaves, usually in clusters along the length of the stem, with a short reddish or green stalk. The flowers are bright orangish-red, with wrinkled petals and several stamens in the middle. The sepals are reddish and fleshy, conical and toothed. Fruits are large and rounded, brownish-red when ripe. Seeds inside numerous, surrounded by edible pulp. Common, an archaeophyte formerly planted for its fruits, sometimes found naturalised. Flowers from April and the fruits are ripe by around August. The Pomegranate has long been cultivated in the Maltese Islands and is native to SW Asia.

Loosestrife Family Lythraceae




Myrtle *Myrtus communis*
Riħan/Raħħan

An aromatic evergreen shrub with shining elliptical to lanceolate leaves, sessile to shortly stalked. The leaves are opposite, and aromatic especially when crushed. Flowers have 5 white rounded petals, sometimes with a pinkish tinge, emerging from the leaf axil, solitary and stalked. Fruit is a rounded berry, greenish-white or bluish-black when ripe, with small pale seeds inside. Flowers from May (late April) to July, but flowers can also be found in autumn and winter. Rare in valleys, maquis e.g. San Martin. Place names such as Għajn Riħana and Wied ir-Riħan suggest that the species was more common in former times. Also found in cultivation and planted in some afforestation sites e.g. at Mellieħa and Comino (Wied l-Aħmar).

Myrtle Family Myrtaceae





Tuart *Eucalyptus gomphocephala*
Ewkaliptus/Siġra tal-Ewkaliptus

A large evergreen tree with lanceolate to sickle-shaped leaves. Bark does not strip. Flowers are in clusters (umbels), whitish with numerous stamens, on a flat and wide stem. The stamens surround a sticky disk. The sepals and petals are fused into a cap called the operculum. This cap falls off as the flower opens. The fruit is a globose to cone-like capsule, becoming woody at maturity and opens at the top with 4 slits to release numerous seeds. Eucalyptus trees grow long and large and provide shelter for birds to roost in. Spanish Sparrows *Passer hispaniolensis* also build their nest in these trees. Native to Australia and planted in gardens, roadsides, fields, etc. Flowers from August to October-November, sometimes also in spring.

Myrtle Family Myrtaceae





River Red Gum/Longbeak Eucalyptus *Eucalyptus camaldulensis*
Ewkaliptus/Siġra tal-Ewkaliptus

A large evergreen tree with peeling bark and lanceolate to sickle-shaped leaves. Adult leaves have a white middle vein. The flowers are in stalked umbels, yellowish-white, with numerous stamens, on a thin stem. The fruits are smaller than those of the Tuart *Eucalyptus gomphocephala*. It has a broad rim and opens at the top through which the seeds are released. Native to Australia and can be found planted in the Maltese Islands. Flowers can be found all year round.

Myrtle Family Myrtaceae





Fagonia *Fagonia cretica*
Fagonja

A spiny herbaceous perennial with horizontal branches and leathery somewhat succulent leaves made up of three spine-tipped segments. The leaves have a petiole and are opposite. Stipules present, spiny, shorter than leaf stalks. Stem is often brownish-purple from above, and green from below. Flowers are solitary and emerge from leaf axil, pink-purple, with 5 petals and yellow anthers. Fruit is a pointed capsule, angled, with persistent style. The plant often supports itself by growing over and through other shrubs. Rare and not widespread found on clay slopes and rdum west Malta. Flowers from January to May. Flowers have also been seen in November. Restricted to the South Mediterranean but occurs also in several tropical/subtropical areas (Lanfranco, 1989).

Caltrop Family Zygophyllaceae



Maltese Cross/Small Caltrops *Tribulus terrestris*
Għatba/Għotba/Salib l-Art

A prostrate hairy annual to biennial with opposite and pinnate leaves without a terminal leaflet. Leaves that are opposite to each other can be of different size. Flowers are yellow and solitary, in the leaf axils on short stalks, with 5 petals, and 5 hairy sepals showing between petals. Stamens 10 and these have yellow anthers. The hairy fruit is hard and spiny, resembling a star or Maltese cross. Seeds inside are relatively large and also hard. Occurs in dry open areas including fields and other disturbed habitats, also in sandy areas. Scarce, flowering from June to November. Found in disturbed habitats, especially in the Inner Harbour area (Lanfranco, 1996). There is the legend that this plant started to grow during the Great Siege of Malta (1565) from the blood of the Maltese and the Knights!

Caltrop Family Zygophyllaceae





White Willow
Salix alba
Żafżafa
Kbira/Żafżafa Bajda

Deciduous tree, bark greyish to silvery, older stems becoming brownish and also fissured. Leaves are alternate, narrow (elongate-elliptical) and finely toothed. Leaves are covered with appressed hairs on both surfaces, and are whitish (greyish to silvery) from below. Flowers have bracts and nectaries, and are tightly grouped in catkins and without petals and sepals. Male flowers and female flowers occur on separate plants. Male flower have 2 stamens, anthers yellow. Fruit a capsule that splits open to release small seeds with tufts of hairs (wind dispersal). Very rare, occurring in a few watercourses. Flowers emerge in March and April. Only one male tree survives, at Ġnien il-Kbir, limits of Rabat. Cuttings from this tree have been planted at Fiddien valley, Baħrija valley and Wied il-Qlejgħa (Stevens & Baldacchino, 1998). The Maltese name Żafżafa can be written as Safsafa.

Willow Family Salicaceae





Mediterranean Willow *Salix pedicellata*
Żafżafa Żgħira

A deciduous shrub to a tree with hairy and greyish young stems. Leaves alternate, elliptical, hairy and paler from beneath and toothed. Lateral veins prominent especially on the underside of the leaf. The leaves have a stalk, and stipules are present. Flowers are in catkins and have nectaries, and their bracts are dark-tipped. Fruit a capsule that opens to release small hairy seeds (wind dispersal). Very rare in a few watercourses, e.g. Fiddien valley, flowering January-March. Only male trees survive, and at l-Imtaħleb and Ġnien il-Kbir; the population at Ġnejna that used to exist up to a few years ago was destroyed around 1983(Lanfranco, 1998a, 1990). The trees at Fiddien valley must have been introduced as cuttings from these trees. Note: Both 2 species of *Salix* have been recently planted by the side of the road leading to Dwejra (Malta).

Willow Family Salicaceae





White Poplar *Populus alba* Luq/Siġra tal-Luq/Siġra taċ-Ċopp/Siġra taċ-Ċop

Deciduous tree, and grows tall along watercourses, with silvery greyish stems, younger ones more white. The bark becomes fissured with age. Parent tree gives rise to several shoots that grow from underground (suckers), eventually becoming new trees. Leaves stalked and mostly ovate, toothed to shallowly lobed, dark green from above and silvery-white from below. Flowers clustered together, hanging down in catkins (wind-pollinated), from February to March. These appear before the leaves. Leaves are shed mostly in the autumn, re-appearing back in springtime. Not common, found along watercourses where most of the trees have been planted. The White Poplar is a true native and a survivor of the last Ice Age (Haslam *et al*., 1977). The White Poplar trees at Wied Ħaż-Żrun are indigenous (Stevens, 1998). Female trees are extremely rare, e.g. at Wied il-Luq (Stevens & Baldacchino, 1998). In summer of 2011 old riparian woodland of White Poplar at Girgenti was severely burnt (S. Żammit Lupi, pers. comm., 2011).




A few trees of Poplar species ("*Populus nigra*"?) occur at Buskett. Leaves are green, stalked and ovate to triangular with a toothed margin. The bark is dark.

Willow Family Salicaceae

The **Sweet Violet** or **English Violet** *Viola odorata* Vjola is a cultivated plant, but also occurred as a native plant e.g. at Imtaħleb and Ġnejna, now probably extinct (Lanfranco, 1989). Leaves occur in a basal rosette, and it has sweetly scented dark violet or white flowers. The plant spreads by above-ground stems (stolons). The **Rock Pansy** *Viola parvula* Vjola Żgħira/Pensjeri Salvaġġa is also possibly extinct as it has not been seen for several years (Lanfranco, 1989). Its flowers are white.

Viola Family Violaceae




Blue Passion Flower *Passiflora caerulea* Fjur tal-Passjoni

A green to greyish-green herbaceous perennial. Leaves are stalked, alternate and palmately-lobed. Tendrils for climbing occur at the leaf axils. Flowers large and showy, solitary and axillary, stalked. They are mostly found from late summer onwards to autumn. Petals are white or pinkish, and with a corona of bluish or purplish filaments. Stamens are 5, yellowish or greenish, stigmas 3, purplish. Fruit a rounded orange-yellow berry. Native to South America, planted locally in gardens, rare as a naturalised plant.

Passion Flower Family Passifloraceae




Slender Yellow Flax/Southern Flax *Linum trigynum* (*Linum gallicum*) Kittien Irqiq

A small and slender ascending or erect flexible annual with small and narrow (linear-lanceolate or elliptical) pointed, alternate leaves. The small flowers have 5 bright yellow petals. The inflorescence is lax. Fruit a capsule. The Slender Yellow Flax is usually smaller and with less dense number of leaves than the Upright Yellow Flax *Linum strictum*. The flowers are also brighter. Both species are often found growing together. Common in garigue and rocky valleys, arid ground, March to June.

Flax Family Linaceae




Upright Yellow Flax *Linum strictum*
Kittien Isfar/Kittien tal-Imħarbat

A slender usually erect rigid annual with small and narrow pointed leaves. The leaves are sessile and often occur in dense numbers, alternating, and have small teeth on the margins. Flowers often crowded, with 5 pale yellow petals, sessile or very shortly stalked. This flax species is usually larger than the similar Slender Yellow Flax *Linum trigynum*, with which it often shares habitat. Its flowers are also pale and not as bright. Seed capsule has a narrow beak. Common in garigue, rocky valleys, arid ground and abandoned fields, also clay slopes, March to June. According to Haslam *et al.* (1977) two subspecies might occur in the Maltese Islands: *strictum* and *corymbulosum*. Borġ (1927) states that "local plants belong mostly to the form *spicatum* with flowers more or less racemose, and sometimes to the form *capitatum* with flowers collected in a loose cyme or head". Lanfranco describes only subspecies *spicatum* (2015).

Flax Family Linaceae




Pale Flax *Linum bienne* (*Linum angustifolium)*
Kittien Ikħal/Kittien Selvaġġ

A slender and branched, ascending to erect annual to herbaceous perennial. Plant is hairless. Leaves are narrow and pointed, alternate and have 1-3 veins. Flowers have a stalk and occur in loose clusters, with 5 pale blue petals up to 7mm-12mm long. Sepals are shorter, with pale margins. Capsule rounded with a short beak. Flowers from April to May, and is rare in the garigue. It was reported by Borġ (1927) as rare "in waste lands and sandy sea-shores". The **Red Flax** *Linum decumbens* Kittien Aħmar used to grow only at Għajn Żejtuna but is now considered extinct (Lanfranco, 1989).

Flax Family Linaceae




Flax/Linseed *Linum usitasissimum*
Kittien Ikħal Kbir

Annual, similar to Pale Flax *Linum bienne* but is larger and generally grow as one unbranched erect stem. Leaves with 3 veins and have smooth margin. Flowers pale blue with darker streaks, large and showy, much larger than the pointed sepals. Sepals have pale margin. Flowers in spring April to May. Introduced with bird seed and can sometimes be found naturalised. *Linum usitasissimum* is not known to be indigenous anywhere and presumed to have arisen from *Linum bienne* and is still cultivated in some parts of Europe and West Asia (Blamey & Grey-Wilson, 1993).

Flax Family Linaceae




Egyptian St.John's-wort
Hypericum aegypticum
(*Triadenia aegyptiaca*)
Fexfiex tal-Irdum

A greyish-green shrub, usually low growing with small and somewhat fleshy elliptical leaves. Leaves do not have black or red glands. Flowers are bright yellow with 5 petals surrounding the yellow stamens, solitary. Frequent in coastal areas including garigue, cliffs and cliff edges, rdum and valleys, flowering from December to May-June. Some flowers may also be found later. "Has a predominantly North African distribution" (Lanfranco, 2007, 1989); "Occurs in Malta, Lampedusa, Sardinia, Morocco, Algeria, Crete and Lebanon-but not in Egypt!" (Lanfranco, 2003). It is an important component of the exclusively Maltese association *Triadenio-Chiliadenetum bocconei* (Brullo & Marceno, 1979- in Lanfranco, 1989). Lanfranco (2015) give the subsp. *webbii* for the Maltese Islands.

Hypericum Family Clusiaceae (Hypericaceae, Guttiferae)





Crisped St.John's-wort
Hypericum triquetrifolium
(*Hypericum crispum*)
Fexfiex tar-Raba'/Fexfiex Imġigħed

A low and branched herbaceous perennial with prostrate to ascending or erect stems. Stems have 2 raised lines. Leaves small and clasping the stem, mostly lanceolate-triangular to linear, opposite and with a wavy margin. The leaves may have small dots (glands). Flowers yellow, with 5 petals and numerous stamens in the middle. The stamens are joined at the base into bundles. The plant turns dark brown when withering. Common mostly in dry open fields in summer, also country roadsides, other disturbed ground, May to October.

Hypericum Family Clusiaceae (Hypericaceae, Guttiferae)




Pubescent St. John's-wort *Hypericum pubescens* Fexfiex Sufi

A low densely hairy herbaceous perennial with prostrate and ascending stems. Leaves opposite, ovate to rounded, and slightly clasp the stem. Flowers yellow with 5 petals, somewhat showy, and have black glands along the margin. The pointed hairy sepals also have black glands along their margin. Frequent in rocky ground including garigue, rocky steppe and valleys, flowering from April to July. Lanfranco (1989) also mentions the **Southern St. John's-wort** *Hypericum australe* as probably extinct.

Hypericum Family Clusiaceae (Hypericaceae, Guttiferae)





Maltese Waterwort/ Maltese Elatine/Pelagian Elatine *Elatine gussonei* Elatine

A small aquatic annual with prostrate and branched stems, rooting at nodes. The stems have ascending tips, and the plants often form carpets at the bottom of rock pools. Leaves are opposite or in twos, spatulate, lower leaves with relatively long stalk and upper ones almost sessile. Flowers have 4 sepals and 4 reddish petals. Fruit a capsule that splits open to release tiny seeds. These seeds do not float on water surface but sink to the bottom. Scarce in rock pools in garigue, flowering from February to around April. The Maltese Waterwort grows only in Malta, Gozo and Lampedusa (Pelago-Maltese endemic) and has become quite scarce (Lanfranco & Lanfranco, 2003). Sommier in 1908 first described the plant as *Elatine hydropiper* var. *gussonei* until it was elevated to species level in 1988 by Brullo, Lanfranco, Pavone and Ronsisvalle (Mifsud, S., www.maltawildplants.com - accessed 2017).

Elatine Family Elatinaceae




Andrachne *Andrachne telephioides* Andrakna

A small greyish-green perennial with prostrate and ascending stems, woody at base. Leaves alternate, hairy, stalked and elliptical-rounded in shape, pointed at tip. Stipules present, silvery and pointed, reddish at base. Flowers separate, male or female in same plant. These generally occur singly and in the leaf axils. The male flowers are yellowish with petals shorter than the sepals, the female flowers without petals. Sepals have a pale margin and the fruit is a rounded capsule. Scarce, in arid ground, fields, urban sites, and paths, March-August.

Phyllanthus Family Phyllantaceae





Turn Sole/Litmus Plant/Girasol/Southern Chrozophora
Chrozophora tinctoria
Turnasol

A greyish-green hairy and branched annual with stalked diamond-shaped leaves. The leaves have a toothed and wavy margin and more or less rough to the touch. The stellate (star-shaped) hairs can be seen with naked eyes. Flowers are small and yellowish-green. The male flowers are in racemes, the female flowers occur on curved stalks below the male flowers. The fruit capsule is made up of 3 rounded lobes, covered with swellings. The plant does not have milky sap. Common in disturbed habitats including fields, also in dry watercourses, May to October.

Spurge Family Euphorbiaceae





Annual Mercury/Herb Mercury
Mercurialis annua
Burikba

An erect and branched annual with opposite and stalked, elliptical-lanceolate leaves that have a toothed margin. Flowers are small and greenish, the male and female flowers occur on separate plants. However plants with both male and female flowers also occur (subspecies *ambigua=Mercurialis ambigua*). Male flowers axillary and are in long upright spikes that are longer than the leaves, female flowers in small clusters at the leaf axils. The flowers have 3 sepals. Fruits are small, divided in 2 rounded parts, and hairy. These hairy fruits easily attach to the fur of animals or clothes and so can be dispersed. Common in disturbed ground flowering from November to May.

Spurge Family Euphorbiaceae





Castor Oil Plant *Ricinus communis*
Siġra tar-Riċnu/Siġra tar-Riġnu

A shrub to a small tree having large, stalked palmate leaves with up to 9-11 toothed lobes. Leaves and stems can be reddish/purplish. Flowers in branched racemes (panicles), and contain both male and female flowers but separate from each other, the male flowers occurring below the female flowers. The male flowers have yellowish-white stamens while female flowers have red stigmas. The rounded capsules (fruits) have soft spines. The 3 bean-like shiny seeds inside are marbled dark and pale brown. This poisonous, non-native plant is rapidly spreading in disturbed areas and also along watercourses and is frequent. The flowers can be found throughout the year. The Castor oil Plant is native to Africa and was introduced in the 19th Century as a medicinal and ornamental species (Lanfranco, 1996; Schembri & Lanfranco, 1996).

Spurge Family Euphorbiaceae



Purple Spurge/Hyssop Spurge *Euphorbia peplis*
Ġemmugħa tar-Ramel

A prostrate slightly fleshy and hairless annual with green or purplish stems trailing over the sand. Leaves are elongate and opposite, greyish-green and with short stalk, entire or with small teeth especially at base. Flowers are small and greenish with reddish glands that do not have horns. The flowers do not occur in umbels. Seeds rounded and greyish. Very rare and endangered in few sand dunes and sandy bays, (April-) May to October (-November). "It was formerly more frequent and present in almost all dunal areas of Malta, Gozo and Comino" (Cassar & Stevens, 2002). The species is endangered and presently found in 2 or 3 localities including Ramla tat-Torri (Armier) and at Ramla l-Ħamra where it is declining (Cassar & Stevens, 2002). It was recorded at Mellieħa bay by Lanfranco (1989) but is now extinct from there (Casha, pers. observations). Photograph taken in Italy.

Spurge Family Euphorbiaceae





Small Spurge *Euphorbia chamaesyce*
Ġemmugħa

A prostrate hairy or hairless annual, often with purplish stems and rounded-elliptical leaves on a short stalk. The leaves are opposite and can be finely toothed. Flowers are inconspicuous, and glands are purple with white appendages, without horns. Capsule generally with deep grooves, hairy or hairless, seeds greyish, wrinkled. Scarce to frequent-common, in gardens, plant nursery pots and plant nurseries, also urban sites, other disturbed ground. Flowers can be found all year round. Haslam *et al*. (1977) describes 2 subspecies as possibly occurring in the Maltese Islands: *chamaesyce* - hairy or hairless, leaves entire and narrow appendages; and *massiliensis* - hairy, leaves finely toothed and wide appendages.

Spurge Family Euphorbiaceae





Spotted Spurge *Euphorbia maculata*
Ġemmugħa Ħamra

Prostrate and ascending annual, similar to Small Spurge *Euphorbia chamaesyce* but leaves often with a dark purplish blotch. Stems are hairy, often reddish/purplish, leaves mostly hairy beneath and with short stalk, elongate-rounded and with small teeth. Flowers minute, glands with pinkish/purplish (or whitish) appendages. Capsule with appressed hairs and has small brownish seeds inside. The seeds have transverse grooves. Native to North America found naturalised in gardens, plant nurseries. Flowers mostly March to October, but flowers can be found all year round.

Spurge Family Euphorbiaceae





Sun Spurge *Euphorbia helioscopia*
Tengħud tar-Raddiena

Hairless or hairy annual, often with an erect solitary stem that can be reddish. The leaves are rounded to spatulate and with a finely toothed margin. Umbel with 5 rays and the 5 ray-leaves are broad and toothed. Bracts are yellowish-green and leaf-like. Capsule contains black seeds with a network of ridges. Common in various disturbed habitats, November to May.

Spurge Family Euphorbiaceae





Sea Spurge *Euphorbia paralias*
Tengħud tar-Ramel

A hairless and erect herbaceous perennial, branched from below. Leaves elongate-elliptical, upper ones ovate, in dense number and may be overlapping. Glands are with horns, and also with small teeth on the margin. Umbel with 3-5 (6) rays. Bracts concave. Fruits are grooved and with small growths. Seeds pale grey. Rare and endangered in sand dunes e.g. Ramla Ħamra, Ramla tat-Torri, flowering from April to September.

Spurge Family Euphorbiaceae





Pine Spurge *Euphorbia pinea* (*Euphorbia segetalis* var. *pinea*)
Tengħud Komuni

A green or greyish-green hairless and variable herbaceous perennial. Stem simple or branched from the base and can be reddish at base. Leaves are narrow, linear and pointed at tip. Flowers have 4 yellowish glands with a pair of horns each. Umbel has 5 rays. Ray-leaves are diamond-shaped, bracts greenish and wide, ovate. Seeds grey, pitted. Common in various habitats including garigue, rdum, valleys, abandoned fields, roadsides and other disturbed areas. Flowers can be found all year round.

Spurge Family Euphorbiaceae





Tree Spurge
Euphorbia dendroides
Tengħud tas-Siġra

Usually a rounded greyish-green woody shrub or a small tree; small tree shape is especially found in sheltered situations. Silvery-grey stem shows scars of detached leaves, and is thick at the base. Leaves elongate, slender, and more or less linear-lanceolate and occur towards the top of the stem. They turn reddish before they are shed in late spring, and so the plant is leafless during the dry season. Bracts are ovate, broad and short, yellowish. Glands are lobed but without horns. Seeds grey. The large amounts of flowers turn the shrubs into a yellow colour during the flowering season. Frequent in valley slopes, rdum and also on sloping coastal garigue, flowering from February to April. The Tree Spurge is often found in groups forming colonies. Probably started to inhabit the Mediterranean in the late Tertiary Period (Pignatti, 2002).

Spurge Family Euphorbiaceae





Maltese Spurge
Euphorbia melitensis
Tengħud tax-Xagħri/Tengħud ta' Malta

Usually a low woody branched shrub with younger stems often reddish. Leaves sessile and alternating, pointed at tip, elliptical-like to more elongate. Rays (stalks of umbel) are short. Ray-leaves are broad. Bracts are yellowish-green. Glands 5, yellow, lobed but not horned. The flowers are aromatic, filling the air around them with their scent. After flowering, the leaves eventually turn reddish, then these are shed, and the plant becomes leafless in the dry season. Flowers from January (sometimes also from December, especially in sheltered sunny situations) to April (-early May). Common in garigue, valleys and rdum. According to Lanfranco (1996) the local population is endemic as confirmed by recent studies.

Spurge Family Euphorbiaceae





Maltese Dwarf Spurge *Euphorbia exigua*
Tengħud Irqiq ta' Malta

A small annual with prostrate or erect and branched stems and is not very noticeable. Leaves are dense, elongate. Ray leaves lanceolate. Flowers small and occur at the top of the stems. The reddish glands have paler narrow horns. Frequent to common in garigue and open rocky ground, especially coastal. Flowers from January to May. The plants of the Maltese Islands belong to the variety *pycnophylla.* It is endemic to the Maltese Islands and Lampedusa (Lanfranco, 2004a). First described by Kramer *et al*. (1972) from the Maltese Islands; later discovered on Lampedusa (Minissale & Spampinato) "and may thus represent a Pelago-Maltese endemic"; fairly frequent in western Malta, Gozo and Comino (Lanfranco, 1989). Mifsud (www.maltawildplants- accessed April 2020) describes also var. *exigua* as frequent (and var. *pycnophylla* as scarce).

Spurge Family Euphorbiaceae





Petty Spurge *Euphorbia peplus*
Tengħud tal-Ġonna

Usually an erect or ascending annual with alternate and stalked, rounded or spatulate leaves. Stem is often reddish. Ray-leaves similar to the stem leaves, and the bracts are ovate, green. Glands have greenish/yellowish horns. The minute seeds are grey with darker holes. Common in dry localities, rocky ground including rocky valleys, disturbed habitats, November to May.

Spurge Family Euphorbiaceae





Dwarf Petty Spurge *Euphorbia peploides* (*Euphorbia peplus* var. *minima*)

Annual, smaller than *E. peplus* and often has the stem reddish. The horns of the glands are brownish to purplish. It grows in dry rocky and other open ground and is frequent to common. Borġ (1927) describes it as a variant of the Petty Spurge *Euphorbia peplus* var. *peploides* and as "very common in exposed situations and on arid waste land".

Spurge Family Euphorbiaceae





Large Mediterranean Spurge *Euphorbia characias*
Tengħud Kbir/Tengħud tal-Ħaġar

An ascending to erect hairy perennial with elongate and pointed (linear-lanceolate) grey-green leaves. Upper leaves more or less erect. The lower part of the stem is usually reddish and leafless with many scars of previous leaves. Flowers are yellowish in large heads, with dark purplish-brown shiny glands. The bracts are fused forming cup-shaped structures. Seeds are smooth, grey. A rare spurge growing in garigue, rocky valleys and in abandoned fields, flowering in (January-) March and April.

Spurge Family Euphorbiaceae





Coastal Spurge *Euphorbia terracina* Tengħud tax-Xtut

An ascending to erect hairless perennial with many stems (often reddish) that rise from the base. The sessile leaves are alternate and elongate, linear-lanceolate. The ray-leaves are in a whorl of 4-5 (or less) depending on the number of rays, and often diamond-shaped. Axillary rays can be present. Glands are yellowish-green and shiny, with a pair of slender horns, fruits becoming purplish. Rare and endangered in sand dunes and sandy areas of Ramla l-Ħamra and Għadira, flowering from March (or earlier) to September (or later). The **Aleppo Spurge** *Euphorbia aleppica* has been recently recorded by Tabone (2007) in a few sites in Malta. It was formerly recorded as locally frequent in Malta in cultivated fields, but rare in Gozo (Haslam *et al*., 1977; Borġ, 1927). This plant has lower leaves that are linear and in dense numbers, overlapping. The glands have a pair of pale horns. It flowers from late spring to summer/autumn. Other 2 species of spurges mentioned for the Maltese Islands (Haslam *et al*.,1977; Borġ, 1927) are the **Pubescent Spurge** *Euphorbia hirsuta* (*Euphorbia pubescens*) e.g. at Xlendi, Gozo, and the **Clustered Spurge** *Euphorbia biumbellata* e.g. Wied Babu, and both were recorded as rare.

Spurge Family Euphorbiaceae







Cape Sorrel/Bermuda Buttercup/African Oxalis/Wood Sorrel *Oxalis pes-caprae* Ħaxixa Ingliża/Ingliża/Qarsu

A bulbous herbaceous perennial, with an underground stem bearing bulbils (small bulbs). Leaves occur in a rosette and on long stalks, with 3 heart-shaped leaflets, mottled brown or darker. Flowers bright yellow, each flower with short secondary stalk, clustered in an umbel at the tip of a long and green, smooth main stalk (peduncle). They have 5 petals, but a double-flowered form with an orangish/reddish tinge (forma *pleniflora*) also occurs, in Maltese called Ingliża Sewda. Flower buds are drooping. When in flower these plants often carpet whole areas yellow. Very sensitive to light and weather conditions and flowers close in dim light or in cold weather, especially in afternoon. The plant does not make seeds and spreads by bulbs and bulbils. Very common everywhere especially in disturbed habitats - fields, gardens, roadsides, in rubble walls, etc., also invades rocky ground, especially where disturbed. It flowers from November to April. Not indigenous, native to South Africa, and has become a serious threat to other native vegetation.

This plant has a long history with the Maltese Islands. It was introduced at the beginning of the nineteenth century, in 1806, probably by an English lady who donated a plant to botanist Father Carlo Giacinto (or introduced by Fr. Giacinto himself), head of the botanical gardens at Floriana, and a few years later it is believed that it was already abundant. From here it has spread to the entire Mediterranean and to the Atlantic coast and British Isles. The Maltese name ("English Plant") comes from the English lady who donated the plant, or due to the fact that its introduction coincided with the start of British rule in Malta (Lanfranco, 1996). Pignatti (2002) writes that in Sicily it became abundant in the second half of the nineteenth century; in Corsica first recorded in 1837; in Toscana in 1923; Pantelleria after 1920. In Malta only one form (out of the 3 in its native region) is found and no viable seed can thus be produced (Lanfranco 1996). According to Borġ (1927) "occasionally a mature capsule is found late in the season". Note: picture above on the right shows the double-flowered form.

Sorrel Family Oxalidaceae





Sleeping Beauty/Creeping Wood-sorrel
Oxalis corniculata
Ingliża tal-Ġonna

Hairy herbaceous perennial, its stems move over ground and root at the nodes. Leaves are alternate and stalked, often dark (tinged with brownish/purplish), with 3 leaflets. Flowers yellow in small clusters, smaller than those of the Cape Sorrel *Oxalis pes-caprae* and it produces cylindrical and hairy seed pods, dehiscing at maturity to release the seeds. The secondary stalks of the flowers become reflexed at fruiting time. Found mostly in gardens and in plant nurseries, but also as a naturalised plant e.g. in areas where tree planting occurs. Flowers can be found throughout the year. Country of origin is not certain (Blamey & Grey-Wilson, 1993). The **Pink-flowered Oxalis** *Oxalis purpurea* also occurs as a cultivated plant and sometimes found naturalised, but less frequent than *O. corniculata*. The **Yellow Wood-sorrel** or **Upright Wood-sorrel** *Oxalis stricta* Ingliża Wieqfa is a recent introduction, and similar to *Oxalis corniculata* but generally grows upright (Lanfranco, 2015).



Sleeping Beauty *Oxalis corniculata* naturalised in a pot plant

Sorrel Family Oxalidaceae



Myrtle-leaf Milkwort/African Milkwort *Polygala myrtifolia*

An attractive evergreen shrub densely covered with leaves and native to South Africa. The showy purplish flowers are at the tips of branches and in short clusters. They resemble the flower of a legume (pea family) but lack the upper (standard) petal. The lower petal has a brush-like tuft. Flowers can be found throughout the year but mainly spring/summer to early autumn. The fruit is a winged capsule. It is widely planted in Malta and in the Mediterranean as an ornamental shrub. This plant has naturalised in the west of the Mediterranean (Blamey and Grey-Wilson, 1993). The **Mediterranean Milkwort** *Polygala monspeliaca* is generally a small erect annual with whitish flowers in a terminal raceme, with three united petals that are fringed at the apex. Flowers from March to May and is scarce to rare. Recorded by Tabone (2008) from a few sites in Malta and one site in Gozo. The Mediterranean Milkwort was given as frequent in arid rocky and open areas (Haslam *et al.,* 1977; Borġ 1927, Sommier & Caruana-Gatto, 1913).

Milkwort Family Polygalaceae





Judas Tree/Mediterranean Redbud *Cercis siliquastrum*
Siġra ta' Ġuda/Ħarrub ta' Ġuda

A deciduous tree with dark reddish-brown bark, leaves rounded and stalked with an entire margin. Flowers in clusters on the branches or trunk, stalked, pinkish-purple. The flowers usually appear before the leaves, or with the young leaves. Pod elongate and flattened, brown when mature. Frequently planted in gardens, roadsides, centre strips, sometimes found naturalised. The Judas Tree has become extinct in the wild. Flowers from February-March to April. Remains of the Judas Tree have been found that date back 7200 to 6500 years ago (Schembri & Baldacchino, 1992; Trump, 1966).

Pea Family Fabaceae (Leguminosae)

Carob/Locust Tree/St.John's Bread *Ceratonia siliqua* Ħarruba/Siġra tal-Ħarrub

An evergreen tree with dark green and leathery pinnate leaves. Trunk is often stout, with greyish to greyish-brown bark. The pinnate leaves have broad and elliptical to rounded leaflets, often with wavy margins. Female flowers and male flowers occur on different trees. Flowers have no petals. The male flowers are borne on a purplish stalk, with 5 yellowish stamens and 5 sepals. The female flowers are also carried on a stalk and have 5 sepals and a yellowish ovary. The flowers are scented, and attract flies, bees, wasps, and other insects. The seed pods (fruits) hang individually on short stalks, forming a cluster on a main stalk. These are at first small and pale, but eventually grow larger and turn green by spring and then eventually ripening to brown. The fruits are used for making syrup or sweets, and were formerly used as fodder for livestock. The brown seeds inside are very hard. A common characteristic tree of the Maltese countryside, found in several habitats including valleys, maquis, field margins, abandoned fields, and around farmhouses. Naturalised specimens can also be found growing low in garigue and in rocky ground. Flowers from October to around November.

The Carob Tree is either a relict of the subtropical vegetation of the Tertiary (Haslam *et al*., 1977) or introduced in ancient times (Lanfranco, 1996) and is thus an archaeophyte. It has been introduced in the Maltese Islands probably in the Roman period or even before (Lanfranco, 1998). Borġ (1927) considered the Carob tree a true native. "The Carouba (Ħarruba) is the most common tree, but it abounds chiefly in the eastern districts of Malta" (Godwin, 1880). The Carob is the lone survivor of some ancient stock and the only representative in the genus *Ceratonia*; it has survived the ice ages from the Tertiary (Polunin & Huxley, 1972). However the Plant List (*www.theplantlist.org*) lists a second species, *Ceratonia oreothauma*, found in Somalia and Oman.







Left to right: leaves, female flowers, male flowers




Above left picture shows ripe fruits, above right picture shows a Carob tree

Pea Family Fabaceae (Leguminosae)




Blue-leaved Acacia/Blue-leaved Wattle *Acacia saligna* (*Acacia cyanophylla*) Akaċja/Gazzija

Usually grows into a small tree with smooth grey to greyish-brown bark. Old trunks become fissured. Leaves pinnate at first, but are later reduced to leaf-like, flattened green stalks (phyllodes). These elongate structures are usually curved and often wavy, and function as leaves. Flowers are bright yellow, clustered in small globose heads that are borne in several short raceme-like inflorescences along the length of the flowering stem. The flowers have a "butter-like" smell. The large number of flowers turn the trees yellow in the flowering season. The brownish pod is constricted between the seeds. Seeds inside are black. Flowers from March to May. The Blue-leaved Acacia is native of Western Australia and was commonly planted as an ornamental tree in former plantations and public gardens in Malta. Sometimes found naturalised, and seedlings tend to grow profusely when an Acacia tree is cut down and the ground is opened up.

Pea Family Fabaceae (Leguminosae)




Red-eyed Wattle *Acacia cyclops* Akaċja Għajnha Ħamra

A shrub or small tree native to Australia. Like many other Acacia species the "leaves" are actually phyllodes (flat and wide leaf stalks). Flower heads yellow and seed pods are often curved. The flower heads are relatively few on the tree during flowering and found mainly in summer. Seeds are black and have a red stalk encircling them. It can be found as a planted tree, occasionally naturalised.

Pea Family Fabaceae (Leguminosae)




Lead Tree
Leucaena leucocephala
Akaċja tal-Fjuri Bojod

A deciduous shrub or small tree with smooth brownish bark. Leaves alternate and large, pinnate, with the leaflets pinnate again (leaves bi-pinnate), with small and narrow numerous segments. The leaves close at night and in rain or dull weather. Flowers occur in globose (rounded), compact and stalked heads, each head containing several white flowers. Flowers appear mainly in late May – June onwards to autumn. Pod is elongate, narrow and flattened, large with dark brown seeds inside. Not native, planted for ornament in gardens, sometimes found naturalised. Native of Central America.

Pea Family Fabaceae (Leguminosae)




Persian Silk Tree
Albizia julibrissin
Albizja

Native to Asia, this deciduous tree is found planted as a street tree. The leaves are bi-pinnate. They close in the night and in rain. The silky-looking flowers are produced in summer, and have long pinkish stamens. They occur in stalked heads. Fruit a flat brown hanging pod containing several seeds inside.

Pea Family Fabaceae (Leguminosae)




Karoo Thorn/Sweet Thorn *Acacia karroo*
Akaċja tax-Xewk Kbir/Gazzija tax-Xewk Kbir

The Sweet Thorn is native to South Africa and locally found planted in several areas. It is evergreen and grows into a shrub or a tree. Its leaves are bi-pinnate. Flowers in axillary stalked heads, and are found mainly in summer. Whitish straight spines occur on the tree. The fruit is a curved pod. Scale 10mm x 10mm. Occurring in smaller numbers is the similar *Acacia farnesiana* Gazzija tax-Xewk Żgħir. This species has smaller thorns. The pods are cigar-shaped (to slightly curved) and ripe to dark brown or black.

Pea Family Fabaceae (Leguminosae)





Bean Trefoil
Anagyris foetida
Fula tal-Klieb

A foetid shrub with trifoliate stalked leaves. Leaves are shed in the dry season and the plant lies dormant in summer emerging new shoots in October (drought-deciduousness). Flowers are greenish-yellow with a dark brownish mark on the standard petal, which is shorter than the other petals. The flowers are borne in clusters. The pod hang downwards, it is large and elongate, constricted between the seeds, and stalked. The few seeds inside are hard, yellow-violet. Poisonous. Rare in the wild in rocky valleys e.g. Wied Anġlu, rarely found planted, e.g. Comino, flowering from December to March. The Bean Trefoil is considered to be pollinated by birds such as warblers (Ojeda Alayon, 2011).

Pea Family Fabaceae (Leguminosae)




Spanish Broom *Spartium junceum*
Ġenista Safra

A greyish-green shrub with many long and thin, smooth flexible stems. Leaves are few, small and narrow, undivided more or less elliptical and fall in the dry season (drought-deciduousness). The leaves are hairy from beneath. Flowers are bright yellow in terminal racemes, sweetly scented and attractive, drawing Large Carpenter Bees (*Xylocopa violacea*) and other insects. They have an erect upper petal (standard) and the lateral petals (wings) are spread out. Seeds small in flattened elongate pods held upright. Flowers in spring from April to June. Rare in the wild in rocky sites, also planted in public gardens and in other areas. "Only a handful of wild shrubs still exist" (Lanfranco, 1989). Small numbers present at Buskett, Mġarr ix-Xini, and at Girgenti near the Inquisitor's Palace; old ones at Girgenti have been burned about 5 years ago (Stevens & Baldacchino, 1998). Sommier & Caruana Gatto (1915) recorded it as rare near the Inquisitor's palace, and at Mġarr ix-Xini in Gozo as abundant but in a restricted area.

Pea Family Fabaceae (Leguminosae)




Milk Vetch *Astragalus boeticus*
Kafe Messikan

A hairy annual having ascending or erect stems and pinnate leaves with notched leaflets. Flowers clustered (racemes) yellowish-white with the side petals (wings) longer than the lower petal (keel). The calyx has pointed tips (teeth) and is hairy. The hairy seed pod (fruit) is oblong, large with a hook at the tip, and the few seeds inside are relatively large. Frequent in fields, gardens, other disturbed habitats, and also in sandy areas, March to May. The seeds were used as a substitute for coffee (Borġ, 1927).

Pea Family Fabaceae (Leguminosae)




Small-flowered Milk Vetch
Astragalus sesameus

A small and hairy prostrate to ascending annual with pinnate leaves, leaflets elliptical. Flowers clustered in leaf axils, bluish, inflorescence a raceme. The pod (legume) is hairy and straight, with a groove on the dorsal side, and a short curved beak at tip. Scarce in arid ground including garigue and along cliff edges, e.g. Selmun, Fomm ir-Riħ and Majjistral Park. Flowers found from February to May. The species has declined as it was formerly recorded as frequent e.g. by Haslam *et al*. (1977) and Borġ (1927). Lanfranco, G. (1969) described it as not frequent. However this plant is small and inconspicuous and it can easily be overlooked.

Pea Family Fabaceae (Leguminosae)




Southern Milk Vetch *Astragalus hamosus*

A hairy annual with prostrate or ascending stems. Leaves are elongate, stalked and pinnate. Leaflets notched at the tip. Flowers are yellowish in stalked clusters. The main stalk (peduncle) of the flowers elongates in fruiting. Calyx has long teeth. The fruit is a curved (semi-circular) narrow pod. Scarce to frequent in open areas including uncultivated ground, fields, other disturbed habitats, rocky places, flowering from February to May.

Pea Family Fabaceae (Leguminosae)




Pitch Trefoil/Bitumen Trefoil/Blue Psoralea *Bituminaria bituminosa* (*Psoralea bituminosa*) Silla Qatranija/Silla tal-Mogħoż/Silla Selvaġġa

A hairy herbaceous perennial with ascending and spreading, thin and finely grooved stems. Leaves are long-stalked dark green and trifoliate (divided in 3 leaflets). Flowers bluish-violet, clustered into a flower head and on a long stalk. The sepals are narrow and hairy. The pod (fruit) has a flattened and curved beak. The stem and leaves have the smell of tar when crushed. Common, flowering from January to June in garigue, valleys, abandoned fields, roadsides and other environments. Occasionally the flowers can be white.

Pea Family Fabaceae (Leguminosae)




Common Vetch *Vicia sativa*
Ġilbiena
Sewda/Ġulbiena/Ġirbiena/Għads il-Ħamiem

A hairy annual with pinnate leaves and terminal branched tendrils that coil around other vegetation for support as the plant climbs for light. The leaflets have a minute projection at the tip. Stipules toothed. Flowers are violet-purple, in ones or twos emerging from the leaf axil on short stalks. White flowers can also be found. The calyx is cut in hairy narrow sepals. The elongate seed pod (fruit) is curved and pointed, brownish to blackish when ripe. Common flowering from February to May, in garigue, fields and other disturbed ground. A number of subspecies are found among them *V. sativa sativa* which is also grown as a fodder crop, and *V. sativa nigra* which is the commonest subspecies (Lanfranco, 1996). Subspecies *sativa* is cultivated as fodder crop and to decorate cribs, but is also found naturalised (Lanfranco & Lanfranco, 2003).

Pea Family Fabaceae (Leguminosae)




Brown-fruited Vetch
Vicia leucantha
Ġilbiena tal-Ward Abjad

Usually a hairy annual with pinnate leaves, the leaflets are narrow and pointed at tip (elliptical). The leaves (at least upper) have branched terminal tendrils. The stipules are green, toothed. The flowers are in racemes, 2 or more, pale violet-white. The elongate hairy pod (fruit) has a small curved beak at the tip and is brown on maturity and contains few (3-6) seeds. It is not constricted between the seeds. Frequent, found in garigue, rocky valleys, other rocky ground, February to June.

Pea Family Fabaceae (Leguminosae)



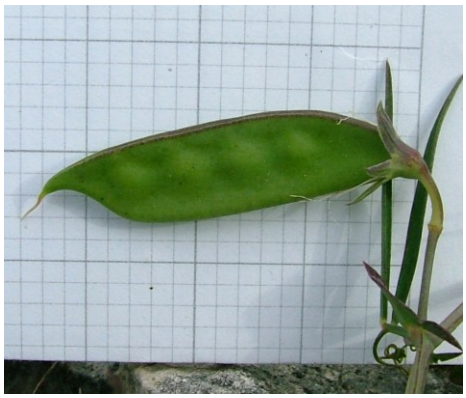

Slender Tare *Vicia parviflora* (*Vicia tenuissima*, *Vicia gracilis*, *Vicia laxiflora*)
Ġilbiena Eleganti

Annual with pinnate leaves, leaflets small and narrow, linear, having a terminal generally unbranched tendril. Leaflets 4-8 (-10), and have a small bristle at tip. Stipules are linear, entire. Inflorescence is a raceme and the flowers are pale pink, purple or pale blue. These occur in singles or small clusters up to 5, on a slender main stalk that is much longer than the leaves, the stalk with a terminal small arista. Fruit (pod) with few seeds inside. Flowers from February to May, and is scarce to rare in garigue and other open rocky ground, valleys, abandoned fields. Scale of large square on right picture above is 10mm x 10mm. The **Smooth Tare** *Vicia tetrasperma* is also recorded for the Maltese Islands; it is similar to *V. parviflora* but the flowers are solitary or 2 together on a main stalk that is more or less equal to the leaves, and without an arista. The pod has generally 4 seeds. It is scarce. Other species of *Vicia* are mentioned by Haslam *et al*. (1977), Lanfranco, G. (1969), and Borġ (1927). These include the **Southern Vetch** *Vicia ervilia* Żosfa; **Fodder Vetch** *Vicia villosa* (rare); **Hairy Tare** *Vicia hirsuta* Ġilbiena Muswafa (rare); **Slender-leaved Vetch** *Vicia peregrina* (rare); **Yellow Vetch** *Vicia lutea* (rare); and **Bithynian Vetch** *Vicia bithynica* Ġilbiena Ħoxna (rare). The **Narbonne Vetch** *Vicia narbonensis* also known in Maltese as Ġilbiena

Ħoxna is recorded as cultivated and sometimes found naturalised. Mifsud (2007) records the Bithynian Vetch *Vicia bithynica* from a new location at Baħrija. Lanfranco (1989) recorded this species as found only at Għajn il-Kbira, Girgenti and endangered. Tabone (2007) gives a record of the Fodder Vetch *Vicia villosa* from Dingli in 2003. The **Broad Bean** *Vicia faba* is locally commonly cultivated.

Pea Family Fabaceae (Leguminosae)





Fodder Pea/Red Vetchling/Flat-topped Vetch *Lathyrus cicera*
Ġilbiena Ħamra

An annual with winged stem and leaves divided into 2 elongate leaflets. Tendrils usually branched. Stipules are wide, in the shape of a butterfly. Flowers are deep purplish-red on a stalk, solitary. The pod is hairless and has 2 ridges on the dorsal (upper) side, brown when ripe. Scarce to frequent in abandoned fields among short vegetation, and in garigue and rocky ground, flowering from February to April.

Pea Family Fabaceae (Leguminosae)





Crimson Pea *Lathyrus clymenum*
Ġilbiena tas-Serp

A climbing annual with winged stem. Lower leaves consist of a broadened leaf stalk without leaflets, the upper ones pinnate with narrow leaflets. It climbs onto other plants by terminal tendrils. Flowers occur in singles or small groups with violet wings and purplish-red standard (upper petal). Seed pod is elongate and flattened, brown, with a groove on the dorsal (upper) side. Common in rocky ground, abandoned fields, clay slopes and other habitats, flowering from late January to May.

Pea Family Fabaceae (Leguminosae)



Yellow Vetchling *Lathyrus aphaca*
Porvlina

A climbing hairless annual with angled stem that is not winged. Leaves (in fact these are stipules) occur in opposite pairs, ovate to heart-shaped, clasping the stem. Tendrils (the true leaves) emerge from among the "leaves". Flowers are generally solitary, pale yellow with deeply divided calyx teeth, on a long main stalk from the leaf axils. Seed pod hairless, brown when mature, with few seeds inside. It is scarce to rare, found in garigue, abandoned fields and valleys, e.g. Xemxija, flowering February to May. Other species of *Lathyrus* are mentioned for the Maltese Islands (Pignatti, 2002; Lanfranco, 1989; Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927): **Round Pea** *Lathyrus sphaericus* Ċikkarda Żgħira (very rare and restricted); **Solitary-flowered Pea** *Lathyrus inconspicuus* Ċikkarda Rqiqa (possibly extinct); **Red Pea** *Lathyrus setifolius* Ċikkarda tal-Weraq Dojoq (possibly extinct); **White Pea** *Lathyrus sativus* Ċikkarda (often naturalised-grown as a fodder crop); **Annual Pea** *Lathyrus annuus* Ċikkarda Kbira (very rare and restricted); **Rare Pea** *Lathyrus gorgoni* Ċikkarda Safra (very rare); **Pale Pea** *Lathyrus ochrus* Ġilbiena Bajda (not frequent). Lanfranco (1989) also records the **Four-winged Pea** *Lathyrus amphicarpos* Ċikkarda tal-Blat and states that it was first discovered at ta Żuta in 1980. He continues by saying that it has a fragmentary Mediterranean distribution and locally it is endangered by the extensive degradation taking place where the species is found.

Pea Family Fabaceae (Leguminosae)




Bushy Restharrow/Large Yellow Restharrow/Goat-root *Ononis natrix* Broxka/Broxka ta' Għawdex

A sticky (glandular) hairy and aromatic much-branched herbaceous shrub with woody stems below and trifoliate leaves. Leaflets toothed. Flowers yellow. The standard (upper petal) is usually finely streaked reddish. The legume (pod) is cylindrical and pointed, with few seeds inside, and has sticky hairs. These legumes split open to release the seeds. Scarce in coastal places, both rocky and sandy, also on clay. Flowers mostly in spring, April to May, but some flowers can also be found in the other months. The subspecies occurring locally belongs to *ramosissima* (Lanfranco, 2015, 1996).

Pea Family Fabaceae (Leguminosae)




Sticky Restharrow *Ononis viscosa* subsp. *sieberi* (*Ononis sieberi*) Broxka Żgħira/Qrempuċ Muswaf

Generally a prostrate to ascending, low and densely hairy plant with a foetid "goat-like" smell. Leaves with 1 or 3 leaflets, the leaflets minutely toothed. Stipules pointed. Flowers in singles, yellow with the standard veined red. The flowers (and the pods) exceed the calyx. Flower stalk with a short, or absent, arista. Seeds small, rounded, few in numbers. Frequent in garigue, other open ground, March to June.

Pea Family Fabaceae (Leguminosae)




Birdsfoot Restharrow *Ononis ornithopodioides* Broxka Sieq l-Għasfur

A small sticky (glandular) hairy erect or ascending annual with trifoliate toothed leaves. Flowers are small, yellow, and shorter than the calyx teeth, in singles or twos, the main flower stalk with an arista. Legume is elongate, curved, hairy, becoming brownish when ripe and constricted between the seeds. Rare in garigue and arid rocky ground, rocky valleys, rdum, e.g. Rdum id-Delli, (January-) February to May. Sommier & Caruana Gatto (1915) described it as "not rare" on Comino.

Pea Family Fabaceae (Leguminosae)




Sand Restharrow/Villous Restharrow *Ononis variegata* Broxka tar-Ramel

A sticky (glandular) hairy annual with stems spreading over the sand or ascending. The leaves consist of one toothed leaflet. Stipules toothed. Flowers are yellow, solitary, in the axils of the upper leaves, longer than the calyx. Pod exceed calyx. Rare and endangered, currently known only from sand dune remnant at Golden bay (Ramla tal-Mixquqa); here the species has occurred spontaneously on sand that has been dumped in the area some years ago. Flowers in spring from April to May. The Sand Restharrow *Ononis variegata* has been described as possibly extinct by Cassar & Stevens (2002). It was recorded at Marsascala by Gulia in 1875 and Ramla l-Ħamra in 1874 and 1875 by Duthie and other subsequent authors. The last reliable record from Ramla l-Ħamra is that of Michael Briffa in 1984 (Cassar & Stevens, 2002). T. Tabone discovered the species at Ramla tal-Mixquqa (pers. comm., 2010).

Pea Family Fabaceae (Leguminosae)




Mediterranean Restharrow *Ononis mitissima*
Broxka tat-Tafal

An annual with spreading and ascending, some erect stems. Leaves are mostly trifoliate with toothed leaflets. Leaflets are elliptical or broadest above the middle. Flowers white with a pink standard (upper petal) and are crowded, inflorescence a raceme. The flower bracts are composed of either one leaflet or 3 leaflets. These bracts have a whitish, sheath-like stipule over the calyx tube. Calyx tube is pale green then eventually turning white. Scarce but can be frequent to common at some sites, and occurs in clay soil near the coast, April to May. Sommier & Caruana Gatto (1915) reported it as found on clay and sandy places, and that it is not rare on Comino.

Pea Family Fabaceae (Leguminosae)




Small Restharrow *Ononis reclinata*
Broxka Żgħira tal-Fjuri Roża

A small hairy annual with prostrate and ascending or erect stems. Lower leaves with 3 leaflets, upper leaves with 1 segment only, and margins toothed. Stipules present, ovate and pointed. Flowers in singles on a stalk, wings and keel white, standard pinkish and streaked. Calyx with long teeth, generally equal to or exceeding the flower. Flower stalk strongly recurved in fruit. Pod small and elongate, hairy and exceeds the calyx. Frequent in garigue and other open ground, flowers from late March to May. The **Two-flowered Restharrow** *Ononis biflora* is recorded by Tabone (2007) for a few sites in Malta and Gozo. This and other species of *Ononis* are mentioned by Lanfranco (1989), Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927), including the **Few-leaved Restharrow** *Ononis oligophylla*. Lanfranco (1989) states that *Ononis oligophylla* could be extinct as it have not been seen for several decades and not been sighted since 1915; however this was re-discovered in 1994 by Timothy Tabone (Tabone, 2007b; Lanfranco, 2007). This species occurs only in the Maltese Islands, South Italy and Sicily (Lanfranco, 1989).

Pea Family Fabaceae (Leguminosae)




Small Melilot/Scented Trefoil *Melilotus indicus* (*Melilotus indica*) Trew tat-Toroq

An erect or ascending annual with slender racemes much longer than the leaf. The leaflets are narrow and toothed. Flowers numerous and small, 2-3 mm. Standard is longer than keel. The Small Melilot is scented especially when fruiting. Pod is wrinkled. Flowers are found from February to May and the plant occurs mostly in disturbed habitats. The Small Melilot is described as frequent by Lanfranco (1996) "especially at road verges and on garden paths". It is also frequent in fields (Haslam *et al*., 1977). It is the commonest Melilot species in the Mediterranean (Blamey & Grey-Wilson, 1993). Scale 1mm.

Pea Family Fabaceae (Leguminosae)




Furrowed Melilot/Mediterranean Melilot/Sweet Clover *Melilotus sulcatus* (*Melilotus sulcata*) Trew Komuni

Annual with 8-25 flowers, raceme elongates in fruit, equal to or longer than the leaves. Flowers small, not more than 4mm, and standard petal is shorter than the keel. Pods concentrically ribbed, rounded with a pointed tip, yellowish-brown when ripe. Flowers from January to May, in garigue, fields, roadsides, and other habitats. Common.

Pea Family Fabaceae (Leguminosae)




Corn Melilot *Melilotus segetalis*
Trew tal-Frotta Safra

Pods concentrically ribbed and ripe to yellowish-brown, and the raceme is dense and holds 30-50 flowers. This eventually elongates much longer than the leaf (3 times as much). The keel is longer than the standard. Scarce in fields and water courses, February to May. Described as common by Borġ (1927). Same author described the similar *Melilotus infestus* as frequent in Malta, less so in Gozo. Its pods ripe to blackish-brown.

Pea Family Fabaceae (Leguminosae)





Southern Melilot
Melilotus messanensis Trew

An erect or ascending annual with yellow flowers that occur in racemes much shorter than the subtending leaf. These carry few flowers, from 3 to around 12. Standard petal is longer than the keel. The pod is somewhat elongate, relatively large, pointed and concentrically ribbed, yellowish-brown when ripe. Frequent to common in marshy habitats, including grounds that are flooded in winter, damp fields, and valleys, flowering from February to May.

Pea Family Fabaceae (Leguminosae)




Hairy Trigonella/Star-fruited Fenugreek
Medicago monspeliaca (*Trigonella monspeliaca*)
Trigonella

A small hairy annual with trifoliate and toothed leaves. The tiny flowers are yellow, in small umbel-like almost sessile clusters in the axils of leaves. The petals exceed the teeth of the calyx. The pod is narrow and long, curved with a small beak and with side veins. Scarce in arid rocky ground including along edges of cliffs, garigue, rocky slopes, rocky valleys, and paths, flowering from February to May.

Pea Family Fabaceae (Leguminosae)




Toothed Medick
Medicago polymorpha (*Medicago hispida*)
Nefel Komuni/Nefel Barri

Hairy or hairless annual with leaflets toothed at the top and stipules deeply toothed (laciniate). Flowers yellow. Legume spirally coiled, cylindrical or disk-shaped, and spiny, the spines curved at the tips. Common in fields, valleys, roadsides and other environments. **Note: Flowers of *Medicago* species are mainly found from January-February to May, although flowers of some species are also seen in the autumn.**

Pea Family Fabaceae (Leguminosae)




Small Medick/Bur Medick *Medicago minima*
Nefel Żgħir

Annual and hairy, with spiny, small legumes. The spines have a curved tip.

These legumes of the Small Medick have the resemblance of a sea urchin, with divergent spines having a hook at their tips. Stipules are triangular, entire or with small indistinct teeth. Frequent to common in garigue, abandoned fields, and other open arid ground.

Pea Family Fabaceae (Leguminosae)




Prickly Medick/Calvary Clover/Sea Egg *Medicago intertexta*
Nefel Kbir

An annual with toothed leaves and toothed stipules. Flowers yellow in clusters and on a main stalk (peduncle) that generally exceeds the leaves. Pod is large and robust, rounded and spiny, usually hairless. Occurs in fields, valleys, humid places and is scarce to frequent.

Pea Family Fabaceae (Leguminosae)




Ciliate Medick *Medicago ciliaris* (*Medicago intertexta* subsp. *ciliaris*)
Nefel Kbir Muswaf

Similar to the Prickly Medick *Medicago intertexta* but the seed pods are hairy. Scarce to frequent in fields, paths, rocky ground and clay.

Pea Family Fabaceae (Leguminosae)




Large Disk Medick/Round-fruited Medick *Medicago orbicularis* Nefel Lixx

Hairy or hairless annual, leaflets toothed. Stipules deeply toothed. Flowers yellow. Pod a relatively large flat disk, smooth and not spiny, with few turns (4-6) and a network of veins. Common in various habitats including garigue, rocky valleys, fields and other disturbed areas. Pignatti (2002) describes the variety *biancae* with 6-9 spirals that is found in Malta, Sicily and Sardinia.

Pea Family Fabaceae (Leguminosae)




Rugose Medick *Medicago rugosa* Nefel tal-Vini

Annual. Stipules toothed. Flowers yellow. Legume disk-shaped and is not spiny. Frequent in fields, garigue and rocky valleys. Scale 1mm.

Pea Family Fabaceae (Leguminosae)




Sea Medick *Medicago marina* Nefel tar-Ramel/Nefel tax-Xtut

A densely silvery-hairy herbaceous perennial. Flowers yellow on short stalks and in dense clusters. Pods are also hairy and have few turns and short spines. Occurs in sand dunes at Ramla l-Ħamra where the species is quite frequent. Otherwise it is considered extinct from other coastal sand dunes in Malta and Comino. Sommier & Caruana Gatto (1915) described it as not rare from some localities, and described it also for Comino. The author (Casha) has seen one specimen at Ramla tal-Mixquqa c.20 years ago.

Pea Family Fabaceae (Leguminosae)





Mediterranean Medick *Medicago truncatula*

An annual with cylindrical pods that have curved spines. Flowers yellow. Stipules toothed and with deep divisions (laciniate). It is frequent to common.

Pea Family Fabaceae (Leguminosae)





Coastal Medick *Medicago littoralis* Nefel tax-Xatt

Slightly hairy annual. Stipules deeply toothed (laciniate). Legumes are spiny or without spines, cylindrical or disc-shaped. Spines on the legume can vary in length from one plant to another. Frequent to common in coastal localities including sandy habitats and sand dunes, also in coastal garigue.

Pea Family Fabaceae (Leguminosae)



Spiny Medick *Medicago murex* Nefel Skars

Mostly hairless annual. Stipules deeply toothed (laciniate). Raceme with 2-3(4) yellow flowers. Peduncles terminate with an awn. The legume (seed pod) is cylindrical or spherical. It has defined coils, and with small conical and slightly curved stout spines. Rare. Borġ (1927) described it as "nowhere common" in fields, along country roads and in valleys.

Picture taken at Buskett in early May

Pea Family Fabaceae (Leguminosae)





Black Medick
Medicago lupulina
Nefel Iswed

An annual or short-lived perennial with numerous, small yellow flowers (2-3mm). Main flower stalk (peduncle) exceeds leaves. Legumes small, ripen to black. Stipules are toothed or entire. Scarce to frequent in garigue, rocky valleys and other rocky ground.

Other species of *Medicago* are mentioned for the Maltese Islands by Lanfranco (1989), Haslam *et al*. (1977) and Borġ (1927). These include the **Field Medick** *Medicago rigidula* Nefel ta' Selmun, **Southern Medick** *Medicago tuberculata* (*Medicago turbinata*), **Straight-spinned Medick** *Medicago doliata* (*Medicago aculeata*), and the **Spotted Medick** *Medicago arabica* Nefel tat-Tikek (grows sporadically in seaside habitats, very rare-Lanfranco, 1989).

Pea Family Fabaceae (Leguminosae)




Scale 1mm

Tree Medick *Medicago arborea*
Nefel tas-Siġra

The Tree Medick is a shrub and it occurs wild in some parts of the Mediterranean but only as a cultivated plant in Malta. It has yellow flowers which it displays in spring. The rounded fruits of the Tree Medick are thin and not spiny. Locally widely planted but is not native to the Maltese Islands, sometimes found naturalised.

Pea Family Fabaceae (Leguminosae)




Lucerne/Alfalfa *Medicago sativa* Alfalfa

This Medick is a perennial and its trifoliate leaves have toothed margins at the apex. The flowers are blue to purple in dense heads (racemes), on a main stalk that exceeds the leaves. The spiralled pod has few turns. The Lucerne is commonly cultivated as a fodder crop in many countries. Its origin is probably SW Asia (Streeter *et al*., 2009); a British native (Blamey & Grey-Wilson, 1993). Sometimes found naturalised e.g. Marsalforn, Gozo. Pictures taken in December.

Pea Family Fabaceae (Leguminosae)




Strawberry Clover *Trifolium fragiferum*
Xnien tal-Frawli/Xnien tas-Sajf

Prostrate herbaceous low-growing perennial with stems often rooting at nodes and forming clumps. Leaves alternate, trifoliate (with 3 leaflets) and are more or less dark green. Stipules are conspicuous. Flowers pink and occur in a head on a long stalk that exceeds the leaves. Fruit head rounded, hairy. Legume (fruit) included within the inflated calyx. Seeds are yellowish–reddish, with a notch at one end, and heart shape. Scarce in wet areas such as along watercourses, e.g. Fiddien, late May onwards to around September.

Pea Family Fabaceae (Leguminosae)




Reversed Clover *Trifolium resupinatum*
Xnien Roża

Usually a hairless annual with small rounded stalked flower heads. Flowers pinkish, the standard petal is beneath the other petals (flowers "reversed"). Calyx hairy, inflated in fruit with 2 upper teeth longer than the other 3. Stipules have long pointed tips. Common in garigue, rocky valleys and other rocky ground, humid areas and roadsides, flowering from March to June (or later). The similar **Woolly Trefoil** *Trifolium tomentosum* Xnien Muswaf also occurs but is not frequent. The calyx does not have the 2 long teeth (they are smaller and not so evident). Its pink flowers are found from March to May. See page 342.

Pea Family Fabaceae (Leguminosae)




Star Clover/Star Trefoil *Trifolium stellatum*
Xnien tal-Istilla/Xnien tal-Kewkba

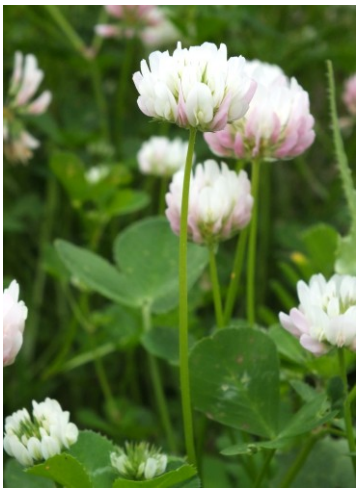
A hairy annual with ascending to erect stems. Stipules are wide, sheath-like and veined. Flowers occur in pinkish globose heads on long stalks. The calyx is very hairy and becomes reddish and star-shaped after flowering. Common in garigue, valleys and fields, February to May.




Hop Trefoil/Rough Clover *Trifolium campestre*
Xnien Isfar/Xnien Inħaxlet

A low hairy annual with sheath-like, entire and pointed stipules. Flowers yellow, clustered in globose heads on long stalks. The flowers eventually turn brownish. Common in garigue and other rocky ground, rdum, fields, roadsides, March to May. The members of the *Trifolium* genus have leaves that are divided in 3 leaflets, usually with a toothed margin. The calyx is united into a tube or is bell shape, with divisions (teeth) that can be of unequal length.

Pea Family Fabaceae (Leguminosae)




Lesser White Clover/Small White Clover/White Clover *Trifolium nigrescens*
Xnien Abjad/Xnejn Abjad

Usually hairless spreading to erect annual with leaves on a long stalk. Stipules pointed. Flowers white (often with pink) in globose head on long stalk, and scented. They later turn brownish. The small pod is slightly constricted. Found in cultivated places, other disturbed ground, valleys and other damp habitats, also in garigue and rocky ground. Common flowering from January (mostly later) to May.

Pea Family Fabaceae (Leguminosae)




Rough Clover/Scabrous Clover *Trifolium scabrum*
Xnien Inħaxlet

A small prostrate to ascending hairy annual. The trifoliate leaves are minutely toothed, and with prominent veins at the margins. Flowers are white (-pink) in dense axillary or terminal sessile heads. Calyx teeth become slightly recurved in fruit, and have a somewhat spiny tip. Flowers from February to May, frequent in garigue, rocky valleys, arid open ground, roadsides. Lanfranco, G. (1969) states that its flowers are often pinkish; Blamey & Grey-Wilson (1993) state that the flowers are "creamy-white, becoming pink with age". Plants at Wied Għomor, Sliema and Ta' Ċenċ have been described as *Trifolium lucanicum* by Borġ, 1927 (Haslam *et* al., 1977). Pignatti describes subspecies *lucanicum* for the Maltese Islands; this has pinkish flowers and is more densely hairy, and the flowers are equal to or exceed the calyx teeth.

Pea Family Fabaceae (Leguminosae)




Suffocated Clover *Trifolium suffocatum* Xnien Moħbi

Small pale green hairless annual forming patches on the ground. The triangular leaflets have a small notch at the tip. The petiole (leaf stalk) is longer than the leaflets. The small inconspicuous and sessile white flowers have the calyx larger than the corolla, and occur in dense heads (often appearing as one head) at the base of the plant. Frequent in dry rocky ground including in country paths, March to May. Other *Trifolium* species mentioned by Lanfranco, 1989, Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) include the **Subterranean Clover** or **Burrowing Clover** *Trifolium subterraneum* Xnien Midfun given from a number of places (but described as probably extinct by Lanfranco, 1989); and the rest rare/very rare - **White Clover** *Trifolium repens*; **Bur Clover** *Trifolium lappaceum* Xnien Xewwieki; **Narrow-leaved Clover** *Trifolium angustifolium* Xnien tal-Werqa Irqiqa; **Spiny Clover** *Trifolium echinatum* Xnien Xewki; **Sea Clover** *Trifolium squamosum* (*Trifolium maritimum*), Xnien tal-Baħar; **Squarrose Clover** *Trifolium squarrosum* Xnien tal-Ilma. Tabone (2008, 2007) recorded the following species in his lists of rare plants - *Trifolium lappaceum, Trifolium angustifolium* and *Trifolium tomentosum*. The **Red Clover** *Trifolium pratense* has also been recorded by Mifsud (2007) in abandoned fields at Qormi. According to the same author these could have been introduced (as seeds) with agricultural products. *Trifolium infamia-ponertii* also occurs (Lanfranco, pers. comm., 2014)

Pea Family Fabaceae (Leguminosae)




Edible Birdsfoot Trefoil/Edible Lotus *Lotus edulis* Qrempuċ

A hairy and low, prostrate and ascending annual. Flowers yellow on a stalk that exceeds the leaves, usually solitary, sometimes 2 together, and are relatively large. The calyx is hairy. Fruit is elongate and curving upwards, and has a groove on the concave side, at first fleshy and green, and is edible. Common in garigue, valleys, open arid ground, fields, roadsides, other disturbed areas, January to May. The *Lotus* species have their leaves divided in 5 leaflets, with 2 of them resembling stipules.

Pea Family Fabaceae (Leguminosae)




Common Birdsfoot Trefoil/Clustered Birdsfoot Trefoil *Lotus ornithopodioides* Qrempuċ tal-Mogħoż/Għantux Sieq l-Għasfur

A spreading hairy annual. The leaves have the 3 upper leaflets clearly set out on a stalk. Leaflets are mostly diamond-shaped (rhombic). Flowers yellow, in small clusters (2-5) on a main stalk that slightly exceeds the leaves and gets longer in fruiting. The elongate and narrow seed pods are curved, and constricted between the seeds. Common in fields and other disturbed areas, valleys, rocky ground, January to May.

Pea Family Fabaceae (Leguminosae)




Grey Birdsfoot Trefoil *Lotus cytisoides* (*Lotus creticus* subsp. *cytisoides*) Għantux tal-Blat

A hairy greyish-green herbaceous low shrub or a smaller perennial with stems spreading over ground and ascending. Leaves are somewhat fleshy, the 2 lower leaflets sessile and upper 3 shortly-stalked. Flowers yellow often with a reddish tinge, in small clusters. The lowest petal (keel) is curved. The main stalk of the flowers is longer than the leaf. The lateral teeth of the calyx are shorter than the upper and lower teeth. Pod is dark, usually straight to slightly curved and with small constrictions between the seeds. Common in rdum and on boulders near the coast, and in coastal garigue, sometimes further away from the sea. Found also growing on sand. Flowers from January (some flowers also found in late December) to May.

Pea Family Fabaceae (Leguminosae)




Sea Birdsfoot Trefoil *Lotus halophilus* Għantux tar-Ramel

A hairy annual with prostrate and ascending stems, leaves without stalk or scarcely stalked, the leaflets appearing as originating from the same point on the stem. Flowers generally in small groups (and up to 9), on a main stalk (peduncle) that exceeds the leaves. Flowers yellow, calyx with unequal teeth, the lateral ones slightly shorter than the upper. Pods (legumes) are straight with a curved tip and slightly constricted between the seeds. February to May, in sandy or rocky coastal areas, rare, e.g. Marfa peninsula and Santa Marija bay in Comino. The plant resembles the Grey Birdsfoot Trefoil *Lotus cytisoides*; the latter has larger flowers and the upper leaflets of the leaves are stalked, and its pods do not have a curved tip.

Pea Family Fabaceae (Leguminosae)





Birdsfoot Trefoil *Lotus preslii* Għantux/Għantux tal-Ilma - Herbaceous perennial, mostly hairless or somewhat hairy with angular prostrate and ascending stems. Leaflets often broad, pointed, upper 3 on short stalk. Flowers in small groups on a relatively long stalk and often washed or veined reddish. The calyx has teeth that are longer than the calyx tube. Seed pod cylindrical. An endangered species of wet habitats flowering from March (February) to May. Lanfranco, G. (1969) and Borġ (1927) recorded the species as *Lotus corniculatus* subspecies *decumbens* and as frequent to rather frequent in wet areas (especially in the west of Malta - Lanfranco, G., 1969). This plant was fairly frequent in humid places (Sommier & Caruana Gatto, 1915) but now seems to exist only in the Mistra valley (Lanfranco, 1989).

Pea Family Fabaceae (Leguminosae)




Winged Pea/Asparagus Pea/Crimson Dragon's-teeth *Lotus tetragonolobus* (*Tetragonolobus purpureus*)
Fiġġiela Ħamra

A hairy annual usually low above ground with prostrate and ascending stems. Leaves with 3 pointed leaflets and 2 leaf-like ovate stipules. Flowers are conspicuous deep red in ones or twos only, on short stalk. The tubular calyx is hairy with 5 teeth. At the base of the flowers are bracts that are cut in 3. The elongate seed pod has 4 expansions (wings). Common in garigue and other open rocky ground, valleys, clay slopes, fields flowering from late January to May.

Pea Family Fabaceae (Leguminosae)




Disk Trefoil/Spiny Kidney-vetch
Hymenocarpos circinnatus
Nefel ta' Għawdex

A prostrate or ascending hairy annual, stems often purplish. Leaves alternate, pinnate, with few elongate-elliptical leaflets, terminal leaflet largest. Lower leaves have fewer leaflets or are entire. Flowers are yellow-orange in small groups at the top of a stalk arising from the leaf axil. Flowers subtended by a bract. Calyx has deep narrow divisions. Fruits are flat and circular with a toothed margin. Rare, recorded only from Gozo, March-April.

Pea Family Fabaceae (Leguminosae)




Shrubby Kidney Vetch/Yellow Kidney Vetch *Anthyllis hermanniae* subsp. *melitensis*
Ħatba Sewda

An endemic woody shrub with small and narrow, dark green, hairy leaves. The leaves are simple (undivided) or divided in 3 leaflets, and often have the sides curving upwards. The shrub is armoured with spiny stems. Flowers small, sweetly scented. The teeth of the calyx are short. The flowers occur in small clusters along the flowering stem, or less often solitary. The Shrubby Kidney Vetch looks a dark shrub when not flowering; however in the flowering season these shrubs turn yellow, colouring whole patches of garigue where they are found. The fruit is a small, pointed pod with a single seed. In summer the leaves are reduced as a protection against loss of water. Common in garigue and other rocky ground, flowering from mid-April (sometimes few flowers also found in March) to May, early June. Studies undertaken by Brullo and Giusso del Galdo in 2006 on taxonomic differences of the *Anthyllis hermanniae* complex identified Maltese plants as an endemic subspecies, and divided the *A. hermanniae* complex in 2 separate species : *A. hystrix* - not found in the Maltese Islands, and *A. hermanniae* with 7 subspecies, including *A. hermanniae* subspecies *melitensis* that is found in the Maltese Islands.

The *Anthyllis* species are annuals, biennials or perennials. Some are shrubs. Leaves are simple or with 3 leaflets, or pinnate. Legumes are usually hidden within the calyx.

Pea Family Fabaceae (Leguminosae)




Common Kidney Vetch/Lady's Fingers *Anthyllis vulneraria*
Silla tal-Blat/Silla Salvaġġa

Prostrate to ascending herbaceous perennial. Lower leaves with a single leaflet or with small and larger leaflets, upper leaves are pinnate, with the terminal leaflet larger than the lateral (side) ones. Flowers are purplish-red (sometimes white) and clustered in stalked heads, and with whitish inflated sepal tube. Common in garigue, rocky steppe and other open arid ground, March to May. The subspecies in the Maltese Islands belongs to *maura* (Lanfranco, 2015,1996; Haslam *et al*., 1977). The Common Kidney Vetch is a variable plant and has many subspecies (Pignatti, 2002).

Pea Family Fabaceae (Leguminosae)





Bladder Kidney Vetch/Four-leaved Kidney Vetch/Annual Kidney Vetch *Tripodion tetraphyllum* (*Anthyllis tetraphylla*) Silla tal-Bżieżel

A prostrate low hairy annual, leaves divided into few leaflets with a terminal leaflet larger than the others. The yellow and white flowers occur in clusters and emerge from the leaf axils. The standard petal is paler than the other petals. The sepals are hairy and later on inflate like a bladder, usually with reddish markings. Seeds 1-2 and pod is constricted between the seeds. Frequent in garigue, rocky valleys, March to May.

Left picture shows inflated calyx of Bladder Kidney Vetch

Pea Family Fabaceae (Leguminosae)




Shrubby Crown Vetch *Coronilla valentina*
Koronilla/Koronilla tal-Kuruna

A greyish-green shrub. Leaves divided into a few pairs of leaflets, the leaflets narrowed at the base and with a slight notch or point at the tip. Flowers yellow, scented and occur in clustered heads (the "crown"). These are held on a main stalk that exceeds the leaves. The pendulous and elongate seed pod is segmented and in each segment there is one seed. Scarce to rare mainly on rocky ground including rocky slopes in valleys, also in rdum, e.g. at Wied Babu, Wied Inċita, Dingli, Majjistral Park. Flowers from February to May. Can be quite frequent where it occurs. Lanfranco (1996) states that the local plants are close to subspecies *glauca*.

Pea Family Fabaceae (Leguminosae)




Yellow Crown Vetch/Annual Scorpion Vetch *Coronilla scorpioides* Xeħt l-Imħabba/Morra

Prostrate, ascending or erect greyish-green hairless annual with rounded to elliptical leaves. Leaves are entire or divided in 3 leaflets, the terminal one larger than the 2 others. Flowers yellow in stalked clusters, the main stalk exceeding the leaves. Pods (fruits) are narrow and strongly curved and segmented. Frequent to common in fields, garigue, rocky valleys, rdum flowering from March to May. *Coronilla* plants include species that are annuals or perennials including shrubs. Flowers occur in clusters and the seed pods are made up of segments containing a seed each. Lanfranco (1989), Haslam *et al*. (1977) and Borġ (1927) give another species - the **Pale Crown Vetch** *Coronilla emerus* (*Hippocrepis emerus*) Koronilla Kbira (rare shrub). Lanfranco (1989) states that it "seems to have disappeared from the wild".

Pea Family Fabaceae (Leguminosae)




Single-flowered Horseshoe Vetch *Hippocrepis biflora* Xintilli Żgħira/Ċintilli

A prostrate hairless annual with small and solitary yellow flowers on short peduncles (main flower stalks). On occasions the flowers can be paired. Legume flattened, straight or slightly curved, with the holes (generally) on the outer (convex) side. Frequent in garigue, fields, and flowers from February-March to May. Lanfranco (2015) states that this species is recorded as *Hippocrepis unisiliquosa*, a similar species that does not occur in Malta. *Hippocrepis unisiliquosa* form *biflora* with flower stalks having occasionally 2 flowers is much rarer than single-flowered forms (Borġ, 1927). The horseshoe vetches are annuals or perennials with pinnate leaves having a terminal leaflet (imparipinnate). Their fruits are flattened and mostly curved, jointed, with horseshoe-shaped hollows. The fruit divides into segments when it ripens, each segment with 1 curved seed. The flowers are yellow, and in clusters (umbels) or in singles from the leaf axils. The calyx has unequal teeth, and is tubular to bell-shaped. Three species are described for the Maltese Islands.

Pea Family Fabaceae (Leguminosae)




Common Horseshoe Vetch/Many-flowered Horseshoe Vetch *Hippocrepis multisiliquosa* Xintilli Komuni

An ascending or erect generally hairless annual with flowers in small clusters on a main stalk. Fruits strongly curved, mostly hairless or with few hairs, segmented with the holes on the outer (convex) side. Common in garigue, roadsides, fields and other disturbed ground, March to May.

Pea Family Fabaceae (Leguminosae)




Lesser Horseshoe Vetch
Hippocrepis ciliata
Xintilli tal-Blat/ Xintilli Skars

A small annual with ascending or erect stems and is generally hairless. Leaflets are linear to linear-spatulate. These are often notched at the tip. The flowers are in clusters on peduncles that are generally shorter than the leaf. Its fruits are hairy on the margin, and the holes open on the inner (concave) side. Resembles *Hippocrepis biflora*, but it has smaller flowers on longer stalks (not almost sessile). In garigue and other open rocky ground, February to May, scarce-frequent, but often overlooked.

Pea Family Fabaceae (Leguminosae)




Scorpion-tail Vetch/Many-flowered Scorpiurus/Caterpillar Plant
Scorpiurus muricatus
Widna

Usually a prostrate and ascending, hairy or hairless annual with entire spatulate and pointed leaves. Flowers yellow to orangish-yellow in small clusters (2-5) on a long stalk. Pod contorted and with small spines or tubercles on the outer ridges. Seeds crescent-shaped. Formerly cultivated as animal fodder. A common plant in garigue, valleys, fields and other disturbed ground, flowering from February to May.

Pea Family Fabaceae (Leguminosae)




Sulla/Italian Sainfoin/French Honeysuckle *Hedysarum coronarium* (*Sulla coronaria*)
Silla

Herbaceous perennial with prostrate to ascending stems and pinnate leaves with broad elliptical-circular leaflets that are hairy from beneath. The leaves have a terminal leaflet. Stipules pointed, triangular. Flowers are bright reddish-purple clustered in an inflorescence on long stalk (raceme). The flowers can on occasions be white. Fruits segmented, with small, few (2-4) circular hairless segments that are spiny for attachment. Common in fields and clay slopes but also cultivated for fodder, flowering from February (also earlier, December–January) to May (June). The Sulla is probably not indigenous and several cultivars have been introduced (Lanfranco, 1996). The Sulla was introduced into cultivation from Africa towards 1750 (Borġ, 1927). Lanfranco (2015) gives another Maltese name as Silla tan-Nebbieta for the wild type.

Pea Family Fabaceae (Leguminosae)




Clustered Sulla/Clustered Clover *Hedysarum glomeratum* (*Hedysarum capitatum*, *Hedysarum spinosissimum* subsp. *capitatum, Sulla glomerata*) Silla Selvaġġa

A prostrate annual with spreading often reddish stems. The pinnate leaves have small leaflets. Flowers are slender in racemes, pinkish-purple. The flower head is on a long stalk. Fruit a segmented pod, with 2-4 segments, each segment containing 1 seed. The segments have small hooked spines to attach to passing animals for dispersal. Frequent in coastal garigue and rocky steppe, February to May.

Pea Family Fabaceae (Leguminosae)



Spiny Sulla *Hedysarum spinosissimum* (*Sulla spinosissima*) Silla tal-Frott Xewwieki/Silla tal-Fjuri Żgħar/Silla Żgħira - A prostrate and densely hairy annual with alternate, pinnate leaves. Leaf segments are few and truncate or notched at the tip. Upper leaves are smaller. Flowers pale, white to pinkish, smaller and less conspicuous than the flowers of *Hedysarum glomeratum*. Seed pod with 2-4 spiny segments. Rare on garigue and open rocky ground, e.g. at Comino, flowering from March to May. According to Lanfranco (pers. comm., 2012) it also used to occur at Baħar iċ-Ċagħaq coast road area, from where it can still be present. Lanfranco (2015) list it as scarce. Gauci (in Haslam *et al*., 1977) reported it from Qalet Marku, and Sommier & Caruana Gatto (1915) from Comino, as abundant in some areas there.

Pea Family Fabaceae (Leguminosae)




Bramble/Blackberry *Rubus ulmifolius* Għollieq/Għolliq

A thorny scrambling perennial with hard curved or straight prickles for support. Leaves stalked and with 3-5 toothed leaflets. Flowers are pale pink, or less commonly white, with 5 petals and a mass of central stamens. The sepals are reflexed at fruiting time. The fleshy fruits (drupelets) are at first green, eventually turning red and ripening to black. Frequent to common in valleys, at times choking whole areas, also in maquis. Flowers can be found throughout the year. Lanfranco (2015) describes the **European Dewberry** *Rubus caesius* that is very similar but has white flowers, trifoliate leaves and bluish fruits, and is rare and "seems to occur mainly in Gozo".

Rose Family Rosaceae





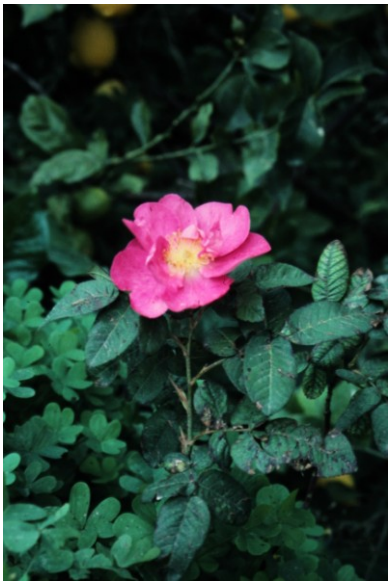
Evergreen Rose
Rosa sempervirens
Girlanda tal-Wied/Warda Selvaġġa

Evergreen scrambling perennial with prickles and shiny alternate leaves. The leaves are pinnate with few toothed leaflets including a terminal one (imparipinnate). There is also a pair of stipules at the base. The flowers are stalked and in small clusters, white, with a mass of stamens in the centre. The styles are united into a column. The sepals are pointed, reflexed and fall off at fruiting. The fruit is a collection of achenes (hip), rounded, red when ripe. Rare in valleys and maquis, e.g. Wied Inċita, April to June.





The **Provence Rose** *Rosa gallica* Warda taż-Żejt was also recorded by past authors as rare in a few valleys such as at Wied il-Għasel and Wied il-Lunzjata (Haslam *et al*., 1977; Borġ, 1927). It has large pink and scented flowers.





Provence Rose *Rosa gallica* photographed at Girgenti by Raymond Galea in February 1984.





Salad Burnet/Fodder Burnet
Sanguisorba minor
Tursin il-Għul

A hairy herbaceous perennial with ridged stem and pinnate leaves mostly in a basal rosette, the leaflets have a short stalk and their margins toothed. Flowers male or female on same plant, clustered in globose heads on an erect flowering stalk. Petals are absent, sepals 4. Upper flowers are female with reddish styles and the lower flowers are the males with dangling stamens (yellow anthers). Fruits (achenes) enclosed in a hard and rough case (the hypanthium). Frequent in garigue, rocky valleys, maquis, roadsides, flowering from March to May. The plants of the Maltese Islands belong to subspecies *muricata* (Lanfranco, 1996; probably *muricata* - Haslam *et al.*, 1977). Subspecies *muricata* occurs in arid regions and is often the most common subspecies in the Mediterranean (Pignatti, 2002).

Rose Family Rosaceae





Thorny Burnet/Prickly Burnet/Brushwood
Sarcopoterium spinosum
Tursin il-Għul Xewwieki/
Tursin il-Għawl Xewwieki

A much branched spiny low shrub, with dense number of branches. Young stems densely hairy. Bark is brown and fissured on old stems. Leaves are pinnate, with small ovate to rounded leaflets, terminal one present (imparipinnate). Flowers are in spherical or elongate heads on a hairy stalk, the females above the males, with 4 sepals but lack petals. The flowers are greenish, the female flowers with purple feathery styles and the male flowers with yellow stamens. Fruit of 2 carpels enclosed in rounded, red and fleshy berry-like structure, later turning to purple-brown and dry and very light and easily carried by the wind. Flowers can be found in spring (March to May, also in autumn), and currently known from rocky steppe-garigue at Pembroke, where few shrubs grow close together. The Thorny Burnet is characteristic of eastern Mediterranean phrygana (phrygana = garigue) community and may represent such a relict community (Lanfranco, 1989). Since locally the species occurs in only one small area there is the possibility that it is an introduced plant and has naturalised. Lytton John Musselman (2007) in his book "Figs, Dates, Laurel and Myrrh: Plants of the Bible and the Quran", suggests *Sarcopoterium spinosum* to be the plant used for the crown of thorns placed on Jesus' head.




Creeping Cinquefoil *Potentilla reptans*
Frawla Selvaġġa

A herbaceous perennial with prostrate and trailing stems, rooting at the nodes. Leaves are digitate (palmate-pinnate) with 5 to 7 elongate and toothed leaflets, and are long-stalked. Flowers are solitary, stalked and axillary, with 5 shiny yellow petals that are larger than the sepals, and yellow anthers in the middle. The achenes (fruits) are grouped in heads. Frequent in valley bottoms, also other shady and humid areas, flowering from March to July.

Rose Family Rosaceae




Quince *Cydonia oblonga*
Sfarġel

A shrub to a small tree without spines. Leaves are ovate to elliptical, pointed and stalked. They are alternate and from the underside are pale and densely-hairy. Stipules present, linear-lanceolate, but fall off early. Calyx with 5 hairy segments, reflexed after flowering. Flowers are solitary and large on short stalks and with 5 pinkish-white petals. Fruit is green and tomentose (hairy) when young, then ripening to yellow, fragrant, pear - or apple-shaped. Native to Asia. Formerly planted for its fruits and also for grafting pears and apples. Flowers from March to May.

Rose Family Rosaceae




Loquat *Eriobotrya japonica*
Naspli

An evergreen shrub to a small tree with thick dark green, large leaves. These have an uneven surface with visible veins and are hairy from beneath. The smooth greyish-brown bark gets fissured with age. The flowers are scented and with 5 white (to yellowish) petals, in a branched inflorescence. Fruits are golden-yellow, small and rounded and edible. Seeds inside are glossy brown, and relatively large. Flowers are found from October to December, and the fruits ripen in springtime. Native to Central China, long cultivated for its edible fruits. The Loquat has been in cultivation in the Maltese Islands since 1811 (Borġ, 1927).

Rose Family Rosaceae




Syrian Pear/Wild Pear *Pyrus syriaca*
Lanġas tal-Lvant/Lanġas Selvaġġ

A deciduous tree with alternate, glossy toothed leaves. Flowers white, scented, with 5 petals and numerous stamens at the centre. Fruits are small, the usual pear-shaped (bell-shaped). Rare, found in valleys and maquis, and it flowers from February to (early) April. The Syrian Pear is native to the East, and probably introduced hundreds of years ago to be grafted for the cultivation of the Cultivated Pear (*Pyrus communis* Lanġas). It is found mostly in the south of Malta (Lanfranco & Lanfranco, 2003). The greatest population occurs at Wied Żembaq (Stevens & Baldacchino, 1998). The **Common Pear** or **Cultivated Pear** (*Pyrus communis*) Lanġas is cultivated for its edible fruits.

Rose Family Rosaceae

Almond *Prunus dulcis* (*Prunus amygdalus*, *Amygdalus communis*)
Lewża/Lewża Żgħira/Siġra tal-Lewż

A deciduous shrub to a small tree with shiny green leaves. The elongate stalked leaves have a toothed margin. Flowers white to pale pink, scented, found in winter when the plant is mostly leafless. Fruits have an outer greyish-green velvety cover that eventually splits from the hard pitted shell. The seed inside is bitter in taste in the wild form. Not native, and is common, introduced in the Maltese Islands several years ago. The Almond was previously commonly planted in fields and field borders, and around farmhouses. It flowers in winter from December to February-March. Probably introduced in the Maltese Islands from the East hundreds of years ago (Lanfranco & Lanfranco, 2003). The native area of the Almond Tree is not certain and its cultivation began in Asia, probably in Mesopotamia (Pignatti, 2002). Blamey & Grey-Wilson (1993) and Coombes (1992) state that the Almond Tree is truly native of North Africa, Central and South-west Asia. The wild specimen is somewhat spiny unlike the cultivated form that produces sweet almonds (var. *dulcis*). In his study Thake (1999) observed that Almond trees produce different kinds of flowers and those that had red filaments produced little nectar and produced seeds while flowers with pink to white filaments produced more nectar and did not produce any seeds. Flowers with pale coloured filaments seem to be produced to attract insect and bird nectar-feeders. Thake (1999) also remarked that Almond trees are clearly adapted to attract and accommodate birds that feed on nectar in various ways, e.g. by producing more nectar than any other species of *Prunus*. Other species of *Prunus* locally found cultivated are **Apricot** *Prunus armeniaca* Berquq, **Wild Cherry** *P. avium*, **Cherry Plum** *P. cerasifera* Għajnbaqar, **Dwarf Cherry** or **Sour Cherry** *P. cerasus* Amarena, **Plum** *P. domestica* Pruna, **Mahaleb Cherry** *P. mahaleb*, **Peach** *P. persica* Ħawħ, and the **Sloe** or **Blackthorn** *P. spinosa* Prajn tax-Xewk/Pruna Selvaġġa. All are not native. The **Service Tree** *Sorbus domestica* Żorba and the **Medlar** *Mespilus germanica* Fomm il-Lipp/Omm il-Epp/Naspli Tedesk are other non-native fruit trees members of the Rosaceae, now probably extinct from the Maltese Islands.





Pictures show Almond *Prunus dulcis* flowers and fruits

Rose Family Rosaceae





Hawthorn/Quickthorn/Whitethorn *Crataegus monogyna* Żagħrun/Anżalor Selvaġġ

A thorny deciduous shrub to a small tree. Leaves and young stems are glabrous (without hairs) or with few short hairs. The stalked leaves are generally deeply lobed, the lobes with minute teeth at the top. Leaves are darker from above. Flowers are numerous, occurring in clusters. These flowers are scented and have 5 white petals and a mass of central stamens, and 1 style. After flowering green fruits appear that will eventually turn red by September-October. These have 1 stony nutlet inside. The sepals are persistent at the top of the fruits. Frequent in rocky valleys and maquis, flowering from late March to April. Flowers can also sometimes be found in the autumn. According to Borġ (1927) the fruits may (rarely) have 2 nutlets.

Note: The **Crete Hawthorn** or **Azarole** or **Mediterranean Medlar** *Crataegus azarolus* Għanżalor/Anżalor is also mentioned by Haslam *et al*. (1977) and Borġ (1927) as occurring in valleys. Lanfranco (1996) states that the Crete Hawthorn occurs in the wild but is rare and was formerly cultivated. It was also mentioned by other authors on Maltese flora. According to Lalov & Lanfranco (2008) the last reliable published records of this species in the wild in the Maltese Islands is that at Wied ix-Xlendi by Duthie in 1875. The same authors cite their recent findings of this species at Wied il-Kbir (Qormi), Mistra, Selmun, Wied Babu, Wied Żnuber and near Wied Maqbul. The Crete Hawthorn has a long history of cultivation for its edible fruits. It could be that the Crete Hawthorn is only native in Crete and other wild populations elsewhere have originated from cultivated plants (Blamey & Grey-Wilson, 1993; Tutin *et al.*, 1978). It is similar to *Crataegus monogyna*, but the *Crataegus azarolus* is more densely hairy and the lobes of the leaves are shallowly cut. The flowers have (1) 2-3 styles and its fruits are larger and ripen to yellowish-brown or red with more than 1 stony nutlet inside. Hybrids between *Crataegus monogyna* and *Crataegus azarolus* (*C.* x *ruscinonensis*) are known in Maltese as Għanżalor Selvaġġ and sometimes occur/are fairly frequent (Lanfranco, 1996, 2015). Lalov & Lanfranco (2008) also record sightings of this hybrid. The first record for the Maltese Islands was given by Sommier & Caruana Gatto (1915). Borġ (1927) records it under *Crataegus azarolus* var. *ruscinonensis* as "rather rare in cool, moist valleys", e.g. Buskett and Wied Babu. According to Stevens & Baldacchino (1998) this hybrid is frequent in the maquis. The leaves and inflorescence are almost glabrous (without hairs), and styles 2-3 (Borġ, 1927).

Rose Family Rosaceae





Christ's Thorn/Jerusalem Thorn *Paliurus spina-christi* Xewk ta' Kristu/Xewk tal-Kuruna

A spiny shrub with zigzag stems and alternate ovate to rounded shortly stalked leaves. Leaves are leathery, hairless and the margin is entire or with small teeth. Flowers yellow with 5 petals in small axillary clusters. Stipules spiny, the longer one straight, the shorter one curved. The dry fruit has a rounded, membranous and wavy wing. Flowers from April to June. Sommier & Caruana Gatto (1915) saw just one specimen in Xlendi valley. Lanfranco & Lanfranco (2003) state that it has probably gone extinct in the wild.

Buckthorn Family Rhamnaceae




Jujube *Ziziphus zizyphus* (*Ziziphus jujuba*, *Ziziphus sativa*, *Ziziphus vulgaris*)
Żinżel

A shrub or a small tree, somewhat spiny. The spines are the stipules, one straight and one that is curved. Bark grey, fissured when old. Younger stems have smooth grey bark. New stems green. Stems usually bent in a zigzag fashion. Leaves shiny green, alternate, rounded to lanceolate, with a finely toothed margin, and shortly stalked. Flowers are tiny, clustered, yellowish, petals shorter than the sepals, and 5-parted. Drupe (fruit) is egg-shaped, dark reddish-brown, edible. Uncommon, in valleys e.g. Wied tal-Speranza, flowers from May to June. A few plants are also found planted in public gardens. The species is native of Temperate Asia. It was formerly cultivated for its edible fruits and also for timber. One very old Jujube is found in a valley at L-Imtaħleb area (MEPA, 2011c).

Buckthorn Family Rhamnaceae




Mediterranean Buckthorn *Rhamnus alaternus*
Alaternu

An evergreen spineless shrub or small tree with pale grey stems. Leaves are leathery and shiny, stalked and alternate, elliptical or rounded with pointed or rounded tips, sometimes having a slightly toothed margin. Flowers are small, greenish, with 5 sepals in a dense inflorescence, axillary, male flowers and female flowers on different plants. Petals are absent or 1. Female plants produce bright red, round fruits which then turn black, from April onwards. The fruits (drupes) are fed upon by several birds thus dispersing the plant. Found in valleys, maquis and woody habitats, not widespread but sometimes frequent where it occurs, example at Buskett. Can also be found growing in the open, e.g. at Wardija. Flowers are found from February to March. The Mediterranean Buckthorn may not be a true native (Lanfranco, 2001). One third of the total Maltese population occurs in the area of Il-Ballut tal-Wardija, limits of St. Paul's Bay (MEPA, 2011d).

Buckthorn Family Rhamnaceae




Olive-leaved Buckthorn/Small Buckthorn *Rhamnus oleoides* (*Rhamnus lycioides* subsp. *oleoides*)
Żiju

A hardy spiny evergreen shrub, usually growing low, but grows larger in sheltered places such as in valleys. Has small leathery variable leaves, elliptical-like to more elongate or spatulate, with pointed or rounded tips, and are shortly stalked. Veins on leaf are conspicuous. The stems have pointed spiny tips. Flowers small and are greenish-yellow, in clusters, axillary, and male or female. They are stalked and with 4 sepals, petals very small or absent. After flowering rounded fruits are produced from June onwards. These can be yellowish, reddish or sometimes blackish. Frequent in garigue, maquis, rocky valleys, and cliff edges, flowering from February to June.

Buckthorn Family Rhamnaceae



Mediterranean Elm/Hoary Elm/Grey-leaved Elm *Ulmus canescens*
Nemmiesa/Ulmu ta' Malta/Siġra tan-Nemus

A deciduous tree with young hairy stems and alternate toothed leaves. Leaves hairy and have asymmetrical bases. Flowers small and are in clusters on very short stalks. The flowers appear in early spring before the leaves. The fruit (samara) has a flat papery wing to aid in dispersal, with the seed positioned in the upper half. Occurs along watercourses and is rare.

The Mediterranean Elm is recorded by Tabone (2007) and Stevens & Baldacchino (1998) at Ġnien il-Kbir, Girgenti and Wied ir-Rum. Only a small population is left, as at Ġnien il-Kbir and Wied ir-Rum (Lanfranco, 2008). One population of this tree at Girgenti was burned in 1982 (Briffa in Lanfranco, 1988a, 1989). The leaves of *Ulmus canescens* have 12-18 veins per half (Pignatti, 2002).







English Elm *Ulmus minor*
Ulmu tal-Buskett

These trees have young stems that are hairy, and the leaves have a hairy underside. These hairs can be seen well with a hand lens. Tufts of hairs are present at the forks of the veins on the underside of the leaves. The fruits hang in clusters and on very short stalks, and the seed is enclosed in a papery wing and situated at the top half. *Ulmus minor* and *Ulmus procera* that have been introduced in some valleys probably hybridise with *Ulmus canescens* (Lanfranco, 2008). *Ulmus procera* occurs at Għajn Riħana (Lanfranco, 1989).

Leaves of Elm with asymmetrical bases. Far left picture shows the fruits




Fig *Ficus carica*
Tin/Siġra tat-Tin/Tina/Tina Selvaġġa/Bajtar/ Siġra tal-Bajtar

Usually a small tree but grows larger in sheltered places such as in valleys. Deciduous and its alternate, palmately lobed leaves that emerge in springtime are more or less rough to the touch. Has milky juice (latex). Stems are greyish. Flowers are enclosed in fleshy green structures and are pollinated by small wasps that enter through a small opening. The mature fruits are green or brownish to dark violet, and are edible, fresh or dried. Fruiting trees are an attraction to birds, both residents and migrants, which also help in the Fig's dispersal after eating on the fruits. The Fig is an archaeophyte and has been cultivated for its fruits, less commonly nowadays. It often naturalises in the wild. Common in valleys, cliffs, rdum, garigue and other rocky ground, also in fields. Several cultivars exist. The fruit of the fig is called a false fruit; a whole inflorescence forms a single structure. The fleshy parts are in fact a developed inflorescence axis. The tiny flowers are borne on the inside of this axis. The Fig is a relic of the glacial periods (Haslam *et al*., 1977) or was introduced by the first human settlers (Lanfranco, 1996).The wild specimens bear both male and female flowers unlike the cultivated forms which has only female flowers (Blamey & Grey-Wilson, 1993). A tree with male flowers is called caprifig (Lanfranco, 1996). Two to three crops can be produced per year: early figs Bajtar, True Figs Tin, Late figs, Tin Imwaħħar (Borġ, 1927). According to Borġ (1927) the var. c*aprificus* Dukkara has an early crop called caprifigs that usually contain many galls of *Blastophaga grossorum*. Galls are formed by gall-wasps that lay their eggs in the plant; when these eggs hatch that area of the plant swells forming the gall.

Mulberry Family Moraceae





Indian Fig/Indian Laurel Fig/Chinese Banyan *Ficus microcarpa* (*Ficus nitida*) Fiku - A massive tropical tree, native to South East Asia. It can be frequently found planted for ornament in urban areas and public gardens in the Maltese Islands. Occasionally it can be found naturalised. Its bark is smooth and often pale greyish, and the leaves are leathery, relatively small and deep green. Fruits are small, rounded. Its massive and dense canopy is a good roosting site for birds, and in the Maltese Islands Spanish Sparrow *Passer hispaniolensis*, Starling *Sturnus vulgaris* and White Wagtail *Motacilla alba* are birds that roost in it in large numbers. Sadly many trees in urban areas had been recently cut down; besides the emptiness left behind it also resulted in a loss of roosting site for birds.

Black Mulberry *Morus nigra* Tuta and the **White Mulberry** *Morus alba* Ċawsli Bajda are two species that were formerly planted in fields and around farmhouses for their edible fruits. They can also be found planted along roads. These deciduous trees have flowers in dense spikes, toothed to lobed leaves, and fleshy fruits. The White Mulberry has smooth branches, and white to pale purplish fruits (sometimes darker); fruits of Black Mulberry are dark blackish-purple. Fruits of both can be found in spring and early summer and are edible to humans and birds. The White Mulberry was introduced to breed silkworm (Borġ, 1915, 1927).





Far left picture shows young fruit clusters of Black Mulberry, late May. The fruits ripen to dark blackish-purple. The leaves of Black Mulberry have a deep "heart-shaped" base. They are hairy from the underside.





Leaf and fruit cluster of White Mulberry. The leaves of the White Mulberry are bright green.

Mulberry Family Moraceae





Pellitory-of-the-wall/Wall Pellitory/Common Pellitory *Parietaria judaica* (*Parietaria diffusa*)
Xeħt ir-Riħ

Prostrate and ascending, rarely erect, much-branching hairy herbaceous perennial with stalked and alternate ovate to rounded leaves that are pointed at the tip. The leaves easily attach to fur or clothes. Stem is often purplish/brownish. The flowers are inconspicuous, borne at leaf axil in globular inflorescence. Fruit is an achene. Common flowering all year round and frequently grows at base or gaps of walls and on boulders and in rdum, especially in sheltered areas, also found growing under trees, and in urban areas. *Parietaria judaica* is in the *Parietaria officinalis* group (Pignatti, 2002).

Nettle Family Urticaceae





Mediterranean Pellitory-of-the-wall *Parietaria lusitanica*
Xeħt ir-Riħ tal-Blat

A small hairy annual with elliptical or ovate (or diamond-shaped) leaves, margin entire. Leaves are not as pointed as in Pellitory-of-the-wall *Parietaria judaica* and have an obtuse tip. Larger leaves may (unusually) have a pointed tip. Leaves have same colour on both sides. Flowers are in small axillary clusters. Fruits are greenish-brown. Scarce in shady humid areas especially on walls and boulders in rdum and valleys. Flowers from January to May. Haslam *et al*. (1977) gives the subspecies *lusitanica*. The **Cretan Pellitory** *Parietaria cretica* Xeħt ir-Riħ tal-Gżejjer occurs at St. Paul's islands, where a small population is found along the northern edge (Lanfranco, 1989, 1983).

Nettle Family Urticaceae





Large-leaved Nettle/Membranous Nettle *Urtica membranacea* (*Urtica dubia*)
Ħurrieq Komuni

An erect and branched hairy annual, with stalked large and wide, ovate or ovate-like to rounded leaves. They are toothed and opposite and equipped with stinging hairs as a defence. Stipules are two at each node. Inflorescence spike-like (raceme), flowers separate but on same plant at the leaf axils, the male flowers long and generally occur on the upper part, later these turn purplish. The commonest of the *Urtica* species, found in disturbed open and shady areas. Flowers from November to May.

Nettle Family Urticaceae





Small Nettle/Dwarf Nettle *Urtica urens*
Ħurrieq Żgħir

Somewhat similar to Large-leaved Nettle *Urtica membranacea* but usually with smaller leaves. The racemes are shorter than the leaves and contain both male and female flowers. Stipules are four. The fruit - as in the other nettles- is an achene. Frequent, found in fields, flowering from December to April.

Nettle Family Urticaceae





Roman Nettle *Urtica pilulifera*
Ħurrieq taż-Żibeġ

A tall and hairy annual. Leaves are ovate and opposite often large and deeply toothed with petiole and stinging hairs. Stipules are 4. Female and male flowers separate but on same plant at the leaf-axils, the female flowers found in stalked globular heads, the male in a branched inflorescence. Scarce, in disturbed ground such as roadsides, e.g. at Wied Qirda, February to May. Borġ (1927) described the species as common in Malta but less frequent in Gozo and Comino, growing "along roads, on heaps of rubbish, in neglected corners close to buildings, etc, rarely in fields and gardens".

Nettle Family Urticaceae





Squirting Cucumber *Ecballium elaterium*
Faqqus il-Ħmir/Bettieħ il-Ħmir

Herbaceous perennial, with heart-shaped to triangular stalked leaves with tiny bristles and a wavy margin. It grows spreading over the ground (prostrate). The flowers are either male or female, on the same plant. The male flowers are in axillary clusters (racemes) while the female flowers are solitary. The flowers have 5 yellowish petals. The rounded fleshy fruits are held on a long stalk, and are also bristly. The ripe fruits explode at the slightest disturbance, and this serves both as a means of defence and to disperse the seeds. Common in disturbed ground and flowers can be found all year round. Species cultivated for food in this family include the **Pumpkin** *Cucurbita pepo* Qargħa Bagħli, **Pumpkin** *Cucurbita maxima* Qargħa Aħmar, **Bottle Gourd** *Lagenaria siceraria* Qargħa Twil, **Musk Melon** *Cucumis melo* Bettieħ, **Cucumber** *Cucumis sativus* Ħjar, and **Watermelon** *Citrullus lanatus* Dulliegħ. These can occasionally be found naturalised.

Cucumber Family Cucurbitaceae

Holm Oak/Evergreen Oak/Ilex Oak *Quercus ilex*
Balluta/Siġra tal-Ballut/Siġra tal-Ġandar/Siġra tar-Ruvlu



A large evergreen tree with variable lanceolate, ovate or elliptical leathery leaves that are sometimes toothed and may also be somewhat spiny. They are dark green from above and paler from below. The leathery cover of the leaves help to reduce water loss (an adaptation to dry conditions). Stems are greyish, or dark grey-black to brownish and fissured. Flowers separate, males or females borne on same plant, male flowers numerous and in catkins (pendulous spike-like inflorescence) that are wind pollinated. Seeds are enclosed in the fruit, called acorn (nut) that has a cup at the base called cupule. These ripen in autumn and winter (October – February) of first year. They are at first green then turn brown. From these acorns saplings can be seen growing under the parent tree. The flowers are mostly found in April and May, but can also be found from October to December. The Holm Oak forms woods in the Mediterranean region. Formerly widespread and formed woods in Malta but now rare and only a few remnants remain in the wild, e.g. Buskett, Selmun, Wardija, San Martin and Wied Ħaż-Żrun. The Holm Oak is also found planted as a street tree, in public gardens, in the Għadira and Is-Simar nature reserves, and sometimes included in afforestation sites. A few trees were also recently planted on Comino at Wied l-Aħmar. The acorns were gathered from





Buskett. In Maltese the acorns are called Ġandar; some refer to them as Ċippitatu. Wood from the Holm Oak has been used in the Mediterranean since early times for construction and charcoal (Blamey and Grey-Wilson, 1993). The Holm Oak trees at Wardija are ancient and must be over 800 years old; they should be considered as a national monument (Borġ, 1927). According to the same author (1927), il-Bosk at Buskett was a forest of Holm Oak which was enclosed by the order of St. John; and that these trees are suckers that have grown from stumps of former large trees. He continues by stating that stumps and coppice exist also at Wied Ħażrun and this is a relict of a small but flourishing forest which was cut down for firewood and timber wood.



Leaves are paler from underneath

Oak Family Fagaceae



Kermes Oak *Quercus coccifera* Balluta tal-Weraq Xewwieki/Ballut Xewwieki/Balluta Xewwikija

This tree can also be found planted at a few sites. Lanfranco (2002) says that this is one of the "missing" species in the local maquis; species that might have existed in the past but have now become extinct. The Kermes Oak is found in many areas of the Mediterranean and also in North Africa and has tough shiny spiny leaves. It grows mainly into a shrub or a small tree. The fruits (acorns) ripen in the second year. Borġ, J. (1925) mentions the **Eastern Kermes Oak** or **Palestine Oak** *Quercus calliprinos* Balluta Xewwikija tal-Lvant as a cultivated tree at Argotti botanical gardens. This species occurs in the Hyblean region (South-eastern part) of Sicily; *Quercus calliprinos i*s in the *Quercus coccifera* group and is similar to *Quercus coccifera* (Pignatti, 2002).

Oak Family Fagaceae





English Oak/Common Oak/Pedunculate Oak *Quercus robur*
Balluta Ingliża/Siġra tar-Ruvlu

The English Oak is a non-native tree, and is deciduous. It grows large, and its leaves are lobed to pinnately-lobed. Rare, planted for example at Buskett. Four massive English Oak (originally 5- one has recently died) occur planted at Msida in Triq il-Wied. The English Oak *Quercus robur* group contains 5 similar species (Pignatti, 2002).

Oak Family Fagaceae





Persian Walnut/English Walnut/Common Walnut *Juglans regia*
Ġewża/Siġra tal-Ġewż

A deciduous tree that can grow large and with stout stems. Leaves are alternate and pinnate, the leaflets ovate to elliptic, untoothed. Flowers are greenish, lacking petals, male flowers in catkins, female ones on short spikes. The flowers are borne on the same tree but separate. Fruit a nut, with a hard wrinkled shell, carried on short thick stalk. The fruits are the edible walnuts. Not native and rare as a planted tree, including in gardens, e.g. Buskett. Scale of large square in picture is 10mm x 10mm.

Walnut Family Juglandaceae





Pecan Nut Tree *Carya illinoinensis*
Ġewża tal-Pekan

A tall deciduous tree with spreading branches and pale greyish-brown fissured bark. Leaves are alternate and pinnate with finely toothed leaflets. Flowers male and female separate but on same tree (monoecious), and do not have petals. Male flowers are in pendulous catkins, female flowers in small clusters. Pollination occurs by the wind. The fruit contains edible nut in a thin shell and encased in a husk. These can be found ripe from late September/October, where several fruits are dropped beneath the tree. Not native, rare, planted in gardens e.g. Buskett, where naturalisation occurs.

Walnut Family Juglandaceae





Drooping She-Oak/Australian Pine/Whistling Pine
Casuarina verticillata (*Casuarina stricta*, *Allocasuarina verticillata*)
Kaswarina

A greyish-green evergreen tree with drooping stems and small, scale-like leaves that occur in whorls at intervals along the stem. Flowers are male or female, borne on different trees, and lack sepals or petals. The female flowers are red and in tufts on short stalks, and are wind-pollinated, the male flowers orange to yellowish-brown spikes. Fruits enclosed in woody, cone-like brownish structures with pointed projections. Fruits (Samaras) are tiny and winged. Not native, planted for ornament along streets, gardens, etc. The foliage and the cone-like structures give the plant a resemblance to pine trees. The name "Whistling Pine" comes from the sound of the wind as it passes through these trees. Under the trees a mass of dead twigs carpets the ground. ***Casuarina equisetifolia*** is monoecious (with male and female flowers produced on the same tree), unlike many other similar species including *Casuarina verticillata* that are dioecious (male and female flowers on different trees). This is also planted as an ornamental tree. The name She-Oak can be written as Sheoak. Above pictures show the woody female cones and the small winged seeds.







Far left picture: top-leaves, bottom-female flowers. Left picture: male spikes

Ironwood Family Casuarinaceae







Garden Nasturtium/Indian Cress/Monk's Cress *Tropaeolum majus*
Kabućinella/Kapućinella

Annual or perennial hairless plant with prostrate and trailing succulent stems. Leaves are alternate, green to greyish-green, paler below, and have a long stalk attached to near the middle of the lower surface of the leaf, and are rounded with wavy margins. Several veins radiate out to the margin of the leaf. Flowers have 5 petals and they can be orange, red or yellow, or parti-coloured. The petals are free and the upper 2 are smaller than the other 3. The 5 coloured sepals are united into a cup-like calyx, with one sepal modified into a nectar spur. Fruit consists of 3 one-seeded parts, separating at maturity. Not native and planted for ornament in gardens, but naturalised in valleys and other places, frequent and increasing. Native to South America. Flowers can be found throughout the year.

Nasturtium Family Tropaeolaceae





White Mignonette/Upright Mignonette *Reseda alba* Denb il-Ħaruf/Resedan Selvaġġ

Erect herbaceous annual to perennial with deeply pinnately-lobed alternate greyish-green leaves. Flowers white in a dense terminal raceme, petals generally five (-six) and cut in three linear lobes at the tip. The flowers are scented. Fruit a capsule, on spreading to erect stalks, elongate and with a hole at the top through which the seeds exit when the plant swings with the wind. The fruit also have 4 small lobes at its top. Seeds black. Common in disturbed environments such as abandoned fields and roadsides, walls, also in rocky ground, flowering from December to May. The **Wild Mignonette** *Reseda lutea* Denb il-Ħaruf Isfar also occurs but is infrequent to somewhat rare in abandoned and cultivated fields, roadsides, paths. Borġ (1927) however recorded that it was "frequent and often common in several places". Tabone (2007) lists this plant from a number of sites in Malta and Gozo. See page 345.

Mignonette Family Resedaceae





Caper *Capparis orientalis* (*Capparis spinosa* var. *inermis*, *Capparis rupestris*) Kappar

A shrub, usually hanging down from walls and cliffs, but also with stems spreading over the ground. Old plants often have stout stems. Usually dormant and leafless in the winter months but new shoots emerge in springtime. Young leaves are reddish. Leaves have a short stalk, and are rounded to ovate, entire, and usually succulent (especially in coastal plants). Flowers are solitary and axillary on a stalk. They have four white petals, four greenish/purplish sepals and a mass of long, white to purple stamens. Among the stamens is the stalked ovary. The flower buds ("kappar") are edible (consumed after pickled). The fruit is large, fleshy and green, and berry-like with numerous seeds inside, eventually drying and splitting open. Common in cliffs and cliff edges, rubble walls, fortifications, rdum, rocky valleys, maquis and garigue, flowering from April to around August. The similar **Spiny Caper** *Capparis x spinosa* Kappar Xewwieki has minute spiny stipules and also occurs but is much less common. Recently shown to be of hybrid origin between *Capparis orientalis* and *Capparis sicula* (Lanfranco, 2015).

Caper Family Capparaceae




London Rocket *Sisymbrium irio* Libsiena Komuni

Slightly hairy or hairless annual with deeply pinnately-lobed leaves. The flowers are small, yellow and condensed in a raceme, and the fruit is a narrow and long often curved siliqua. Top fruits exceed the raceme during flowering. Pedicels (stalks of flowers) elongate

in fruiting. Frequent in disturbed environments including urban areas, flowering from February to April. The London Rocket is probably not indigenous (Lanfranco, 1996).

Cabbage Family Brassicaceae (Cruciferae)





Hedge Mustard/Hedge Rocket *Sisymbrium officinale*
Mustarda Rqiqa

Annual to biennial erect herbaceous plant with narrow flowering and fruiting stems. Leaves are pinnately-lobed with large terminal lobe and smaller side lobes. Lowest leaves occur in basal rosette. Upper leaves less lobed. Flowers are very small, yellow, crowded, the raceme elongating in fruiting. Fruits held erect and appressed to inflorescence axis (main flower stem) on short pedicel, hairy. These are wider at the bottom, tapering towards the top. Found in disturbed areas, e.g. Ta' Qali, generally scarce, flowering from April (or earlier) to May. It was commoner in former times.

Photo on left shows siliqua (fruit) spaced apart for viewing

Cabbage Family Brassicaceae (Cruciferae)



Maltese Stocks *Matthiola incana* subsp. *melitensis*
Ġiżi ta' Malta

A hairy endemic perennial with a woody stem at base and elongate, channelled and succulent leaves with wavy edges. Younger leaves silvery, larger leaves may be lobed. The flowers have 4 violet petals and are slightly scented. The fruit is long and narrow (siliqua). A scarce plant found mostly in Gozo in cliffs, rdum and other coastal localities, e.g. Dwejra, flowering from January to May. In Malta it is rare and occurs in Selmun-Mistra area. First described in 1988, and subspecies *melitensis* is endemic (Lanfranco, 2007, 1996). Pignatti (2002) describes it as subspecies *rupestris*. The **Hoary** or **Garden** or **Common Stocks** (*Matthiola incana* subsp. *incana*) Ġiżi is commonly cultivated for ornament and sometimes can be found naturalised. The **Night-scented Stock** or **Evening Stock** *Matthiola longipetala* Giżi ta' bil-Lejl is recorded by Mifsud (www.maltawildplants.com) as a casual alien and not widespread. It is an ornamental plant, emitting a scent in evening and night, hence its name. The **Spanish Stock** *Matthiola lunata* Giżi ta' Spanja has been recorded by Guido Lanfranco from Dwejra, Gozo in 1957 and has not been seen again. It occurs in Spain and North Africa (Lanfranco, 1989). Note: The word Stocks can also be written as Stock.

Cabbage Family Brassicaceae (Cruciferae)





Mediterranean Stocks/Three-horned Stocks
Matthiola tricuspidata
Ġiżi tal-Baħar/ Ġiżi Selvaġġa

A hairy annual with pinnately-lobed leaves. Flowers have 4 violet/pink petals, somewhat scented. Its name Three-horned Stocks comes from the 3 horns at the tip of its long siliqua. Scarce in sandy and other coastal areas, e.g. Ramla tal-Mixquqa (Għajn Tuffieħa) and Għadira s-Safra area, flowering from January to May-July or later.

Cabbage Family Brassicaceae (Cruciferae)





Water Cress
Nasturtium officinale
Krexxuni/Sija

A herbaceous perennial with prostrate rooting, and ascending or floating stems. Leaves are pinnate with rounded or elliptical leaflets. Lower leaves usually more rounded with fewer segments. The margin of the leaves have small, indistinct teeth. Flowers white in a raceme. Fruit is a siliqua. Occurs in watercourses, flowering from January to June and is scarce. It is threatened due to habitat degradation and destruction.

Cabbage Family Brassicaceae (Cruciferae)





Sweet Alison *Lobularia maritima*
Buttuniera

A branched and usually hairy green to greyish-green perennial with ascending and erect stems. The elongate, narrow and pointed leaves are usually broadest above the middle; lower leaves more or less spatulate, upper ones narrower, linear-lanceolate. The flowers are clustered in globular heads, with four small white petals. They are sweetly scented, and are borne in racemes. Main flower stalk lengthens in fruiting. The fruit (silicula) is a rounded and pointed, flattened capsule with 2 seeds. Seeds have small wing. Common in various habitats including garigue, valleys, sandy areas, clay slopes, walls, roadsides and other disturbed areas, September to June.

Cabbage Family Brassicaceae (Cruciferae)





Shepherd's Purse *Capsella bursa-pastoris*
Ġarġir il-Ġemel

Erect and branched non-hairy or slightly hairy annual with basal rosette of leaves that are toothed to pinnately-lobed. Upper leaves are smaller and less lobed to entire, clasping the stem. Flowers small and white in clusters at the top of the flowering stem, inflorescence a raceme. Petals exceed the green sepals. Fruit a silicula, heart-shaped and flattened with 2 compartments and with pale brown seeds inside. Frequent in disturbed habitats, November to June.

Cabbage Family Brassicaceae (Cruciferae)



Red Shepherd's Purse/Pink Shepherd's Purse *Capsella rubella*
Ġarġir il-Ġemel Ħamra

Small annual, similar to the Shepherd's Purse *Capsella bursa-pastoris*, but generally with purplish sepals, and stem and leaves often purplish also. Flowers small, petals are pinkish, equal to or slightly exceeding sepals. Margins of heart-shaped fruit are concave. Flowers from November to June.

Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) described the Red Shepherd's Purse as frequent.

Cabbage Family Brassicaceae (Cruciferae)





Mediterranean Buckler Mustard *Biscutella didyma*
Xeħt il-Forom

A hairy erect and branched annual with basal toothed leaves often in a rosette, and smaller stem leaves. Stem branched in the upper part. Flowers pale yellow in racemes that elongate in fruiting. Fruits small (silicula) and consist of 2 flat disks. Fruits and stems often tinted with purple. Frequent in garigue, disturbed ground. Flowers can be found from December to April. Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) describe also the **Lyrate Biscutella** *Biscutella lyrata* as frequent in dry places and valleys. The leaves are pinnately-lobed with a large terminal lobe. This species forms part of the *Biscutella didyma* group, which also includes *Biscutella eriocarpa* (Pignatti, 2002).

Cabbage Family Brassicaceae (Cruciferae)





Grass-leaved Pepperwort
Lepidium graminifolium
Buttuniera Wieqfa

A slender ascending or erect branched herbaceous perennial, stems are often purplish. Leaves are narrow, elongate (linear-spatulate). Lower leaves are toothed to pinnately-lobed, upper ones often curved downwards. Sepals are purplish. The flowers are small, about 1mm with 4 white petals and yellow anthers, clustered in small heads, inflorescence a raceme that elongates in fruiting. Capsule (silicula) is small, flattened and often purplish. Grows in valleys, roadsides, paths, also in gardens and urban areas, and is scarce, e.g. Chadwick lakes, Marsalforn. Flowers can be found all year round.

Cabbage Family Brassicaceae (Cruciferae)




White Rocket/White Mustard
Diplotaxis erucoides
Ġarġir Abjad

A hairy variable annual with ascending or erect stems and toothed to pinnately-lobed leaves with or without a large terminal lobe. The scented white flowers have 4 petals and may sometimes be tinged with violet. The inflorescence is a raceme. The seeds are enclosed in a thin and elongate capsule (siliqua) with a small beak. A common plant in fields and other disturbed areas, too often carpeting the whole ground white with its flowers. Flowers from October to June in fields, roadsides and other disturbed areas, also along watercourses. Some flowers may also be found in the summer months. Its leaves are edible and may be used in salads (Lanfranco, 1996).

Cabbage Family Brassicaceae (Cruciferae)




Perennial Wall-rocket
Diplotaxis tenuifolia
Ġarġir Isfar/Ħaberxa Selvaġġa/Aruka Selvaġġa

Herbaceous perennial and hairless or with few hairs, and elongate, bright green narrow leaves that are toothed, lobed to pinnately-lobed (some may be entire), with a particular foetid smell when crushed. The scented yellow flowers occur in a raceme. Sepals are greenish-yellow. Seeds enclosed in a siliqua. The plant is a favourite food source for the larvae of the Large White Butterfly *Pieris brassicae.* Common in disturbed habitats, including fields, gardens, roadsides, and also along watercourses. Flowers throughout the whole year, especially in the autumn after the rains and also in spring.

Cabbage Family Brassicaceae (Cruciferae)




Southern Rocket
Diplotaxis viminea
Aruka Selvaġġa/
Ġarġir Żgħir

A hairless or slightly hairy small and low annual. Has basal rosette of pinnately-lobed leaves, often with a larger terminal lobe. The minute flowers are yellow with 4 petals in a raceme inflorescence. Flower stalk often spreading and low over ground. The sepals are erect. Fruits narrow (siliqua). Frequent and flowers from October to June, growing in abandoned fields, open dry ground.

Cabbage Family Brassicaceae (Cruciferae)




Bargeman's Cabbage/Wild Cabbage/Summer Rape/Wild Turnip *Brassica rapa* subsp. *silvestris* (*Brassica campestris*) Liftija/Kawliċelli

A slightly hairy to hairless annual with more or less erect green or purplish stems. Leaves green or greyish-green and the lower ones are generally somewhat bristly. Basal leaves usually wide and lobed to pinnately-lobed with a large terminal lobe. Upper leaves usually entire and clasping stem. Flowers with yellow petals, scented, in racemes that are short during flowering but elongate in fruiting. The flowers project above the buds. Fruit is a siliqua. Common in fields, roadsides and other disturbed areas, flowering from October to May, often carpeting whole fields yellow. Some flowers may also be found in summer. Cultivars of the **Cabbage** *Brassica oleracea* are commonly grown for food e.g. subspecies *capitata* and subsp. *gemmifera*. **Rapeseed** *Brassica napus*, a greyish-green robust herbaceous annual or biennial, can also occasionally occur in the wild; This plant is probably of hybrid origin and has long been in cultivation.

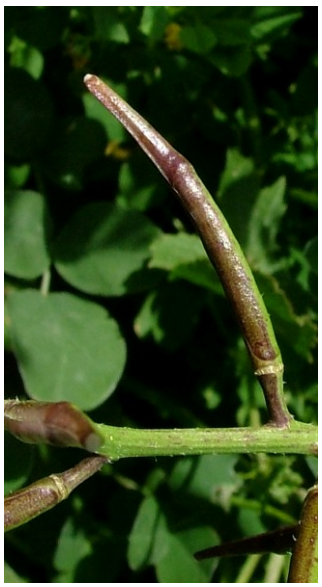
Cabbage Family Brassicaceae (Cruciferae)




Tournefort's Cabbage/Tournefort's Turnip/Mediterranean Turnip/Sea Cabbage *Brassica tournefortii* Kaboċċa ta' Tourneforti

Annual to biennial, lower leaves with rough (bristly) hairs, pinnately-lobed and stalked, terminal lobe larger than the side ones. Upper leaves are smaller and sessile, often entire. Petals are small, yellow and violet at base, or white. Fruit (siliqua) has a conspicuous beak. Rare e.g. Għallis. Flowers February to May or later (summer-autumn).

Cabbage Family Brassicaceae (Cruciferae)

Charlock *Sinapis arvensis* Mustarda Salvaġġa

A hairy-bristly ascending or erect annual, similar to the White Mustard *Sinapis alba*. Lower and middle leaves toothed to pinnately-lobed with a large terminal lobe. The upper leaves are small and unstalked, entire, toothed. Flowers yellow in a raceme, fruits a siliqua that is hairy or hairless and slightly compressed, more or less sickle-shaped, on spreading to erect stalks. Hairs are pointing downwards towards the base. Scarce in Malta, found e.g. at Għajn Tuffieħa, frequent to common in Gozo, growing in clay slopes, valleys, fields, roadsides, other disturbed ground, February to April.

Cabbage Family Brassicaceae (Cruciferae)





White Mustard *Sinapis alba* Mustarda/ Mustarda Bajda/ Sinapa Bajda

An erect hairy to somewhat bristly annual, sometimes with lower or all stems purplish. Stems grooved, leaves are stalked and pinnately-lobed, often deeply lobed, green or purplish. Leaf margin toothed. Flowers with 4 pale yellow and scented petals arranged in a raceme. Sepals are narrow, yellowish-green. The fruit is a siliqua, which is also hairy and has a sword-like beak at the tip (an extension of the fruit). The fruit contains few globose seeds. Common in disturbed environments such as fields, roadsides, also watercourses, flowering from February to May. Has greatly increased; was formerly described as rare.

Cabbage Family Brassicaceae (Cruciferae)




Salad Mustard/Eruca/Rocket *Eruca sativa* (*Eruca vesicaria*) Aruka

Usually hairy, ascending to erect and branched annual with deeply pinnately-lobed leaves that have a large terminal lobe. Upper leaves are smaller. Leaf margin usually toothed. The flowers are in a raceme, on a short stalk, white with a yellowish tinge and violet veins. The sepals are erect and purplish. The fruit is a siliqua with a beak, erect, at first short and broad with white hairs, then elongating and without hairs, and has 2 compartments, each with a number of small seeds. Scarce, flowering from December to May. According to Haslam *et al.* (1977) and Borġ (1927) this species is frequently cultivated and often naturalises and is probably native in the valleys. Since it is cultivated as a salad plant its native region is not known for sure (Haslam *et al*., 1977).

Cabbage Family Brassicaceae (Cruciferae)





Hoary Mustard/Short-pod Mustard/Bastard Rocket *Hirschfeldia incana*
Mustarda Selvaġġa

An erect and bristly annual to herbaceous biennial (-perennial) with lower leaves deeply pinnately-lobed and margins toothed. The lower leaves have 2-4 side lobes and a larger terminal lobe. Upper leaves are smaller, less lobed to entire. Stems can be purplish. The plant is branched and has many thin stems. The flowers are yellow and crowded in a rounded head at the top and are held on short stalks, inflorescence a raceme that elongates in fruiting. Sepals are yellowish, narrow (linear). The siliquae are held vertically along the main flowering stem (appressed) and have a beak at the tip, hairless. Common along tracks, disturbed rocky ground and other disturbed habitats, flowering from February to May but also in summer and autumn.

Cabbage Family Brassicaceae (Cruciferae)





Sea Rocket *Cakile maritima* Kromb il-Baħar

A hairless greyish-green usually succulent annual with almost entire to pinnately-lobed leaves and prostrate or ascending stems. The lobes of leaves may be toothed. Flowers have 4 petals, usually pink or violet (but can also be white), in a raceme that elongates in fruiting. Fruit a siliqua in the shape of a spear head, divided in 2 parts each with 1 seed; the lower section has 2 extensions and remains attached while the outermost section falls off from the plant. Locally scarce-frequent in sand dunes and sandy areas at the coast, also found on disturbed coastal areas. Flowers can be found throughout the whole year. Both variety *maritima* (*Cakile maritima*) and variety *latifolia* (*Cakile aegyptiaca*) occur in the Maltese Islands, with var. *maritima* being the most frequent (Cassar & Stevens, 2002). Mediterranean plants belong to subspecies *aegyptiaca* (Blamey & Grey-Wilson, 1993; Haslam *et al*., 1977). Variety *maritima* has its leaves cut in linear segments.

Cabbage Family Brassicaceae (Cruciferae)




Annual Bastard Cabbage/Common Giant Mustard
Rapistrum rugosum
Mustarda tal-Frotta Tonda

An annual (rarely herbaceous biennial) with hairy stems. Basal leaves pinnately-lobed, with a few side lobes and a larger terminal lobe (lyrate). Upper leaves are smaller, less lobed to entire, toothed. Flowers yellow and occur in a raceme that elongates in fruiting. Fruit (silicula) has a short stalk, and appressed to the stem. It has 2 segments, the upper one rounded, wider than the lower segment and with a slender beak. Flowers found from February to April (-June) and is generally scarce in fields and other disturbed areas, e.g. Xrobb il-Għaġin, Gozo. Described as formerly frequent in Malta (less so in Gozo) in fields, paths and waste places (Haslam *et al.*, 1977; Lanfranco, G., 1969; Borġ, 1927).

Cabbage Family Brassicaceae (Cruciferae)




Wild Radish/Wild Charlock *Raphanus raphanistrum*
Ravanell Selvaġġ

A bristly erect and branched annual with pinnately-lobed leaves that have few side lobes and a large terminal lobe. Lobes toothed. Upper leaves are smaller and less lobed. Flowers have 4 petals, white (occasionally yellow) and with violet venation. Sepals violet, erect. Siliqua constricted between the seeds and with a beak, mostly erect or curved. Common in fields, gardens, valleys and roadsides, often forming patches or covering whole fields. Flowers from December to May. Three subspecies are described (Haslam *et al*., 1977; Borġ, 1927): subspecies *raphanistrum* with petals 12-20mm long; subspecies *landra* with petals 10-15mm long; and subspecies *maritimus* with petals 15-25mm long.

Cabbage Family Brassicaceae (Cruciferae)




Italian Wild Radish *Raphanus raphanistrum* subsp. *landra* Ravanell Isfar

A bristly erect annual branched above, bristles pointing downwards. Lower leaves are pinnate with a large terminal leaflet. Leaves have side leaflets spaced apart and generally not touching each other. Upper leaves reduced. Flowers clustered, elongating in raceme, with 4 yellowish (-white) petals and with faint veins. Sepals are erect and greenish-purplish, bristly especially before petals open. The fruit is the usual siliqua, constricted between the seeds and with a thin beak, held on erect-spreading stalks. Scarce, found in coastal sandy and rocky areas.

Cabbage Family Brassicaceae (Cruciferae)




Summer Radish/Garden Radish *Raphanus sativus* Fejġel tas-Sajf

Similar to *Raphanus raphanistrum*. Its fruits are not or scarcely constricted between the seeds. It is a rough hairy-bristly annual with erect stem and pinnately-lobed leaves with a large terminal lobe, upper leaves smaller. Mentioned by Haslam *et al. (*1977) and Borġ (1927) as cultivated and a frequent escapee. Sommier & Caruana Gatto (1915) described the species as seen several times but as an escapee from cultivation.

Cabbage Family Brassicaceae (Cruciferae)

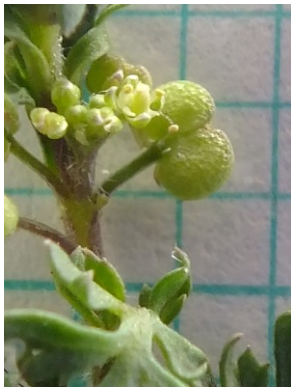



Swine Cress *Coronopus squamatus* (*Lepidium coronopus*) Koronopu

A prostrate and spreading mostly hairless annual with deeply pinnately-lobed leaves, at first in a basal rosette. Flowers are small, borne in short clusters (racemes) with 4 white petals and 4 sepals. Fruit a rounded silicula with minute pointed tip, wrinkled and with small growths. Scarce in valleys, February to June.

Cabbage Family Brassicaceae (Cruciferae)





Lesser Swine Cress *Coronopus didymus* (*Lepidium didymum*) Koronopu tat-Toroq

Prostrate to ascending and much-branched mostly hairless small annual to biennial. Leaves are deeply divided. Flowers small, petals white sometimes absent, raceme somewhat elongates in fruit. Fruit (silicula) is small on short stalk, and with two globular lobes separating on maturity into 1-seeded parts. It occurs in disturbed habitats including urban areas and is scarce-frequent. It flowers from April to October. Native to South America.

Cabbage Family Brassicaceae (Cruciferae)




Hairy Bitter-cress *Cardamine hirsuta*

A small annual with ascending stems, branched at the base. Basal leaves in rosette, pinnate with larger terminal leaflet. Stem leaves smaller. The flowers are small and inconspicuous on short stalks, petals white and only c. 2-3mm long, not exceeding sepals. Siliquae (fruits) are held erect, often overtopping the flowers. Found in shaded areas, humid areas, disturbed habitats, including nursery pots. Flowers from January to April. Status given as not frequent by Lanfranco, G. (1969) but frequent by Haslam *et al*. (1977). This is a frequent plant in nursery pots, but very rare in habitats not influenced by man (Tabone, 2008).

Other members in the Cabbage Family mentioned for the Maltese Islands include the following: The **Common Whitlow Grass** *Erophila verna* is a small annual with leaves in a basal rosette, petals white and sepals often reddish. The petals are cut. Rare, in dry localities including valley bottoms, sandy soils, rocks and walls. Flowers from December to March. Not seen for several decades (Lanfranco, 1989), but rediscovered by S. V. Lalov in 2006 at Wied ta' Kandia, near Żebbuġ, Malta. **Ball Mustard** *Neslia apiculata* a densely hairy annual with elongated leaves, the basal stalked the upper ones sessile and clasping stem. Flowers yellow. Rare in cultivated places, February to April. It was probably frequent in the past (Lanfranco, 1989). **Creeping Hutchinsia** *Hymenolobus procumbens* var. *revelierei* form. *sommieri* (=*Hymenolobus revelierei* subsp. *sommieri*) Ġarġir ta' Kemmuna is a small annual to biennial with entire or slightly lobed leaves and white flowers. It occurs in arid areas and is rare, flowering in March and April. According to Lanfranco (2004a) the *Hymenolobus revelierei* subsp. *sommieri* is endemic to the Maltese Islands and Lampedusa. It probably occurs only on Comino, from where it was first discovered by Duthie in 1874 (Lanfranco, 1989). **Lesser Shepherd's-cress** *Teesdalia coronopifolia* an annual with basal rosette of pinnately lobed or entire leaves. Flowers white. Rare, mentioned for 2 places (Wardija and Ta'Ċenċ), flowering February to May. **Perfoliate Penny-cress** *Thlaspi perfoliatum* an annual with stalked basal leaves and upper sessile and clasping stem. Flowers white. Rare, flowers from February to May. Probably extinct (Lanfranco, 1989). **Hoary Cress** or **Whitetop Plant** *Cardaria draba* (*Lepidium draba*) with white flowers, lower leaves stalked and upper sessile also occurs. Doubtful if native or not. The **Garden Cress** *Lepidium sativum* is described by Mifsud as a casual alien and not widespread. **Tumble Mustard** *Sisymbrium altissimum* a naturalised alien with yellow flowers**,** flowering from spring to summer. References: Stephen Mifsud (www.maltawildplants.com), Lalov & Lanfranco (2008), Tabone (2008, 2007), Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927).




Hoary Rock-rose/Grey Cistus *Cistus creticus* Ċistu Roża/Warda tal-Blat/Borgħom Roża

An aromatic shrub with pale brownish-grey stems and shortly-stalked mostly elliptical leaves. The leaves have a wavy margin and a crumpled surface. The plant contains sticky (glandular) hairs. Flowers are pink, showy, with 5 crumpled petals and a mass of stamens with yellow anthers at the centre of the flower. Sepals 5, hairy. Seeds are numerous in a rounded, hard and brown, hairy capsule. Scarce, but may be frequent where it occurs, in garigue, flowering in March (or even earlier) to June (-July). The subspecies usually met with is *eriocephalus* which occurs mainly in NW Malta; subspecies *creticus* seems to be found only at Ta' Baldu/Wied Ħażrun area (Lanfranco, 1989). Lanfranco (2015) describes the species as *Cistus creticus* subsp. *eriocephalus*. The Hoary Rock-rose belongs to the *Cistus incanus* group (Pignatti, 2002). *Cistus creticus* is sticky with glandular hairs, unlike *Cistus incanus* (Pignatti, 2002). The largest indigenous concentration of the species in Malta is found in the area of Il-Kortin ta' Għajn Żejtuna. *Cistus creticus* is found planted in a few sites such as at Mellieħa and Comino.

Rockrose Family Cistaceae




Narrow-leaved Rock-rose *Cistus monspeliensis* Ċistu Abjad/Borgħom Abjad

An aromatic shrub with sessile narrow and elongate (linear-lanceolate) dark green leaves. The leaves are densely hairy on the underside and have a wrinkled surface with a somewhat wavy margin. The plant contains sticky (glandular) hairs. Flowers white on short secondary stalks with 5 petals, in small clusters on a main stalk. Fruit a capsule with small seeds. Rare, confined to a few garigue habitats e.g. Baħrija in Malta and il-Qortin tal-Magun in Gozo. Planted in few sites e.g. Mellieħa and Comino. Flowers in spring, March to May.

Rockrose Family Cistaceae




Mediterranean Sun Rose/Arabian Sun Rose/Mediterranean Rock-rose *Fumana arabica* Ċistu Isfar

A prostrate to ascending glandular-hairy shrub, with small, sessile and alternating narrow flat leaves. Stipules are 2 and short. Flowers are yellow, stalked, solitary or in small loose clusters, having 5 wide, triangular-shaped petals and a mass of stamens at the centre. They are not as bright as those of the Thyme-leaved Sun Rose *Fumana thymifolia*. Sepals five and three of them are large and veined. Ripe capsule opens up in 3 parts to release the seeds. Frequent in garigue, rocky steppe, (January-) February to June. The species has become less frequent in recent times (Lanfranco & Lanfranco, 2003). The word Sun Rose can be written as Sun-rose. ***Fumana laevipes*** also has alternate leaves but these are small and needle-like (filiform), and more than 2 stipules occur at the leaf axils. It is non-hairy and the young shoots are greyish-green. This species has been recorded by Tabone (2008b) in 2007 at iż-Żewwieqa, South Gozo.

Rockrose Family Cistaceae







Thyme-leaved Sun Rose/Thyme Rock-rose *Fumana thymifolia* (*Helianthemum thymifolium*) Ċistu Żgħir

A small sticky shrub with a woody base. Leaves are small and narrow, pointed, densely glandular-hairy, opposite and with a narrow revolute margin. These are smaller on the flowering stems. Stipules and short shoots are present in leaf axils. Flowers are stalked and in small clusters, bright yellow with 5 petals and numerous stamens at the centre. Sepals 5 and 3 of them are wide and veined. Capsule has few seeds inside. Frequent in garigue, rocky steppe, flowering from February to June, with flowers also found as early as January.

Note: *Fumana thymifolia* seems to be a variable species, or in fact more than one species can be recognised. There are plants that have red markings on the petals (see photo left), and variations in hairiness also occur. These have been observed by several authors, e.g. Casha (un-published material), Mifsud (2012), Weber & Kendzior (2006) and also way back in 1927 by Borġ. Some authors (e.g. Pignatti, 2002) regard *Fumana thymifolia* plants that have variations in simple and glandular hairs as the same one species. Borġ (1927) included *Helianthemum thymifolium* var. *viride* (*Fumana thymifolia* var. *virides* = *Fumana laevis*). In 2012 Mifsud classified ***Fumana laevis*** as a "new" species to the Maltese Islands. This is very similar to *Fumana thymifolia*, but its leaves are devoid of hairs as opposed to those of *Fumana thymifolia* that are glandular-hairy and often sticky. The leaves are also described for *Fumana laevis* as linear to linear-lanceolate that are devoid of hairs (or glabrescent, i.e. becoming hairless at maturity) while in *Fumana thymifolia* the leaves have an oval to oval-lanceolate shape and are densely hairy and glandular, making them viscid, i.e. sticky (Alvarez 2001, in Mifsud, 2012). Mifsud assumes that *Fumana laevis* is frequent in the Maltese Islands especially in areas where other species of *Fumana* (*F. arabica*, *F. thymifolia*) are common. In his paper (2012), Mifsud gives the distribution of this species for the Maltese Islands, chiefly in the northern part of Malta, also in 4 sites in Gozo, and considers this to be partial. Edwin Lanfranco (pers. comm., April 2016) states that he has personally seen *Fumana laevis* at Xemxija and San Martin, and that it is probably more widespread.

Rockrose Family Cistaceae







Mediterranean Mallow *Malva cretica*. Ħobbejża Żgħira/Ħobbejża Tat-Toroq

An erect or prostrate hairy annual with stalked leaves. Lower leaves rounded with a toothed margin or slightly lobed. Upper leaves divided into narrow lobes. Flowers are pink, solitary and on a stalk, axillary. The calyx is hairy and with long divisions. The epicalyx is made up of 3 free, narrow segments. The seeds are set together as a ring. Frequent, flowers from February to May and grows on rocky ground. Borġ (1927) states (for subsp. *althaeoides*) that the plant hardly exceeds 5cm in arid locations, while a white-flowered form is “occasionally met with in valleys”. The **Hispid Marsh Mallow** *Althaea hirsuta* Ħobbejża Sufija occurs as a rare plant in dry rocky places (Haslam *et al*., 1977; Lanfranco, G., 1969). Lanfranco (1989) states that it seems to be now restricted to Comino. Borġ (1927) states that it is common only at Comino. This is similar to the Mediterranean Mallow *Malva cretica* but *Althaea hirsuta* has more than 3 epicalyx segments.

Mallow Family Malvaceae




Least Mallow
Malva parviflora
Ħobbejża tal-Warda Żgħira

A hairy annual, with prostrate, ascending or erect stems that can reach over 130 cm in height. Leaves stalked and rounded, with 5-7 shallow lobes. Leaf margin toothed. Flowers are small, and in groups of 2-4 on short pedicels. These are whitish to violet, and veined. Petals are c. 6mm long, with claw (base) that is glabrous, and they hardly exceed the sepals. Calyx is wide in fruit, incurving and partly covering the fruit. Epicalyx segments small and narrow, hairy. Frequent-common and flowers from winter to spring in disturbed areas. Fruit is in the form of a ring (see page 348). Another similar species is the **Southern Mallow** *Malva nicaeensis* Ħobbejża Mitfija. This has been described as common e.g. Lanfranco, G. (1969) and Borġ (1927). The petals are 9-13mm long, at least twice as long as the sepals, bluish, pale lilac or whitish without darker streaks (Pignatti, 2002; Blamey& Grey-Wilson, 1993; Haslam *et al*. 1977). See page 344.

Mallow Family Malvaceae




Common Mallow *Malva sylvestris*
Ħobbejża Komuni/Ħobbejża tar-Raba/Ħobż tal-Madonna

A hairy prostrate to sprawling and ascending, sometimes erect, herbaceous annual-biennial to perennial and stems woody at base. Has both stellate (star-shaped) and simple (unbranched) hairs. Leaves are large, lobed with up to 5-7 lobes, with a toothed margin. They are long-stalked. The flowers are axillary on an erect peduncle, purple-pink, and strongly veined, and the petals are notched. The purple-pink stamens are fused. The sepals are wide. The epicalyx segments are narrow and hairy, free (not joined at the base). Common, flowering from (December-) January to June, sometimes also later on in summer, in fields and other disturbed ground, garigue, valleys.

Mallow Family Malvaceae



Cretan Mallow/Small Tree Mallow/Cornish Mallow *Malva linnaei* (*Malva multiflora*, *Lavatera cretica*) Ħobbejża Wieqfa

A hairy annual to herbaceous biennial, often erect. Star-shaped hairs are present on the flower stalk. Leaves long-stalked and with 5-7 lobes and a toothed margin. Lower leaves are more rounded. Flowers occur in small axillary clusters. The flower stalk is shorter than the leaf stalk. Flowers with 5 notched petals, pale violet with darker veins. The epicalyx segments are broad and triangular and shorter than the sepals. The mericarps are smooth or with few ridges only (see picture on page 348). The flowers of this plant are paler than the flowers of the Common Mallow *Malva sylvestris* and smaller and paler than the flowers of the Tree Mallow *Malva arborea*. Common in disturbed ground from January to May.



Mallow Family Malvaceae





Tree Mallow/Velvet Tree Mallow
Malva arborea (Lavatera arborea)
Ħobbejża tas-Siġra/Ħobbejża Franċiża

A robust tall biennial with woody stems at least at the base. Stem is hairy above. Leaves are large and wide, lobed with up to 5-7 lobes, often palmate, and with a stalk. Flowers purple with veins, and a dark centre, in small axillary clusters. Their stalk is shorter than the petiole of the leaf. The 3 epicalyx segments are longer than the sepals, and they enlarge in fruit. Fruit has a ring of ridged mericarps. Common in disturbed habitats especially in coastal places, flowering from January-February to June. Probably not indigenous (Lanfranco, 1996). Native to the Mediterranean.

Mallow Family Malvaceae





Large-flowered Mallow/Annual Mallow/Annual Lavatera
Malva trimestris (*Lavatera trimestris*)
Ħobbejża tal-Warda Kbira

An erect to ascending hairy annual. Leaves long-stalked, and usually lobed, margin toothed. Upper leaves more deeply lobed. Flowers large, solitary in the leaf axils, bright pink, and the petals are veined darker. Epicalyx is wide, shorter than the sepals. Sepals fused at the base, enlarging in fruit. Mericarps ridged. Scarce, flowering from late April to July in abandoned fields, roadsides, other disturbed ground. Tabone (2007) also re-discovered the **Rough** or **Hairy Mallow** *Malope malacoides* Ħobbejża Muswafa in the vicinity of Mġarr (Malta). This species was described by past authors, and Lanfranco (1989) described it as possibly extinct.

Mallow Family Malvaceae





Abutilon *Abutilon theophrasti*

An erect annual or perennial. The young stems and leaf stalks have spreading hairs. Leaves are long-stalked heart-shaped to rounded and pointed at the tip, the margins with small teeth. The flowers are yellow, unlike many other members of the *Malvaceae* family. These flowers are in small clusters with stalks and at the upper parts of the plant, and appear from around March/April to December. Epicalyx is absent. Nutlets are black. A naturalised alien re-discovered by Mifsud (2007) growing at Qormi in fallow fields. It was described as “naturalised on the fortifications of Valletta and Floriana, and often found in old gardens” by Borġ (1927).

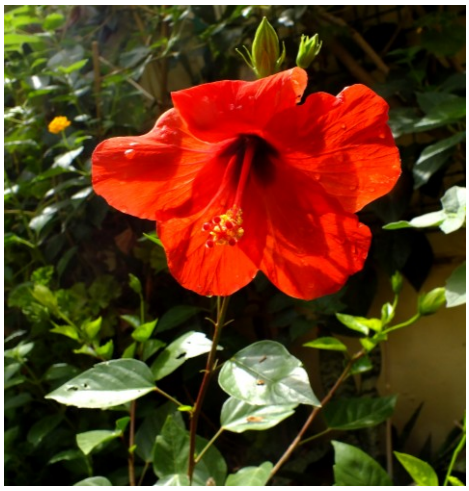
Mallow Family Malvaceae



Primrose Tree/Pyramidal Tree/Itchy Pod Tree *Lagunaria patersonia*
Lagunarja

An evergreen tree with thick entire ovate-elliptical leaves, paler from beneath. Flowers with 5 pink petals on short and thick stalks borne in the leaf axils. Outer calyx segments (epicalyx) consist of 3-5 broad segments, which enclose the flower when in bud. Stigma has 5 radiating lobes. Fruits are capsules with smooth, kidney-shaped seeds. The interior of the capsules are filled with short rough hairs, irritant to the skin (hence the name Itchy Pod Tree). Endemic to Australia, planted for ornament in public gardens, urban areas and streets, flowering in summer and autumn.

Mallow Family Malvaceae





Species of *Hibiscus* are frequently grown in gardens as ornamentals, including the evergreen **Rose Mallow** *Hibiscus rosa-sinensis* with shiny broad leaves and showy red flowers. The flowers appear from summer to autumn - winter, each flower generally lasting only a short time. The **Yellow Hibiscus** *Hibiscus trionum* was described as growing formerly in fields of cotton (Haslam *et al*., 1977).

Mallow Family Malvaceae

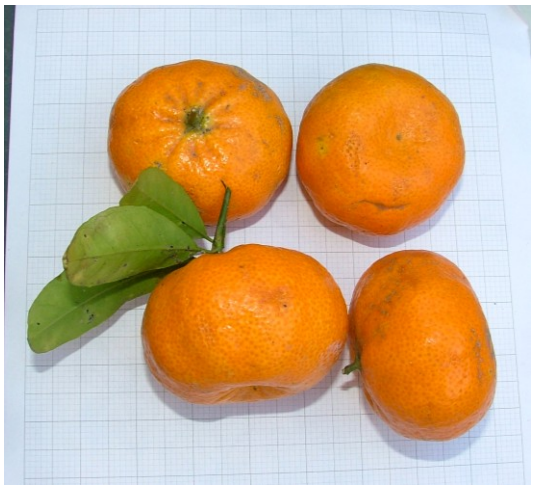




Fringed Rue/Wall Rue *Ruta chalepensis*
Fejġel

A greyish-green shrub with a pungent smell. Stems pale brown, woody at base. Leaves alternate, deeply cut in segments (bi-pinnate), dotted with glands. Inflorescence branched, flowers greenish-yellow with a fringed petal margin, petals generally 4. The flower stalks are hairless. Seeds enclosed in a capsule with pointed lobes. Frequent in garigue, rocky valleys, flowering from February to June.

Rue and Citrus Family Rutaceae



The genus *Citrus* – Family Rutaceae

The *Citrus* are a genus of plants that are widely cultivated for their fruits and are native to South-east Asia. They are evergreen trees or shrubs, with alternate shiny and aromatic leaves. Young shoots often have spines. Flowers are scented and have 5-8 petals, often appearing in winter and early spring, giving a pleasant smell to the air. The fruit (called hesperidium) has an outer separable skin and the inside is fleshy and divided in segments. Several cultivars and forms exist. Species widely cultivated in the Maltese Islands include the **Sweet Orange** *Citrus sinensis* Laringa Ħelwa, **Lemon** *Citrus limon* Lumi and the **Tangerine** *Citrus reticulata* Mandolina, Mandarina.

Scale 10mm x 10mm

Rue and Citrus Family Rutaceae





Indian Lilac/Persian Lilac/Chinaberry/Bead Tree/White Cedar *Melia azedarach*
Siġra tat-Tosku

A deciduous tree with alternate and 2-pinnate large leaves, leaflets toothed or lobed. Flowers occur in a large branched inflorescence, pink-violet/purple and fragrant. Stamens clustered into a dark purplish tube. Fruit a round fleshy drupe, pale yellow or orangish, long persisting on the tree, becoming wrinkled. Not native and planted for ornament, native to South East Asia and Australia.

Persian Lilac (Mahogany) Family Meliaceae





Tree of Heaven *Ailanthus altissima*
Xumakk Falz

A deciduous fast-growing tree with large pinnate leaves, the leaflets are lanceolate and pointed and with few teeth at base. Flowers occur in a branched inflorescence, with 5 greenish-white petals and 10 stamens. Fruit (samara) is reddish when young. Not native and invasive, propagating mostly by suckers (shoots from underground - vegetative propagation). Native to Asia planted for ornament, frequent. Flowers around May to July.

Tree of Heaven Family Simaroubaceae





Lentisk/Mastic Tree *Pistacia lentiscus*
Deru/Derwa/Deluwa

Evergreen shrub to a small tree with pinnate leaves, the leaves without a terminal leaflet (paripinnate). The stem holding the leaflets (the axis or rachis) is winged. Male and female flowers occur on separate plants and found in clusters (racemes) from leaf axil. The male flowers are very conspicuous with dark reddish anthers, the female less so, greenish-reddish. The male flowers will eventually become less conspicuous when they produce pollen (yellowish). Fruits small, red ripening to black, have one seed inside and are eaten and dispersed by birds. These fruits (drupes) will turn red from around July/August and ripen to black. The plant has a characteristic odour due to its resin. Common and increasing in rocky valleys, maquis and rdum, and also in garigue. Flowers from February to April.

Pistacio Family Anacardiaceae





Terebinth/ Turpentine Tree *Pistacia terebinthus* Siġra tat-Turpentina/ Terebintu

Deciduous shrub or small tree and differs from the Lentisk in that the stem holding the leaflets (rachis or axis) is not winged, and the pinnate leaves have a terminal leaflet (imparipinnate). The flowers are held in a branched inflorescence and not spike-like. The shape of the fruit is also different, being egg-shaped and not as globose as in the *Pistacia lentiscus*. According to Lanfranco (2001) the Terebinth is a true native. Found planted for ornament in gardens e.g. San Anton, at Mosta and Buskett, and is rare in the wild. The largest known population of the Terebinth occurs at Tal-Bloqq area (MEPA). Fruits like those of Lentisk and Terebinth are called drupes; a drupe is a fleshy fruit that contains one or more seeds each enclosed by a hard stony layer.

Pistacio Family Anacardiaceae





Sumach/Elm-leaved Sumach *Rhus coraria* Xumakk tal-Konza/Xumakk tal-Konz

A shrub to a small tree, with alternate imparipinnate leaves, hairy when mature. The leaf segments have a toothed margin. The small flowers are clustered in terminal or axillary branched racemes and have 5 greenish-white petals. The rounded fruit (drupe) has short glandular hairs and is brownish-purple when ripe. Flowers generally appear in late spring, May to June, but also in the autumn. Found at Wied Qirda, where it is frequent, propagating by suckers.

Pistacio Family Anacardiaceae





The **Pistachio** *Pistacia vera* (produces the edible Pistachio nuts) and the **Mount Atlas Mastic Tree** or **Persian Turpentine Tree** *Pistacia atlantica* can also be found planted in the Maltese Islands, e.g. at Buskett. According to Schembri & Lanfranco (1996) "*Pistacia atlantica* originally imported as a stock for *Pistacia vera*, has also escaped and tends to grow on fortifications".

Pistacia vera - thin, wide leaves

Pistacia atlantica

Pistacio Family Anacardiaceae





Upright False-pepper/Brazilian Peppercorn Tree/Christmas Berry Tree
Schinus terebinthifolia
Bżar Falz/Skinus

An evergreen shrub to a tree with pinnate leaves having a terminal leaflet (imparipinnate). Flowers white in a branched inflorescence, with 5 petals and 5 sepals. Drupes are bright red. Native to Central and South America, planted for ornament in gardens, streets and other urban areas, sometimes found naturalised. Flowers appear from September to October-November.

Pistacio Family Anacardiaceae





Drooping False-pepper/Californian Pepper Tree/Peruvian Mastic Tree
Schinus molle
Siġra tal-Bżar

An evergreen tree, similar to Upright False-pepper *Schinus terebinthifolia* but the fruits are pinkish and its branches are pendulous. The pinnate leaves have slender leaflets (linear-lanceolate) and without a winged midrib (axis holding leaflets). Native to Central and South America planted locally for ornament.

Pistacio Family Anacardiaceae




Brookweed/Water Pimpernel *Samolus valerandi*
Ħarira tal-Ilma

Herbaceous perennial with spatulate basal leaves in a rosette and erect stem simple or branched above. Leaves on the stem are smaller, alternate. Flowers are small, white in un-branched or branched racemes. Their petals are fused together for part of their length. Flower stalk with bract. Capsule rounded, with numerous small seeds. Found in wet habitats including moist caves and watercourses. Flowers from March to September and is scarce-frequent. Picture on left above shows *Samolus valerandi* with *Adiantum capillus-veneris*.

Primrose Family Primulaceae




Blue Pimpernel/Scarlet Pimpernel/Poor Man's Weather-glass *Anagallis arvensis*
Ħarira Kaħla/Ħarira Ħamra

A prostrate and ascending annual or herbaceous biennial with square stems. Leaves mostly like a wide triangle (ovate), in pairs, opposite to each other, sessile. They are usually spotted from the underside. The flowers are stalked, and solitary, emerging from the leaf axil, blue or red and a red/purplish centre. The anthers are yellow. Petals are generally overlapping in the lower half. The five sepals are narrow and smaller than the petals, star shaped, and showing from among the petals. The fruit is a round capsule that splits off from the top, seeds dark brown. Common in various habitats like cultivated and abandoned fields, gardens and rocky ground. Flowers from February to June. Subsp. *foemina* also occurs (see page 338).

Primrose family Primulaceae




Chinese Persimmon/Possumwood *Diospyros kaki*
Kaki

A deciduous tree with pale greyish bark and alternate, ovate to elliptical leaves, pointed at the tip. The leaves are paler and hairy from beneath. In the autumn the leaves acquire an orange or reddish colour before they fall. Flowers are unisexual (male or female), on separate plants. Male flowers are yellowish-white in clusters, females solitary. The fruits (berries) are relatively large, ripening to orange-yellow or red, and persist on the tree after the leaves have fallen. These are edible, but only after ripening. Flowers in late spring (May-) to summer, and fruits ripen around October. Not native, a few planted trees are found at Buskett, and other sites. Native region unknown, and known only in cultivation (Coombes, 1992). The word *Diospyros* means fruit of the Gods in Greek.

Ebony Family Ebenaceae



Mediterranean Heath *Erica multiflora*
Leħjet ix-Xiħ/Erika/Savina/Issopu/Sagħtar Aħmar

An evergreen woody shrub, with stiff, narrow, needle-like leaves. Margins of leaf revolute (rolled downwards and inwards). Flowers stalked, in terminal clusters, pink to purplish, sometimes whitish, narrow and bell shaped, with protruding dark anthers. The flower stalk is longer than the corolla. Petals are fused, sepals much smaller than petals. The petals are persistent in fruit. Style 1. Fruit a capsule with numerous small seeds. Common in maquis, rocky valleys, garigue, rdum, flowering from November to April. Lanfranco (2015) states that in Gozo it is also known as Xpakkapietra.

Heath Family Ericaceae





Strawberry Tree *Arbutus unedo*
Imbrijagla/Imbrijakla/ Imbragla

An evergreen shrub to a small tree with a fissured reddish-brown bark. Younger stems are minutely hairy and purplish. Leaves toothed, alternate, and more or less elliptical to broader above the middle, shortly stalked. The flowers are in clusters, drooping, greenish white or pink, bell-shaped. The spherical fruits are reddish when ripe. Flowers can be found from October onwards. The Strawberry Tree is widely found in the Mediterranean and grows in maquis, evergreen woods and rocky slopes. It is absent as a wild tree in Malta and only found as a cultivated plant, or planted in afforestation areas e.g. at Mellieħa.

Heath Family Ericaceae





Common Heliotrope
Heliotropium europaeum
Vanilja Bajda/Għobbejra Bajda.

A greyish-green hairy erect or ascending annual, leaves with stalk, more or less elliptical to ovate in shape. Flowers with 5 petals, white with a yellow centre, in clusters. The flowering stem gradually unwinds as the flowers start to open. The small fruits (nutlets) are grouped in clusters of 4. Common in disturbed ground such as fields and roadsides flowering from June to October-November. The **Dwarf Heliotrope** *Heliotropium supinum* Għobbejra Muswafa is described as rare at Dwejra, Gozo (Haslam *et al*., 1977; Borġ, 1927) or possibly extinct by Lanfranco (1989). It is an annual and its leaves are white-hairy from beneath. Flowers white with a yellow centre. It flowers in late spring to early summer or later. The **Salt Heliotrope** *Heliotropium curassavicum* is a herbaceous perennial and described by Mifsud (www.maltawildplants.com) as a very rare casual alien. Lanfranco (2015) describes it as native of South America and was naturalised for about a decade in the Tigne' area of Sliema but is now extinct due to development. It has linear to spatulate fleshy leaves and its white flowers have a purplish or yellowish tinge at the centre. Flowers from March to October.

Borage Family Boraginaceae





Honeywort/Large Cerinthe *Cerinthe major* Qniepen

An ascending or erect rather fleshy and bristly annual with wide leaves, lower leaves stalked and upper ones clasping stem. Leaves have white patches, lower ones elongate-spatulate (broadest above the middle), upper ones ovate to elliptical. Flowers drooping and in terminal clusters, the petals are united into a tube. At the top the tube has 5 recurved lobes. The base of the flower has a dark brown-purple ring, the upper part is creamy white or yellow. Flowers have bracts that conceal the calyx, leaf-like and often tinged purplish. Stamens are five and within tube to slightly protruding. Style generally protrudes out of flower tube. Fruits (nutlets) are shiny and black, fused into 2 pairs. Common in disturbed habitats, such as paths in valleys, roadsides, abandoned fields, rdum, garigue and damp or shady areas including valley floors. Flowers from January to May.

Borage Family Boraginaceae





Pale Bugloss/Italian Viper's Bugloss *Echium italicum* Lsien il-Fart il-Kbir/Lsien il-Fart Abjad/Lsien il-Fart Ċar

Herbaceous biennial plant with a basal rosette of leaves. The leaves are elongate (lanceolate to elliptical), bristly and rather stiff, those on the stem are narrower. The erect flowering stem is branched and in the form of a pyramid, carrying several flowers. The flowers are funnel-shaped, with 5 petals and protruding stamens. The colour of the flowers is pale pinkish/violet or bluish, but specimens with white flowers also occur. The sepals are narrow and bristly. Common in roadsides, valleys including along dry watercourses, disturbed garigue, April to June-July.

Borage Family Boraginaceae





Purple Viper's Bugloss *Echium plantagineum* Lsien il-Fart Vjola

Erect annual or herbaceous biennial with soft hairs. Lower leaves are stalked, elongate (lanceolate to spatulate) and upper leaves smaller and sessile. Inflorescence branched, flowers funnel-shaped with a wide mouth and 2 protruding stamens, oblique at the top and hairy on the outer margins and veins. The flowers are reddish/purplish to violet-blue. Very rare, roadsides, abandoned fields. Flowers in spring, March to May. It was described as rare in roadsides by past authors (in Haslam *et al*., 1977) as at Wied Inċita, Binġemma and Buskett. In the 1990s the author (Casha) saw the species in fields at Attard. Photographs taken in Sicily.

Borage Family Boraginaceae




Small-flowered Bugloss/Small-flowered Viper's Bugloss *Echium parviflorum*
Lsien il-Fart Żgħir

A prostrate to ascending or erect bristly plant. Stems have purplish spots, and lower leaves are stalked and elongate-spatulate, upper ones sessile. Flowers are small, some bluish others purple-pink on the same plant. Stamens do not protrude out of the flower. Specimens with entirely white flowers also occur. Calyx is wide. Fruit composed of 4 rugose (wrinkled) nutlets only a few mm long, brownish and triangular with a flat base (as in other Echium species). Common in various habitats including garigue, valleys, rdum, sandy areas, fields and roadsides, flowering from November to June.

Borage Family Boraginaceae




Coastal Viper's Bugloss *Echium arenarium* Lsien il-Fart tar-Ramel/Lsien il-Fart tax-Xtut

A prostrate to ascending, sometimes erect, bristly herbaceous biennial (or annual). Stems spotted. Lower leaves stalked elongate-spatulate. Upper leaves are sessile. Flowers are (purplish-) blue (or sometimes pink), on short stalks, in raceme that elongates in fruiting. Stamens included (do not emerge out of the flower). The calyx is narrow and remains so in fruiting. Frequent to common in sandy and rocky areas around the coast, sometimes also inland. Flowers from February to May, but flowers have also been seen in January and after May up to November.

Borage Family Boraginaceae




Sand Viper's Bugloss *Echium sabulicola*
Lsien il-Fart tax-Xatt

Herbaceous biennial to perennial and similar to *Echium arenarium* but its flowers are larger and more conspicuous and generally with 1-2 stamens protruding out of the flower. It also has a more erect habit, although stems can also be prostrate and ascending. The plant is covered with white bristles and the flowers are hairy. Rare and occurs along the south west cliffs of Gozo, e.g. Sanap Cliffs, and flowers mainly in spring, March to May or later.

Borage Family Boraginaceae





Large Blue Alkanet/Purple Alkanet/Italian Alkanet
Anchusa azurea (*Anchusa italica*)
Lsien il-Fart Ikħal/Lsien il-Fart Tar-Raba/Lsien il-Fart

An erect and branched bristly herbaceous perennial with elongate leaves. The lower leaves are linear-spatulate and stalked the upper ones sessile. The 5-lobed flowers are bright blue (or purplish) with a pale centre. Inflorescence branched. The calyx is also bristly with 5 narrow teeth. Scarce to frequent in abandoned fields, cultivated fields, clay soil, and along country roadsides and paths. Flowers from March to June-July.

Borage Family Boraginaceae





Blue Hound's-tongue/Southern Hound's-tongue
Cynoglossum creticum
Lsien il-Kelb

An erect hairy annual or herbaceous biennial with elongate soft leaves, upper ones clasping the stem. Flowers are on short stalks and without bracts, purple or blue, with 5 petals that are veined. Fruit of 4 nutlets having hooked bristles, these attach to the fur of animals or clothes as a means of dispersal. The fruiting pedicels become recurved. Scarce to frequent in valleys, also on rocky ground, abandoned fields, rdum, flowering from March to May.

Borage Family Boraginaceae





Borage *Borago officinalis*
Fidloqqom

A bristly annual with wide elliptic or ovate to lanceolate leaves at the base, upper ones are smaller. The lower leaves are stalked, the upper ones sessile and clasping the stem. Flowers are blue, sometimes pink, with a white centre, (occasionally all white) stalked and in loose clusters, and facing downwards. The dark anthers are set in a central cone. The sepals are narrow and pointed, and show from among the petals. A common plant from December to May in roadsides, fields, paths, and other disturbed areas. Other species in the Borage Family mentioned for the Maltese Islands are the following (Lanfranco, 1989; Haslam *et al*., 1977; Borġ, 1927):**Yellow Gromwell** *Neatostema apulum* – rare in dry rocky areas; **Corn Cromwell** *Buglossoides arvensis* –frequent in fields; **Common Comfrey** *Symphytum officinale* - rare damp shady places; **Wigandia** *Wigandia caracasana* a rare naturalised alien.

Borage Family Boraginaceae




Putoria/Stinking Madder *Plocama calabrica* (*Putoria calabrica*) Putorja

A prostrate woody shrub, with pale stems spreading over ground forming a mat. It also grows hanging down from rocky walls. Plant is foetid when crushed. Leaves small and smooth (leathery), opposite and shortly-stalked, elliptical to lanceolate, usually with revolute margins (margins curving down and inwards). Stipules are ovate, small. Flowers are clustered, purplish-pink, funnel-shaped, with long tube and 4 spreading lobes. The 5-toothed calyx persists in fruit. The small fruits are fleshy and berry-like, red or black when ripe, with 2 compartments. Rare in rocky valleys, coastal garigue and on coralline rocks in rdum*, e*.g. Selmun, Mistra, Wied il-Għasel and Comino. Flowers can be found throughout the year.

Bedstraw Family Rubiaceae




Field Madder/Spurwort *Sherardia arvensis* Ħarxajja/Ħarxajja tal-Għelieqi/Ħarxajja Roża

A small and spreading annual, with square stem. Plant is usually prostrate, but also grows taller (ascending) when among vegetation. Plant is rough to the touch owing to numerous bristles. Leaves are small, with small bristle at tip, in whorls of 4-6. Flowers occur in small terminal clusters, pink or pale violet (-white) with tube and 4 petal lobes and are accompanied by leaves. The calyx is toothed and the fruit is bristly. Frequent to common in garigue, valleys, fields, flowering from February to May.

Bedstraw Family Rubiaceae




Rock Crucianella/Coastal Crucianella/Rock Crosswort/Crosswort *Crucianella rupestris* (*Crucianella maritima*) Kruċanella - A low shrub with whitish stems and a dense number of overlapping ovate-lanceolate leaves. Leaves occur in whorls of four, with pale margins. Flowers yellow and tubular with 5 lobes, funnel shaped. Common in rocky coastal ground, cliffs, April to June. Mainly a North African species and in Europe occurs only in the Maltese Islands, Pelagian Islands (Lampedusa, Linosa and Lampione) and in the south of Sicily (Lanfranco, 2007).

Bedstraw Family Rubiaceae



Southern Squinancywort *Asperula aristata*
Asperula/Xpakkapietra

A small herbaceous perennial, often not very noticeable growing low among other plants. Stems are slender, prostrate and ascending. Leaves small and narrow elongate (linear–lanceolate), pointed at tip, in whorls of four or opposite. Flowers are clustered (corymbose = flowers lie at more or less same level), whitish/yellowish to purplish-pink or darker reddish, and funnel-shaped with tube and 4 spreading lobes. These lobes are much shorter than the flower tube. Fruits are small with blunt projections. Common in garigue and arid ground, rocky valleys, rdum, with flowers all year round. Lanfranco (2015) describes Maltese plants as subsp. *scabra*. In the past, *Asperula aristata* was considered rare (e.g. Lanfranco, G., 1969; Borġ, 1927) and ***Asperula cynanchica*** as common. In 2015 Lanfranco gives the status of *Asperula cynanchica* as scarce.

Asperula cynanchica is a polymorphic (variable) species and the corolla tube is 1-1.5 (2) times as long as the corolla lobes, while in *Asperula aristata* is 2-3 (5) times as long (Pignatti, 2002) and as such the corolla tube appears evidently long in *Asperula aristata*. Weber *et al*.(2006) follow the Italian botanist Fiori and describe Maltese plants as *Asperula cynanchica*, with some plants having the corolla tube 2-3 times as long (or more) as the petal lobes as var. *aristata* since " Maltese plants lack, in the strictest sense, specific and important characteristics of *Asperula aristata…*"

Bedstraw Family Rubiaceae





Common Goosegrass/Cleavers/Burweed
Galium aparine
Ħarxajja Komuni/Ħarxajja

A scrambling rather rough annual that attaches easily to clothes and fur of animals due to numerous hooked hairs. These hairs point backwards, and help the plant to climb onto vegetation. Stem is square. The plant has up to 6-9 elongate leaves in whorls. The leaves have a bristle-tip. Flowers are small and white, in small clusters. Fruits rounded, also with tiny hooked hairs, each fruit composed of a joined pair of lobes. Common in fields and other disturbed habitats, valleys, February to May.

Bedstraw Family Rubiaceae





Corn Cleavers *Galium tricornutum*
Ħarxajja

A scrambling rough annual with hooked hairs. Leaf margin is also with hooked hairs, with the hairs pointing backwards. Leaves occur in whorls. Flowers white with 4 lobes, fruits rounded and covered with small projections (papillae). Stalks of flowers sharply recurved in fruit. Frequent in cultivated fields, valleys, March to May.

Bedstraw Family Rubiaceae





Southern Cleavers *Galium verrucosum* (*Galium saccharatum*)
Ħarxajja

A small rough scrambling annual, stems square with hooked hairs, leaf margins with hairs (prickles) that are not pointing backwards. Flowers greenish-white to white, with 4 petals, fruits rounded and full of warts (growths). Common in cultivated fields, other disturbed areas including roadsides, also in rocky valleys, January to May.

Bedstraw Family Rubiaceae





Yellow Bedstraw *Galium murale*
Ħarxajja Safra

A small inconspicuous prostrate to ascending annual, the stem branched from the base. The leaves are in whorls of 4-6 and have a stiff hair at the tip. Flowers are small, less than a mm, yellowish, solitary or in pairs, on stalks shorter than the leaves. Fruits are cylindrical and with hairs. Flowers from February to April and found in rocky sites, paths, valleys, also humid areas. Common.

Scale of large square 20mm x 20mm

Bedstraw Family Rubiaceae





Wild Madder *Rubia peregrina*
Robbja Salvaġġa/Ħarxajja Kbira/
Ħarxajja Salvaġġa

A scrambling perennial, with many prickles curved downwards by which it attaches to nearby plants. Stems square, woody at the base. The dark green and shining, sessile, elongate and pointed leaves are put out in whorls, usually in 5-6 (4-8). Flowers are small, greenish-white/yellowish-green, in a branched terminal or axillary inflorescence, with 5-6 lobes. After flowering green rounded and shiny berries are produced (from around May to August), these ripening to purplish-black in the autumn (sometimes even as early as in summer - June and August) that last throughout winter. Common in wooded areas, maquis, valleys, rdum, abandoned fields, field margins and on rubble walls, flowering from late March to June (or later on). Flowers are also found in autumn and winter.

Bedstraw Family Rubiaceae





Wall Valantia/ Crosswort *Valantia muralis* Valantja

An inconspicuous low annual with prostrate and ascending, square stems and ovate–elliptical leaves in whorls of 4. Flowers are in axillary clusters, yellowish-green. Fruit stalks are recurved and hide the fruit, and have hooked bristles and conspicuous horns. Horns also have hooked bristles. Fruit composed of smooth mericarps. Common in rocky ground, walls, rdum, disturbed ground, February to May. Another similar species is the **Hairy Valantia** *Valantia hispida*. This has fruit stalks with numerous straight bristles and appearing densely hispid (=bristly). It is a rare plant, recently re-discovered at Xatt l-Aħmar in Gozo by Mifsud (2009b). The species was first discovered by Duthie (1874) at Ramla l-Ħamra, Gozo, and at Cominotto. Borġ (1927) recorded it also from Comino. In *Valantia*, the pedicels and peduncles unite together, enlarge and encircle the fruit.

Bedstraw Family Rubiaceae





Dog Cabbage *Theligonum cynocrambe* Ħabaq Il-Ħnieżer

A small hairless somewhat succulent foetid annual having stalked and ovate leaves. Stems are prostrate or ascending, swollen at the nodes. Lower leaves are opposite, upper alternate, and stipules united and membranous. Flowers are greenish, male or female in the axils of leaves and on same plant, solitary or in small clusters. Male flowers have a 2-lobed perianth and stamens with long anthers. Fruit a small nut-like drupe, with a single seed inside. Frequent in garigue and rocky valleys, December to May.

Bedstraw Family Rubiaceae





Yellow-wort/Yellow Centaury *Blackstonia perfoliata* Ċentawrija Safra

A hairless erect and greyish mealy (powdery) annual. Plant is un-branched or branched at the top. Basal leaves lanceolate to ovate, not fused, stem leaves are opposite and fused, ovate-triangular and pointed. The flowers are bright yellow with 6-8(-10) petals, and in small terminal clusters. Flowers close in the shade and at night. Calyx deeply divided, with several narrow and long segments. The flower stalks have bracts. Fruit a capsule. Scarce to frequent in garigue, rocky valleys, rdum, also damp habitats, March to May or later on.

Gentian Family Gentianaceae




Common Centaury *Centaurium erythraea* Ċentawrija Kbira/ Ċentawrija Ħamra/ Ċentawrija

An erect and branched annual to biennial. Plants often have a single stem, branched above and also from below. Stem is square, leaves sessile and elongate (elongate-spatulate or elliptical), pointed or rounded at the top. Has basal rosette of leaves, present at flowering time, but can also be dry during flowering. Upper leaves are opposite. Flowers mostly in flat-topped clusters at top of flowering stem, deep pink with 5 petal lobes and protruding yellow stamens, and are barely stalked. The petals are joined below to form a tube, and the calyx is toothed, the teeth reaching at least half of the flower tube. The flowers close in the shade or in dull days. Plants with 4 petals also occur. Fruit a cylindrical capsule with several minute seeds inside. Common, growing in garigue, rocky valleys, rocky steppe, also abandoned fields, flowering in spring, mostly in May and June. Some flowers can also be found in the autumn.

Gentian Family Gentianaceae




Lesser Centaury/Beautiful Centaury/Showy Centaury/Branched Centaury *Centaurium pulchellum* Ċentawrija Żgħira

Annual, generally small plant with stems mostly branched at the base, main stem with 2-4 internodes (spaces between pairs of leaves on the stem). Plants only a few cm long and with un-branched stem occur, including dwarf specimens only c. 2 cm tall. Stem is square. Basal rosette is generally absent. Leaves are in pairs, ovate or lanceolate (-elliptical), sessile and often with curved margins. Flowers occur on a short stalk, in branched and spreading (not flat-topped) clusters. They have 5 (sometimes 4 in simple plants) purplish-pink petal lobes often with a pale base, and a tube, and the calyx have teeth almost as long or as long as the flower tube. Capsule is elongate, containing many minute seeds. Common in garigue, rocky steppe, valleys and wet areas, cultivated grounds. Flowers from April to July. The Maltese name Ċentawrija can also be found written as Ċentawrja.

Gentian Family Gentianaceae



Slender Centaury/Channel Centaury *Centaurium tenuiflorum* Ċentawrija Rqiqa

An erect annual, stems generally branched at the top, and with a basal rosette of leaves that generally disappears or is dry at flowering time. Main stem has 5-9 internodes. Stem leaves are sessile and opposite, ovate to elliptical. Flowers occur on very short stalks in more or less flat topped clusters (corymb). Flowers have purplish-pink petals. Flowers in spring and is scarce, April to June, in garigue, clay and wet habitats. This species is similar to the Lesser Centaury *Centaurium pulchellum*. In the field specimens exist that show characteristic of both and may be difficult to tell apart. Pignatti (2002) states that branching of



the stem is extraordinarily variable in all the *Centaurium* species. Lanfranco & Lanfranco (2003) state that the Slender Centaury is found in wet valleys. Lanfranco (2015) describes *Centaurium tenuiflorum* as a "slender herb which may be up to 30cm tall and with a much-branched inflorescence, and usually grows in humid regions". Haslam *et al* .(1977) records it as rare in open grassy places, while Lanfranco, G. (1969) states that it is less frequent than the Lesser Centaury.

Gentian Family Gentianaceae







Spiked Centaury *Centaurium spicatum* (*Schenkia spicata*) Ċentawrija

An erect branched annual or herbaceous biennial with square stem. Basal leaves in a rosette, ovate to spatulate, usually dry by flowering time. Upper leaves are sessile and opposite, elliptical to lanceolate or ovate, getting narrower upwards. Flowers are purplish pink or white, with 5 petal lobes and yellow anthers, in spike-like inflorescence. Calyx has teeth almost as long as the tube of the flower. Fruit an elongate capsule with numerous small seeds. The Spiked Centaury is a more robust plant than the Lesser Centaury *Centaurium pulchellum*, which can be found in same habitats. Scarce in damp areas and on clay, June to September.

Gentian Family Gentianaceae





Oleander *Nerium oleander* Oljandru/Difla/Siġra tal-Wirdien/ Siġret il-Ġarab

An evergreen shrub with leathery, elongate and pointed leaves on short stalks. Flowers are showy, clustered and terminal (at the tips of the stems). The flowers have a tube and 5 purplish-red broad petal lobes, or of other colour namely pink or white, sometimes also yellowish. Toothed scales occur at the centre of the flower. Calyx purplish, toothed. The fruits (follicles) are large and elongate, purplish when ripe, and contain seeds with tufts of hairs which are dispersed by the wind. Flowers found mainly in summer, from April to October, or later on. Common as a planted shrub for ornament, sometimes found also in the double-flowered form. Found in gardens, roadsides, centre strips and roundabouts, occasionally naturalising. Contains a poisonous milky juice. Native to the Mediterranean.

Oleander Family Apocynaceae







Wolfbane/African Wolfbane/Dogbane *Periploca angustifolia* (*Periploca laevigata* subsp. *angustifolia*). Siġra tal-Ħarir

A woody shrub with opposite elongate leaves, broadest above the middle, with pointed or rounded tips. Leaves on older stems clustered. Stems may be twining at the tip, especially among dense vegetation, coiling around support to reach higher for sunlight. Flowers smelly and occur in clusters, with crown (corona), and 5 petal lobes curved backwards, brown-purple with greenish to yellow border. Seeds are enclosed in horn-like fruits (follicles), green then turning to brown-purple. The seeds contain tufts of white hairs (wind dispersal). When the fruits open up, the released seeds give the plant a silken appearance (hence its Maltese name). Plant is drought-deciduous, and in summer they are without leaves or with greatly reduced number of leaves. Has milky latex that oozes out when a leaf is detached. Flowers can be found throughout the year especially from October to May. Frequent to common in garigue, maquis, rocky valleys, cliff edges and rdum, and is increasing. The Wolfbane is mainly a North African species; in Europe it occurs only in Southern Spain, Lampedusa and the Maltese Islands (Lanfranco, 2007). The typical form is Macaronesian, and the Wolfbane represents a Tertiary relict species of the Mediterranean (Lanfranco, 1989). The **Greater Periwinkle** *Vinca major* Vinka - another member of the Apocynaceae - is frequently grown as an ornamental in gardens, and sometimes can be found naturalised in valleys and other areas. It is an evergreen perennial with bluish to purplish flowers found in spring and early summer. Several cultivars exist with different flower colour. See page 344.

Oleander Family Apocynaceae





Narrow-leaved Ash/False Excelsior Ash/Caucasian Ash *Fraxinus angustifolia* (*Fraxinus oxycarpa*) Fraxxnu/Siġra tal-Fraxxnu/Siġra tal-Paċenzja

A deciduous tree with greyish-brown fissured bark. Leaves are pinnate with toothed leaflets, terminal leaflet present, and the tips often tapering to a fine point. Flowers are small and inconspicuous, without sepals or petals, and have purplish anthers. Fruits are flat, elongate and winged and contain one seed inside, first green then turning brown. The fruit is called samara. Flowers in January and February. Rare, some old trees occur at Wied il-Luq (planted), but young trees have grown there naturally from the seed. Can be found planted in a few areas, e.g. Wied Għollieqa and Mellieħa. Probably introduced in the Maltese Islands several years ago (archaeophyte) - Lanfranco, 2000. Species of *Fraxinus* was discovered in remains of Għar Dalam phase in the Neolithic Period, (Metcalfe, 1996) and as pollen grains in Quaternary deposits (Hunt, 1997).

Olive Family Oleaceae









Olive *Olea europaea*
Żebbuġ/Siġra taż-Żebbuġ/Żejtuna

An evergreen tree, well known due to its edible fruit and oil. As the tree matures the greyish trunk becomes more fissured and twisted. Leaves are narrow, pointed at the tip, elongate-elliptical, short-stalked, and have a greyish-green upper surface and a light greyish hairy underside. Flowers scented, small, yellowish-white with 4 petals, in clusters, produced in a branched inflorescence. Fruits (drupes) are green, rounded to egg-shaped, these ripening to black or dark green. The fruits are eaten by birds like Starlings *Sturnus vulgaris* that help in its dispersal. The Olive has long been widely cultivated. Frequent in maquis, valleys, fields, also in open rocky areas and it grows naturally as a shrub in garigue and other exposed rocky ground. Some small olive groves are still found today, some of the trees are of old age, e.g. at Bidnija, but formerly much more cultivated, although recently its cultivation has once again increased. Flowers in April and May, the fruits ripening around October/November. Wild plants (var. *sylvestris* = *Olea oleaster*) differ from the cultivars (var. *europaea*) by having smaller fruits, spiny branches and smaller leaves. The natural distribution of the Olive tree is often used to indicate the boundary of the Mediterranean region.

Olive Family Oleaceae





Another member of the Olive Family Oleaceae recorded for the Maltese Islands is the **Greater Phillyrea Tree** (also called **Greater Mock Privet** or **Jasmine Box**) *Phillyrea latifolia* Siġra tal-Fillirja/Olivastru. Lanfranco (1998) states that among the rarest of local maquis species is the *Phillyrea latifolia* (including *Phillyrea media*) and only 2 specimens exist in the wild. This grows into a shrub or a tree, with opposite dark green, leathery leaves that are shiny from above, and with greenish-white flowers produced in racemes at leaf axils mainly in spring. Fruits (drupes) are bluish-black and fleshy. It is evergreen, with juvenile leaves ovate-lanceolate and mature leaves lanceolate to elliptical. The margin can have minute teeth. Nerves on the leaves well defined. Remains of *Phillyrea* in the Maltese Islands were found from the Bronze Age period (Renfrew, 1972). The Greater Phillyrea Tree is found in maquis, open woods and rocky areas in the Mediterranean. Two specimens are found at Buskett. According to MEPA (2012a) only 2 native trees exist and in 2 different localities. Sommier (1916) remarked that the Phoenician Juniper *Juniperus phoenicea*, Strawberry Tree *Arbutus unedo* and the Privet *Phillyrea latifolia* s.l. have become extinct from the Maltese Islands because of the activities of man. *Phillyrea latifolia* s.l. has since been re-discovered by Edwin Lanfranco in the seventies (Stevens & Baldacchino, 1998). Photographs taken in Sicily.





Southern Water-starwort *Callitriche truncata* Kallitrika/Erba Gamberaja

A small delicate aquatic annual with opposite narrow more or less linear leaves. Leaves are emarginate (shallowly notched) or truncate (cut abruptly) at tips, those at the upper parts of the stem are closer together and form a kind of rosettes at the water surface. Flowers are solitary, minute, in leaf axils. They do not have petals or sepals. The fruit is more wide than long, at maturity splits into 4 one-seeded nutlets. Found in rock pools in the garigue, e.g. at Aħrax and other areas at Mellieħa, scarce, flowers from October to April. Picture above right shows the fruits.

Plantain Family Plantaginaceae



Ivy-leaved Toadflax/Ivy-Wort/Kenilworth Ivy *Cymbalaria muralis* Ċimbalarja

A prostrate and ascending trailing herbaceous perennial, leaves alternate and lobed and often fleshy. The flowers are solitary and axillary, on a stalk. They are violet or purple with a yellow patch on the lower lip. Sometimes the flowers can also be white. The fruit is a capsule that exceeds the lobes of the calyx. Seeds are small and numerous, black. A cultivated plant but naturalised plants can sometimes be found, especially in humid areas on walls, rocks and in gardens. Flowers from spring to autumn, February to October or later. According to Borġ (1927) it is a "real native but rare. Along walks and on shaded walls of gardens and in cool valleys".

Plantain Family Plantaginaceae





Round-leaved Fluellen/Rounded Toadflax/Cancer-wort *Kickxia spuria* Xatbet l-Art Safra

A densely glandular-hairy annual, the stems mostly prostrate and ascending. The leaves are shortly stalked, mostly ovate-lanceolate to rounded, with wavy edges and rounded bases. They do not have lobes. Lower ones are opposite, others alternate. Flowers are small and solitary, on a hairy stalk, with leaf-like small bracts and a curved spur. They are yellow with a dark purplish upper lip. Frequent to common, flowering from May to September, in fields especially after harvest, on clay ground, other open spaces, also paths and other disturbed areas. The plants of the Maltese Islands belong to subspecies *integrifolia* (Lanfranco, 1996).

Plantain Family Plantaginaceae





Sharp-leaved Fluellen *Kickxia elatine*
Xatbet l-Art

A densely glandular-hairy annual with prostrate and ascending stems. Lower leaves opposite, ovate with an obtuse tip and with a toothed margin, upper leaves smaller, arrow-shaped, and alternate. They are shortly-stalked. Flowers are stalked and occur in the axils of the upper leaves (bracts). These have a more or less straight spur, and an upper violet lip and a yellow lower lip. Fruit a capsule, seeds small and look like a honey-comb. Flowers from May to September, in valleys and fields and is scarce. Rare in Malta, frequent in Gozo; "usually grows in wheat fields, flourishing after the harvest, during early summer" (Tabone, 2008). Lanfranco, G. (1969) describes it as rather frequent especially in fields. Our plants seems to belong to subspecies *crinita=Kickxia sieberi* (Lanfranco, 1989). The **Mediterranean Fluellen** *Kickxia commutata* Xatbet l-Art Vjola is similar but the spur of the flower is curved and the seeds are tuberculate (with swellings). The flowers can also be violet, and have purple spots on the palate (the rounded projection of the lower lip). According to Tabone (2008) *Kickxia commutata* grows in dry valley beds not in fields. Borġ (1927) recorded it growing in rubble walls, country roads and in fields after harvest. It is a scarce species, flowering from around May to September.

Plantain Family Plantaginaceae





Water Speedwell/Blue Water Speedwell *Veronica anagallis-aquatica*
Veronika tal-Ilma/Bronka tal-Ilma

A herbaceous perennial of wet habitats, with ascending and erect branches. Stems generally hollow and can float on water. Leaves are wide, ovate to lanceolate or elliptic, upper ones unstalked and clasping the stem, in opposite pairs. Each pair alternates with the next. Flowers in racemes, with 4 petals, pale bluish to violet and streaked. Sepals 4. Fruit a capsule. Frequent along watercourses flowering from February to October.

Plantain Family Plantaginaceae





Grey Field Speedwell *Veronica polita*
Veronika Żgħira/Veronika Kaħla

A small prostrate and hairy annual, stems spreading over ground, or ascending to erect. Leaves ovate, lowest opposite but upper mostly alternate, and stalked, margin toothed. Flowers solitary in leaf (bract) axils with 4-5 petals, blue, streaked and with a whitish centre. Sepals show from between petals. Fruit a capsule of 2 lobes. Found in disturbed habitats, including gardens, also in sandy areas, flowering from around January to April, and is frequent to scarce. The species is described from a few valleys and gardens including Buskett by past authors (Haslam *et al*., 1977). The Grey Field Speedwell belongs to the *Veronica agrestis* group. The **Green Field Speedwell** *Veronica agrestis* is described by Haslam *et al*. (1977) and Borġ (1927) as occurring in gardens, shady places and along country roads and as frequent. According to Pignatti (2002) the capsule of *Veronica agrestis* has only glandular hairs and no

simple hairs and the flowers are of a light blue, white or pale pink colour; the capsule of *Veronica polita* has dense short simple hairs and slightly longer glandular hairs and the colour of the flowers is generally a shiny blue.

Plantain Family Plantaginaceae




Ivy-leaved Speedwell *Veronica hederifolia* Veronika tal-Liedna

A small prostrate and ascending hairy annual with stalked and lobed leaves, lowest opposite, upper ones alternate. The leaves have 3-7 lobes, generally 5-lobed, the middle lobe wide and large. Flowers are axillary and solitary, pale blue with a pale centre and stalked. The calyx has 4 pointed and hairy sepals. Fruits are rounded capsules. Not frequent in valleys, fields, walls, roadsides, January to March. Haslam *et al*. (1977) describes the species as occasional in a few localities in Malta and Gozo, and Borġ (1927) as "frequent but not common". This plant is in the *Veronica hederifolia* group which has 3 species (Pignatti, 2002). The **Wall Speedwell** *Veronica arvensis* is another small blue-flowered speedwell that is described for the Maltese Islands as rather frequent in gardens, old walls and waste places by Haslam *et al*. (1977) and Borġ (1927).

Plantain Family Plantaginaceae




Cymbalaria-leaved Speedwell/Pale Speedwell *Veronica cymbalaria* Veronika taċ-Ċimbalarja/Veronika Bajda

A prostrate and ascending hairy annual, leaves stalked and rounded, lowest opposite upper ones alternate, with 5-9 lobes. Flowers solitary, white with 4 petals, borne on stalks as long as or longer than the leaves. Capsule with 2 rounded lobes with a projecting style in between. Not frequent on walls, in rocky ground, gardens and other habitats and flowers from December to May. The Cymbalaria-leaved Speedwell belongs to the *Veronica cymbalaria* group which includes the *Veronica panormitana* that is also described for the Maltese Islands (Pignatti, 2002; Haslam *et al*., 1977; Borġ, 1927) as var. *panormitana*. The *Veronica panormitana* is described from the Maltese Islands, South of Italy, Sicily and Corsica (Pignatti, 2002). *Veronica panormitana* has capsules (fruits) that are without hairs or with very few simple hairs; *Veronica cymbalaria* has capsules that are hairy.

Plantain Family Plantaginaceae





Yellow Bartsia/Yellow Eye-bright *Parentucellia viscosa*
Perlina Safra

An erect glandular-hairy annual, leaves opposite, elongate (elongate-lanceolate to lanceolate), sessile and toothed. Flowers borne in spike-like inflorescence in the axils of bracts, 2-lipped, yellow, lower lip larger and divided in 3 lobes. The upper bracts form an apical tuft. Calyx has 4 sepals. Semi-parasitic. Scarce in garigue and abandoned fields, also in damp areas, March to June. Parasitic on grasses - Lanfranco, 2015.

Plantain Family Plantaginaceae





Bellardia/Viscid Eye-bright/Cow Wheat *Bartsia trixago* (*Bellardia trixago*)
Perlina Bajda

An erect and glandular-hairy semi-parasitic annual with sessile opposite leaves. The leaves are narrow and elongate, and with a toothed margin. Bracts are leaf-like. Flowers are 2-lipped, the lower lip larger and divided in 3 lobes. The upper lobe is pink or purple, the rest white or pinkish. Flowers occur in the axils of leaf-like bracts in a spike-like inflorescence. Stamens 4. Fruit a capsule. Frequent to common in garigue, rocky steppe, other open ground, April to June. Purple plants are particularly common on Comino (Lanfranco, 1996).

Plantain Family Plantaginaceae





Greater Snapdragon/Large Red Snapdragon *Antirrhinum tortuosum* (*Antirrhinum majus* subsp. *tortuosum*)
Papoċċi Ħamra/Ras il-Baqra/Ras ta' Mewt

Herbaceous perennial, woody at base, leaves slender (linear–lanceolate) and narrows towards the tip. Flowers are in racemes, dark pink to reddish-purple, with 4 hidden yellow stamens. Stamens are 4, two shorter than the other 2. Flowers consist of an upper and lower lip, the lower one with yellow patch. The flower carries small hairs, as does the five-lobed calyx. Bracts are smaller than the leaves. Seed capsule with openings at the top from where seeds can exit. Common, found growing on cliffs, walls (rubble walls, fortifications), rocky areas, field margins, valleys and other habitats. Flowers with most vigour in spring (March to May), but flowers can also be found in the other seasons, especially autumn. Native of Spain, Sicily and Malta, but has now naturalised in various other parts of the Mediterranean (Lanfranco, 1996).

Plantain Family Plantaginaceae




Sicilian Snapdragon/White Snapdragon/Yellow Snapdragon/Wall Snapdragon *Antirrhinum siculum*
Papoċċi Bajda/Ras il-Baqra/Ras ta' Mewt

Similar to the Greater Snapdragon *Antirrhinum tortuosum*, but has smaller yellowish-white flowers. Leaves are similar, elongate and pointed at tip. Common on rubble walls, cliffs, rocky valleys and fortifications. Flowers can be found all year round. Originally endemic to Sicily and Malta, but is now naturalised in southern Italy, France and Spain (Lanfranco, 1996). Flowers that are purple-veined could be hybrids between the Sicilian Snapdragon *Antirrhinum siculum* and Greater Snapdragon *Antirrhinum tortuosum* (Lanfranco, 1996).

Plantain Family Plantaginaceae




Lesser Snapdragon *Misopates orontium* (*Antirrhinum orontium*)
Papoċċi Irqiqa/Papoċċi tar-Raba

An erect or ascending hairy annual, smaller and less conspicuous than Snapdragon *Antirrhinum* species. Leaves narrow, elongate (linear). They are opposite below but are alternate in the upper parts. Flowers are pinkish, solitary arising from the axils of leaf-like bracts and forming (leafy) racemes. The sepals are narrow and long, the longest sepals exceeding the flower. Capsule is hairy and contains several small black seeds. Found in rocky valleys and in other rocky ground, fields, flowering from March to June. Frequent. The **Pale Lesser Snapdragon** *Misopates calycinum* has nearly white flowers and is very rare (Lanfranco, 2015).

Plantain Family Plantaginaceae




Maltese Toadflax *Linaria pseudolaxiflora*
Papoċċi ta' Malta/Xatbet l-Andar ta' Malta

A small, often unnoticeable annual with prostrate and ascending slender stems and ovate to elliptical sessile leaves. Lower leaves opposite or in whorls of 3, upper leaves mostly alternate. Flowers are small and with a spur, white and pale violet with a yellow "throat", on a short pedicel in the axils of bracts or terminal. Fruit is a rounded capsule, shorter than the calyx. Seeds are black, wrinkled. Flowers from March to May, in garigue, rocky steppe, open arid ground, rdum, e.g. at Selmun, Mistra, Ghadira area (in garigue), Majjistral Park (in rdum). Scarce in Malta, but can be frequent in some locations. More frequent in Gozo. The Maltese Toadflax is a "Pelago-Maltese endemic restricted to Malta, Lampedusa and Linosa" (Lanfranco, 1989). The **Mediterranean Toadflax** *Linaria chalepensis* is recorded by Tabone (2007) from a few sites in Malta. Haslam *et al*. (1977) and Borġ (1927) recorded it in fields and open places in a few localities in Malta. The **Field Toadflax** *Linaria arvensis* is described as rare in cultivated ground (Lanfranco, G., 1969; Borġ, 1927).

Plantain Family Plantaginaceae




Three-leaved Toadflax *Linaria triphylla*
Papoċċi ta' Tlett Werqiet

A small greyish-green hairless annual with ascending simple or branched stem. Leaves are sessile and wide, ovate to rounded or elliptical, in whorls of 3, or opposite or alternate. Flowers are held erect and occur in upright dense racemes, on short stalk and almost sessile. Bracts present. The raceme elongates in fruiting. The flowers are white (streaked with violet) with yellow or orange projections (the palate) and have a conspicuous curved violet spur. The calyx has unequal lobes. Capsule is globular, seeds greyish-brown. Scarce to frequent in fields, dry open areas, February to April.

Plantain Family Plantaginaceae




Greater Plantain/Rats-tail Plantain *Plantago major* Biżbula Kbira - A herbaceous perennial with large, broad and stalked ovate to elliptical leaves in a basal rosette. Margin of leaf is entire or toothed. Flowers are on a thin and long spike, with small protruding greenish-yellow anthers. Fruit a capsule that splits open to release the small seeds. Subspecies *major* and subspecies *intermedia* are said to occur in the Maltese Islands (Haslam *et al.*, 1977). Scarce to frequent along watercourses and in damp valleys, flowering from March to November.

Plantain Family Plantaginaceae



Buck's-horn Plantain/Star of the Earth
Plantago coronopus Biżbula tal-Baħar/Salib l-Art

Annual, biennial or perennial (generally annual or biennial) low herbaceous plant. Leaves narrow and elongate, mostly linear to lanceolate, in a basal rosette, deeply toothed to pinnately-lobed, not fleshy to somewhat fleshy. The flowers are clustered in a spike with protruding yellow anthers. Flowers small, individually inconspicuous and have 4 lobes. Common and found in arid and open ground such as garigue, cliff edges, sandy areas, also valleys, especially coastal. Flowers from February to August or later.

Note: *Plantago coronopus* is considered by some botanists as an aggregate of species, subspecies and varieties. See note on page 341.

Plantain Family Plantaginaceae





Perennial Buck's-horn Plantain *Plantago macrorhiza*
Biżbula

Herbaceous perennial with basal leaf rosettes, leaves elongate-spatulate and with ovate and pointed teeth at the sides. Leaf margin hairy and middle vein of leaf is not so obvious. Flowers occur in a spike on ascending stem. Scarce to frequent in coastal places, flowering from February to October. The Perennial Buck's-horn Plantain belongs to the *Plantago coronopus* group (Pignatti, 2002).

Plantain Family Plantaginaceae





Toothed Plantain *Plantago serraria*
Biżbula

A low herbaceous perennial with elongate somewhat fleshy pointed leaves in basal rosettes, margin regularly toothed. Flowers clustered in a cylindrical spike, with protruding yellowish anthers. The flowering stem is hairy, prostrate to ascending and equal to or longer than the leaves. Common in garigue, valleys, country roadsides, paths and other open ground even disturbed, also coastal, flowering from March to June.

Plantain Family Plantaginaceae





Hare's-foot Plantain *Plantago lagopus*
Biżbula Komuni

An annual with stalked elongate and pointed leaves in a basal rosette, margin with or without small teeth. Flowers small with pale yellowish, protruding anthers, clustered into a hairy head at the top of a long finely grooved stalk that exceeds the leaves. The sepals are hairy. Common along paths, open disturbed ground including abandoned fields, shallow pools, rocky ground and other areas, from February to May. The flowers are in a cylindrical head in the subsp. *cylindrica* (Lanfranco & Lanfranco, 2003). *Plantago lanceolata* occurs as a very rare casual alien (Lanfranco, 2015).

Plantain Family Plantaginaceae





Glandular Plantain/Fleawort Plantain *Plantago afra* (*Plantago psyllium*) Żerriegħet il-Brigħet

An ascending to erect small annual branched at the base, stems hairy and often purplish. Leaves are sessile, elongate and narrow, margin entire or with few small teeth, with smaller leaves in the axils. Flowers with 4 inconspicuous pointed petals in rounded spikes on long stalks from the axils of the upper leaves. Common in open ground such as areas with short vegetation, in fields and garigue, January to May. The variety *stricta* has been observed in Malta (Pignatti, 2002).

Plantain Family Plantaginaceae





Hairy Plantain *Plantago bellardii* Biżbula Sufija

A low annual with linear-lanceolate pointed and entire (or slightly toothed) hairy leaves. Rosettes of leaves are one or more than one. The flower stalk is densely hairy. The flowers are brownish and on short stalks that are circular in cross-section and less than or generally slightly longer than leaves. The whitish or yellowish anthers have a small membranous area on the top. It occurs in dry coastal areas, flowering from March to May, and is scarce to rare. Several plants were found at a coastal stretch above Rdum id-Delli, thanks to Timothy Tabone (March, 2014). The **Downy Plantain** *Plantago albicans* was also mentioned as rare in roadsides, paths and on walls (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927; Sommier & Caruana Gatto, 1915) but considered as probably extinct by Lanfranco (1989) -"has been wiped out from its last known outposts as a result of modifications in the harbour area". ***Plantago crypsoides*** is listed for Għadira s-Safra by ERA (https://era.org.mt/en/Documents/20180601_MT0000008-Ghadira-Safra-SAC.pdf).

Plantain Family Plantaginaceae





Vervain/Holy Herb/Juno's Tears *Verbena officinalis* Buqexrem/Birbiena/Ħaxixa tal-Banju

A slender and erect hairy herbaceous perennial with square grooved stems and toothed to pinnately-lobed leaves. Lower leaves are larger than upper ones. Flowers small, violet to pink with a pale centre, somewhat two-lipped, on long thread-like spikes; these spikes elongate in fruiting. The calyx has 5 teeth. Fruit consists of 4 nutlets. Common, growing mostly on disturbed ground like roadsides, field margins and tracks, also valleys and other damp areas, flowering from April (or earlier) to December.

Vervain Family Verbenaceae





The **Tall Verbena** *Verbena bonariensis* has naturalised at Manoel Island (Bernt-Gunnar Østerkløft, pers. comm., 2014)

Pictures of Tall Verbena by Bernt-Gunnar Østerkløft

Vervain Family Verbenaceae







Lantana *Lantana camara* Lantana

An aromatic hairy shrub with opposite, stalked and toothed ovate or lanceolate leaves. Stems have prickles. Flowers yellow, orange, red or purple, borne in crowded showy heads. Fruit a black berry. A cultivated plant frequently used as a hedge, sometimes found naturalised. Its flowers often attract a diversity of insects including butterflies. Native to tropical and sub tropical parts of America. Flowers mainly from spring to autumn/winter, but flowers can be found all year.

Vervain Family Verbenaceae





Golden Dew Drops/Honey Drops/Skyflower *Duranta erecta* (*Duranta repens, Duranta plumieri*)

A thorny shrub with fragrant pale bluish/violet or whitish flowers in clusters, these are followed by orange-yellow fleshy fruits. The flowers have 5 petal lobes. Fruiting stems often drooping. Flowers and fruits can be present on plant at same time. Leaves pale green, elliptical to ovate, opposite and toothed. Cultivated forms include plants with variegated leaves. An ornamental species planted in gardens, sometimes naturalising, with flowers found almost all year round. Native to America.

Vervain Family Verbenaceae




Southern Bugle/Musky Bugle/Herb Eve/Southern Groundpine *Ajuga iva*
Xantkura/Xantkura Roża

A small prostrate or ascending hairy herbaceous perennial with a woody base. Leaves elongate (linear) usually toothed or weakly lobed, sessile, with dense hairs. Flowers are purple or pink, sometimes yellow (subsp. *pseudoiva*, Xantkura Safra), and on rare occasions can also be white. They emerge from the leaf axil. The lower lip is larger than the upper, is 3-lobed and has a large middle lobe. Frequent in garigue, rocky valleys, March-May (or earlier) to June-July and September to November (-January).

Mint Family Lamiaceae (Labiatae)




Olive-leaved Germander/Tree Germander/Evergreen Germander/Narrow-leaved Germander *Teucrium fruticans*
Żebbuġija/Żebbuġ tal-Blat

An evergreen shrub, with many lanceolate to ovate or elliptical leaves usually dark green from above and whitish from the underside, shortly stalked. Younger stems are also whitish. Flowers occur in pairs, are one-lipped only (lower) and with a long central lobe, whitish to pale bluish-violet with protruding stamens. Common in garigue, maquis, rocky valleys, rdum flowering from December to May.

Mint Family Lamiaceae (Labiatae)




Yellow Germander *Teucrium flavum*
Borgħom/Borgħom Komuni

A hairy shrub with erect and often purplish flowering stems. Leaves are stalked, ovate and with a toothed margin, shiny from above. Leaves are foetid when crushed. Flowers pale yellowish in clusters, with 5 lobes; the upper two lobes shield the 4 stamens, the lateral slender lobes are purplish and the middle (lower) lobe is concave and almost circular. Common, flowers from late April (mostly May) to June, in garigue, maquis, valleys, rdum, abandoned fields, roadsides. Another species of *Teucrium* recorded for the Maltese Islands is the **Water Germander** *Teucrium scordium* Borgħom tal-Ilma (Lanfranco, 1989; Haslam *et al*., 1977; Borġ, 1927). Lanfranco (1989) records the Water Germander as subspecies *scordioides*. The same author stated that it used to be found along several watercourses (Sommier & Caruana Gatto, 1915) but seems to have declined and restricted to Baħrija watercourse. This same population was small and severely damaged by excessive herbicides (in run off) and by disturbance to its environment. Later on in 1992 Tabone (2008) recorded it from the Baħrija valley, but considered it extinct in the wild by the late 1990s. Mifsud (2013) found a single specimen at Il-Fiddien valley in 2013; specimens found by Mifsud at Fiddien/Wied il-Qlejgħa were re-introduced there by Tabone (www.maltawildplants.com).

Mint Family Lamiaceae (Labiatae)




White Hedge-nettle/Great Spanish Hedge-nettle/Mediterranean Prasium/Prasium
Prasium majus Te Sqalli

A shrub with shiny ovate to lanceolate, stalked leaves, margin toothed. Leaves greatly reduced to none at all in dry season. Its two-lipped flowers are white, with violet markings, terminal and in the axils of bracts. The 4 anthers and the stigma & style are situated under the upper lip. The lower lip is divided in three lobes. Calyx has short bristles at tips of teeth. The fruit consists of 4 glossy black nutlets. Common in garigue, maquis, valleys, rdum, and other habitats, and also grows on rubble walls, flowering from November to May.

Mint Family Lamiaceae (Labiatae)




Ironwort/Common Sideritis
Sideritis romana
Sideritis

A small erect or prostrate hairy annual with a simple or branched stem. Leaves opposite, toothed, lower ones stalked. Flowers white in leafy whorls along the flowering stem. The calyx is bristly and two-lipped, with the upper lip made up of one tooth, the lower lip of 4 smaller and narrow teeth. Frequent in garigue, rdum, arid rocky ground, from March to June.

Mint Family Lamiaceae (Labiatae)




Woody Phlomis/Jerusalem Sage/Great Sage
Phlomis fruticosa
Salvja tal-Madonna/Salvjun

A hairy shrub with stalked mostly lanceolate to ovate or elliptical leaves usually with rounded tips. Leaves are paler from below due to dense woolly hairs. Flowers large and showy, yellow, in clusters forming whorls one above the other on the flowering stem. These whorls are in the axils of sessile leaves. Flowers are made up of two lips, the lower with 3 lobes. Calyx has short, pointed teeth. Bracts are hairy, narrow and long. The plant has a characteristic smell. Frequent, growing in rocky valleys and rocky slopes and garigue, flowering from April to early June (some flowers may also be found in late March).
Mint Family Lamiaceae (Labiatae)





Henbit Dead-nettle *Lamium amplexicaule*
Kappilliera

A hairy annual with erect or ascending stems that branch from the base, and ovate to rounded leaves having a toothed or lobed margin. Lower leaves are stalked and upper ones sessile, clasping the stem. Flowers are in dense whorls from the axils of the upper leaves. The flowers are pinkish-purple with a long tube that exceeds the calyx. Calyx has 5 teeth. Frequent to common in fields, other disturbed habitats December to May.

Mint Family Lamiaceae (Labiatae)





Black Horehound/Stinking Horehound *Ballota nigra* subsp. *uncinata*
Marrubja Sewda

A hairy and foetid herbaceous perennial with ascending stems, woody at base. Stems have hairs facing down. Leaves are dark green and stalked, ovate and toothed. Flowers whitish in dense whorls, 2-lipped, and the calyx has 5 teeth. Scarce to rare in shady places including valleys, flowers from April to November. The similar **White Horehound** *Marrubium vulgare* Marrubja Bajda is also listed for the Maltese Islands as not frequent or rare (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927). The calyx has 10 teeth.

Mint Family Lamiaceae (Labiatae)





Hairy Woundwort *Stachys ocymastrum*
Stakis

A hairy annual with ascending stems and ovate toothed leaves, lower ones stalked. Uppermost leaves do not have teeth. Flowers occur in small whorls, 2-lipped, yellowish-white with purplish markings. The upper lip is cut in 2 lobes; the lower lip has 3 lobes. Calyx has 5 bristle-tipped teeth. Scarce in rocky valleys and garigue, March to May, e.g. Wied Inċita and Wied Ħoxt. Scarce but is more frequent in Gozo than in Malta (Lanfranco, 2007). Rare in Malta, less so in Gozo (Lanfranco, 1989).

Mint Family Lamiaceae (Labiatae)




Lemon Balm/Balm
Melissa officinalis
Melissa/Nagħniegħ In-Naħal/Burieħa

An aromatic erect and branched herbaceous perennial. Leaves stalked and have a toothed margin, and are ovate. The veins on the leaves are conspicuous, and hairs are present on the leaves and leaf stalk. Flowers small and occur in axillary whorls, pale yellow becoming pinkish or white. Flowers are 2-lipped. The plant has a characteristic lemon scent. Flowers from May to July. Haslam *et al*. (1977) state that the plants in the Maltese Islands probably belong to subsp. *altissima*, and is listed as rare in valleys, shady places and also as a cultivated plant in a few places in Malta and Gozo.

Mint Family Lamiaceae (Labiatae)




Lesser Calamint
Clinopodium nepeta (*Calamintha nepeta*, *Satureja nepeta*)
Kammilta

A strongly aromatic low greyish-green herbaceous perennial with prostrate or ascending stems. Leaves are small and opposite, diamond-shaped to ovate, shortly stalked, with small teeth or untoothed. Some are spotted white. Flowers are small, two-lipped, and white to pale violet, spotted, in whorls. Lower lip is 3-lobed, median lobe notched (with a cut). Frequent in garigue and rocky valleys, rocky steppe, roadsides and other disturbed areas, from May to December. The plants of the Maltese Islands belong to subspecies *glandulosa* (Lanfranco, 1996; Haslam *et al*., 1977).

Mint Family Lamiaceae (Labiatae)




Maltese Savory/Small-leaved Micromeria
Micromeria microphylla (*Satureja microphylla*)
Xpakkapietra/Xkattapietra/Sagħtrija/Xaqq il-Blat

A small and hairy low shrub, woody at base with prostrate and ascending stems. Stems and leaves often purplish. The leaves are small, opposite, elliptical to ovate, sometimes with 2 or more minute teeth. Flowers pale violet to pink, 2-lipped and with tube, the lower lip is 3-lobed. The calyx has 5 teeth. Flowers are in small clusters emerging from leaf axil. Common in garigue, rocky valleys, rdum and other rocky ground, and also in roadsides; plants can also be seen growing out from cracked road surfaces. Flowers from April to October or later, but flowers can be found throughout the year. The Maltese Savory is restricted to the Puglia region of Italy and to islands in the Central Mediterranean (Maltese Islands and Sicily), and is related to a number of Aegan and Middle Eastern species (Lanfranco, 1996, 1989). The **Pink Micromeria** or **Greek Savory** *Micromeria graeca* Sagħtrija Griega is also listed

for Malta (Haslam *et al*., 1977; Borġ, 1927). Lanfranco (1989) states that it was recorded by Grech-Delicata (1853) whose records could not be confirmed.

Mint Family Lamiaceae (Labiatae)




Mediterranean Thyme/Thyme *Thymbra capitata* (*Coridothymus capitatus, Thymus capitatus*) Sagħtar

A low and strongly aromatic shrub, with pale brownish-grey to silvery stems. Leaves are sessile, small and narrow (linear), reduced in summer. The leaves can be seen to have dots (glands) when viewed under a hand lens. Flowers are small and violet to pinkish (on some occasions also pale whitish-violet), in dense clustered ovoid heads at the tips of stems (terminal). They are 2-lipped, the lower lip divided in three lobes, middle lobe longer and spotted. Stamens protrude out of flower. Common and a characteristic shrub of garigue habitats, carpeting whole areas in violet when flowering, also grows on cliffs and rdum. Flowers from May to July, sometimes earlier from April. Some few flowers also appear in autumn-winter, especially after a spell of good weather.

Mint Family Lamiaceae (Labiatae)




Pennyroyal *Mentha pulegium* Plejju

A strongly aromatic herbaceous perennial, stems green and purplish, creeping along ground (which readily take root) and ascending. Leaves have a small petiole, and are mostly rounded to elliptical with a pointed or rounded tip. Margin untoothed or toothed. Flowers small, pale violet, with protruding stamens, in clustered whorls one above the other, in a spike-like inflorescence. The whorls are borne in the axils of a pair of opposite reflexed leaf-like bracts. Calyx has unequal teeth. Common along watercourses in valleys and also found in pools in the garigue, sometimes occurs also in drier places. A characteristic flowering plant of late spring and early summer in dry valley beds. Flowers from May to August. The **Apple Mint** *Mentha suaveolens* Nagħnieħ Selvaġġ is rare, the **Water Mint** *Mentha aquatica* Nagħniegħ taż-Żwiemel is probably extinct (Lanfranco, 1989; Haslam *et al*., 1977, Lanfranco, G., 1969, and Borġ, 1927). The **Spearmint** *Mentha spicata* Nagħniegħ is cultivated and sometimes found naturalised. It is strongly aromatic.




Far left picture: *Mentha suaveolens*
Left picture: *Mentha spicata*

Mint Family Lamiaceae (Labiatae)





Rosemary *Rosmarinus officinalis*
Klin/Rosmarin

An aromatic and evergreen shrub, leaves are opposite, sessile, narrow and linear, dark green from above with revolute (rolled down) margins, white from below. Clusters of leaves are generally present at the axil of the leaves. Flowers pale bluish, two-lipped, in axillary clusters, with 2 protruding stamens. The lower lip is divided in 3, with a larger middle lobe. Generally scarce, flowering mostly from October to May, in maquis and rocky valleys.

Mint Family Lamiaceae (Labiatae)





Three-lobed Clary/Three-lobed Sage/Greek Sage *Salvia fruticosa* (*Salvia triloba*) Salvja

A hairy shrub with ascending stems, and leaves greenish above and greyish underneath. Leaves are simple (not lobed) or with 2 small side lobes and a larger terminal lobe. Their stalk is hairy and wide. Inflorescence the usual verticillasters with flowers in whorls on a flowering stem. Flowers are pink to violet, calyx often dark (brown-purple) and is toothed. Stamens only 2. Flowers from April to August. A cultivated species, very rare in the wild. The Three-lobed Sage is on the verge of extinction and few shrubs still exist close to Buskett (Lanfranco, 1989). The same author continues that "records of *Salvia officinalis* in the wild should probably be referred to this species". According to Borġ (1927) it is "rare at Luqa, often naturalised in old gardens". The **Garden** or **Common Sage** *Salvia officinalis* is similar but with only simple (not lobed) leaves. It is found in cultivation.

Mint Family Lamiaceae (Labiatae)





Wild Clary/Wild Sage *Salvia verbenaca*
Salvja Selvaġġa/Salvja tal-Madonna

An aromatic herbaceous perennial with basal leaves in a rosette, wrinkled and stalked. The leaves have round teeth or are lobed to pinnately-lobed. Upper leaves are shortly-stalked or unstalked. Flowering stem is erect and hairy. Flowers are bluish-violet, 2-lipped, in whorls forming a spike-like inflorescence. Stamens 2. Nutlets black. Common in garigue, paths in valleys, roadsides and other open disturbed ground, October to June.

Mint Family Lamiaceae (Labiatae)





Chaste Tree *Vitex agnus-castus* Virga/Siġra tal-Virgi/Virgija/ Għadiba/Bżar tal-Patrijiet

A deciduous and aromatic shrub to a small tree, with silvery-greyish stems that become brownish with age. Leaves are palmate with narrow leaflets, and stalked. Flowers clustered in whorls in branched spike-like inflorescence, violet-blue, two-lipped and with protruding stamens. Fruits (nutlets) spherical and persist throughout winter, also aromatic, exceeding the calyx. Scarce to rare in damp places mostly in valleys (especially coastal), and also on clay where water seeps. The Chaste Tree is planted in certain sites, e.g. Wied il-Qlejgħa, and is-Simar nature reserve. Chaste Trees found at the back of the saltmarsh area behind Sta. Marija bay in Comino are considered native. Flowers from May to around July, but also later to September or October, with flowers also seen in December. Borġ (1927) mentions a white-flowered form *albiflora*; these occur at Marsascala (Stevens & Baldacchino, 1998). The plant was thought to preserve chastity, and referred to as Monk's Pepper (Blamey & Grey-Wilson, 1993). Fairly frequent in Gozo but is rare on Malta. Its stems were used to make bases, handles and frames of Giant Reed woven baskets (Lanfranco, 2007). It tolerates high salinities (Lanfranco, 1989).

Mint Family Lamiaceae (Labiatae)





Acanthus/Common Bear's Breeches *Acanthus mollis* Ħannewija/Brankorsina

A herbaceous perennial, with large pinnately-lobed long-stalked basal leaves. Flowers are large, white with purple veins/tinge, in long spikes, frequently visited by Large Carpenter Bees *Xylocopa violacea*. The flowers have a 3-lobed lower lip. Calyx divided in 2 lips. The flower bracts are purple, and spiny. When the capsules (fruits) mature, the seeds inside are dispersed by an explosive mechanism and the seeds are shot a distance away. In late spring and early summer one can frequently hear such "explosives" in areas with Acanthus. Common in valleys, maquis, wooded areas (e.g. Buskett, Mġiebaħ Oak wood) also field margins, often in shady places, from April to June, also July. Note: Corinthian columns (developed in ancient Greece) are carved with *Acanthus* leaf designs on their top part (called the capital).

Acanthus Family Acanthaceae





Wavy-leaved Mullein *Verbascum sinuatum* Xatbet L-Andar

Densely hairy herbaceous biennial, basal leaves in a rosette, wavy and pinnately-lobed. The upper (stem) leaves are smaller, less lobed to entire, pointed, ovate to lanceolate. The bracts are usually triangularly-shaped. Inflorescence with long flowering stem, branched, and flowers have 5 yellow petals and 5 stamens with purplish hairs on the filaments. Fruit a capsule with many seeds inside. Frequent to common in rocky ground, rdum, roadsides, field margins, paths and other disturbed areas, flowering from May to September (-October). Tabone (2007) also records the rare **Glandular Mullein** *Verbascum creticum* Xatbet l-Andar Kbir from three sites in Malta including il-Girgenti. It also occurs on Comino (Jeffrey Sciberras, pers. comm., 2015).

Figwort Family Scrophulariaceae





Nettle-leaved Figwort/Brown Figwort
Scrophularia peregrina
Fiswiet il-Kelb/Nittiena/Ħaxixa tal-Ħnieżer

An erect annual with square stems and stalked ovate and toothed leaves. Lower leaves are opposite, upper leaves alternate. Flowers 2-lipped, in small clusters, dark reddish-brown or purplish, and bracts are leaf-like. Calyx divided in 5 equal lobes. Fruit a rounded capsule with numerous black wrinkled seeds inside. Frequent in disturbed ground, flowering from January to May. The **Water Figwort** *Scrophularia auriculata* Fiswiet il-Kelb tal-Ilma/Werqa tal-Madonna is also mentioned for the Maltese Islands, as occurring in "shady, damp places, occasionally occurring in gardens and irrigated ground" (Haslam *et al*., 1977). Lanfranco (1989) states that it has decreased as a result of constant disturbance to its habitats and is "now confined to the watercourse at Baħrija". The Water Figwort is a herbaceous perennial and has stems that are winged.

Figwort Family Scrophulariaceae





Mousehole Tree
Myoporum laetum
Mijoporum

An evergreen shrub with brownish-grey bark and alternate, leathery and rather thick fleshy hairless leaves, toothed at the upper half. Leaves dotted with glands, and are pointed at the tip. Flowers are in axillary clusters, with short tube and 5 petal lobes that are hairy on the inside. Flowers white with purplish spots and the fruit is a purplish drupe. Native to New Zealand, planted for ornament, occasionally found naturalised or planted in the countryside. Flowers in spring, April to June.

Figwort Family Scrophulariaceae





Hairy Broomrape *Orobanche pubescens*
Budebbus tal-Lellux/Budebbus Muswaf

A densely hairy and variable annual with brown, yellow or purple erect and simple (unbranched) stem. Leaves alternate, elongate (linear-lanceolate) and flowers are hairy and in a spike, purple-yellow. The upper lip is mostly undivided, the lower lip divided in 3 lobes, middle lobe greater than the 2 side ones. Calyx deeply divided in thin segments (teeth). Stigma is purplish. It is 2-lobed, like in other Orobanchaceae members. Parasitic (root parasite) and is often associated with Crown Daisy *Glebionis coronaria* and Alexanders *Smyrnium olusatrum*; parasitic also on plants of the Pea Family Fabaceae. Common, April to May.

Broomrape Family Orobanchaceae




Dwarf Broomrape *Phelipanche mutelii (Orobanche mutelii; Orobanche ramosa* subsp. *mutelii*)
Budebbus tal-Ingliża

An erect small annual, generally branched. Leaves are few, lanceolate. Inflorescence a spike, bracts and secondary bracts present. Flowers are 2-lipped, whitish or bluish-violet. Common flowering in spring, March to May. The plant is a parasite on the Cape Sorrel *Oxalis pes-caprae*. The white-flowered form has been described as endemic (var. *melitensis*), but according to Lanfranco (2007) this is debatable "since practically all coloured flowers may give rise to white-flowered forms". The "melitensis" is only an albino form of *Phelipanche mutelii* (Lanfranco, pers. comm., June 2017). The Dwarf Broomrape was originally parasitic on leguminous plants (Fabaceae) but changed its host to Cape Sorrel *Oxalis pes-caprae* when the plant was introduced in Malta (Lanfranco & Lanfranco, 2003).

Broomrape Family Orobanchaceae




Lavender Broomrape *Phelipanche lavandulacea* (*Orobanche lavandulacea*)
Budebbus Vjola/Budebbus Ikħal

A hairy annual with simple or branched stem and ovate scale leaves. Flowers condensed at first, later becoming spaced, with narrow tube and 2-lipped, and are bluish-violet with a white base. Upper lip is entire or toothed, lower lip lobed. Bracts and bracteoles present, linear-lanceolate. Stigma is white or yellowish. Parasitic on Pitch Trefoil *Psoralea bituminosa*, and is scarce-rare, e.g. Miżieb, Buskett, Majjistral Park, March to May. Grows taller than the Dwarf Broomrape *Phelipanche mutelii*.

Broomrape Family Orobanchaceae




Drooping Broomrape/Nodding Broomrape *Orobanche cernua*
Budebbus Abjad u Vjola/Budebbus tax-Xatt

Annual - perennial, plant is glandular-hairy, though sometimes only sparse. Stems dark, yellowish or purplish, simple (unbranched). Leaves are triangular. Inflorescence is a spike. Flowers have a shiny white tube inflated near the base and blue-violet down-curved tips. Upper lip has two lobes, lower lip with 3 more or less equal lobes. Bracts are about as half as long as the flowers. Secondary bracts (bracteoles) are absent. Stigma is whitish. Rare in rdum, garigue, maquis, April to May. The species is parasitic on *Artemisia*, rarely *Helianthus* or other species (Pignatti, 2002). Parasitic mostly on *Artemisia*, occasionally on sunflowers, *Helianthus annuus* (Blamey & Grey-Wilson, 1993). On Compositae and Solanaceae, rarely on other herbs (Haslam *et al*., 1977).

Broomrape Family Orobanchaceae





Bean Broomrape *Orobanche crenata* Budebbus tal-Ful

A hairy annual with angled stems. Leaves linear to lanceolate, and flowers white with violet veins in a spike. The flowers are 2-lipped, the upper lip more or less entire and the lower lip divided in 3 lobes. Bracts are narrow and pointed. Stigma is white, yellow or pinkish. Frequent to common among fields of Broad Bean *Vicia faba*, also other crops of the Pea Family Fabaceae, flowering from March to May. May also parasitizes cultivated Geraniums, *Pelargonium* species, Sardinell (Lanfranco, 2015).Archaeophyte or native; probably originated in the Near East where the broad bean was cultivated, and spread to the Mediterranean region with the cultivation of Broad Bean *Vicia faba* (Lanfranco, 2015).

Broomrape Family Orobanchaceae




Dense-flowered Broomrape/Sand Broomrape *Orobanche densiflora* f. *melitensis* Budebbus tar-Ramel

Annual with alternate narrow and pointed (lanceolate) leaves and a dense spike inflorescence. Flowers pale yellow, slightly curved, 2-lipped; upper lip has a notch more or less 2-lobed. Bracts narrow and pointed (lanceolate). Stigma is yellow. Parasitic on Grey Birdsfoot Trefoil *Lotus cytisoides.* Rare, confined mostly to the north of Malta, (Marfa area) on sandy and rocky ground, March to May-June. Parasitic on *Lotus halophilus* (Haslam *et al*., 1977; Borġ, 1927).Outside the Maltese Islands grows only in the Iberian Peninsula and in Morocco. Maltese plants are in an endemic form *melitensis* (Lanfranco & Lanfranco, 2003). Note: This species has been excluded from Malta by Domina & Soldano (2009). Mifsud (www.maltawildplants.com, accessed May 2020) states that according to recent studies it was found that these plants belong to a form of *Orobanche sanguinea*.

Broomrape Family Orobanchaceae



Ox-tongue Broomrape *Orobanche picridis* Budebbus Isfar

A yellowish hairy annual, stems sometimes swollen at base and plants are tinged with brownish or purplish. Leaves are lanceolate to triangular. Flowers are whitish to yellowish, and stigma is purple. It is parasitic on Fabaceae, Asteraceae and Apiaceae. Rare, flowering in April and May.

Orobanche picridis is parasitic on *Picris* and *Daucus* (Pignatti, 2002). *Orobanche picridis* is synonym with *Orobanche loricata* (var. *picridis*), though these two plants are sometimes separated into 2 different species.

Broomrape Family Orobanchaceae



Common Broomrape *Orobanche minor*
Budebbus Żgħir

Generally small hairy annual with simple (unbranched) purplish stem, sometimes swollen at base. Leaves are ovate to linear-lanceolate. Flowers yellowish tinged with violet at the upper part, generally curved, in a spike inflorescence. Upper lip has a notch or is 2-lobed, lower lip with the central lobe largest. Lower lip is hairless. Flowers have purple sometimes yellowish stigma. Not frequent, March to April. More frequent in Gozo as at Ta' Ċenċ, Mġarr ix-Xini, Sannat and Xlendi; parasitic mostly on Fabaceae and Asteraceae (Haslam *et al*., 1977; Borġ, 1927).

The **Ivy Broomrape** *Orobanche hederae* Budebbus tal-Liedna is "abundant at San Anton Gardens" (Tabone, 2008). It is recorded from other places by Haslam *et al*. (1977) and Borġ (1927).

Broomrape Family Orobanchaceae





The **Great Bindweed** *Calystegia silvatica* and **Hedge Bindweed** *Calystegia sepium* Leblieb Kbir are similar to each other and often confusing to separate. Specimens can show characteristics of both species. Plants growing wild in the Maltese Islands in fact could be hybrids, "although it cannot be excluded that either or both parents used to grow wild in Malta" (Lanfranco, 1989, 1973). *Calystegia silvatica*/*sepium* can be found growing in a few localities in the Maltese Islands including Buskett and Girgenti but also in other valleys. They are cultivated as ornamentals in gardens, and occasionally naturalise in semi-urban areas, e.g. Mellieħa. The flowers can be found in spring, May to June. Tabone (2008) records hybrids (*Calystegia* x *lucana*) as well as both species. *Calystegia silvatica* and *C.sepium* have large heart-shaped leaves with stalk, showy solitary white flowers arising from leaf axils, and twining stems. The flowers can have a pinkish tinge, and are funnel-shaped. At their base are large bracts that enclose the sepals. These bracts often have reddish veins.

Bindweed Family Convolvulaceae





Sea Bindweed *Calystegia soldanella*
Leblieb tar-Ramel/Leblieb tal-Baħar

A hairless rhizomatous herbaceous perennial, leaves smooth, stalked and heart-shaped. The shining leaves are dark green and more or less fleshy. Flowers are solitary in the axils of leaves. Sepals partly enclosed by a pair of ovate to rounded bracts. Flowers pale pink, with pale/white stripes. Fruit a capsule. Occurs in sand dunes, flowering from May to July/August-October. Rare and endangered, occurs mainly at Ramla l-Ħamra in Gozo and the degraded sand dune remnant at Ramla tal-Armier. Within these last 10 years sighted also at Ramla tat-Torri (by the author and Matthew Borġ Cardona).

Bindweed Family Convolvulaceae




Mallow Bindweed/Mallow-leaved Bindweed *Convolvulus althaeoides*
Leblieb Roża/Leblieb tax-Xagħri

A hairy and often robust, trailing and twining herbaceous perennial with variable leaves. Leaves stalked and lower ones somewhat heart-shaped, the upper ones palmate and deeply lobed. The leaves are dark greyish-green. The flowers are funnel-shaped, deep pink to purplish, with a dark centre, and petals fused. They are solitary or 2 or few together, axillary and on a long stalk with 2 small and narrow bracts. Calyx has 5 teeth. Common in garigue, valleys, rdum, fields, roadsides and other disturbed sites, March to June.

Bindweed Family Convolvulaceae




Slender Bindweed *Convolvulus elegantissimus* (*Convolvulus althaeoides* subsp. *tenuifolius*)
Leblieb Ċar/Leblieb tax-Xagħri Ċar

A hairy prostrate, trailing and twining herbaceous perennial with variable leaves. Hairs are silvery and appressed. Leaves are stalked, lower ones somewhat heart-shaped with a toothed margin, upper ones deeply lobed with narrow lobes (palmate). The flowers are stalked, pink with a white centre, and the petals are fused. Sepals 5. Common in garigue and rocky ground, abandoned fields and roadsides from (February-) March to June, sometimes also in July.

Bindweed Family Convolvulaceae



Olive-leaved Bindweed/Pink Bindweed *Convolvulus oleifolius* Leblieb tal-Blat

A silvery shrub with narrow and elongate linear leaves. The leaves are covered with appressed silky hairs, and are long-tapering at base and without a scarious (dry and membranous) margin at base. The flowers are in terminal clusters, often spreading and branched. The petals are pink or pinkish-white with darker stripes, and fused. Calyx has 5 sepals. These shrubs turn leafless or reduce the number of leaves in summer. Frequent to common mostly in coastal areas including garigue, cliff edges and rdum. Flowers from March to July. Plants flowering as early as January have been observed. The Olive-leaved Bindweed is an Eastern Mediterranean species with Malta at its westernmost point (Lanfranco, 1996); the species has a restricted geographical distribution and grows mostly in the eastern part of North Africa westwards to Libya (Lanfranco & Lanfranco, 2003); "Has a very restricted geographical distribution being found in the Levant and the Gebel Akhdar in eastern Libya" (Lanfranco, 2015). Sommier & Caruana Gatto (1915) reported it as quite rare in Malta, as frequent between Qala and Marsalforn (Gozo), and that it is also found on Cominotto. See note on page 340.

Bindweed Family Convolvulaceae



Narrow-leaved Bindweed
Convolvulus lineatus
Leblieb tax-Xatt/Leblieb Abjad

Herbaceous perennial generally small and prostrate, stems woody and contorted. Leaves are narrow and channeled, silky, covered with appressed hairs. Flowers are generally white and/or with a pinkish tinge, solitary or in small clusters on stalks shorter than the accompanying leaves. Calyx is densely hairy. Uncommon in coastal rocky and arid areas including cliffs and cliff edges and paths, March to June. Lanfranco, G. (1969) describes it as locally frequent in NNW Malta near the sea; Lanfranco (2007) as "rather uncommon", and "uncommon" (2015). Sommier & Caruana Gatto (1915) reported it as quite frequent on the NE of Malta example Mellieħa and Imtaħleb, as abundant in many places in Gozo, and that it is also found on Comino. See note on page 340.

Bindweed Family Convolvulaceae



Southern Bindweed/Pink Bindweed
Convolvulus cantabrica Leblieb Skars

A hairy herbaceous perennial with prostrate, ascending or erect stems woody at base. Hairs are mostly spreading. Lower leaves elongate-spatulate, upper ones linear-elliptical. Leaves are broader above the middle. Flowers pink in small clusters, on main stalks longer than the leaves. Calyx is hairy with 5 triangular sepals. Capsule rounded, hairy. Scarce to rare in rocky valleys, garigue, April to June.

Bindweed Family Convolvulaceae





Field Bindweed
Convolvulus arvensis
Leblieb tar-Raba

Herbaceous perennial, stems either running over ground (prostrate) in absence of vegetation, or climbing and twining around other plants, fences etc. Leaves are somewhat elongate and spear-shaped/heart-shaped and with petiole (stalk). Flowers are scented, white, or white and pink, with a yellow centre, petals fused. They are stalked, and occur singly or 2 (-3) together from leaf axils. Flower stalk with 2 small bracts. Capsule rounded. Common, especially in fields, roadsides, other disturbed ground, March to October.

Bindweed Family Convolvulaceae




Small Blue Convolvulus/Blue Bindweed
Convolvulus siculus
Leblieba Kaħla/Leblieb tal-Werqa Tleqq

A hairy annual with prostrate and ascending stems. The leaves are stalked, more or less lanceolate-ovate or heart-shaped, upper leaves smaller and narrower. Flowers are shortly stalked and usually solitary (or up to 3), emerging from leaf axil. They are blue or violet, with a pale (yellow/white) centre, and clearly lobed (5 lobes). The 5-sepal calyx is also hairy, and there are 2 small and narrow bracts just below the sepals. Fruit is a rounded capsule slightly exceeding the calyx, with few rough black seeds. Frequent in rocky valleys, open dry ground, fields, March to June. The subspecies *siculus* occurs in the Maltese Islands (Pignatti, 2002). This has the bracts situated at the base of the calyx and almost covering it.

Bindweed Family Convolvulaceae




Two-coloured Bindweed
Convolvulus pentapetaloides Leblieb Żgħir

Hairy small annual with sessile narrow leaves, linear to broadest above the middle (elongate-spatulate). Flowers 5-lobed, solitary on relatively long stalk with 2 minute bracts,axillary, blue with a white and yellow centre. Capsule rounded and hairless, exceeding teeth of calyx. Scarce to frequent in garigue and arid ground, rocky valleys, March to June.

Bindweed Family Convolvulaceae




Blue Bindweed/Three-coloured Bindweed
Convolvulus tricolor Leblieb Ikħal/Leblieba Kaħla

A prostrate to ascending hairy annual. Leaves entire and alternate, elongate-spatulate. The rather showy flowers are solitary and in the axils of the upper leaves, and are stalked. They are blue with a white and yellow centre, and are larger than the flowers of *C. pentapetaloides* and *C. siculus*. Fruit a hairy capsule. Rare, flowering in April and May. It is described in Haslam *et al*. (1977) as found in cultivated places and sometimes planted. Lanfranco(1989) states that *Convolvulus tricolor* subsp. *cupanianus* is a rare plant with a restricted distribution in both the Maltese Islands and the Mediterranean region with Sicily and Malta the only native regions in Europe for the subspecies; and found in steppes and waysides (Lanfranco, 2015). Pictures shown above were taken at Wied Rini, Baħrija by Raymond Galea in April 1996. The species was seen at is-Simar nature reserve in the 1990s (Casha, un-published material).

Bindweed Family Convolvulaceae



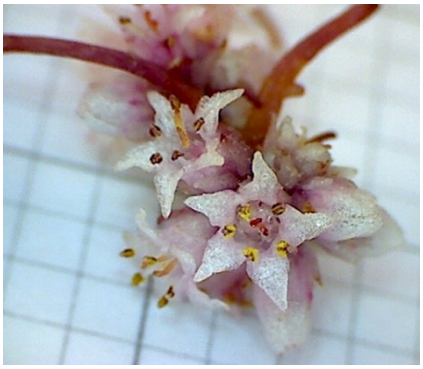


Mediterranean Bindweed/Cress *Cressa cretica*
Kressa

An erect or ascending greyish-green hairy herbaceous perennial. Leaves are dense, alternate, and ovate to lanceolate. Flowers arise from leaf axil, forming rounded terminal clusters, white or yellowish, with protruding stamens. Flowers have short tube and 5 petal lobes. Fruit an ovoid capsule with 1 seed. Plants are often moist with salt water. Scarce-frequent, confined to saltmarshes, clay and moist fine soil near the coast, May to September.

Bindweed Family Convolvulaceae





Common Dodder *Cuscuta epithymum*
Pittma

An annual parasitic plant. Mass of long and slender, thread-like purplish or reddish (also yellowish) stems scramble on and entwine shrubs and other plants, taking up their sap. The flowers are small and have 5 pointed triangular petal lobes in clusters, pale violet, pale pink or white. The flower tube slightly exceeds the calyx. Hosts include the Mediterranean Thyme *Thymbra capitata*, Maltese Spurge *Euphorbia melitensis*, Shrubby Kidney Vetch *Anthyllis hermanniae*, and Sea Squill *Urginea pancration*. The Dodder may represent some threat to shrubs on which it parasitizes. Common in garigue and other habitats, and it flowers mostly in spring, March to May, but also earlier in warm weather, even from January. Mifsud (www.maltawildplants.com) and Lanfranco (2015) also describe the **Western Field Dodder** *Cuscuta campestris* Pittma tal-Amerika/Pittma tal-Għelieqi as a rare naturalised alien. This has white flowers. Charles Gauci saw and photographed this species at L-Imselliet (pers. comm., 2011).

Bindweed Family Convolvulaceae





Blue Morning Glory/Oceanblue Morning Glory/Blue Dawn Flower *Ipomoea indica*
Kampanella

A hairy robust herbaceous perennial climber, leaves stalked and alternate, and are deeply 3-lobed. Flowers axillary, stalked and are large and showy often blue to violet and fading to pink, but can also be white. The calyx has fine hairs on the teeth. Cultivated for ornament and sometimes found naturalised, native of the tropics. Flowers mainly from April to November. Other *Ipomoea* species can be locally found in cultivation. The name *Ipomoea indica* means worm-like (*Ipomoea* = in Greek) and of India/the Indies (*indica*= in Latin).

Bindweed Family Convolvulaceae





African Boxthorn/Cape Boxthorn/Boxthorn *Lycium ferocissimum* Għawseġ Feroċi

A spiny shrub with pale greyish stems, bark fissured on older stems. Leaves mostly in clusters, or are alternate, and shortly-stalked, often broadest above the middle, more or less spatulate, or elliptical, sometimes fleshy. Leaves reduced in summer, plant sometimes becomes leafless. Flowers white with violet marks at the centre, stalked and solitary or in 2-3, in the axils of the leaves, funnel-shaped, the petals fused below and with 5 free lobes. Stamens 5 protruding out from flower, with hairy filament bases. Fruit a globose berry first green then ripening to yellowish and eventually bright orange-red, with a number of yellowish seeds inside. Flowers and berries noticed all year round, especially spring and autumn. Native to South Africa. The name comes from the Greek *Lycium* meaning thorny tree, and the Latin *ferocissimum* meaning very savage or fierce. In Malta these plants originated as seeds brought from Tunisia and have been planted as part of the hedge along the perimeters of Is-Simar and Għadira nature reserves in the 1990s, where the species has naturalised. Naturalised specimens can also be seen growing outside the nature reserves. These thorny shrubs are invasive and seedlings grow rapid and profusely, obliterating other smaller and weaker plants.

Potato Family Solanaceae




Southern Boxthorn/Southern Tea-tree *Lycium intricatum* Għawseġ

A spiny summer-deciduous shrub. Leaves small and mostly in clusters, more or less spatulate or elongate-elliptical to almost linear. Flowers are funnel-shaped, small, and purplish with dark patches at centre, with relatively long tube. Stamens attached to tube of flower, not protruding out of the flower, and have hairless filaments. Calyx is small. Flowers occur singly or in small groups of 2-3. Berries are generally black when mature. Rare, found in valleys and rdum, e.g. Wardija, L-Aħrax, and it flowers from autumn to spring-summer. Previously recorded as *Lycium europaeum*, e.g. Borġ, 1927; Haslam *et al*., 1977.

Potato Family Solanaceae



Chinese Boxthorn/Chinese Tea-tree/Chinese Wolfberry *Lycium chinense* Għawseġ taċ-Ċina

A shrub with pale greyish stems and few slender spines. Leaves are alternate or in small clusters. Summer deciduous or leaves reduced in summer. Flowers are dark pinkish-purplish, becoming brown on drying, solitary or in small clusters at the leaf axils. Calyx is small and with short lobes. Stamens protrude out of flower and at their bases are tufts of hairs. Fruit is a red berry. Very rare; used to occur at Mdina but recently destroyed by works carried out. Flowers from April to August. Native to East Asia. Naturalised in Valletta main ditch in 1905 and spread to other ditches and fortifications (Haslam *et al*., 1977; Borġ, 1927).

Potato Family Solanaceae




White Henbane *Hyoscyamus albus* Mammażejża/ Banġ

A densely sticky and glandular-hairy greyish-green annual or herbaceous biennial - perennial. Leaves with stalk and are toothed to lobed to pinnately-lobed. Flowers occur in leafy spike-like inflorescence. Flowers yellowish-white, tubular, with 5 petals, joined almost all the length. They have a greenish or purplish base and the stamens are slightly protruding or not. The anthers have abundant pollen, and the filaments are purple. Calyx hairy, toothed. Seeds numerous in capsules enclosed within the calyx. Frequent to common, in disturbed habitats including urban areas and old walls, also in natural areas in rdum, flowering from around October to June, but also in other months.

Potato Family Solanaceae





Black Nightshade *Solanum nigrum* Għeneb id-Dip/Żina tal-Foqra - A hairy annual with ascending or erect stems and ovate to diamond-shaped stalked leaves. The margin is usually weakly toothed to weakly lobed. Flowers are star-shaped, in small clusters of up to 10, with 5 white petals and yellow anthers at the centre. The cluster of flowers has a main stalk (peduncle). Fruit a globose berry, first green then black. Common in disturbed habitats and flowers and berries can be found all year round.

Potato Family Solanaceae




Hairy Nightshade/Yellow Nightshade *Solanum villosum* subsp. *miniatum* (*Solanum nigrum* subsp. *villosum*, *Solanum luteum* subsp. *alatum*) Tuffieħ is-Serp

A hairy annual similar to the Black Nightshade *Solanum nigrum* but its berries are orangish-red, and leaves often toothed. Flowers are in clusters of 3-5. Common in disturbed habitats, flowering all year round. Possibly an archaeophyte (Lanfranco, 2015). The **Silver Leaf Nightshade** *Solanum elaeagnifolium* is reported for Malta by Lanfranco, G. (1969) at the harbour area, and recently by Sciberras & Sciberras (2010a) at St. Paul's bay bypass. See page 337.

Potato Family Solanaceae





Shrub Tobacco/Glaucous Tobacco *Nicotiana glauca* Tabakk tas-Swar/Siġra tat-Tabakk/Tabakk Isfar/Tabakka

A greyish-green hairless shrub to small tree with alternate, stalked ovate to lanceolate or elliptical leaves. Flowers are tubular and occur in clusters, yellow. Calyx toothed, much shorter than the tube. Fruit a dehiscent capsule. Frequent, grows in disturbed habitats including on building rubble and in building sites. Flowers can be found all year round. Indigenous to South America.

Potato Family Solanaceae





Greater Thorn-apple/Moonflower/Angel's Trumpet/Stinkweed/Prickly Burr *Datura innoxia* (*Datura meteloides*) Siġret ir-Rizzi/Stramonju Abjad

Annual to short-lived perennial, generally grows low with its stems spreading out. Stems and underside of leaves are covered by fine hairs. Leaves are ovate, alternate and stalked, flowers white, large and tubular (trumpet-shaped), solitary emerging from leaf axils on short stalks. They have 5 fused segments, and are erect at first but eventually become drooping. The flowers may be tinged with purple. Calyx is tubular and 5-toothed, shorter than petal tube and its lower part persist as a cup/disk under the fruit. The stamens are 5, not protruding. Fruit a rounded capsule, nodding, covered with soft spines and splits up open in 4 parts to release numerous pale brown seeds. Flowers in summer and autumn, from around May onwards. Poisonous, native to Central America cultivated and sometimes found naturalised especially in disturbed areas even urban. Not common in the wild. **Jimson-weed** *Datura stramonium* Stramonju is a casual alien (Lanfranco, 2015).
Other members of the Potato Family include the **Tomato** *Lycopersicon esculentum* (*Lycopersicon lycopersicum*) Tadam and **Potato** *Solanum tuberosum* Patata. Both species are extensively cultivated in fields for their fruits (Tomato) and their tubers (Potato). Naturalised specimens of Tomato can sometimes be found especially near fields.





Tomato, flowers and green fruits (ripen to red)

Potato Family Solanaceae




Ivy/English Ivy *Hedera helix*
Liedna

Perennial evergreen climber, stems putting out adventitious roots for attachment. The leaves are of 2 kinds: those on stems that do not flower are palmately-lobed to heart-shaped; on flowering stems the leaves are elliptical, ovate or diamond-shaped. Flowers are greenish, with 5 green petals and 5 yellow anthers borne around the stigma that is surrounded by a nectar-secreting disk. Sepals are small. Inflorescence branched, and the flowers are in umbel-like clusters. After flowering, rounded berries are produced; at first these are green then ripen to black. Flowers in October and berries can be seen around November. These turn black by December/January. Uncommon in the wild mainly in wooded areas, maquis and valleys, but also occurs in gardens in different cultivars.

Ivy Family Araliaceae




Japanese Pittosporum
Pittosporum tobira
Pittosporum

A small tree or a shrub with evergreen, leathery alternate leaves. Leaves stalked and with curved margins, paler beneath. They are broadest above the middle (more or less spatulate) and the tip is usually rounded. Flowers are at first white then turning yellowish, scented, in flat-topped clusters, petals 5. Fruit a rounded capsule with reddish-brown seeds and a sticky liquid inside. Non-native, commonly planted in gardens as an ornamental plant, sometimes found naturalised such as in garigue, maquis and valleys. The flowers appear in spring-summer, followed by the fruits. Native to the East (China, Japan, Korea).

Pittosporum Family Pittosporaceae




Sea Holly *Eryngium maritimum*
Xewk tar-Ramel/
Xewk tal-Ħobż/
Eringu

A spiny greyish-green herbaceous perennial. Leaves are leathery and hard, lobed and with wavy, spiny margins. The lower leaves are stalked, upper ones smaller and sessile. The plant branches to give a spreading inflorescence of rounded flower heads surrounded by spiny bracts. Localised to sand dunes, mainly at Ramla tat-Torri in Malta and Ramla l-Ħamra in Gozo. It is rare but may be frequent where it grows, flowering from June to October-November.

Carrot Family Apiaceae (Umbelliferae)




Spiny Echinophora/Prickly Parsnip/Prickly Samphire
Echinophora spinosa
Ekinofora/Bużbież Xewwieki tar-Ramel

A spiny and somewhat hairy greyish-green perennial with deeply divided fleshy leaves. The leaves are rigid, and grooved from above and have spiny tips. Flowers white in umbels and the bracts are spiny. Outer petals are larger than inner ones. Fruits have persistent erect styles, and enclosed in woody spiny structures. Rare and endangered, and occurs mainly at Ir-Ramla l-Ħamra sand dune, flowering from June to September-October. Sommier & Caruana Gatto (1915) described it as rare at Marfa peninsula and Ramla l-Ħamra.

Carrot Family Apiaceae (Umbelliferae)




Shepherd's Needle/Venus' Comb *Scandix pecten-veneris* Maxxita

A slender erect or ascending small annual with grooved stems. Leaves finely divided, (2-3 pinnate) with several narrow linear segments, their sheathing bases hairy on the margins. Flowers are white, without sepals, in umbels. Umbels carry few rays. Outer petals of the flowers usually enlarged (radiate). Fruit capsules are elongate and narrow, with long beaks, pointing upwards. Occurs in cultivated and abandoned fields and also along watercourses, January-February to May.
Frequent to common.

Carrot Family Apiaceae (Umbelliferae)





Alexanders
Smyrnium olusatrum
Karfus il-Ħmir/Tursin il-Ħmir

An aromatic and erect hairless herbaceous biennial having grooved stems becoming hollow when mature. Upper branches are often opposite. Leaves shiny and dark green, pinnate, leaflets mainly divided in 3 toothed segments, and a segment can be further divided in 3. Lower leaves stalked. Upper leaves are smaller. Leaves have sheathing bases. Flowers are small, yellowish-green in rounded umbels, scented. Flowers lack sepals. Fruit black, ridged, persists on the dry stalks even in winter. Often a robust plant, and common in wooded areas, maquis, valleys, and field margins, also roadsides, especially in shady situations, and flowering from January to March- April. "Possibly introduced during the Roman Period" (Lanfranco, 2007); "Native or archaeophyte" (Lanfranco, 2015). Young leaves and shoots were in the past consumed.

Carrot Family Apiaceae (Umbelliferae)




Southern Burnet-saxifrage *Pimpinella peregrina* Sensiela

A hairy biennial with erect, finely grooved and branched stem. Lowest leaves undivided, then the next leaves are pinnate with rounded toothed leaflets. The lower leaves are often purplish and dry/drying when plant is in flower or to flower. Upper leaves more finely divided. Flowers white in umbels, rays several, without bracts. Flower head nodding before flowers open. Fruit is hairy. Frequent in abandoned fields, rocky ground including valleys, also in rdum, April to June. The **Anise** (**Sweet Cumin**, **Aniseed**) *Pimpinella anisum* Anisi or Ħlewwa is cultivated for its fruits.

Carrot Family Apiaceae (Umbelliferae)




Rock Samphire/Sea Samphire *Crithmum maritimum* Bużbież tal-Blat/Bużbież il-Baħar

Perennial, with woody base and herbaceous flowering stems. Leaves and stem greyish-green, the leaves fleshy and wide, devoid of hairs. These are pinnate, the leaflets cut into elongate and flat segments. Inflorescence is an umbel, the flowers have yellowish-green petals and the sepals are minute. Bracts and secondary bracts present. Flowers found mainly in summer and autumn, from July to October, sometimes later on. Flowers as early as January have also been seen. The yellowish or purplish fruits have prominent ridges. Grows by the sea, mostly on rocky shores, cliffs, and in rdum and is common.

Carrot Family Apiaceae (Umbelliferae)




Mediterranean Water Dropwort/Round-headed Water Dropwort *Oenanthe globulosa* Karfus tal-Wied

A branched herbaceous perennial with hollow ascending grooved stems. The lower leaves are pinnate with the leaflets pinnate again (2-pinnate). Upper leaves pinnate or undivided, and with narrower segments. Flowers white in umbels. The outer flowers have larger petals. Fruits rounded and with ridges. Scarce to rare in watercourses, March to May. The plant has declined in recent years owing to great disturbances to watercourses. Poisonous.

Carrot Family Apiaceae (Umbelliferae)




Fennel *Foeniculum vulgare*
Bużbież/Busbies

A hairless and tall greyish-green aromatic herbaceous biennial or perennial with finely grooved stems. Leaves finely dissected into narrow thread-like segments. The stalk of the leaf is sheathed at base. Flowers yellow, in umbels. Bracts are absent. Fruits ridged. The fruits are also aromatic, and those of the cultivated form widely used in cooking to flavour food. A typical late spring/summer flowering plant, especially of roadsides, abandoned fields, tracks, and other disturbed habitats. Common, flowers from May to October with some flowers found later on. Haslam *et al.* (1977) describe 2 subspecies - *vulgare* (fruits sweet tasting) and *piperitum* (fruits sharp tasting).

Carrot Family Apiaceae (Umbelliferae)





Kundmannia *Kundmannia sicula* Kundmannja - A generally erect and hairless dark green herbaceous perennial, leaves with toothed segments. Lower leaves are pinnate, some with the leaflets pinnate again (2-pinnate). Uppermost leaves are deeply cut in narrow segments. Flowers are yellow in umbels with unequal rays, bracts numerous and linear, reflexed. The fruits are narrow, almost linear in shape and ridged. Scarce, found in fields, rocky ground, also in shady areas under trees. Flowers in April and May. Lanfranco, G. (1969) describes the species as frequent in “moist places especially West and South Malta”.

Carrot Family Apiaceae (Umbelliferae)




Spear-leaved Hare’s-ear/False Thorow-wax *Bupleurum lancifolium* Widnet il-Fenek

An erect hairless annual with elliptical, ovate or lanceolate leaves encircling the stem (perfoliate). Umbels have few rays (generally 2-3, rarely 5). Flowers with yellow petals clustered in umbels, with rounded secondary yellowish-green bracts (bracteoles) that are longer than the flowers. These bracteoles form a cup around the cluster of flowers. Fruits are egg-shaped, with warts (growths). Cultivated and abandoned fields, dry open areas, March to May. Scarce, formerly frequent. The **Grey Hare’s-ear** *Bupleurum semicompositum* Widnet il-Fenek Irqiqa is also described as rare for the Maltese Islands (Haslam *et al*., 1977; Borġ, 1927). Lanfranco (1989) states that it is confined to the Rdum tal-Madonna (Marfa peninsula). Used to occur at the Citadel in Gozo but destroyed by works carried out there (Lanfranco, 1981).

Carrot Family Apiaceae (Umbelliferae)




Fool's Water Cress/Procumbent Marshwort/European Marshwort *Apium nodiflorum* Karfus tal-Ilma/Karfus tal-Wied

A hairless herbaceous perennial with hollow prostrate or ascending grooved stems. Stems give out roots at the nodes. Leaves pinnate, the segments mostly ovate to lanceolate and often lobed (especially the older leaves), margin toothed. Flowers are greenish-white, in umbels, with a short stalk less than the rays or sessile. Secondary bracts present under the flower umbels. Frequent to common in watercourses, flowering from April onwards, till the water and ground dries out. The **Wild Celery** *Apium graveolens* Karfus is widely cultivated and sometimes found naturalised. According to Lanfranco, G. (1969) it is a true native and occurs as a rare plant along watercourses in the higher regions of Malta. Sommier & Caruana Gatto (1915) reported it along water courses as "here and there" and give 4 examples of sites in Malta and 1 place in Gozo (Xlendi). Mifsud (2019) reports it as naturalising in 2 valleys in Gozo (Wied Sara and Wied il-Belliegħa). The Wild Celery does not have bracts or secondary bracts.





Wild Celery *Apium graveolens* is strongly aromatic, and has solid and grooved stems




Ridolfia *Ridolfia segetum*
Bużbież tal-Għelieqi/
Bużbież il-Qamħ/Xibt

A hairless greyish-green often erect annual with a foetid smell when crushed. Leaves are pinnate, the leaflets finely dissected into thread-like segments, upper leaves reduced. Flowers yellow, sepals, bracts and bracteoles (secondary bracts) absent. Fruits elongated (cylindrical) and ridged. Scarce to frequent in fields, clay soil, April to June.

Carrot Family Apiaceae (Umbelliferae)




Bullwort/Large Bullwort/False Bishop's Weed/False Queen Anne's Lace/Lace Flower
Ammi majus Dakra

A hairless erect annual with finely grooved stems, the leaves cut in toothed segments (1-3 pinnate). Lower leaves with mostly elliptical segments, upper leaves with narrower divisions. Flowers white in umbels with outer ones radiate (with unequal petals). Rays of umbel are numerous, erect to spreading, and slender. Bracts present and also numerous, cut in narrow segments. Bracteoles (secondary bracts) also divided in narrow (linear or lanceolate) divisions, equal to the secondary rays. Fruits ridged. Frequent, flowers April (or earlier) to June, in valleys. Described as frequent in "cultivated and waste places" by Haslam *et al*. (1977); Lanfranco, G. (1969) describes it as frequent especially in arable land; "frequent and sometimes common in fields and valleys and on waste lands in Malta and Gozo" - Borġ, 1927.

Carrot Family Apiaceae (Umbelliferae)




Small Bullwort
Ammoides pusilla
Dakra Żgħira

A small hairless erect annual with finely divided leaves. Lower leaves with short narrow segments, upper leaves with longer thread-like segments. Flowers white in umbels on unequal slender rays. Bracts absent or few and fall off early, secondary bracts few linear-lanceolate or spatulate. The small fruits have ridges. Dry open habitats, rocky valleys, March to June, frequent to common.

Carrot Family Apiaceae (Umbelliferae)





Giant Fennel/Ferule *Ferula communis* Ferla/Qasbija

An erect, tall and robust herbaceous perennial, leaves large and with conspicuous sheathing bases. Leaves are shiny green, 3-4 times pinnate so that the leaflets are finely divided into narrow segments. The plant produces a tall flowering stalk with many yellow, small and smelly, sticky flowers in large umbels. Before an umbel opens, it is closely associated with the upper leaves that are reduced to a conspicuous sheath. The umbel does not have bracts, but secondary bracts are present, few and fall off in a short time. Fruit is brownish, rounded to elliptical and flattened, and with a thin wing. The flowers attract lots of insects including flies and wasps. On drying the stem becomes hard and somewhat woody. Flowers from January-February to April, and is common in abandoned fields, roadsides, garigue and arid rocky ground, valleys, rdum. Brullo *et al*. (2018) describes Maltese plants as a new species ***Ferula melitensis***.

Carrot Family Apiaceae (Umbelliferae)





Hartwort/ Mediterranean Hartwort *Tordylium apulum* Ħaxixet it-Trieraħ

An erect and hairy branched annual with grooved stem and pinnate toothed leaves. Lower leaves long stalked and with ovate to circular segments, upper leaves with narrow linear segments and shortly stalked almost sessile. Flowers white, in umbels. The outer (marginal) flowers have a petal larger than the other petals and divided in 2 parts (appearing as 2 petals). Bracts and secondary bracts are narrow and reflexed or spreading. Fruit is rounded but flattened. Common in garigue and fields, from February to April.

Carrot Family Apiaceae (Umbelliferae)





Knotted Hedge-parsley/Knotted Bur-parsley *Torilis nodosa* Tursin Xewwieki

An ascending to erect or prostrate hairy annual, stems can be purplish. Leaves pinnate, the leaflets deeply divided into narrow segments. Flowers white in sessile or short stalked umbels. The flowers (and fruits) appear as a clustered head and not as an umbel inflorescence. Fruits are bristly on the outer parts, and with warts on the inner parts. Scarce, in shaded areas, also fields, gardens, March to May. The **Spreading Hedge-parsley** *Torilis arvensis* is also reported as rare from a few sites, e.g. Mistra (Haslam *et al.*, 1977; Borġ, 1927).

Carrot Family Apiaceae (Umbelliferae)





Wild Carrot/Queen Anne's Lace *Daucus carota* Zunnarija Salvaġġa/ Sfunnarija/Karrotta Salvaġġa/Bejt id-Durrajs



A variable erect and roughly hairy (hispid) herbaceous biennial (or annual). The stems have fine grooves and the leaves are stalked, pinnate and cut into narrow segments. Upper leaves are shorter. Flowering stalks carry white flowers in umbels. One or more flowers at the centre of the umbel are often purplish. The flowers can also be purplish. The bracts are slender and divided in narrow segments. Secondary bracts (bracteoles) are similar. The umbels contract during fruiting, resembling a bird's nest. The fruits are small, with an outer spiny margin and two spiny rows in the centre, and are aromatic. The spines are as long as the width of the fruit. Common in garigue, rocky valleys, abandoned fields, country roadsides, other disturbed ground. Flowers from March to July, but flowers can be found earlier or later in the season. *Daucus carota* subsp. *sativus* Zunnarija (a major food crop) and the **Coriander** *Coriandrum sativum* Kosbor are all cultivated for food or for flavouring.

Carrot Family Apiaceae (Umbelliferae)

Sea Carrot/Cliff Carrot *Daucus gingidium*
Zunnarija tal-Baħar/Zunnarija tal-Irdum

Often a robust hairy herbaceous and erect biennial or perennial with white flowers in large mostly rounded umbels. Leaves stalked, pinnate and cut in segments, shiny and fleshy. Bracts and secondary bracts cut in narrow divisions. The fruiting head does not contract into a "bird's nest" but becomes mostly straight. Fruits have ridges and short spines. Common in coastal areas, flowering mostly in spring, March-June, or later, sometimes even in winter.





Note: The Wild Carrot *Daucus carota* and the Sea Carrot *Daucus gingidium* belong to the *Daucus carota* group (Pignatti, 2002), with both plants having subspecies. Separation between the 2 species is still not clear and populations of wild plants exist that have characteristics of both (Pignatti, 2002). Lanfranco (2007) advises that our coastal populations of *Daucus* should be investigated carefully and compared with other *Daucus* from other parts of the Mediterranean. Lanfranco (1996) also states that several insufficiently studied varieties for *Daucus carota* are known. Another *Daucus* reported for the Maltese Islands is the **Lampedusa Carrot** *Daucus lopadusanus* Zunnarija tal-Blat (Lanfranco, 2007). The same author continues that this might only be an ecological variant of *Daucus carota* and that it grows flat, with shortly-stalked central umbels and horizontal radiating branches with stalked umbels, and known from Malta and Comino, and possibly occurs also on Gozo. It is endemic to the Maltese and Pelagian islands (Lanfranco, 2015). Grows in coastal rocky areas. The **Sand Carrot** *Pseudorlaya pumila* Zunnarija tar-Ramel is also recorded from sand dunes and sandy beaches. Haslam *et al*. (1977) described it as locally frequent. Lanfranco (1989) records it as "seems to be confined to Ramla l-Ħamra, Gozo, where it is rare" and that it has disappeared from Mellieħa Bay and Ramla tat-Torri due to habitat disturbance. It is now a rare plant and endangered and recorded only from Ramla l-Ħamra in Gozo. Tabone (2008) found 6 plants there in 1995, but these plants were no longer found and the same author states that the species could be extinct. The Sand Carrot is a small hairy prostrate annual with finely divided (2-3 pinnate) leaves and white or pinkish flowers in umbels. Bracts and secondary bracts are present and the fruit is elliptical and spiny. Another member of the Apiaceae is the **Mediterranean Bifora** *Bifora testiculata* Kosbor Selvaġġ/Sorm il-Patri/Bumnieħer. According to Lanfranco (1989) this plant was fairly frequent and associated with cereal crops, but now probably extinct as it has not been recorded for several decades. It is an annual with small white flowers and testicle-shaped pods, hence *testiculata*. The **Kapnophyllum** or **Krubera** *Capnophyllum peregrinum* was recorded at Għajn Riħana by Borġ (1927) but is now probably extinct (Lanfranco, 1989). It has sessile to shortly-stalked umbels, and the flowers are white to violet-tinged.

Carrot Family Apiaceae (Umbelliferae)





Small Bellflower/Forked Bellflower
Campanula erinus Kampanula

A bristly-hairy prostrate or ascending annual, sometimes erect. Plant can be small, only a few cm. above ground. Stems branch in two's. Leaves alternate or opposite. Lower leaves are spatulate, toothed. Upper leaves also toothed, with few teeth on each side, often opposite. Flowers are small and not so conspicuous, bluish, and bell-shaped with 5 petals. They are borne solitary at the tips of stems (terminal) or axillary. Calyx with deeply divided divisions (sepals), spreading after flowering, slightly shorter than the corolla. Fruit a capsule. Frequent in garigue, on rubble walls, rocks, valleys, cultivated areas, March to May. Two other species of Campanulaceae are **Venus's-looking Glass** *Legousia hybrida* (rare) and **Trachelium** *Trachelium caeruleum* (naturalised in old gardens, e.g. San Anton and Buskett) - Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927). *Legousia hybrida* is considered as possibly an endemic variety but is now probably extinct (Lanfranco, 1989).

Bellflower Family Campanulaceae





Annual Daisy *Bellis annua*
Bebuna

A small more or less hairy annual with spatulate leaves, lower leaves with distinct petiole (stalk), and margin toothed. Head of flowers is solitary and terminal with yellow disc florets and white ray florets. Fruit is hairy but does not have pappus (tufts of hairs). Common often found growing in patches in garigue, shallow depressions that fill with water in winter, areas with short vegetation, moist areas in valleys and by watercourses, December to April.

Daisy Family Asteraceae (Compositae)





Southern Daisy/Portugal Wood Daisy/Large Daisy *Bellis sylvestris*
Margerita Selvaġġa

A hairy herbaceous perennial with a basal rosette of dark green elongate leaves that are narrowed towards the base into a winged stalk. Leaves have a toothed margin. Flower heads are solitary and terminal on a long stalk, with yellow central disc florets and white outer ray florets. The underside of the ray florets (sometimes also the upper side) is often tinged with purplish. Fruits are hairy but without pappus. Frequent to common in moist habitats in garigue, maquis and valleys flowering from October to March.

Daisy Family Asteraceae (Compositae)





Narrow-leaved Aster *Symphyotrichum squamatum* (*Aster squamatus*)
Settembrina Selvaġġa/Aster

A tall erect or ascending annual, herbaceous biennial or perennial with alternate and elongate, smooth, narrow pointed leaves. Older plants have woody stems, especially at lower parts. Stems are often purplish. Flowers are small, with pale violet outer (ray) florets and yellowish central (disc) florets, in branched inflorescence. Involucral bracts are numerous and overlapping, dark-tipped. Fruits have a pappus for wind dispersal. Common and invasive, especially in disturbed and humid places, coastal and inland, September to January. Native to South America. The first plants appeared in Malta after 1935 (Lanfranco & Lanfranco, 2003). Has probably escaped from Argotti Gardens possibly in the late 1930s (Schembri & Lanfranco, 1996).

Daisy Family Asteraceae (Compositae)



South American Fleabane *Erigeron bonariensis* (*Conyza bonariensis*) Żagħżigħa Selvaġġa

A hairy erect greyish-green annual with grooved stems, leaves elongate and narrow with a toothed margin. Flower heads are small and numerous, yellowish-white, in branched clusters. The flowers are not eye-catching. Fruits have pappus for wind dispersal. Common especially in disturbed ground and flowers can be found throughout the year. Native to South America. A similar but larger plant is the **Greater Fleabane** *Erigeron sumatrensis* (*Conyza sumatrensis*) Żagħżigħa Kbira/Żagħżigħa Twila. This plant is less greyish and grows tall often exceeding 2m, and appeared in Malta in the 1970s (Lanfranco & Lanfranco, 2003; Lanfranco, 1996; Lanfranco, 2015). Native to South America, and is now rare as a naturalised plant in the Maltese Islands.

Daisy Family Asteraceae (Compositae)




Pygmy Cudweed *Filago pygmaea* (*Evax pygmaea*)
Evaks

A small hairy greyish-whitish annual. Leaves are elongate-spatulate and flower heads occur in compact clusters. Leaves form rosettes around clusters of flower heads and exceed them. Flower heads are yellowish-green/brownish-yellow. Fruits do not have pappus. Common in garigue, paths and other open dry ground, flowering from March to May.

Daisy Family Asteraceae (Compositae)




Filago/Malta Cudweed/Broad-leaved Cudweed *Filago cossyrensis*
Filago/Kabuċinella ta' Malta

A prostrate greyish annual covered with white woolly hairs. Stems woody at base, branching and with a dense number of leaves. Leaves small, elongate (-spatulate), widest above the middle, pointed at tip, sometimes with margins recurved. The leaves are covered with hairs both below and above. Flower heads small and with tubular florets, inconspicuous, in clusters, surrounded by leaves that can be about as long. Involucral bracts have long slender divisions, yellowish. Frequent in paths, open dry ground, March to May. Endemic to the Maltese Islands and Lampedusa (Lanfranco, 2015; Lanfranco & Lanfranco, 2003). Two other species of *Filago* are mentioned as common for the Maltese Islands (Haslam *et al*., 1977; Borġ, 1927) – **Common Cudweed** *Filago germanica* (*Filago vulgaris*) and **Broad-leaved Cudweed** *Filago pyramidata* (*Filago vulgaris* subsp. *pyramidata, Filago spathulata*; sometimes *Filago cossyrensis* is regarded as a synonym of *F. pyramidata*; Lanfranco (2015) states that *Filago cossyrensis* may just be a local variant of *Filago pyramidata*). *Filago pyramidata* usually has a well developed erect or ascending main stem and a smaller number of flower head clusters. *Filago germanica* has lanceolate to linear-lanceolate leaves, widest below the middle.

Daisy Family Asteraceae (Compositae)




Eastern Phagnalon *Phagnalon rupestre* subsp. *graecum* (*Phagnalon graecum*)
Lixka Komuni

A small shrub with whitish stems. Leaves are small and narrow, broadest above the middle, upper ones sessile, green above and white below. The leaf margin is toothed and revolute (curved down). The yellowish flower heads are solitary on a long stalk without leaves. They are composed of tubular (disc) florets only. The numerous involucral bracts are narrow, somewhat pointed at tip and brownish. The fruits are tiny, greyish, and with brownish-white pappus. Like many other native shrubs, much of its leaves are reduced in the dry season. Common in garigue, rocky valleys, rdum, cliffs, flowering from February to May. The **Rock Phagnalon** *Phagnalon rupestre* (subsp. *illyricum* - Lanfranco, 2015) Lixka/Lixka tal-Blat is

frequently found in the Maltese Islands, having the involucral bracts rounded not pointed (Lanfranco, 2015,1996; Lanfranco & Lanfranco, 2003; Haslam *et al*., 1977). The **Mediterranean Phagnalon** *Phagnalon saxatile* is described from Għadira by Kramer & Westra (in Haslam *et al*., 1977).

Daisy Family Asteraceae (Compositae)







Maltese Everlasting
Helichrysum melitense
(*Helichrysum rupestre* var. *melitense*)
Sempreviva ta' Għawdex/
Sempreviva Safra

A silvery shrub with elongate, narrow and somewhat fleshy alternate leaves, widest above the middle and covered with whitish hairs. Flower heads yellow, made up of tubular (disc) florets, clustered at top of flowering stalk. Involucral bracts are overlapping, "papery" (membranous) and shiny yellow. Fruits have short hairs. Endemic, found in coastal localities in the west of Gozo, including cliffs and rocky beaches, in the Dwejra area including General's Rock, rare but frequent where it occurs. The whitish-greyish look of the plant picks it up even from a distance. Flower heads can be found from March to June. Haslam *et al*. (1977) and Borġ (1927) mention the species also from one site in Malta (Wied Babu); occurs only in Gozo and seems to be extinct in Malta (Lanfranco, 2007). The species "has not been seen in recent times" in Malta (Lanfranco, 1996).

Left picture shows the papery involucral bracts

Daisy Family Asteraceae (Compositae





Golden Samphire *Limbarda crithmoides* (*Inula crithmoides*)
Xorbett/Xorbebb/Xurbebb

A succulent hairless shrub, with fleshy finger-like, cylindrical or flattened pale green leaves, some in clusters. Larger leaves generally have 3 teeth at the tip. Older stems are woody. Flower heads yellow, with both disc and ray florets. Bracts of the involucre overlap. The fruits produced contain a pappus of brownish-white hairs (wind dispersal). Plant is green all year round, even in summer, too often standing out against the arid surroundings. It is a characteristic plant of coastal areas including low rocky shores, saltmarshes, cliffs, rdum and on disturbed ground by the sea. It can also be found inland. Common, flowers mainly from around September to November-December, but a few flower heads can be found in other months as well. Lanfranco (2015) gives the subspecies occurring locally as *longifolia*.




Sticky Fleabane/Sticky Samphire/Aromatic Inula/Large Fleabane *Dittrichia viscosa* (*Inula viscosa*, *Cupularia viscosa*)
Tulliera Twaħħal/Tulliera/Tulliera Komuni

An aromatic herbaceous shrub-like glandular perennial with a strong characteristic smell, stems are erect and woody at base. Leaves are pointed, upper ones clasping the stem, covered in hairs, and are sticky, entire or with small teeth at the margin, with or without wavy margin. Flower heads are yellow and numerous in a branched inflorescence. Flower heads have both disc and ray florets. Ray florets exceed the involucre, the involucral bracts overlapping. Fruits pale, with a brownish pappus. The plant flowers from around May-June to November-December with its best around September-October. A common plant found in various habitats, including valleys, rdum, abandoned fields and country roadsides.

Daisy Family Asteraceae (Compositae)




Stink Aster/Stinking Fleabane/Lesser Samphire *Dittrichia graveolens* (*Inula graveolens*, *Cupularia graveolens*)
Tulliera Żgħira/Żagħżigħa Safra

An erect, hairy and aromatic much-branched sticky (glandular) annual, leaves alternate, narrow and elongate. The leaves are entire or toothed, upper ones clasping stem. Lower leaves are elongate-spatulate, generally withered by flowering time. Flower heads are small and numerous, yellow with both ray and disc florets in branched inflorescence. Ray florets do not exceed or only slightly exceeding the involucre. Fruits have pale brownish pappus. Formerly common, now scarce, in open arid ground, cultivated ground, e.g. Comino, September-November.

Daisy Family Asteraceae (Compositae)




Maltese Fleabane *Chiliadenus bocconei* (*Jasonia bocconei*)
Tulliera ta' Malta/ Tulliera Selvaġġa

An aromatic and endemic herbaceous small shrub, generally resting in winter and emerging new shoots from (late winter-) spring to autumn. The plant is sticky (glandular-hairy) and is covered in small white hairs, with a strong characteristic smell (of camphor). Leaves are alternate and sessile. It produces many yellow flower heads, consisting only of tubular (disc) florets. The involucre has bracts spreading outwards. Flowers from July to November, some flowers may also be found in December. The fruits are equipped with a brownish pappus and are dispersed by the wind. Common in garigue, rocky valleys, rocky steppe, rdum and cliffs. This plant is dedicated to Sicilian botanist Paulo Boccone who first described it in 1674 as *Conyza melitensis retusis foliis* (Lanfranco, 2007; Lanfranco & Lanfranco, 2003). The first endemic plant (together with Maltese Sea-lavender *Limonium melitense*) to be described by Boccone in 1674 (Lanfranco, 1996). Previously described as *Jasonia glutinosa*.

Daisy Family Asteraceae (Compositae)



The **Common Fleabane** *Pulicaria dysenterica* Tulliera tal-Buskett and the **Mediterranean Fleabane** *Pulicaria odora* Tulliera tad-Dell are also mentioned as rare by Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927). One small population of Common Fleabane at Buskett was wiped out some years ago (early 1990s) during "cleaning" operations. Lanfranco (1989) mentions the *Pulicaria dysenterica* as confined to Buskett and Għajn il-Kbira "where, however, it is quite numerous". This species has now decreased drastically. The *Pulicaria odora* is given as probably extinct by Lanfranco (1989). The Common Fleabane flowers in summer and autumn. It is a hairy perennial, its leaves densely hairy beneath, and wrinkled. The lower leaves are dry when the plant is in flower. Its yellow flower heads have both disc and ray florets, and the fruits have a pappus of scales. Its habitat includes damp, sunny or semi-shaded areas. The Mediterranean Fleabane is similar but has the lower leaves in a basal rosette and these would still be green at flowering. It also flowers in summer and autumn. Picture above shows *Pulicaria dysenterica* pictured at Buskett in 1990.

Daisy Family Asteraceae (Compositae)





Seaside Ox-eye Daisy/Golden Star/Ox-eye Daisy *Asteriscus aquaticus* (*Nauplius aquaticus*) Għajn il-Baqra tax-Xatt/Għajn il-Baqra

An aromatic hairy annual with erect stems branched at the upper parts. Lower leaves stalked and upper ones sessile clasping the stem. The leaves are elongate-spatulate. Flower heads singly, with outer short yellow ray florets and inner disc florets. These flower heads are exceeded by soft green leaf-like bracts. Fruits have pappus. Frequent in coastal areas, rocky and sandy, April to June. Common on Comino. Sometimes plants can be small and low growing.

Daisy Family Asteraceae (Compositae)





Spiny Ox-eye Daisy/Pallenis/Golden Star *Pallenis spinosa* (*Asteriscus spinosus*) Għajn il-Baqra Xewwikija/Xewk tad-Deni

A hairy and branched erect or ascending annual or biennial with purplish stems, woody at base. Side branches usually longer than the central ones. The lower leaves are elongate and stalked, longer than those at the upper part which are sessile and clasp the stem, pointed at tip. Flower heads terminal, stalked. The yellowish disc florets are usually darker than the ray florets. Plants with darker yellow flower heads having the disc florets the same colour as the ray florets are found but are less common. The outer involucral bracts are spiny and long, exceeding the flower heads. Fruits have short scales. A common plant in garigue, rocky steppe and other rocky ground, abandoned fields, country roadsides, also in shady places under trees, flowering from March to June-July.

Daisy Family Asteraceae (Compositae)




Ambrosia/Sea Ragweed/ Common Ragweed/Demigod's Food *Ambrosia maritima* Ambrożja/Mentna

A branched, aromatic and hairy, shrub-like annual-biennial. Stems are erect, woody at base. Lower leaves are opposite, upper ones alternate. Leaves stalked and deeply cut into lobes, greyish and densely hairy from beneath, dark green from above. Flower heads are inconspicuous, male or female, but on same plant, and florets are tubular. The female flowers occur at the axils of the upper leaves below the male flowers, and consist of one floret only. The small yellow male flowers occur in drooping heads in terminal spike-like raceme inflorescence. Fruit enclosed in a woody and hardened involucre with 4-5 pointed projections. Rare and endangered in coastal (sandy) areas, e.g. Għadira nature reserve, flowering from June to November. The Sea Ragweed used to occur frequently in most sand dunes and sometimes also inland (Cassar & Stevens, 2002). Lanfranco, G. (1969) records the species as rather rare in coastal areas in the North West of Malta, and Borġ (1927) as frequent in sandy places close to the sea shore and sometimes inland. The Sea Ragweed is today one of our most endangered plants. It occurs at Għadira, including a small and fragile population outside Għadira nature reserve, threatened by farming activities[now probably extinct there -2016]. The author has conserved the species in the nature reserve, and the plant was increasing by seedlings growing on their own (left picture) in several parts of the sand-dune remnant. The action plan (2009-2013) involved gathering seeds from plants at Ghadira and planting the resulting seedlings. In 2020 however only a handful of plants and very few seedlings were present in the reserve. Tabone (2007) records 3 plants growing at Wied Sara in Gozo (the only present record outside Għadira).



Daisy Family Asteraceae (Compositae)

Cocklebur/Rough Cocklebur *Xanthium strumarium* - A branched and hairy annual with long-stalked triangular to ovate rough leaves. The leaves are lobed and with a toothed margin. Flower heads terminal or axillary, greenish, inconspicuous, of tubular florets, male or female on the same plant, the male above the female. The female flowers occur in pairs. The fruit is formed by the involucre that has spines and hooks. Grows in watercourses, frequent to common where it occurs, and flowers in summer, from around July to October. The plant is probably native to North America (Blamey & Grey-Wilson, 1993), or South America (Haslam *et al*., 1977). Its origin is unknown (Schönfelder & Schönfelder, 1990).





Daisy Family Asteraceae (Compositae)





One specimen of the **Spiny Cocklebur** *Xanthium spinosum* has been found by Mifsud (2009) at Mġarr ix-Xini in Gozo. This plant has been described from Marsa, Addolorata Cemetery, and Marsalforn (Haslam *et al*., 1977; Borġ, 1927). It has 3-forked yellowish spines at the leaf bases. Species still present at Mġarr ix-Xini in 2015 (Casha, pers. observations, 2015).

Daisy Family Asteraceae (Compositae)





Maltese Sea Chamomile/ Prostrate Chamomile *Anthemis urvilleana* (*Anthemis secundiramea* subsp. *urvilleana*) Bebuna tal-Baħar

An endemic and small prostrate to ascending aromatic annual, with alternate and fleshy leaves. Stems can be purplish. The leaves are pinnately-lobed (to pinnate-like, with the lobes often lobed again). Flower heads are solitary with a yellow centre (disc florets), and white ray florets. The disc florets are not entirely surrounded by the ray florets. Upper involucral bracts are tipped brownish. The Maltese Sea Chamomile is common and several plants are often found growing together in a patch, in coastal garigue, cliff edges, rdum and other coastal ground. Flowers from February to May. "Endemic to the Maltese Islands. Related forms grow in Sicily and surrounding islands" (Lanfranco, 2007). The Maltese Sea Chamomile is one of a small group of species found in the small islands around Sicily and is named after botanist D'Urville. This French botanist and explorer was the first to remark about the species after stopping in Malta and collecting samples of the plant (Lanfranco & Lanfranco, 2003; Lanfranco, 1996).

Daisy Family Asteraceae (Compositae)





Corn Chamomile *Anthemis arvensis* Bebuna tar-Raba'

An ascending to erect and branched aromatic hairy annual, sometimes herbaceous perennial. Leaves are finely divided, with short segments. Flower heads are solitary, with yellow disc florets and white ray florets on long stalks. Involucral bracts are hairy and have transparent to brownish (membranous) margins. Fruits have vertical ribs (ridges) and a "ring" (reduced pappus) at the top. Scarce-frequent in garigue and fields, March-April to May. Two subspecies are recorded – *arvensis* and *incrassata* (Haslam *et al*., 1977). The **Woolly Chamomile** *Anthemis tomentosa* is a woolly-hairy annual and has been recorded from sandy places by the sea (Sliema and Comino); **Stinking Chamomile** *Anthemis cotula* records come from fields at Marsa, Sliema, Floriana and Pieta (Haslam *et al*., 1977; Borġ, 1927). The **Dark Chamomile** *Chamaemelum fuscatum* (*Anthemis fuscata, Anthemis praecox*) Kamumilla Rari is probably extinct (Lanfranco, 1989).

Daisy Family Asteraceae (Compositae)





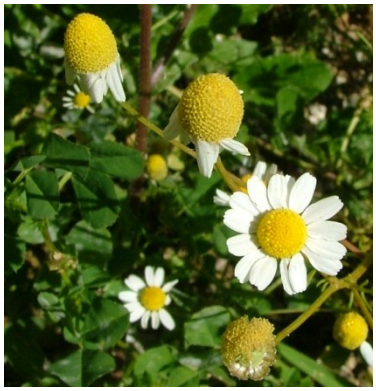


White Anacyclus
Anacyclus clavatus
(*Anacyclus tomentosus*)
Anaċiklus

An ascending to erect hairy annual with grooved stems and finely dissected leaves. Flower heads are showy, somewhat scented, with yellow disc florets and white ray florets. These flower heads are solitary and on a hairy stalk that generally thickens at fruiting. The involucral bracts have purplish margins. Fruits do not have pappus. Scarce to rare but can be frequent where it occurs, in disturbed habitats, open sunny areas, e.g. Mellieħa, Ta' Qali, Xemxija, March to June. The **Yellow Anacyclus** *Anacyclus radiatus* Anaċiklus Isfar is mentioned by Borġ (1927) from St. George's Bay and Għajn Dwieli. The ray florets are yellow.

Daisy Family Asteraceae (Compositae)







Chamomile/Scented Mayweed *Matricaria chamomilla* (*Matricaria recutita*, *Chamomilla recutita*)
Kamumilla

An ascending to erect aromatic hairless annual. Leaves alternate and finely divided, flowers with yellow central disc florets and white ray florets. The central disk is conical and the ray florets eventually become reflexed (bent downwards). The flower heads have bracts with a brownish membranous margin. Fruit is very small, greyish-brown, pappus absent or very short. Scarce in disturbed areas such as roadsides and fields, March to May. Lanfranco (1996) describes it as frequent and mostly to be found in inhabited areas. Haslam *et al*. (1977) describes it as a "weed in old gardens and waste places but not common". Lanfranco, G. (1969) describes it as frequent in East Malta. Borġ (1927) states that it is not common and was "often cultivated for use in domestic medicine". Scale of large square in photo above is 10mm x 10mm.



The ray florets are also reflexed in early morning; later on the flowers open fully during the day

Daisy Family Asteraceae (Compositae)



Golden Chamomile/Golden Mayweed *Matricaria aurea* (*Chamomilla aurea*) Kamumilla Għawdxija/Kamumilla Nana

A small inconspicuous aromatic annual with ascending stems and finely-cut leaves with slender segments. Flower heads yellow and aromatic, consisting only of disc florets, at the top of the stem (terminal). Very rare, known from at least 2 sites in Gozo, including at Iċ-Ċittadella, growing on disturbed ground. Flowers in spring, February to May. "Plants from the Maltese Islands, Lampedusa and Cyprus may belong to a distinct form" Lanfranco, 2007. The picture shows *Matricaria aurea* only a few cms above ground growing with *Sagina* sp. Photo taken at Iċ-Ċittadella in April 2013

Daisy Family Asteraceae (Compositae)





Crown Daisy *Glebionis coronaria* (*Chrysanthemum coronarium, Pinardia coronaria*) Lellux/Żigland/Margerita Safra

An erect and branched annual with an unpleasant aromatic scent and deeply pinnately-lobed alternate leaves with the lobes divided again. Flower heads large and showy, the disc and ray florets yellow, sometimes with ray florets having the base yellow but the rest white or cream (variety *discolor*). These flower heads stand solitary and terminal on thickened stalks. Involucral bracts have membranous brownish margins and are overlapping. Fruits of two kinds, winged. Common in disturbed ground such as roadsides, rubble, fields and field margins, sometimes covering whole surface of fields. Flowers from (November-) December to June. Lanfranco (2015) states that it is probably an archaeophyte and that in Gozo it is also known as Bebbuna.





Left picture shows fruit heads, far left picture variety *discolor*

Daisy Family Asteraceae (Compositae)

Corn Daisy/Corn Marigold *Glebionis segetum* (*Chrysanthemum segetum*) Lellux ta' Għawdex/Lellux tar-Raba'/Żigland ta' Għawdex

A hairless often greyish-green annual with a simple or branched stem. Leaves are alternate and somewhat fleshy, lower and middle ones toothed to pinnately-lobed, uppermost ones sub entire to entire and sessile. Flower heads yellow on relatively long stalks that thicken at the top. Ray florets and disc florets are yellow, sometimes orangish. Involucral bracts are overlapping, with membranous brownish margins. The fruits of disc florets and of ray florets are different, but all with vertical ribs. Occurs mostly in Gozo along paths and arable fields, where it is scarce to rare; and





in Malta it is rare. Flowers in spring, March to May. According to Lanfranco (2007) it has decreased severely since the 1980s and it is now rare but was formerly frequent. Scale 20mm x 20mm.

Corn Daisy pictured in Gozo

Daisy Family Asteraceae (Compositae)





Cottonweed/Sea Cudweed *Otanthus maritimus* (*Filago maritima*, *Diotis maritima*)
Santolina/Bajda tar-Ramel

An aromatic herbaceous perennial with a dense cover of white hairs giving the plant a silvery appearance. Stems are spreading or ascending and somewhat woody. Leaves are sessile and alternate, elongate or spatulate, margin toothed or entire. Florets are yellow, tubular (disc) florets without ray florets, in rounded flower heads. These heads are in clusters on short stalks, terminal. Involucral bracts also have white hairs. Fruits are without pappus. A sand dune species that have suffered as a result of the destruction, degradation, lack of awareness, and mismanagement of sand dunes including "beach cleaning" operations. Its current status in the Maltese Islands is extinct. It flowers from June to September or later. Tabone (2007) recorded it from Ramla tat-Torri (1992) in Malta and from Xatt l-Aħmar (2002) in Gozo. The same author remark that the species is no longer found in these localities. Pictures taken in Sicily.

Daisy Family Asteraceae (Compositae)





Silvery Ragwort/Cineraria/Sea Ragwort *Jacobaea maritima* subsp. *sicula* (*Senecio bicolor*, *Senecio cinerari*a subsp. *bicolor*)
Kromb il-Baħar Isfar

A shrub with pinnately-lobed and somewhat fleshy alternate leaves, silvery (white-hairy) from the underside and green from above. They often fold inwards during hot weather to conserve water (by reducing surface area, and the silvery surface reflects sunlight). The young stems are also silvery. Inflorescence branched, flower heads in clusters, all ending at the same level (corymb). Flower heads yellow, with both disc and ray florets, fruit with whitish pappus for wind dispersal. Common in coastal sites and also inland, in garigue, rocky valleys, rdum, cliffs, rubble walls, roadsides, from May to August, with many plants in full bloom in June. The Sea Ragwort belongs to the *Senecio cineraria* group (Pignatti, 2002). See also page 340.

Daisy Family Asteraceae (Compositae)




Coastal Ragwort/Cliff Groundsel *Senecio leucanthemifolius* Kubrita tal-Irdum/Kromb tax-Xatt

A coastal annual with ascending to erect stem that is generally branched but sometimes the stem can also be simple (un-branched). Leaves are toothed to lobed to pinnately-lobed and fleshy. Lower leaves stalked, upper ones are sessile. Flower heads are yellow, clustered, with both ray and disc florets. The involucral bracts are tipped black. Fruits pale grey, hairy, with white pappus. Scarce to frequent at cliff edges, coastal garigue, cliffs and other coastal habitats and is more frequent in Gozo than in Malta. Occurs also at Comino. Flowers from February (or even earlier, from November) to April.

Daisy Family Asteraceae (Compositae)




Groundsel *Senecio vulgaris* Kubrita/Ħaxixa tal-Kanali

An ascending or erect annual with toothed to pinnately-lobed shiny leaves, the lobes toothed. Lower leaves spatulate in outline. Uppermost leaves toothed. Stems are often weak, simple or branched above. Flower heads small and in clusters, yellow, with tubular (disc) florets only, enclosed in a cylindrical involucre, the involucral bracts tipped (or entirely) black. Fruits grey with pappus of white hairs. Common, from November to May-June, in fields, disturbed ground and other habitats.

Daisy Family Asteraceae (Compositae)




Pygmy Groundsel *Senecio pygmaeus* Kubrita Nana

A small annual with more or less fleshy and spatulate leaves. The leaves are toothed on the margins. Flower heads yellow with disc (tubular) florets only and enclosed in a cylindrical involucre. Involucral bracts tipped black. Fruits have pappus. Found in rdum and coastal garigue, flowering in winter from around January to March. Scarce-frequent, and often overlooked. Endemic to Malta and Sicily (Lanfranco & Lanfranco, 2003). Sub-endemic, also found in SE Sicily (Lanfranco, 2015).

Daisy Family Asteraceae (Compositae)



Creeping Groundsel/Climbing Groundsel/Cape Ivy
Senecio angulatus Kubrita Xeblieka

A hairless creeping perennial having thick and fleshy stalked shiny leaves with toothed/lobed margin. Upper leaves are smaller, with fewer teeth or without teeth. Flower heads yellow in clusters at the tips of stems (terminal), with both disc and ray florets. Fruits have short hairs and are dispersed by the wind. The Creeping Groundsel is native to South Africa, grown locally as an ornamental plant and is scarce in the wild as a naturalised alien. Flowers can be found throughout the year, especially May to December.

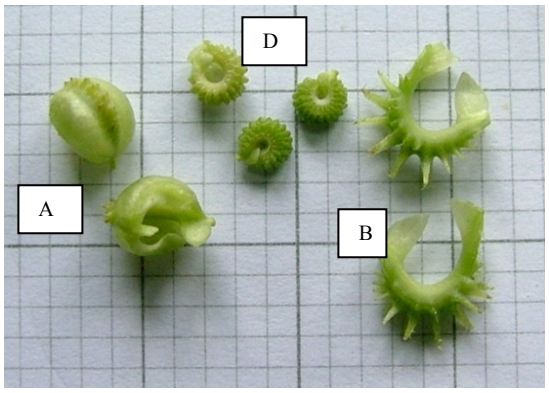
Daisy Family Asteraceae (Compositae)





Field Marigold
Calendula arvensis
Suffejra tar-Raba'/Suffejra

An aromatic ascending or erect hairy annual. Leaves are alternate, sessile, lower ones elongate-spatulate, upper ones smaller, toothed. Flower heads small, solitary, with disc and ray florets, orange to bright yellow. They close at night or in the shade. Involucral bracts are green, narrow and pointed, with fine hairs, and tipped purplish. Fruits curled. Common in various habitats including fields, paths and roadsides. Flowers from October to May-June. The fruits are of 3 kinds and are dispersed by different vectors - wind, ants, and animals with feathers or hair (Lanfranco & Lanfranco, 2003). The Field Marigold belongs to the *Calendula arvensis* group, and its flower heads are of one colour (Pignatti, 2002). Pignatti (2002) also states that the genus *Calendula* is a difficult one and classification of the species is often based on the types of fruits:





A- curved and winged, with a spiny back (convex side), and without a beak;
B- curved and without a wing, generally spiny on the lower part of the back, and elongated into a spineless beak;
C- curved and with 3 wings, spiny on the back, without a beak;
D- ring form, without wings or beak.

The *Calendula arvensis* group has fruits of type A, B and D (Pignatti, 2002).



Calendula arvensis var. ***bicolor*** is similar to *Calendula arvensis* but has purplish-brown disc florets. It is a hairy plant with ascending stems. Lower and middle leaves are elongate-spatulate and larger than the upper lanceolate leaves. The margin of the leaves can have teeth. The flower heads are small, and the yellow ray florets have purplish tips. Fruits are of 3 types, including ring-form fruits. According to Pignatti (2002) the flower heads are generally smaller than 3 cm, and the plant could be a hybrid between *Calendula arvensis* and *Calendula stellata*. Plants of *Calendula arvensis* var. *bicolor* found in the Maltese islands with yellow ray florets and purplish disc florets have generally small flowers not larger than 20mm. It is frequent to common, flowering from October to May, especially in open sunny areas, sometimes growing with *Calendula arvensis*. According to Haslam *et al.* (1977) *Calendula stellata* is "almost certainly to be found in the Maltese Islands". According to Pignatti (2002) *Calendula stellata* rarely have (or does not have) winged fruits with spines on the back (type A fruits) and ring-form (D type) fruits.

Daisy Family Asteraceae (Compositae)





Sicilian Marigold *Calendula sicula* (*Calendula suffruticosa* subsp. *fulgida* var. *gussonei*) Suffejra ta' Malta/Suffejra ta' Sqallija/ Suffejra/

A hairy herbaceous perennial with woody stems at base and elongate leaves clasping stem. These are usually wavy and slightly lobed/toothed. Flower heads showy and have yellow disc and ray florets, solitary on a stalk. The involucral bracts are narrow and pointed and generally tipped purplish. The fruits are curved. Scarce to frequent in rocky habitats, abandoned fields and roadsides. Flowers mostly from around October-November to May, but sometimes also in summer. The Sicilian Marigold has "yellow flowerheads which rarely exceed 3cm" and "it occurs mainly in Gozo" (Lanfranco, 2015). The orange-flowered species is described as the **Shrubby Marigold** *Calendula suffruticosa* subsp. *fulgida* Suffejra Kbira (Lanfranco, 2007); it is a perennial that has flower heads over 4cm across that are orange-yellow to intense orange, and frequent in the west of Malta (Lanfranco, 2015). *Calendula sicula* has been regarded as endemic (var. *melitensis*) by Sommier and Caruana Gatto (1915) but this still needs to be assessed (Lanfranco, 2007). Restricted to SE Sicily and the Maltese Islands (Lanfranco, 1989). *Calendula sicula* is in the *Calendula suffruticosa* group (Pignatti, 2002). The **Sea Marigold** *Calendula maritima* Suffejra tal-Baħar is a sub-endemic plant that is regarded extinct from Malta (Mifsud, www.maltawildplants.com).

Daisy Family Asteraceae (Compositae)





Plymouth Thistle/Small-flowered Thistle/Italian Thistle *Carduus pycnocephalus*
Xewk tal-Fjura Żgħira/Ħorfox tal-Fjura Żgħira/Ħorfox Twil

An erect hairy herbaceous annual-biennial branched at the upper parts. Plants can be tall, but short plants are also found. Stem with spiny wings often reaching base of flower heads. Leaves are not rigid, lobed to pinnately-lobed, and densely white hairy beneath, less hairy above, and spiny. Lower leaves with petiole. Flower heads are small and narrow, pink to pale purplish, solitary or 2-3 (or up to 5 together). They consist of tubular florets only. Involucral bracts numerous and overlapping, are

narrow and hairy and with thick central vein and a small spine at the tip. Fruits are pale and with vertical ribs, with brownish-white pappus of simple hairs. Scarce in disturbed habitats such as roadsides and paths, February to June. Used to be common until the 1970s but declined (Lanfranco, 2015). The similar *Carduus tenuiflorus* (*Carduus pycnocephalus* var. *tenuiflorus*) also occurs. It has the flower heads united in 3-8 or up to 12. The most notable difference between these 2 species is the involucral bracts (Pignatti, 2002, according to Kazmi, 1964): in *Carduus pycnocephalus* the involucral bracts have a robust central vein at the upper parts and a non-membranous margin, and with the aid of a hand lens small hairs can be seen on the vein and on the margin; in *Carduus tenuiflorus* the vein and the margins of the involucral bracts are not hairy and the margin is membranous.

Daisy Family Asteraceae (Compositae)





Arabian Thistle
Carduus pycnocephalus subsp. *marmoratus* (*Carduus arabicus, Carduus australis*)
Ħorfox/Xewk

An erect annual with winged and spiny stems. Flower heads small, purple, in small groups (2-6) at the top of the stem, exceeded by the spiny tips of the uppermost leaves (bracts). Leaves alternate, and are thick and spiny, and white-veined (marbled). From the underside the leaves are hairy (with white woolly hairs) and with raised veins. Lower and stem leaves stalked, upper ones sessile. Involucral bracts are numerous and spiny, and with purplish tips. Fruits have pappus of simple hairs. Scarce to frequent, sides of paths, arid ground, March to June. Flowers often white (Pignatti, 2002). Described as very common in roadsides, other waste places, uncultivated ground, valleys, fields, etc., and plants of the Maltese Islands (*Carduus arabicus*) belong to subspecies *marmoratus* (Haslam *et* al., 1977; Lanfranco, G., 1969; Borġ, 1927). "Mainly in Gozo" (Lanfranco, 2015).

Daisy Family Asteraceae (Compositae)





Syrian Thistle/ Horse Thistle
Notobasis syriaca
Xewk tax-Xitan/ Għallis

An erect and tall hairy annual with grooved stems. Stems not winged, and hairy but eventually become hairless. Leaves are alternate, leathery and stiff, with white venation and hairy from below. They are pinnately-lobed and spiny; the uppermost leaves (bracts) have stout spines, tinged purplish and clustered around the flower heads. Flower heads purple, in singles or clusters, with tubular florets only. Involucral bracts are spiny. Fruits have pale brownish-white feathery pappus. Scarce to frequent in disturbed ground including roadsides, paths, and along watercourses, April to May.

Daisy Family Asteraceae (Compositae)





Wild Artichoke/Prickly Artichoke/Cardoon *Cynara cardunculus*
Qaqoċċ tax-Xewk/Qaqoċċ Selvaġġ

A herbaceous robust perennial with ridged un-winged stems. Leaves are large and elongate, deeply pinnately-lobed and spiny; the lobes are also themselves pinnately-lobed. The lowest leaves are in a basal rosette, stem leaves are alternate, lower leaves stalked, uppermost are sessile. The leaves are pale from the underside. Flowering stem branched, with large round bluish-violet flower heads having spiny involucral bracts. Fruits are thick with feathery pappus of brownish-white hairs. Common in clay slopes and rdum, also garigue, rocky steppe and paths, flowering from mid-April to June. The **Globe Artichoke** *Cynara scolymus* (*Cynara cardunculus* subsp. *scolymus*) Qaqoċċ is a widely grown vegetable. The leaves are not spiny. In Gozo the plant is called Għossfur (D. Camilleri, pers. comm., 2016).

Daisy Family Asteraceae (Compositae)





Milk Thistle/Holy Thistle/Blessed Thistle *Silybum marianum*
Xewk tal-Madonna/Xewk Bagħli

A robust, erect and tall herbaceous biennial. Stem is not winged and not spiny. Basal leaves elongate, pinnately-lobed and spiny having white venation and white patches on upper side, green from underside. Upper leaves (stem leaves) smaller and sessile, toothed to lobed. Flower heads are globular, solitary and purple in colour, on stalks carrying leaf-like bracts. The flower heads consist of tubular florets only. Involucral bracts are thick and spiny. Fruits are shiny, with white pappus, the hairs with small "teeth" (rough hairs). Frequent in disturbed ground including paths, watercourses, March to May.

Daisy Family Asteraceae (Compositae)





Boar Thistle/Galactites/ Mediterranean Thistle/Edible Thistle *Galactites elegans* (*Galactites tomentosa, Lupsia galactites*)
Xewk Abjad

An erect white hairy annual with winged and spiny stems, leaves alternate and deeply pinnately-lobed with elongate and spiny lobes/teeth. Leaves are green and variegated with white veins and markings from above, and whitish from below. Lower leaves stalked and upper ones sessile. Flower heads of tubular florets, terminal, solitary or in clusters, white, sometimes tinged purple, with spiny involucral bracts. Both white and purplish flower

heads can be found on the same plant. The outer florets are larger than those in centre of flower head. Fruits pale brown with a feathery pappus for wind dispersal. Common in disturbed ground including abandoned fields and field margins, building sites, roadsides, paths along watercourses, and disturbed garigue, flowering from December to May, mostly in spring. The dominant type in the Maltese Islands is the form *alba* with white flower heads (Lanfranco, 2007).

Daisy Family Asteraceae (Compositae)





Argolian Cotton Thistle *Onopordum argolicum*
Xewk ta' Għawdex

Densely hairy greyish-green to whitish herbaceous biennial with erect and branched spiny-winged stems. Basal leaves in rosette, at least in first year. Upper leaves are sessile. Leaves toothed to pinnately-lobed and with spiny teeth, densely hairy especially on the underside. Flower heads are large and terminal, with overlapping spiny involucral bracts. Involucral bracts are erect or spreading to reflexed. Tubular florets purple. Fruits have pappus of hairs. Scarce to rare in coastal clay slopes, also roadsides and other disturbed sites, April-May. The Argolian Cotton Thistle is a scarce species (less so in Gozo) and usually found on clay e.g. between Mġarr harbour and Mġarr ix-Xini in Gozo. It has a restricted Mediterranean distribution occurring mostly in the southeast (Lanfranco, 2007). It is also found on Comino (Tabone, 2008, 2007; Borġ, 1927).

Daisy Family Asteraceae (Compositae)









Southern Crupina *Crupina crupinastrum*
Krupina

A slender and erect annual with the lowest leaves stalked and toothed to pinnately-lobed, stem leaves sessile and deeply pinnately-lobed, the segments narrow and toothed. Leaves are found in the lower half of the plant. The lowest leaves often wither by flowering time. The flower heads are small, purple, made up of tubular florets, and on a stalk. The involucre is narrow and pointed, with green or purplish non-spiny involucral bracts. The achenes are thick, and with pappus of rigid black hairs. Scarce to frequent in Malta but is generally rare in Gozo. Found mostly in garigue, arid ground, April and May.

Large square in picture above is 10 mm x 10 mm

Daisy Family Asteraceae (Compositae)




Southern Star Thistle/Mediterranean Star Thistle *Centaurea sicula* (*Centaurea nicaeensis*)
Xewk tal-Għotba

A hairy herbaceous biennial with erect or spreading un-winged stems. Leaves are alternate, not spiny, and pinnately-lobed, with terminal lobe larger than the side lobes. The stem leaves are smaller, sessile and narrow. Flower heads have only tubular florets, and are solitary, shiny yellow and the involucre has spiny bracts. Fruits have short pappus. Common among fields, disturbed garigue, roadsides, paths and other disturbed ground. Flowers from late March to July.
Daisy Family Asteraceae (Compositae)




Maltese Star Thistle *Centaurea melitensis*
Xewk Malti/Xewk ta' Malta/Xewk tad-Deni/ / Ċentawrja ta' Malta/Ċentawrja Irqiqa

Annual or biennial with slender and erect stem, branched above. The stem has narrow wings at the top. The leaves are hairy, pinnately-lobed and stalked, those on the stem are entire and sessile. Involucral bracts are spiny, each having one long spine and short spines at the base. Flower heads yellow and small, much less conspicuous than those of *Centaurea nicaeensis*. They occur in singles or in small groups (2-3). Achenes with short pappus. Rare in rocky steppe, arid ground and abandoned fields, e.g. Comino. It flowers from April to June. The Maltese Star Thistle is not endemic (Lanfranco, 2007, 1996) and is quite widely distributed in the southern Mediterranean; it was first described from Maltese plants collected by Paolo Boccone (Lanfranco, 1989). It also occurs in America (Lanfranco & Lanfranco, 2003). The **Yellow Star Thistle** *Centaurea solstitialis* also occur (rare) (Haslam *et al*., 1977; Borġ, 1927). Other species of *Centaurea* mentioned for the Maltese Islands include the **Stemless Centaury** *Centaurea acaulis* Ċentawrja tan-Nuffara (very rare) found at In-Nuffara in Gozo (Buttiġieġ, R. & Lanfranco, E., 2001) and the **Red Star Thistle** *Centaurea calcitrapa* which is very rare (Haslam *et al*., 1977; Borġ, 1927).

Daisy Family Asteraceae (Compositae)



North African Knapweed *Centaurea diluta*
Ċentawrja tal-Afrika ta' Fuq

A tall hairy annual or herbaceous perennial, stem grooved and is branched above. Leaves alternate, basal leaves stalked pinnately-lobed, upper ones sessile to shortly stalked, uppermost entire and narrow. Flower heads are large and showy, solitary with tubular florets, the inner pale/whitish, and the outer pink-purple, deeply cut and longer than inner. Involucral bracts green with brownish cut appendage, and fringed along the margin. Lower involucral bracts have minute spines. Fruits have white pappus. Flowers in spring, April to May and is rare, fields and other disturbed habitats. The plant is native to North Africa and South-west Europe. According to Lanfranco (pers. comm., 2010) he first saw the species in the 1960s and afterwards till the early eighties, and it was probably introduced with bird seed. Joseph Casha also saw *Centaurea diluta* in fields at Mosta (now built up), identified by Lanfranco (pers. comm., 2010). The author (Casha) saw the species also in Gozo in fields at Xatt l-Aħmar (2011). The **Greater Knapweed** *Centaurea scabiosa* appeared in the 90s and still grows today (Lanfranco, pers. comm., 2010).

Daisy Family Asteraceae (Compositae)



Maltese Rock-centaury/Malta Knapweed *Palaeocyanus crassifolius* (*Cheirolophus crassifolius*, *Centaurea crassifolia*)
Widnet il-Baħar

Herbaceous perennial with fleshy basal spatulate leaves and erect striated stems, branched at the upper parts. The upper (stem) leaves are narrower. Flower heads large, rounded, involucre not spiny with several overlapping involucral bracts. Flower heads consist of tubular florets, purplish and scented and are solitary on long stalk. The fruits are parachute-type with a pappus and are dispersed by the wind. Scarce, but usually frequent where it occurs, on the south-southwest cliffs of Malta and Gozo. It flowers from May (April) to around July (August). Endemic and is the national plant of Malta. The Maltese Rock-centaury is a primitive species and probably related to the ancestors of the genera *Centaurea* and *Serratula* (Lanfranco, 1996). Officially designated as Malta's national plant in 1971 (Lanfranco, 1989).





Originally the Maltese Rock-centaury was described in 1827 as *Centaurea spathulata* by the Maltese botanist Stefano Zerafa. Its name was however changed by Antonio Bertoloni to *Centaurea crassifolia* in 1828, because the name applied by Zerafa had already been used for another *Centaurea* in 1811. In 1975 it was transferred to the one-genus *Palaeocyanus* as *Palaeocyanus crassifolius* by Josef Dostal. In 1999 the plant was renamed as *Cheirolophus crassifolius* by Alfonso Susanna on the basis of molecular studies (Lanfranco, 2007; Lanfranco, 2006). Lanfranco (2015) placed it back in the genus *Palaeocyanus*.

Daisy Family Asteraceae (Compositae)





Carthamus/Woolly Safflower/Woolly Carthamus/Woolly Distaff Thistle
Carthamus lanatus
Xewk ta' Kristu/Xewk il-Far

An erect and densely hairy spiny annual. Stems are pale (yellowish/whitish). Basal leaves in a rosette, often withered by flowering time. Stem leaves pinnately-lobed and spiny, upper ones are sessile. Leaves are channeled, upper ones stiff. Flower heads bright yellow, solitary, and terminal, composed of lobed tubular florets. Outer involucral bracts are long and spiny, rigid, hairy and leaf-like. Inner involucral bracts have brownish less spiny tips and pale margins. Fruits on the inner side of the fruit head have pappus of scales. Frequent to common, flowering from May to around August, in rocky steppe, disturbed habitats including roadsides, paths, abandoned fields and disturbed garigue. Only the subspecies *baeticus* occurs (Lanfranco, 1996).

Daisy Family Asteraceae (Compositae)




Blue Thistle/Carduncellus
Carduncellus caeruleus
(*Carthamus caeruleus*)
Xewk Ikħal

A herbaceous hairy perennial with ascending or erect generally un-branched stems. Stems do not have wings. Leaves not rigid, variable, toothed to pinnately-lobed, and with bristles at the margins. Upper leaves clasping the stem. The lower leaves are entire or deeply lobed, pinnate-like. Flower heads blue with lobed tubular florets, solitary at the tips of stems, clear above the upper leaves. These flower heads are surrounded by hairy leaf-like outer involucral bracts. The inner involucral bracts have small hairs at the upper margins. Fruits have pappus. Rare, May to June on clay soil, paths, uncultivated ground.

Daisy Family Asteraceae (Compositae)




Clustered Carline Thistle *Carlina involucrata* (*Carlina corymbosa* subsp. *involucrata*)
Sajtun/Xewk tas-Sajf

A spiny herbaceous perennial with ascending or erect stems. Stems are often purplish. Leaves are sessile, wavy and channelled, toothed to pinnately-lobed, the lobes pointed and spiny. The lower leaves are dry by flowering time. Flower heads yellow with only tubular florets, solitary and terminal, surrounded by soft yellowish-brown involucral radiating bracts. Outer involucral bracts are large and spiny, leaf like, green or brown when plant is flowering. Fruits have feathery pappus. Common in garigue, rocky steppe, rocky valleys and other rocky and dry ground, in abandoned fields, and also clay slopes in rdum, June to August. “A North African species extending to the Maltese and Pelagian Islands” (Lanfranco, 2007). Has a very restricted Mediterranean distribution (Lanfranco, 1989). The Clustered Carline Thistle *Carlina involucrata* is similar to the **Carline Thistle** *Carlina corymbosa* but the upper leaves of *Carlina involucrata* are up to 6 times longer than wide (Pignatti, 2002).

Daisy Family Asteraceae (Compositae)




Purple Carline Thistle/Woolly Carline Thistle *Carlina lanata*
Sebqet l’Ommha

A densely hairy annual with alternate spiny leaves, stems simple (unbranched) or branched at the upper parts, without wings. Lower leaves elongate, relatively soft, toothed to lobed, usually dry by flowering time. Upper leaves are smaller, sessile, pinnately-lobed, rigid and with yellowish spines. Leaves have wavy margin. The leaves have dense white hairs beneath (tomentum), and become hairless on the upper surface. Flower heads with tubular florets only, yellow. The radiating (inner) involucral bracts are often purplish on both sides. The outer involucral bracts are rigid and spiny, curved and exceed the flower head. Fruits have pappus. Scarce to rare in clay soil, along paths, arid ground, late June to August.

Daisy Family Asteraceae (Compositae)




Cage Thistle/Common Atractylis
Atractylis cancellata
Xewk tal-Gaġġa

A small greyish/whitish-green annual with erect or ascending slender stems. Lower leaves occur in basal rosette. Leaves are elongate and narrow, channeled, covered with white hairs and with a toothed margin, the teeth with small spines. Flower heads solitary with purple tubular florets. The involucre has outer involucral bracts that are deeply divided and surrounding it as if it is in a cage. Fruits have white pappus. Scarce in dry ground including sloping rocky ground and rocky valleys, April to May.

Daisy Family Asteraceae (Compositae)




Ground Thistle/Atractylis/Stemless Atractylis/Distaff Thistle
Carlina gummifera
(*Atractylis gummifera*)
Xewk tal-Miskta/Xewk tal-Mixta

A herbaceous stemless perennial with pinnately-lobed leaves that are spiny. The solitary flower heads are composed of tubular florets, pinkish-purple, directly on the ground, and are found when the leaves are withered and before the emergence of new leaves. The involucre is white hairy, the inner involucral bracts with a brown spiny tip. The outer involucral bracts are larger and spiny at the margins and with 3 larger spines at the tip. Fruits have white pappus. Common in garigue, rocky steppe, rocky valleys, arid ground, roadsides, flowering from August to December (on occasions even January).

Daisy Family Asteraceae (Compositae)



Common Golden Thistle/Spanish Oyster Plant/Sand Oyster Thistle/Spanish Golden Thistle *Scolymus hispanicus* Xewk Isfar/Xewk Isfar tar-Ramel

A hairy erect and branched herbaceous biennial or perennial with spiny wings. Leaves pinnately-lobed, with white venation, lower ones stalked and soft, upper ones are more rigid and more spiny with wavy margins. Basal leaves in rosette. Flower-heads are conspicuous, orangish-yellow, consisting of ray florets only, generally solitary. These are surrounded by rigid spiny bracts hairy on the underside. The involucral bracts are soft, lanceolate and with a pale margin, gradually tapering to a point. These are not or scarcely hairy. Fruits have small wings. Plant has latex. Scarce and local in coastal mainly sandy areas including sand dunes, May to July. A few plants still occur at Għadira beach, and the plant is present and increasing at Għadira reserve. Tabone (2008) also records the **Large-flowered Golden Thistle** *Scolymus grandiflorus* Xewk Isfar Kbir from Wied Gerżuma (Malta). This species is also recorded by Lanfranco (2015, 1989) who records it as steadily declining and is now a very rare plant, and that it grows in steppes. Haslam *et al*. (1977) gave it as locally frequent. The Large-flowered Golden Thistle has very hairy involucral bracts, the upper parts of stems have continuous wings and the flower heads are larger than those of *Scolymus hispanicus.*

Daisy Family Asteraceae (Compositae)




Spotted Golden Thistle *Scolymus maculatus*
Xewk Isfar tar-Riga Bajda

An erect and slender hairy annual with spiny, pinnately-lobed leaves and winged stems. Lower leaves spatulate. Specimens are usually tall, but short ones occur. The wings of the stems are spiny and continuous. The leaves have white venation from above, and the stem wings are also white-veined. The flower-heads are yellow with ray florets, at top of stems, involucral bracts not hairy and with membranous margin. Plant has latex (milky sap). Scarce in valleys e.g. Wied il-Qlejgħa and Wied tal-Speranza, and coastal clay slopes, e.g. Selmun, flowering from May to August.

Daisy Family Asteraceae (Compositae)




Chicory *Cichorium intybus*
Ċikwejra

A herbaceous perennial with erect stem holding spreading to ascending rigid branches. Stems are not spiny. Lower leaves are elongate, toothed to pinnately-lobed, upper ones have entire or toothed margin, clasping the stem. Leaves have stiff hairs on the underside. Flower heads are of ray florets toothed at the tip, bright blue, in singles or small clusters, terminal or axillary. The stalk holding a terminal flower is more or less thickened at the top beneath the head. Inner involucral bracts are longer than the outer. Fruits minute with very short scales at the top. Scarce to frequent in valleys, fields and other disturbed habitats, flowers can be found from April to June (-October). The **Endive** *Cichorium endivia* Indivja is cultivated for food.

Daisy Family Asteraceae (Compositae)



Spiny Chicory/Hedgehog Plant
Cichorium spinosum
Qanfuda

A hemispherical, low and much-branched shrub armed with sharp-pointed stems (spines) for defense. Leaves elongate, and can be fleshy, widest above the middle, toothed to pinnately-lobed. Flower heads blue to pale violet, of ray florets toothed at the tip, mostly borne where the stems fork out, in singles or small groups. Inner involucral bracts are larger than the outer. Fruits are small and with a pappus of short stiff hairs. Common, mostly coastal in garigue, and also in rdum, flowering from May to July-August.

Daisy Family Asteraceae (Compositae)

The **Yellow Catananche** or **Yellow Cupidone** *Catananche lutea* Żigland Bellusi also occurs but rare (Lanfranco, 1989; Haslam *et al*., 1977; Borġ, 1927). Tabone (2007) gives recent records, e.g. at Mellieħa and Pembroke. It is a hairy annual with elongate pointed leaves, margins entire or with few small teeth. The leaves mostly occur at the base. Flowers have yellow ray florets, toothed at the tips. Involucral bracts overlapping and silvery, the outer involucral bracts are ovate, inner ones lanceolate and tapered to the pointed apex. Flowers March to May. See page 344.

Daisy Family Asteraceae (Compositae)

Annual Hyoseris *Hyoseris scabra*
Żigland Żgħir/Ċikwejra Żgħira

A small, hairless or scarcely hairy annual, with pinnately-lobed leaves spreading on the ground in a basal rosette. Petiole winged. Flower heads yellow, solitary, on spreading stalks that are swollen at the top. Flower heads of ray florets only. Involucral bracts erect. Inner involucral bracts are larger than the outer. Fruits have pappus of hairs and scales. Outer and middle fruits in the flower head are compressed, inner ones circular in cross section. Common in garigue, open ground, often coastal, January to May.





Daisy Family Asteraceae (Compositae)





Perennial Hyoseris *Hyoseris radiata*
Żigland tal-Pizzi/Ċikwejra Selvaġġa

A herbaceous perennial with leaves in a basal rosette, slightly hairy or not, pinnately-lobed, almost pinnate. Side lobes toothed, more or less triangular and pointing backwards, terminal lobe larger. Leaf stalk is not winged, often purplish and midrib (central vein) of leaf greenish-purplish. Flower heads yellow, of overlapping ray florets only, solitary on leafless green or purplish long stalk. Flower stalk often powdery (mealy). Outer florets are usually striped purplish on the underside. Involucre may also be powdery. The outer fruits are brown, flattened, inner (central) ones cylindrical. Fruits have a pappus of scales and rigid hairs. Common flowering from February to May in various habitats, including garigue, rocky valleys, abandoned fields, roadsides.

Daisy Family Asteraceae (Compositae)





Maltese Hyoseris/Gozo Hyoseris/Shrubby Hyoseris *Hyoseris frutescens* Żigland ta' Għawdex

A herbaceous perennial with deeply pinnately-lobed fleshy leaves, almost pinnate, with larger terminal lobe. Leaf stalk not winged. Leaves can be powdery (mealy). Flower heads yellow made up of ray florets, solitary on long smooth stalks that can also be powdery (mealy). Outer fruits are flattened, middle ones long and narrow with scales at the top. Endemic and frequent in some localities in Gozo but is rare in Malta. A coastal species inhabiting rocky areas, cliffs, rdum, also fallow coastal sites. Flowers mainly in spring from March to June but also in other months. "First described in 1988 by Italian botanists Salvatore Brullo and Pietro Pavone" (Lanfranco, 2007). Probably the most ancient *Hyoseris* species (Lanfranco, 1996).

Daisy Family Asteraceae (Compositae)

The **Star Hyoseris** or **Star Hawkbit** *Rhagadiolus stellatus* Żigland tar-Raġġi is an annual species with lower spatulate toothed leaves, upper leaves smaller, more or less entire. The flower heads are stalked, and consist of yellow ray florets. It flowers in spring March to May. Fruits are of 2 types, inner ones small and incurved, and outer ones straight or slightly incurved. The outer involucral bracts are small, the inner ones forming a star-shaped structure together with the outer fruits. Lanfranco (1989) records it as has declined and is very rare. Tabone (2007) records it from a few areas in Malta and Gozo. Haslam *et al*. (1977) and Borġ (1927) all listed it as not frequent to rare.

Daisy Family Asteraceae (Compositae)





Variable Hyoseris *Hedypnois rhagadioloides* (*Hedypnois cretica*) Ħedipnojs

A variable hairy erect or ascending annual with slender stems, sometimes only a few cm above ground. Basal leaves have winged stalk, upper leaves smaller and sessile, clasping stem. Leaves are entire or toothed to lobed. Flower heads yellow and small made up of ray florets at the top of stalks; these stalks are either thin and not thickened or thickened just below the flower head. Flower stalks green or purplish. Flower heads drooping before opening. Involucre is made up of 2 rows of involucral bracts, the inner longer than the outer. The underside of the outer florets has a purplish streak. During fruiting, the involucral bracts curve inwards. The fruits are cylindrical, hairy and black and have pappus of scales (inner fruits) or a ring-form pappus (outer fruits). The outer fruits are curved and partially enclosed in the involucral bracts. Common flowering from March to June in garigue, sandy areas, roadsides, paths, open dry ground, disturbed habitats. Pignatti (2002) separates *Hedypnois rhagadioloides* and *Hedypnois cretica* as the former having a thin stem beneath the flower head, *Hedypnois cretica* as having thickened stem beneath the flower head. Lanfranco, G. (1969) lists them as 2 separate species, mentioning that both are common.

Daisy Family Asteraceae (Compositae)




Smooth Goatsbeard/Hairless Goatsbeard/Purple Goatsbeard/Slender Salsify *Geropogon hybridus* (*Geropogon glaber*, *Tragopogon hybridus*) Leħjet il-Bodbod

An erect and slender rather delicate annual. Leaves alternate, long and narrow, linear, pointed at tip, their base sheathing the stem. Flower heads of pale purplish-violet ray florets, solitary on a stalk thickened at the top, with long and narrow involucral bracts that are not spiny and longer than the flower head. Fruits are beaked, narrow and long. Pappus of the outer fruits has rigid hairs, inner fruits with feathery pappus. Plant has latex. Generally not frequent, flowering from late March to May in clay soil, fields and field margins. The name *Tragopogon* is derived from the Greek words "tragos" meaning goat, and "pogon" meaning beard, hence the English name Goatsbeard.

Daisy Family Asteraceae (Compositae)





Viper's-grass *Podospermum laciniatum* subsp. *decumbens* (*Podospermum resedifolium*, *Podospermum calcitrapifolium*, *Scorzonera resedifolia*)

An erect or ascending annual or herbaceous biennial. Stems striated. Leaves are narrow, deeply pinnately-lobed with narrow segments, stem leaves smaller and sessile. Flower heads are yellow, stalked, and of toothed ray florets. Underside of outer florets is reddish. Involucral bracts are in several rows. Fruits greyish or brownish, cylindrical, grooved, with whitish pappus. Scarce on clay ground, March to May. Frequent in Gozo (Tabone, 2008). According to Pignatti (2002) the ray florets do not exceed the tip of the involucre. Pignatti (2002) describes another species for Italy, the *Podospermum canum*. This species is similar to *Podospermum laciniatum* subsp. *decumbens*, but a perennial and with the side florets projecting out of the involucre.

Daisy Family Asteraceae (Compositae)



Mediterranean Cat's-ear *Hypochoeris achyrophorus* (*Hypochoeris aethnensis*) Żigland Żgħir

A rough hairy annual, with simple (un-branched) or branched stem. Leaves are mostly in basal rosette, spatulate and entire to toothed. Stem leaves are smaller and few, sessile and pointed. Flower heads have yellow ray florets, solitary and terminal, with the underside of outer ray florets purplish-red. Involucral bracts are narrow and densely bristly-hairy, in 1 row with outer shorter bracts. Fruits are thin, brown with brownish-white pappus. Common in garigue, rocky valleys, sandy habitats, open and dry ground, April to May. The **Southern Cat's-ear** *Hypochoeris cretensis* Żigland Rari is mentioned in a few places by Haslam *et al*. (1977) and Borġ (1927).

Daisy Family Asteraceae (Compositae)




Prickly Urospermum/Prickly Golden-fleece
Urospermum picroides
Tfief Xewwieki

An erect bristly annual with basal rosette of spatulate toothed to pinnately-lobed leaves that are enlarged at base and clasping the stem. Uppermost stem leaves are smaller, toothed or not. Flower heads yellow, solitary and on a stalk, consisting of ray florets only. Involucral bracts are bristly and long and pointed (ovate-lanceolate), in one row with a dark margin. The fruits are long-beaked, with whitish feathery pappus, and are also able to attach to the fur of animals. Fruit head is rounded, like a small whitish ball. Common in disturbed habitats flowering from February to May- June. The **Golden-fleece** *Urospermum dalechampii* has been described from Wied Balluta and Ta' Xbiex (Haslam *et al*., 1977; Borġ, 1927).

Daisy Family Asteraceae (Compositae)




Tuberous Hawkbit *Leontodon tuberosus*
Żigland tal-Għerq/Żigland

A low and hairy herbaceous perennial with slender tubers and elongate leaves in basal rosette. The leaves are either toothed or lobed to pinnately-lobed, some of the lobes pointing backwards. Leaves are usually widest above the middle, and pointed at the tip. The leaf stalk is somewhat winged. The stalk and midrib (central vein) of the leaves, and the flower head stalk are purplish or greenish. Flower heads yellow of ray florets only, solitary, the outer ray florets with stripe (usually brownish-purplish-greyish) on the underside. The stalk holding the flower head does not have bracts. The involucral bracts are hairy and generally dark green with some pale green. Outer fruits have short pappus and weak transverse ridges; inner fruits are beaked and have feathery pale brownish pappus and strong transverse ridges. Common flowering from around September to March in garigue, valleys, rdum, clay slopes, roadsides and abandoned fields.

Daisy Family Asteraceae (Compositae)




Bristly Oxtongue *Helminthotheca echioides* (*Helminthia echioides*, *Picris echioides*)
Ilsien il-Baqra Xewwikija/Tfief tat-Tafli

A bristly erect or ascending annual or herbaceous biennial with grooved often purplish stems. Stems also have slender small spines. Leaves alternate, wavy, lower ones stalked and elongate with pointed or rounded tips and winged petiole, upper ones smaller and clasping stem. The lower leaves are elliptical to spatulate. Flower heads with yellow ray florets and the underside of the outer florets striped purplish. Outer involucral bracts are wide and bristly, ovate-lanceolate, inner bracts narrower. Fruits are small, brown, and elliptical with transverse wrinkles and white feathery pappus. Common in clay ground and rdum, valleys, fields, roadsides, other disturbed areas, flowering from (March-) May to November.

Daisy Family Asteraceae (Compositae)





Early Dandelion/Southern Dandelion *Taraxacum minimum* Ċikwejra Selvaġġa

A herbaceous perennial with leaves in basal rosette, elongate and deeply cut with lobes and teeth. Flower heads yellow composed of ray florets, solitary on hairy stalk. These flower heads appear before the plant emerges its new leaves in the autumn. The plant continues to produce flower heads later on in winter. The ray florets are striped purplish/brownish on the underside. The outer involucral bracts are wide and ovate and have a wide membranous, often reddish margin and an appendage at the tip. The inner involucral bracts are narrower. Fruits have pappus of white hairs. It flowers from September to March, rare, e.g. Valletta. Restricted to urban areas in the Inner Harbour area (Lanfranco,1996). Lanfranco also records it at Sliema in the neighbourhoods of Tigne (pers. comm., 2010).

Daisy Family Asteraceae (Compositae)





Prickly Sow-thistle *Sonchus asper* Tfief Xewwieki

A variable greyish-green annual or herbaceous biennial, and is mostly hairless except for few glandular hairs on the upper parts. Stems are angled, usually with purplish colour, solitary, branched only at upper part that carries flower heads. Leaves are alternate, entire or pinnately-lobed, lobes often triangular-like (especially terminal lobe), and with slightly spiny margin. Upper leaves clasping stem. The leaves have end (basal) lobes with rounded bases called auricles, small or large and embrace the stem. Flower heads have ray florets, pale whitish-yellow (often whitish with a pale yellow centre) smaller than those of the Smooth Sow-thistle *Sonchus oleraceus*, and in loose clusters. The base of capitulum (flower head) and stalk of flower head is often with white tomentum (dense white hairiness). Fruits are brown, and abruptly restricted at the top, with vertical ribs, mostly smooth between the ribs, and with pappus of white hairs. Like other *Sonchus*, latex oozes out when part of stem is cut. Common in disturbed ground such as paths, fields, gardens. Flowers from around November to June, but sometimes also in other months. Haslam *et al*. (1977) describes 2 subspecies – *asper* that is annual and without a spiny margin on the leaves, and *glaucescens* that is biennial or perennial with leathery thicker leaves that often forms a basal rosette and have a more strongly spiny margin. Subspecies *glaucescens* is not common. The Prickly Sow-thistle belongs to the *Sonchus oleraceus* group. The Prickly Sow-thistle and the **Smooth Sow-thistle** *Sonchus oleraceus* are highly variable and still incompletely studied (Pignatti, 2002). According to Pignatti (2002) –

Fruits smooth; leaves shiny and spiny ……*Sonchus asper*
Fruits spiny on the ribs; leaves opaque, smooth……...*Sonchus oleraceus*

Daisy Family Asteraceae (Compositae)

Smooth Sow-thistle/Common Sow-thistle/Annual Sow-thistle *Sonchus oleraceus*
Tfief Komuni

An erect or ascending variable annual or herbaceous biennial with angled hollow stems (5 sides), branched from the base or at the upper parts, hairless but with glandular hairs at the upper parts. Stem has latex (milky sap), and is often purplish especially at the lower parts, the leaf stalk and midrib (central vein) also often with purplish colour. Leaves





are alternate, pinnately-lobed and with a large apical (terminal) lobe, with the side lobes cut down to almost the midrib. Side lobes can be themselves lobed again. Lower leaves with a winged petiole and clasping stem with small pointed end lobes at the base (auricles). Upper leaves with progressively wide stalk becoming part of leaf, and clasping stem with linear-lanceolate end lobes (apparently upper leaves appear to be without stalk but with a wing at the base and clasping the stem). The uppermost leaves are entire or deeply lobed with narrow lateral lobes, and at the base are narrow linear-lanceolate end lobes (auricles). All leaves are soft, margin with small teeth, (there are soft, bristle-like small projections at margin). Tomentum (dense hair) often occurs at base of flower heads, and also at leaf axils and stalks of flower heads. Flower heads composed of yellow ray florets, striped white on the underside. The fruits are brown and gradually narrowed towards the base. These have vertical ribs and horizontal lines (wrinkles), and with white pappus. Common in disturbed ground including cultivated and abandoned fields, roadsides, afforestation areas, paths, gardens, sometimes also in more natural areas such as rdum and sandy areas, from September/October to June, some also in summer in areas where there is enough moisture. Occasionally hybridises with *Sonchus asper* (Blamey and Grey-Wilson, 1993).

Daisy Family Asteraceae (Compositae)





Mediterranean Sow-thistle/Slender Sow-thistle *Sonchus tenerrimus*
Tfief Fin

Annual, herbaceous biennial to perennial with erect angular hairless stem. The stem is often purplish especially at base. Few glandular hairs present on the flower head stalks. The leaves are alternate, stalked and with 2 small and pointed end lobes (auricles). Leaves are deeply pinnately-lobed, with narrow linear-elliptical (or rhombic = diamond-shaped) lobes pointing backwards. These can have further lobes and toothed at the margin. The teeth have small soft hairs. The terminal lobe is narrow and elongate, or triangular. The uppermost leaves are small and can be undivided. Dense hairs (tomentum) are present at the base of the capitulum (flower head) and on the capitulum stalks. Flower heads yellow with ray florets. Fruits are pale or reddish-brown and equipped with white pappus, and with an abrupt constriction (narrowing) at the base. They have ribs and between them are wrinkles or tubercles (small outgrowths). Common flowering from September/October to June or later. Can be found in disturbed and natural areas. Scale of picture above on left is 20mm x 20mm, other picture 10mm x 10mm. Lanfranco & Lanfranco (2003) describe the Mediterranean Sow-thistle as often being biennial to perennial and with narrow firm stems and leaves that are cut down to the midrib with narrow finger-like lobes. However these authors continue to state that the 3 species of *Sonchus* (including *Sonchus asper*-the Prickly Sow-thistle) are all common and variable and that is often difficult to separate in the field. Blamey & Grey-Wilson (1993) and Haslam *et al*. (1977) state that in *Sonchus tenerrimus* the lobes (of the leaves) are clearly constricted at base. Pignatti (2002) states that the majority of the cauline (stem) leaves of the Mediterranean Sow-thistle have a proper stalk with the base widening to a sheath that clasps the stem. *Sonchus* plants that have their top parts eaten by rabbits seem to develop leaves with narrow linear lobes. A *Sonchus* plant can have both leaves with narrow lobes (generally upper leaves) and leaves with wider lobes (generally lower leaves).

Daisy Family Asteraceae (Compositae)






Prickly Lettuce/Wild Lettuce/Compass Plant *Lactuca serriola* Ħass tal-Pizzi/Ħass Selvaġġ

An erect greyish-green annual to herbaceous biennial with whitish stems. Plant has foetid latex. Small prickles are present on the stem, the margins of the leaf and also on the underside of the middle vein (midrib) of the leaf. The leaves are alternate, rigid, sessile and clasping stem with 2 basal lobes (auricles), toothed to pinnately-lobed, uppermost leaves smaller and less deeply lobed. The leaves on branches of inflorescence are reduced. Leaves are held more or less vertical. Flowers yellow of ray florets only, in a branched inflorescence at the top of the stem. Fruits are small, greyish with short rigid hairs at the top and with pappus for wind dispersal. Common in disturbed habitats including roadsides, paths, fields, gardens, June to September. The **Great Lettuce** *Lactuca virosa* Ħass Xewwieki also occurs. It is an annual or biennial plant and similar to the Prickly Lettuce *Lactuca serriola*. The leaves of the Great Lettuce are toothed and spiny, and the leaves are held more or less horizontally. Its fruits are dark purplish-blackish and does not have hairs at the top. It is given as frequent/common in disturbed habitats by Lanfranco (2015,1996). The **Least Lettuce** *Lactuca saligna* is also mentioned for the Maltese Islands (Haslam *et al*., 1977). Its stem leaves are narrow (linear-lanceolate) and the inflorescence is spike-like. The **Lettuce** *Lactuca sativa* Ħass is cultivated as a food crop (leaf vegetable).

Daisy Family Asteraceae (Compositae)




Common Reichardia/Mediterranean Reichardia *Reichardia picroides* Qanċlita/Kanċlita/Żigland

A green or greyish-green annual or herbaceous perennial, mostly hairless. Leaves at the lower region usually toothed or lobed to pinnately-lobed, some more than others, those at the upper region are smaller and less lobed to entire/toothed. Leaves at the base may form basal rosette. Lower leaves stalked, those on the flowering stem clasping it. Flower heads of toothed ray florets, yellow, solitary at the top of flowering stem. The underside of the florets is striped greyish-white or purplish/brownish. Involucral bracts numerous and overlapping with membranous (whitish) margin, bracts on flower stalk often also with whitish margins. Fruits have pappus, inner fruits pale and almost smooth, outer ones rough and dark. Common in various habitats, including garigue, rdum, valleys, abandoned fields, gardens, roadsides and also on rubble walls, from September to June, but flowers can also be found in other months. Subspecies *intermedia* (*Reichardia intermedia*) is annual and has leaves that are generally entire and with a toothed margin. Lanfranco (2015) describes var. *maritima* that occurs in coastal localities with deeply-lobed somewhat fleshy leaves and grows low and shrubby.

Daisy Family Asteraceae (Compositae)





Bulbous Hawksbeard *Aetheorhiza bulbosa*
Qanċlita tat-Tuberi

A herbaceous perennial with whitish rhizomes carrying whitish rounded tubers, and basal elongate-spatulate leaves. Leaves mostly hairless, entire or weakly toothed. Involucral bracts have black glandular hairs; these hairs extend also on the upper parts of the stalk of the flower head. Flower stalks with 1-2 leaves. Flower heads yellow of toothed ray florets, solitary on long stalks. Outer involucral bracts are smaller than inner bracts. Fruits grooved and with white pappus. Frequent to common, mostly coastal, in dry, also sandy areas, cliff edges, and rdum, March to April.

Daisy Family Asteraceae (Compositae)



Maltese Dwarf Hawksbeard *Crepis pusilla* (*Melitella pusilla*)
Melitella

A very small plant with a basal rosette of elongate toothed leaves and bunches of yellow florets at the centre. The plant easily goes unnoticed. The Maltese Dwarf Hawksbeard is not endemic to the Maltese Islands. Very rare, flowering in March and April.

This species represents an abnormal species within the genus; first records outside the Maltese Islands date to 1967 from Crete, then found in several other Mediterranean sites e.g. Majorca and Portugal, but also outside the Mediterranean in Australia (Lanfranco, 1989). Picture was taken at Dingli in a path in early April 2012, shown to the author by Edwin Lanfranco.

Daisy Family Asteraceae (Compositae)




Italian Hawksbeard *Crepis bursifolia*

Herbaceous low perennial with basal rosette of pinnately-lobed leaves. Stem leaves few, upper ones linear. Flower stems are erect or prostrate, simple or branched, and without leaves but with bracts. Flower-heads consist of yellow ray-florets; the outer ones have purplish stripe on underside. Involucral bracts several. Tomentum is frequently present at base of involucre, and keel of involucral bracts often with hairs. Fruits have tufts of white hairs. Not frequent. An alien

that has naturalised e.g. at Dingli and Ta' Qali. Flowers from May to September. Lanfranco records it also from the University Campus and at Sta. Lucia (pers. comm., 2012).

Daisy Family Asteraceae (Compositae)





Hawksbeard *Crepis neglecta*

Annual with stems branched at the base and a basal rosette of hairy leaves. Leaves entire, toothed or pinnately-lobed. Flowers numerous, small, yellow, and pendulous before opening. Involucre cylindrical, hairy. A naturalised scarce alien in gardens, paths and other disturbed areas e.g. Il-Ħofra (Mellieħa), San Anton and Ta' Qali gardens, May to October.

Daisy Family Asteraceae (Compositae)

The **Rush-leaved Sow-thistle** (**Gum-Chicory, Common Chondrilla**) *Chondrilla juncea* Tfief tar-Ramel, Tfief tal-Għadira is a very rare and endangered plant. It used to grow at Għadira till the mid -1920's (Borġ, 1927 in Lanfranco, 1990) but is currently extinct at the reserve (Casha, pers. observations, 2001-2014).

The **Gallant Soldier** *Galinsoga parviflora* has been introduced with ornamental plants (Schembri & Lanfranco, 1996).

Species of **Sunflower** *Helianthus* sp. Ġirasol/Warda tax-Xemx are also cultivated for their flowers and seeds (bird seed) and can sometimes be found naturalised. The ornamental **Bitter Sneezeweed** *Helenium amarum* has also recently been seen growing wild (Jeffrey Sciberras, pers. comm., 2018).




Far left picture shows a cultivated Sunflower *Helianthus* sp. with flowers in early July. Left picture: the **Jerusalem Artichoke** *Helianthus tuberosus* Artiċoks/Patata ta' Ġerusalem is cultivated as food crop, sometimes found naturalised as here in a watercourse, November.





The genus ***Artemisia*** is also represented in Maltese botanical literature by *Artemisia absinthium*, *Artemisia arborescens* and *Artemisia alba*, as cultivated and naturalising (Haslam *et al*., 1977; Borġ, 1927). *Artemisia* plants are mostly aromatic. *Artemisia annua* (pictured) is known by several English names such as **Sweet Wormwood**, **Annual Wormwood** and **Sweet Sagewort**. Here it is seen as a naturalised plant in a nursery pot plant, pictures taken in September. *Artemisia annua* have pendulous flower clusters and is aromatic. Scale 10mm x 10mm.

Daisy Family Asteraceae (Compositae)





Dwarf Elder *Sambucus ebulus* Sebuqa Selvaġġa/ Nittiena

A non-woody herbaceous and rhizomatous foetid perennial. Leaves opposite, pinnate with a terminal leaflet (imparipinnate) and with a toothed margin. They are darker from above. Stipules are conspicuous. Flowers are rosy-white with purplish anthers and in flat-topped clusters. Fruit a shiny black drupe. Rare in shady, damp valleys and cultivated areas, e.g. Wied il-Lunzjata and Xlendi. Flowers in May and June-July. Probably introduced (Haslam *et al*., 1977) and is less rare on Gozo than on Malta (Lanfranco, 2007). Picture above on the right shows the stipules.

Sambucus Family Sambucaceae





Common Elder *Sambucus nigra* Sebuqa/Sebuqa Kbira/Sebuqa Sewda/Sebuqa tas-Siġra/Sambuka

A deciduous shrub to a small tree, with mostly pale greyish-brown stems, younger ones green, older ones fissured. Leaves opposite



and pinnate, with elliptical leaflets, margin toothed, and with terminal leaflet (imparipinnate). Flowers are numerous and small, clustered in flat-topped heads. They are creamy white with yellow anthers. Fruits (drupes) are rounded, shiny purplish-black when ripe. Flowers from March to May-June. Rare, e.g. Fomm ir-Riħ. The Common Elder, found mostly in Gozo and not probably native, is occasionally found near farmhouses where it was planted for its medicinal applications (Lanfranco, 2007, 1996; Lanfranco, G., 1993). Haslam *et al*. (1977) also state that it was formerly cultivated for medicinal purposes and is found near farmhouses.

Sambucus Family Sambucaceae

The **Viburnum** *Viburnum tinus* Viburnum or Meruna is commonly cultivated for ornament. It is an evergreen shrub with glossy opposite leaves. Flower buds reddish-pink, the flowers white to pale pink, scented and in clusters. The fruits (drupes) are bluish-black. Flowers are found in Spring, March to May. It is a native plant in the Mediterranean, occasionally found naturalised in the Maltese Islands. According to Tabone (in Stevens & Baldacchino, 1998) it is found wild in the Maltese Islands only at Buskett and could be indigenous. One plant seen by the author (Casha) at Buskett is growing under the Aleppo Pine *Pinus halepensis* canopy and in the company of wild vegetation such as Lentisk *Pistacia lentiscus* and Mediterranean Buckthorn *Rhamnus alaternus*.







Viburnum tinus - left pictures taken at Buskett; far left picture is an ornamental plant in a garden

Viburnum Family Viburnaceae





Honeysuckle *Lonicera implexa* Qarn il-Mogħża

An evergreen shrub and also a climber, with twining new shoots that curl onto surrounding vegetation. Has opposite, sessile leaves, ovate-elliptical and paler from underneath, united (fused) on flowering stems. Leaves are pointed at tip or some may have rounded tips, and margins rolled down (revolute). Flowers are two-lipped with long tube, stamens with yellow anthers. They are in clusters of usually 6 (2-9), pinkish-white and are funnel-shaped and generally scented. The upper lip is divided in 4. Berries orange. Flowers mostly from around mid-April to June but flowers can be found all year round (especially October onwards). Frequent to common in maquis, rocky valleys and valley slopes, rdum and also in garigue.

Honeysuckle Family Caprifoliaceae





Southern Scabious/Pin-cushion Plant/Mournful Widow *Scabiosa maritima* (*Scabiosa atropurpurea* subsp. *maritima*) Skabjoża/Kuxxinetti

Annual or herbaceous biennial, sometimes perennial. Stems erect, branched at the upper parts. Lower leaves spatulate, toothed to pinnately-lobed (lobes toothed), upper ones are deeply lobed with linear lobes, the terminal lobe larger than the lateral ones. Flowers occur in heads on long, narrow stem and surrounded by narrow bracts. The flowering stem at the centre is longer than the two side ones. Flowers are two-lipped, pale pink, and the lower lip with a larger median lobe. The outer flowers are larger than those at the centre of the flower head. Stamens are protruding. Fruits are hard, with one seed and with hairs. Common, flowering from March to September (noted also in other months including December and January) in garigue, valleys, sand dunes, abandoned fields, roadsides, gardens. The **Sweet Scabious** *Scabiosa atropurpurea* Skabjoża Ħamra is an ornamental that can sometimes be found naturalised, e.g. at Manoel island (Weber *et al*., 1996).

Scabious and Teasel Family Dipsacaceae





Horn-of-plenty *Fedia graciliflora* Sieq il-Ħamiema/Ilsien il-Ħamiema

A prostrate to erect annual with opposite leaves, the lower ones stalked and spatulate, the upper ones sessile and are elliptical-ovate and finely toothed. Flowers are small, purplish-pink, sometimes also white, and 2-lipped with 5 petal lobes and a slender purple tube, in dense clusters. Stamens protruding, anthers are dark. Common in garigue and rocky valleys from January to May. The species was formally recorded as *Fedia cornucopiae*, a different species from the western Mediterranean area (Spain, Portugal and Morocco) - Lanfranco (2007); Lanfranco & Lanfranco (2003).

Valerian family Valerianaceae



Hairy-fruited Cornsalad/Italian Cornsalad *Valerianella eriocarpa* Valerjanella

A small annual with grooved and angled (square), rather rough stems with hairy to bristly margins. Stems branch in two. Leaves opposite. Lower leaves are spatulate, the upper ones smaller and toothed at base. Flowers are funnel-shaped with 5 pinkish-violet petal lobes and in dense clusters. Calyx at fruiting has unequal, distinct teeth, persistent. Fruit has one fertile (with seed) chamber that is well developed against the other 2 undeveloped sterile chambers. Scarce in fields and other disturbed areas, March to May. Fruit has one developed fertile chamber, while the sterile one is reduced to 2 slender



canals (Pignatti, 2002). Several similar species of *Valerianella* occur. Other species of *Valerianella* described for the Maltese Islands by Lanfranco (1989), Haslam *et al*. (1977) and Borġ (1927) are the **Keel-fruited Cornsalad** *Valerianella carinata* with pale purplish-white or pale bluish flowers; the **Small-fruited Cornsalad** *Valerianella microcarpa* Valerjanella Tar-Ramel with blue flowers; the **Oblique-fruited Cornsalad** *Valerianella truncata* (*Valerianella muricata*) Valerjanella tar-Raba' with pinkish or pale blue flowers; and the **Crown Cornsalad** *Valerianella coronata* with pale purplish-bluish flowers. All are uncommon, and described from a few places only. The Small-fruited Cornsalad used to grow at Ramla tat-Torri and might be "possibly already extinct" (Lanfranco, 1989).

Valerian family Valerianaceae



Red Valerian *Centranthus ruber*
Toppu tar-Reġina

An ascending greyish-green herbaceous perennial with a woody base. Leaves are opposite, ovate to triangular or lanceolate, upper leaves narrower (linear-lanceolate) and slightly toothed, clasping stem. Flowers pink or red/purple (occasionally white), with tube, and spur at the base. The flowers are fragrant and occur in a large and showy branched inflorescence. The calyx develops into a feathery pappus at fruiting. Often on old walls, April onwards (-July). Rare. Plants found in the Maltese Islands may be naturalised specimens from cultivated plants. Lanfranco (1989) states that it can possibly be a true native as at Ġnien il-Kbir. The **Pink Valerian** *Centranthus calcitrapa* Valerjana Roża is an annual scarce plant but may be frequent where it occurs. It has pinnately-lobed leaves and small pinkish flowers that occur in small terminal clusters. Tabone (2008) records it from a few sites in Malta and Gozo. It is recorded as local in rocky valleys by Haslam *et al*. (1977). Borġ (1927) records it also with white flowers but rarer than the normal pale pink flowered ones. See also page 346. Lanfranco (2000a) records the **Spur Valerian** *Centranthus macrosiphon* at Ta' Qali in 1996 growing as weeds in a flowerbed. These plants have pinkish/reddish flowers with a long corolla tube.

Valerian family Valerianaceae





Friar's Cowl/Small Lords-and-ladies/Jack-in-the-Pulpit *Arisarum vulgare*
Garni tal-Pipa/Garni tal-Ilsien/Garni tal-Kelb/Ilsien il-Kelb

A small unmistakable tuberous and herbaceous perennial. Leaves basal, wide and heart-shaped and with relatively long stalk. The inflorescence is a fleshy spike (called the spadix) that carries at its base the female flowers and above them the male flowers. These are enclosed by a leaf-like bract (spathe), and on a long speckled flowering stem. The spathe is erect, with a tube below and a "helmet" above, greenish to brownish or purplish, striped. The "tongue" that emerges out of the helmet is an extension of the spadix. Fruits are berries, green and in clumps. Common in various habitats including shady and sunny areas, such as in wooded areas (both in clearings and under the trees), maquis, rdum, valleys, open sites including abandoned fields, garigue and sloping rocky ground, flowering from October to March.

Arum Family Araceae





Italian Lords-and-ladies/Monk's Cowl/Cucoo Pint/Large Cuckoo Pint *Arum italicum* Garni

A tuberous herbaceous perennial with large and showy leaves. The leaves are basal and long stalked, and can be described as heart-shaped with 2 basal diverging lobes; or as spear-shaped; or triangular-shaped. These are glossy green or variegated with white/cream. The small flowers do not have petals or sepals, and the male flowers are above the female flowers, and occur on a swollen fleshy axis (the spadix), partly enveloped by a greenish-yellow sheath (the spathe) that is pointed at the top. The upper sterile part of the spadix is yellow. The spadix does not emerge out of the spathe, and is often less than half its length. Fruits are numerous and clustered, at first green then yellowish and eventually bright orange-red in summer, which are easily noticeable. A common plant found in several environments, usually in shady places such as under trees, maquis, valleys and rdum, flowering from March to May.

Arum Family Araceae




Dragon Arum/Giant Lords-and-ladies/Dragonwort *Dracunculus vulgaris* Garni Qoxret is-Serp

A herbaceous perennial with tuberous rhizome. Leaves stalked and palmate, with narrow segments, the central segment largest, and margins wavy. The speckled "stem" is formed by the inflorescence stalk covered in sheathing leaf bases, white with green spots/marks. These spotted sheathing bases cover almost entirely the stalk of the inflorescence. The spathe is large and wavy, and pointed at the top, greenish outside but dark brownish-purple on the inside. The small flowers lack petals and sepals and are carried at the base of the spadix (inflated spike) and hidden by the spathe. The spadix is about as long as the spathe, dark brownish-purple. The striking inflorescence has an unpleasant odour (for some time only), like the stench of rotting meat. This attracts flies that pollinate the flowers. Fruits are orange-red berries. Flowers in spring in April and May. The Dragon Arum is not found wild in the Maltese Islands. Lanfranco (1989) states that according to Grech-Delicata (1853) this plant used to occur at Wied Iż- Żurrieq but not found by others. The plant is listed also from other localities by Haslam *et al*. (1977) and Borġ (1927). Haslam *et al*. (1977) state that it is cultivated at Argotti Botanical Gardens from plants collected at Wied Iż-Żurrieq. The smell of the flowers is particularly strong in sunlight (Borġ, 1927). It is interesting to note that in Arums a rise in temperature in the spadix helps the spread of the smelling substances further away, attracting flies or other insects that may then be trapped within the inflorescence by hairs. The trapping of insects helps pollination of the flowers.

Arum Family Araceae




Calla Lily *Zantedeschia aethiopica* Buqar

A large rhizomatous herbaceous perennial with stalked and heart-shaped basal leaves. The bases of the leaf stalks sheath the inflorescence stalk. Inflorescence typical of the *Araceae*, with fleshy spike (spadix) enclosed by a white sheath-like bract (spathe). The female flowers are at the base of the spadix, the male flowers above them. Fruits are fleshy (berries), at first green then yellowish. A cultivated plant in public and private gardens, sometimes found naturalised,

flowering in winter and spring around January onwards, and is native to South Africa. Naturalised specimens can be seen at Baħrija watercourse. According to Joe Vella (pers. comm., 2009) the locals say that these plants have been living here wild for "many years". Mifsud (2019) reports it naturalised in 4 other valleys.

Arum Family Araceae





Common Duckweed *Lemna minor*
Lemna

A tiny aquatic annual, floating on the water surface. The species thrives in freshwater. These plants are not differentiated into leaves or stem and the plant body is flattened and ovate-rounded in shape, longer than wide, and with one unbranched root that goes vertically down in water. They have 3 veins that are not always easy to see. Flowers are minute, enclosed in tiny sheath with 2 male and 1 female flower at the margin of the plant body. Male flower reduced to just one stamen. Occurs in fresh water e.g. reservoirs, also watercourses (in areas where water is not moving, or moving slowly), often forming a carpet on the water surface. It can grow in sunlight and in shade and flowers in late winter-spring (March to May). A naturalised alien. The **Least Duckweed** *Lemna minuta* has been recorded at Wied tal-Hżejjen (Malta) and Wied ta' Żejta (Gozo) by Mifsud (2010). This has only 1 vein on the "leaf". Another member of this group – ***Landoltia punctata*** (*Spirodela oligorrhiza*) - has also been recently recorded in stagnant pools in the valley bed of Wied Sara in Gozo (Mifsud, 2008). This plant has 2-4 roots on each "leaf" (Pignatti, 2002). Weber & Kendzior (2006) also recorded the **Greater Duckweed** *Spirodela polyrrhiza*, with 7-12 roots. The **Rootless Duckweed** *Wolffia arrhiza* is also mentioned by Haslam *et al*. (1977). These plants float on the water and have no roots.

Arum Family Araceae





Water-plantain *Alisma plantago-aquatica* Biżbula tal-Ilma

An often robust herbaceous perennial, leaves shiny green and long-stalked, basal. These are elongate/ovate-elliptical with a pointed tip. Stem is bulb-like and fleshy (tuberous rhizome) and buried in sediment under water. Inflorescence is erect and branched, slender, with whorls of branches and small pink flowers having 3 wide rounded wavy petals. Sepals 3. Fruits are in a ring. Frequent to common in watercourses, marshy ground, flowering from April to May-June, or later if water is still present; may also be found flowering in autumn and winter. Has decreased due to degradation/destruction of its habitat.

Water-plantain Family Alismataceae





Mediterranean Starfruit *Damasonium bourgaei* (*Alisma bourgaei*) Damażonju

Annual with basal elliptical and stalked leaves. Leaves float on the water. When the water level drops and the plant is exposed these leaves shrivel and are replaced by tougher leaves. The flowers have 3 white petals with yellowish base, slightly longer than the sepals. The plant is named for its star-shaped fruits. Plant lives in water, inhabiting rock pools in the garigue and also watercourses. Generally scarce but can be frequent to common where found, March to May.

Water-plantain Family Alismataceae




Bulbous Arrowgrass *Triglochin bulbosa* subsp. *barrelieri* (*Triglochin barrelieri*) Triglokin/Triglokin tal-Melħ/Ħaxixa tal-Baħar.

Herbaceous perennial, bulbs covered with brown fibres. Leaves narrow, linear and basal, generally shorter than the stem, and pointed at the tip. They are also shiny and smooth, and are grooved on the upper side. Inflorescence a raceme, elongating in fruit, flowers small and inconspicuous with 6 tepals (2 whorls of 3 tepals) on leafless main stalk. The individual flowers have a more or less spreading short stalk (pedicel). Fruits (made up of 3 carpels) are elliptical. Rare and endangered in saltmarshes e.g. Għadira nature reserve, February to April. Recorded as frequent in wet areas near the sea by Sommier & Caruana Gatto (1915).

Arrowgrass Family Juncaginaceae




Lesser Arrowgrass/Lax-flowered Arrowgrass *Triglochin bulbosa* subsp. *laxiflora* (*Triglochin laxiflora*) Triglokin Sekond/Ħaxixa tal-Baħar tal-Ħarifa

The Lesser Arrowgrass is similar to the Bulbous Arrowgrass *Triglochin bulbosa* subsp. *barrelieri* but the raceme is less dense and it flowers in autumn. The fruiting pedicels are also shorter than the fruits and generally held erect. It grows in valleys and in shallow rock pools in the garigue and is scarce but locally frequent to common at certain sites. Flowers from September to November.

Arrowgrass Family Juncaginaceae

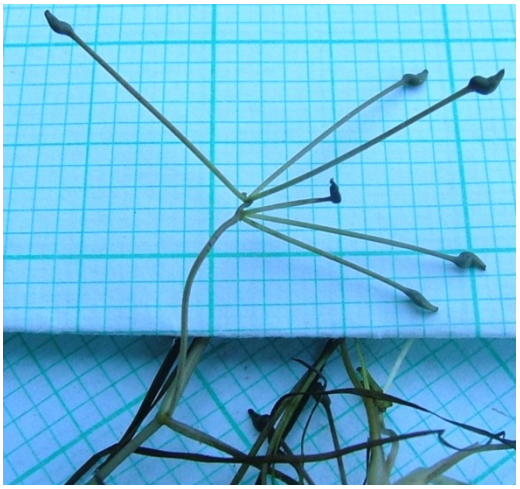




Posidonia *Posidonia oceanica*
Posidonja/Alka

A herbaceous marine perennial that occurs submerged in seawater. Has stout creeping stem (rhizome) which is covered with the remains of dead leaves. Leaves elongate and flat with rounded tips, and occur in clusters. Flowers are greenish and occur in a spike, with the upper flowers male, the lower ones hermaphrodite flowers (flowers that are male and female). The flowering stem fork in pairs at the top. Fruit fleshy and looks like an olive. Since the plant lives under water it is generally not observed from land; however Posidonia is often detached by strong currents and pieces of the plant including leaves and rhizomes are washed ashore, forming mounds on sandy beaches. The thread-like fibrous remains of the leaves are also packed by the rolling action of the waves forming rounded structures and washed ashore. Posidonia is important for marine species as breeding and feeding grounds, and also to protect sandy beaches from eroding waves. The plant lives at depths of 2-50 m, even away from the coast (Pignatti, 2002). Flowers in early spring (Lanfranco, 1996). "Flowering is rare and does not seem to occur regularly in Maltese waters" (Lanfranco, 2015).

Posidonia Family Posidoniaceae

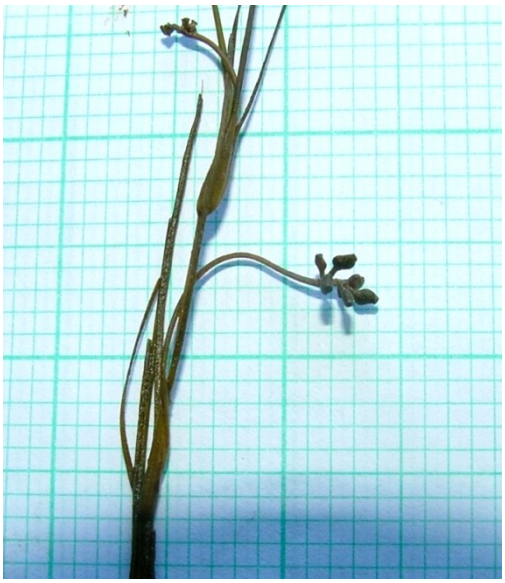




Beaked Tassel-weed *Ruppia maritima* (*Ruppia rostellata*)
Ruppja tas-Salini

A submerged aquatic herbaceous perennial with loose slender stems and alternate linear leaves with a sheath at base. Leaf tip is acute. Upper leaves are opposite. Flowers occur in clusters, umbel-like, without petals or sepals, the cluster on main straight or curved (but not spiraled) stalk (peduncle). Each flower occurs on a long secondary stalk (pedicel). Fruit is asymmetrical with an apical beak. Occurs in saltmarshes, March to July. Haslam *et al*. (1977) and Borġ (1927) list it as locally frequent in a few saltmarshes. See page 348.

Ditch Grass Family Ruppiaceae





Spiral Tassel-weed/Lesser Tassel-weed/Spiral Ditch-grass *Ruppia drepanensis*
Ruppja tal-Għadira

A herbaceous perennial that lives in water and similar to the Beaked Tassel-weed *Ruppia maritima*. The leaves have an obtuse tip and swollen sheaths at base. The peduncle (main flower stalk) is however long and spirally coiled at fruiting, much longer than the very short pedicels. Fruit is less asymetrical than that of *R. maritima*. Rare, occurs in saltmarshes e.g. at Għadira nature reserve especially along shoreline and edges of



islands, March to July. Haslam *et al*. (1977) and Borġ (1927) describe it from few areas in Malta.

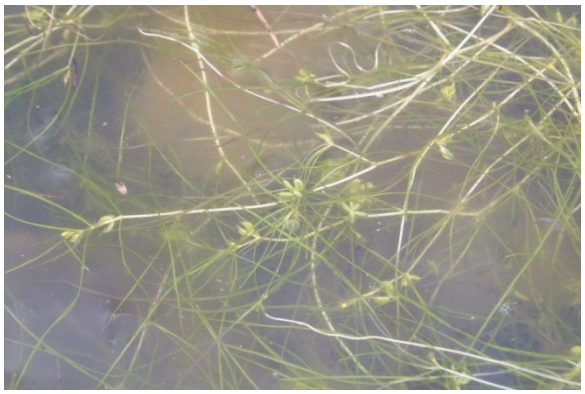


Ruppia drepanensis: Far left picture shows roots from the stem, and left picture shows the fruit.

Note: Tassel-weeds are also called by the name Tassel-pondweed or Ditch Grass (Ditch-grass), and can be annuals or (rarely) perennials. These plants have a creeping rhizomatous stem at the lower parts, while upper stems are flexible. The stems have roots at the nodes and often a zig-zag appearance. Tassel-weeds provide food and shelter for many aquatic species. See page 348.

Ditch Grass Family Ruppiaceae





Maltese Horned Pondweed *Zannichellia melitensis* Ħarira tal-Ilma ta' Malta

A herbaceous perennial with slender stems and thread-like leaves, living submerged in water. Lower part of stem is creeping and rhizomatous. The leaves are translucent (semi-transparent) and have a cup-shaped sheath at the base. Flowers are tiny, male or female, axillary, in the cup-shaped sheath. Male flowers reduced to only 1 stamen. Fruit is an achene. The Horned Pondweed is more or less frequent in rock pools in the garigue, November to May. Previously confused with *Zannichellia palustris* and *Zannichellia pedicellata*; *Zannichellia melitensis* is presumably endemic and first described in 2002 (Lanfranco, 2007). Haslam *et al*. (1997), Lanfranco, G. (1969) and Borġ (1927) describe it as *Zannichellia palustris* and as frequent. Mifsud (2009a) discovered *Zannichellia major* at il-Fiddien.

Pondweed Family Potamogetonaceae





Althenia *Althenia orientalis* Altenja

A submerged plant that lives in brackish to salty water. It has thread-like stems and leaves, and the fruits are in clusters. The style is long and the stigma is funnel-shaped. This species was discovered by the author in 2006 at Għadira nature reserve where it is common to abundant. Its introduction in the reserve is believed to be a natural introduction by migratory birds that visit wetlands during migration. Other members of the Pondweed Family Potamogetonaceae included in Maltese Flora are **Broad-leaved Pondweed** *Potamogeton natans*, the **Curled Pondweed** *Potamogeton crispus* and the **Fennel Pondweed** *Potamogeton pectinatus*; all are rare and occur in freshwater (Haslam *et al*., 1977; Borġ, 1927, Gulia, 1873). According to Lanfranco (1989) the Fennel Pondweed has an uncertain native status and "occurs only at Għajn il-Kbira" and that this and other species of *Potamogeton* recorded by Gulia (1873) is "almost certainly in error".

Pondweed Family Potamogetonaceae





Black Bryony *Dioscorea communis* (*Tamus communis*)
Brijonja Sewda

A tuberous herbaceous perennial, with twining slender stems and long-stalked, alternate heart-shaped and shiny leaves. At base of leaf stalk are 2 stipule-like projections. Leaves large, plant conspicuous among other vegetation onto which it clambers. The flowers are in axillary racemes, male and female on separate plants. Male flowers occur solitary or in small clusters on the raceme, with 6 yellowish-green tepals and 6 stamens. Female racemes are shorter than male racemes, and flowers have conspicuous ovary. Fruit a fleshy pale red berry. A poisonous plant, and is scarce to frequent and mainly coastal, in rdum and valley bottoms, December to May.

Yam Family Dioscoreaceae




Mediterranean Meadow Saffron
Colchicum cupanii
Buswieq tax-Xitwa/Busieq

A low herbaceous perennial with swollen underground stem base (corm). Leaves 2, basal, short and pointed at flowering time, grooved (channelled). Flowers have narrow and veined tepals, ranging in colour from white to pale or darker pinkish/purplish-violet. The tepals unite below into a tube. Stamens are 6, with yellowish or black /brownish anthers. Fruit a capsule. Frequent to common in garigue and rocky steppe, blooming after the first rains from October to December.

Colchicum family Colchicaceae





Common Smilax/ Mediterranean Smilax/Sarsaparilla /Rough Bindweed/ Prickly Ivy *Smilax aspera*
Zalza
Pajżana/Pajżana

A prickly rhizomatous evergreen scrambling perennial with leathery and shiny alternate leaves. When plant is growing in shady areas the leaves are larger than when growing in sunny situations. Leaves are stalked, heart-shaped to triangular, often with pale blotches, and with prickles on margin and underside of midrib. Stems are also armed with prickles. Plant has tendrils that coil around other nearby vegetation for support, too often growing over and climbing on nearby vegetation. Flowers are small and clustered (umbels), scented, greenish-yellow/white, often in an elongate pendulous inflorescence. Male flowers and female flowers occur on different plants. Male flowers have 6 stamens and female flowers have the stigma divided in 3. Tepals 6. Berries are globose and red, with few (1-3) reddish-brown seeds. Frequent to common in maquis, valleys, base of cliffs, cliff edges, rdum, sometimes also in garigue, flowering from September to December.

Smilax Family Smilacaceae

The **White Lily** or **Madonna Lily** *Lilium candidum* Ġilju Abjad has large white flowers in a short raceme on a long flowering stem. It used to occur as a naturalised plant at Wied Żembaq but became extinct due to over collection (Lanfranco, 1993). Borġ (1927) describes it as "long cultivated and often partly naturalised in old gardens". The word *candidum* means shining or pure white.

Lily Family Liliaceae




Wild Tulip *Tulipa australis* Tulipan Salvaġġ

A herbaceous bulbous perennial with linear leaves and yellow (generally solitary) flowers in March and April. It grows in fallow field at Wied Qirda and is very rare, and the plants show characteristics between subsp. *sylvestris* and subsp. *australis* (Lanfranco, 1996, 1989). Maltese plants have the tepals tinged with purple on the outside, a characteristic of *Tulipa australis* (*Tulipa sylvestris* subsp. *australis*). The plant is still present at Wied Qirda but seems to be declining. Only a handful of plants were seen flowering when site was visited in late March 2013. It was recorded as very rare at Wied Qirda and Wied Inċita (Borġ, 1927; Haslam *et al*., 1977). It used to grow in several fields but became extinct (except in one locality) due to over collection to sell the flowers (Lanfranco & Lanfranco, 2003).An old note by Dr. Gulia- "Very beautiful is the yellow tulip *Tulipa sylvestris* which grows beneath the Olive, and on the edges of the fields opposite to the picturesque Chapel of Sant. Antonio. It was first met with here (Wied Qirda) by Dr. Augustino Naudi, and grows nowhere else in Malta and Gozo" – Dr. Gulia, in Botanical Notes by Rev. G. N. Godwin (1880). Sommier & Caruana Gatto (1915) reported it from Wied Qirda and Wied Inċita, and as nearly extinct from the last locality.

Lily Family Liliaceae

Orchid Family: Orchidaceae - The present list of Maltese orchids include 10 species that can be regularly found growing wild, plus other species that are considered rare/very rare to endangered or extinct. Most flower in late winter and spring. One rare species - Autumn Lady's Tresses *Spiranthes spiralis* - flowers in late summer and early autumn after the first rains. The largest of them all to be found locally is the Giant Orchid *Himantoglossum robertianum*. Its flowers start appearing in December, producing a spike of conspicuous flowers. Orchids can be found in a variety of habitats especially in garigue, maquis, rocky valleys and slopes, and rocky steppe. A good area for orchids can be a gently sloping rocky ground, and areas with low vegetation. Orchids are also found in long-abandoned fields. These plants can also grow in shady or sunny spots under the trees. Some occur singly, or scattered in loose groups, others more closely together. Two species are considered to be endemic to the Maltese Islands - Maltese Pyramidal Orchid *Anacamptis urvilleana* (sometimes recognised as *Anacamptis pyramidalis* subsp. *urvilleana*) and Maltese Spider Orchid *Ophrys melitensis* (considered a hybrid *Ophrys* x *flavicans* - see page 281). *Ophrys bombyliflora* var. *parviflora* are considered sub-endemic (Kuhn *et al*., 2019). Orchids are sensitive to disturbance, and suffer a lot from habitat degradation, such as dumping of rubble on garigue, and also by agricultural intensification.

The Orchid family is one of the largest families of flowering plants. They are herbaceous perennials and many are found in the tropics, and in these places they live attached to trees as a support (**epiphytes**), with dangling roots through which they absorb moisture from the air. Terrestrial species such as those found in the Maltese Islands have swollen roots (root-tubers) or rhizomes, and are **geophytes**. At flowering time there are generally 2 root-tubers (but some species may have more), one of them withered and crumpled. For this reason orchids are often called Ħajja u Mejta (dead and alive) or Bajdet il-Fenek (rabbit's testicles) in Maltese. The leaves of orchids are entire. At the base of the plant there is a rosette of leaves and up the stem the leaves are alternate. Uppermost leaves are often sheath-like or bract-like. The flowers are irregular in shape and have 6 tepals in 2 whorls; an outer whorl of 3 sepals (calyx) and an inner whorl of 3 petals (corolla). The sepals are green or coloured. The lower (median or middle) petal is largest and in the shape of a lip (the **labellum** or **Lip**) that can be lobed, and is a landing stage for many insects. Kuhn et al., (2019) state "Most European orchids have flowers that have evolved to be pollinated by particular insects". In the genus *Ophrys* the lip has a shiny area called the **speculum**. In some orchid flowers, the lip has a narrow tubular extension called the **spur**. Bracts are present; these can be leaf-like or scale-like and can also be coloured. Flowers are often arranged in spikes, racemes or in a branched raceme. The shape of the inflorescence varies and includes pyramidal (or cone), cylindrical and spiral, and can be loose or dense. The pollen grains occur in masses called **pollinia** (singular **pollinium**) which can be carried by an insect to another flower. The fruits are capsules that split open to release a large number of dust-like minute seeds that travel on air currents. For the seed to germinate it must be first invaded by a fungus (**mycorrhiza** - a symbiotic relationship).

Many orchid species are fertilised by one or a few species of insects. To facilitate insect pollination most orchids have the lip facing downwards on the open flower, but at the bud the lip is at the top. As the bud opens 180 degrees rotation of the flower occurs (**resupination**) so that the lip faces downwards. Orchids were thought to be a recently evolved group of plants; however recent fossil discoveries suggest that these have existed for at least 15 million years (Delforge, 2006).

The groups of orchids found in the Maltese Islands -

Lady's Tresses *Spiranthes* - These orchids have a slender elongated, spirally twisted inflorescence. Flowers small, white, without a spur, and shaped as a tube.

Giant Orchids *Himantoglossum* – Large and robust orchids with wide, large and shiny leaves, and conspicuous flowers. Flowers are in axils of long and pointed bracts in an elongated spike-like inflorescence, somewhat scented. The lip has 2 narrow side lobes with wavy margins, and the middle lobe has a cut at its tip, forming 2 lobes. The hood is formed by the lateral petals and the median sepal; the 2 lateral sepals are concave and curved forwards and also more or less form the hood. Spur present, short, and conical and points downwards.

Tongue Orchids *Serapias* – These orchids have flowers in which the main lobe of the lip (the 'tongue") hangs downwards and is the part of the flower which projects out of the hood. The hood is pointed and formed by the sepals, and hides the 2 lateral petals. The 2 side lobes of the lip are also mostly hidden within the hood. The lip is hairy. The hood and the bracts are streaked (veined), often of same colour. Spur absent. The flowers are in a spike. The leaves are channeled and spreading or curving upwards to erect. The upper stem leaves are smaller. Delforge (2006) states that the *Serapias* lack nectar, and that the closest relatives of *Serapias* are the *Anacamptis* and *Orchis*.

Pyramidal Orchids *Anacamptis urvilleana*, *Anacamptis pyramidalis* – These are usually conspicuous. Their flowers are arranged in a pyramidal or cylindrical spike. Their colour varies from pinkish to darker purplish/red or very pale, almost white to white. The hood is formed by the middle (median) dorsal sepal and the 2 lateral petals. Sepals and petals same colour as lip (lip, also called labellum is the middle and large petal). The lip is divided in 3 lobes. The spur is thin, long and down-curved. The leaves are channeled, linear-lanceolate and pointed. Some *Orchis* have been recently changed to genus *Anacamptis*. Kuhn *et al*. (2019) state that "it is difficult to distinguish *Anacamptis* from *Orchis* at the generic level". *Anacamptis* and *Orchis* are seperated fairly well in that the former has a combination of at least 3 leaves on the stem above the basal rosette (when present) and the lip do not have tufts of tiny coloured hairs (Kuhn *et al*.,2019).

Ground Orchids *Orchis* - This group of orchids has flowers with a hood formed by the sepals and lateral (side) petals. In some species the lateral (side) sepals spread out, and the hood formed only by the petals and the dorsal (middle) sepal. Lip is usually lobed. At the back of the flower there is a spur. Inflorescence is a spike, often dense. The leaves are variable and are spotted or unspotted, basal leaves often in a basal rosette. Pale individuals (as a result of a reduction of colour pigments) are known for all *Orchis* species, including specimens having white flowers instead of their normal colour (Delforge, 2006). *Orchis lactea* has now been placed in genus *Neotinea* (*Neotinea lactea*). This genus (*Neotinea*) has only four species, all found in Europe, and "difficult to distinguish from *Orchis* at the generic level" (Kuhn et al., 2019).

Bee Orchids *Ophrys* - The genus *Ophrys* is characterised by orchids having the flowers that often resemble an insect. The flowers consist of a median large petal (the lip or labellum) and two smaller and elongated lateral (side) petals. The hairy lip faces downwards and is entire or 3-lobed, and has a shiny area called the speculum. Spur absent. The sepals are showy, green or coloured, the lateral (side) sepals spreading, the dorsal (middle) one often forms a hood or is erect. The flowers are often in a loose spike. The leaves are mostly in a basal rosette, usually elongate and pointed (ovate, elliptic, or lanceolate), with 1-2 upper leaves that are smaller and pointed, and sheath the stem. Bee Orchids have 2 (-3) root-tubers (or more in some). The genus *Ophrys* is made up of a large number of species and subspecies. The flowers of the same species may have different marks on the speculum. Hybrids occur, even in the Maltese Islands (example *Ophrys bombyliflora* x *Ophrys fusca*). In some orchids, mainly in the genus *Ophrys*, the flowers emit scents and imitate the shape of some species of female bees and wasps. This lures the male bees that attempt to mate with the lip of the flower (**pseudocopulation**; pseudo=false). The insect then transfer pollen from one flower to another as it moves on to "copulate" or to find food. The genus *Ophrys* is divided into 2 sections according to the position of the insect on the flower during pseudocopulation (Delforge, 2006). This positioning of the insect will decide if the pollen is picked up by the head or by the abdomen of the insect. The group *Pseudophrys* includes those species in which the insect takes the pollen by the abdomen (example the *fusca* group), while in the *Euophrys* the pollen sticks to the head of the insect. The *Pseudophrys* include the *Ophrys fusca*, *Ophrys fusca* subsp. *iricolor*, and *Ophrys lutea* groups (plus also the *Ophrys omegaifera* group); *Euophrys* include the other *Ophrys* (Delforge, 2006). *Pseudophrys* are probably derived from *Orchis* s.l. (s.l. = sensu lato = widest sense) and principally associated with Andrenidae and Colletidae bees (Delforge, 2006). The main process of formation of new species within the *Ophrys* is constituted by insect pollinators (Delforge, 2006). Most orchid flowers have evolved to be pollinated by paticular insects (Kuhn *et al*., 2019).



The seeds of orchids are small and are carried by air currents. Shown here are the seeds of the Bumble Bee Orchid *Ophrys bombyliflora*. Scale 2mm x 2mm.



Eucera longicornis bee in pseudocopulation with a **Bumble Bee Orchid** flower. Bumble Bee Orchids are among the common orchids to be found in the Maltese countryside. February and March is a good time to look for these orchids.

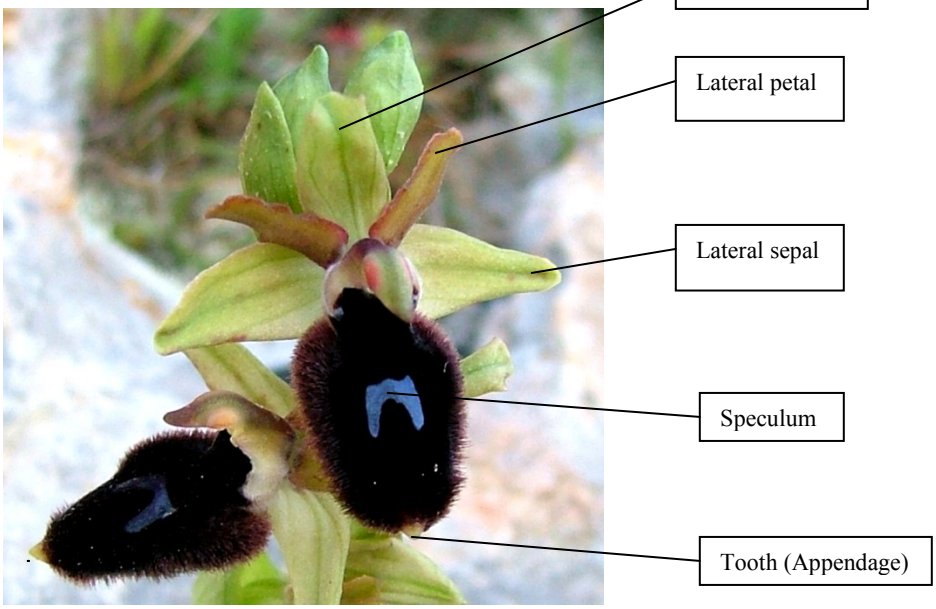


To facilitate insect pollination most orchids have the lip facing downwards on the open flower, but at the bud the lip is at the top. As the bud opens 180 degrees rotation of the flower occurs (**resupination**) so that the lip faces downwards.

Bumble Bee Orchid *Ophrys bombyliflora* with flower still to turn further to face downwards

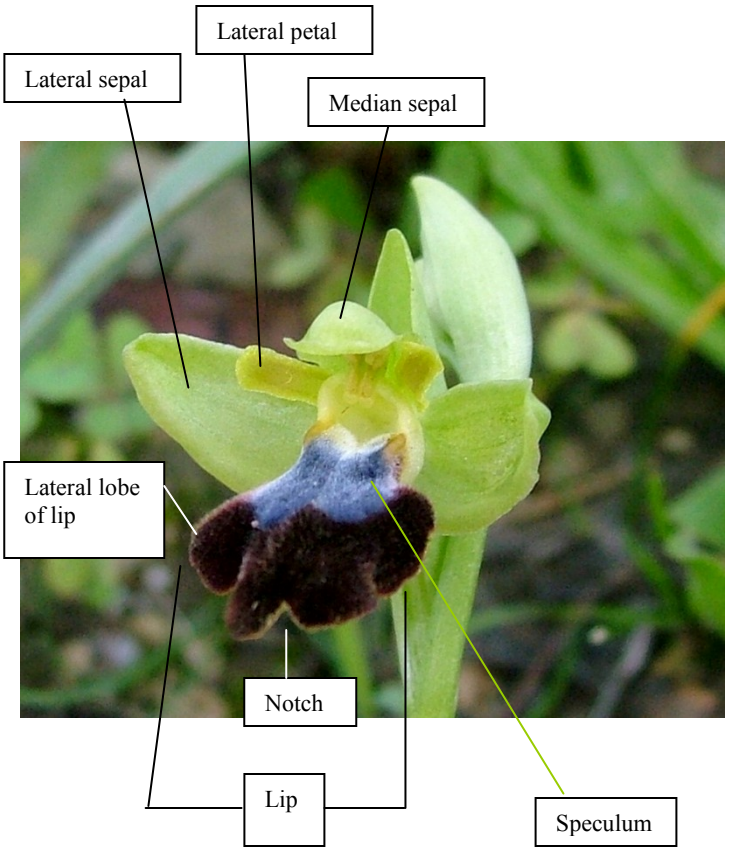
Euophrys: *Ophrys speculum*

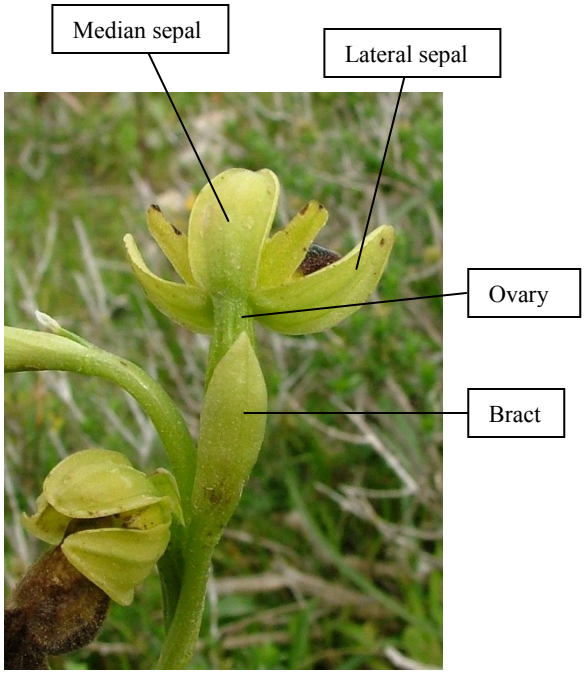




Euophrys: *Ophrys melitensis*

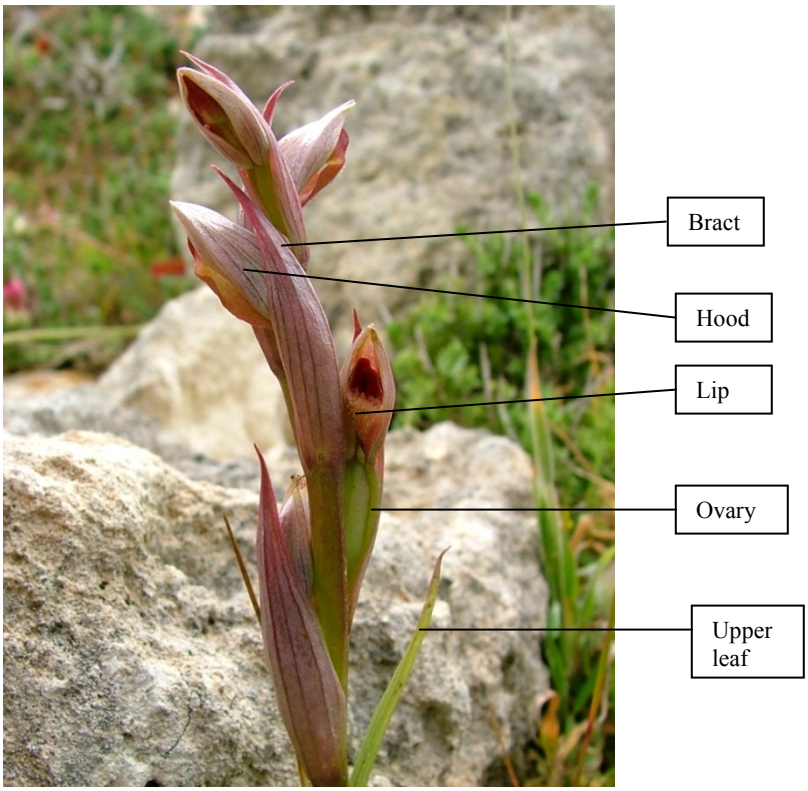




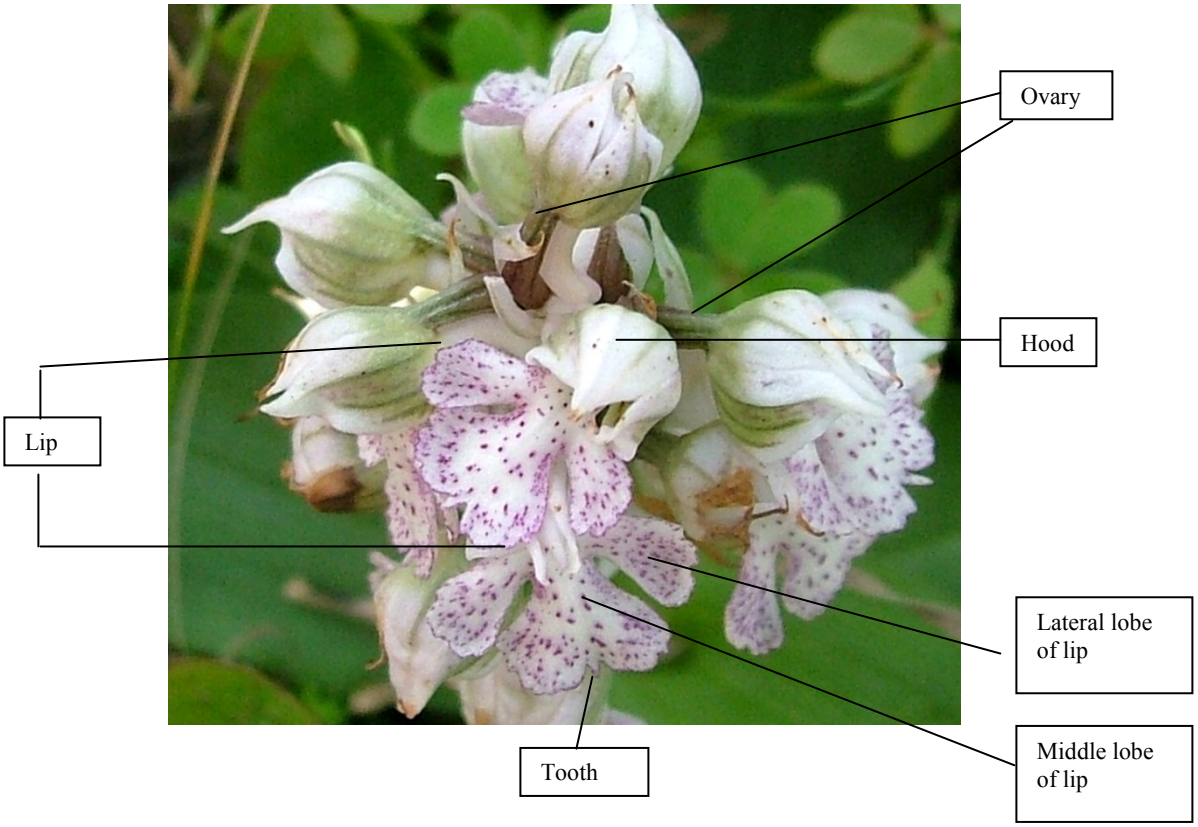


Pseudophrys: *Ophrys fusca*





Serapias: ***Serapias parviflora***





Neotinea: *Neotinea lactea*





Autumn Lady's Tresses *Spiranthes spiralis*
Orkida Spirali/Orkida tal-Ħarifa

A slender orchid, stem hairy and with small sheathing leaves. Basal leaves pointed, ovate or elliptical, still young and developing when plant is flowering. Bracts green or greenish-white, lanceolate and pointed, and sheath the ovary. These bracts are equal to or longer than the ovary. Inflorescence elongate and spike-like, with small flowers spirally twisted. Flowers are greenish-white, with the middle sepal, petals and lip forming a tube. Rare e.g. Buskett area, in garigue and arid rocky places, appearing after the first rains in September/October up to November.

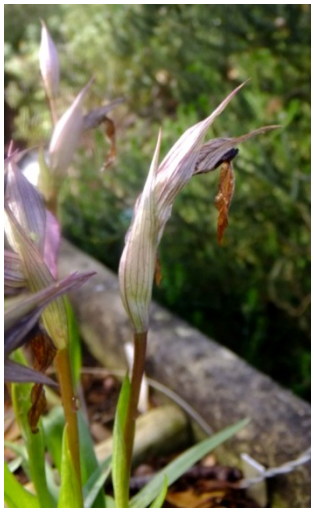
Orchid Family Orchidaceae





Small-flowered Tongue Orchid/Small-flowered Serapias/Small Tongue Orchid/Lesser Tongue Orchid
Serapias parviflora
Orkida tal-Ilsien Żgħira

A slender orchid with elongate (linear-lanceolate) and channelled leaves, sheathing the stem, spreading to erect. The leaves are often with red spots. Upper leaves are smaller. The flowers are small, borne in a spike, the pointed hood pale purplish (or pinkish) with faint green and veined, the "tongue" (median lobe of lip) brownish-red to purplish-red, pointing downwards, often curving backwards. Side lobes of lip mostly concealed within hood. Bracts pointed and veined, shorter or longer than hood and same colour or darker than the hood. Frequent to common in garigue, rocky steppe, rocky valleys, March to April. *Serapias parviflora* is regularly self-pollinating (Delforge, 2006); Flowers autogamous (Kuhn *et al*. 2019). Other species of *Serapias* have been recorded for the Maltese Islands: **Heart-flowered Tongue Orchid** *Serapias cordigera*, **Long-lipped Tongue Orchid** *Serapias vomeracea* Orkida tal-Ilsien Kbira and **Tongue Orchid** *Serapias lingua* Orkida tal-Ilsien (Lanfranco, 2007; Bartolo *et al*., 2001; Lanfranco, 1989; Haslam *et al*., 1977; Lanfranco, 1969; Borġ, 1927). Some records of *Serapias vomeracea* (including subsp. *laxiflora* and subsp. *vomeracea*) are given by Bartolo *et al*. (2001), while Lanfranco (2007) states that *Serapias vomeracea* is very rare in rocky steppe and garigue and (Lanfranco,1989) that only a few specimens still exist and it is endangered. Mifsud (2010a) gives a record of *Serapias bergonii* (*Serapias vomeracea* subsp. *laxiflora)* from Wied tax-Xlendi, Gozo. The Tongue Orchid *Serapias lingua* has a lax inflorescence with 2-8 rather pale flowers. The lip is not reflexed. It is described as very rare in four places in Malta e. g. at Wied il-Għasel and Wied Inċita by past authors. Lanfranco (1989) gives the status of *Serapias lingua* as "not seen for over 70 years". The photographs of *Serapias lingua* shown in the next page of this book were taken at Argotti Botanical Gardens by courtesy of Dr. Joseph Buhagiar.

Serapias lingua at Argotti Botanical Gardens, mid-April

Orchid Family Orchidaceae




Pyramidal Orchid *Anacamptis pyramidalis*
Orkida Piramidali

A slender orchid with erect or spreading pointed leaves. Stem is leafy up to the inflorescence, leaves on the stem smaller and sheathing. The uppermost leaves can have a hint of pinkish/purplish colour. Lower leaves usually dry at flowering time. Flowers have bracts, often coloured, equal to or slightly longer than the ovary. Flowers vary in colour intensity, some pale and some dark, pink to pinkish-red, in dense pyramidal (cone) spike. Inflorescence eventually becomes cylindrical. Blooms later than the endemic Maltese Pyramidal Orchid *Anacamptis urvilleana*, and is generally also darker and larger-flowered. Frequent to common and widespread in garigue, rocky steppe, maquis, rocky valleys and abandoned fields, mid-April to early June. Lanfranco (2015) states that "The Maltese populations seem to represent an endemic race, described as the form *comata*".

Orchid Family Orchidaceae





Maltese Pyramidal Orchid *Anacamptis urvilleana* (*Anacamptis pyramidalis* subsp. *urvilleana*) Orkida Piramidali ta' Malta

Similar to the Pyramidal Orchid *Anacamptis pyramidalis*, but generally smaller and paler in flower colour and blooms earlier. Flowers scented, and vary from white to almost white with a faint tinge of pink, to paler or darker pink. The inflorescence elongates as the flowering season progresses. The bracts can be shorter, equal to or slightly exceeding the ovary. Widespread and often frequent-common, in garigue, rocky steppe, rocky valleys and abandoned fields, February to March (up to mid-April). The Maltese Pyramidal Orchid is thought to be endemic but it may also occur in the Gargano Peninsula in Italy (Lanfranco, 1996); however records of this species from outside the Maltese Islands are not reliable (Lanfranco, 2015). Endemic; first described by Stefano Sommier and Alfredo Caruana Gatto in 1915 (Lanfranco, 2007). Scarce in Gozo (Lanfranco, 2007). Late flowers of this species coincide with early flowers of *Anacamptis pyramidalis*, thus making it possible for pollen of both species to mix.

Orchid Family Orchidaceae





Scented Bug Orchid *Anacamptis coriophora* subsp. *fragrans* (*Orchis fragrans*, *Orchis coriophora* subsp. *fragrans*) Orkida Tfuħ

A variable ground orchid, basal leaves spreading to erect, linear-lanceolate, stem leaves smaller. The sepals and petals form the hood. The hood is greenish or purplish, streaked. Flowers in a dense spike, and can be pale or darker purplish-red, with lip spotted and having a whitish base, lateral lobes green or purplish-red, toothed. Bracts whitish-green or purplish that generally exceed the ovary. Flowers are sweetly scented. Frequent to common in garigue, rocky steppe, rocky valleys and areas with short vegetation from March to May.

The "*Orchis coriophora* group" (*Orchis coriophora*, *O. fragrans* and *O. sancta* - in Delforge, 2006) has strongly-scented flowers and spur with nectar; many species of insects visit the flowers to feed on this nectar. The remaining *Orchis* species do not have nectar (Delforge, 2006).

Orchid Family Orchidaceae





Pink Butterfly Orchid *Anacamptis papilionacea* (*Orchis papilionacea*) Farfett

Basal leaves are in rosette, spreading to erect, the uppermost cauline leaves sometimes pinkish-red and sheath the stem. Bracts are equal to or longer than flower, pinkish-red and veined. The petals and sepals are pinkish-red and veined, and form the “helmet”. The lip is entire and fan-shaped, violet, veined and spotted, and with fine teeth on the margin. Inflorescence is a lax spike. The Pink Butterfly Orchid is very rare in the Maltese Islands and is not listed by previous authors e.g. by Haslam *et al*. (1977) and Borġ, 1927. Stevens (2003) mentions *Anacamptis papilionacea* as endangered in his list of extinct or endangered orchid species in the Maltese Islands. One flowering plant was found in March 2014 by Matthew Borg Cardona growing in garigue on the Eastern side of Malta. The pictures above show the plant found by Borg Cardona. Edwin Lanfranco (pers. comm., 2016) states that the first plant in Malta was confirmed in c. 1999-2000, and now there are 2 confirmed records. Delforge (2006) describes several varieties for this orchid and that this species varies mainly in the “size of the floral parts, colour of the hood, and markings on the lip, but without clear-cut boundaries emerging”.

Orchid Family Orchidaceae







Fan-lipped Orchid/Red Orchid *Anacamptis collina* (*Orchis collina*, *Orchis saccata*)
Orkida Ħamra

Leaves sheathing stem often 2 or 3 (1-4), green or tinged purplish-brown. The flowering stalk is purplish-brown, and holds from 2 to 12 or more flowers in a spike. The purplish-brown bracts are longer than the ovary (at least in lower flowers, in upper ones sometimes equal to). The hood is formed by the median sepal and the two lateral petals. The fan-shaped lip is not divided into lobes, and can be pinkish or darker purplish-pink/red, white at base and with a brownish border, and with wavy edges. The lip is usually purplish-brown to brown at the back. The sepals and lateral petals are generally purplish-brown that can be tinged with green. The spur is

white, with a greenish base and a purplish/greenish vein. A less common form has white lip, with green sepals and petals. Frequent to common and widespread in garigue, rocky steppe, maquis, rocky valleys, open areas with short vegetation, blooming from January to early March, mostly in February.

Orchid Family Orchidaceae





Milky Orchid
Neotinea lactea
(*Orchis lactea*)
Orkida tat-Tikek

A variable orchid with flowers in a spike, some specimens paler than others, almost white, while in others the flowers are mottled dark purple. There can also be a dark border at the margin of the lip. The middle lobe of lip can have the edges parallel or not, and a tooth is often present at its tip. Lateral lobes of lip spreading and toothed. Hood is formed by the sepals and lateral petals, and whitish or purplish, with green/purple streaks from the outside and dark streaks inside, with the sepals finely cut at the tips (sepals acuminate = taper to fine points), giving the hood its acuminate appearance. Bracts are shorter or longer than ovary, whitish. A frequent and widespread species in garigue, rocky steppe, rocky valleys, maquis, open areas with short vegetation, and also in rdum. It flowers in February and March, sometimes also in January. Lanfranco (2015) reports this species as *Orchis conica* (*Neotinea tridentata* subsp. *conica*), and continues "Very closely related to *Orchis lactea* and *Orchis tridentata* in which it has often been included". For the same species (*Orchis conica*) Lanfranco (2007) states "Variously confused with related *Orchis tridentata*, *Orchis lactea* and *Orchis commutata*".

Orchid Family Orchidaceae




Italian Orchid/Italian Man Orchid/Naked Man Orchid
Orchis italica Orkida tal-Italja/Ħajja u Mejta tal-Werqa Fdewxa/Orkida tal-Werqa Fdewxa

Leaves are mostly in basal rosette, spreading to erect and have wavy margins. Stem leaves are smaller, sheathing. The flowers are in dense ovate or conical to cylindrical head, pinkish or purplish. Hood is long-pointed (long-acuminate), veined and spotted. Lip is deeply 3-lobed, the central lobe further divided in 2 narrow spreading lobes with a prominent tooth/narrow extension in between. The 2 side lobes are long and narrow. The lip resembles a man with arms (side lobes) and legs (divisions of central lobe). Centre of lip pale, spotted. Bracts are shorter than ovary. Spur is curved downwards. Very rare and endangered in rocky valleys. Flowers in spring, late February-March to April. Much of the plants occur in one rocky valley (Wied Babu) and the species is thus vulnerable. The author found the species also at Wied il-Għasel in 2011 and 1 plant in the 1990s at Dwejra ridge (Malta). This single specimen was not seen again, probably destroyed by degradation caused by large human presence in the area (Dwejra is popular especially in winter on Sunday afternoon) as well as by the construction of a bird shooting hide. Mifsud (2018) reports it also from Għajn Tuffieħa and Nadur in Gozo. *Orchis italica* belongs to the *Orchis militaris* group (Delforge, 2006).

Orchid Family Orchidaceae





Giant Orchid *Himantoglossum robertianum* (*Barlia robertiana*) Orkida Kbira

A relatively large and robust orchid with a dense inflorescence. Leaves shiny and smooth, pale green and pointed at tip, keeled underneath and channeled above. Stem leaves erect and almost enveloping stem above. Uppermost leaves narrow, bract-like and can have a purplish tinge. Inflorescence a dense spike-like head, and flowers somewhat scented. Flowers are purplish, dark or pale. Lip with 3 lobes, middle lobe further cut in 2 lobes at tip; lip appears "man-like". The border of the lip is purplish-brownish, and the central area of the lip is pale with purplish spots and marks. The "hands" (the 2 narrow side lobes) have wavy margins. The hood is formed by the 2 lateral petals and the sepals. The 2 lateral petals are small, greenish. Sepals are greenish-purplish. Spots are present on petals and sepals. Sepals and petals curve forwards. Ovary is purple, exceeded by the bracts. Bracts are mostly purplish but also have some green colour, and with purple spots. This orchid was not recorded by past authors until the mid-1970s, and could possibly be a relatively recent naturally- introduced plant (Lanfranco, 2015). Rare in garigue and rdum, flowering from December to February (-March). Two populations found by the author have gone extinct; one (at Miżieb) was destroyed by trenching works carried out in the area, and another population in the nort-west of Malta was destroyed by works on the land converting it into a bird-trapping and pseudo-agricultural site! The Giant Orchid is in the *Himantoglossum robertianum* group (Delforge, 2006).

Orchid Family Orchidaceae



Brown Orchid *Ophrys fusca* Dubbiena

A variable orchid. Basal rosette of few leaves (often 3-4), elliptical or ovate or elongate-elliptical, pointed at tip, shiny and smooth. Stem leaves smaller and few (often 1-3), sheathing, uppermost leaf smallest and sometimes bract-like. Stem leaves sometimes partly enclose the stem. The leaf is paler on the underside and the parallel veins more noticeable. Flowers few, (often 2-4-5), in lax spike at the axils of bracts; bracts shorter, equal to or exceeding ovary but generally gets shorter than ovary as the latter enlarges. Sepals green to yellowish-green; the upper one curved forwards and downwards forming the hood, the lateral ones spreading and curved forwards. Lateral petals are thin and elongate, spreading, sometimes with a somewhat undulating (wavy) margin. These are green, yellowish-green or green with a faint tinge of brown. The lateral sepals and petals usually curve towards the lip. Lip hairy and is divided in 3 lobes, the main (median) lobe with a notch and longer than the side ones. The lip appears paler in sunlight, often reddish-brown; in shade appears darker, purplish-brown to blackish. Speculum shiny or drab, bluish or greyish, and can be marbled. The side lobes are spreading and often "falling down" like two tired arms. A yellowish or greenish border, sometimes faint and hardly noticeable, can be present around the lip. The underside of the lip varies from greenish to purplish. It must be noted that tall and short plants can be found within a colony of Brown Orchids. Brown Orchids can be found in the garigue, in rocky steppe (including among Branched Asphodel *Asphodelus ramosus*), rocky valleys, maquis, and also in wooded areas under the trees. Here they grow both on hard ground and on soft, moss-covered ground. The Brown Orchid is usually a scarce to frequent-common orchid, flowering from December to May. The *Ophrys fusca* has been recently divided by some botanists into a number of different species that are closely related to each other. This is however debatable as sometimes new "species" have been based on minor differences. Kuhn *et al*. (2019) describe 5 subspecies of this orchid for Europe and the Mediterranean. Two subspecies occur in the range of the Maltese Islands - subspecies *fusca*, with a green underlip, and *iricolor* with a reddish underlip and a shiny blue speculum. Lanfranco (2015) argues that *Ophrys fusca* is an aggregate of microspecies many of which are probably of very questionable value, and that these could be just local variants or hybrids. He continues that in Malta 2 groups can be recognised - the *Ophrys fusca* group and the *Ophrys iricolor* group. One such difference among these 2 groups is that the underside of the lip is often partly reddish in *iricolor* and

the lip has distinct lateral lobes. In some cases Brown Orchids examined by the author (Casha) from same areas had both reddish and greenish underside of lip.





Ophrys fusca pictures. Small-flowered ones (lip c. 10mm long and with a yellow border) has been considered as sub-endemic *Ophrys caesiella* but are regarded as *Ophrys fusca* (e.g. by Kuhn *et al*., 2019). See also page 341.

Orchid Family Orchidaceae




Yellow Bee Orchid *Ophrys lutea*
Żunżana

Lip is broadly edged with yellow. The speculum is 2-lobed, bluish-grey, and has brownish hairs at the centre of the lip, sometimes forming a v at the tip. Lateral sepals wide and greenish/yellowish, curving towards the lip. Lateral petals greenish/yellowish. Rare in garigue, rocky steppe and maquis, flowering in March and April (-May).

Orchid Family Orchidaceae




Bumble Bee Orchid *Ophrys bombyliflora*
Naħla

One of the smallest and least variable *Ophrys*. The lip is dark brown, divided in three lobes, the side ones hairy and humped. These side lobes are bent backwards and pointing downwards and their lower ends are hairless and often tipped greenish. Median lobe is globular. The speculum is bluish or greyish, inconspicuous. The 2 lateral hairy petals are triangular, green tinged purplish, small and curve away from the lip. The green sepals are wide and larger than the lateral petals, spreading. Eventually the sepals curve towards the lip. Flowers are few on a spike. Bracts are shorter than ovary. A frequent to common orchid in maquis, garigue and other open ground including rocky steppe, and also in rdum. Several individuals can often be found growing in one patch. Flowers from February to early April, mostly in March. In March 2008 pseudocopulation by *Eucera longicornis* bee was seen on the flowers of Bumble Bee Orchids by the author at Ta' Ċenċ, Gozo. The event was accompanied by sounds emitted by the bee itself. More than one bee of the same species were seen on different flowers of Bumble Bee Orchids. Hybrids between this species and *Ophrys fusca* have been seen at Dwejra, Malta by the author. Smaller-flowered specimens (var. *parviflora*) have been discovered by Stephen Mifsud at Pembroke (MEPA, 2012; Mifsud, 2009c). Small-flowered *Ophrys bombyliflora* have also been noticed elsewhere, e.g. Sicily (Kuhn *et al*., 2019) and Majjistral Park, Malta.





Small-flowered specimens (*Ophrys bombyliflora* var. *parviflora*) at Pembroke, pictured in March 2014. These plants have smaller flowers than the other "normal" *Ophrys bombyliflora* (*Ophrys bombyliflora* var. *bombyliflora*), easily noticed when observed.

Orchid Family Orchidaceae





Mirror Orchid/Mirror of Venus *Ophrys speculum* (*Ophrys ciliata*, *Ophrys vernixia*) Dubbiena Kaħla/Orkida tal-Mera

An unmistakable orchid. The flowers are carried in a lax spike. The lateral sepals are green, and striped purplish-brown. The median sepal is curved forwards and down. The 2 lateral petals are small and dark purplish-brown, hairy. These are curved away from the lip. The lip has a hairy purplish-brown margin and divided in three lobes. The median lobe has a shining blue speculum with a greenish-yellow margin. Generally a scarce orchid found in several localities e.g. at Ta' Ċenċ, Pembroke, Ghadira area, Dwejra (Malta), Nadur (Malta), Buskett, Comino and is found in garigue and rocky steppe, flowering in March and April. It is more frequent in Gozo, and is common at Ta' Ċenċ.

Orchid Family Orchidaceae



Maltese Spider Orchid *Ophrys melitensis*
Brimba Sewda/Brimba Sewda ta' Malta



An endemic variable orchid with many different speculum shapes on the lip. The shape of the speculum includes two thin or thick vertical lines, short or tall, parallel or diverging; 2 wavy lines; 2 lines, one shorter than the other; H-shaped; an H that lost some of the horizontal line; an inverted U (horseshoe); or two spots. There are also specimens that have no speculum on the lip. The same plant can have flowers with different speculum on different flowers. The lip can be wide or thin. It is usually dark reddish-brown with a paler hairy margin, two humps on the sides, and a pale appendage (tooth) in the middle. The speculum colour is bluish-grey. The lateral petals are greenish or brownish (or dark brown), and usually wavy. The sepals are usually broad and pale whitish-green, sometimes tinged brown, curving towards the lip. On occasions petals can be whitish or pink/purple and the sepals can be whitish or pinkish with a green/brown middle vein. Generally frequent to common in garigue, rocky valleys, rocky steppe, maquis, flowering mostly in March, also in April. "Probably of hybrid origin and still very much unsettled as a species" (Lanfranco, 2015). The synonym given by Lanfranco (2015) is *Ophrys sphegodes* subsp. *melitensis*. The Maltese Spider Orchid is in the *Ophrys sphegodes* complex, in the *Ophrys lunulata* group; the pollinator of the Maltese Spider Orchid is *Chalicodoma sicula* (Delforge, 2006). Under the Plant List http://www.theplantlist.org/ (accessed 5 April 2017) its name is given as *Ophrys* x *flavicans*. Kuhn *et al*. (2019) describe it as *Ophrys* x *flavicans* notomorph (hybrid population) *melitensis* and that its parent species are *Ophrys bertolonii* and *Ophrys sphegodes*. See page 347.

Orchid Family Orchidaceae





Yellow Spider Orchid/Late Spider Orchid
Ophrys fuciflora subsp. *lacaitae* (*Ophrys lacaitae*) Brimba Safra

This orchid has a very striking yellowish lip with a bluish-grey speculum in the form of an H (or variable) on the velvety reddish-brown base/half. The tip of the lip (appendage) is yellow and is projected forwards. The sepals are whitish-green and have 1-3 greenish veins. The lateral petals are very small and whitish or greenish. Bracts exceed the flowers. Very rare, possibly extinct, flowering in spring March to May. Left pictures show Yellow Spider Orchid taken near Laferla Cross in April 1992 by Raymond Galea. Note: Old records of *Ophrys fuciflora* belong to subsp. *fuciflora* and subsp. *oxyrrhynchos* (Haslam *et al*., 1977).

Orchid Family Orchidaceae





Bee Orchid *Ophrys apifera* Naħla

The sepals are broad, whitish to pinkish/purplish and with central green vein. The median sepal is erect. Lateral petals directed forwards, small and green to purplish/pinkish, and hairy. The labellum (lip) is reddish-brown to dark purplish/blackish, velvety (covered with dense short hairs) and 3-lobed with the side lobes hairy. The speculum is variable, bluish, purplish or brownish and with a yellowish margin, and often shaped as an H with the 2 lower lines of the H short. The appendage at tip of lip is green and bent backwards and under lip. Mostly self-pollinating. Flowers in spring, April to May, and is very rare to possibly extinct. The species is recorded by past authors as rare in sheltered valleys in a few areas in Malta. Pictures shown here were taken by Raymond Galea at Wied Rini in April 1996.

Orchid Family Orchidaceae









Bertoloni's Bee Orchid *Ophrys bertolonii* Dubbiena ta' Bertoloni/Dubbiena ta' Sqallija

The Bertoloni's Bee Orchid has a dark velvety lip covered with blackish-brown hairs and is entire or weakly 3-lobed and its margins are rolled back. The speculum is bluish-grey and saddle-shaped, placed near the tip of the lip. The appendage is curving upwards. The sepals are somewhat concave, pink or white or rarely greenish, and with a central green vein. Lateral petals pink/purple and darker than sepals. Very rare in garigue and rocky areas, March to May. It was recorded as rare from a few arid rocky places in Malta (Haslam *et* al., 1977).

Ophrys bertolonii pictured at Wied Dalam in April 1995 by Raymond Galea

Orchid Family Orchidaceae

Note: Of interest are the *Ophrys* hybrids as given in Bartolo *et al.* (2001) including *Ophrys melitensis* x *Ophrys bombyliflora*, and *Ophrys melitensis x Ophrys speculum*; others include *Ophrys bombyliflora* x *Ophrys fusca* (seen by the author at Dwejra, Malta) and *Ophrys lutea* x *Ophrys fusca*. Mifsud (2018) gives a record of one plant from Gozo of *Ophrys x gaulosana* (*Ophrys melitensis* x *tenthredinifera*).

Below is a table of 3 *Ophrys* species that are endangered or extinct in the Maltese Islands with their English and Maltese names:

Species	**English Name**	**Maltese Name**
Ophrys fuciflora subsp. *oxyrrhynchos*	Beaked Spider Orchid, Sicilian Spider Orchid	Brimba ta' Sqallija
Ophrys lunulata	Crescent Orchid, Moon Orchid	Orkida tal-Qamar/Brimba tal-Qamar
Ophrys tenthredinifera	Sawfly Orchid	Naħla Kbira

Current status of orchids in the Maltese Islands -

Species	**Status**
Anacamptis *collina*	Frequent to common
Anacamptis coriophora subsp. *fragrans*	Frequent to common
Anacamptis morio	Extinct
Anacamptis morio subsp. *longicornu* (*Anacamptis longicornu*)	Very rare - 1 plant extant in Gozo (Mifsud, 2018)
Anacamptis papilionacea	Very rare
Anacamptis pyramidalis	Frequent to common
Anacamptis urvilleana	Frequent to common in several sites, but scarce in Gozo
Himantoglossum *robertianum*	Rare
Neotinea *maculata*	Extinct
Neotinea lactea	Frequent to common
Ophrys *apifera*	Very rare to possibly extinct
Ophrys bertolonii	Very rare
Ophrys bombyliflora	Common. Variety *parviflora* is rare.
Ophrys fuciflora subsp. *candica* (*Ophrys oxyrrhynchos* subsp. *calliantha*)	Very rare - at least two stations are known (Mifsud, 2018)
Ophrys fuciflora subsp. *lacaitae*	Very rare to possibly extinct
Ophrys fuciflora subsp. *oxyrrhynchos*	Very rare to possibly extinct
Ophrys fusca subsp. *fusca* and subsp. *iricolor*	Frequent to common
Ophrys lunulata	Very rare to possibly extinct
Ophrys lutea	Rare
Ophrys melitensis	Frequent to common
Ophrys speculum	Rare to scarce but frequent in Gozo.
Ophrys sphegodes subsp. *atrata* (*Ophrys incubacea*)	Very rare - four plants are known (Mifsud, 2018)
Ophrys sphegodes subsp. *passionis* (*Ophrys passionis*)	Very rare- only two plants are known (Mifsud, 2018)
Ophrys tenthredinifera	Very rare - 2 plants extant one in Gozo, one in Malta (Mifsud, 2018, as subsp. *grandiflora*)
Orchis *italica*	Very rare
Serapias *cordigera*	Extinct
Serapias lingua	Extinct
Serapias parviflora	Frequent to common
Serapias vomeracea subsp. *laxiflora* (*Serapias bergonii*)	Very rare - probably only two extant populations on the Maltese Islands (Mifsud, 2018)
Serapias vomeracea subsp. *vomeracea*	Very rare
Spiranthes *spiralis*	Rare

Note: Guido Lanfranco (1969) describe *Ophrys sphegodes* as "rather rare but widespread...in several forms and subspecies", and illustrates three subspecies including *atrata* and *mammosa*. Haslam *et al*. (1979) describe it as "local" and that it is found in two subspecies - *sphegodes* and *atrata*. These orchids were later described as *Ophrys melitensis*, a species that is frequent to common in the Maltese Islands. One feature of *Ophrys sphegodes* subsp. *sphegodes* is that the speculum is usually H-shaped and connected to the base of the lip (Kuhn *et al.*, 2019). Some flowers of *Ophrys melitensis* show this characteristic and have an H-shaped speculum touching the base of the lip. *Ophrys sphegodes* subsp. *sphegodes*, and the subspecies *atrata* and subspecies *passionis* can be found within the region of the Maltese Islands but subspecies *mammosa* has a range further east (Kuhn *et al.*, 2019). *Ophrys fusca* subsp. *pallida* (*Ophrys pallida*), the **Pale Green Orchid** is found in NW Sicily and NE Algeria (Kuhn *et al*., 2019); it was included in the flora of the Maltese Islands, e.g. by Borġ, 1927.




Stinking Iris/Fetid Iris/Roast Beef Plant *Iris foetidissima* Fjurdulis tal-Bosk/Fjurdulis tal-Buskett/Fjurdulis tad-Dell.

A rhizomatous perennial forming tufts. Leaves are long, flat and pointed, linear to sword-shaped, smooth and shiny. Flowers occur on flattened green stalk, and have six tepals - 3 outer, larger ones and curving down (falls), and three smaller and inner ones erect (standards). The flower is dull brownish-violet, with veins. The 3 outer tepals have yellowish bases. Styles 3, long, and curve above the larger tepals, each with a yellowish stamen underneath. Spathe is green. Fruit a capsule that splits in 3 parts, filled with numerous bright and conspicuous orange seeds inside. Rare and localised in shaded areas, e.g. Buskett. The species is also found in gardens. Flowers in May and June. The plant is named after its foul-smelling leaves when these are crushed.

Iris Family Iridaceae




Southern Dwarf Iris *Iris pseudopumila* Bellus

A short iris with rhizomes. Leaves are found all year round. Flowers are bluish-violet or yellowish (with variable amount of brownish/violet on outer tepals), with violet veins, and scented. The outer tepals (falls) are bearded on the upper surface. Plants can be numerous and form colonies, sometimes large. The violet-flowered variety is scarce but widespread in garigue and open rocky ground, also in rdum, the yellow-flowered variety is rare and less widespread and has smaller leaves and generally blooms earlier. Flowering occurs around January to March. The Southern Dwarf Iris is sub-endemic and restricted to Malta, Sicily and southern Italy (Lanfranco, 2015, 2007, 1989). First discovered in 1970 (Lanfranco, 1989).

Iris Family Iridaceae




Sicilian Iris *Iris sicula* Fjurdulis Sqalli

A tall herbaceous perennial with rhizomes. Leaves sword-shaped and long but shorter than flowering stalk, these dry out in summer and new ones emerge in autumn. Flowers are violet and scented, large and showy, on long main branched stalk. Outer tepals have veins at their base, and a yellowish beard. Spathe membranous above, green below and eventually becomes membranous. It is rare in the wild, in rocky ground including sides of valleys. Flowers from late April to May. Sub-endemic. Occurs in the Maltese Islands, Sicily, Lampedusa, Egadi Islands, and possibly also in Isola di San Pietro in Sardinia (Lanfranco, 2015; 2007; 1996). Related to *Iris pallida* but has larger and darker flowers (Lanfranco, 1989).
Iris Family Iridaceae



Florentine Iris/White German Iris *Iris florentina* (*Iris germanica* var. *florentina, Iris x germanica var. florentina*) Fjurdulis Abjad

The Florentine Iris can be distinguished by its white flowers having a yellow and white beard on the outer tepals. The flowers are held on short stalks, and the flower tube exceeds the spathe. Spathe is white-membranous at the tip and at the margin. Leaves are flat, sword-shaped. This medium-sized iris is not native and cultivated for ornament, sometimes found naturalised. Flowers in spring, April-May. The *Iris florentina* belongs to the *Iris germanica* group (Pignatti, 2002). The **Yellow Flag** or **Yellow Iris** *Iris pseudoacorus* Fjurdulis Isfar or Fjurdulis tal-Ilma has shiny yellow flowers. It used to grow at Saqqajja but was destroyed when the water was drained. Caruana Gatto reports the disappearance of this plant by 1911 (Lanfranco, 1993, 1989; Haslam *et al*., 1977).

Iris Family Iridaceae



Barbary Nut Iris/Spanish Nut Iris/Blue Iris *Moraea sisyrinchium* (*Gynandriris sisyrinchium*, *Iris sisyrinchium*) Fjurdulis Salvaġġ

A small cormous (with corm) herbaceous perennial. Plant has only 1-2 leaves, and these are long, channelled and grooved, linear and curved, lying on the ground. Flowers are bluish-violet, with yellowish patches on the 3 recurved outer tepals (the falls). The 3 inner tepals (standards) are erect. The flowers come out from membranous spathes, and open only for a few hours in the early afternoon before withering. The stamens are attached to the branches of the style. Fruit a capsule with many brownish seeds. Common in garigue (also disturbed), rocky valleys, rocky steppe, paths and other open ground, March to May. A taller variant with larger, earlier flowers also occurs and is rare (Lanfranco, 1996). This may be the "*Iris aegyptia*" recorded by Grech Delicata (1853) - Lanfranco, 1989. The same author states that it occurs in at least 2 localities. Tabone (2008) records *Iris aegyptia* near Wied Ħarq Ħamiem, Malta.

Iris Family Iridaceae





Field Gladiolus/Common Gladiolus/Round-seededCorn-flag/Corn-flag *Gladiolus italicus* (*Gladiolus segetum*) Ħabb il-Qamħ tar-Raba'/Ħabb il-Qamħ/Gladjoli tar- Raba'

A cormous (with corm) herbaceous perennial with flat sword-shaped leaves. Flowers are pinkish/reddish-purple and showy, in a spike longer than the leaves. Flowers have 6 unequal tepals (an upper one, 2 side ones and 3 lower ones) and with a short tube near the base. The lower 3 tepals have pale marks bordered by purple. Upper tepal is larger and set well apart from the side petals. At the base of each flower are a bract and a spathe. Stamens are 3, with the anthers longer than the filaments. Fruit is a three-chambered capsule, containing a number of orangish to reddish-brown angled and unwinged seeds. Common in fields among crops such as cereals, also in valleys, abandoned fields, clay slopes, roadsides, garigue and other rocky ground, March to May. Originally imported with crop seeds (Schembri & Lanfranco, 1996). Another species of *Gladiolus* to be found in the Maltese Islands is the **Mediterranean Gladiolus**/**Wild Gladiolus** *Gladiolus communis* Ħabb il-Qamħ/Gladjoli Slavaġġ, that has winged seeds. Lanfranco (2015) includes *Gladiolus byzantinus* and *Gladiolus dubius* as synonyms of *Gladiolus communis*; these 2 were included in Maltese flora as species or varieties.



Left picture shows winged seeds of *Gladiolus* species, photographed in late July.

Note: According to Mifsud & Hamilton (2013) only 2 species of *Gladiolus* are found in the Maltese Islands - *Gladiolus italicus* and *Gladiolus communis*. In their study the authors concluded that *Gladiolus italicus* is "infrequent to rare (locally frequent in only a few sites), whereas *Gladiolus communis* is by far the most common species, often abundant in clayey fields that have been abandoned for a long time..." Their study of the genus *Gladiolus* in the Maltese Islands were based on the corolla, the tepals, the fruits and the seeds and not on the anther to filament proportions.

Iris Family Iridaceae





Chasmanthe/Cobra Lily *Chasmanthe* sp.
Kasmanti

A cormous herbaceous perennial with sword-shaped flat leaves having a prominent vein. The leaves are arranged in a fan, and pointed, stem leaves smaller. Flowers are striking, with 6 unequal tepals, the tepals orange-red, at first with a greenish/yellowish tube. These are borne on an erect or inclined stalk in a spike inflorescence with the flowers set alternately on both sides of it. The flowers narrow at the base with a twisted portion. Fruit a capsule that splits open to release small orange-coated seeds. An alien species, native to South Africa, planted for ornament and also found naturalised, e.g. Qammieh, Mistra. Flowers from late autumn/winter (late December, January) to spring. The word *Chasmanthe* comes from the Greek words *Chasme* meaning wide mouth, and *anthe* meaning flower. In their native range, the flowers are pollinated by sunbirds. The brightly-coloured flowers attract these birds that visit them to drink nectar. The 3 closely-related species of *Chasmanthe* - *C. biflora*, *C. aethiopica* and *C. floribunda* have all been mentioned for the Maltese islands.

Iris Family Iridaceae





Common Freesia *Freesia refracta*
Friżja

A low cormous herbaceous perennial with slender stems and flat sword-shaped leaves. Flowers scented in spike-like inflorescence, flowers set on one side of the stalk. Flowers yellowish-white, sometimes tinged with violet, and with a tube. Fruit a capsule. An alien species planted for ornament and naturalised. Native to South Africa. Common at Buskett under the trees and at roadsides; seen growing wild also in neighbouring areas including in garigue. Occurs also in other sites e.g. at Majjistral Park. Flowers in spring, March to April. Mifsud (2019) identify these plants as 2 species - *Freesia alba* and *Freesia leichtlinii*, and that "most probably *Freesia refracta* does not occur in Malta" (www.maltawild plants, accessed June 2020).

Iris Family Iridaceae




Yellow-throated Crocus *Crocus longiflorus*
Żagħfran Salvaġġ

A cormous low herbaceous plant with slender dark green basal and linear leaves. These are channelled and have a middle white vein from the upperside, and are present at flowering time. Flower has 6 tepals, pale or dark violet, veined or not from outside. Occasionally flowers can be white. The throat of the flower (on the inside at the base of the tepals where they meet to form the tube) is yellow. Stamens 3, yellow, the style with 3 orange-red branches longer than the stamens, and much divided at the tips. The spathe encloses base of flower-tube during flowering. Flower closes in the evening. Fruit has 3 compartments, seeds reddish-brown. Rare on the whole, but localised and frequent to common in garigue where it occurs, (Buskett-Dingli area) flowering mostly in November (October-December).The Yellow-throated Crocus has a limited geographical distribution which includes Malta, Sicily and Southern Italy (Lanfranco pers. comm., 2005).

Iris Family Iridaceae




Sand Crocus *Romulea variicolor*
Żagħfran tal-Blat

A cormous small herbaceous perennial with slender linear leaves, at first erect then recurved to the ground. Flowers stalked and solitary, violet, in different shades, with 6 veined tepals having a pale base and forming a white or yellow throat. Tepals in 2 rows, outer ones are greenish or purplish on the outer side. Flower tube short. Flowers enclosed in 2 spathes when in bud. Spathes green (leaf-like) or green with a membranous margin. Anthers yellow. Common in coastal areas and in garigue, rocky steppe, rocky valleys, rdum, and in open areas even disturbed, flowering from mid/late January to March. Most Sand Crocus examined by the author in Malta and Gozo were found to have the lower spathe green with very narrow membranous margin (often unnoticeable) and the upper spathe green with a wide membranous margin. The filaments have hairless filament bases. Styles are generally shorter than anthers, though it may reach or slightly overtop them. The elliptical tepals vary in shades of purple (violet); some pale others dark to very dark. Tepals gradually become paler in colour. In a study undertaken by Stephen Mifsud (2015) some important changes were made to *Romulea* found in the Maltese islands. Two species - *Romulea rollii* and *Romulea bulbocodium* were excluded from the Maltese islands, *Romulea ramiflora* has been assessed as rare, the (sub-) endemic **Maltese Sand Crocus** *Romulea melitensis* Żagħfran ta' Malta (has very narrow tepals-Lanfranco, 1996- linear tepals and deep violet flowers -Pignatti, 2002; Blamey & Grey-Wilson, 1993 - which has now been recently recorded also from SE Sicily-Lanfranco, 2015) - as a doubtful species, and a new Siculo-Maltese endemic species - *Romulea variicolor* (**Varied-coloured Sand Crocus**) - described as the most common sand crocus in Malta (previously referred to as *Romulea ramiflora*). This variable species was sub-divided in 3 varieties (var. *variicolor*, var. *mirandae* and var. *martynii*).

Iris Family Iridaceae




Lesser Sand Crocus *Romulea columnae*
Żagħfran Ċar - This short Crocus has small pale whitish flowers. The tepals have yellow patch at base forming the yellow centre (the throat) of the flower, and dark veins. The upper spathe is largely membranous. Scarce to frequent, and often overlooked. It can be found growing in garigue and open areas with short vegetation (even disturbed) at times in the company of *Romulea variicolor*. Flowers around February to March.

Iris Family Iridaceae




Hollow-leaved Asphodel/Pink Asphodel/Hollow-stemmed Asphodel/Onion Weed *Asphodelus fistulosus* Berwieq Żgħir

A herbaceous short-lived perennial (or biennial) with slender and elongate, hollow, basal semi-cylindrical leaves. Flowers are star-shaped, pinkish to white with 6 tepals in a branched raceme. The tepals have a middle brownish-pinkish vein. Bracts are membranous. Fruit a rounded capsule. Rare, January to June, on bastions and in public gardens (Argotti). Grows also along the road leading to Calypso Cave in Gozo and whereabouts, and naturalised at Majjistral Park. "Probably native" (Lanfranco, 2015).

Xanthorrhoeaceae Family Xanthorrhoeaceae




Branched Asphodel/Asphodel/Common Asphodel *Asphodelus ramosus* (*Asphodelus microcarpus*)
Berwieq

A robust and hairless herbaceous perennial with tuberous roots and elongate greyish-green leaves in basal rosette, pointed at the tip. Leaves channelled. Flowers are white or pinkish, star-shaped with 6 tepals and with a brownish-pinkish middle vein. Inflorescence a branched raceme, erect and branched with long flowering stems. Bracts are thin and membranous. Fruit a capsule with horizontal wrinkles. A common plant, flowering from January to April, sometimes also found flowering in December. Occurs in several habitats including valleys, maquis, garigue, steppe, clay slopes, rdum, field margins, abandoned fields and disturbed rocky habitats. Its thick tuberous roots are resistant to fire. Maltese plants are now regarded as *Asphodelus ramosus*, not *Asphodelus aestivus*, as were in the past. Both are similar but *Asphodelus aestivus* have smaller fruits. *Asphodelus ramosus* and *Asphodelus aestivus* are given as synonyms of *Asphodelus microcarpus* in Pignatti (2002).

Xanthorrhoeaceae Family Xanthorrhoeaceae




Yellow Aloe/Medicinal Aloe/Barbados Aloe *Aloe vera* (*Aloe barbadensis*) Sabbara/Żabbara

Perennial with basal rosettes of dense, stiff sword-shaped succulent leaves with spiny teeth at the margins. The leaves generally turn reddish especially in the dry season. Inflorescence dense of yellow flowers carried in simple or branched racemes. Flowers have the tepals fused into a tube and are borne on short pedicels with protruding stamens and styles. Fruit a capsule that splits open longitudinally. It occurs in garigue and other open rocky ground and in rocky valleys, and is not common in the wild, e.g. at Pembroke. Flowers appear from April to June. It is also cultivated as an ornamental plant in gardens. Plants in the wild tend to have un-branched racemes while those in cultivation often have branched inflorescences; probably introduced in antiquity as a medicinal plant (Lanfranco, 2007). Aloe flowers in Malta are visited by Paper Wasps *Polistes* spp. that enter the tubular flower to feed on the nectar.

Xanthorrhoeaceae Family Xanthorrhoeaceae




Pale Garlic *Allium dentiferum*
Tewm Safrani

A bulbous herbaceous perennial with flowering stalk covered in half by a sheath. Leaves semi-circular in cross-section, and are elongate and margins rolled inwards (involute). Flowers in umbel, central (and majority of) flowers on erect pedicels (secondary flower stalks); marginal flowers on spreading/curved down pedicels. Stamens just exceed the tepals. Flowers are bell shaped, with 6 pale yellowish-brown tepals, each tepal with brownish/purplish thin middle stripe and pale brownish/purplish margins. The spathe is originally long and pointed, green, but it divides in 2 long and narrow sheaths as the flowers open. These sheaths are persistent in flowering and become membranous. Fruit is a capsule made up of 3 parts and splits up when mature to release tiny and numerous black seeds. Scarce in abandoned fields, paths, other disturbed ground, May to July. Plants which were previously referred to as *Allium paniculatum* were in fact *Allium dentiferum* (Lanfranco, pers. comm., 2008); this species was erroneously referred to as *Allium paniculatum* in previous publications, which species is not found in Malta (Lanfranco, 1996).

Amaryllis Family Amaryllidaceae




Wild Leek *Allium commutatum*
Kurrat Selvaġġ

A bulbous herbaceous robust perennial with a tall and erect flowering stem. Leaves long and narrow, channeled, tapering at tip, lowest often dry by flowering time. They have a sheath at base that surrounds the stem. Flowers scented (garlic smell), pale purplish, bell-shaped, clustered in a rounded dense umbel. The 6 tepals have a darker central stripe. Inner tepals have irregular fine teeth on the margin. Stamens are protruding. Beneath the inflorescence is a dry brown sheath (spathe), which encloses flowers before opening and is present or absent at flowering time. Fruit a capsule with 3 compartments, on ripening it splits to release the seeds. Seeds black. Scarce to frequent especially coastal in garigue, rocky valleys, abandoned fields, other disturbed ground, May to July. Large specimens with flowering stem over 150 cm tall and fist-sized flowering heads are found on Filfla, Ġebla tal-Ġeneral (Fungus Rock) and Wied Iż-Żurrieq (Lanfranco, 2007). Mifsud & Mifsud (2018) consider this species to be very rare. See page 345.

Amaryllis Family Amaryllidaceae




Maltese Leek *Allium melitense*
Kurrat ta' Malta- A bulbous herbaceous perennial similar to the Wild Leek *Allium commutatum* but differs in that this species is smaller, generally not exceeding 20-30 (-50) cm high and with smaller flower heads generally less than 3 cm across. It is common in garigue, rocky steppe, clay slopes, margins of fields, paths, abandoned fields, and is not restricted to coastal areas. Flowers from April to June-July. The Maltese Leek is probably endemic. It was first described by Stefano Sommier and Alfredo Caruana Gatto in 1915 as a variety of *Allium ampeloprasum*. The Maltese Leek may be a small variant of the Wild Leek *Allium commutatum* (Lanfranco, 2015, 2007). Mifsud & Mifsud (2018) consider *Allium melitense* as a synonym of *Allium polyanthum*. See page 345.

Amaryllis Family Amaryllidaceae




Purple Garlic/Round-headed Leek/Ball-headed Onion *Allium amethystinum*?
Tewm Vjola

A bulbous herbaceous perennial with thin flowering stem that often does not exceed 20-25 cm in height. Stem is generally ascending and all green, or is purplish beneath the inflorescence. Leaves are long and narrow, linear, their base sheathing lower part of stem, dry when plant is flowering. Leaves grooved from the upper parts, without toothed margins. Flowers are dark reddish-purple, small, tubular to bell-shaped, with protruding dark anthers, and clustered in small globose inflorescence (umbel). The central flowers are carried on erect stalks. The style exceeds the anthers. Spathe is in 2 parts and does not fall off when plant is flowering. Capsule made up of 3 parts, seeds black. Scarce, but can be frequent where it occurs in garigue and other dry rocky ground, flowering in late June and July. See note on page 346.

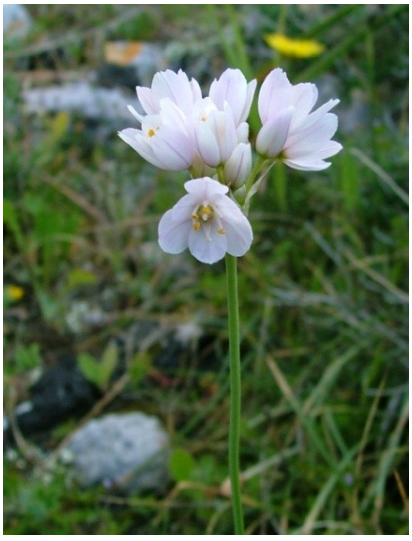
Amaryllis Family Amaryllidaceae




Maltese Dwarf Garlic *Allium lojaconoi*
Tewm Irqiq ta' Malta

A small and slender bulbous herbaceous perennial with thread-like leaves, often dry at flowering time. Inflorescence is an umbel, flowers tubular to bell-shaped, whitish-pinkish/purplish and with dark stripes. The 6 tepals have spreading tips. Beneath the inflorescence is a dry brown sheath (spathe). Frequent to common in garigue, rocky steppe and rocky valleys, especially coastal, but also inland, from late May to July. Endemic. First described in 1982 by Salvatore Brullo, Pietro Pavone and Edwin Lanfranco. Previously confused with another species- the **Few-flowered Garlic** *Allium parciflorum* (Lanfranco, 2007).

Amaryllis Family Amaryllidaceae

Rosy Garlic *Allium roseum*
Tewm Ħamrani

A bulbous herbaceous perennial. Lower part of inflorescence stalk sheathed by the linear pointed leaves. Flowers are more or less bell-shaped, pale or dark pink in an umbel inflorescence. The stamens have yellow anthers and do not protrude out of the flower. A short spathe is present at the base of the inflorescence, membranous and divided in 3-4 parts, persistent. Fruit is a capsule with black seeds. Frequent to common in garigue, rocky steppe, rocky valleys, rdum and abandoned fields, March to May. Subspecies *bulbiferum*, having small red bulbils in the inflorescence, sometimes also occurs (Lanfranco, 1996).

Amaryllis Family Amaryllidaceae




Hairy Garlic *Allium subhirsutum*
Tewm Muswaf

A bulbous herbaceous perennial with long leaves pointed at tip. The leaves are weak and with soft hairs at the margin, and sheath the base of the inflorescence stalk. Flowers stalked, white and star-shaped, in a lax umbel with 6 tepals and 6 stamens having brownish or yellowish anthers. Beneath the flowers is a sheath (the spathe), which envelopes the cluster of flowers before opening, as in other *Allium* species. Fruit a capsule, seeds black, rough. Common in garigue, rocky steppe, rocky valleys, rdum from March to May.

Amaryllis Family Amaryllidaceae




Pink Garlic *Allium trifoliatum* (*Allium subhirsutum* subsp. *trifoliatum*)
Tewm tal-Linja Vjola-
The Rosy Garlic is similar to the Hairy Garlic *Allium subhirsutum* but petals often pinkish and has a pinkish/purplish stripe. The tepals are pointed at the tip. Leaves are hairy on both sides. Scarce, and found in abandoned fields, rocky ground including rocky steppe, March to April-May. Sommier & Caruana Gatto (1915) reported it as very frequent.

Amaryllis Family Amaryllidaceae




Three-cornered Garlic
Allium triquetrum
Tewm ta' Tliet Kantunieri

The Three-cornered Garlic has three-angled stems and relatively wide leaves that are keeled from below. The flowers are in drooping rather lax umbels, the white tepals with green middle vein. Pedicels are longer than the flowers. Stamens not protruding. Spathe divided in 2. Rare and recorded from shady places e.g. Buskett, Wied Gerżuma, and Wied il-Baruni and in Gozo from Xlendi and Mġarr (Haslam *et al*., 1977; Borġ, 1927; Sommier & Caruana Gatto, 1915; Gulia, 1800s). Flowers from February to April.
Amaryllis Family Amaryllidaceae



The **Dwarf Garlic** *Allium chamaemoly* Tewm Qerqni, shown in left picture, is a low plant with basal rosette of leaves usually spreading on the ground, and hairy at the margins. Flowers are close to the ground, white with violet stripes and the flower stalks are curved in fruit. Scarce in dry rocky ground, valleys, paths, flowering in winter, November-January (Tabone: internet source; Mifsud, S: www.maltawildplants.com; Haslam, *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927).

Other species of *Allium* recorded for the Maltese Islands include: The **Black Garlic** *Allium nigrum* Ċuplajs (rare) – Tabone (2008), Lanfranco, (1989), Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927). Haslam *et al*. (1977) records the Black Garlic as "Common especially in the south and west" in "cultivated fields especially on the clay"; the **White Round-headed Garlic** *Allium arvense* (*Allium sphaerocephalon* subsp. *arvense*) Tewm ta' Għawdex – found only in Gozo on the NW and W cliffs with greenish-white small dense umbels produced in late spring and early summer (Lanfranco, 2007; Lanfranco, 1989); The **Mediterranean Garlic** *Allium permixtum* is also recorded from Ta' Ċenċ, Gozo (Haslam *et al*., 1977; Borġ, 1927; Gulia, 1800s).





Some species of *Allium* are cultivated as food crops; these include: **Onion** or **Garden Onion** *Allium cepa* Basla or Basal (flowers shown in left pictures); **Shallot** *Allium ascalonicum* Xalotti; **Garlic** or **Clove Garlic** *Allium sativum* Tewm; **Garden Leek** or **Cultivated Leek** *Allium porrum* Kurrat

Onion (*Allium cepa*) is widely grown for food throughout the world. Its origin is Asia. It is generally a robust plant and has a large bulb covered with rosy tunic and long channeled basal leaves. It produces an erect stem with a round and large umbel inflorescence at the top. The flowers are densely packed and have greenish-white tepals. The stamens protrude out of the flower. Beneath the inflorescence is the spathe, which divides in 2-4 parts when the flowers open. The Shallot (*Allium ascalonicum*) is derived from *Allium cepa*. Its bulb is smaller, and has tiny bulbs (bulbils) in the inflorescence.

The Garlic (*Allium sativum*) has small bulbs covered with white papery tunic. The cylindrical scape (flowering stem) holds an umbel inflorescence at the top that contain bulbils. The flowers have whitish or greenish tepals, and the stamens are not protruding. The spathe has a long beak and exceeds the inflorescence. The use of Garlic is not restricted solely for food but also in medicine and other uses, and is widely cultivated throughout the world.

The ancestor of the Garden Leek *Allium porrum* is *Allium ampeloprasum*. The Garden Leek has an elongated cylindrical bulb. Both the bulb and the light green stem are edible. The leaves are basal and generally wide and flat. The umbel inflorescence is dense and spherical at the top of the stem and the flowers are whitish. The stamens protrude out of the flower. The spathe exceeds the umbel, and has one sheath.



Onion *Allium cepa* Basla 10mm.



Garlic *Allium sativum* Tewm



Garden Leek *Allium porrum* Kurrat. Scale 10mm x




Sweet Garlic/Fragrant False Garlic *Nothoscordum borbonicum* (*Nothoscordum* x *borbonicum*)
Tewm tal-Qsari

A bulbous herbaceous perennial with long and smooth (linear-lanceolate) hairless leaves. The plant does not have "garlic smell". Inflorescence is a lax umbel on a long main stalk, flowers small, white with a green base and sweetly scented, bell-shaped, the flower segments with an outer purplish middle stripe and joined at the base. Stamens do not protrude out of the flower. Spathe is made up of 2 membranous sheaths. Seeds black. Native to North America. Planted in gardens, sometimes found naturalised. Flowers in spring and autumn, from April onwards (-November).

Amaryllis Family Amaryllidaceae




Sea Daffodil/Sea Lily/Sea Pancratium *Pancratium maritimum*
Pankrazju/Pankrazju Selvaġġ/Ġilju tar-Ramel/Narċis tar-Ramel.

A hairless bulbous perennial with long and twisted, linear greyish-green leaves. Flowers occur in an umbel, large and sweetly scented, with 6 tepals and a funnel-shaped corona that has 6 stamens on its rim. The flower buds are striped white and green. Beneath the inflorescence is a membranous (papery) spathe that initially encloses the flowers before opening. The fruit is a capsule with 3 compartments with many seeds that are covered with a dark shiny skin. Seeds drop down beneath the plant; the resulting new plants form clumps. Occurs in sand dunes and sand dune remnants, sometimes also on cliffs and in rdum (e.g. at Aħrax), and may be frequent to common where it occurs, flowering from June (or earlier) to October-November. Another member of the *Pancratium* genus is the **Foetid Pancratium** *Pancratium foetidum* Pankrazju tal-Ħarifa. This plant is similar to the Sea Daffodil *Pancratium maritimum* but its flowers are foetid (stinking). It also flowers later on in the autumn. One specimen was collected by Hubert J. Spiteri at Mellieħa Bay (Lanfranco & Spiteri, 2001). This plant occurs in North Africa.

Amaryllis Family Amaryllidaceae




Autumn Narcissus/Lesser Narcissus *Narcissus obsoletus*
Narċis Imwaħħar/Ranġis Imwaħħar - A small and slender bulbous herbaceous perennial that appears after the first autumn rains. Leaves are linear and thin. Flowers are generally solitary, sometimes 2, white, with six pointed tepals and yellow to orange cup (corona) at the centre. This corona surrounds 6 stamens. When in flower the plant is usually leafless, and the thin stalk holding the flower comes out from the ground. Fruit a capsule, seeds black. Common in garigue, rocky steppe and rocky valleys, flowering from September/October to November. Previously recorded as *Narcissus serotinus* "a closely related species confined to the extreme west of the Mediterranean area" - Lanfranco, 2015. Note: Variation occurs in the shape of the tepals, the number of flowers on the stem (even up to 5) and the width of the leaves. The leaves can also at times germinate before the flowers and be well developed at flowering. This has given rise to some species that have been based on these inconsistent characters – e.g. *Narcissus elegans*, *Narcissus cupanianus*, *Narcissus autumnalis* (Pignatti, 2002). Mifsud & Caruana (2010) give records of *Narcissus elegans* from Selmun (Malta) and Dwejra (Gozo). Lanfranco (2015) states that the **Elegant Narcissus** *Narcissus elegans* Narċis Skars is very rare in the Maltese Islands.

Amaryllis Family Amaryllidaceae




Narcissus/French Daffodil/Cream Narcissus/Polyanthus Narcissus/Rose of Sharon *Narcissus tazetta*
Narċis/Rankis

A hairless bulbous herbaceous perennial with shining greyish-green leaves. Flowers are sweetly scented, with 6 creamy white and broad tepals surrounding a yellow crown (corona). The flowers also have a tube and are in an umbel, each carried on a stalk, in bunches of up to 9 or more. There is a spathe at base of inflorescence. Fruit a capsule with many black seeds. Frequent to common, flowering from October to March, in rocky steppe, garigue, maquis, valleys, rdum and clay slopes, crevices of rocks, and in fields including abandoned ones. It is also grown as an ornamental plant in gardens.

Amaryllis Family Amaryllidaceae




Autumn Squill *Prospero autumnale* (*Scilla autumnalis*)
Għansar tal-Ħarifa/Għansar tax-Xitwa.

A small inconspicuous bulbous and herbaceous perennial. Leaves narrow, 1-2 mm wide, linear and channeled, too often absent or short at flowering time. A stalk holds a number of pale flowers, white with purplish tinge, in a raceme. The star-shaped small flowers have 6 tepals striped from outside, each bearing six stamens with dark anthers. Bracts are absent. Fruit a capsule, seeds black. It flowers after the first autumn rains, usually in September/October and November. A common plant in garigue, rocky steppe, maquis and open ground. Lanfranco (2015) states that "Maltese plants are almost certainly a local race" as plants growing elsewhere are larger and have purplish-pink flowers. The Maltese word Għansar can also be written as Għansal.

Asparagus Family Asparagaceae




Sicilian Squill *Scilla sicula* (*Oncostema sicula*)
Għansar Ikħal

A bulbous herbaceous perennial with smooth elongate leaves pointed at the tip. Margin of leaf has a thin transparent margin bearing fine short hairs that can be seen with a hand lens. Flowers with 6 tepals, white with a pinkish tinge, striped greenish, in a raceme inflorescence in the shape of a pyramid. Raceme elongates in fruiting. The stamens have bluish filaments and green anthers. The flower bracts are whitish with a green middle vein, often shorter than the flower stalk especially at fruiting. Fruit a pointed capsule, seeds black. Scarce in garigue, valleys, maquis, sometimes along country roads, February to April. The Sicilian Squill is endemic to Malta, Sicily and Calabria. Formerly was confused with *Scilla peruviana* (Lanfranco, 1996). Tabone (2007) also records the *Scilla clusii* growing in a clump at Wied il-Ħżejjen. The **Large Squill** *Scilla hyacinthoides* Għansal Selvaġġ is also mentioned by Haslam *et al*. (1977) and Borġ (1927) from a few localities e.g. Mellieħa and Ta' Ċenċ.

Asparagus Family Asparagaceae





Sea Squill/Giant Hyacinth/Sea Onion/White Squill/Red Squill *Urginea pancration* (*Charybdis pancration*, *Drimia pancration*) Għansar/Għansar Kbir/Basal tal-Għansar

Herbaceous perennial with large bulb that is often close to and emerging from the surface of the soil. Leaves basal and bright green, elongate and large, usually channelled (especially when young), appearing from October onwards. They wither in the dry season. Flowers are white and star-shaped and slightly scented in racemes, with 6 tepals striped purplish-pinkish. The pedicel is also purplish-pinkish. The flowers are found long after the leaves have withered and before the new ones emerge. Bracts are small and membranous. The fruit is a capsule, membranous when ripe and splits open in 3 parts to release black shiny seeds. Common in various habitats including garigue, rocky steppe, rdum and abandoned fields, flowering from late July, mostly August to September-October. The Sea Squill is confined to Malta, Sicily and several circum-Sicilian islands, the Pelagian Islands, Sardinia, Corsica and Mallorca (Lanfranco, 1989). It was included under *Urginea maritima* - a related species of the western Mediterranean (Lanfranco, 2007). This plant is referred to as *Urginea maritima* or *Drimia maritima* in some publications, which appears to be a group of species (Lanfranco & Lanfranco, 2003). First described from Malta (Lanfranco, 2015).

Asparagus Family Asparagaceae




Lesser Star of Bethlehem *Ornithogalum divergens* Ħalib it-Tajr Skars/Ħalib it-Tajr Żgħir

A bulbous herbaceous perennial with basal linear and channeled slender leaves. The flowers are carried on stalks, lower flowers with longer stalks. The flowers have 6 white tepals with a broad green stripe on the back. The stalks of the lower flowers are a little bent down at fruiting. The bracts are membranous and shorter than flower stalks. Fruit a capsule with black seeds. Rare in abandoned fields and clearings in wooded areas, e.g. Buskett, flowering in March and April. Sommier and Caruana Gatto (1915) reported it as not common but was present at Buskett in good numbers. The Lesser Star of Bethlehem belongs to the *Ornithogalum umbellatum* group (Pignatti, 2002).

Asparagus Family Asparagaceae




Greater Star of Bethlehem/Arabian Starflower *Ornithogalum arabicum* Ħalib it-Tajr Kbir

A bulbous herbaceous perennial with basal, long linear leaves and showy flowers. Leaves are shorter than the flowers, spreading or recurved, sheathing at base. Flowers white in a raceme, scented, with broad curved 6 tepals, and a conspicuous shiny black ovary in the centre. Raceme elongates in fruiting. Bracts are whitish-green, fruit a rounded capsule. Frequent, in garigue, rocky steppe, rocky valleys, abandoned fields, margins of cultivated fields, flowering in April and May.

Asparagus Family Asparagaceae




Southern Star of Bethlehem *Ornithogalum narbonense*
Ħalib it-Tajr Żgħir

A bulbous herbaceous perennial with basal linear and channelled leaves sheathing at the base. The flowers are white with a green stripe on the back (showing as a faint green stripe on inside face), star-shaped, with 6 tepals, in a slender raceme. Stamens are 6 and have yellow anthers surrounding the green ovary. Bracts are membranous and long. The fruit is a capsule that contains several seeds. Common, in garigue, rocky steppe, rocky valleys, abandoned fields, April and May.

Asparagus Family Asparagaceae




Tassel Hyacinth/Grape Hyacinth/Tassel Grape Hyacinth/Purple Grape Hyacinth *Leopoldia comosa* (*Muscari comosum*)
Basal il-Ħnieżer/Basal il-Ħmir

A bulbous herbaceous perennial with long basal and channelled leaves, narrowed at the tip. These are often weak and bend down to the ground, and generally shorter than the main flower stalk. Flowers in a raceme, the lower fertile ones brownish and horizontal to drooping, tubular to bell shaped and with yellow teeth, on short secondary stalks (pedicels). The upper infertile flowers are more conspicuous, bluish-violet and spreading to ascending on longer bluish-violet pedicels. Fruit a capsule divided in 3 parts. Common in garigue, rocky steppe, abandoned fields, paths, March to May.

Asparagus Family Asparagaceae



Autumn Grape Hyacinth/Lesser Grape Hyacinth *Muscari parviflorum*
Ġjaċint tal-Ħarifa

A small bulbous and slender herbaceous perennial with linear and grooved basal leaves, shorter than the inflorescence stalk. The flowers are elongate to bell-shaped in a loose raceme and pale violet to bluish in colour. Each flower is held on a spreading to erect secondary stalk. Fruit a capsule that splits open in 3 parts at maturity to release the black seeds. Scarce to frequent in garigue, open areas with short vegetation, flowering after the first autumn rains September-October to November. Two other species of *Muscari* occurs: **Common Grape Hyacinth** or **Southern Grape Hyacinth** *Muscari neglectum* Muskari tal-Blat and **Narrow-leaved Grape Hyacinth** *Muscari commutatum* Muskari Skur. *Muscari commutatum* was discovered by Briffa (1986) and it has now been recently found growing in garigue at Qrendi and is probably native (Mifsud, 2007). *Muscari neglectum* is rare in Malta and Gozo (Tabone, 2008, 2007; Mifsud, 2007; Lanfranco, 1989; Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927). The **Roman Hyacinth** *Bellevalia romana* Ġjaċint Salvaġġ also occurs and is recorded by Tabone (2008) at il-Qolla, Malta. Lanfranco (1989) and Haslam *et al*. (1977) records it as rare and mostly restricted to clay soils, especially in fields. Lanfranco, G. (1969) records it as rare in "higher regions of Malta in moist grassy places". It flowers in spring with dirty white flowers tinged pale blue in a raceme.

Asparagus Family Asparagaceae




Century Plant *Agave americana* Agave

A rhizomatous, large and tough perennial with fleshy and spiny leathery leaves in basal rosette. The greyish-green leaves can reach 2 metres long and have a dark spiny tip. The margins are also spiny (with few recurved spines). Some may have variegated leaves (leaves green and yellow). The main flowering stalk is erect and robust with more or less horizontal branches, set up when the plant is about 10-15 (7-20) years old. It has several bracts more or less appressed to it. Inflorescence branched and large, flowers have 6 yellowish-green tepals, tubular at the lower part, and scented, in clusters. Stamens 6 and protrude out of the flower. Fruit a capsule. After fruiting the plant dies. Its underground stems (rhizomes) give rise to several small plants (suckers-vegetative propagation). Not native, planted for ornament and naturalises mostly by means of vegetative propagation, and found wild in several areas including wooded environments, clay slopes, rdum, cliff edges and also garigue. Flowers are found in the summer, around June to August (or earlier). The Century Plant is native to eastern Mexico. It has long been in cultivation in Europe. The word Agave comes from the Greek word agavos, meaning noble, admirable.

Asparagus Family Asparagaceae




Sisal Agave/Sisal/Blue Agave/Hemp Plant *Agave sisalana* Sisal

The Sisal Agave is a perennial and similar to the Century Plant *Agave americana*. Its fleshy leaves are bright green and large, the margins generally lack spines but sometimes spines occur. Teeth may be present on young leaves but these are lost as they mature. At the tip is a stout dark spine. Its inflorescence stalk can reach 6m high and flowers are yellowish-green. Introduced as an ornamental species and naturalises by the growth of new plants (suckers) from its rhizomes. Found in different areas e.g. wooded environments and coastal areas including clay slopes. The Sisal Agave was introduced in 1900 for a short-lived sisal industry (Schembri & Lanfranco, 1996). The leaves have stiff fibres used in making ropes. The plant is native to eastern Mexico, where it is still cultivated for its fibres.

Asparagus Family Asparagaceae



Spiny Asparagus/Mediterranean Asparagus/Thorny Asparagus/Prickly Asparagus *Asparagus aphyllus* Spraġ Xewwieki/Spraġ Selvaġġ/Ċaqċieqa

A spiny and tough rhizomatous perennial. Leaves are replaced by short, spiny needle-like specialised stems called cladodes (phylloclades), borne in clusters, and with a yellowish/brownish tip. The true leaves are tiny and membranous. Flowers are small and fragrant, yellowish-green in groups, with 6 tepals, arising from the axils of cladodes. The flowers are male or female on different plants. Fruit a globose berry, first green then ripening to black. The young shoots are soft and eatable. Common in garigue, maquis, wooded areas, valleys, rdum, steppe, field margins, abandoned fields, country roadsides, often growing through and over other nearby plants. Flowers are found from





late August to November, sometimes also in December and January.

Asparagus aphyllus with flowers pictured in late November

Asparagus Family Asparagaceae





Grey Asparagus *Asparagus horridus* (*Asparagus stipularis*) Sprag Griż

Perennial with rhizomes, resembling Spiny Asparagus *Asparagus aphyllus* but the cladodes are solitary or those at the tips of stems in clusters of 2-3. Cladodes grow larger than those of *Asparagus aphyllus*, and have a yellowish spiny tip. Flowers are solitary or in small clusters on short stalks, male or female and found on different plants. Flowers are scented and have 6 tepals, yellowish-green on the upperside but are reddish-brown from the underside. Fruits rounded bluish-black berries. Flowers are found in spring, March to May. Rare in coastal areas especially cliff edges, in Gozo, e.g. Ta' Ċenċ to Xlendi. Pre-1927 records were confirmed by Sdravko Vesselinov and Stephen Mifsud (Lanfranco, 2007). Borġ (1927) recorded it as rare in Wardija, Buskett and Wied Inċita. Mifsud (2019) reports the **African Asparagus** *Asparagus africanus* naturalising at Wied Għomor, San Ġwann.

Asparagus Family Asparagaceae





Large Butcher's Broom/Spineless Butcher's Broom/Southern Butcher's Broom *Ruscus hypophyllum* Belladonna/Rusku

Rhizomatous evergreen perennial with erect stems that emerge directly from the ground. Leaves are scale-like, small and membranous; leaf-like cladodes (phylloclades) are wide, dark green and pointed, without spines. These are alternate (at least the upper ones) on the stem and more or less elliptical. Flowers inconspicuous in small clusters produced from the axil of a small bract on the cladodes and can occur both on the upper (majority) or lower surface. The flowers have 6 tepals in 2 rows, and are either male or female, on separate plants. Fruits are shiny red berries. A garden plant and frequently found in cultivation, flowering from around November/December to April. The population at Għajn il-Kbira may be truly native (Lanfranco, 1989). Borġ (1927) recorded the species as naturalising at Buskett, Girgenti and Għajn il-Kbira and states that the species is possibly a true native. The **Butcher's Broom** *Ruscus aculeatus* Nigżet il-Far/Rand Xandri has spine-tipped cladodes and is an ornamental plant. This tough evergreen small shrub can be found wild in the Mediterranean.



Butcher's Broom *Ruscus aculeatus* pictured growing wild in Italy.

Asparagus Family Asparagaceae



Dwarf Fan Palm/European Fan Palm
Chamaerops humilis
Ġummara/Ġummar Safrani

Generally a small to medium-sized handsome palm. Stem can grow tall up to 4 metres or more and is covered in fibres, the remains of leaves. Stems are in clumps by means of suckers. Leaves are fan-shaped (palmate), with narrow pointed segments radiating out, and with a stalk that carries up-curved spines. The leaves are evergreen and leathery. Flowers are yellowish in dense branched inflorescence, with sheathing bract. Male and female flowers occur on same or separate plants. Drupes (fruits) are rounded, reddish-brown or yellow. Flowers and fruits can be found at the same time on the same plant. Probably does not exist any more in the wild, but occurs only in gardens or elsewhere as planted specimens and generally from non-local stock. Flowers from November-January to April (or later). The Dwarf Fan Palm could have been wiped out locally from the wild due to over collection for horticulture (Lanfranco, 1989). The Dwarf Fan Palm was known in the wild from Marfa and Wied il-Għasel (Żerafa, 1827; Grech Delicata, 1853; Lanfranco, 1993). Two specimens in Argotti and San Anton public gardens were brought over from Wied il-Għasel, and "the last known remains of this native plant" (Borġ, 1927).

Palm Family Arecaceae (Palmae)

Date Palm *Phoenix dactylifera*
Palma tat-Tamar

A tall palm with slender erect stem covered in fibres, the scars of leaf stalks of the removed leaves. Stem solitary or more than one with offshoots (suckers), and can grow as a single plant or as a clump. Young leaves longitudinally folded, exposing the underside. Leaves are large, greyish-green, spreading to arching on the mature plant, in a cluster at the top of the stem. These are pinnate, with slender linear-lanceolate keeled and stiff segments, the lower ones spine-tipped. Flowers are dense in branched inflorescence, yellowish, at first enclosed by sheath-like bracts. Male and female flowers occur on separate plants. Fruits (drupes) are the dates, fleshy and large, edible, orangish when ripe, with 1 seed. Flowers in late winter-spring (February onwards). The Date Palm is planted for ornament, and can be found planted/naturalised in the countryside. In 1536 Jean Quintin d'Autun (Quintinus) wrote about the presence of *Phoenix dactylifera* in the Maltese Islands and that they did not produce fruits (Lanfranco, 1998). The dates do not ripen sufficiently in the Maltese Islands to be eatable because they require a dry and warm autumn (Borġ, 1927). When it is young, or the leaves not removed, the Date Palm appears without a stem, as a mass of large spreading leaves. This tree is widely planted in the Mediterranean and North Africa, and cultivated in some countries especially Arab countries for its edible fruits. The leaves of Palms are used in religious ceremonies on Palm Sunday. The words *Phoenix dactylifera*

are derived from phoenix = Phoenicians, as the Phoenicians themselves were supposed to have spread these Palms, and dactylus (from Greek dactylos) = date, and fero = I bear (for date bearing).









Canary Island Date Palm *Phoenix canariensis* Palma tal-Kannizzati/Palma tal-Kanarji

Stem solitary and grows tall, generally stouter than that of *Phoenix dactylifera*. The pinnate and large leaves are green and are featherlike, forming a large crown at the top of the stem. Leaves are often arching. The fruits (drupes) are smaller than those of *Phoenix dactylifera* and with a thin pulp. They contain 1 large seed and are rounded to oval, and become reddish-brown when ripe. It is native to the Canary Islands and locally planted for ornament and sometimes naturalises. Note: Palms (Arecaceae = Palmae) are perennial woody plants with a solitary stem or with offshoots at the base forming clumps, rarely branched. Wild plants can sometimes be seen growing from the stem of palms. The leaves are large and often pinnate or palmate, without stipules. Their stalk is armed with spines, or unarmed. The flowers of the palms have 3 sepals and 3 petals, and are male or female, or both, and in one or separate plants. The inflorescence is axillary, and has spathe of one or more bracts. The fruit is a berry or drupe. Recently *Phoenix* palms in the Maltese Islands are being destroyed by the Red Palm Weevil *Rhynchophorus ferrugineus.* This insect has been introduced locally by the importation of infested young or adult *Phoenix* trees. Damage is mainly done by the larvae of this large reddish-brown insect when it feeds on soft parts and makes tunnels and cavities before it pupates. The end result is the death of the tree, though *P. dactylifera* can grow back from suckers. Picture on left shows an old *Phoenix* destroyed by the Palm Weevil.





The genus ***Washingtonia*** has 2 species, and also represented in the Maltese Islands. These are not native and are planted in public and private gardens, roadsides, roundabouts and other places for ornament. *Washingtonia* are robust fan palms, with petiole (leaf stalk) having sharp curved teeth. They can grow large with fan-shaped (palmate) leaves at the top of the stem. The species are **Mexican Fan Palm** *Washingtonia robusta* and the **Desert Fan Palm** or **Arizona Fan Palm** *Washingtonia filifera* (*filifera* = Latin "thread-bearing"). The general Maltese name for Washingtonia species is Palma tal-Imrewħa. Right picture above shows leaf of *Washingtonia filifera.*

Palm Family Arecaceae (Palmae)





Southern Reed-mace/Southern Bulrush/Southern Cat-tail *Typha domingensis* (*Typha australis*, *Typha angustata*)
Buda/Bordi

A tall rhizomatous herbaceous perennial that grow emergent from the water. The stem is erect and unbranched, the leaves are narrow, long and pointed at tip (linear), and the outer side more or less rounded, the inner side flat. Their base sheathes the stem. Flowers are tiny but numerous, in a brown terminal spike-like inflorescence, making up a cigar shape. The lower part of this inflorescence consists of female flowers, while the male flowers constitute the upper part. The male and female flowers are however separated by a short piece of naked stem. Pollination occurs by the wind and the fruits have tiny tufts of hairs and are dispersed by air currents. The fruits can also be dispersed by water. Has increased in recent years in shallow freshwater areas, and often form large colonies. Frequent to common in some watercourses, ponds, reservoirs, also streams in rdum and in other places with freshwater. Flowers in spring and summer.

Reed-mace or Cattail Family Typhaceae



Hollow-leaved Rush *Juncus subulatus*
Simar tal-Ilma

A herbaceous rhizomatous perennial with narrow and long, soft and hollow leaves. Stems erect and with leaves. Flowers in dense clusters at the top of the stems, bracts present. The seed capsules are slightly longer than the 6 yellowish tepals. Grows in saltmarshes, watercourses and clay slopes flowering in spring, April to May and is scarce.





Hollow-leaved Rush *Juncus subulatus*





Hybrid Toad Rush *Juncus hybridus*
Simar Żgħir

An annual small and slender soft rush. Stems often more than one, rarely solitary and the leaves are linear and pointed at tip, channelled, and with sheathing bases. Flowers are sessile, in twos or threes, sometimes in 2 groups and forming heads of 4-6 flowers. The flowers are wind-pollinated. Inflorescence is loose, bracts present. Flowers have 6 tepals striped white and green, pointed, the outer 3 tepals are larger than the inner 3 and slightly exceed the seed capsule. Capsule splits open along its length to release numerous small brown seeds. Frequent to common especially in humid areas like valleys, temporary pools and their margins in the garigue, and marshes including saltmarshes, January to June. The *Juncus hybridus* belong to the *Juncus bufonius* group. The English name for *Juncus bufonius* is Toad Rush, (*bufonius*= toad-like; of the colour of a toad). *Juncus bufonius* is also listed for the Maltese Islands by Haslam *et al*. (1977) and Borġ (1927). Both species are similar but *Juncus bufonius* has solitary flowers. Another member of this group is *Juncus sorrentinii* (pictures on far left and left,) which is similar to *Juncus hybridus* but has flowers in dense heads. It is also listed by Borġ (1927) as frequent in humid areas. *Juncus sorrentinii* has flowers set in fan-shaped 1-5 clusters, the clusters with 6-20 flowers; lowest bract far exceed the inflorescence (Pignatti, 2002). In the Maltese Islands it can be found in humid areas like marshes and rock pools.








Sea Rush/Lesser Sharp Sea Rush *Juncus maritimus*
Simar tal-Baħar

A rhizomatous perennial with long wiry green leaves, softly pointed at the top. Sheaths reddish-brown at the base of leaves. Leaves are shorter or longer than stems. Flowers occur at the top of the stem in a branched inflorescence, flowers with 6 tepals, greenish-yellow. There is a long bract at the base of the inflorescence which often far or slightly exceeds the inflorescence; however this bract can be equal to or shorter than the inflorescence. Fruits are capsules which are pointed and are equal to or slightly exceed the tepals. Seeds are numerous, minute. Rare in saltmarshes, rock pools at the coast (where freshwater trickles down to the sea), and also clay slopes in coastal areas, e.g. Qammieħ, May to June.

Rush Family Juncaceae




Sharp Rush/Great Sharp Sea Rush/Sharp-pointed Rush *Juncus acutus*
Simar Niggież/Simar Lixx

A rhizomatous perennial with long, rigid and sharply-pointed spiny leaves, longer than the stems. Basal sheaths are brownish or blackish. Forms tufts, and often robust. Flowers with anthers full of yellowish pollen. Inflorescence clustered and dense, rounded, reddish-brown, with lowest spiny bract exceeding it. Fruit a pointed capsule longer than the tepals with many small seeds. Scarce in saltmarshes, also in clay slopes where water seeps in rdum, and rock pools in coastal garigue, flowering in spring, March to April.

Rush Family Juncaceae



Articulated Rush/Jointed Rush *Juncus articulatus*
Simar

A rhizomatous herbaceous perennial with an erect leafy stem. Leaves soft, curved and shorter than the stem and have sheathing bases. They are smooth, linear and pointed at tip but not spiny, hollow and circular in cross-section. By careful examination faint joints can be seen on the stems. Flowers are in small groups with 6 straight and pointed equal tepals on erect to erect-spreading and diverging branches. The tepals have a middle green vein and membranous margins. Fruit a pointed blackish-brown capsule that exceeds the tepals. Scarce to rare in watercourses and other wet areas, flowering from March to May or later if water is still present. The **Dwarf Rush** *Juncus capitatus* Simar Irqiq and the **Soft Rush** *Juncus effusus* Simar Ħafif are both recorded by Lanfranco (1989) as possibly extinct. Status of *Juncus capitatus* by Mifsud (www.maltawildplants.com, accessed June 2020) is given as very rare, that of *J. effusus* as extinct.

Rush Family Juncaceae





Sweet Galingale *Cyperus longus*
Bordi tal-Wied

Rhizomatous herbaceous perennial with robust, erect and solid triangular stems. Leaves are narrow and basal, keeled, and with rough margins, pointed at the tip. Inflorescence branched and terminal (branched terminal umbel) with spreading stems. Spikelets (containing glumes and small male and female flowers) are reddish-brown, narrow, and in groups on short or long unequal peduncles, some branched. Female flowers with 3 stigma-branches. Bracts are leaf-like, few (2-6), some overtopping the inflorescence. Scarce to frequent in watercourses, April to November. The **Compact Galingale** *Cyperus badius* (*Cyperus longus* subsp. *badius*) is similar but with a more compact inflorescence with longest branches of the inflorescence generally not exceeding 10 cm. The umbel is mostly simple (unbranched), or when the peduncles (rays) are branched they have very short secondary rays. Generally scarce in wet areas including irrigated ground.

Sedge Family Cyperaceae



Brown Galingale *Cyperus fuscus*
Bordi Żgħir

A small hairless annual with 3-angled smooth and soft stems. Leaves pointed and soon wither. Spikelets are in heads in umbel inflorescence, bracts 3-5, leaf-like, channeled and longer than inflorescence. The dark brown glumes have a reddish-brown middle vein. Very rare and endangered, flowers from summer to autumn, August to November (-December). Sommier and Caruana Gatto (1915) reported it from Mtaħleb where they only found 1 specimen. Borġ (1927) described it as rare in Wied Ħanżir and Mtaħleb. Lanfranco (1989) recorded it as "now confined only to San Martin where it is represented by the form *virescens*"; this population has however gone extinct (Lanfranco, pers. comm, 2014). Tabone (2007) recorded it in 1992 from Wied tal-Grazzja in Gozo from where the same author has reported its destruction soon after his discovery.

Sedge Family Cyperaceae



Sand Galingale *Cyperus capitatus*
Bordi tar-Ramel

A rhizomatous hairless perennial with channelled and recurved narrow greyish-green leaves. Inflorescence is terminal and globose (capitate) on an erect and slightly curved wiry stem. Stigma-branches 3. Beneath the inflorescence are long bracts that exceed it. The Sand Galingale is generally a low-growing plant (from a few cm. above ground to c. 50 cm). Found in sand dunes e.g. Ramla l-Ħamra, and it flowers from around March to June. The species has disappeared from the dune remnants at Għadira nature reserve. Cassar & Stevens (2002) reported it as has declined at Għadira and has disappeared from Ġnejna and a number of Marfa dunes but still found in fairly good populations at Ramla tat-Torri and Ramla l-Ħamra.

Sedge Family Cyperaceae




Umbrella Papyrus/ Umbrella Sedge *Cyperus alternifolius*

A widely cultivated ornamental in gardens, occasionally found naturalised in valleys/wet areas, e.g. Pembroke, Għajn tal-Mellieħa and Lunzjata. It is native to Madagascar. Lanfranco (pers. comm., 2016) states that these planst are probably *Cyperus flabelliformis* or *Cyperus involucratus*. The **Round Galingale** *Cyperus rotundus* Bordi tat-Toroq grows along road verges and irrigated fields and is probably not indigenous (Lanfranco, 1996). The **Rush Galingale** *Cyperus distachyos* (*Cyperus laevigatus* subsp. *distachyos*) Bordi Iswed was last recorded from Għajn Riħana until the mid-seventies when it was destroyed by habitat disturbance and is considered extinct (Lanfranco, 1993, 1989).

Sedge Family Cyperaceae




False Fox Sedge *Carex cuprina* (*Carex otrubae*)
Sogħda Kompatta

Tuft-forming rhizomatous herbaceous perennial sedge with erect 3-angled stems. Leaves pale to bright green, keeled below channeled above. Ligule is white. Spikes numerous and adjacent, dense (especially in fruit), forming an elongated head. Female flowers occur below the male flowers on each spike, and have 2 stigma-branches. Utricles are smooth, shiny and pale orange-brown with green border, eventually becoming brown, and with a beak at the top. Glumes are orange-brown with green middle vein. Scarce to frequent in watercourses, e.g. Wied il-Qlejgħa, other wet areas, April-June.

Sedge Family Cyperaceae




Grey Sedge/Prickly Sedge/Grassland Sedge *Carex divulsa* (*Carex muricata* var. *divulsa*)
Sogħda Separata

A tuft-forming herbaceous perennial with narrow stems. Spikes all or almost all separated from each other forming an interrupted elongate inflorescence. Male flowers and female flowers present on each spike, female ones at the base below the male flowers. Stigma-branches 2. Bracts generally present. Utricles and glumes are greenish eventually turning brownish. Rare in watercourses and other humid environments, e.g. Wied il-Luq (where threatened by habitat degradation), April to June. The Grey Sedge belongs to the *Carex contigua* group (Pignatti, 2002). Pignatti (2002) also states that in *Carex divulsa* the mature utricles (fruits) are appressed to the stem and more or less erect.

Sedge Family Cyperaceae




Divided Sedge/Marsh Sedge *Carex divisa*
Sogħda

This herbaceous perennial sedge has a creeping rhizome and small and compact often cylindrical inflorescence, spikes numerous, contiguous (spikes touching each other). Each spikelet has both male and female flowers, male flowers above the female ones. Bracts are shorter than or (much) longer than the inflorescence. Seen under a microscope the margins of the bracts have glass-like teeth pointing upwards. Stigma with 2 branches and the utricles have a short bifid beak. The glumes have a green (later brown) central projection, and semi-transparent margins. Flowers from February to June in watercourses and marshy ground, also other wet areas including clay slopes, and is frequent-common. Pignatti (2002) states that the species also inhabits brackish soils.

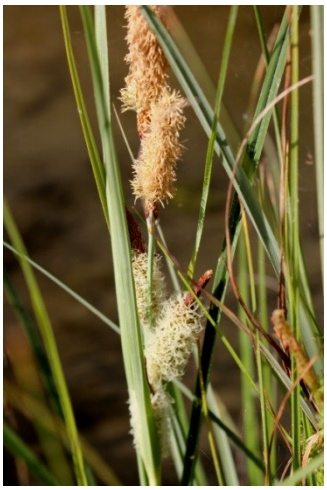
Sedge Family Cyperaceae




Long-bracted Sedge *Carex extensa*
Sogħda tal-Baħar

Densely tufted rhizomatous herbaceous perennial sedge with brownish/reddish-brown sheaths at base of stems and slender often spreading to curved leaves. Stems circular in cross-section, and the leaves are about as long as the stems, channeled above and keeled below. The male and female flowers are on different spikes; the upper narrow spike consists of male flowers, and below them are female spikes. The female spikes touch each other but the lowest spike often separated by a short distance. Utricles have a bifid (notched) beak, stigma branches 3. Glumes are brown. Very rare in saltmarshes and coastal valleys e.g. Wied Musa. Flowers from March to May. Scale of large square 10mm x 10mm.

Sedge Family Cyperaceae




Hispid Sedge *Carex hispida*
Sogħda Kbira

Rhizomatous rather robust herbaceous perennial forming tufts and with leaves rough to the touch. Margins of leaf have small “glass” teeth pointing upwards. Leaves are keeled on the underside and are channeled on the upper surface, and they are more or less rigid, narrowing to a pointed tip. Flowering stalk is triangular to almost circular in cross-section, longer than the leaves, carrying the female and male spikes. Male spikes are narrow (linear) and occur above the large female spikes. Female spikes are sessile or sometimes with a stalk (especially lower ones), and are close to and touching each other. Bracts are leaf-like, the lower one much longer than the inflorescence. Glumes are brownish with a green middle vein and have an arista, utricle with small bristles (hispid) along the margins and with a beak. Stigma branches 3. Very rare, mostly in humid valleys, flowers in spring, April to May. Sommier and Caruana Gatto (1915) recorded it as very rare from Mtaħleb. Borġ (1927) recorded it from Baħrija. Tabone (2008) recorded the species from a few sites in Malta including Baħrija, Dingli cliffs, Wardija, Fawwara and L-Mtaħleb.

Sedge Family Cyperaceae




Glaucous Sedge *Carex flacca*
Sogħda tax-Xagħri

Herbaceous perennial sedge. Leaves keeled, and have minutely toothed margins, and taper to a fine point. They are more or less rigid. Inflorescence is with 1-3 male spikes above the 2-3 female spikes. Style has 3 stigma-branches. Glumes are dark, with pale middle part and membranous margins. Utricles are without a beak. Found in garigue, maquis, rocky valleys, flowering from March to June, frequent. Pignatti (2002) states that this species is polymorphic and describes 3 sub-species. The similar **Southern Sedge** *Carex halleriana* Sogħda tal-Makkja is also recorded by Lanfranco (1989) as small populations at Wied Babu, Wied Żnuber and Wied Ħas-Saptan. Another species of sedge to be found in the Maltese Islands is the **Distant Sedge** *Carex distans* e.g. at Fiddien and Wied l-Speranza (Tabone, 2008). *Carex halleriana and Carex distans* have also been recorded by Borġ (1927).

Sedge Family Cyperaceae




Sea Club-rush *Bolboschoenus maritimus* (*Scirpus maritimus*)
Simar tal-Baħar

A rhizomatous perennial with triangular stems and keeled leaves. Inflorescence of brownish spikelets, in heads held on a stalk, central head with a short stalk. Bracts leaf-like and also keeled, longest one exceeds inflorescence. Under a hand lens the glumes can be clearly seen. These have pointed lobes and a long pointed projection at the middle. Found mostly in watercourses and also clay slopes, e.g. Ramla l-Ħamra area, Marsalforn, Wied Qlejgħa, and grows in both fresh and brackish waters, flowering from April to June. Scarce to rare, but may be frequent and often forming large populations where it occurs. The appearance of the inflorescence is much variable (Pignatti, 2002).

Sedge Family Cyperaceae

Round-headed Club-rush *Scirpoides holoschoenus* (*Holoschoenus vulgaris*, *Holoschoenus romanus*, *Scirpus holoschoenus*)
Simar tal-Boċċi

Rhizomatous perennial, with long and slender leaves forming dense tufts. Stems cylindrical, and leaves shorter than stems. Inflorescence of spikelets in dense globose heads, pale brown, in a loose terminal inflorescence. Upper bract is equal to or longer than the inflorescence. Frequent in watercourses, and also in springs on clay slopes (e.g. in rdum), as well as in field margins/country roadsides near watercourses. In flower from March-April to July. The **Slender Club-rush** *Isolepis cernua* (*Scirpus cernuus*) Simar Irqiq was recorded by Sommier & Caruana Gatto (1915) as quite frequent along springs and watercourses. The species have declined steadily and is now considered extinct, the last plants seen at Għajn Riħana in the middle seventies, destroyed by habitat disturbance (Lanfranco, 1993, 1989). Borġ (1927) recorded it also from Mtaħleb, Fiddien, Wied Gerżuma and Baħrija. The **Common Club-rush** *Scirpus lacustris* was recorded by Borġ as rare e.g. Wied Ħanżir and Għajn Riħana (Haslam *et al*., 1977).





Round-headed Club-rush *Scirpoides holoschoenus*

Sedge Family Cyperaceae





Common Spike Rush *Eleocharis palustris*

Rhizomatous perennial, often forming tufts. Stems not angled. Leaves reduced to sheaths. Spikelets are small, terminal and solitary. The glumes have a green middle stripe, and membranous (semi-transparent) margins. The 2 lower glumes half encircle the base of the spikelet. Fruit a nut, yellow or brown/black. In watercourses, scarce to rare, March to October. Formerly frequent. The plants of the Maltese Islands belong to subsp. *microcarpa* and are the common subspecies in the Mediterranean (Haslam *et al*., 1977). The Common Spike Rush is one of 4 species in the *Eleocharis palustris* group. The base of the style is thickened and jointed to the ovary. In *Eleocharis palustris*, this thickening is about as long as wide (Pignatti, 2002; Borġ, 1927). Another species the **Southern Spike Rush** *Eleocharis ovata* Simar tal-Wardija is recorded as rare from Wardija (Lanfranco, 1989; Haslam *et al*., 1977).

Sedge Family Cyperaceae





Black Bog Rush *Schoenus nigricans*
Simar Iswed

Herbaceous perennial forming tufts. Stems circular in cross-section, leaves narrow and pointed, with dark shiny sheaths. Spikes are terminal, small and narrow, black. Lowest bract exceeds inflorescence. Glumes have rough hairs on the back. Fruit a small nut. Flowers from March to June. Rare but frequent to common in Marfa area growing on dry rocky ground. Haslam *et al*. (1977) describes it as “rather rare” in “marshy maritime places”. Lanfranco (1989) described it as “seems to be decreasing”.

Sedge Family Cyperaceae




Large Quaking Grass *Briza maxima*
Beżżulet il-Qattusa/Fanali

An annual grass with pendulous spikelets at the tips of delicate stalks. The narrow leaves are more or less rough at the margins (bristly hairs). Spikelets flattened on the sides. Inflorescence is a panicle (branched raceme), sparingly divided and with few spikelets. Awns are absent. Flowers in spring, March to May, in garigue, maquis, rocky steppe, abandoned fields. Scarce to frequent.

Grass Family Poaceae (Gramineae)




Lesser Quaking Grass/Pearl Grass *Briza minor*
Beżżulet il-Qattusa Żgħira

A small annual with leaves rough to the touch (rough hairs on upper surface and margins). Ligule pointed and generally long (up to 6mm-10mm). Inflorescence much branched (panicle), pyramidal, spikelets numerous, the small spikelets nodding and on fine stalks. Lemma has broad membranous margins, and without awn. Flowers in spring, March to May. Described as frequently cultivated and naturalised by Borġ (1927).

Grass Family Poaceae (Gramineae)




Aeluropus/Cat's-foot Grass *Aeluropus lagopoides*
Sieq il-Qattus

Herbaceous white-hairy prostrate to ascending perennial with stems above ground (stolons), giving out branches at the nodes. Stems numerous and form tufts, erect or ascending. Leaves are small, pointed and channeled, pungent. Inflorescence is spike-like and dense at the top of the stem. The glumes of the spikelets are unequal and with a keel. Rare and endangered, occurs at Dwejra (Gozo), flowers from April to around October. The plant was first discovered by Silverwood (1971) at Qalet Marku; then at Dwejra, Gozo by Wolseley. The Qalet Marku plants were destroyed by development. The Dwejra population belongs to a different form with very crowded leaves (Lanfranco, 1989). Thought to be extinct, until Dwejra plants were re-discovered by the author (Casha, 2009a).
Grass Family Poaceae (Gramineae)




Cock's-foot Grass *Dactylis glomerata*
Dekkuka/Deqquqa

An ascending or erect herbaceous perennial forming tufts. Spikelets are in clusters on a branched inflorescence. Inflorescence with lower branches spreading or erect, and spaced apart from the upper ones, exposing the main flower stem; or spike-like with short branches. Glumes are often purplish, hairy, anthers purplish or whitish. Lemmas have short awns. Common in valleys, abandoned fields, open dry ground, April to June. Maltese plants are described as *Dactylis glomerata* subsp. *hispanica* (*Dactylis hispanica*) e.g. in Haslam *et al*. (1977), while Borġ (1927) describe both, stating that *hispanica* "is frequent with the typical form, in more exposed and drier situations". Subspecies *hispanica* has a dense spike-like inflorescence.

Grass Family Poaceae (Gramineae)




Annual Meadow-grass/Annual Bluegrass *Poa annua* Mellieġ

A small tufted annual with ascending or erect stems. Leaves are often with wrinkles. Flowers occur in branched inflorescence with spreading thread-like branches. These branches are in singles or in pairs. The flowers are closely overlapping in the spikelet. Glumes are unequal, pointed, and lemma with membranous margin and hairy. After flowering inflorescence becomes drooping. Frequent in roadsides, paths, field margins and other disturbed habitats, also in wet habitats such as watercourses, December to May.

Grass Family Poaceae (Gramineae)




The **Early Meadow-grass** or **Weak Bluegrass** *Poa infirma* is a small tufted annual, similar to *Poa annua* but a paler and a more delicate plant with a smaller and reduced inflorescence in which the axis of the spikelet is generally visible and the anthers are minute. Its inflorescence remains erect after flowering. It is found on sides of paths and other open disturbed areas, flowering in winter and early spring.

Key to *Poa annua* and *Poa infirma* (from Haslam *et al*., 1977; Pignatti, 2002)-
Poa annua: spikelets axis generally hidden, anthers 0.7mm-1.3mm (0.6mm-1.2mm) long;
Poa infirma: spikelets axis generally visible, anthers 0.2mm-0.5mm (0.2mm-0.3mm) long.

The **Rough Meadow-grass** *Poa trivialis* and **Bulbous Meadow-grass** *Poa bulbosa* are also recorded for the Maltese Islands, the first in damp places in valleys and the latter in arid rocky areas and roadsides (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927). *Poa trivialis* has the branches of the inflorescence in whorls of 3-7, and can grow tall a metre or so, while the stems of *Poa bulbosa* have fleshy leaf sheaths at the base.

Grass Family Poaceae (Gramineae)





Ciliate Fescue *Vulpia ciliata*
Sufija

Annual, stems solitary or forming tufts, leaves channeled or with rolled margins. Inflorescence is linear, spike-like, and one-sided. Spikelets are with unequal glumes, the lower one very small, upper glume longer but shorter than lemma. Glumes have membranous margins. Lemmas are densely hairy and with awn. Stamens 1 per flower. Common in garigue, rocky valleys, fields, paths, also sandy areas including dunes, March to May.

Grass Family Poaceae (Gramineae)





Dune Fescue *Vulpia fasciculata*
Ħortan tar-Ramel

An ascending annual, stems solitary or forming tufts. Leaves narrow, the edges generally rolled inwards (involute). Flowers with short secondary stalks (pedicels) in a dense spike-like inflorescence at the top of the stem, mostly on one side only. Awns present. Lower glume is minute, mostly noticed under hand lens or microscope. Upper glume is much larger, with awn and membranous margin. Spikelets enlarge after flowering. Stamens 3. Scarce-frequent, in sandy areas including dunes, and rocky coastal areas, March to May. The species is listed as locally frequent in arid, often coastal places by Haslam *et al*. (1977) and as "rather frequent rocky arid ground" by Lanfranco, G. (1969).

Grass Family Poaceae (Gramineae)

Fescues: *Festuca*

These grasses are perennial and form tufts. Several species of *Festuca* can be found in the Mediterranean. Some of them are very similar to each other and grouped together under the name of the main species. Moreover several different names have been applied to the members of this genus that often give rise to confusion. The general Maltese name is Żwien, though this name is also applied to species of *Desmazeria/Catapodium*. The main species associated with the Maltese Islands are members of the group *Festuca pratensis* (previously *Festuca elatior*). This group has 3 species: *Festuca pratensis*, *Festuca arundinacea*, and *Festuca fenas*. Characteristics of this group include - Smooth, erect and hairless robust stems; leaves flat with several visible veins and ligule reduced; inflorescence branched (panicle), elongated and often curved at the top; glumes unequal, and lemma often with short awn (ref: Pignatti, 2002). The species most common for the Maltese Islands is the **Tall Fescue** *Festuca arundinacea* (*Schedonorus phoenix*). Haslam *et al*. (1977) referred to these plants as *Festuca fenas* (*Festuca elatior* var. *arundinacea*) and described by Borġ (1927) as *Festuca elatior* var. *arundinacea* form *mediterranea*. The **Meadow Fescue** *Festuca pratensis* is also recorded as very rare from Wied Babu (Haslam *et al*., 1977; Borġ, 1927). These species have branches of inflorescence in pairs, one shorter than the other. According to keys by Haslam *et al*. (1977): *Festuca fenas* have short awns on the lemmas, and auricles (appendages at tip of leaf sheaths) that are spreading and shortly hairy on the margins.

Keys by Pignatti (2002) : *Festuca fenas* – inflorescence linear with lower branches short and erect, with few spikelets; leaf flat, eventually with rolled margins; *Festuca arundinacea*- inflorescence wide, with lower branches erect to spreading, carrying lots of spikelets; leaves flat, but often with margins rolled at the leaf tips.

Both species have ligules that are sparsely hairy, and with short stolons. Streeter (2009) mentions *Festuca arundinacea* with margins of auricles having few scattered hairs and that these "soon rub off". In the Maltese Islands the Tall Fescue *Festuca arundinacea* forms conspicuous long and tufted grasses. Spreading auricles are present at the tip of the leaf sheaths. Ligule is nil. Fescue plants can be met with in valleys, other wet areas, clay slopes in rdum, maquis and also in dry open areas, flowering in spring April to May, and are scarce to frequent. Note: Lanfranco (2006) names the genus as *Schedonorus* instead of Festuca; "Until recently known as *Festuca arundinacea* as it still appears in most texts. However this, and related species, have recently been transferred to *Lolium* as *Lolium arundinaceum*; but these look nothing like the typical *Lolium* and, in the opinion of the author (Lanfranco) are best placed in their own genus *Schedonorus* as was formerly the case".









Tall Fescue *Festuca arundinacea* growing by the edge of a field








Fern–grass/Stiffgrass
Catapodium rigidum (*Desmazeria rigida*, *Scleropoa rigida*)
Żwien

A small hairless annual with prostrate or ascending/erect stems forming tufts. Inflorescence has narrow and rather distant spikelets, branched in lower part with some spikelets distinctly stalked, and mostly unbranched at the upper part. Inflorescence is often on one side of the stem with angular branches, and eventually becomes stiff with spreading branches. Awns are absent. Common especially in dry open ground, garigue, valleys, fields, roadsides, coastal areas, March to May.

Note: This grass is variable and subspecies *rigidum* (with inflorescence pyramidal in shape) and subspecies *hemipoa* (top 2 pictures on right) recognised, together with one variety *majus* (with inflorescence lanceolate in shape).

A small variant that occurs generally near the coast is described as *Catapodium zwierleinii* (Lanfranco, pers. comm., 2013).

Grass Family Poaceae (Gramineae)




Sea Fern-grass
Catapodium marinum (*Desmazeria marina*)
Żwien tax-Xatt

A small annual with prostrate or ascending stems. Leaves often exceed the inflorescence. Inflorescence mostly unbranched (raceme) of small spikelets in 2 rows on one side of a rigid stem. Spikelets appressed to stem, and florets compressed. In dry open ground along the coast, March to May, and is frequent but easily goes un-noticed. Haslam *et al*. (1977) and Borġ (1927) describe it as frequent in arid rocky places.

Grass Family Poaceae (Gramineae)





Pignatti's Fern-grass *Desmazeria pignatti*
Żwien ta' Malta

A small annual with prostrate or ascending stems. Inflorescence of spikelets set close to each other, in 2 rows along the inflorescence stem. Spikelets are often set on one side of the stem, and have a prominent keel on the back of lemma. Frequent to common on coastal rocky ground, rdum, March to May. Endemic to Malta and South East (Hyblean region of) Sicily (Lanfranco, 2007).

Grass Family Poaceae (Gramineae)





Crowfoot/Egyptian Crowfoot Grass *Dactyloctenium aegyptium*
Sieq iċ-Ċawla

A prostrate and creeping to geniculately ascending annual, with stems taking roots at the nodes. The leaves are hairy at the bases and on the margins. Inflorescence consists of spikes spreading out from the same point in a digitate fashion. The spikelets are on one side of the axis (unilateral) in rows of 2s. Upper glume has an arista, lemmas are pointed. Rare in coastal areas (valleys, disturbed rocky ground), flowering from late spring to autumn (May-November). Recorded by Mifsud at Xlendi, Gozo (2008) and also at Għadira bay (pers. comm., 2010).

Grass Family Poaceae (Gramineae)





Ciliate Melick *Melica ciliata*
Melika Sufija

Herbaceous perennial with ascending or erect stems and leaves that are channeled or with edges rolled in (involute). Flowers are in a dense spike-like inflorescence, with short branches. Glumes are membranous. Spikelets with lemma having dense hairs giving the inflorescence a hairy appearance, at least when mature. Found in garigue and arid ground, also in rubble walls, April to June. Not frequent. Haslam *et al*. (1977) describe two varieties- var. *nebrodensis* (subspecies *ciliata*) and var. *magnolii* (subspecies *magnolii*) as occurring.

Grass Family Poaceae (Gramineae)





Small Melick *Melica minuta*
Melika

Annual with ascending or erect stems and is tuft-forming. Leaves with edges rolled in (involute). Spikelets are on one side only, on thread-like stalks in a simple (or branched below) inflorescence. The spikelets have small hairs and the glumes are with membranous margins. Frequent in garigue, rocky valleys, rocky steppe, April to June.

Grass Family Poaceae (Gramineae)



Branched Melick/Slender Melick *Melica arrecta* (*Melica minuta* var. *arrecta*)
Melika Piramidali

Annual and similar to the Small Melick *Melica minuta* but is larger. Inflorescence is branched and pyramidal in shape, with spreading thread-like branches. In valleys, maquis, April to June. Described as frequent in rocky valleys (Lanfranco, G., 1969; Borġ, 1927).

Grass Family Poaceae (Gramineae)







Stiff Rye-grass *Lolium rigidum*
Sikrana

Annual and variable tuft-forming or stems solitary, prostrate or ascending, and with a linear dense spike. Spikelets set on a more or less rigid stalk, alternating in 2 rows. The spikelets have one glume, except for the uppermost one. The glume is as long as or longer than the spikelet. Lemma is usually without an awn. Common in fields, sides of paths, other disturbed habitats, March to May.

Grass Family Poaceae (Gramineae)





Italian Rye-grass *Lolium multiflorum*
Sikrana ta' Ħafna Fjuri

A tall annual to biennial or short-lived perennial. The spikelets alternate along the bristly and undulating flowering stem. Glume is shorter than spikelet, and with 3-5 veins. Lemmas are numerous and awned. In fields, flowering April to June. Reported as at "Marfa and probably elsewhere" by Borġ, 1927. The species is not common in Malta, and is scarce to frequent in places in Gozo. According to Lanfranco (pers. comm., 2012) the species hybridizes with *Lolium rigidum*. Other species of *Lolium* mentioned for the Maltese Islands include the **Perennial Rye-grass** *Lolium perenne* and the **Darnel** *Lolium temulentum* (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927). The latter species has the glume almost as equal to or longer than the spikelet and the spikelets are awned. *Lolium perenne* is perennial and somewhat similar to *Lolium rigidum*. It is densely tufted and its leaves are dark green and shiny. The general Maltese name for *Lolium* species is Sikrana.

Grass Family Poaceae (Gramineae)





Golden Grass/Golden Dog's-tail
Lamarckia aurea Lamarkja/Xkupilja

Annual with erect or ascending usually tufted stems and bright green flat leaves. Ligule is membranous and pointed or rounded and extended to the inflated leaf sheath. The inflorescence is elongate, resembling a bottle-brush, and is spike-like, dense and shining with bright green to golden green spikelets in clusters. The spikelets are of 2 types, sterile and fertile, occurring in same cluster. The sterile spikelets assist in dispersal. Some of the spikelets are awned, and their pedicel (stalk) is white-hairy. The glumes have 1 vein and are hairy. Generally scarce to rare in disturbed areas and rocky ground, e.g. Ghajn Tuffieħa, February to May. Scale of large square 20mm x 20mm.

Grass Family Poaceae (Gramineae)





Rough Dog's-tail/Annual Dog's-tail/Bristly Dog's-tail/Common Dog's-tail/Cock's Comb-grass
Cynosurus echinatus
Denb il-Kelb Xewwieki

Annual with solitary or clustered stems and flat, rough leaves. Inflorescence dense on thin stalk, ovate-rounded, the lemmas with long awns giving the flower head a bristly appearance. Under a hand lens the lemma can be seen to have short rough hairs at the top. Glumes with awn that is shorter than awn of lemma. Frequent in garigue, rocky arid ground, rocky valleys, disturbed habitats, March to May. The **Crested Dog's-tail** *Cynosurus cristatus* Denb il-Kelb have become extinct possibly well over a hundred years ago. Two specimens exist at the Argotti Botanical gardens (Grech Delicata, 1853; Żerafa, 1827; both in Lanfranco, 1989).

Grass Family Poaceae (Gramineae)





Cutandia Grass *Cutandia maritima*
Kutandja

An annual with prostrate, ascending or erect stems, plant often turns purplish. Stem with dark nodes. Leaves flat or with edges rolled in, narrower than the inflated sheaths. Inflorescence branching in pairs, at first contracted but then opens up with spreading rigid branches. Spikelets are small and narrow, flattened laterally and held on triangular stalks. The stem is more or less rigid, but the pedicels on which the spikelets are borne are fragile; this helps the mature spikelets to break up and disperse. Upper glume is longer than lower. Generally frequent to common in sand dunes and on disturbed sandy ground, February to June (also throughout the year).

Grass Family Poaceae (Gramineae)





False Brome/Slender False Brome *Brachypodium sylvaticum*
Bunixxief tad-Dell

A tuft-forming perennial with ascending or erect stems. Leaves are flat, soft and hairy, bright green to yellowish-green with prominent middle vein on the underside. The tips of the leaves are often bent down. Inflorescence is narrow, usually curved and not straight at the top, spikelets with long awns. Glumes unequal, lower smaller than upper, and pointed. Scarce in valleys, maquis, wooded areas, and other shady situations, April to June or later.

Grass Family Poaceae (Gramineae)



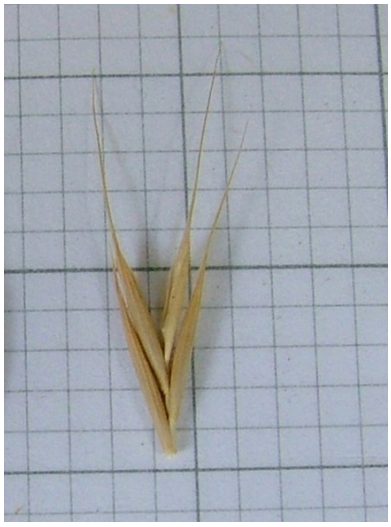


Mediterranean False Brome *Brachypodium retusum* (*Brachypodium ramosum*)
Pinna/Għomma

A rhizomatous herbaceous perennial with erect or ascending stems. Populations of plants often cover whole areas of ground. Leaves inrolled, channeled at base, narrow and spreading, and rough to the touch. Spikelets occur at the top of the stem on short secondary stalks, narrow and linear (especially before eventually “opening up”), few (1-5-7). The lemma has a short awn not longer than half its length. The glumes are not equal, upper larger than lower. Common in rocky steppe, garigue, maquis, arid ground April to June. According to Pignatti (2002) the number of spikelets on the stem is 1- 5.

Grass Family Poaceae (Gramineae)





Purple False Brome/Trachynia Grass
Brachypodium distachyon (*Brachypodium distachyum*, *Trachynia distachya*)
Għomma Żgħira

Annual with ascending or erect rigid stems carrying few spikelets (1-7) at the top. Leaves are hairless or slightly hairy. The spikelets have unequal glumes, and the lemmas are with relatively long and straight awns. Spikelets flattened from the side. Common in cultivated ground, abandoned fields, garigue, rocky steppe, maquis, rocky valleys, April to June.

Grass Family Poaceae (Gramineae)





Mediterranean Brome *Bromus fasciculatus*
Bunixxief Żgħir

A small greenish to purplish annual with erect or ascending stems, nodes few. Stems are solitary or few in a cluster. Inflorescence is erect and wedge-shaped, and with short branches. Spikelets are nearly sessile, glumes unequal, lanceolate and pointed. Lemmas are long-awned, bifid, and with awns spreading outwards. Common in garigue and other open rocky areas, rocky valleys, February to May.

Grass Family Poaceae (Gramineae)





Compact Brome *Bromus madritensis*
Bunixxief Vjola

Annual with spikelets in a more or less compact inflorescence. Stems are hairless beneath inflorescence. Leaves are hairy. Lower branches of inflorescence occur in whorls. Spikelets are often purplish and are on short erect to spreading stalks. Glumes are unequal, the lower smaller than the upper. Lemma is bristly and with awn, and has shiny membranous margin. The top of lemma is bifid (notched). This can be seen under hand lens or microscope. Common in open dry ground, abandoned fields, garigue, valleys, other places, January-May but also in the autumn.

Grass Family Poaceae (Gramineae)





Great Brome *Bromus diandrus*
Bunixxief Kbir

Annual, similar to Compact Brome *Bromus madritensis* but larger. Inflorescence is loose and generally pendulous, branches spreading, rough and with 1-2 spikelets. Spikelets rough to the touch owing to bristles on lemmas. Branches are in whorls. Ligule is deeply divided. Glumes unequal, lower shorter than upper. The lemma has a bifid (cut) apex, and is dorsally rounded and with a keel. These can best be viewed under a hand lens or microscope. Bristly straight awns are present on lemmas. Spikelets turn purplish on fruiting. Common especially in disturbed habitats including abandoned fields and paths, October to May.

Grass Family Poaceae (Gramineae)



The **Rigid Brome** or **Ripgut Brome** *Bromus rigidus* (*Bromus diandrus* subsp. *rigidus*) is similar to *Bromus diandrus*, but its spikelets are held on short stalks, and the panicle (inflorescence) is mostly erect. The stems are hairy beneath the inflorescence, leaf sheaths and leaves are softly hairy. Not frequent. Described as "rather frequent on poor ground" by Lanfranco, G. (1969).

Key to *Bromus diandrus, Bromus rigidus* and *Bromus madritensis* (from Haslam *et al*., 1977):

- Spikelets 70-90mm long including awns:

1. Inflorescence loose, nodding and stems holding spikelets up to 10cm long……..*B. diandrus*
2. Inflorescence generally erect and stems holding spikelets up to 2cm long…….*B. rigidus*

- Spikelets not more than 60mm long including awns:

3. Inflorescence compact and erect, stem hairless below inflorescence; lemma with bristles but not really hairy……..*B. madritensis*





Soft Brome *Bromus hordeaceus*
Ħurtan

Annual grass with ascending stems. Stems are generally solitary, leafless at the upper part. Leaves are flat and softly hairy. Inflorescence is contracted and dense, generally erect, and branched, the spikelets on short hairy pedicels (stalks), in singles or in groups. Spikelets are hairy, with unequal veined glumes. Lemma has distinct veins and with awn arising from just beneath the tip. They have pale (hyaline) margins and overlap, rounded on the back. Common in abandoned fields, paths, other open ground, March to May. According to Borġ (1927) variety *mollis* is "often considered as the typical form of the species". The **Southern Brome** *Bromus molliformis* (*Bromus hordeaceus* subsp. *molliformis*) is similar but the inflorescence is reduced and carries only few spikelets. It is also recorded for the Maltese Islands. Lanfranco also describes *Bromus lanceolatus* and *Bromus sterilis* from the Maltese Islands (pers. comm., 2013). The Maltese name Ħurtan can be written as Ħortan.

Grass Family Poaceae (Gramineae)





Weedy Brome *Bromus alopecuros* (*Bromus alopecuroides*)
Ħurtan Dejjaq

An annual grass with a narrow inflorescence of spikelets on short stalks. Lemmas have narrow membranous margins with deeply cut (bifid) tips. Lemma has long and twisted awn. Scarce in valleys, e.g. Buskett area, March-May.

Occurs close to watercourses e.g. Wied Mula and Wied Qannotta; an Eastern Mediterranean species (Lanfranco, 1989).

Grass Family Poaceae (Gramineae)





Rescue Grass/Prairie Grass *Bromus catharticus* (*Bromus unioloides*, *Bromus willdenowii*, *Ceratochloa cathartica*, *Ceratochloa unioloides*)
Ħurtan Amerikan/Ħurtan Perenni

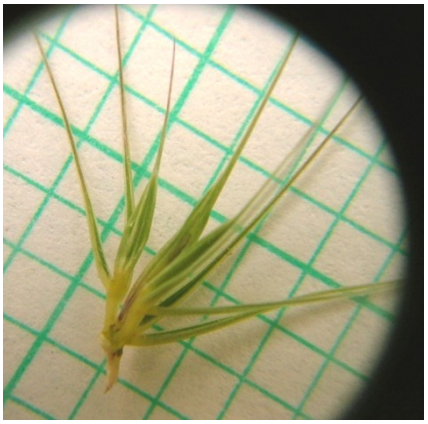
Herbaceous annual, biennial or perennial, stems smooth and forming tufts at base. A tall grass and can grow over 100 cm tall, with large flattened spikelets reaching 35mm long. Leaves are flat and rough to the touch, with prominent middle vein underneath and with few hairs on upper surface. Leaf sheaths smooth to softly hairy, with spreading hairs. Margin of leaf sheath is densely hairy where it opens up at base of leaf. Uppermost leaf reaches base of inflorescence.



Inflorescence axis rough to the touch and spikelets occur on branches in alternating half whorls along the axis and also terminal, upper whorls reduced. The inflorescence is generally nodding. Branches rough to the touch, with bristles pointing upwards towards the spikelets. The spikelets are held on thin unequal also bristly stalks and occur solitary or in small groups. The whole inflorescence (panicle) becomes narrower upwards. Spikelets rough to the touch and very flattened laterally, initially closely overlapping. Glumes unequal lower one shorter than upper, 5-9 veined, pointed/shortly awned, and with membranous margin. Lemmas have membranous margin, awn absent or very short (c.2mm). Seed is pale with both tip and base pointed, hairy at the tip. Rare, native to South America, naturalised in valleys e.g. Mistra valley, flowering in spring.

Grass Family Poaceae (Gramineae)





Sea Barley/Squirrel-tail Grass *Hordeum marinum* (*Hordeum maritimum*)
Bunixxief tal-Baħar

Annual with erect or ascending and generally solitary or loosely tufted stems. Leaves are flat, ligules very small, hairless or with few hairs. Spikelets on a dense elongate terminal spike and occur in groups of 3. Glumes are hairless and with long awns. The glumes of lateral spikelets are dissimilar; one reduced to just an awn and the other has a broad wing at the base. The lemmas are awned. Scarce-frequent in sandy ground, clay slopes and rdum, paths, arid places, March to June. The **Mediterranean Barley** *Hordeum hystrix* (*H. geniculatum*) Bunixxief tal-Mediterran is similar and easily confused with *Hordeum marinum.* It has hairy basal leaf sheaths. A rare species, recorded from dry and disturbed ground at Mtaħleb, Baħrija, Għajnsielem and Qbajjar (Lanfranco, 1989; Haslam *et al*., 1977; Borġ, 1927)

Grass Family Poaceae (Gramineae)





Hare's-tail Barley/Mouse Barley *Hordeum leporinum* (*Hordeum murinum* subsp. *leporinum*)
Bunixxief/Nixxief Komuni/Nixxieba

Annual grass with solitary or fascicled stems, and a dense spike inflorescence at the top of the stem. Spikelets are awned and numerous. As in other *Hordeum* species, spikelets occur in groups of 3, dispersed together when ripe. The inner glume on the lateral spikelets has hairs on both sides. Common in fields, paths, valleys and other areas especially disturbed, March to June. The similar **Wall Barley** *Hordeum murinum* has the inner glume of the lateral spikelets hairy on one side (short, rough hairs on other side). This is recorded as common for the Maltese Islands by Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927).
Grass Family Poaceae (Gramineae)




Sand Couch *Elymus farctus* (*Elytrigia juncea*) Sikrana tar-Ramel

A rhizomatous tuft-forming grass with ascending or erect flowering stems. Leaves are greyish-green, flat or with margins rolled in. The spikelets are alternating in 2 rows on a rigid axis (flowering stem) in a spike inflorescence. There are usually a small number of spikelets on the stem (up to 9 or more), and the lower spikelets are usually more distant from each other than the upper ones. At maturity the flowering stem becomes fragile and readily breaks up facilitating the release of the mature spikelets. Spikelets rigid, glumes more or les equal, shorter than the rest of the spikelet. Spikelets are not awned, glumes and lemmas with membranous margin. Scarce (but can be frequent where it occurs) in sand dunes and sand dune remnants, its creeping rhizomes help to stabilise the sand. Threatened by habitat destruction and degradation. Flowers from around May to August. The similar *Elymus repens* (*Elytrigia repens*) was discovered by Tabone (2008a) at Wied il-Għasri, Gozo. Two other species recorded by Lanfranco (1989) are the **Marsh Couch** *Elymus flaccidifolius* (*Elytrigia flaccidifolius*) Sikrana tal-Bwar from Salina and Mistra (extinct?) and the endangered **Sea Couch** *Elymus pycnanthus* (*Elytrigia atherica*) Sikrana tal-Baħar from Qalet Marku (see below).

Grass Family Poaceae (Gramineae)




Sea Couch *Elymus pycnanthus* (*Elytrigia pycnantha, Agropyron pycnanthum*) Sikrana tal-Baħar/Sikrana tas-Salina

A rhizomatous densely tufted perennial. Leaves narrow and stiff, and rolled when they are dry. The inflorescence is erect and stiff, spikelets appressed to the winding stiff axis, and closely set and overlapping. Lemma without awn. Used to occur at Salina, and the only colony was destroyed by the widening of the coast road in 2014 (Lanfranco, pers. comm., June, 2014). Some specimens were collected by MEPA (2014) in order to distribute to different institutions to take care of them for eventual re-planting.

Grass Family Poaceae (Gramineae)




Wheat *Triticum* spp.
Qamħ - Species of wheat are annuals or biennials. They are generally erect and with flat leaves. Inflorescence is a cylindrical spike. Glumes are unequal, and lemmas are with or without awns. These plants are cultivated for their grain - used for food (example in making bread, pasta). Commonly cultivated in the Maltese Islands and thus occur mostly in fields, sometimes naturalising in the surroundings. Throughout the world, species of *Triticum* are one of the most important food crops. Lanfranco & Lanfranco (2003) mention *Triticum aestivum* (Qamħ), *Triticum durum* Qamħ and *Triticum spelta* Farru as commonly cultivated. Two species of wheat were discovered in remains of the Għar Dalam phase (7,200-6000 years ago) - *Triticum dicoccum* and *Triticum compactum* (Schembri & Baldacchino, 1992).

Grass Family Poaceae (Gramineae)




Aegilops/Ovate Goat Grass/Goat Grass *Aegilops geniculata*
Brimba

Annual with solitary or tuft-forming stems, leaves flat and more or less hairy. Spikelets few, rounded and clustered at the top, with rigid and rough relatively long awns. Common in open arid areas, garigue, rocky valleys, rocky steppe, March to May. The **Mediterranean Aegilops** *Aegilops biuncialis (Aegilops lorentii)* and the **Three-awned Aegilops** *Aegilops neglecta* are also recorded for the Maltese Islands (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927).

Grass Family Poaceae (Gramineae)




Curved Hard-grass/Curved Sea Hard-grass/Curved Sickle Grass/Curved Parapholis *Parapholis incurva*
Nokkli

A small annual, often prostrate or ascending and generally tufted, and leaves flat or with inrolled margins. The small spikelets are set alternating and appressed, in hollows on a rigid, curved stem that becomes delicate and breaks up releasing the spikelets. Spikelets are with equal glumes. Lemma without awn and is clearly shorter than the glumes, best seen under hand lens. Plants often turn purplish. Common, especially coastal, in saltmarshes, sandy areas, open dry rocky areas and garigue, clay and rdum, paths, March to June, also later.

Grass Family Poaceae (Gramineae)




Hard-grass/Sea Hard-grass/Strigose Sickle Grass *Parapholis filiformis*
Lixxa

Annual, similar to Curved Hard-grass *Parapholis incurva*, but during flowering the stems are green and usually erect and straight or slightly curved. Spikelets are appressed to the stem. The lemma is more or less equal to the glumes (but also shorter). Scarce although can be frequent where it occurs, and not widespread, in coastal areas including saltmarshes, sandy areas, on fine soils along coastal paths, March to June.

Grass Family Poaceae (Gramineae)





Cylindrical Hard-grass/One-glumed Hard-grass *Hainardia cylindrica* (*Monerma cylindrica*, *Lepturus cylindricus*) Monerma

Annual with solitary or clustered stems, erect or ascending. Inflorescence is slender (but thicker than that of *Parapholis strigosa*) and tough, generally not curved at tip. Spikelets sessile, and appressed to the stem, sunk into cavities between the nodes of the stem. The spikelets have one glume, except for the terminal (uppermost) one which has two glumes. Lemma is shorter than glume and without awn. Infrequent to frequent in humid areas, salt marshes, coastal rock pools, clay slopes in coastal areas, e.g. Għadira s-Safra and Għajn Tuffieħa, March to May. It is recorded as locally frequent in a few arid coastal areas by Haslam *et al*. (1977). Lanfranco, G. (1969) recorded it as not frequent but widespread. Borġ (1927) recorded it as "here and there in arid and sandy places especially near the coast". Lanfranco states that it is not particularly rare in humid areas though often overlooked, and is similar to *Parapholis* (pers. comm, 2014).

Grass Family Poaceae (Gramineae)





Barbed Oat/Bearded Oat *Avena barbata*
Ħafur Żgħir/Ħafura Rqiqa

Annual with branched inflorescence carried on long stem. Spikelets hang on thin erect or spreading branches, nodding and narrow, eventually become gaping. The lemma carries 3 awns - a long one and 2 other shorter awns. Lemma is bearded (hairy) below. Common in fields including abandoned ones, rocky steppe, garigue, maquis, roadsides, arid rocky ground, January-February to May. The Barbed Oat is similar to the **Animated Oat** *Avena sterilis* Ħafur Kbir but its spikelets are evidently smaller in size; also the lemma of the spikelet of *Avena sterilis* carries the normal long awn from the dorsal side, and the tip of the lemma is just bi-dented (not carrying extra 2 short awns as in *Avena barbata*).

Grass Family Poaceae (Gramineae)





Animated Oat/Winter Wild Oat *Avena sterilis*
Ħafur Kbir/Ħafur

Annual tall grass, with erect smooth cylindrical stems in singles or clusters, and branched inflorescence carrying spikelets on thin branches. Spikelets are nodding, inflorescence lax. Glumes are pointed, more or less equal and as long as the spikelet. Lemmas of lower florets are awned and bearded (hairy), upper lemmas generally not awned and beardless. Awns are borne on the dorsal side of the lemma, and the tip of the lemma is shortly cut in 2 (toothed). Lemma is twisted at the lower part and blackish, with an elbow, then generally

pale. On maturity the spikelets become fragile and detach from the glumes. These fruits are easily attached to the fur of passing animals or to clothes of people. Common in cultivated and abandoned fields, other cultivated ground, roadsides and other disturbed habitats, valleys, from January (December) to May. The **Common Wild Oat** *Avena fatua* Ħafur is also recorded for the Maltese Islands (Haslam *et al*., 1977; Lanfranco, G., 1969; Borġ, 1927) and described as rare. This has small spikelets and resemble the Barbed Oat *Avena barbata* but does not have the 2 short awns. Besides *Avena barbata* and *Avena sterilis* other species of *Avena* occur (Lanfranco, 1996)

Grass Family Poaceae (Gramineae)





Crested Hairgrass/Mediterranean Hairgrass/Mediterranean Oat/Annual Cat's-tail *Rostraria cristata* (*Lophochloa cristata*, *Lophochloa phleoides*, *Koeleria phleoides*)
Denb il-Qattus

Annual slender grass, tufted or with solitary stems, ascending or erect. Leaves flat, hairy and sheaths are also hairy. Stem does not carry leaves for a length at the upper part beneath inflorescence. Inflorescence is elongate and terminal, spike-like, bright green. Spikelets are small, glumes unequal and less than rest of spikelet, upper glume larger than lower glume. Lemma has apex with a notch (bifid) and also a short awn. Common in various habitats including abandoned fields, garigue, valleys, dry open ground, paths, roadsides, March to May.

Grass Family Poaceae (Gramineae)





Golden Oat *Trisetaria aurea* (*Trisetum aureum*)
Trisetarja

A small bright green annual with ascending stems. Inflorescence is partly enclosed by uppermost leaf sheath during the early stages. Inflorescences dense to lax, branched, the "golden" spikelets small and occur on thread-like stalks. Upper glume is larger than lower and lemmas have awns. Awn is without elbow. Common in abandoned fields, open areas (including in wooded grounds), paths, March to May.

Grass Family Poaceae (Gramineae)





Nit Grass *Gastridium ventricosum*
Mustaċċ il-Qattus

Annual with solitary or fascicled erect/ascending stems. Inflorescence is narrow, bright green, dense and spike-like with short erect secondary stalks (pedicels). It widens to the middle and narrows again to the top. The stem is leafless below the inflorescence. Spikelets are small and overlapping, glumes unequal (upper shorter), narrow (linear-lanceolate) with middle vein and membranous margins. Base of glumes swollen (hence the name *ventricosum*) - this is best seen under microscope or hand lens. Lemma has bent awn exceeding glumes. Frequent to common in garigue, maquis, rocky valleys, March to May. The **Harsh Nit Grass** *Gastridium scabrum* Mustaċċ il-Qattus Aħrax is a rare grass with a restricted distribution both in the Mediterranean and the Maltese Islands (Lanfranco, 1989). The name Nit Grass can be written as Nit-grass.

Grass Family Poaceae (Gramineae)





Hare's-tail Grass *Lagurus ovatus* Denb il-Fenek/Il-Mejxu **-** Annual with solitary or fascicled ascending stems, leaves flat and with soft hairs. Terminal inflorescence is more or less egg-shaped (ovate), white and soft, the small spikelets dense and with awned lemmas. Glumes are densely silky-hairy (appearing feathery). Frequent to common in rocky ground including garigue, rocky valleys and rocky steppe, also paths, sandy areas including sand dunes, March to May.

Grass Family Poaceae (Gramineae)




Water Bent *Polypogon viridis* (*Polypogon semiverticillatus*, *Agrostis verticillata*)

Annual or herbaceous perennial with stems above ground rooting at the nodes, and ascending. Leaves hairless and are soft, narrow and pointed. Inflorescence is terminal and branched, generally conspicuous, oblong to pyramidal in shape, and with a dense number of minute spikelets. Spikelets have 1 flower. The spreading-erect branches are set on a main axis at intervals and in a kind of half whorls with long and short branches giving the inflorescence a lobed appearance. Spikelets are without awn, glumes with small hairs on the back (best seen under microscope or hand lens). Generally scarce in watercourses flowering from around April to June.

Grass Family Poaceae (Gramineae)

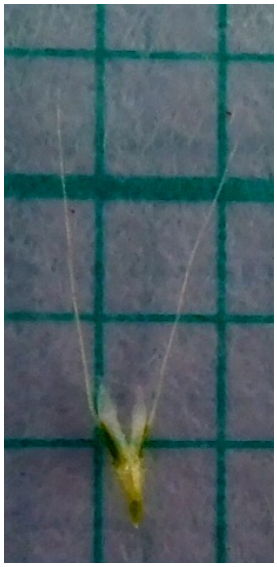



Annual Beard-grass *Polypogon monspeliensis*
Denb il-Liebru Kbir

Annual with shiny and striking spike-like terminal cylindrical inflorescence having several small spikelets. The stems are erect or ascending, and plants can grow quite tall. The spikelets have equal and hairy glumes that are equipped with relatively long diverging awns. The tips of the glumes are toothed (shallow notch). These can best be viewed under a hand lens or microscope. Lemma has short awn or awnless. The inflorescence is dense and branched, but often appears as un-branched especially at a casual glance. Common in wet habitats such as damp valleys and watercourses, also saltmarshes, March to June.

Grass Family Poaceae (Gramineae)





Sea Beard-grass *Polypogon maritimus* (*Polypogon maritimus* subs. *subspathaceus*, *Polypogon subspathaceus*) Denb il-Liebru Żgħir

Annual similar to Annual Beard-grass *Polypogon monspeliensis* but generally smaller. The glumes have long awns and at the base have inflated hairs, resembling scales. The glumes are densely hairy at the upper half, and are also deeply notched (bi-lobed) at the top. Lemma is without awn. Inflorescence generally becomes tinged purplish, and its base is wrapped with the sheath of the uppermost leaf. Frequent to common in saltmarshes, valleys, rock pools on the garigue, roadsides, March to May.

Scale of large square 20mm x 20mm.

Grass Family Poaceae (Gramineae)





Southern Hair-grass/Small Hair-grass *Aira cupaniana* Ħaxixa Irqiqa ta' Cupani

A small delicate generally erect and narrow annual, hardly noticeable especially when growing among other vegetation. Stems and leaves thread-like, stems solitary or tufted. Inflorescence branched and terminal, open (but still rather contracted). Glumes are membranous (transparent), as long as or exceeding rest of spikelet. Spikelets are small and lemmas with bent awn (often only one lemma with awn), the spikelets hanging on thin short stalks. Frequent on rocky and dry ground, valleys, abandoned fields, March to May.

Grass Family Poaceae (Gramineae)





Marram Grass/Mediterranean Marram Grass *Ammophila arenaria* (*Ammophila littoralis*) Qasba tar-Ramel/Birrun

Rhizomatous and tall tuft-forming perennial, leaves with inrolled (involute) margins. Inflorescence is elongate and slender, spike-like, with dense overlapping spikelets. Spikelets compressed (flattened) on the sides. Glumes larger than lemma, lemma is bifid at tip, and with hairs at the base. Occurs in sand dunes and sandy beaches, April-June (–August.) The plant has long rhizomes buried in the sand, stabilising the mounds of sand. An important sand dune builder. Extinct in the Maltese Islands. Lanfranco (1989) comments that "The last to succumb was the population at Ramla tat-Torri which disappeared in the early 1980s". Pictures taken in Italy.

Grass Family Poaceae (Gramineae)




Common Reed *Phragmites australis* Qasbet ir-Riħ

A rhizomatous perennial grass with stolons (stems creeping above ground) giving out roots and new shoots. Stems that carry the inflorescence are erect and long (2 metres or more), hollow and round and have large lanceolate tough and flat greyish-green leaves often with inrolled margins at the tips. Ligule is often a tuft of hairs. Inflorescence is large and branched with several spikelets on short stalks (pedicels), greenish to silvery, plume (feather)-like. Young inflorescence is brownish-purplish. The spikelets have the glumes unequal and veined, and the inside is full of silvery hairs. Frequent to common especially coastal in saltmarshes, watercourses, springs, rdum, July-October, sometimes forming dense reedbeds.

Grass Family Poaceae (Gramineae)




Great Reed/Giant Reed *Arundo donax* Qasba/ Qasba Kbira/Ħażrun

A large and robust rhizomatous perennial grass with erect firm woody and hollow stems. Leaves are flat and tough, lanceolate with rough margins. Inflorescence branched and large, plume (feather)-like with several spikelets. Lemmas have silky hairs which give the inflorescence a silvery appearance. Common in valley bottoms, rdum and clay slopes, hills, also in cultivated and abandoned fields, August to October. It often forms dense reed beds in valley bottoms. This grass has or had several uses - from a natural screen for sheltering crops from the wind (or cutting the canes and left to dry then made into a fence/windbreak) to making cane baskets, cane blinds and cane fish traps, also for roofing in order to provide shade. The Great Reed appears to be a native of India and was probably introduced into the Mediterranean in the Roman period (Lanfranco, 2007). “Probably introduced in antiquity” Lanfranco, 1996.

Grass Family Poaceae (Gramineae)




False Reed/Dwarf Reed *Arundo plinii* (*Arundo pliniana*)
Għaljun/Qaljun

Rhizomatous perennial with tough erect stems, similar to Great Reed *Arundo donax* but smaller, generally about 2 m high (compared with 4m-5m or more in *Arundo donax*), and is more slender. Leaves are elongate and narrow, often with rolled margins at the tips. Inflorescence silvery to purplish-tinged and is plume-like. Lemma has awn and silky hairs, and is shorter than the glumes. Found mostly in watercourses, maquis, also other areas, June-July to October. Often frequent-common where occurs, but is less widespread than *Arundo donax*.

Grass Family Poaceae (Gramineae)





Truncate Canary Grass *Phalaris truncata*
Skalora tat-Tafal/Skalora tal-Ġnejna

A tufted erect or ascending generally tall herbaceous perennial, leaves often with rolled margins. Inflorescence is spike-like with dense overlapping spikelets. Spikelets compressed on the sides, glumes winged. The wing of the glume is cut to rounded beneath the tip. Lemmas are hairy. Scarce mostly on clay ground, e.g. Mellieħa, Selmun, Mistra, March to June.

Grass Family Poaceae (Gramineae)





Purple Canary Grass/Blue Canary Grass *Phalaris coerulescens*
Skalora tal-Ilma

A herbaceous tuft-forming rhizomatous perennial with stems swollen at base. Spikelets compressed on the sides, dense in a spike-like terminal inflorescence that often becomes purplish. Glumes with a minute awn at tip, winged, the wing toothed, and carried to the tip. Watercourses, clay slopes, scarce to frequent, March to June.

Grass Family Poaceae (Gramineae)





Lesser Canary Grass/Small Canary Grass/Little-seed Canary Grass *Phalaris minor*
Skalora Żgħira/Skalora Selvaġġa

A tuft-forming erect or ascending annual, stems slender and the leaves are more or less rough. Inflorescence is spike-like with dense spikelets, the glumes pointed at tip and with an irregularly-toothed wing. Glumes equal. Common in several habitats including cultivated and abandoned fields, paths, watercourses, rocky valleys, February to June.

Grass Family Poaceae (Gramineae)





Canary Grass *Phalaris canariensis*
Skalora

Annual grass with solitary or tuft-forming stems and flower head carried on ascending-erect stems. The inflorescence is spike-like, ovate (elongate-ovate), spikelets laterally compressed, the glumes whitish-green and with prominent green veins. The glumes have an entire wing. A naturalised alien, March to June. Originally from Canary Islands and the west of the Mediterranean, and cultivated for its seeds that are fed to cage birds. Naturalised plants can be seen growing where seeds are dropped out of the cage accidentally or when the cages are cleaned.

Grass Family Poaceae (Gramineae)





Mediterranean Canary Grass/Awned Canary Grass *Phalaris paradoxa*
Skalora

Annual ascending or erect tuft-forming grass with club-shaped inflorescence, the base of which is generally enclosed in the sheath of the upper leaf. Spikelets are in small groups. The glumes have narrow pointed wings and a relatively long awn at tip. Common on clay slopes, fields, March to June.

Grass Family Poaceae (Gramineae)





Mediterranean Steppe Grass/Common Awn-grass *Stipa capensis*
Nixxiefa tal-Steppa

Tuft-forming shiny green annual with ascending or erect stems. Leaves have inrolled margins. Inflorescence branched, linear to a more open "V-shaped", dense with golden spikelets that carry a long awn. The broadened sheath of the uppermost leaf partly encloses the young inflorescence. The glumes are semi-transparent, almost equal and long-pointed, and longer than the lemma. The lemma has a long and 2-elbowed (bent) awn. The awn is twisted and hairy at the bottom, but then is straight above. The awn twists and straightens according to dryness and moisture, and this helps to bury the seed below the soil surface. Common, often forming "golden" populations, in garigue, abandoned fields, rocky steppe, open dry ground, roadsides, March to May.

Grass Family Poaceae (Gramineae)





Rice-grass/Smilo Grass
Oryzopsis miliacea (*Piptatherum miliaceum*)
Barrum Komuni

Tuft-forming ascending or erect herbaceous perennial. Leaves linear and pointed, at first flat later often with involute (inrolled) margins. Inflorescence branched, at first contracted then spreading, the lower branches in small whorls. The axis and branches are thin, inflorescence generally nodding. Spikelets are small, glumes membranous and lemma with small straight awn that often falls early. Common in several habitats including disturbed areas, April to June. The **Blue Millet-grass** *Oryzopsis vicaria* (*Piptatherum caerulescens*) Barrum tal-Irdum was discovered at Ta' Ċenċ in 1973 by S. Brullo and G. Ronsisvalle.

Grass Family Poaceae (Gramineae)





Esparto Grass/Albardine *Lygeum spartum* Ħalfa

A rhizomatous herbaceous tuft-forming perennial with thread-like and tough leaves having inrolled margins. Spikelets occur at the top of the narrow stems, almost completely enveloped in a pale sheath-like and veined papery bract. The spikelets lack glumes and the lemmas are fused below and have silky hairs. Common in coastal areas especially on clay slopes, forming steppe habitats, its rhizomes help to stabilise the clay and prevent erosion. It is also found growing on abandoned coastal clay fields, and along coastal garigue/rocky ground. Flowers from March to June, mainly in late spring.

Grass Family Poaceae (Gramineae)





Goosegrass/Indian Goosegrass/Crowfoot Grass/Wiregrass/Yard Grass *Eleusine indica*
Elusin

Annual to short-lived tuft-forming perennial grass with prostrate and ascending stems branching from the base. Leaves pointed at tip, upper ones reaching or exceeding inflorescence. Hairs occur on the upper part of sheath in node area. Inflorescence is composed of narrow elongate digitate (finger-like) few spikes (2-6 or more, rarely only 1) at the top of the flattened flowering stalk. These spikes emerge from same (or almost same) point, or one a short distance below the others. Spikelets are sessile, dense and overlapping, in 2 rows along the inflorescence axis. Upper glume of spikelets is larger than the lower one. Awns are absent. A rare naturalised alien in disturbed habitats including urban sites, e.g. Mosta. Lanfranco (2000a) records *Eleusine indica* subsp. *africana* from Marsa sports club and from flower pots in Sliema. Lanfranco (2000a) also makes reference to the **Finger Millet** *Eleusine indica* var. *coracasana* from San Anton gardens that was recorded by Borġ (1935).
Grass Family Poaceae (Gramineae)




Sand Dropseed/Sand Dropwort *Sporobolus pungens* (*Sporobolus arenarius*)
Niġem tar-Ramel

A rhizomatous greyish-green herbaceous perennial with erect or ascending stems and pointed leaves. The tough leaves are in 2 closely set rows (almost opposite) and have channeled-rolled margins. The greenish/purplish inflorescence is branched, pyramidal in shape, its base often partly enclosed by the upper leaf sheath. Spikelets do not have awns, and the upper glume is longer than the lower glume. Frequent in sand dunes and in sandy beaches with sand dune remnants, also low coastal rocky ground, June-September (also later).

Grass Family Poaceae (Gramineae)




Bermuda Grass
Cynodon dactylon
Niġem

A rhizomatous herbaceous perennial with stolons (stems running above ground), rooting and giving off new shoots and forming mats. Stems are erect or ascending, wrapped in the leaf sheaths. Leaves are flat or channeled, soft or tough, pointed, hairy or hairless, shorter on the sterile stems. Ligule made up of hairs. Inflorescence branched, with 3-7 slender "fingers" with purplish spikelets. The spikes ("fingers") diverge from the same point at the top of the stem. Spikelets are appressed to the axis, glumes narrow and pointed. The lemmas are hairy. Common in several habitats including cultivated and abandoned fields, gardens, paths, roadsides, valleys, clay slopes, rdum, and also sand dunes (- care: its leaves are similar to *Sporobolus pungens*), April to November.
Grass Family Poaceae (Gramineae)




Creeping Panic-grass/Torpedo Grass *Panicum repens*
Panikum

A rhizomatous and stoloniferous (with stolons) herbaceous perennial. Stolons rooting at the nodes. Stems erect or ascending, leaves flat or channeled, hairy, linear-lanceolate and ligule made up of hairs. Uppermost leaf reaches up to the bottom or half of the inflorescence. Inflorescence branched and carries several small solitary spikelets that hang on short secondary stalks. Inflorescence dense, becoming open and loose. Glumes unequal, the lower one smaller and very reduced. The anthers have a very characteristic orange colour. The stigmas are purplish. Generally scarce but can be frequent to common where occurs. Found in watercourses and in fields near marshy or wet areas, often forming dense colonies, also in sand dunes (example Ramla l-Ħamra, Gozo). Flowers from June to November. The **Common Millet** *Panicum miliaceum* has been imported with birdseed and is often a casual (Schembri & Lanfranco, 1996).

Grass Family Poaceae (Gramineae)

Cockspur/Barnyard Grass *Echinochloa crus-galli*
Xrika

Annual with ascending or erect stout stems, leaves flat, soft and lanceolate and rough on the margins. The ligule is nil or only of a few hairs. The inflorescence stem is straight to slightly curved. Spikelets dense in spike-like unilateral (one-sided) racemes set alternately on the stem. The axis (stem) of the raceme is ridged and tough and with small teeth on the ridges pointing towards the tip of the raceme, and there are also long hairs. Glumes are unequal, the lower smaller than the upper. Glumes have bristles on the nerves and also short hairs in between. At their tip is a sharp point. Lemmas with or without awns. Scarce (sometimes frequent) in watercourses, other wet areas, June to October (or even later on). The Cockspur is a variable species (Pignatti, 2002). The **Millet-grass** or **Millet-rice** *Echinochloa colona* Xrika is also recorded for the Maltese Islands by Haslam *et al*. (1977), Lanfranco, G. (1969) and Borġ (1927) as not frequent. Lanfranco, G. (1969) described it as "much less rare" than *Echinochloa crus-galli*. Its leaves have purplish-brown stripes (Pignatti, 2002).








Sticky Bristle-grass/Adherent Bristle-grass *Setaria adhaerens*
Xrika Komuni

An annual ascending or erect tufted grass. Leaves soft and flat and flowers clustered in an elongate spike-like bristly inflorescence. The spikelets are in groups, and are without awns. The anthers are yellow and the feathery stigmas are purplish-brown. Beneath the spikelets are bristles with small hooks pointing downwards towards the spikelet. This can best be viewed under a hand lens. These hooks are very efficient for attachment to clothes and fur. Glumes are veined and unequal, the lower one smaller than the upper glume. Common in urban and semi-urban areas, fields, gardens, damp ground including irrigated lands, May to October. *Setaria adhaerens* is very similar to *Setaria verticillata*. Other *Setaria* species occur in the Maltese Islands (Lanfranco, 1996). **Foxtail Millet** *Setaria italica* is an introduction with birdseed (Schembri & Lanfranco, 1996).




Hairy Finger-grass/Crab Grass/Summer Grass *Digitaria sanguinalis*
Diġitarja

A prostrate to ascending annual, rooting at the nodes, leaves soft, flat and lanceolate. Inflorescence sub-digitate, consisting of narrow and long finger-like (spike-like) spreading racemes with small spikelets. These racemes do not all come out from the same point and are often more or less whorled. The lower glume is very small, and the upper glume about as half as the spikelet. Occurs in wet areas including edges of fields in valleys, gardens, irrigated ground, and plant nurseries. Flowers in summer and autumn, August (late July) to November. Haslam *et al*. (1977) described it as occasional and that it occurred mostly as a weed of lawns and cultivated areas.

Grass Family Poaceae (Gramineae)




Knotgrass/Water Grass/Water Finger Grass/Water Couch *Paspalum distichum* (*Paspalum paspaloides*)
Paspalum

A rhizomatous herbaceous perennial with stolons and prostrate or ascending/erect stems. Leaves flat, linear-lanceolate, pointed, hairs present on margins at leaf base. Inflorescence consists of linear spike-like racemes, 2 at the top of the stem, one sessile and the other shortly-stalked. The small spikelets occur in 2 rows (distichous) on the axis, set close and touching each other. They are pointed and with a prominent middle vein. Common in some watercourses in summer, often covering whole areas of valley bottoms, June to October. A naturalised alien. The **Golden Crown-grass** *Paspalum dilatatum* is recorded by Haslam *et al*. (1977) and Borġ (1927) as frequent at Marsa water course. Scale of far left picture 10mm x 10mm.

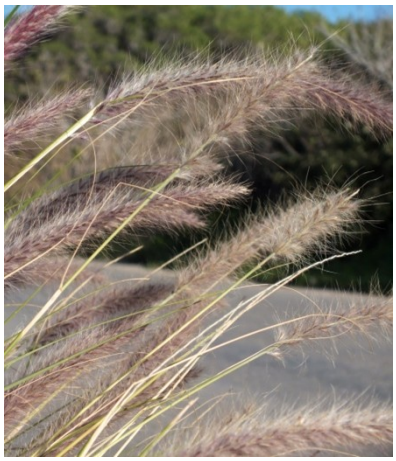
Grass Family Poaceae (Gramineae)




Feathertop/White Foxtail/Fountain Grass *Pennisetum villosum*
Rixa

A rhizomatous, tuft-forming and herbaceous hairy perennial. Leaves narrow and long, flat or with inrolled margins, and slight keel, and ligule made up of hairs. Inflorescence is a dense spike, plume-like (feather-like), and whitish. Spikelets are surrounded by tufts of plumose silky bristles, set on alternating teeth of the flowering axis. These tufts of bristles fall with the spikelets. Glumes are unequal, the lower glume minute and smaller than upper. A naturalised alien and is rare in dry rocky places, e.g. Xemxija, and roadsides e.g. Għajn Tuffieħa. It has been noticed flowering in the autumn and winter up to January; by the end of February the inflorescence has been seen withered and plants hardly noticeable. Native to parts of Africa and of Arabia. Lanfranco, G. (1969) also recorded this plant as rare and gives its flowering season from spring to mid-autumn. Borġ (1927) stated that this grass was introduced at the botanical garden towards 1908 from where specimens have subsequently naturalised at Floriana.

Grass Family Poaceae (Gramineae)




Fountain Grass/African Fountain Grass/Crimson Fountain Grass *Pennisetum setaceum* Rixa Twila

A rhizomatous, tuft-forming and herbaceous hairy perennial, similar to *Pennisetum villosum* but inflorescence is purplish, more linear and longer than 10cm, and with smaller spikelets. The spikelets are surrounded by tufts of bristly hairs and shorter hairs at the bottom. Inflorescence axis is hairy. Introduced as an ornamental plant, and naturalised in several areas as in rocky steppe, roadsides and on walls. It is found naturalised for example at Armier, Mellieħa, Mistra, Miżieb, Pwales, St. Paul's Bay, Għajn Tuffieħa, Naxxar and Msida and is increasing. Native range includes parts of Africa and Asia. Flowers can be found mainly from spring to autumn but also in winter.

Grass Family Poaceae (Gramineae)





Aleppo Millet/Johnson Grass *Sorghum halepense*
Qaraboċċ Selvaġġ

A large herbaceous perennial with erect and shining stems, leaves rough, flat, long and tapering towards the tip. Leaves with white middle vein and the tips are often withered. Ligule made up of hairs. Inflorescence is pyramidal and branched with spreading to vertical and whorled branches. Spikelets narrow, lanceolate, in pairs, one with stalk the other sessile, greenish to purplish, shiny. The glumes are as long as the spikelet and with few hairs. Awn present or absent on lemma. Not frequent in disturbed humid areas, roadsides, cultivated ground, May to October. The 2 spikelets of each pair detach together on maturity (Pignatti, 2002). The **Millet** *Sorghum bicolor* Qaraboċċ is cultivated. The spikelets are ovate to spherical.

Grass Family Poaceae (Gramineae)

Southern Sandbur/Southern Sandspur/Hedgehog Grass/Mossman River Grass/Golden Grass *Cenchrus echinatus* Qanfud

Tuft-forming ascending to erect annual, biennial or perennial grass, with rigid stems that gives off roots at nodes. Leaves elongate (lanceolate) and have few hairs on the upper surface, especially at the base. Upper leaves are shorter. Sheaths are hairy especially on the top, or hairless. Inflorescence greenish/yellowish to purplish, and is cylindrical and dense, spike-like. Flower stem eventually elongates and there is a leafless part below the hard and hairy fruits. Fruits (burs) are spiny, with 2 kinds of spines – flattened and hard spines spread over the surface of the bur and smaller flexible spines in a ring at the bottom. The spines on the fruits are armed with barbules (small barbs) pointing towards the base and very efficient in attachment to clothes or other material, fur and even feathers, and the fruits can also float on water. Axis 2009 growing on slightly sloping sandy ground, close to the main road of the spike is winding with short teeth internodes. The Southern Sandbur is an alien species, native to North and South America, the first and only record coming from Għadira nature reserve, where the author saw the plant in December 2009 growing on slightly sloping sandy ground, close to the main road. Its introduction could either be natural by means of migratory birds or by people coming from countries where the species is found as a native or as a naturalised plant.





Southern Sandbar *Cenchrus echinatus*
Scale 2mm x 2mm

Grass Family Poaceae (Gramineae)




Hispid Beard-grass
Hyparrhenia hirta
(*Cymbopogon hirtus*, *Andropogon hirtus*)
Barrum tax-Xagħri

Herbaceous tuft-forming perennial with ascending or erect stems. Inflorescence made up of pairs of spikes. Each pair of spikes occurs on a stalk that arises from leaf axil. The spikelets are in pairs, one with stalk and awnless, the other sessile and with bent awn. Glumes are equal and with silky hairs. Anthers are yellow. Common in garigue, rocky steppe, rocky valleys, maquis, abandoned fields, with flowers that can be found all year round.

Grass Family Poaceae (Gramineae)




Purple Beard-grass/Long-beard Grass
Andropogon distachyos
Barrum Aħmar/Barrum Vjola

Herbaceous tuft-forming perennial with ascending or erect stems carrying at its top 2 finger-like divergent spikes, one sessile and the other stalked. Spikelets are paired and the sessile spikelet has bent and twisted awn. Glumes have purplish tinge, and upper glume is shorter than lower. Awns present on glumes. Stigmas purple, anthers generally purplish. Frequent to common in garigue, rocky steppe, rocky valleys, abandoned fields, March to October, also other months.

Grass Family Poaceae (Gramineae)

Other members of the *Poaceae* that are rare but recently seen (Tabone, 2008) include-

1. **Slender Vernal-grass** *Anthoxanthum gracile* (recorded as frequent in valleys by Haslam *et al*., 1977), recorded in a few sites including in the Buskett area. Lanfranco (1989) states that this species is "Restricted to the SE Mediterranean, westwards to Malta, Sardinia and Corsica" and "rather uncommon".
2.**Pricklegrass** *Crypsis aculeata* Kripsis in 2 sites including at Għadira s-Safra at Għallis, a small saltmarsh. Lanfranco (1989) - confined to 2 small saline marshes, Għadira s-Safra and Qaliet. *Crypsis aculeata* was not sighted at Għadira s-Safra on 2 occasions, in June and September of 2009 (Casha, 2009 - List of Plants of Għadira s-Safra, unpublished).
3. **Swamp Pricklegrass** *Crypsis schoenoides* Kripsis tad-Dwejra at Dwejra, Gozo.
4. **Coastal Grass** or **Wedge-Footed Grass** *Sphenopus divaricatus* in a few sites in Malta including near Salina salt pans.

The very rare grass **Borrer's Salt Marsh Grass** *Puccinellia fasciculata* is described from is-Salina (ERA, 2018).

Grass Family Poaceae (Gramineae)








Addendum: **Silver Leaf Nightshade/Purple Nightshade** *Solanum elaeagnifolium*

Herbaceous perennial to a low shrub. Plant is covered with stellate (star-shaped) hairs. Stem has small prickles. Leaves are stalked and alternate, and have a wavy margin. They are white-tomentose from the underside. Flowers violet with 5 yellow stamens at the centre. Fruits rounded, ripening to yellow, looking like small yellow tomatoes. Native to Central and South America, planted for ornament and occasionally found naturalised as at St. Paul's Bay, from where these pictures were taken. Flowers in summer and autumn July to November. Acknowledgements to my brother Joseph for informing me about these plants. Edwin Lanfranco first met with this species in Malta in the late 60s or early 70s from a neglected patch adjacent to the former medical school at Pieta. The population was still there two years ago when he revisited the area (Lanfranco, pers. comm., August 2015).

Potato Family Solanaceae

Addendum**: Mexican Tea** *Dysphania ambrosioides* (*Chenopodium ambrosioides)* Għobbejra Tfuħ Te Falz

An annual, sometimes herbaceous perennial, erect aromatic plant. Its stems are often reddish and striated. Leaves alternate, elongate and toothed. Flowers small and inconspicuous, typical of the *Chenopodium*. An alien plant, native to America and Mexico. It can be found naturalised in some places such as valleys and along paths but is rare. Formerly described as rare, frequent and also widespread in certain areas by former authors (Haslam *et al*., 1977). Pictures taken at Mġarr ix-Xini in September. A few plants were seen.

Formerly common up until mid-80's; then it declined and presently is somewhat rare. Seen at Fiddien in summer 2014 (Lanfranco, pers. comm, October 2015).





Fat Hen Family Chenopodiaceae

Addendum: **Blue Pimpernel/Scarlet Pimpernel/Poor Man's Weatherglass** *Anagallis arvensis* subsp. *foemina* (*Anagallis foemina*)

This subspecies is very similar to *Anagallis arvensis* (page 178). There are some differences listed below:

	Anagallis arvensis (*Anagallis arvensis* subsp. *arvensis*)	*Anagallis arvensis* subsp. *foemina* (*Anagallis foemina*)
Petals overlapping at base	Yes	No
Petal margin	Densely fringed with glandular hairs. Hairs made up of 3 cells.	Only a few glandular hairs present. Hairs made up of 4 cells.
Flower stalk	Equal to or exceeds subtending leaf	Equal to or shorter than subtending leaf
Flowers concealed by sepals (calyx) in bud	No	Yes
Flower colour	Usually blue or red. On rare occasions lilac or almost white. Generally red, rarely blue.	Usually blue, but red ones also occur. Petals blue with a red centre, violet on the underside.
Status	Common (blue form *azurea* is the commonest)	Scarce

Source: Lanfranco (2015); Pignatti, 2002.

As with many other closely-related plants variations occur, and it is not always possible to seperate the 2 subspecies. The fringed margin (with hairs having 3 cells) is perhaps the best identification feature.




The densely-fringed margin of *Anagallis arvensis* (subspecies *arvensis*) is best seen under a hand lens.

Primrose Family Primulaceae

Addendum: **Frogfruit/Sawtooth Fogfruit** *Phyla nodiflora* (*Lippia nodiflora*) - Herbaceous perennial with non-flowering prostrate stems rooting at the nodes. Flowering stems ascending. Leaves opposite, spatulate, and have few teeth at upper half. Flowers are weakly 2-lipped, white to violet, produced in short spikes (heads) from the leaf axils. Main flower stalk (peduncle) is long and exceeds subtending leaf. Rare in humid places, flowering from April to July. Recorded at Marsa by Denis Cachia growing in a shady and rather humid site (pers. comm., April 2016) and at same site by Michael Briffa in 1986 (pers. comm., April 2016). Old records in Haslam *et. al* (1977) by I.M. Evans & Gauci come from Msida.

Vervain Family Verbenaceae

Addendumn: **Sickle-fruited Hypecoum** *Hypecoum procumbens* Qarn il-Mogħża - A prostrate to ascending, spreading greyish-green annual with grooved stem and finely-divided pinnate leaves in a rosette. The leaflets are again pinnate. Stem leaves few and smaller. Flowers are yellow and small, in clusters. They have 4 petals that are 3 lobed/toothed. The outer 2 petals are larger and their lateral teeth are shorter than the middle one, looking diamond-shaped. Seed capsule elongate, curved and jointed, each part with one seed. Flowers from January to April. Rare to scarce on sandy soil in coastal areas. The species was described as “frequent in many places” (Malta) and as “here and there” (Gozo) in “fields and on uncultivated ground especially in the neighbourhood of the sea” by Borġ (1927). Lanfranco, G. (1969) described it as not frequent in East Malta. Haslam *et al.* (1977) describes it as not frequent in “cultivated and waste places especially near the sea”. Lanfranco, E. (pers. comm., March 2016) states that it is "not extremely rare" and that he has received several reports of the species.

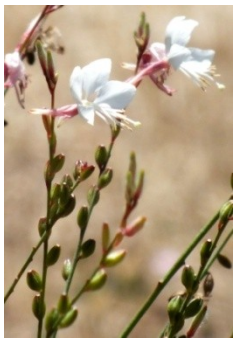





Poppy Family Papaveraceae

Addendum: **White Stonecrop** *Sedum album* Sedum Abjad/Beżżul il-Baqra Bajda - The subspecies present in the Maltese islands is *rupi-melitense*. This new endemic subspecies was described after a study of this plant by Mifsud *et. al* (2015). They consider this new endemic plant that has "evolved recently due to its insular reproductive isolation".

Stonecrop Family Crassulaceae



Addendum**: Lindheimer's Beeblossom/Appleblossom Grass** *Gaura lindheimeri* (*Oenothera lindheimeri*) - A herbaceous perennial plant with rhizomes. The hairy leaves are toothed. The white or pink flowers have 4 petals that are free from each other, and diamond-shaped. The stamens are relatively long. Native to America, planted locally for ornament. A naturalised plant was found by Denis Magro at San Gużepp tat-Targa, Mosta in July 2016. Lanfranco (pers. comm, 2016) has stated that he had seen another naturalised species of *Gaura* with smaller flowers some 3 years earlier. Picture on left shows flower of cultivated *Gaura lindheimeri* in a public garden.

Around 30 specimens of naturalised **Rose Evening Primrose** *Oenothera rosea* have been found by Jeffrey Sciberras at Wied Għollieqa (pers. comm. June 2020).

Willowherb Family Onagraceae

Addendum **: Common Hollyhock** *Alcea rosea* Bastun ta' San Ġużepp
An erect herbaceous perennial with un-branched stem. Leaves large with 5-7 lobes. The flowers are large and occur in spike-like terminal racemes. The 5 petals have a shallow notch at the tip (emarginate), and are pink in colour, but can also be white or dark purple (-brown). Flowers from April to June. A cultivated plant that can occasionally be found naturalised in the wild. Is probably a hybrid of cultivated origin including with *Alcea setosa* (Pignatti, 2002; Haslam *et al*. ,1977).






Mallow Family Malvaceae

Addendum: **Silvery Ragwort** *Jacobaea maritima* Kromb il-Baħar Isfar - After a study on the *Jacobaea maritima* group by Passalacqua *et*. *al* (2008) a new subspecies was identified that occurs only on Sicily, Malta, Linosa and the Egadi Islands - subspecies *sicula*. Hence Maltese plants are now considered by these authors as sub-endemics and named *Jacobaea maritima* subsp. *sicula*.
Daisy Family Asteraceae (Compositae)

Addendum: Note on *Convolvulus oleifolius* and *Convolvulus lineatus* by Lanfranco, 2015: These species can easily be confused, especially dwarf specimens of *C. oleifolius* with *C. lineatus*. The flowers of *C. lineatus* in Malta are most commonly white sometimes suffused pink. The edges of the flower is "rather prominently scalloped"; the flowers of *C. oleifolius* are usually white with pink rays, occasionally entirely pink.

The **Blue Rock Bindweed** *Convolvulus sabiatus* has been recorded as naturalised at Kennedy Grove limits of Salina (Stephen Mifsud, pers. comm., 2016). It occurs native in Sicily and North Africa so Malta is within its native geographical range.

Bindweed Family Convolvulaceae

Addendum: Here is included part of a note on *Plantago coronopus* by Edwin Lanfranco (pers. comm., March 2014) :
" The *Plantago coronopus* aggregate is very complex and includes some numerous taxa, some of which are of questionable status...Our plants (according to my Sicilian colleauge Salvatore Brullo) are actually *Plantago crypsoides*. These two entities* are sometimes synonymised ...and their status is unclear and several botanists regard them as ecotypes of some other *Plantago* in the same group (perhaps *Plantago weldenii*).
*(*Plantago bombycina* and *Plantago crypsoides*)

Pignatti (2002) gives 3 species in the *Plantago coronopus* group: *Plantago coronopus*, *Plantago macrorhiza* and *Plantago cupani*.

Plantain Family Plantaginaceae





Addendum **: Spanish Iris** *Iris xiphium* Fjurdulis tal-Ġonna - A bulbous herbaceous perennial with membranous tunic. Stem erect, cylindrical and leafy, and can reach 60(-80) cm high. Leaves are channelled, at first erect then curved. Flowers showy, solitary, violet-purple. The 3 outer larger tepals (the falls) have a conspicuous yellow patch. Inner tepals (the standards) are erect and taller than the falls. Spathe is green with a membranous border. Fruit a cylindrical capsule. Flowers from February to May. An ornamental plant in gardens, occassionaly found naturalised. Pictures shown here were taken at Manikata by Darren Saliba. Acknowledgements to Brian Restall for his remarks about this species.

Iris Family Iridaceae





Addendum: **Brown Orchid** *Ophrys fusca* Dubbiena

Underside of lip of *Ophrys fusca*, showing a green one and a pale reddish one. These pictures were taken on the same date (January) in the same area of Malta



Picture showing flower of *Ophrys fusca* taken in March

Orchid family Orchidaceae





Addendum: Typical flowers of the **Common Poppy** *Papaver rhoeas* Pepprin with dark blotch at base of each petal forming a black centre.

Poppy Family Papaveraceae

Addendum: The **Southern Sand-spurrey** *Spergularia diandra* - According to Tabone (pers. comm., 2011), plants recorded as *Spergularia bocconei* are in fact *Spergularia diandra*; and that Spergularia *bocconei* occurs but is rare. *Spergularia diandra* has been recently recorded from Selmunett (St. Paul's Islands) by Mifsud *et al*. (2016).

Pink Family Caryophyllaceae

Addendum: **Pteranthus** *Pteranthus dichotomus* - The Pteranthus has last been observed by Gulia (in Sommier & Caruana Gatto, 1915), and was later regarded as extinct (e.g. Lanfranco, 1989). The species was rediscovered by Tabone at Ta' Rdum in Gozo in 1994 (Tabone, 2007b).

Pink Family Caryophyllaceae

Addendum: **Maltese Red Campion** *Silene melitensis* Lsien l-Għasfur ta' Malta - Fleshy plants of *Silene colorata* growing in coastal areas have been recently classified as a new endemic species by Brullo *et al*. (2017). The stems of these annual hairy plants are much branched at the base, and the plants have a prostrate to ascending habit, fleshy spatulate leaves (basal ones spatulate, upper ones elongate-spatulate) and generally fewer flowers than typical *Silene colorata*. The Maltese Red Campion occurs in several coastal areas. Since it occurs in coastal areas it is less likely to start flowering early (as *Silene colorata*), and its main flowering season is late February-March to April.





Silene melitensis from Miġra Ferħa

Pink Family Caryophyllaceae









Addendum: **Woolly Trefoil** *Trifolium tomentosum* Xnien Muswaf - Similar to *Trifolium resupinatum* (see page 137) but the flower heads are smaller and the stems are generally prostrate. The calyx in fruit is densely white hairy, resembling wool. Calyx teeth small and usually hidden. Scarce, flowering from March to May in paths and other disturbed areas.

Pea Family Fabaceae (Leguminosae)

Addendum*:* **Long-beaked Storksbill/Crane Storksbill** *Erodium gruinum* Ħalq l-Għarnuq Kbira - Hairy annual, with hairs pointing backwards. Lower leaves in basal rosette and have 3 lobes, or cut in 3 segments. Margin toothed. Veins of leaves often purplish (at least in winter). Flowers relatively large (petals c. 20mm long x 15 mm wide), bluish-violet, with darker veins, generally in clusters of 2-6. The petals are short-lived, and soon fall off. Sepals have membranous margin and long tips, showing among the petals. Bracts and stipules whitish. Fruit splits into 5 parts with long "beaks" (10 cm or more). Flowers from March to May. *Erodium gruinum* is an addition to the flora of the Maltese islands. Around 12 plants were discovered by the author in a small area in an afforestation site in Majjistral Park (near Manikata) in 2017. The plants were growing along a path. Its introduction from nearby Sicily could be anthropogenic (example attached with clothes) or natural, example by sticking to bird feathers. It could also have been introduced with soil of trees planted in area, though trees planted on site did not originate from Sicily. Since it occurs in nearby Sicily it can be regarded as a native plant rather than an alien one. See page 354 for detail of the dry fruit.


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1= lower leaf pictured in February with reddish veins
2 = lower leaf with 3 leaflets in late March
3 = upper leaf
4 = long-pointed sepals
5 = whitish bracts
6 = flower with streaked petals
7 = fruits in late March. Notice sharp bent of the stalk holding fruits (arrow)
8 = flower on main stalk
9 = flower and leaves

Addendum: **Yellow Catananche/Yellow Cupidone** *Catananche lutea* Żigland Bellusi/Katananċe
These pictures of the Yellow Catananche below are from a dry disturbed area along one of the paths at Majjistral Park. Pictures taken in mid-April.




Daisy Family Asteraceae

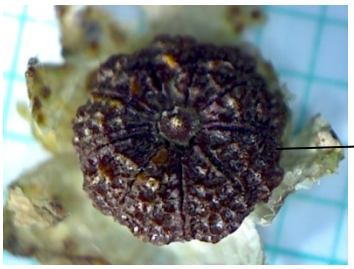
Addendum: **Greater Periwinkle** *Vinca major* Vinka naturalised at Wied tal-Isperanza, Mosta. Pictures taken in late April.




Oleander Family Apocynaceae

Addendum**: Southern Mallow** *Malva nicaeensis* Ħobbejża Mitfija



Pictures of *Malva nicaeensis* from plants growing by the side of a path at Buskett. Pictures taken in late April. The small flowers are pale and have faint streaks. The petals clearly exceed the sepals.

Fruit of *Malva nicaeensis*. The fruit segments are rough and the angles are not winged. See and compare fruit of *Malva parviflora* on page 348. Scale 2mm x 2mm

Mallow Family Malvaceae





Addendum**: Wild Mignonette/Yellow Mignonette** *Reseda lutea* Denb il-Ħaruf Isfar

The Wild Mignonette is a herbaceous perennial (sometimes annual to biennial), similar to *Reseda alba* (page160) but its foliage is shiny green (not greyish-green). The flowers are yellowish-green, deeply 3-lobed (the side lobes longer than the central lobe). The capsule has 3 teeth at the top, generally held erect. This plant depicted here was found growing at the side of a rocky path at Għajn Żnuber area, Mellieħa in late May.

Mignonette Family Resedaceae



Addendum: The pod and tiny yellowish seeds of the **Small Restharrow** *Ononis reclinata* Broxka Żgħira tal-Fjuri Roża. Scale 2mm x 2mm.

Pea Family Fabaceae (Leguminosae)

Addendum: **Balloon Vine** *Cardiospermum grandiflorum* Bużżieqa - A herbaceous climbing shrub with grooved stems and tendrils. Leaves stalked and cut into leaflets with toothed margins. Flowers are small and scented, with 4 white petals and a yellow centre, in clusters. The plant can grow long stems (c. 10 m) and clambers about by means of its tendrils. Fruit is an inflated and hairy ridged green capsule containing rounded black seeds. An alien and invasive species that is native of Africa and North and South America. Naturalizes, its seeds dispersed by both wind and water.







Soapberry Family Sapindaceae

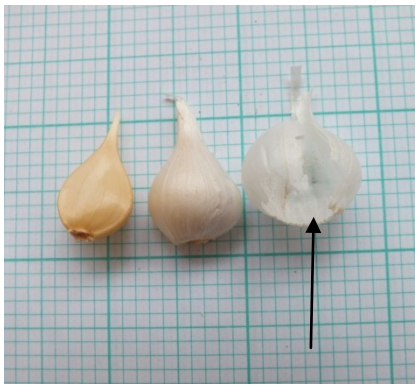
Addendum: *Allium* - According to a study by Mifsud & Mifsud (2018) on *Allium* species, *Allium polyanthum* is very common in the Maltese Islands but *Allium commutatum* is very rare and that their hybrid *Allium commutatum* x *Allium polyanthum* is rare. *Allium melitense* has been considered as a synonym of *Allium polyanthum*.

Amaryllis Family Amaryllidaceae

Addendum: The **Madeira Vine** *Anredera cordifolia* is a South American evergreen perennial climber with somewhat succulent leaves. It can be found naturalised in the Maltese islands.

Basella Family Basellaceae

Addendum: **Purple Garlic** *Allium amethystinum*? Tewm Vjola - In Flora Melitensis Nova, Sommier & Caruana Gatto (1915) describe *Allium descendens* = *Allium sphaerocephalon* var. *descendens* as somewhat rare in arid localities, probably as a reference to the species described here as *Allium amethystinum*? Borġ (1927) describes the same - "The typical form (*Allium sphaeracephalon*) must be very rare or does not exist in the Maltese Islands", and that *Allium sphaeracephalon* var. *descendens* is rather rare in a few localities. Haslam *et al.* (1977) describes *Allium sphaerocephalon* as rare in arid rocky places. In all three publications the Maltese name is given as Tewm Kaħlani, and all three publications give the flowering season from May to June. Maltese plants however flower mainly from late June to July. They grow short, with thin flowering stem and small umbels, and are easily overlooked in the dry summer arid ground. In the few areas known to the author, this *Allium* is not rare there, but is frequent to common. Tutin *et al.* (1980) describe *Allium sphaerocephalon* as a "very variable and plastic species" and describe 3 subspecies that are "sometimes treated as distinct species", one of which is the subsp. *sphaerocephalon* that has pink or redish-purple tepals. The Plant List (accessed February 2020) describes *Allium sphaerocephalon* subsp. *sphaerocehalon* as a synonym of *Allium sphaerocephalon*. Pignatti (2002) describes *Allium amethystinum* with robust stem, which is not the case for Maltese plants, and that the spathe is caducous (falls off early), another feature that does not hold for Maltese plants. Some further descriptions observed by the author (Casha) of this *Allium* species described here as *Allium amethystinum?* - Bulb small, acuminate (tapering to a long point) with tunic, outer tunic dark brown, inner white. Bulblets (small bulbs) have yellowish or white tunic. Stem hollow and grooved, leaves hollow and grooved. Leaves can be dry even before flowering. Umbel partly enclosed at first in spathe. Spathe in two (or more) parts, acuminate and persistent (does not fall during flowering). Umbels are small (one dry umbel measured was 1.5 cms long x 1.3 cms wide). Flowers are at first pale (whitish to greenish) with green keel. They later turn dark reddish-purple. The tepals are keeled. Tepals more or less equal to the capsule. Pedicels unequal. Pedicels of outer flowers become upright when flowers are dry. The general appearence of this *Allium* is that of a small *Allium* with small umbel, thin flowering stem and is easily overlooked even when flowering.


Above left picture shows a whole bulb with whitish tunic (outermost tunic removed), and 3 miniature bulbs (bulblets). Middle picture shows whole bulb opened showing one bulb covered with white tunic, and one smaller bulb covered with yellowish tunic, and outermost tunic that enclosed both bulbs (arrow). Other picture shows habit of this *Allium* species flowering on rocky ground in mid-July. Note: All bulbs shown here were up-rooted by rabbits digging the soil, and not up-rooted by the author.

Amaryllis Family Amaryllidaceae



Addendum: **Pink Valerian** *Centranthus calcitrapa* Valerjana Roża

Sommier & Caruana Gatto (1915) recorded the species in various localities in Malta, and that it is more frequent in Gozo.

Picture of *Centranthus calcitrapa* taken in Portugal.

Valerian family Valerianaceae

Addendum**: Maltese Spider Orchid** *Ophrys melitensis* (*Ophrys* x *flavicans* notomorph *melitensis*) Brimba Sewda/Brimba Sewda ta' Malta **-** Different speculum shapes



Flower without speculum



Ophrys melitensis flower from above

Addendum: *Ruppia* species

In an un-published paper by Henwood, Lanfranco, & Casha (2009), two species were identified for the Maltese Islands (*Ruppia maritima* and *Ruppia drepanensis*); while a 3rd one-*Ruppia cirrhosa*- found at Qbajjar by Lanfranco had become extinct. The survey located *Ruppia* in five of the investigated localities namely Għadira and Simar nature reserves, Salina salt pans, il-Magħluq ta' Marsaxlokk, Ta' Rafel and Qbajjar.

The locations and species are:

- Għadira nature reserve- *Ruppia drepanensis*; in 2012 the author (Casha) also discovered *Ruppia maritima*
- Simar nature reserve-*Ruppia maritima*
- Salina salt pans- *Ruppia maritima*
- Ta Rafel- *Ruppia drepanensis*
- Qbajjar-*Ruppia drepanensis*

At Ballut ta' Marsaxlokk Mark Żammit discovered *Ruppia maritima* (pers. comm., 2012). *Ruppia drepanensis* is included in *Ruppia cirrhosa* by Pignatti (2002).

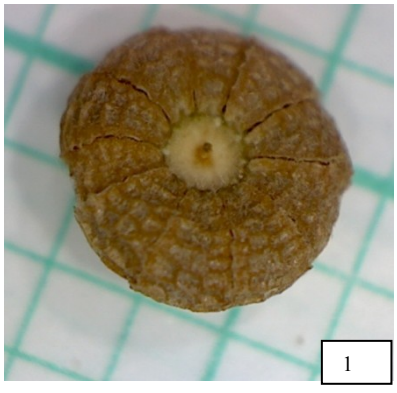
Ditch Grass Family Ruppiaceae



Addendum: The yellow-flowered form of the **Southern Bugle** *Ajuga iva* subsp. *pseudoiva*

Mint Family Lamiaceae (Labiatae)

Addendum: **Least Mallow** *Malva parviflora* Ħobbejża tal-Warda Żgħira and **Cretan Mallow/Small Tree Mallow/Cornish Mallow** *Malva linnaei* Ħobbejża Wieqfa. Picture 1 below shows the whole fruit and picture 2 shows the one-seeded fruit segments (mericarps) of *Malva parviflora*. The angles of these fruit segmenst are slightly winged. Picture 3 shows the mericarps of *Malva linnaei*. Notice the smooth round edges of *Malva linnaei* mericarps. Scale 2mm x 2mm


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Mallow Family Malvaceae

Glossary

Achene: A small dry fruit with one seed; a fruit that does not split open when ripe. An achene is formed from a superior ovary and it does not have pappus.
Actinomorphic: Flowers with radial symmetry; regular; a flower cut through the half in more than one plane to give two identical halves.
Acute: Pointed.
Adventitious: Coming out from an unusual position, e.g. roots coming out from stems of Ivy.
Alien: (Plants) a plant that is not indigenous but introduced deliberately or non-deliberately by man and not by nature such as a bird or wind.
Alternate: (Leaves) one leaf above the other along the stem, the leaves inserted singly at different levels, and alternating; not opposite and not attached at same level.
Amplexicaul: Clasping.
Angiosperm: Flowering Plant.
Annual: A plant that completes its life-cycle in one year, i.e. it grows, flowers, sets seeds and fruits and then dies in one year.
Anther: The upper part of the stamen that carries the pollen grains; the fertile part of the stamen.
Apex: Tip.
Appressed: Lying flat against; pressed closed to, e.g. a leaf lying flat against the stem.
Archaeophyte: A plant that originated elsewhere and was introduced by man several hundred years ago, now forming part of the local environment, e.g. the Carob.
Areole (**Aeriole**): A small area on the surface of cacti where spines or bristles arise. Areoles are easily visible on the segments of cacti as light-coloured or dark-coloured spots.
Arista: Awn, bristle.
Aromatic: with a smell; smelly; fragrant; perfumed; scented; pungent.
Ascending: (Stem) curving upwards.
Asymmetric: (Flower) irregular flower that cannot be divided in any vertical plane into two halves to give equal images of each other.
Attenuate: With a long tapered point.
Auricle: Small "ear-like" projection at the base of leaves or at the tips of leaf sheaths especially in grasses (Poaceae).
Autogamous : Self-pollinated.
Awn: A small hair-like/bristle-like projection.
Axil: The upper angle between leaf and stem.
Axillary: In the axil.
Axis: The main stem of a plant from which grow other parts of it; the main stem of an inflorescence; the main central development of any plant or organ, e.g. leaflets attached to a central stem in a pinnate leaf.
Bark: The outermost layer of stems (and roots) of woody plants.
Basal: At the base.
Berry: A fruit which is fleshy (succulent), and in the flesh are the seeds that are not enveloped by a hard, stony layer.
Biennial: A plant that completes its life-cycle in two years, growing, flowering, making seeds and fruits, and then dies in two years.
Bifid: Notched; cut; split into two, e.g. the petals of the Red Campion are bifid (notched, cut).
Blooming: Flowering.
Borne: To have; having; carried.
Botany: The scientific study of plant life; the science of plants.
Brackish: Salty water but less saline than sea water.
Bract: Leaves, sometimes small and look like scales that are located at the angle between stem and flower-stalk; floral leaves; inflorescence leaf.
Bracteole: A small bract; bract on secondary stems of inflorescence.
Bristle: Short stiff hair, e.g. the leaves of the Common Goosegrass has a short stiff hair at the tip.
Browsing: Feeding on the higher parts of woody plants; e.g. a Goat browsing on leaves, shoots and fruits of a shrub.
Bulb: An underground storage organ of plants; an underground bud, that serves also for vegetative reproduction (gives rise to new bulbs). Bulbs are formed from fleshy leaf bases containing food reserves around a short flattened stem and these are enclosed in protective scale-like leaves.
Bulbil: A small bulb in the leaf axil or in the inflorescence.
Bulbous: Having a bulb; resembling a bulb.
Caespitose: Forming tufts; forming clusters; growing in tufts or clusters.
Calyx: The sepals collectively; usually found as an outer whorl in most flowers.
Capitulum: The flower head inflorescence of the Daisy family (Asteraceae) formed by many small flowers, and resembling a single flower.
Capsule: A dry fruit that normally splits open (dehiscent) to release the seeds.
Carbohydrate: An organic compound containing carbon, hydrogen and oxygen (usually in a ratio of 1:2:1) and serves as an energy source.
Carpel: A female reproductive organ in the flower, comprising a stigma, a style and one or more ovules; unit of the gynoecium (female reproductive organ).
Caryopsis: A dry fruit (achene) typical of the Poaceae (Grass family).
Catkin: Pendulous inflorescence, usually of unisexual (i.e. male or female) flowers, e.g. inflorescence of the Holm Oak.
Cell: Unit of living organism. An organism can be composed of only one cell, e.g. a bacteria, or an organism can be more highly complex and contains many cells.
Channelled (**Channeled**): (Leaf) a leaf that is folded; with sides curving up and forming a slit in the middle; grooved.

Chlorophyll: The green pigment found in plants that traps sunlight. Chlorophyll is found in chloroplasts. It is important for photosynthesis.
Cilia: Hairs at the margin.
Cladode (Phylloclade): A flattened stem that looks like a leaf, and has taken the role of the leaves, e.g. the needle-like cladodes of the Spiny Asparagus.
Climax: (vegetation) the established vegetation in an environment after a long time and without the interference of humans, e.g. the Oak woodland is climax vegetation in the Mediterranean.
Compound: (Leaf) made up of several leaflets; (Inflorescence) a branched inflorescence, where the main flower stalk is branched.
Cone: The reproductive structure of coniferous trees, female cones are woody and conspicuous, male cones much less so; structure which is made up of scales and houses the seeds/pollen in coniferous trees; strobilus; reproductive structure of horsetails (Equisetaceae) and some clubmosses (Selaginaceae).
Contiguous: touching or adjoining, but not united, e.g. female spikes of *Carex extensa*.
Corm: An underground storage organ formed from a swollen stem base. A new corm often grows every year on top of the old one. Corms have a cover of scale-like remains of leaves of the previous season and function also as an organ of vegetative reproduction.
Corolla: The petals collectively; often brightly coloured and scented to attract pollinating animals. The petals are often in a whorl and are non-reproductive structures that protect the reproductive organs (together with the sepals when these are present).
Corona: Found in the centre of some flowers, usually cup-shaped or trumpet-shaped, e.g. the flowers of the Sea Daffodil has a corona in the centre, as do those of the Narcissus.
Corymb: An inflorescence where the flowers are more or less at the same level but their stalk arises from different points on the stem.
Cotyledon: The first leaf when a seed germinates, above or below ground.
Cyathia (Singular: **cyathium**): Clusters of flowers in the Spurges (Euphorbiaceae).
Cyme: An inflorescence where the oldest flower terminates the main inflorescence axis. Cymes can be simple (unbranched) or compound (branched).
Cypsela (Plural: **cypselae**): A small and dry indehiscent one-seeded fruit formed from an inferior ovary and may have a pappus, e.g. fruits of Dipsacaceae and Asteraceae are cypselae.
Deciduous: Losing leaves, e.g. the White Poplar loses the leaves in the autumn, and new ones grow in spring. Some plants are summer deciduous - they lose their leaves in late spring/summer to remain leafless till the following autumn.
Dehiscent: A fruit that splits open to release the seeds.
Digitate: A compound leaf with finger-like segments arising from same point, e.g. the leaf of the Chaste Tree.
Disc-florets: The small flowers (florets) at the centre of a flower head forming the disc in the Daisy family (Asteraceae).
Drupe: A fruit that is fleshy (succulent) and the seeds (one or more) are surrounded by a hard stony layer, e.g. the fruit of the Lentisk.
Elliptic/al: Lanceolate-like, but broadest at the middle and with both ends narrow.
Elongate: (Leaf) longer than broad, e.g. the leaves of the Southern Bugle are longer than broad.
Endemic: Native and restricted only to one area/country, e.g. the Maltese Fleabane is found only in the Maltese Islands; sub-endemic plants are found in the Maltese Islands and neighbouring lands.
Entire: (Leaf margin) not toothed or lobed or cut.
Epicalyx: A whorl of segments outside the calyx.
Epipetalous: Stamens attached to the petals.
Epoch: A division of a geologic period, e.g. the Pleistocene Epoch and the Holocene Epoch are divisions of the Quaternary Period.
Erosion: Soil carried away by wind, water, ice, gravity or other agents.
Evergreen: Green throughout the year; with leaves all the year.
Farinose: Mealy; covered with white powder; with a flour-like texture/appearance.
Fertile: (Flower) produces seeds; (branch) produces flowers; (soil or water) with good supplies of plant nutrients like phosphorus and nitrogen.
Filament: The stalk of the stamen below the anther.
Filiform: Thin and thread-like, with parallel sides.
Floret: A small individual flower in the flower head of the Daisy family (Asteraceae). Florets of same or different kinds make up the flower head; small individual flower in the spikelets of grasses (Poaceae).
Flower: The organ that produces seeds in flowering plants.
Flower head (**flowerhead**): An aggregation of small same or different flowers into a tight head; inflorescence.
Foetid: Strong unpleasant smell, e.g. the smell of the Fringed Rue.
Follicle: A dry dehiscent fruit; a fruit that develops from an ovary, dries on ripening and splits along one side to release seeds. Follicles are solitary or grouped together.
Form: A minor variation of a species, such as in flower colour. Below the level of variety. Abbreviated as f. or the word forma is used, and put after the species name (and after subspecies and variety where these are included).
Fruit: Contains the ripened seeds and the structures surrounding them; the ripened ovary. Fruits can be dry (e.g. a nut) or fleshy (e.g. a berry).
Gamete: A specialised cell that give rise to a zygote after the fusion with another gamete during the process of fertilisation.
Garigue (**garrigue**): A habitat formed by low shrubs (taken as c. 1 metre high) together with other herbaceous plants; plant community characterised by many low hardy shrubs; habitat formed by the degradation of maquis plant communities.
Geologic period: A unit of time that is longer than an Epoch, and is itself a division of an era; e.g. the Cenozoic Era is divided in the Tertiary Period and the Quaternary Period. The Pleistocene Epoch and the Holocene Epoch are divisions of the Quaternary Period.
Geophyte: A plant with underground organs to store food in them (e.g. bulbs), and by which means it survives unfavourable periods.
Glabrous: Without hairs.

Gland: Small vesicle with oil or resin found on the surface of a plant, with or without a stalk, and makes leaves and stems sticky. Glands often appear as tiny dots on the surface, e.g. on leaves. Glandular hairs are hairs that have glands.
Glandular: With glands.
Glaucous: Bluish-green; greyish-green.
Globose: Rounded, globe-like.
Glochids: Small spines or bristles found on the areoles of cacti. These are found in clusters and easily detach and cause some form of pain or irritation to the skin.
Glume: An empty bract at the base of a spikelet in grasses (Poaceae); outermost bract in the spikelet of grasses. Two (sometimes one) glumes occur at the base of the spikelet. A glume can be with or without an awn at the tip.
Grazing: Feeding on low-lying vegetation like grasses; e.g. a sheep feeding on grasses.
Gymnosperm: Plants with "naked seeds" – seeds develop on the surface of scale-like appendages, e.g. Pine, or at the tips of short stalks (Ginkgo).
Gynoecium (**Gynaecium**): Female reproductive organs of a flower with one or more carpels; the collective term for all carpels in a flower. The Gynoecium may consist of one or more carpels, the carpels free or fused to each other.
Halophytic: Salt-tolerant; salt-loving.
Haustoria: Highly modified structures in parasitic plants that penetrate the host plant to obtain nutrients.
Herbaceous (Herb): Plants that do not develop definite woody stems, and die to the ground after growing season. Herbaceous plants are not like shrubs and trees since they do not form permanent woody stems. Herbaceous annual plants would have completed their life cycle in a year, but herbaceous biennial or perennial plants will grow again from underground storage organs. The word herbaceous also refers to parts of plants that are green and not woody, or before they come woody.
Herbivore: An animal that feeds on plants.
Herbivorous: Feeding on plants.
Hermaphrodite: (Flower) having both sex organs (male and female); with both stamens and carpels in the same flower.
Hispid: With rough hairs/bristles.
Host: Supplies nourishment to a parasite.
Hyaline: Thin and semi-transparent (translucent).
Hybrid: Organism resulting from the cross of two different and related species. Is generally not fertile (sterile) but not always the case especially in plants.
Imbricate: Overlapping.
Imparipinnate: A pinnate leaf with a terminal leaflet.
Indehiscent: A fruit that does not split open to release the seeds.
Indigenous: Native.
Infertile: (Flower) does not produce seeds; sterile; (branch) does not produce flowers.
Inflorescence: The flower arrangement on a plant and includes bracts and branches; the flowering part of a plant including the bracts and branches; flowering shoot. Several types of inflorescences occur.
Internode: The distance between two nodes on a stem.
Introduced: Is not native and is brought deliberately or non-deliberately by man.
Involucre: Bracts (Involucral bracts) forming a whorl under an inflorescence.
Involute: Rolled inward.
Irregular: Divisible only in one longitudinal plane to give 2 mirror images of each other, e.g. the flowers of the Olive-leaved Germander.
Keel: The two lower petals in the Fabaceae flower (Pea family); (leaf) sharp edge shaped like the keel of a boat.
Labellum: Lip; the middle petal of orchids, lowest and largest of the three petals, distinct from the other two.
Laciniate: Cut into deep irregular lobes/segments; deeply cut.
Lamina: (Leaf) blade of leaf.
Lanceolate: (Leaf) shaped like a spear, or lance; tapering at both ends; narrowly ovate; elliptical-like, but broadest below the middle; elliptical–like, broadest at the base.
Latex: A milky juice found in some plants, e.g. in the Spurges (Euphorbiaceae), white or other colour.
Lax: Loose.
Leaflet: An individual part of a compound leaf.
Lemma: The lower bract that together with the upper bract (Palea) encloses the tiny flowers in the spikelets of grasses (Poaceae).
Lenticel: A pore in the bark for exchange of air.
Ligule: strap-shaped; (Daisy family) the fused petals of ray florets (Ligulate florets); (Grass family) the scale-like projection at the junction of the leaf blade and leaf sheath, often small and translucent, or absent, sometimes a ring of hairs.
Linear: (leaf) narrow and with parallel sides.
Lip: (Orchids) the specialised middle (lower) petal (Labellum); (mint family, Lamiaceae) many flowers are 5-lobed into 2 lips - 2 lobes forming the upper lip, 3 lobes forming the lower lip. Some flowers have only 1 lip.
Lobe: (Leaf/flower) a part in the leaf or flower, but not cut as an individual part.
Maquis: A type of habitat characterised with shrubs higher than 1 metre and small trees, together with climber plants and herbaceous plants; plant community formed by shrubs above 1 metre, small trees, climbers, and herbaceous plants; habitat formed by the degradation of the woodland plant community; habitat formed by the evolution of the garigue community.
Mealy: Farinose; with flour-like or powdery texture/appearance.
Membranous: Thin, dry and translucent (semi-transparent); brown, not green, like a membrane.
Mericarp: One-seeded portion (carpel) of a compound dry fruit (schizocarp). Mericarps can be dehiscent or indehiscent.
Midrib: The central vein of a leaf.
Mycorrhiza: An association between fungi and plant roots, beneficial for both.
Native: Indigenous; occurs naturally and not introduced by man.
Naturalised (**naturalized**): A species that has been introduced by man and is now established outside its original native area.

Nectar guide: lines or patterns on the petals of plants that direct the pollinator towards nectar. Especially found in bee-pollinated flowers.
Nectary: An organ that produces nectar, a sweet and sugary solution that is much sought by insects.
Nitrogen-fixing bacteria: These convert Nitrogen into soluble compounds which can be absorbed by plants.
Node: The point on the stem where the leaf is attached.
Notched: (Flowers) a cut in the petals, V-shaped or indentation; bifid.
Nut: An indehiscent fruit with one seed and a woody wall; an indehiscent one-seeded fruit with a hard shell.
Nutlet: A small nut.
Oblong: (Leaf) longer than broad and the margins are more or less parallel.
Obtuse: Blunt; rounded.
Ochrea: A sheet formed by the extension of the base of the leaf stalk and surrounds the stem; formed by the joining together of 2 stipules.
Opposite: (Leaves) two leaves that are attached at the same level on the stem but in opposite directions.
Organ: Cells are arranged together in tissues (group of cells that perform similar function), and these are further arranged into organs (group of tissues that perform similar function).
Organic: Coming from once-living material; of living origin.
Organism: A living thing, e.g. a plant or an animal.
Oval: An ellipse with rounded ends.
Ovary: The female part of a flower containing the ovules; the basal part of the carpel containing the ovules.
Ovate: (Leaf) Shaped like a hen's egg; widest near base of leaf; shortly lanceolate.
Ovoid: Ovate. Generally describes a solid shape having an egg shape.
Ovule: Found in the ovary and contains an ovum (egg cell, female gamete) that after fertilisation from a pollen grain develops into the seed.
Ovum (Plural: **ova)**: Unfertilised egg cell (female gamete) found in the ovule.
Palate: A projecting part on the lower lip of a 2-lipped corolla that closes the throat, e.g. Snapdragon (Antirrhinum).
Palea: The upper (inner) bract that together with the lower bract (Lemma) encloses the tiny flowers in the spikelets of grasses (Poaceae).
Palmate: A leaf that has leaflets coming out like fingers, example in the Creeping Cinquefoil and the Chaste Tree; hand-like. Palmate-pinnate leaves are divided in separate leaflets, but palmately-lobed leaves are not cut down into separate individual leaflets.
Panicle: A branched inflorescence; compound inflorescence.
Pappus: Tufts of feather-like hairs, bristles, awns or scales derived from the calyx on fruits and aiding in dispersal, e.g. the fruits of the Sow-thistles.
Parasite: (Plant) derives nourishment from another living plant that is attached to it, e.g. the Dense-flowered Broomrape derives nourishment from the Grey Birdsfoot Trefoil (the host). In this way the broomrape does not need to photosynthesize to get its food. Parasitic plants have special structures (haustoria) by means of which they derive nutrients from the host.
Paripinnate: A pinnate leaf without a terminal leaflet.
Pedicel: The stalk of an individual flower; secondary flower stalk.
Peduncle: The main stalk of an inflorescence; primary flower stalk.
Perennial: A plant that lives for a number of years, often long-living; a plant that lives for more than two years.
Perianth: The collective name for the petals and sepals; used when these organs cannot be easily separated; tepals.
Petal: Inner perianth segment of a flower, collectively the corolla. It is often brightly coloured.
Petiole: Leaf stalk.
pH: The measure of acidity (or lack of it) in water.
Photosynthesis: Chemical reaction where plants build their own food (organic compounds=sugars=carbohydrates) from water, carbon dioxide and sunlight. In the process oxygen is released.
Phyllode: Flattened green leaf stalk looking and functioning as leaf, e.g. Acacia.
Pinnate: A leaf that has leaflets on both sides of a central axis, and are cut down right to the axis, as individual leaflets; leaf with individual leaflets; compound leaf.
Pinnately-lobed: A leaf that resembles pinnate, but the leaflets are not separated into individual leaflets; leaflets not cut down to central axis.
Pistil: This is the collective name for the female reproductive parts of a flower, comprising the ovary (which contains the ovules), the style and the stigma, the latter is a sticky surface which receives the pollen grains. The Pistil is also called Gynoecium.
Plumose: Feather-like; hairs with side projections resembling feathers.
Pod: Dry and splitting fruit formed from a single carpel, e.g. the pods of peas (Fabaceae).
Pollen: These are tiny particles that contain the male reproductive cells and are produced by the anthers.
Pollinia: In the orchids, pollen is aggregated in masses called pollinia.
Prickle: A small hair; a weak spine; a sharp and hooked point. Grows from the stems, sometimes from the leaves, and from the epidermis (outermost layer of cells) and breaks off easily.
Prostrate: (Stems) lying flat over the ground; growing horizontally over the ground.
Pungent: Sharp irritating smell; not pleasantly scented; aromatic.
Raceme: An inflorescence resembling a spike but the individual flowers are stalked.
Rachis (**Rhachis**): The axis that holds leaflets or flowers; stalk of leaf of a fern.
Ray florets: Outer florets surrounding the central disc florets of the flower head in the Daisy family (Asteraceae).
Ray: The stalk of an umbel inflorescence. Primary rays radiate out from same point to hold secondary rays that radiate out from same point and bearing the flowers.
Receptacle: The enlarged tip of the stem bearing flower parts.
Recurved: Curved backwards.
Reflexed: Bent back or down at a sharp angle; bent/curved abruptly backwards or downwards.

Relict: (species) a survivor after a natural phenomenon, e.g. after the ice age, and generally now found in remnant population compared to former existence.
Remnant: (species) was abundant in former times, but now occurs in much less numbers.
Revolute: Rolled backwards or downwards.
Rhizoid: Thread-like structure that is used to anchor the plant to the ground, and also to absorb nutrients. Found mainly in lower plants, and function as the roots of higher plants. Also found in Fungi.
Rhizomatous: With rhizomes.
Rhizome: An underground horizontal stem having roots and shoots and usually remains for more than a year. Rhizomes are a means of vegetative reproduction and are often thick and swollen.
Rib: (Fruit) a ridge.
Rosette: Circular cluster of Leaves generally at the base of the plant on the ground or close to, radiating out from the centre.
Rugose: Wrinkled; ridged; rough.
Runner: A stem that moves over the ground and produces roots and new plants at the nodes.
Saline: Saturated with salt; containing salt; salty.
Salinity: Measure of salt content; concentration of salt.
Samara: A winged dry and indehiscent, usually one-seeded fruit, e.g. the fruit of elm.
Saprophyte: An organism that is living on and obtaining food from dead and decaying organic matter, e.g. bacteria and mushrooms.
Scabrid: Bristly; rough to the touch; rough or scaly surface.
Scape: Leafless flowering stalk with only flowers.
Scarious: Thin and dry and not green; membranous.
Schizocarp: A dry fruit made up of 2 or more carpels. These carpels mature into one-seeded units (mericarps).
Sediment: Material that is deposited after being broken down by weathering and erosion and is subsequently transported, e.g. by water and wind.
Seed: The fertilised and mature ovule of angiosperm and gymnosperm flowers.
Sepal: A segment of the calyx; collectively the calyx, the outer whorl of segments of a flower.
Sessile: (Leaf) a leaf without a stalk.
Sheath: In grasses (Poaceae) the lower part of the leaf forms a sheath that surrounds the stem.
Silicula: A small siliqua that is not more than twice as long as broad, and sometimes broader than long.
Siliqua: A fruit pod many times longer than broad, e.g. as in some members of the Cabbage family (Brassicaceae).
Simple: (Leaf) made up of a single blade only; can have lobes but not compound; not divided into leaflets; (inflorescence) un-branched.
Spadix: Spike inflorescence with small flowers borne on fleshy stem, typical of the Araceae, e.g. of the Friar's Cowl. This inflorescence is surrounded by a sheath-like bract known as the spathe.
Spathe: Bract surrounding a spadix in the Araceae, coloured and petal-like to attract pollinators; large bract that forms a sheath to enclose the cluster of flowers, may become woody at maturity e.g. in the Palms (Arecaceae). One or more spathes surround the inflorescence.
Spatulate: (Leaf) shaped like a spoon; shaped like a paddle.
Speculum: The shiny part on the lip (middle petal) of the orchid flower.
Spike: A simple (un-branched) inflorescence with sessile (un-stalked) flowers on the axis; a raceme inflorescence where all flowers are sessile.
Spikelet: Made up of 2 outer bracts (glumes), and tiny flowers each enclosed between two bracts (lemma and palea) in grasses (Poaceae); the unit of a grass inflorescence. Occurs also in sedges (Cyperaceae).
Spine: A sharply pointed projection; a modified leaf. A spine is derived from an entire leaf, or some part of the leaf e.g. stipule or petiole.
Sporangium (Plural: **sporangia**): Structure containing spores; structure where spores are formed.
Spore: Unit of asexual reproduction (asexual=without the fusion of gametes), a single spore develops into a new organism. Often unicellular, and produced by many plants.
Spreading: Plant with stems that are horizontal or standing outwards; prostrate (if stems spread over ground).
Spur: A tubular projection from a flower containing nectar.
Stalk: Stem.
Stamen: The male reproductive organ of a flower, made up of the top part - the anther that contains the pollen - and a stalk or filament.
Standard: The upper petal in the flower of the Pea family (Fabaceae).
Stellate: Star-shaped.
Stem: The axis that bears buds, shoots with leaves, and roots at the base; stalk; trunk. The stem has a lot of functions, e.g. conducts water and minerals, and if green produces also food.
Steppe: A habitat characterised by many species of plants that are not woody, e.g. by grasses and thistles; plant community that forms after the degradation of the garigue habitat.
Stigma: the tip of the style, the part onto which pollen grains adhere and germinate; a part of the female reproductive organ in a flower.
Stipule: A small leaf-like structure at the base of the leaf-stalk, not always present.
Stolon: A stem creeping above ground; a stem that moves horizontally over ground and rooting at the nodes and produces new plants; a runner.
Strobilus: Cone.
Style: Below the stigma; connects the stigma to the ovary.
Subspecies: Separated geographically from the typical plant (species) and has different characteristics; a sub-division of a species.
Succulent: Fleshy; juicy; contains water.

Sucker: A shoot which grows from a bud at the base of a tree or shrub, or from its roots. Suckers may originate some distance from the parent plant. Suckers may also grow from the stumps of trees when they are cut down; vegetative propagation.
Synonym: An alternative name given to a plant but is not considered to be the officially accepted name.
Tendril: An organ that is part of the stem, leaf or petiole (leaf stalk) that is modified for climbing, often thread-like and coiling, simple or branched.
Tepal: Used when the segments of a flower (petals and sepals) cannot be identified as petals or sepals. Example, in the Autumn Narcissus the flowers have 6 white tepals; perianth.
Terminal: (Inflorescence) inflorescence that occurs at the tip of a stem.
Thorn: A sharply-pointed woody structure derived from shoots (leaf, stem or branch). A thorn is connected to the vascular system of the plant and occurs at the axil of a leaf.
Throat: (Tubular flower, funnel-shaped flower) that area where the tube or funnel opens, near the base of each petal, often has nectar guides to direct the animal (pollinator) to the nectar.
Tomentose: With tomentum.
Tomentum: With dense covering of short and matted hairs, often white/silver or greyish. The hairs form a woolly (=resembling wool) coating.
Toothed: Serrated; margin that has teeth; tooth=small lobe at the margin.
Trifid: Divided into 3 parts.
Trifoliate: Having three leaflets.
Truncate: Abbreviated; shortened; cut abruptly, the base or top is straight across.
Tuber: A swollen underground stem or root that contains food reserves, functioning as a storage organ and as a means of vegetative reproduction.
Tunic (bulb): The coat of a bulb; the skin-like/paper-like covering of a bulb.
Umbel: An inflorescence in which all the stalks (rays) are attached from the same point. In a compound (branched) umbel the lower bracts are called primary bracts, while those above are the secondary bracts.
Unisexual: Having only one sex in a flower or plant, male or female.
Utricle: A dry one-seeded, bladder-like indehiscent fruit.
Variety (Abbreviation **var**.): A plant that differs in some characteristics from the typical plant species. Variety is in a level below that of subspecies and above that of form. Varieties of same species of plants will have different characteristics but are able to hybridise with each other if they come in contact. Varieties are group of plants that became geographically or otherwise isolated from the species and developed unique traits due to the environmental factors they are in (weather, pollinators, etc.). Varieties can be present in same or different geographical areas of the species (though the word variety is often used in plants having same geographical areas, and subspeies is used for plants with different geographical areas).
Vascular: (Plant) a plant with a system of tubes (xylem and phloem) for the transport of water, minerals and food. Xylem conducts water and dissolved minerals from the roots to all the other parts of the plant while phloem transports food from the leaves or other photosynthetic parts.
Verticillaster: A false whorl, e.g. in Lamiaceae (Mint family).
Vesicle: A small structure containing fluid.
Weathering: Breaking of rocks, by physical, chemical and biological processes; gradual breakdown of rocks by these natural processes.
Whorl: (leaves) three or more leaves radiate out from same node on the stem, e.g. whorl of leaves in many Rubiaceae (Bedstraw family).
Wings: (Flowers) the two side (lateral) petals of the flower of the Pea family (Fabaceae).
Zygomorphic: Irregular; divisible in only one plane of symmetry to produce two mirror images of each other; bilaterally symmetrical, e.g. the flowers of the snapdragon.
Zygote: The cell formed by the union of two gametes; the organism that develops after fertilisation of two gametes; the first cell formed when two gametes are joined by means of sexual reproduction.



From left to right: Bulbous Arrowgrass *Triglochin bulbosa* subsp. *barrelieri* ; fruits of *Erodium gruinum* on the plant; details of the top part of the fruit as seen under a microscope. Scale 2mm x 2mm.

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Picture dedicated to the memory of the **Giant Orchid** *Himantoglossum robertianum* and many other native wild plant species that were eradicated from the north-west of Malta by sheer ignorance of a native that destroyed the whole garigue and rocky steppe area and turned it into a bird trapping site and a pseudo-agricultural area.

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Flora of the Maltese Islands describes over 730 species of plants and contains over 1,500 colour photographs. Another 260 species are described briefly or mentioned. This book can be regarded both as an informative one and as a guide to the wild flowers of the Maltese Islands. Information contained in this book includes about the endemic and sub-endemic plants, origins of Maltese flora, habitats, the islands' geology, climate, fire and plants, pollination, how plants disperse their seeds, how they defend themselves and how they survive the dry season. Flora of the Maltese Islands is a useful resource for all those who want to learn about the wild plants of these islands situated in the central Mediterranean region.

