Conservatoire de l'espace littoral et des rivages lacustres

MEPA
L-AWTORITÀ TA' MALTA DWAR L-AMBJENT U L-IPPJANAR

Petites îles de Méditerranée

REPORT OF NATURALISTS PROSPECTIONS REALIZED IN MALTA

Petites îles de Méditerranée 08

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MOTS-CLES :

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RESUME :

L'archipel maltais se distingue par un remarquable patrimoine floristique notamment au niveau de l'île de Comino. Cette île se distingue par ses remarquables paysages et par des formations à grandes valeurs patrimoniales, en l'occurrence les falaises et les rochers littoraux (caractérisées par les saladelles de *Limonium melitense* et de *Limonium zeraphae*), les garrigues d'Anthyllide d'Hermann et/ou d'Euphorbe de Malte. Les formations dunaires se distinguent par des zones sableuses atypiques marquées par la compétition de trois espèces ; le lys maritime *Pancratium maritimum*, l'Inule visqueuse (*Dittrichia viscosa*) et le tamaris, ainsi que les pelouses sub-steppiques de graminées et d'annuelles.

Ainsi, l'île de Comino révèle un inventaire floristique vasculaire qui affiche plus de 300 espèces, dont 6 % sont endémiques tel que *Allium lojaconoi*, *Chiliadenus bocconei* et *Darniella melitensis* ; cette flore est particulièrement dominée par les thérophytes (56 %) et presque à égale distribution par les hémicryptophytes (15 %), les géophytes (11 %) et les chaméphytes (9%). Les hydrophytes ne représentent que 1 % du patrimoine floristique de l'île, ce qui confirme son caractère aride de l'île.

Au final, l'état de conservation floristique global de Comino, se montre satisfaisant (notamment pour les saladelles et les garrigues) et se distingue par sa richesse botanique élevée. Il se caractérise également par une forte dynamique de recolonisation spontanée au sein de laquelle l'Euphorbe de Malte (*Euphorbia melitensis*) semble jouer un rôle important.

Cependant, la fréquentation humaine de l'île, sans cesse croissante a généré des déséquilibres localisés plus ou moins pesants, tel que l'introduction de plantes à tendance invasive (*Carpobrotus* sp., *Ailanthus altissima*), la dégradation des formations dunaires, la menace des pelouses sub-steppiques (destructions par urbanisation, piétinement de la végétation, multiplication de sentes « sauvages », érosion, etc…)

Ces importants problèmes de conservation des habitats et du patrimoine floristique insulaire (qui restent localisés), imposent des actions de gestions ponctuelles et rapides, en vue de garantir leur efficacité et de limiter les atteintes portées à ces habitats et à leurs flores.

1. PREAMBLE

For a complete description of the mission PIM 2008, we refer the reader to the report by M. Sami Ben Haj (see PIM internal document)

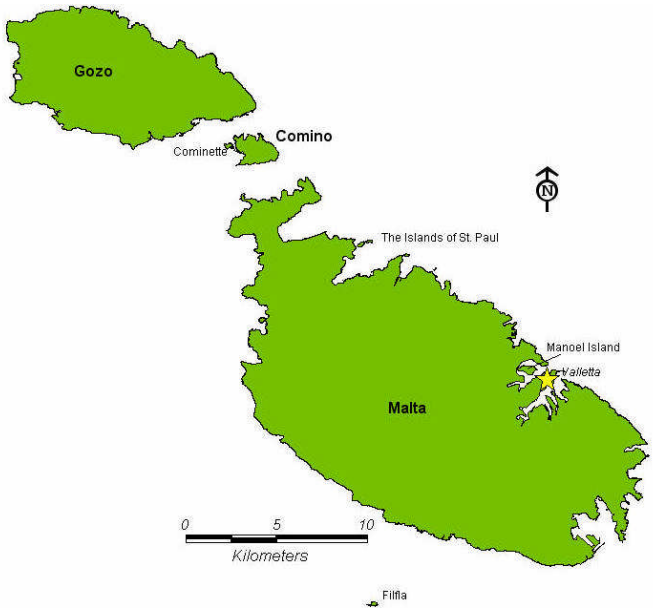
In the frame of botanical surveys, the island of Comino was the flagship destination of this visit to Malta; two whole days were granted to it. The visits were done in the company of our Maltese hosts and notably of MEPA agents. Two other days were devoted to rapid visits of various Natura 2000 sites on the island of Malta. The first three visits were carried out with all the participants of PIM mission while the last one only concerned botany.

The three days of surveys were conducted on:

- May 13: visiting diverse sites on Malta
- May 14 and 15: visiting the island of Comino
- Mays 16: visiting diverse Natura 2000 sites on Malta

Presentation

The Maltese archipelago is located in the Siculo-Tunisian threshold, geographically delimiting the western basin and the eastern basin of Mediterranean Sea. It is composed of three main islands: Malta, Gozo and Comino. It consists of marine sedimentary rocks (mainly limestone). From a bioclimatic point of view, it fits into the thermo-Mediterranean area. For more details, we refer the reader to the synthesis of Schembri (1997).



Source : http://www.emwis-mt.org/documentation/map%20of%20malta2.jpg

The island of Comino, the smallest of the three (2.7 km²) is located between the two largest islands. The island is at 80 meters altitude and presents a rather homogeneous relief in which coastal cliffs are key elements of the landscape. The human impact as current past is important on this island. The several buildings, runways and stone walls certify the constant pressure of man over nature. At present, there is a change in these practices with a significant decline in agricultural and pastoral activities (no flock has been seen during our surveys) to the benefit of tourism and a perceptible increase of the number of visitors to the site.

Views of Comino Island

Flora and vegetation

Eco-physionomic descriptions of natural habitats

Overall, the landscape of this island is shaped by three main types of environments. In parallel to these dominant habitats, there are two other habitats (with cut surfaces), however presenting a strong patrimonial value.

A. The cliffs and coastal rocks exposed to salt spray

Characterization and patrimonial interest

The sea lavender (*Limonium sp. pl.*) cliffs and coastal rocks forma an overall belt of vegetation occupying the periphery of the island by settling in areas where the salt content of the soil is very important, limiting or prohibiting the installation of characteristic species of garigue. The specifics of these environments which figure, as such, among the habitats of Community interest (code EUR27: 1240), confer them a high patrimonial value and imply their conservation.

These habitats host great biological and evolutionary interest species belonging to the *Limonium* genus (Plumbaginaceae). To this day, the sea lavenders continue to be studied by

specialists who regularly describe new taxa for science. Whatever the taxonomic rank to be given to them, these numerous localized "micro-species" present an important evolutionary and biogeographic interest, by forming many endemics with limited repartition (CRESPO & LLEDO, 1998 ; ERBEN, 1978 ; LLEDÓ *et al.*, 2005 ; PALACIOS *et al*., 2000 ; PIGNATTI, 1972).

On Comino, we note the presence of two Maltese endemic sea lavenders (*Limonium melitense and L. zeraphae*).

State of conservation

The state of conservation of the environments of this island is generally satisfactory. The only problems seem specific. They are usually localized in the vicinity of residential areas and much frequented landing areas.

Actions of conservation

In light of what has been said, it seems important, in general to monitor the state of conservation of this habitat. However, no overall measure of conservative management seems to be set up in the short term. Targeted and localized actions deserve to be implemented in order to limit the damage done to these habitats (see next chapter). In addition, it is advisable to monitor possible pollution of the marine environment because many chemicals are released on the coasts in the form of droplets in the sprays and cause necrosis to the most exposed plant species (CROUZET & RESCH, 1993; SIGOILLOT *et al*., 1981and 1987).

Extensive work on the dynamic demography of these sea lavenders species would permit to better identify them biologically and specify, if necessary, any possible conservation actions to be implemented in the long term.

There is an extensive bibliography on these aspects related to *Limonium* genus.

B. *Anthyllis hermanniae* and/or *Euphorbia melitensis* formations

Characterization and patrimonial interest

The local garigues can be broadly related to two major types of habitats of Community interest (interpretation manual of habitats EUR 27): some phryganas dominated by yellow kidney

vetch *Anthyllis hermanniae* and pre-desertic thickets dominated by Maltese spurge *Euphorbia melitensis*. The codes of these habitats are respectively 5410 and 5330.

While it may seem easy to distinguish these two theoretically vegetal formations, surveys on the field have shown, on the contrary, a significant difficulty of characterization. This is because these species appear very often in combination and then form a mosaic of habitats (5410 x 5330). Only certain areas of the island have almost pure populations of one kind or another.

On the left side, phryganas with Yellow Kidney Vetch *Anthyllis hermanniae*

Maltese spurge (*Euphorbia melitensis)* formations


At left *Anthyllis hermanniae* ; at right *Euphorbia melitensis*

Remarks:

The local garigues present other facies, rather located, among which some species such as shrubby St John's wort *Hypericum aegyptiacum, Periploca augustifolia, Thymus capitatus* or also olive-leaved germander *teucrium fruticans* , play an important role.

In addition, an original facies, rather located, dominated by the lentisk *Pistacia lentiscus,* should be reported. The presence of this shrub characterized by its rather slow natural dynamics could show advanced evolutionary stages of the natural vegetation of the island.

***Pistacia lentiscus* facies**

State of conservation

All these habitats have appeared in an overall good condition of conservation on the whole of the island. They benefit of an important natural dynamics. Only a few localized areas are degraded. These areas are usually located near residential areas and much frequented landings areas.

Actions of conservation

Yet, and in light of what has been said above, no overall measure of conservative management seem to be implemented in the short term. Targeted and localized actions must be implemented to limit the damage done to these habitats.

In addition, further work on these environments, their characteristic species and dynamics of formation and evolution would better permit to identify them biologically, and, where appropriate, specify any conservation actions to be implemented in the long term.

C. Dune formations

Characterization and patrimonial interest

The only sandy zone that we were able to survey with our Maltese guides appeared somewhat typical at first glance. Only a few individuals of sea daffodil *Pancratium maritimum* still persist in a population of false yellowhead *Dittrichia viscosa*, however, a grove of tamarisk covered a large area of sandy surface.

State of conservation

Actually, it appears that the dune zone that we were able to observe is in a bad state of conservation. The over-frequentation seems to have disturbed this small area where many characteristics and high patrimonial value species are reported in the literature.

Actions of conservation

It seems difficult to be able to maintain this heavily degraded habitat. A preliminary and urgent restoration program will be presented in a later chapter.

D. The sub-steppe lawns of graminaceous and annuals

Characterization and patrimonial interest

These semi-natural lawns originating among others from multi-secular grazing are specially characterized by Mediterranean false-brome *Brachypodium retusum* as well as the false brome *Brachypodium dystachion*. There are also many other therophytics and geophytics, the latter, most often, have high

patrimonial value (*Allium, Ophrys,* etc…). They are a priority habitat of community interest (code EUR27: 6220).

Only a small area of this habitat is mentioned on the island. During our fieldtrip, we have seen a dry lawn less typical of this habitat; probably this was due to our late surveys. We have observed *Hyparrhenia hirta* and *Allium lojaconoi,* an endemic bulbous of the Maltese archipelago.

State of conservation

The conservation state of this small area appears to be difficult to assess because of the late surveys and also the weak local typicality of the habitat.

Actions of conservation

We did not detect problems requiring urgent implementation of conservation actions in this area.

E. The fallow areas and other anthropised sectors

The abandonment of farming activities as well as the localized over-frequentation allow the existence of fallow lands formerly characterized by the presence of some species such as giant fennel *Ferula communis* and/or wild artichoke *Cynara cardunculus.* These environments are common around abandoned buildings and ruins.

They have no patrimonial value from floristic point of view but remain attractive for a large part of the fauna of the island (including insects and reptiles). No conservation measure can be proposed from a purely botanical aspect.

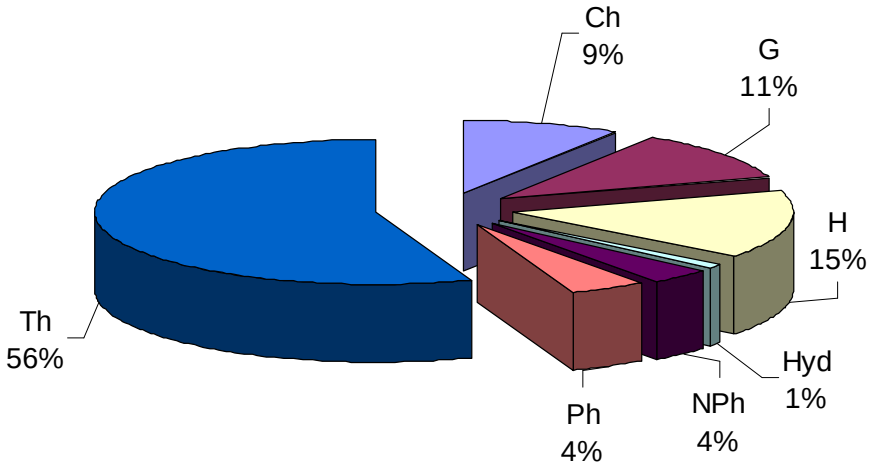
The vascular flora

A preliminary list of the plant species of Comino Island figures in the annex. It was realized following bibliographic data from the flora of the Maltese islands (HASLAM *et al.* 1977) actualized by recent field observations and data by MEPA in the file concerning this Natura 2000 site. It presents over 300 species.

- Biological types

The biological types are defined according to the rule of survival of a plant during the bad season and depending on the particular position of its regeneration buds. Schematically, we have:

- The phanerophytics: tall woody plants with buds of regeneration that are more than 50 cm (trees and shrubs). The division into macro and nanophanerophytics (Ph; NPh) is well justified in the Mediterranean coastal region.
- The chamephytics (Ch): sub-shrubs and woody shrubs generally with regeneration buds that are not above 40 cm.
- The hemicryptophytics (H): herbaceous plants with regeneration buds at ground level. These species are perennials or biennials.
- The geophytics (G): are perennial plants with the survival body buried in the ground (bulb, rhizome or tuber).
- The hydrophytics (Hyd): these are plants that grow their entire vegetative apparatus inside the water or on its surface.
- The therophytics (Th): are annual species that germinate, bloom, grow and die with the same year. During the bad season, they survive in the soil in the seed state.

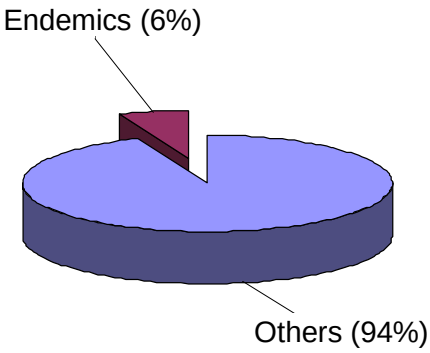


Thus, the analysis of biological types reveals a very important dominance of annuals (therophytics), a real characteristic of the Mediterranean area. The very small share of hydrophytics shows the aridity of the island and the scarcity of wetlands. We did not see them during our surveys. If ever they exist, they deserve to be preserved in priority.

The percentages are in relation with the total number of species on the island. Thus, if we think in recovery, it is then the nanophanerophytics but especially the chamephytics that dominate and shape the landscape.

- Chorologic types

We have not considered in a first time a complete chorologic analysis of the flora of this island. Only the strict endemic or in a broad sense - the sub-endemic – were taken into account.



It therefore appears that nearly 6% of the flora of Comino consists of endemic species with large patrimonial value.

- Remarkable species

Endemic species of Malta

Allium lojaconoi Brullo

Chiliadenus bocconei Brullo

Darniella melitensis (Bochantzev) Brullo

All the remarkable species of Comino seem to be known from a natural point of view, whether from historical and/or current data. However, we did not have informations on the number and on the dynamics of these populations. Thus, it would seem useful to map precisely and to estimate the population of remarkable species on Comino to put in place a monitoring over the medium and long term. A lightweight protocol consists in locating with the help of a GPS the "patches" of population in which individuals can be counted on a logarithmic scale (of individuals 1-9/10-99/100-999 etc…). The simple method, which can be easily carried out every year by students (for example) permits to evaluate the population dynamics in the medium

and short term taking into account the possible natural hazards (regularity of enumeration permits to manage the climatic hazards particularly in the case of annual species).

Local priorities of management and conservation

The global problem of invasive species

This chapter is intended only to warn once again on this problem well known and particularly crucial in the case of Mediterranean islands. We will not extend here on this problem because there exist many references as well as many specialized Internet sites (see for example : BOURGEOIS *et al.*, 2005 ; GRITTI *et al.*, 2005 ; LAMBDON & HULME, 2006 ; LE NEINDRE, 2002 ; MULLER, 2004 ; SCHEMBRI & LAFRANCO, 1996 ; SUEHS *et al.*, 2004a, 2004b, 2004c et 2005 ; TRAVESET *et al.*, 2007 ; VILÀ *et al.*, 2006 ; or either the website : http://www.issg.org).

So, we will only state our impression concerning this problem on the island of Comino. Thus, it appears that many introduced species which were planted in abundance can locally generate ecological imbalances. It is the case of, for example, Kaffir Fig *Carpobrotus edulis* or the tree-of-heaven *Ailanthus altissima*. However, the damage observed does not, to this day, represent the magnitude of those known in other areas of western Mediterraean (example of some islands of Provence or portions of the northern coast of Corsica). It is imperative to make significant information campaigns to rapidly reduce and then ban the planting of these species on the island.

Exotic garden with alien species on Comino

***Ailanthus altissima* on Comino**

***Carpobrotus sp. individuals* on Comino**

In the meantime, and to fight against their progression it is better:

- To prevent the spreading of the fruit;
- To perform notches on the barks of the trunks of *Ailanthus* (incisions from 3 to 5 cm), nearest possible to the ground (attention to the possible falls of the tree after interventions!);
- To pull the individuals of *Carpobrotus*
- To limit the spread of stations by seeding the lands made bare with native species and local sub-taxas;
- To bring the waste to incineration and not to composting

To be effective, these actions must be repeated regularly and over several years.

The case of relictual dune area

The sandy area visited on Comino presents a bad condition of conservation, while important difficulties of restoration are to be envisaged within and its very attractive character vis-à-vis the boaters.

The current situation presents an area completely covered with

a False Yellowhead (*Dittrichia viscosa*) and another portion closed, covered with Tamaris.

Views of sandy zone

A first restoration program can be considered. It goes through the following main axis:

- Slight clarification at the heart of tamaris zone (warning: the wooded area also allows the maintenance of the sand and provides significant shelter to sparrows for example);
- Manual pulling up of False Yellowhead;
- Prohibiting access to sandy area;
- Establishing slight signs explaining issues of conservation and the behavior to follow for a successful regeneration of the site.

In the medium term, and where such measures would not suffice, a heavier program should be studied inspired in particular from the already similar actions implemented in Mediterranean (see for example, GALLEGO-FERNÁNDEZ et al., 2003 ; GOMEZ-PINA et al., 2002 ; LEY et al., 2007 ou encore le site Internet : http://www.lifeduna.com).

A large part of sandy area is now occupied by *Dittrichia viscosa*, a characteristic species of Mediterranean brownfield, almost stifling the few individuals of *Pancratium maritimum*

"The Blue Lagoon"

On this very much frequented sector, the repeated trampling of the vegetation and multiplying of "wild" trails pose localized but important problems of conservation of the natural environments and any patrimonial species. Some urgent efforts to inform users and direct their movement must be made.

- A study of behavior of visitors including their movement;
- Choice of trails to be protected/closed (very much frequented and/or already severely degraded);
- Accomplishment of slight arrangements in dry stone to direct or redirect visitors;
- Establishment of slight and suitable signs on the site;
- Development of a substantial program of information on local resources and their conservation interest (not only dedicated for visitors but also for professionals).

Low frequentation day in Blue Lagoon


Views of the many spontaneous trails and erosion in the Phrygana sector

The bad state of this to *Anthyllis* individual illustrates the effect of repeated trampling

To reinforce its interest, it would be useful to initiate an ecological monitoring of the sector (photo monitoring of the vegetation) (MC DOUGALD *et al.*, 2003). A presence of rangers trained for the management and protection of natural areas ensuring ecological monitoring and information for visitors during the periods of heavy influx would be a plus.

Point of view on the state of conservation of the global flora of Comino.

We therefore retain from our surveys on the island of Comino:

- An important agricultural abandonment accompanied by a strong spontaneous dynamic of recolonization in which maltese spurge (*Euphorbia melitensis*) seems to play an important role;

- A vegetation overall in a good state of conservation due to the absence of large colonies of seabirds (BONNET et al., 1999 ; MEDAIL & VIDAL, 1998 ; VIDAL et al., 1998);
- A high floristic wealth including many patrimonial plant species, in particular endemic to Malta;
- Imbalances localized and to be defined due to introduced plants having an invasive feature;
- Strong tourism frequentation generating significant localized problems which are to eliminate in priority;

2. *OTHER LOCALIZED INTERVENTIONS ON MALTA*

In parallel with the surveys conducted on Comino, two days were devoted to a quick tour of various natural sites. The issues raised during these fieldtrips are discussed in this chapter.

Concerning various natural habitats

- The sub-steppic lawns of grasses and annuals

In the northern countries of the Mediterranean these semi-natural lawns face localized problems of closing of the environment due to former rural abandonment and in particular following the abandonment of grazing and to the stronger dynamics of certain ligneous species like Aleppo Pine or Pubescent Oak.

It is true that according to our rapid observations, this does not seen to be the case in Malta. Indeed, the affinities of this southern territory make the colonization by the wood much slower. We have not observed sites where the problems of conservation were related to the dynamic of natural vegetation. In contrast, the environments observed remain under the mercy of possible destruction by urbanization and associated infrastructure. These lawns typically host bulbous and patrimonial endemics (various orchids, alliums, etc…).

Views of various facies of sub-steppic lawns

Thus, in the case of this priority habitat of Community interest, protection measures (in particular related to securing land property) are needed and remain a priority, in the short term, against the measures of conservative management.

- The *Sarcopterium spinosum* formations

During our surveys, we observed a species with a range of repartition rather south-east Mediterranean which structures in the eastern basin some phryganas very representative of thorny pads formations. Very rare in the western basin, it only exist in the islands (Sardinia and Sicily) and the southern of Italy ((PIGNATTI, 1997) as well as on the island of Zembra in Tunisia (POTTIER-ALAPETITE, 1979).

We have observed it in small populations in sub-steppe lawns of grasses and annuals of Ther-Brachypodietalia, on a site where it has already been the subject of management measures (plantations in particular).

***Sarcopoterium spinosum* in Malta**

Locally, these *Sarcopterium* formations have posed a problem of typology, regarding the following points:

- The interpretation manual of habitats (EUR 27) mentions "phryganas of *Sarcopterium spinosum* – code 5420" as a habitat of Community interest relating them to the code of Palearctic classification 33.3. It signals them to the Aegean islands in Greece, the Ionian islands and the coast of Anatolia, considering them as east-Mediterranean formations.
- The same manual presents another habitat of Community interest named "Endemic phryganas of the Euphorbio-Verbascion – code 5430" in which it treats an Italian sub-type of *Sarcopterium spinosum* to the code 33.6 of Palearctic classification.

The Maltese formations were never mentioned in this manual and, also, the biogeographic location of this archipelago could cause a hesitation. Despite this geographic location, the flora of Malta seems much closer to the west-Mediterranean area according to our field observations, at fact confirmed by the work of JUNIKKA et al. (2006). Thus and following the point of view of DEVILLERS & DEVILLERS-TERSCHUREN (2001), these Maltese formations of *Sarcopterium* seem to be preferentially linked to this last habitat of Community interest.

The conservation and management of this species and the habitat which it structures were the subject of an important literature from which it would be useful to be inspired (see for example: BERGMEIER, 1997 ; GARGANO et al., 2007 ; HENKIN et al., 1998 ; OSEM et al., 2007 ; TSIOURLIS et al., 2007).

These formations have local priority in view of their biogeographical position and their rarity. They deserve the implementation of protective measures and the pursuit of management measures already undertaken, taking into account the context and the mosaic of the habitats in which this species fits on the Maltese territory.

- The mixed formations of *Periploca*, *Anthyllis* and *Erica*

During our surveys, we met on Malta some formations of bushes containing among others, these three species in combination:

- *Anthyllis hemanniae* L. : a rather eastern and central Mediterranean species absent from North Africa and whose western boundary area lies in Corsica and Sardinia (DE BOLÒS & VIGO, 1984 ; JEANMONOD & GAMISANS, 2007 ; PIGNATTI, 1982) with a vicarious endemic in Balearic islands (BENEDÍ, 2000). It is therefore rare in the western basin.
- *Erica multiflora* L.: a western-Mediterranean species present through the western basin (DE BOLÒS & VIGO, 1995).
- *Periploca augustifolia* Labill. : a southern Mediterranean and Saharan species very rare in the eastern basin (there are populations located in Crete and in Turkey). In the European Union, we can only find it in the southeast of Spain, the Sicilian archipelagos of Egadi, Pantelleria, Lampedusa and Linosa as well as in Malta (AMARAL FRANCO, 1986; DE BOLÒS & VIGO, 1995 ; HASLAM et al., 1977 ; PIGNATTI, 1982).

Given their respective repartition, this situation, at least appears very exceptional in the Mediterranean basin! Moreover, we find it locally associated with the Maltese spurge (*Euphorbia melitensis* Parl.), which is an endemic Maltese species, and

sometimes even the Sandarac Gum Tree1 (*Tetraclinis articulata* (Vahl) Masters), a rare southwestern Mediterranean species which does not almost extend beyond the Maghreb (exceptions in Malta and Murcia in Spain).

Anthyllis hermanniae

Erica multiflora

Periploca angustifolia

The Maltese territory is therefore real biogeographic cross roads, and for these reasons, we believe that such vegetal formations, rare in the European Union, observe a special attention.

Concerning terrestrial mollusks

During our visit to Malta, we did not conduct targeted surveys concerning this biological group. Nevertheless, our Maltese hosts showed us some sites hosting rare and threatened terrestrial species of gastropods. Here we will give our point of view on this compartment.

It seems that this group is locally well-known in systematic terms. The recent and excellent fauna dedicated to the Maltese terrestrial mollusks (GIUSTI et al., 1995) and the work of KOLOUCH (2003) are a proof. In contrast, mollusks remain little known because they are difficult to study from an ecological point of view and in particular according to the dynamics of the populations. This is also truer in the case of the Mediterranean terrestrial species with a slow pace of life largely dependent on the seasons and also on daily weather conditions. Although this group of invertebrates deserves a strong consideration in urgent conservation plans (BOUCHET et al., 1999; LYDEAR et al., 2004), there are little or no available studies on the conservation and management of the Mediterranean terrestrial species. In contrast, there is an

[1] During our surveys, we did not see real Tetraclinis articulata forest formations. This environment is a priority Community interest habitat (code EUR 27:9570)

important literature on freshwater bivalves and other species from European wetlands (see for example: ANDERSON, 2004; ARAUJO & RAMOS, 2000; KILLEEN, 2003; PRESTON et al., 2007; STEBBINGS & KILLEEN, 1998).

The local conservation priorities seem already known and mainly concern two rare endangered species of the genus *Lampedusa* (family Clausiliidae), both listed in annex 2 and 4 of the European Directive 92/43/CEE:

- *Lampedusa imitatrix* (Boettger, 1879): a species recorded on the IUCN list with the category VU ("vulnerable") according to the criteria of the version 2.3. (1994);
- *Lampedusa melitensis* (Caruana Gatto, 1892): a species recorded on the IUCN list with the category CR ("critically endangerd") according to the criteria of the version 2.3. (1994), and of "priority" in the frame of Natura 2000.

In addition, there are other endemic taxa but not locally threatened, such as a reassessed taxon *Tudorella sulcata melitensis* (MARTINEZ-ORTI et al., 2008 ; VELA et al., 2008).

Concerning this biological compartment, it is important to retain that we locally have:

- A high rate of endemism leading to a very high conservation responsibility;
- Recent fragmentation problems of the cores of populations and of loss of habitats.

We are talking here about current problems due, in particular, to urbanization and associated infrastructures. Indeed, we are not able to assess the "natural and historical" share of the fragmentation and isolation of populations on a geological scale. The latter is in fact largely responsible for the speciation I this group.

Moreover, these animals with weak dispersal (Genus *Lampedusa*, in particular) have without doubt be ability to survive on a few square meters and in low numbers. Finally, it is worth recalling that the current malacologic assemblies reflect the landscape and ecological changes mainly caused by disturbances such as fire, grazing and/or biological invasions (KISS & MAGNIN, 2003 et 2006; MARTIN & MAGNIN, 2006). It is therefore impossible actually, to know for how long these populations have been fragmented and if they are threatened because of that, regardless of current human activities consuming natural areas (mainly urbanization).

Thus, and in view of these biological specificities, simple and urgent measures of conservation seem appropriate:

- Setting the protection of sites and habitats in face of urbanization and associated infrastructures (to ensure the control of land);
- Prohibition of equipping possible cliffs to practice climbing;
- Supervision of possible sampling by the collectors.

Additional studies on local malacologic assemblies and their ecological preferences (structure of habitats and attempt of characterization of micro-habitats), supplemented by populational estimates should however be carried out. (see for example APPLEGARTH, undated digital document).

3. CONCLUSIONS AND PROSPECTS

- The views of the PIM program on the flora and vegetation in surveyed sites in Malta

The surveys and exchanges with local experts have enabled us to retain the following points on the habitats and vegetal species (vascular flora):

- A high-quality work already realized on the Natura 2000 sites (MEPA cards presenting a balance sheet of flora and a mapping of habitats);
- An apparent uniformity of landscapes, strongly humanized, but in reality, with a great vegetal diversity represented by a fin mosaic of habitats and numerous species with high patrimonial values;
- An island of Comino overall well-preserved thanks to an important dynamic plant (agricultural abandonment) but with localized problems of conservation deserving the rapid establishment of conservatory management measures;
- General and serious threats, almost always linked to human activities (invasive vegetal species, over frequentation, urbanization and infrastructures), difficult to control because of too recent political awareness linked to the protection of the flora and fauna (LAFRANCO, 1995).

These facts therefore lead to high stakes of conservation and the necessity to implement urgent conservatory management measures proceeding through strategies such as "multi-approaches" (OLIVIER & HERNANDEZ-BERMEJO, 1995), tackling reflection points on the protection, communication, and also the improvement of knowledge.

- Vade-mecum for the management and conservation of habitats and species

Our intervention in the territory of Malta has called once again on the need for the conservation and management of its natural environment to achieve both conservation actions and tools.

This requires short term measures by reducing "hot spots" (developed earlier in § 2.3.). In the medium and long term, many areas of study could be considered. At the follow, we present some of them:

- The establishment of national fight program against invasive species;
- Achieving a real plan of ecological and pedagogical movement on Comino;
- The systematic achievement of impact studies (protected species) and repercussion studies (network Natura 2000) in the context of economic projects involving natural sites;
- The protection of remarkable natural sites, not only on the Natura 2000 sites, inspired by the example of the Spanish initiative of "flora micro-reserves" (LAGUNA, 2001 et 2004 ; LAGUNA et al., 2004);
- Achieving a Maltese guide of habitats of Community interest (LAGUNA et al., 2003) and an atlas of the patrimonial flora (such as protected, rare and/or threatened) of Malta (LAGUNA et al., 1998) compiling distribution, conservation status and population dynamics.

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PRELIMINARY LIST OF THE VASCULAR FLORA OF COMINO ISLAND

List conducted in collaboration with Stephen MIFSUD.

Species	Source	Biologic type	Endemism
Adiantum capillus-veneris	Mifsud (pers. obs., 2008)	H	
Adonis annua	Haslam *et al.* (1977)	Th	
Aegilops ovata	Haslam *et al.* (1977)	Th	
Aetheorhiza bulbosa	Haslam *et al.* (1977)	G	
Agave americana	Haslam *et al.* (1977)	H	
Ailanthus altissima	Pavon & Mifsud (pers. obs., 2008)	Ph	
Ajuga iva	Pavon & Mifsud (pers. obs., 2008)	Ch	
Allium lojaconoi	Pavon & Mifsud (pers. obs., 2008)	G	Yes
Allium melitense	MEPA	G	Yes
Allium roseum	Haslam *et al.* (1977)	G	
Allium subhirsutum	Haslam *et al.* (1977)	G	
Allium trifoliatum	Haslam *et al.* (1977)	G	
Althaea hirsuta	Mifsud (pers. obs., 2008)	Th	
Ambrosia maritima	Haslam *et al.* (1977)	Th	
Ammoides pusilla	Haslam *et al.* (1977)	Th	
Anacamptis pyramidalis	Pavon & Mifsud (pers. obs., 2008)	G	
Anacamptis urvilleana	MEPA	G	Yes
Anagallis arvensis	Haslam *et al.* (1977)	Th	
Anagallis cf. foemina	Pavon & Mifsud (pers. obs., 2008)	Th	
Anchusa italica	Haslam *et al.* (1977)	H	
Anemone coronaria	Haslam *et al.* (1977)	G	
Anthemis arvensis	Haslam *et al.* (1977)	Th	
Anthemis tomentosa	Haslam *et al.* (1977)	Th	
Anthemis urvilleana	Mifsud (pers. obs., 2008)	Th	Yes
Anthyllis hermanniae	Pavon & Mifsud (pers. obs., 2008)	Ch	
Anthyllis tetraphylla	Pavon & Mifsud (pers. obs., 2008)	Th	
Anthyllis vulneraria subsp. maura	Haslam *et al.* (1977)	H	
Antirrhinum siculum	Haslam *et al.* (1977)	H	
Arisarum vulgare	Haslam *et al.* (1977)	G	
Arthrocnemum macrostachyum	Haslam *et al.* (1977)	NPh	
Arum italicum	Pavon & Mifsud (pers. obs., 2008)	G	
Arundo donax	Pavon & Mifsud (pers. obs., 2008)	G	
Asparagus aphyllus	Pavon & Mifsud (pers. obs., 2008)	Ch	
Asphodelus aestivus	Pavon & Mifsud (pers. obs., 2008)	G	
Asteriscus aquaticus	Pavon & Mifsud (pers. obs., 2008)	Th	
Astragalus boeticus	Haslam *et al.* (1977)	Th	
Astragalus hamosus	Haslam *et al.* (1977)	Th	
Atractylis gummifera	Pavon & Mifsud (pers. obs., 2008)	H	

Species	Source	Biologic type	Endemism
Avena barbata	Haslam *et al.* (1977)	Th	
Avena sterilis	Haslam *et al.* (1977)	Th	
Bellardia trixago	Haslam *et al.* (1977)	Th	
Bellis annua	Haslam *et al.* (1977)	Th	
Bellis sylvestris	Haslam *et al.* (1977)	H	
Beta vulgaris subsp. maritima	Haslam *et al.* (1977)	H	
Biscutella didyma	Haslam *et al.* (1977)	Th	
Biscutella lyrata	Haslam *et al.* (1977)	Th	
Bituminaria bituminosa	Haslam *et al.* (1977)	Th	
Blackstonia acuminata	Pavon & Mifsud (pers. obs., 2008)	Th	
Borago officinalis	Pavon & Mifsud (pers. obs., 2008)	Th	
Brachypodium retusum	Pavon & Mifsud (pers. obs., 2008)	H	
Briza maxima	Haslam *et al.* (1977)	Th	
Bromus diandrus	Haslam *et al.* (1977)	Th	
Bromus fasciculatus	Haslam *et al.* (1977)	Th	
Bromus hordeaceus s.l.	Haslam *et al.* (1977)	Th	
Bromus madritensis	Haslam *et al.* (1977)	Th	
Bromus rigidus	Haslam *et al.* (1977)	Th	
Bromus tectorum	Haslam *et al.* (1977)	Th	
Bupleurum lancifolium	Haslam *et al.* (1977)	Th	
Cakile maritima	Mifsud (pers. obs., 2008)	Th	
Calendula arvensis	Haslam *et al.* (1977)	Th	
Calendula suffruticosa	Haslam *et al.* (1977)	Ch	
Campanula erinus	Haslam *et al.* (1977)	Th	
Capparis orientalis	Pavon & Mifsud (pers. obs., 2008)	NPh	
Capsella rubella	Haslam *et al.* (1977)	Th	
Carduus arabicus subsp. marmoratus	Haslam *et al.* (1977)	Th	
Carduus pycnocephalus	Haslam *et al.* (1977)	Th	
Carlina involucrata	MEPA	H	
Carpobrotus sp.	Pavon & Mifsud (pers. obs., 2008)	Ch	
Catapodium hemipoa	Haslam *et al.* (1977)	Th	
Catapodium marinum	Mifsud (pers. obs., 2008)	H	
Catapodium rigidum	Haslam *et al.* (1977)	Th	
Centaurea melitensis	Haslam *et al.* (1977)	Th	
Centaurium erythraea	Pavon & Mifsud (pers. obs., 2008)	H	
Centaurium pulchellum	Mifsud (pers. obs., 2008)	Th	
Ceratonia siliqua	Pavon & Mifsud (pers. obs., 2008)	Ph	
Chenopodium murale	Haslam *et al.* (1977)	Th	
Chiliadenus bocconei	MEPA	Ch	Yes
Chrysanthemum coronarium	Haslam *et al.* (1977)	Th	
Cichorium spinosum	Mifsud (pers. obs., 2008)	Ch	
Colchicum cupani	Haslam *et al.* (1977)	G	

Species	Source	Biologic type	Endemism
Convolvulus althaeoides	Haslam *et al.* (1977)	G	
Convolvulus arvensis	Haslam *et al.* (1977)	G	
Convolvulus lineatus	Haslam *et al.* (1977)	H	
Convolvulus oleifolius	MEPA	Ch	
Convolvulus pentapetaloides	Haslam *et al.* (1977)	H	
Conyza bonariensis	Haslam *et al.* (1977)	Th	
Coronilla scorpioides	Haslam *et al.* (1977)	Th	
Crithmum maritimum	Haslam *et al.* (1977)	Ch	
Crucianella maritima	Haslam *et al.* (1977)	Ch	
Crucianella rupestris	MEPA	Ch	
Cynara cardunculus	Pavon & Mifsud (pers. obs., 2008)	H	
Cynodon dactylon	Pavon & Mifsud (pers. obs., 2008)	H	
Dactylis glomerata subsp. hispanica	Haslam *et al.* (1977)	H	
Darniella melitensis	MEPA	NPh	Yes
Daucus lopadusanus	MEPA	H	Yes
Daucus rupestris	MEPA	H	Yes
Desmazeria pignatti	Mifsud (pers. obs., 2008)	Th	Yes
Dittrichia graveolens	Haslam *et al.* (1977)	Th	
Dittrichia viscosa	Pavon & Mifsud (pers. obs., 2008)	Ch	
Drimia maritima	Pavon & Mifsud (pers. obs., 2008)	G	
Ecbalium elaterium	Pavon & Mifsud (pers. obs., 2008)	G	
Echium arenarium	Haslam *et al.* (1977)	H	
Echium parviflorum	Haslam *et al.* (1977)	Th	
Emex spinosa	Mifsud (pers. obs., 2008)	Th	
Erica multiflora	Pavon & Mifsud (pers. obs., 2008)	NPh	
Erodium chium/malacoides ?	Pavon & Mifsud (pers. obs., 2008)	Th	
Erodium cicutarium	Pavon & Mifsud (pers. obs., 2008)	Th	
Erodium malacoides	Haslam *et al.* (1977)	Th	
Erodium moschatum	Haslam *et al.* (1977)	Th	
Eryngium maritimum	Haslam *et al.* (1977)	G	
Euphorbia dendroides	Haslam *et al.* (1977)	NPh	
Euphorbia exigua var. pycnophylla	MEPA	Th	Yes
Euphorbia melitensis	Pavon & Mifsud (pers. obs., 2008)	NPh	Yes
Euphorbia paralias	Haslam *et al.* (1977)	Ch	
Euphorbia peplis	Haslam *et al.* (1977)	Th	
Euphorbia peplus	Haslam *et al.* (1977)	Th	
Euphorbia pinea	Pavon & Mifsud (pers. obs., 2008)	Ch	
Evax pygmaea	Haslam *et al.* (1977)	Th	
Ferula communis	Pavon & Mifsud (pers. obs., 2008)	H	
Ficus carica	Pavon & Mifsud (pers. obs., 2008)	Ph	
Filago cossyrensis	MEPA	Th	Yes
Filago pyramidata	Haslam *et al.* (1977)	Th	

Species	Source	Biologic type	Endemism
Filago vulgaris	Haslam *et al.* (1977)	Th	
Foeniculum vulgare s.l.	Haslam *et al.* (1977)	H	
Frankenia hirsuta	Haslam *et al.* (1977)	Ch	
Frankenia laevis	Haslam *et al.* (1977)	Ch	
Frankenia pulverulenta	Pavon & Mifsud (pers. obs., 2008)	Th	
Fumaria flabellata	Haslam *et al.* (1977)	Th	
Fumaria officinalis	Haslam *et al.* (1977)	Th	
Galactites elegans	Pavon & Mifsud (pers. obs., 2008)	Th	
Galium murale	Haslam *et al.* (1977)	Th	
Gastridium ventricosum	Haslam *et al.* (1977)	Th	
Geranium molle	Haslam *et al.* (1977)	Th	
Geranium robertianum	Haslam *et al.* (1977)	Th	
Gladiolus italicus	Haslam *et al.* (1977)	G	
Glaucium flavum	Haslam *et al.* (1977)	H	
Gynandriris sisirynchium	MEPA	G	
Hedera helix	Haslam *et al.* (1977)	Ph	
Hedypnois cretica	Haslam *et al.* (1977)	Th	
Hedysarum coronarium	Haslam *et al.* (1977)	H	
Hedysarum spinosissimum	MEPA	Th	
Heliotropium europaeum	Haslam *et al.* (1977)	Th	
Hippocrepis ciliata	Haslam *et al.* (1977)	Th	
Hippocrepis multisiliquosa	Haslam *et al.* (1977)	Th	
Hippocrepis unisiliquosa	Haslam *et al.* (1977)	Th	
Hirschfeldia incana	Haslam *et al.* (1977)	Th	
Hordeum murinum subsp. leporinum	Haslam *et al.* (1977)	Th	
Hymenolobus revelieri subsp. sommieri	MEPA	Th	Yes
Hyosciamus albus	Haslam *et al.* (1977)	Th	
Hyoseris radiata	Haslam *et al.* (1977)	H	
Hyoseris scabra	Haslam *et al.* (1977)	Th	
Hyparrhenia hirta	Pavon & Mifsud (pers. obs., 2008)	H	
Hypericum aegyptiacum	Pavon & Mifsud (pers. obs., 2008)	Ch	
Hypericum pubescens	Haslam *et al.* (1977)	H	
Hypericum triquetrifolium	Haslam *et al.* (1977)	Th	
Hypocheris achyrophorus	Haslam *et al.* (1977)	Th	
Inula crithmoides	Pavon & Mifsud (pers. obs., 2008)	Ch	
Juncus acutus	Haslam *et al.* (1977)	H	
Juncus bufonius	Haslam *et al.* (1977)	Th	
Juncus maritimus	Haslam *et al.* (1977)	H	
Lagurus ovatus	Pavon & Mifsud (pers. obs., 2008)	Th	
Lamium amplexicaule	Haslam *et al.* (1977)	Th	
Lathyrus articulatus	Haslam *et al.* (1977)	Th	
Lathyrus clymenum	Haslam *et al.* (1977)	Th	

Species	Source	Biologic type	Endemism
Lathyrus ochrus	Haslam *et al.* (1977)	Th	
Laurus nobilis	MEPA	Ph	
Lavatera cretica	Haslam *et al.* (1977)	Th	
Leontodon tuberosus	Haslam *et al.* (1977)	H	
Limonium melitense	Pavon & Mifsud (pers. obs., 2008)	H	Yes
Limonium virgatum	MEPA	H	
Limonium zeraphae	MEPA	H	Yes
Linaria pseudolaxiflora	Mifsud (pers. obs., 2008)	Th	Yes
Linum bienne	MEPA	H	
Linum strictum	Mifsud (pers. obs., 2008)	Th	
Linum trigynum	Pavon & Mifsud (pers. obs., 2008)	Th	
Lobularia maritima subsp. maritima	Haslam *et al.* (1977)	Ch	
Lolium rigidum	Haslam *et al.* (1977)	Th	
Lonicera implexa	Pavon & Mifsud (pers. obs., 2008)	Ph	
Lotus edulis	Haslam *et al.* (1977)	Th	
Lotus halophilus	MEPA	Th	
Lotus ornithopodioides	Pavon & Mifsud (pers. obs., 2008)	Th	
Malva cretica	Haslam *et al.* (1977)	Th	
Malva parviflora	Haslam *et al.* (1977)	Th	
Medicago littoralis	Haslam *et al.* (1977)	Th	
Medicago marina	Haslam *et al.* (1977)	Ch	
Medicago minima	Haslam *et al.* (1977)	Th	
Medicago orbicularis	Haslam *et al.* (1977)	Th	
Medicago polymorpha	Haslam *et al.* (1977)	Th	
Medicago scutellata	Haslam *et al.* (1977)	Th	
Medicago truncatula	Haslam *et al.* (1977)	Th	
Melilotus indicus	Haslam *et al.* (1977)	Th	
Melilotus messanensis	Haslam *et al.* (1977)	Th	
Melilotus segetalis	Haslam *et al.* (1977)	Th	
Melilotus sulcatus	Haslam *et al.* (1977)	Th	
Mentha pulegium	Haslam *et al.* (1977)	H	
Mercurialis annua	Pavon & Mifsud (pers. obs., 2008)	Th	
Mesembryanthemum cristallinum	MEPA	Th	
Mesembryanthemum nodiflorum	Haslam *et al.* (1977)	Th	
Muscari comosum	Haslam *et al.* (1977)	G	
Narcissus serotinus	Haslam *et al.* (1977)	G	
Narcissus tazetta	Haslam *et al.* (1977)	G	
Nicotiana glauca	Pavon & Mifsud (pers. obs., 2008)	Ph	
Nigella damascena	Haslam *et al.* (1977)	Th	
Olea europea	Pavon & Mifsud (pers. obs., 2008)	Ph	
Ononis mitissima	Haslam *et al.* (1977)	Th	
Ononis natrix s.l.	Pavon & Mifsud (pers. obs., 2008)	H	

Species	Source	Biologic type	Endemism
Ononis ornithopodioides	Haslam *et al.* (1977)	Th	
Ononis reclinata	Haslam *et al.* (1977)	Th	
Ononis viscosa	Haslam *et al.* (1977)	Th	
Onopordum argolicum	Haslam *et al.* (1977)	H	
Ophrys fusca	Haslam *et al.* (1977)	G	
Ophrys melitensis	MEPA	G	Yes
Ophrys speculum	Haslam *et al.* (1977)	G	
Orchis coriophora s.l.	Haslam *et al.* (1977)	G	
Ornithogalum arabicum	Haslam *et al.* (1977)	G	
Ornithogalum narbonense	Haslam *et al.* (1977)	G	
Orobanche cernua	MEPA	Th	
Orobanche crenata	Haslam *et al.* (1977)	Th	
Orobanche gr. ramosa	Haslam *et al.* (1977)	Th	
Orobanche picridis	Haslam *et al.* (1977)	Th	
Orobanche pubescens	Haslam *et al.* (1977)	Th	
Oxalis pes-caprae	Haslam *et al.* (1977)	Th	
Pallenis spinosa	Haslam *et al.* (1977)	H	
Pancratium maritimum	Pavon & Mifsud (pers. obs., 2008)	G	
Papaver rhoeas	Haslam *et al.* (1977)	Th	
Parapholis incurva	Haslam *et al.* (1977)	Th	
Periploca angustifolia	Pavon & Mifsud (pers. obs., 2008)	NPh	
Phagnalon graecum subsp. ginzbergeri	MEPA	Ch	
Phagnalon rupestre	Haslam *et al.* (1977)	Ch	
Phalaris minor	Haslam *et al.* (1977)	Th	
Phalaris paradoxa	Haslam *et al.* (1977)	Th	
Phragmites australis	Pavon & Mifsud (pers. obs., 2008)	G	
Picris echioides	Haslam *et al.* (1977)	Th	
Pinus halepensis	Pavon & Mifsud (pers. obs., 2008)	Ph	
Piptatherum miliaceum	Haslam *et al.* (1977)	H	
Pistacia lentiscus	Pavon & Mifsud (pers. obs., 2008)	Ph	
Plantago coronopus	Haslam *et al.* (1977)	Th	
Plantago crypsoides	MEPA	Th	
Plantago lagopus	Haslam *et al.* (1977)	Th	
Plantago serraria	Haslam *et al.* (1977)	H	
Poa annua	Haslam *et al.* (1977)	Th	
Polycarpon diphyllum	MEPA	Th	
Polycarpon tetraphyllum	Haslam *et al.* (1977)	Th	
Polygonum maritimum	Mifsud (pers. obs., 2008)	Ch	
Polypogon maritimus	Pavon & Mifsud (pers. obs., 2008)	Th	
Portulaca oleracea	Haslam *et al.* (1977)	Th	
Prasium majus	Mifsud (pers. obs., 2008)	Ch	
Prunus dulcis	Haslam *et al.* (1977)	Ph	

Species	Source	Biologic type	Endemism
Pseudorlaya pumila	Haslam *et al.* (1977)	Th	
Putoria calabrica	MEPA	NPh	
Ranunculus baudotii	Haslam *et al.* (1977)	Hyd	
Ranunculus bullatus	Haslam *et al.* (1977)	Hyd	
Ranunculus muricatus	Haslam *et al.* (1977)	Th	
Raphanus raphanistrum	Haslam *et al.* (1977)	Th	
Reichardia picroides	Haslam *et al.* (1977)	Ch	
Reseda alba	Haslam *et al.* (1977)	Th	
Ridolfia segetum	Haslam *et al.* (1977)	Th	
Romulea melitensis	MEPA	G	Yes
Rosmarinus officinalis	MEPA	NPh	
Rostraria cristata	Pavon & Mifsud (pers. obs., 2008)	Th	
Rumex bucephalophorus	Haslam *et al.* (1977)	Th	
Rumex conglomeratus	Haslam *et al.* (1977)	H	
Ruta chalepensis	Pavon & Mifsud (pers. obs., 2008)	NPh	
Sagina apetala	Haslam *et al.* (1977)	Th	
Sagina maritima	Haslam *et al.* (1977)	Th	
Sagina procumbens	Haslam *et al.* (1977)	H	
Salvia verbenaca	Haslam *et al.* (1977)	H	
Samolus valerandi	Haslam *et al.* (1977)	H	
Sanguisorba minor subsp. verrucosa	Pavon & Mifsud (pers. obs., 2008)	Th	
Satureja microphylla	Mifsud (pers. obs., 2008)	Ch	
Scandix pecten-veneris	Haslam *et al.* (1977)	Th	
Scilla autumnalis	Haslam *et al.* (1977)	G	
Scilla sicula	MEPA	G	Yes
Scolymus grandiflorus	Haslam *et al.* (1977)	H	
Scolymus hispanicus	Haslam *et al.* (1977)	H	
Scolymus maculatus	Haslam *et al.* (1977)	Th	
Scorpiurus muricatus	Pavon & Mifsud (pers. obs., 2008)	Th	
Scrophularia peregrina	Haslam *et al.* (1977)	Th	
Sedum caeruleum	Pavon & Mifsud (pers. obs., 2008)	Th	
Sedum litoreum	Mifsud (pers. obs., 2008)	Th	
Sedum rubens	Haslam *et al.* (1977)	Th	
Sedum sediforme	Pavon & Mifsud (pers. obs., 2008)	Ch	
Senecio bicolor	Pavon & Mifsud (pers. obs., 2008)	Ch	
Senecio leucanthemifolius	MEPA	Th	
Senecio pygmaeus	MEPA	Th	Yes
Senecio vulgaris	Haslam *et al.* (1977)	Th	
Serapias parviflora	Haslam *et al.* (1977)	G	
Setaria verticillata	Haslam *et al.* (1977)	Th	
Sherardia arvensis	Haslam *et al.* (1977)	Th	
Sideritis romana	Mifsud (pers. obs., 2008)	Th	

Species	Source	Biologic type	Endemism
Silene colorata	Haslam *et al.* (1977)	Th	
Silene nocturna	Haslam *et al.* (1977)	Th	
Silene sedoides	Pavon & Mifsud (pers. obs., 2008)	Th	
Silene vulgaris	Haslam *et al.* (1977)	H	
Sixalix atropururea	Haslam *et al.* (1977)	H	
Smyrnium olusatrum	Haslam *et al.* (1977)	H	
Solanum nigrum	Haslam *et al.* (1977)	Th	
Sonchus asper s.l.	Haslam *et al.* (1977)	Th	
Sonchus oleraceus	Haslam *et al.* (1977)	Th	
Sonchus tenerimus	Haslam *et al.* (1977)	Th	
Spergularia marina	Haslam *et al.* (1977)	Th	
Spergularia rubra	Haslam *et al.* (1977)	Ch	
Sporobolus pungens	Haslam *et al.* (1977)	G	
Stellaria media	Haslam *et al.* (1977)	Th	
Stellaria neglecta	Haslam *et al.* (1977)	Th	
Stellaria pallida	Haslam *et al.* (1977)	Th	
Stipa capensis	Haslam *et al.* (1977)	Ph	
Tamarix africana	MEPA	Ph	
Tamarix gallica	Haslam *et al.* (1977)	Ph	
Tetraclinis articulata	MEPA	Ph	
Tetragonolobus purpureus	Haslam *et al.* (1977)	Th	
Teucrium flavum	Pavon & Mifsud (pers. obs., 2008)	Ch	
Teucrium fruticans	Pavon & Mifsud (pers. obs., 2008)	NPh	
Theligonum cynocrambe	Haslam *et al.* (1977)	Th	
Thymus capitatus	Pavon & Mifsud (pers. obs., 2008)	Ch	
Tordylium apulum	Haslam *et al.* (1977)	Th	
Trifolium nigrescens	Haslam *et al.* (1977)	Th	
Trifolium repens	MEPA	H	
Trifolium resupinatum	Haslam *et al.* (1977)	Th	
Trifolium scabrum	Haslam *et al.* (1977)	Th	
Trifolium stellatum	Haslam *et al.* (1977)	Th	
Trifolium tomentosum	Haslam *et al.* (1977)	Th	
Trisetum aureum	Haslam *et al.* (1977)	Th	
Triticum durum	Haslam *et al.* (1977)	Th	
Urospermum picroides	Pavon & Mifsud (pers. obs., 2008)	Th	
Urtica membranacea	Haslam *et al.* (1977)	Th	
Urtica pilulifera	Haslam *et al.* (1977)	Th	
Urtica urens	Haslam *et al.* (1977)	Th	
Valantia hispida	MEPA	Th	
Valantia muralis	Haslam *et al.* (1977)	Th	
Verbascun sinuatum	Pavon & Mifsud (pers. obs., 2008)	H	
Verbena officinalis	Haslam *et al.* (1977)	H	

Species	Source	Biologic type	Endemism
Vicia sativa s.l.	Haslam *et al.* (1977)	Th	
Vitex agnus-castus	Mifsud (pers. obs., 2008)	NPh	
Vulpia ciliata	Pavon & Mifsud (pers. obs., 2008)	Th	
Vulpia fasciculata	Haslam *et al.* (1977)	Th	
Zannichellia melitensis	Mifsud (pers. obs., 2008)	Hyd	Yes