

Updated checklist of flora of the satellite islets surrounding the Maltese Archipelago

Jeffrey Sciberras¹, Arnold Sciberras^{2*} & Luca Pisani³

¹24 'Camilleri Court' flat 5, il-Marlozz Str, Mellieħa, Għadira, Malta; email: wildalienplanet@gmail.com

²133 'Arnest', Arcade Str, Paola, Malta; email: bioislets@gmail.com

³ 9, Milller Str, Sliema, Malta; email: luca.pisani@hotmail.com

*Corresponding author

ABSTRACT The present study provides an updated list of flora species encountered in multiple visits carried out during 2010-2012 to the satellite islets surrounding the Maltese Archipelago.

KEY WORDS Flora; Satellite Islets; Maltese Archipelago.

Received 11.05.2012; accepted 18.11.2012; printed 30.12.2012

Proceedings of the 1st International Congress "Insularity and Biodiversity", May 11th-13th, 2012 - Palermo (Italy)

INTRODUCTION

Although the Flora of the Maltese islands has been studied extensively from a taxonomic perspective, little is known regarding the distribution and demographic status of most species. Moreover, restricted or much less accessible areas have often been poorly studied with the consequence that few published records have been made available. Very few works mention the minor satellite islets. John Borg (1927) records 23 species of flowering plants occurring on Selmunett Island. A study published on Selmunett Island in 1983 by The Society for the Study and Conservation of Nature (SSCN) (Lanfranco, 1983) records 90 species and Sciberras & Sciberras (2009) record 2 species for the site and additional 7 species in a subsequent paper (Sciberras & Sciberras, 2010). Camilleri (1990) includes in a children's article a preliminary list of the flora of Taċ-Ċawl Rock. Cassar and Lanfranco provided a preliminary list (unpublished) of plant species collected by themselves on Ħalfa islet and Taċ-Ċawl Rock, along with Stevens and Schembri.

A number of floral species are mentioned for several sites in the book on the natural environment of the Maltese islands (Lanfranco, 2002); in 2007 one

of the authors (AS) along with Sdravko Lalov recorded floral species for Fungus Rock (Sciberras, 2007; Sciberras & Lalov, 2007; Sciberras, 2008). Recently, Sciberras & Sciberras (2010) gave a detailed study recording the majority of species as new records for the respective locations, including the distributions of various species found and a general description of topography of each islet presented for the first time. Other data for Taċ-Ċawl and Tal Ħalfa are published by Mifsud (2011). Sciberras & Sciberras (Unpublished Malta Environment Planning Authority MEPA report 2012) gave a detailed report of present biodiversity on Fungus Rock.

The present work aims at bringing up to date the latest records known of floral species observed for the first time from these locations. These records are based on unpublished or overlooked works of the authors and personal communications. Most of them were not present in Sciberras & Sciberras (2010) work because proof or further identification was required. To this day some are still undergoing thorough investigation in order to study in detail their taxonomy and distribution. Other species were recently discovered. Some minor amendments to the previous work were also made. This includes

corrections in taxonomy as well as species thought not to be present but rediscovered after the 2010 work. The flora of Filfola and Manoel Island were not included in this work because they are still under study by the authors. Of the other islets, Filflett, Fessej Rock, Għallis Rocks, Għemieri Rocks, Ħnejja Rocks, Bear Rocks, Crocodile Rock, White Rock of Marsalforn, Devil's End Rock and Xrobb l-Għagin Rock are constantly inundated and sometimes submerged by wave action during rough weather and therefore they do not support terrestrial vegetation. Other boulders and stacks do exist but, as far as in our knowledge, they are uninhabited.

MATERIALS AND METHODS

Multiple seasonal visits were carried out except to those islets/rocks which require a legal permit to

visit as, for example, Fungus Rock, which in 2012 was visited once. Those were visited only in the available restricted period. The location was generally divided in virtual transects to facilitate the counting of species and individuals. Several species were photographed for later identification performed by the authors and generally checked afterwards with other local and foreign botanists.

Study area and flora

The Maltese archipelago consists of three main islands, Malta, Gozo (Għawdex) and Comino (Kemmuna) together with a number of minor satellite islands, islets and rocks. These smaller islets are listed below in Table 1 and appear according to their abbreviation letter in the Maltese archipelago maps (Figs. 1-3). Following is the checklist of flora of the Satellite Islets surrounding the Maltese Archipelago (Table 2).

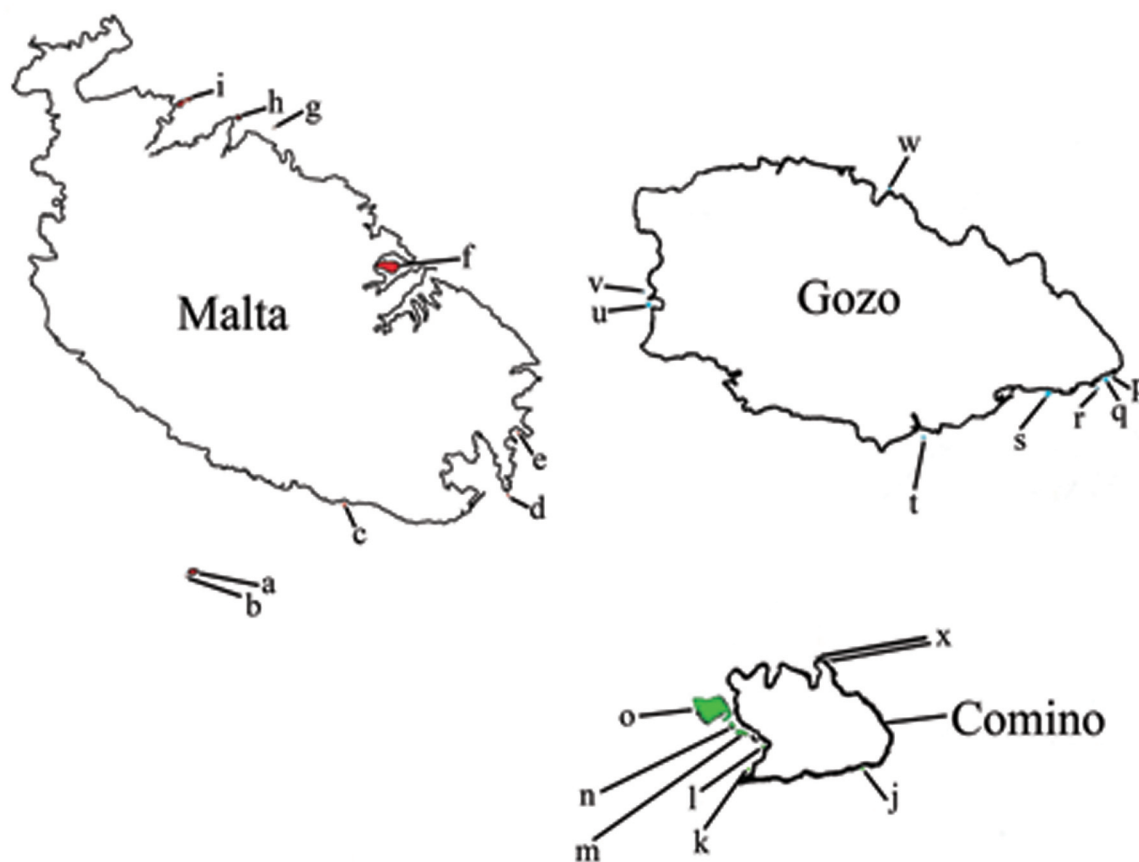


Figure 1. Map showing Malta and its satellite Islets/Rocks. Figure 2. Map showing Gozo and its satellite Islets/Rocks. Figure 3. Map shows Comino and its satellite Islets/Rocks (Maps by the authors).

	ENGLISH NAME	MALTESE NAME	CODE
<i>Malta's nearby islets</i>			
Malta (in Maltese)	Filfolta	Filfla	A
	Filflette	Il-Ġebbla ta' Xutu	B
	Cheirolophus Rock	Il-Hagra tas-Sajjetta	C
	Devil's End Rock	Il-Ġebbla tax-Xifer l-Infern	D
	Xrobb l-Għaġin Rock	It-Taqtiegha	E
	Manoel Island, but peninsula since 1750	Il-Ġżira ta' Manoel	F
	Għallis Rocks	Il-Ġebbla ta' Għallis	G
	Qawra Point or Ta' Fra Ben islet	Il-Ponta/ Ras il- Qawra	H
(marked in map as "Red" Islets/Rocks)	Selmunett Island/ St. Paul's Island	Il-Ġżira Ta' San Pawl	I
<i>Comino's nearby islets</i>			
Kemmuna (in Maltese)	Old Battery's Rock	Il-Ġebbla ta' taht il -Batterija	J
	Lantern Point Rock	Il-Ġebbla Tal-Ponta l-Irqiqa	K
	Comino Cliff Face Rock/ Pigeon Rock	Il-Ġebbla ta' taht il-Mazz	L
	Small Blue Lagoon Rock	Il-Hagra Ta' Bejn il-Kmiemem iż-Żgħira	M
	Large Blue Lagoon Rock	Il-Hagra Ta' Bejn il-Kmiemem il-Kbira	N
	Għemieri Rocks	L-Iskolli Ta' l-Għemieri	X
(marked in map as "Green" Islets/Rocks)	Cominotto	Kemmunett	O
<i>Gozo's nearby islets</i>			
Ghawdex (in Maltese)	Barbaġanni Rock	Il-Ġebbla tal-Barbaġanni	P
	Halfa Rock	Il-Ġebbla tal-Halfa	Q
	Hnejja rocks	Il-Ġebel tal-Hnejja	R
	Tač-Ċawl Rock	Il-Ġebbla tač-Ċawl	S
	Fessej Rock	Il-Ġebbla tal-Fessej	T
	Fungus Rock/ General's islet	Il-Ġebbla tal-Ġeneral	U
	Crocodile Rock and Bear rocks (3 rocks in total)	Il-Ġebbla tal-Baqra u l-Ġebel tal-Or-sijiet	V
(marked in map as "Blue" Islets/Rocks)	White Rock~	Il-Ġebbla tal-Għar Qawqla	W

Table 1. List of satellite islets of the Maltese Islands surveyed in the present study.

SPECIES	SATELLITE ISLETS OF THE MALTESE ISLANDS												
	C	H	I	J	K	L	N	M	O	P	Q	S	U
<i>Cynara cardunculus</i>			*						*				
<i>Cynodon dactylon</i>											**		
<i>Cynomorium coccineum</i>							*						*
<i>Darniella melitensis</i>	*		**			*	*	*	*			*	*
<i>Dactylis hispanica</i>			**								*		
<i>Daucus gingidium</i>	*		**			**	**	**	**		*	*	*
<i>Daucus rupestris</i>			*										
<i>Desmazeria marina</i>			*?										
<i>Desmazeria pignattii</i>						*					**	*	*
<i>Desmazeria rigida</i>			*?										
<i>Dittrichia graveolens</i>			*?										
<i>Dittrichia viscosa</i>			*						*				
<i>Ecballium elaterium</i>			*?										
<i>Echium arenarium</i>		**	*						**				
<i>Echium parviflorum</i>			*?									*	
<i>Erodium malacoides</i>									**			**	
<i>Euphorbia exigua</i> var. <i>pycnophylla</i>			*				**		**				
<i>Euphorbia dendroides</i>									*?				
<i>Euphorbia melitensis</i>									*			*?	
<i>Euphorbia pepus</i>			*?								**		
<i>Euphorbia pinea</i>									*			*	
<i>Evax pygmaea</i>			*						**				
<i>Fumaria officinalis</i>			**						**				
<i>Fedia graciliflora</i>									**				
<i>Ferula communis</i>									*		*	*	
<i>Ficus carica</i>			*						*				
<i>Foeniculum vulgare</i>												*?	
<i>Frankenia hirsuta</i>		*	*					**				*	

SPECIES	SATELLITE ISLETS OF THE MALTESE ISLANDS												
	C	H	I	J	K	L	N	M	O	P	Q	S	U
<i>Frankenia pulverulenta</i>			*										
<i>Galactites tomentosa</i>			*						*		*	*	
<i>Geranium rotundifolium</i>			**										
<i>Gynandris sisyrrinchium</i>		*									*	*	
<i>Halimione portulacoides</i>			**										
<i>Hedypnois rhagadioloides</i>			*?										
<i>Hedysarum spinosum</i>									**				
<i>Hedysarum coronarium</i>			*										
<i>Helichrysum melitense</i>													*
<i>Hippocrepis biflora</i>									**		**		
<i>Hippocrepis multisiliquosa</i>											*		
<i>Hypericum aegypticum</i>							*		*			*	*
<i>Hypericum triquetrifolium</i>			*										
<i>Hyoscyamus albus</i>			*										
<i>Hyoseris frutescens</i>			*										
<i>Hyoseris scabra</i>									**				
<i>Iris pseudopumila</i>			**						**				
<i>Iris sicula</i>			**										
<i>Limbarda crithmoides</i>	*	*	*	*	*	*	*	*	*	*	*	*	*
<i>Lagurus ovatus</i>			**									*	
<i>Lavatera arborea</i> (<i>Malva dendromorpha</i>)								*					*
<i>Leontodon tuberosus</i>									**				
<i>Limonium melitense</i>		*	**		*	*	*		*		*	*	*
<i>Limonium virgatum</i>	*	*	*								*		*
<i>Limonium zeraphae</i>			*?										
<i>Linaria pseudolaxiflora</i>									*?				*
<i>Linum strictum</i>			**						*		*		
<i>Linum trigynum</i>									*				

SPECIES	SATELLITE ISLETS OF THE MALTESE ISLANDS												
	C	H	I	J	K	L	N	M	O	P	Q	S	U
<i>Ornithogalum arabicum</i>			*										
<i>Ornithogalum narbonense</i>									*				
<i>Orobanche</i> sp.									**		**	**	*
<i>Orobanche cernua</i>								**					
<i>Orobanche</i> cf. <i>densiflora</i>								**					
<i>Orobanche ramosa</i> subsp. <i>mutelii</i>			*?										
<i>Oxalis pes-caprae</i>			*										
<i>Pancratium maritimum</i>			*										
<i>Pallenis spinosa</i>									*		*		
<i>Parapholis filiformis</i>		*	**					**			*		
<i>Parapholis incurva</i>			*?										
<i>Parietaria cretica</i>			*?										
<i>Parietaria judaica</i>			*										
<i>Periploca angustifolia</i>			**						*			*	
<i>Phagnalon graecum</i> subsp. <i>ginzbergeri</i>			**						*		*	*	
<i>Pistacia lentiscus</i>						*			*		*	*	
<i>Plantago afra</i>									**				
<i>Plantago coronopus</i>		*	*										
<i>Plantago lagopus</i>			*								**	*	
<i>Prasium majus</i>			**						**		*	*	
<i>Prospero autumnale</i>						**	**	**	**		*		
<i>Polypogon maritimus</i> subsp. <i>subspathaceus</i>			*?										
<i>Reseda lutea</i>			*?										
<i>Rostraria cristata</i>												*	
<i>Romulea columnae</i>			*										
<i>Romulea ramiflora</i>		**					**		**		**	**	
<i>Reichardia picroides</i>			*								*		
<i>Rhodalsine geniculata</i>									*				

SPECIES	SATELLITE ISLETS OF THE MALTESE ISLANDS												
	C	H	I	J	K	L	N	M	O	P	Q	S	U
<i>Thymbra capitata</i>			*?					*	*		*	*?	
<i>Tordylium apulum</i>			*?						**				
<i>Trachynia distachya</i>											*	*	
<i>Trifolium scabrum</i>			*						**				
<i>Trifolium stellatum</i>			*?						*				
<i>Umbilicus horizontalis</i>			*										
<i>Urginea pancracion</i>			*			**			*		*	*	**
<i>Urospermum picroides</i>												*	
<i>Valantia hispida</i>									*			*	
<i>Valantia muralis</i>		**	*						**		*	*	
Total number of species for each location observed	6	18	130	1	2	17	24	22	89	1	63	61	30

Table 2. Checklist of Flora of the Satellite Islets surrounding the Maltese Archipelago. Each letter represents the location, as in Table 1. ** = newly recorded species; * = species recorded in past works and observed by the authors; *? = species recorded in past works but not observed by the authors.

RESULTS AND CONCLUSIONS

In this work a total of 205 species of plants were recorded from 13 islets/rocks including Selmunett having the highest variety with a total number of 130 species whilst Old Battery's Rock and Barbaġanni Rock both containing the least variety with 1 species. This is clearly due to the topography and size of the sites. A total of 35 species are new for Salmunett Islet's species list when compared to Sciberras & Sciberras (2010), while 87 new species were recorded considering the all islets/rocks.

It is rather unusual that conspicuous species such as *Scilla sicula* Tineo ex Guss. and *Iris sicula* Tod. were not recorded before in previous writings. Although *Iris pseudopumila* Tineo is rather common in the surrounding area such as in Selmun and must be native to the island of Selmunett, *Iris sicula* may have been recently introduced to the island as it is popularly cultivated in many areas in Malta, besides being planted in several private gardens and

parks such as Bahar ic -Caghaq; populations such as those of Mellicha and those of Comino are known to have been introduced in the late 1980's and early 1990's. Related species were also planted in Mgarr and Majjistral Park. In addition, other conspicuous species like *Pancratium maritimum* L., *Matthiola incana* subsp. *melitensis* Brullo et al. and *Parietaria judaica* L. went unnoticed until Sciberras & Sciberras (2009; 2010) either due to their rarity on site, season ideal for identification or where they are located. Several other species especially large alien species were also not recorded before these writings. Also a very interesting observation noted through this study is that the biodiversity of these satellite islands tends to be somewhat different from the closest area on the mainland.

The main islands are often influenced and altered by human activity, whilst these islets, being lesser known and often more difficult to access, have remained virtually untouched. The biodiversity of the islets depends on the specialization, adaptation,

(such as small, succulent or hairy leaves and growth structure) and natural selection of only the hardiest species to survive in these extreme, unrelenting environments with limited land area and thin soils, constant sea spray and the continuous exposure to strong winds. The location of an islet or rock, together with its topography and size plays an important role in species diversity, number and distribution. Species' lists generally vary with different authors, possibly due to a species being mistakenly identified or, in the time between different publications, populations may have gone extinct or overlooked.

Whilst on certain sites very few or no new observations can be made, others, especially those more inaccessible or restricted by legislation, hold a high potential for future discoveries. Schembri et al. (1987) already listed some of the locations mentioned in this work as localities with conservation value even without giving any species for most sites. We hope that the present work and future ones to follow will aid in the protection and further raise the value of their conservation status for these sensitive ecological gems.

ACKNOWLEDGEMENTS

The authors are indebted to Romario Sciberras, Esther Sciberras, Matthew Borg Cardona, Simon Sultana Harkins for their assistance in field visits and to Mario Gauci for his generous hospitality during Gozo field visits and assistance in literature search. Edwin Lanfranco is greatly acknowledged for confirming the identity of several species in this work. Thanks also go to Mario Sciberras for providing numerous transport trips to various locations and staff members of Pisciculture Marine De Malta Ltd for providing transportation several times to

Selmunett. MEPA is also acknowledged for issuing permits to visit the protected sites.

REFERENCES

- Borg J., 1927. Descriptive Flora of the Maltese islands. Government Printing Office, Malta.
- Camilleri A., 1990. IL- Gebla Tac-Cawl. IL-Ballotra vol 1, 5-6.
- Lanfranco E., 1983. The Flora of St. Paul's Islands. Potamon, 2: 23-31.
- Lanfranco S., 2002. L-Ambjent Naturali tal-Gzejjer Mal-tin. Kullan Kulturali (45). Publikazzjoniet Indipendenza, Malta, 196 pp.
- Mifsud S., 2011. A floristic survey on the Gozitan islets of Tac-Cawl and Tal-Halfa in the Maltese islands. MaltaWildPlants.com Online Publications (Ref: MWPOP-001), Article Update Version 3.0(released on 5-Dec-11). URL: <http://www.MaltaWildPlants.com/publ/index.php#W01>
- Schembri P.J., Schembri S., Lanfranco E., Farrugia P. & Sultana J., 1987. Localities with Conservation Value in the Maltese Islands: Environment Division, Ministry of Education, Malta.
- Sciberras A., 2007. Lizards at Id-Dwejra. Dwejra Heritage Park Gozo, Dwejra Management Board, p. 28-33.
- Sciberras A. & Lalov S.V., 2007. Notes on the impact of the black rat (*Rattus rattus* L.) on the flora and fauna of Fungus Rock (Maltese Islands). The Central Mediterranean Naturalist, 4: 204-207.
- Sciberras J., 2008. IL - Fejgel. IL-Ballotra issue 12. Nature Trust Malta publications, 192 pp.
- Sciberras J. & Sciberras A., 2009. Notes on the distribution of *Helichrysum melitense*, *Hyoseris frutescens* and *Matthiola incana melitensis* in the Maltese islands. The Central Mediterranean Naturalist, 5: 28-34.
- Sciberras J. & Sciberras A., 2010. Topography and Flora of the Satellite islets surrounding the Maltese Archipelago. The Central Mediterranean Naturalist, 5: 31-42.