

# A FLORISTIC SURVEY ON THE GOZITAN ISLETS OF TAĊ-ĊAWL AND TAL-ĦALFA IN THE MALTESE ARCHIPELAGO

Stephen Mifsud

Citation: 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. URL: <http://www.MaltaWildPlants.com/publ/index.php#W01>

## Abstract

A floristic survey was carried out on the islets of Tal-Ħalfa and Taċ-Ċawl, both situated just off the Southern coast of Gozo. The aim was to confirm or otherwise results of a recent study (Sciberras & Sciberras, 2010) which concluded that a number of species had become extinct or doubtful when compared to an earlier work (Cassar and Lanfranco, 2000). The present work confirms the occurrence of most of the species found by Cassar and Lanfranco and in addition reports on the discovery of a significant number of new records of legally protected or rare vascular plants. Taxonomical notes concerning a few ambiguous plants which were discovered are discussed.

## Keywords

Flora, Taċ-Ċawl, Tal-Ħalfa, Islets, Maltese Islands

## 1: Introduction

After reading an article (Sciberras & Sciberras, 2010) regarding surveys carried out on the islets around the Maltese islands, the author decided to visit and survey the flora of the islets of Taċ-Ċawl and Tal-Ħalfa. The reason being that of a substantial number of discrepancies between this article and an earlier survey (Cassar and Lanfranco, 2000). It was surprising to read that after visiting each site at least “four times each season from the period 1998-2010” the authors had only found 24 and 21 species for Taċ-Ċawl and Tal-Ħalfa Rocks respectively. Apart from the small number of species reported, most were frequent or common to the Maltese islands, and only a few were protected or listed in the Red Data Book (RDB) (Lanfranco, 1989). Moreover, their survey contrasts with an earlier survey carried on the 23<sup>rd</sup> May by Cassar & Lanfranco in 2000, which reported more species from each islet some of which are legally protected, endemic, listed in the RDB, or/and considered rare. Consequently on the basis of their findings, Cassar and Lanfranco proposed that both islets should be scheduled as a Special Area of Conservation of national importance by the Malta Environment Planning Authority.

Since Sciberras & Sciberras (2010) failed to discover a number of protected species in their surveys, previously found by Cassar & Lanfranco (2001) they concluded that these could be considered “as doubtful or possibly extinct from site”. Such peer-reviewed comments may give rise to doubts as to whether the islets should even be awarded any legal environment protection (Special Area of Conservation of National Importance) as originally suggested by Cassar & Lafranco (2010). Moreover the substantial differences between both surveys and the alleged significant deterioration in plant biodiversity over a short time required further investigation to clarify the findings of both surveys. Site visits were conducted by the author to clarify these preoccupying and divergent findings. .

## **2: The Islets**

These islets, which are often referred to as rocks due to their small size, are situated a few tens of metres from the South-South-eastern coast of Gozo; the second largest island of the Maltese archipelago. These islets occupy an area less than 5000 m<sup>2</sup> (0.005km<sup>2</sup>). Taċ-Ċawl rock is about 90m x 35m in size, and just 25m away from the mainland cliffs, separated by a mass of limestone rock debris, washed clay and boulders occurring just above sea level. Despite this land-bridge, the rock is still isolated from mainland, because the opposite mainland cliffs are sheer cut and the islet is unreachable on foot. Tal-Halfa Rock is rock is about 95m x 50m in size and isolated from mainland by a distance of 75m of sea. The plateau of both islets are inclined from a North to South orientation (and to a less extent East to West), resulting in a cliff-like edge to the North and low coastal rock to the South. This low rock is often reached by sea-spray and waves and results in a scarcity of both quantity and diversity of flora. Most plant species were located in the central and highest parts of the islets.

## **3: Methods & Materials**

The author, assisted by Ms. Malin Mifsud, visited Taċ-Ċawl Rock twice in the same year, on the 9<sup>th</sup> May , and the 12<sup>th</sup> November of 2011. Tal-Halfa rock was also visited twice; on the 16<sup>th</sup> May, and on the 5<sup>th</sup> December 2011. The dates were chosen to record both spring and autumn flora. Both islets were reached by a short swim from the nearby coast. Photographic equipment and writing instruments were carried in a sealed plastic box, which was floated and towed along. On arriving at the islet of Taċ-Ċawl, the plateau was reached by scaling a cliff-face, which consisted of friable and crumbling limestone rock. The reader wishing to explore the islet is advised to take a less perilous route and approach the islet from the South-East where the rocky shore is low lying. Similarly, easy access to Tal-Halfa islet is from its South-Eastern approach. A list of vascular plant species and their estimated frequency was recorded during a

three to four hour survey on each islet. Where possible, at least one specimen of each species was photographed, to serve as evidence of its occurrence.

When consulting previous records of flora for these islets, only those reported in the last 15 years have been taken into consideration, including the work by Cassar & Lanfranco (2000) Tabone (2007, 2008), and Sciberras & Sciberras (2010).

In this work, the frequency of each species per islet is provided. This is graded into five scales, as indicated below. This measurement should be interpreted as a guideline estimate, since frequency can change according environmental conditions in successive years or periods.

+++++	Very common; dominating with numerous specimens occupying large areas.
++++	Frequent; sub-dominating, easily met in several parts of the area, in large (often merging) patches.
+++	Scarce; many specimens scattered here and there or in some isolated but relatively large patches.
++	Rare; few specimens (11-100) scattered or in a few small isolated patches or covering an area of 2-10m <sup>2</sup>
+	Very rare; occasional individuals (1 - 10 specimens) or single to a few small patches less than 2m <sup>2</sup>

Protection status of each species was obtained through the provisions of the Flora, Fauna and Natural Habitats Protection Regulations, 2006 - Legal Notice 311 of 2006 (LN311/2006) and Trees and Woodlands (Protection) Regulations, 2011 – Legal Notice 200 of 2011 (LN200/2011), both published through the Environment Protection Act and Development Planning Act. Also given are the species listed in the Flora section of the (RDB) compiled by Lanfranco (1989).

#### **4 Taxonomical treatments applied in this study:**

- 1) *Allium melitense* (Sommier & Caruana Gatto) Ciferri & Giacomini was treated as the variable *Allium commutatum* Gussone and no distinction was made between the two.
- 2) Few specimens of *Capparis* sp. were examined to distinguish between *C. spinosa* L. subsp. *spinosa* and *C. spinosa* L. subsp. *rupestris* (Sm.) Nyman. The examined material corresponded to the latter species and assumed so for the entire islets' population.

- 3) The involucre bracts of few specimens of *Phagnalon* sp. that were examined corresponded to *Ph. graecum* Boissier et Heldreich subsp. *ginzbergeri* Pignatti. As above, it was assumed that all specimens of *Phagnalon* are this species, but it was not excluded that the similar and more common *Ph. rupestre* (L.) DC was also present.
- 4) The author was unable to distinguish *Limonium melitense* Brullo from *L. zerafae* Brullo, in the non-flowering period and only the former was reported. It was not excluded that the latter species might also exist, though none of the previous authors had reported it. *Limonium virgatum* (Willdenow) Fourreau (not protected) was not clearly distinguished, and was given as *Limonium* cf *virgatum*.
- 5) The distinction between specimens of *Daucus carota* L. and *D. gingidium* L. was often not clear-cut and a spectrum of intermediates was observed. This was also mentioned by Cassar & Lanfranco (2000) who also included *D. rupestris* Gussone in the complex. Owing to the fact that the coastal habitat was that of *D. gingidium*, these specimens were considered as *D. gingidium*, except few typical specimens of *D. carota*.

## 5: Results

### 5.1: Species list of vascular plants at Taċ-Ċawl Rock.

Table 1 shows a list of species recorded from Taċ-Ċawl Rock. The species highlighted in yellow were species found by Cassar & Lanfranco (2000) but not by Sciberras & Sciberras (2010). while those in purple were species not reported by any of these authors and hence new records for the islet, made by the author of this study, except those marked <sup>T</sup> which were reported by Tabone (2007,2008). Species found by Cassar & Lanfranco (2000), and/or Sciberras & Sciberras (2010) are not highlighted. (R) denotes a species which is considered rare for the Maltese islands. Three species were not observed during the Spring visit but subsequently observed during the Autumn visit. These included *Oxalis pes-caprae* L., *Sonchus oleraceus* L. and *Arisarum vulgare* Targ.-Tozz.

**Table 1:** List of species reported from Taċ-Ċawl Rocks, 9<sup>th</sup> May and 12<sup>th</sup> Nov. 2011. Species found in autumn but not in spring are marked with an asterix (\*) in the spp. no. column.

Spp. No.	Family	Species	Freq.	Status of Species for Malta	Protection		
					RDB (1989)	LN311 (2006)	LN12 (2001)
1	ALLIACEAE	<i>Allium commutatum</i>	+++	Native			
2	ALLIACEAE	<i>Allium lojaconoi</i>	+	Endemic	*	Sch. III	
3	ANACARDIACEAE	<i>Pistacia lentiscus</i>	+	Native			*
4*	ARACEAE	<i>Arisarum vulgare</i>	+++	Native			
5	APIACEAE	<i>Crithmum maritimum</i>	+++	Native			
6	APIACEAE	<i>Daucus gingidium</i>	+++++	Native			
7	APIACEAE	<i>Ferula communis</i>	+	Native			
8	ASCLEPIADACEAE	<i>Periploca angustifolia</i>	+	Sub-endemic	*		*
9	ASPARAGACEAE	<i>Asparagus aphyllus</i>	+++	Native			
10	ASPHODELACEAE	<i>Asphodelus aestivus</i>	+++	Native			
11	ASTERACEAE	<i>Anthemis urvilleana</i>	+	Endemic	*		
12	ASTERACEAE	<i>Carlina involucrata</i>	+++	Native	*		
13	ASTERACEAE	<i>Galactites tomentosa</i>	++	Native			
14	ASTERACEAE	<i>Limbarda crithmoides</i>	++++	Native			
15	ASTERACEAE	<i>Phagnalon graecum subsp. ginzbergeri</i>	++++	Native	*		
16	ASTERACEAE	<i>Senecio bicolor</i>	+++	Native			
17	ASTERACEAE	<i>Sonchus oleraceus</i>	+	Native			
18	ASTERACEAE	<i>Sonchus tenerrimus</i>	+	Native			
19	ASTERACEAE	<i>Urospermum picroides</i>	+	Native			
20	BORAGINACEAE	<i>Echium parviflorum</i>	+++	Native			
21	BRASSICACEAE	<i>Lobularia maritima</i>	++	Native			
22	CAPPARIDACEAE	<i>Capparis spinosus subsp. rupestris</i>	+++	Native		Sch. VIII	

23	CARYOPHYLLACEAE	<i>Silene sedoides</i>	+++	Native			
24	CHENOPODIACEAE	<i>Darniella melitensis</i>	+++	Endemic	*		*
25	CLUSIACEAE	<i>Hypericum aegypticum</i>	++++	Native	*		
26	CONVOLVULACEAE	<i>Convolvulus oleifolius</i>	+++	Native	*	Sch. III	
27	CRASSULACEAE	<i>Sedum caeruleum</i>	++	Native	*		
28	CRASSULACEAE	<i>Sedum litoreum</i> <sup>T</sup>	++	Native (R)	*		
29	CRASSULACEAE	<i>Sedum caespitosum</i> <sup>T</sup>	+	Native			
30	EUPHORBIACEAE	<i>Euphorbia pinea</i>	++	Native			
31	FABACEAE	<i>Astragalus hamosus</i>	++	Native			
32	FABACEAE	<i>Lotus cytisoides</i>	+++	Native			
33	FABACEAE	<i>Melilotus indicus</i>	++	Native			
34	FRANKENIACEAE	<i>Frankenia hirsuta</i>	+	Native			
35	GERANIACEAE	<i>Erodium malacoides</i>	++	Native			
36	HYACINTHACEAE	<i>Urginea pancratiion</i>	+++	Native	*	Sch. VIII	
37	IRIDACEAE	<i>Romulea sp.</i>	+	Native			
38	LAMIACEAE	<i>Prasium majus</i>	+	Native			
39	ORCHIDACEAE	<i>Anacamptis cf pyramidalis</i>	+	Native		Sch. VIII	
40	OROBANCHE	<i>Orobanche minor</i>	+	Native			
41	OXALIDACEAE	<i>Oxalis pes-caprae</i>	+++	Nat. Alien			
42	PLANTAGINACEAE	<i>Plantago lagopus</i>	+++	Native			
43	PLUMBAGINACEAE	<i>Limonium melitense</i>	++++	Endemic	*	Sch. III	
44	PLUMBAGINACEAE	<i>Limonium cf. virgatum</i>	+	Native	*		
45	POACEAE	<i>Avena sterilis</i>	+	Native			
46	POACEAE	<i>Bromus madritensis</i>	+	Native			
47	POACEAE	<i>Catapodium marinum</i>	++	Native			
48	POACEAE	<i>Desmazeria pignattii</i>	++	Sub-	*	Sch. III	

				endemic			
49	POACEAE	<i>Lagurus ovatus</i>	++	Native			
50	POACEAE	<i>Lygeum spartum</i>	++++	Native			
51	POACEAE	<i>Parapholis filiformis</i>	+	Native			
52	POACEAE	<i>Rostraria cristata</i>	+	Native			
53	POACEAE	<i>Trachynia distachya</i>	++++	Native			
54	PRIMULACEAE	<i>Anagallis arvensis</i>	++	Native			
55	RUBIACEAE	<i>Crucianella rupestris</i>	++	Native	*		
56	RUBIACEAE	<i>Valantia muralis</i> (incl. <i>V. muralis</i> var. <i>hirsuta</i> )	+++	Native			

## 5.2: Species list of vascular plants at Tal-Halfa Rock

Table 2 shows a list of species recorded from tal-Halfa Rock. Species highlighted in yellow are species found by Cassar & Lanfranco (2000) but not by Sciberras & Sciberras (2010) while those in purple are species not reported by any of these authors and hence new records for the islet. Species found by Cassar & Lanfranco (2000), and Sciberras & Sciberras (2010) are not highlighted. (R) denotes a species which was considered rare for the Maltese islands. Five species were not observed during the Spring visit but subsequently observed during the following Autumn visit. These were *Narcissus serotinus* L., *Narcissus tazetta* L. *Leontodon autumnalis* L., *Prospero autumnale* (L.) Speta and *Arisrum vulgare* Targ.-Tozz.

**Table 2:** Species list reported from Tal-Ħalfa Rock, 16<sup>th</sup> May and 5<sup>th</sup> December (2011). Species found in autumn but not in spring are marked with an asterix (\*) in the spp. no. column.

Spp. No.	Family	Species	Freq.	Status of Species for Malta	Protection		
					RDB (1989)	LN311 (2006)	LN12 (2001)
1	AIZOOACEAE	<i>Mesembryanthemum nodiflorum</i>	+	Native			
2	ALLIACEAE	<i>Allium commutatum</i> (incl. <i>A. melitense</i> )	+++	Native			
3	ALLIACEAE	<i>Allium lojaconoi</i>	+	Endemic	*	Sch. III	
4*	AMARYLLIDACEAE	<i>Narcissus serotinus</i>	++	Native			
5*	AMARYLLIDACEAE	<i>Narcissus tazetta</i>	+++++	Native			
6	ANACARDIACEAE	<i>Pistacia lentiscus</i>	++	Native			*
7	APIACEAE	<i>Daucus carota</i>	+	Native			
8	APIACEAE	<i>Daucus gingidium</i>	+++	Native			
9	APIACEAE	<i>Ferula communis</i>	+	Native			
10*	ARACEAE	<i>Arisarum vulgare</i>	+++	Native			
11	ASPARAGACEAE	<i>Asparagus aphyllus</i>	++	Native			
12	ASPHODELACEAE	<i>Asphodelus aestivus</i>	+++	Native			
13	ASTERACEAE	<i>Carlina involucreta</i>	+++	Native	*		
14	ASTERACEAE	<i>Galactites tomentosa</i>	+	Native			
15	ASTERACEAE	<i>Inula crithmoides</i>	+++	Native			
16*	ASTERACEAE	<i>Leontodon autumnalis</i>	+	Native			
17	ASTERACEAE	<i>Pallenis spinosa</i>	+	Native			
18	ASTERACEAE	<i>Phagnalon graecum subsp. ginzbergeri</i>	++	Native	*		
19	ASTERACEAE	<i>Reichardia picroides</i>	+	Native			
20	ASTERACEAE	<i>Sonchus oleraceus</i>	+	Native			



21	ASTERACEAE	<i>Sonchus tennerimus</i>	+	Native			
-	ASTERACEAE	Unidentified sp. (1)	+				
22	CAPPARIDACEAE	<i>Capparis spinosa</i> subsp. <i>rupestris</i>	++	Native		Sch. VIII	
23	CARYOPHYLLACEAE	<i>Silene sedoides</i>	+++	Native			
24	CHENOPODIACEAE	<i>Arthrocnemum macrostachyum</i>	++++	Native			
25	CONVOLVULACEAE	<i>Convolvulus oleifolius</i>	+++++	Native	*	Sch. III	
26	CRASSULACEAE	<i>Sedum litoreum</i>	+++	Native (R)	*		
27	FABACEAE	<i>Hippocrepis multisiliquosa</i>	++	Native			
28	FABACEAE	<i>Lotus cytisoides</i>	++	Native			
29	FABACEAE	<i>Lotus edulis</i>	+	Native			
30	FABACEAE	<i>Melilotus indicus</i>	+	Native			
31	FABACEAE	<i>Ononis ornithopodioides</i>	+++	Native (R)			
32	FABACEAE	<i>Scorpiurus muricatus</i>	+++	Native			
33	GENTIANACEAE	<i>Centaurium pulchellum</i>	++	Native			
34*	HYACINTHACEAE	<i>Prospero autumnale</i>	++	Native			
35	HYACINTHACEAE	<i>Urginea pancracion</i>	+++	Native	*	Sch. VIII	
36	IRIDACEAE	<i>Romulea sp.</i>	++	Native			
37	LAMIACEAE	<i>Prasium majus</i>	+	Native			
38	LAMIACEAE	<i>Teucrium fruticans</i>	++	Native			
39	LAMIACEAE	<i>Thymbra capitata</i>	+	Native	*	Sch. III	
40	LINACEAE	<i>Linum strictum</i>	+++	Native			
41	LINACEAE	<i>Linum trigynum</i>	++	Native			
42	ORCHIDACEAE	<i>Anacamptis pyramidalis</i>	++	Native		Sch. VIII	
43	OROBANCHE	<i>Orobanche cernua</i>	+	Native	*		

				(R)			
44	OROBANCHE	<i>Orobanche minor</i>	+	Native			
45	PLUMBAGINACEAE	<i>Limonium cf virgatum</i>	++	Native	*		
46	PLUMBAGINACEAE	<i>Limonium melitense</i>	++++	Endemic	*	Sch. III	
47	POACEAE	<i>Bromus fasciculatus</i>	+++	Native			
48	POACEAE	<i>Catapodium marinum</i>	+	Native			
49	POACEAE	<i>Catapodium rigidum</i>	+	Native			
50	POACEAE	<i>Dactylis hispanica</i>	+	Native			
51	POACEAE	<i>Desmazeria pignattii</i>	++	Sub-endemic	*	Sch. III	
52	POACEAE	<i>Lygeum spartum</i>	+++	Native			
53	POACEAE	<i>Parapholis filiformis</i>	+	Native			
54	POACEAE	<i>Trachynia distachya</i>	++	Native			
55	PRIMULACEAE	<i>Anagallis arvensis</i>	+	Native			
56	RUBIACEAE	<i>Crucianella rupestris</i>	+++++	Native	*		
57	RUBIACEAE	<i>Rubia peregrina</i>	+	Native			
58	RUBIACEAE	<i>Valantia muralis</i>	++	Native			
59	SMILACEAE	<i>Smilax aspera</i>	+	Native			
-		Unidentified plant 1	+	Native			

## 6: Discussion

### 6.1. Tač-Ċawl Rocks.

Fifty-six plant species were recorded of which four were endemic: *Allium lojaconoi* Brullo Lanfranco & Pavone; *Anthemis urvilleana* (DC.) Sommier & Caruana Gatto; *Darniella melitensis* (Botschantzev) Brullo; *Limonium melitense* Brullo and two species are sub-endemic: *Desmazeria pignattii* Brullo & Pavone and *Periploca angustifolia* Labill.

Fifteen species are listed in the National RDB (Lanfranco, 1989): *Allium lojaconoi* Brullo Lanfranco & Pavone; *Anthemis urvilleana* (DC.) Sommier & Caruana Gatto; *Carlina involucrata* Poiret; *Darniella melitensis* (Botschantzev) Brullo; *Hypericum aegypticum* L.; *Convolvulus oleifolius* Desrousseaux; *Crucianella rupestris* Gussone; *Desmazeria pignattii*

Brullo & Pavone; *Limonium melitense* Brullo; *Limonium virgatum* (Willdenow) Fourreau; *Periploca angustifolia* Labill.; *Phagnalon graecum* subsp. *ginzbergeri* Pignatti; *Sedum caeruleum* L.; *Sedum litoreum* Gussone; *Urginea pancration* (Steinheil) Philippe.

Ten species are protected by law of which seven are protected by LN311/2006: *Allium lojaconoi* Brullo Lanfranco & Pavone; *Anacamptis pyramidalis* (L.) L.C.M. Richard; *Convolvulus oleifolius* Desrousseaux; *Limonium melitense* Brullo; *Desmazeria pignattii* Brullo & Pavone; *Capparis spinosa* subsp. *rupestris* (Sm.) Nyman; and *Urginea pancration* (Steinheil) Philippe; and 3 species protected through LN200/2011- *Darniella melitensis* (Botschantzev) Brullo, *Pistacia lentiscus* L. and *Periploca angustifolia* Labill.

In addition, *Sedum litoreum* Gussone is in the author's experience a rare species for the Maltese islands with a restricted distribution in very few arid coastal shores. three stations were recently recorded by Tabone (2008) and the author knows it only from Comino and Cominotto where it occurs quite frequently and from where it was first recorded by Duthie (1875).

All ten species found by Cassar & Lanfranco (2000) and presumed extinct or doubtful by Sciberras & Sciberras (2010) were reconfirmed of which two were protected and three listed in the Red Data Book (Lanfranco, 1989). Amongst these species were large and/or conspicuous specimens like that of *Pistacia lentiscus* L., the largest covering about an area of 4m x 3m, *Urginea pancration* (Steinheil) Philippe (numerous specimens observed), the shrubby *Phagnalon graecum* Boissier & Heldreich subsp. *ginzbergeri* Pignatti, dense patches of *Oxalis pes-caprae* L. and the red-coloured *Sedum caeruleum* L.

A further 22 species were not recorded neither by Sciberras & Sciberras (2010) nor by Cassar & Lanfranco (2000), four of which were protected or listed in the RDB (refer to table 1). These are *Anacamptis pyramidalis* (L.) L.C.M. Richard, *Anthemis urvilleana* (DC.) Sommier & Caruana Gatto, *Limonium* cf. *virgatum* (Willdenow) Fourreau and *Periploca angustifolia* Labill.

Finally the author failed to observe *Opuntia* sp. (Cassar & Lanfranco, 2000) but it was neither found by Sciberras & Sciberras (2010) and hence could be considered as a casual occurrence. *Cichorium spinosum* L. (Cassar & Lanfranco, 2000; Sciberras & Sciberras, 2010) where "only two specimens of this species were seen" by the former authors and *Gynandris sisyrrinchium* (L.) Parlato (Sciberras & Sciberras, 2010 ; Cassar & Lanfranco, 2000), where the flowering of this geophyte is normally already over in mid-May and hence difficult to spot within the debris of other dry vegetation. One last note-worthy remark is that, with the single exception of the alien species of *Oxalis pes-caprae* L., all recorded plant species are native.

## 6.2 Taxonomical Notes

Two specimens of *Anacamptis* that were located on the North-Western side of the islet perhaps merit a short mention. The specimens shown in Figure 1 had a conical inflorescence rather than

a pyramidal one, hence similar to that of *A. urvilleana* Sommier & Caruana Gatto. However, this species is described to flower between Feb and beginning of April, while *A. pyramidalis* (L.) L.C.M. Richard flowers distinctly later, *i.e.* April to June (Bartolo et al., 2001). The environment at Taċ-Ċawl Rock is exposed and relatively dry and such geophytes are not expected to flower later from their normal period. In addition, *A. urvilleana* produce flowers with a distinctly paler colour: from baby pink to white. Since the specimens had a vivid purple colour and were found in full bloom during the 9th of May the author believes that they were actually *A. pyramidalis*. Further investigations are required on these specimens which form part of a genus where numerous “variants have been named” according to the size, shape of inflorescence, degree of lip indentation and colour of corolla (Delforge, 2006).

### 6.3. Fauna observed

During these surveys no attempt was made to study the fauna, nevertheless, it might be noteworthy to mention that a few specimens of the protected and endemic *Podarcis filfolensis* s.l. (Maltese Wall Lizard) were observed at Taċ-Ċawla. Specimens of woodlice (Order: Isopoda) were seen in several occasions on the islet in November 2011.

### 6.4. Tal-Ħalfa Rock

Fifty-nine plant species in total were recorded during the two site visits. Two species were endemic: *Allium lojaconoi* Brullo Lanfranco & Pavone and *Limonium melitense* Brullo while one species is subendemic *Desmazeria pignatti* Brullo & Pavone.

Twelve species are listed in the National Red Data Book (Lanfranco, 1989): *Allium lojaconoi* Brullo Lanfranco & Pavone; *Carlina involucrata* Poirlet; *Convolvulus oleifolius* Desrousseaux; *Crucianella rupestris* Gussone; *Desmazeria pignattii* Brullo & Pavone; *Limonium melitense* Brullo; *Limonium cf. virgatum* (Willdenow) Fourreau; *Orobancha cernua* Loefling; *Phagnalon graecum* subsp. *ginzbergeri* Pignatti; *Sedum litoreum* Gussone; *Thymbra capitata* (L.) Cavanilles; *Urginea pancration* (Steinheil) Philippe.

Nine species were protected by law of which eight were protected by LN311/2006: *Allium lojaconoi* Brullo Lanfranco & Pavone; *Anacamptis pyramidalis* (L.) L.C.M. Richard; *Convolvulus oleifolius* Desrousseaux; *Limonium melitense* Brullo; *Desmazeria pignattii* Brullo & Pavone; *Capparis spinosus* subsp. *rupestris* (Sm.) Nyman; *Thymbra capitata* (L.) Cavanilles and *Urginea pancration* (Steinheil) Philippe; and the other species, *Pistacia lentiscus* L., were protected through LN200/2011is.

*Sedum litoreum* was considered rare for the reasons given above. Similarly, *Orobanche cernua*, was a rare species for the Maltese islands, and known by the author only from Seguna Cliffs, Sannat, Gozo (May 2010) while Tabone (2007, 2008) recorded it from only 5 other stations - two in Malta and three in Gozo. One of these location was “ta’ Rdum (opposite l-Gebbla tal-Halfa [or Tal-Halfa Rock] 12-4-2008 ).” *Ononis ornithopodoides* L. was also considered quite rare for the Maltese islands both from the author’s experience, and because it was recorded from just ten stations in the Maltese Islands by Tabone (2007,2008). Very interesting was that Tabone (2008) claimed that in his experience, the largest population of this species was to be found in the rocky area opposite Tal-Halfa rock and extends to Hondoq ir-Rummien. The finding that two rare species (*Ononis ornithopodoides* and *Orobanche cernua*) were found both on the Tal-Halfa Rock and the coast opposite the rock, may indicate that tal-Halfa rock may have formed part of the island of Gozo.

All species found by Cassar & Lanfranco (2000) and presumed as extinct or doubtful by Sciberras & Sciberras (2010) were reconfirmed and so are extant on the islet. One should note the incorrect referencing found in the work by Sciberras & Sciberras (2010) specifically “*Echium parviflorum*”, “*Plantago lagopus*” and “*Urginea pancration* which were recorded Tal-Halfa Rock by Cassar and Lanfranco (2000)” but in actual fact these species were not listed from Tal-Halfa by Cassar & Lanfranco (2000). A further 33 species were not recorded both by Sciberras & Sciberras (2010) and Cassar & Lanfranco (2000) (Table 2), and although a considerable number of these are casuals or frequent in the Maltese islands, seven species are legally protected, listed in the Red Data Book (Lanfranco. 1989) or considered rare. These include *Anacamptis pyramidalis*, *Desmazeria pignatti*, *Limonium cf virgatum*, *Ononis ornithopodoides*, *Orobanche cernua*, *Sedum litoreum* and *Urginea pancration*

Finally the author failed to observe *Anacamptis urvilleana* (Cassar & Lanfranco, 2000) {endemic and protected}, *Bromus madritensis* L. (Cassar & Lanfranco, 2000), {native and unprotected} and *Gynandris sisyrrinchium* (Sciberras & Sciberras, 2010 ; Cassar & Lanfranco, 2000) {native, and unprotected}. One should remark that Cassar & Lanfranco (2000) recorded *Anacamptis urvilleana* on the 23<sup>rd</sup> May from Tal-Halfa Rock but not *A. pyramidalis*. Owing to the fact that the flowering period of *A. urvilleana* is between February and beginning of April and that of *A. pyramidalis* is between April and June (Bartolo et al., 2001) it was possible that Cassar & Lanfranco (2000) actually met specimens of *A. pyramidalis* with a pale flowering form or specimens similarly found at Taç-Ċawl. However, at least ten typical *A. pyramidalis* specimens were found by the author and its presence was confirmed at Tal-Halfa Rock.

Surprisingly, Sciberras & Sciberras (2010) did not report certain species that were abundant considering they have visited the islet in each season for several years. Examples include *Limonium melitense* which was frequently found throughout the arid rocky parts of the islet and *Narcissus tazetta*, dominating the central fertile part of the islet in December. More interesting

was the new record of *Ononis ornithoipodes*, a rare and RDB species frequently met on the central (vegetated) part of the islet, roughly 100 plants were estimated to be present.

From a personal communication with Michael Briffa (2009), *Atractylis cancellata* L. and *Pteranthus dichotomus* Forskal had been observed by him at Tal-Halfa during a visit in 1994, but these rare and protected species were not reconfirmed by Cassar & Lanfranco (2000), Sciberras & Sciberras (2010), or the present surveys. All recorded plant species were native and no alien species were observed. Finally, a species of lichen (*Xanthoria* sp.) was also observed.

#### 6.5: Taxonomical Notes

The author encountered some specimens which did not possess the normal habit of their species, and hence appeared morphologically different or unusual, more often than not due to dwarfism or stunted growth. A case in point, included specimens of *Pistacia lentiscus* which did not assume their usual shrubby habit, but instead formed a prostrate mat only 25-35cm high. Few specimens of *Galactites tomentosa*, were just 10-15cm high, with poorly developed leaves and solitary inflorescence with a small capitula. Two young plants (Fig. 3) with a height of 8-10cm, mildly lanate, thistle-like leaves and without inflorescences were observed and photographed, but their identification could not be determined. Another 2 specimens with small ovate leaves having a dark-green colour (almost blackened at the margin), just 5-8cm high and without any flowers or fruit, are thought to correspond to a *Solanum* sp. which usually is 30-100 cm high. Identification of these specimens could not be confirmed, though *Solanum villosum* was recorded at Tal-Halfa (Cassar & Lanfranco, 2000).

Due to these atypical forms, speculation arises concerning the “small group of plants belonging to the Asteraceae family which were discovered in 2010 by Sciberras & Sciberras (2010) and “taxonomy of the species is still underway” during these last ten years of research. Such atypical forms are likely a result of the arid conditions, lack of soil depth, sea spray, and strong winds prevailing from most directions. Environmental conditions are not suitable for high growing plants, esp. annuals without a vigorous rooting system..

#### 6.6: Water filled hole at the South East part of the Islet

A circular, vertically dug cavity approximately 2.5m in diameter and 4m deep (estimated by sight) was observed at the South-Eastern part of the islet and was about 12m distant from the shore (data measured via GoogleEarth software, May 2011). This pool was studied by Sciberras & Sciberras (2010) who stated that the water was brackish, since, according to them, it received sufficient fresh water from an “underground fresh water system which emerged from a small cave/tunnel just outside the mouth of the brackish pool”. During the author’s

surveys in May and November, no water was found flowing from this cave/tunnel, and its mouth was devoid of alluvial soil deposits, vascular flora, or mosses, indicating that the alleged water spring was small (not surprising for a small rock like Tal-Ħalfa) and so any, if any, influx would have had negligible effect to the pool's salinity. Further evidence that the pool was not brackish was the presence of few sea urchins which are devoid of osmoregulatory functions, and thus would not survive in brackish water, (pers. comm.: Prof. Patrick J. Schembri, May 2011). On further research, this hole was found to be a fourgasse which were introduced in Gozo in 1743 (QLC, 2011) and as a result of explosions, it was likely that underground cracks in the rock had developed possibly resulting in a connection between the pool and the sea.

### 6.7: Fauna observed

No attempts of studying fauna was performed during these surveys, nevertheless, it might be noteworthy to mention that few specimens of the protected and endemic *Podarcis filfolensis* s.l. (Maltese Wall Lizard) were also observed at Tal-Ħalfa. *Astroides calycularis* (ID: Prof. P.J.Schembri) was photographed from the shaded sides of the islet.

### **7: Conclusion:**

The surveys carried out on the islets of Taċ-Ċawl and Tal-Ħalfa islets have confirmed almost all the species found by Cassar and Lanfranco (2000), and hence disproves the observations by Sciberras & Sciberras (2010) that a number of species which they have not found are extinct or doubtful. The results of these surveys and adds 19 species and 36 species to the inventory of Taċ-Ċawl and Tal-Ħalfa rocks respectively, including more endemic, protected, rare or RDB species, as summarized in Table 3.

**Table 3:** Summary of results comparing records between this study, that by Sciberras & Sciberras (2010), and Cassar & Lanfranco (2000)

	Taċ-Ċawl Rock			Tal-Ħalfa Rock		
	Present study	Sciberras & Sciberras (2010)	Cassar & Lanfranco (2000)	Present	Sciberras & Sciberras (2010)	Cassar & Lanfranco (2000)
No. of recorded species	56	24	37	59 (+2) <sup>1</sup>	19 (+1) <sup>1,2</sup>	23

No. of endemic and sub endemic species <sup>3</sup>	6	3	5	3	1	3
No. of protected species (of which strictly protected)	10 (7)	5 (4)	7 (5)	9 (6)	4 <sup>2</sup> (3)	6 (4)
No. of species listed in the red data book	15	5	11	12	5	7
No. of species considered as rare in the Maltese Islands	1	0	1	3	0	0
No. of alien species	1	0	0	0	0	0
	<sup>1</sup> Number in brackets corresponds to plants that were not fully identified to species level. <sup>2</sup> The authors clearly state that <i>Urginea pancracion</i> was not found by them at Tal-Ħalfa (ref: 5.1.1), but given in their “table 2”. It is assumed that the mistake is in the table, because writing has precedence in such circumstances. <sup>3</sup> Does not include <i>Allium melitense</i> for reasons given above (ref: 3.0)					

Sciberras & Sciberras (2010) concluded that a significant number of species (including some protected ones) were “*considered as doubtful or possibly extinct from site*” at Taċ-Ċawl and Tal-Ħalfa rocks. These conclusions have been disproved from recent surveys reported here . In addition, a number of new species have been discovered when compared to those recorded by Cassar & Lanfranco (2000) some of which are protected, RDB species or rare, and hence gives more reason for these islets to continue to enjoy protected status.

The author has concerns about the validity of the work by Sciberras & Sciberras (2010), because as described above, a significant number of species that they failed to observe during their numerous surveys between 1997-2010 consisted of very conspicuous species that are difficult to miss in the small area of these islets. Additionally, their records are mostly all Spring-flowering plants, hence doubts arise as to whether the islets were visited every season as they claimed.



**Acknowledgments:**

Special thanks to Prof. Patrick J. Schembri for his consultation and identification about marine organisms and Dr. Sandro Lanfranco for supplying a checklist of flora from unpublished work by Cassar & Lanfranco (2000). I am indebted to Mr. Brian Farrugia for his time dedicated to proof read this paper.

## Illustrations:



**Figure 1:** Young specimens of *Melilotus indicus* with leaflets having a red stripe. Tač-Ċawl Rock, 12-Nov-11.



**Figure 1:** *Anacamptis* cf. *pyramidalis* with conical inflorescence, at Tač-Ċawl Rock, 9-May-11.



**Figure 3:** Carpets of *Narcissus tazetta*; first recorded from Tal-Halfa islet in Dec 2011.

## References:

### i) References from printed sources

**Bartolo, G.; Lanfranco, E.; Pulvirenti, S. & Stevens, D.T.** (2001). L'Orchidaceae dell'Arcipelago Maltese (Mediterraneo Centrale). *Journal Europäischer Orchideen*, 33(3): 743-870.

**Cassar, L.F. & Lanfranco S.** (2000). Gozo and Comino Local Plan: Survey of environmental resources. Volume 1 (144pp) and Volume 2 (119pp) .

**Delforge, P.** (2006). *Orchids of Europe, North Africa and Middle East*. 3rd Edition, A&C Black Ltd. Publishers, London. ISBN- 13: 978-0-7136-7525-2.

**Duthie J. F.** (1875). *On the botany of the Maltese islands in 1874* - Parte 1\ The Journal of Botany British and foreign 1874, p. 321-326. Parte 5" Ibid. 1875, p. 36-42. London 1874 e 1875.

**Lanfranco, E.** (1989). The Flora, in: P.J. Schembri and J. Sultana, *Red Data Book for the Maltese Islands*: pp. 5 – 70, Ministry of Education, Malta.

**Sciberras, J. & Sciberras, A.** (2010). Topography and Flora of the Satellite Islets surrounding the Maltese Archipelago. *The Central Mediterranean Naturalists* 5(2): 31-42 Malta, April 2011

**Tabone, T.J.** (2007) A list of records of some rare vascular flowering plants occurring in the Maltese Islands (Central Mediterranean) *Central Mediterranean Naturalist* 4(3): 181-189 Malta, November 2007.

**Tabone, T.J.** (2008) A list of records of some rare vascular flowering plants occurring in the Maltese Islands (Central Mediterranean) *Central Mediterranean Naturalist* 4(4): 311-337 Malta, November 2008.

### ii) References from online sources

**QLC** – Qala local Council Website (last accessed on May 2011)

<http://www.qala.gov.mt/default.asp?module=content&pageid=124>