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UPDATES IN THE FLORA OF THE MALTESE ISLANDS (CENTRAL MEDITERRANEAN)

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ABSTRACT

During the last 5 years, this author has been involved in the research and exploration of the flora of the Maltese islands in order to create and update the website http://www.maltawildplants.com. This paper consists of several important discoveries of new populations of very rare or endangered floral species for the Maltese Islands which were recorded during field surveys to collect material for this website. It also includes the species *Calendula bicolor* Rafin., which is a new record for the Maltese islands.

***Muscari commutatum* Gussone**

Muscari commutatum was first recorded by Michael Briffa in 1986 from Wied Rini as single population consisting of few individual plants. Since so far, this was the only population found in Malta, and since it resides very close to a planted lemon tree, he correctly reasoned out that this species might have been introduced rather than being native in origin. [Briffa Michael, 1986]

New evidence may however change the current origin status of this species. On the 22nd of March, 2005, a patch of plants was encountered with an inflorescence consisting of dark-indigo, inflated tubular flowers. The plants were identified as *Muscari commutatum* Gussone since the outer toothed rim of the flowers were typically dark-indigo, unlike that of *M. neglectum* Gussone which is white. [Blamey M., Grey-Wilson C., 2004]

This species was found in a pristine garigue on the coastal cliffs of Qrendi (close to a bird trapping site) in 5 different populations of different sizes in an area of 2m x 3m. The largest population had some 80-100 plants, very close to each other, looking as a tuft of about 40cm in diameter. The surroundings (approx. 80m radius from the population) were explored several times, but no other specimens of *M. commutatum* Gussone were encountered. It is unlikely that this population has been planted there.

Fig.1 Population of *Muscari commutatum* found at Qrendi in 2005. (Photo: Stephen Mifsud, Maltawildplants.com)

It is the author's opinion that, in view of the large number of plants forming the population, and their location in an open garigue, in a depth of few cm of soil, the established population has been growing there for a very long time, and hence most probably native in origin.

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Detailed botanical descriptions and an extensive photogallery of this population can be found on www.Maltawildplants.com/HYCN/Muscari_commutatum.php

***Calendula bicolor* Rafin.**

Calendula (Marigolds) has always been a difficult group and a number of subspecies, varieties and forms have been described by early botanists. Taxonomical updates, insertions, and deletions are an ongoing process in the taxonomy of *Calendula*. Currently, the *Calendula* species in Malta are basically grouped into three complexes:

1) *Calendula arvensis* agg. (annual plants with flowerheads less than 2cm)
2) *Calendula suffruticosa* agg. (suffruticose perennial plants with woody stem bases and flower heads greater than 2cm)
3) *Calendula officinalis* agg. (various ornamental and horticultural plants with large showy flower heads)

In the course of this author's investigations on the genus *Calendula* in the Maltese Islands, an interesting observation was made. Some photos of a *Calendula* with orange and relatively large flower heads had been taken. This population was observed and photographed on the 26th of March, 2005 from Dwejra, Gozo. The main morphological features were as follows:

i) A non-shrubby herb without a woody stem.
ii) Flower capitula consisting of vivid orange ray florets (ligules) with an orange-maroon disc.
iii) A rather large flower-head (capitulum) measuring 22mm c. across.

Fig.2: Herbaceous and non bushy *Calendula bicolor* Rafin. from Dwejra

These features excluded any of the three complexes above. The closest previous identification was *Calendula aegyptiaca* Pers., but this species does not form large flower heads and orange ray petals.

The variety of *Calendula arvensis* L. with smallish discolorous flowerheads - thus consisting of yellow ray-petals and a central brown disc (as shown in Fig.3) - has been locally referred to as *Calendula aegyptiaca* Pers. However, the latter is a desert species from our islands, since this plant has narrower leaves described as linear-lanceolate (Pignatti, 2002; Migahid, 1989) in contrast to the oblanceolate ones of *C. arvensis* s.l. found in Malta. Such plants with a discolourous capitulum less than 2cm wide are for the moment placed as *Calendula arvensis* var. *bicolor* (Rafin.) DC. (Edwin Lanfranco, personal communication)

Fig 3: Calendula arvensis var. *bicolor* (Rafin.) DC. previously mistaken for *Calendula aegyptiaca* Pers.

New identification clues came from an Italian online forum where Luigi Rignanese (personal communication) suggested to check the species *Calendula bicolor* Rafin. The species from Dwejra fits well as *C. bicolor* Rafin., both by the keys from Pignatti.(2002) and Fiori (1969). The vegetative part of *C. bicolor* Rafin. looks similar to that of *Calendula arvensis* L. s.l. – in fact, it is a herbaceous plant that forms several green branches and sub-branches, but which does not attain the gross form of a bush. It has sessile, oblanceolate leaves, rather obtuse and minutely ciliated or pubescent.

The capitulum consists of a single row of slender phyllaries (involucral bracts), closely packed next to each other and a single row of ligules (ray florets) that are twice as long as the phyllaries. The ligules have a vivid orange colour with a slightly paler region at the base. The disk florets are relatively large and dark orange in colour. The buds are darker. The diameter of the capitulum observed varied between 20 to 24mm. Achenes are variable in size and shape, and similar to *C. arvensis* L.

When contrasted, the flowers of *C. bicolor* Rafin. appear different and larger from those of *C. arvensis* var. *bicolor* (Rafin.) DC.

Fig.4: Calendula bicolor Rafin. compared to C. arvensis var bicolour (Rafin.) DC

On discussing this with Edwin Lanfranco, he stated that the photos looked identical to the *Calendula bicolor* Rafin. that he saw in Tunis with such large flower diameters. These plants from Dwejra were also confirmed as belonging to *Calendula bicolor* Rafin.

This recorded presence of *Calendula bicolor* Rafin is the first on the Maltese islands and this comes as no surprise, because this species is reported in neighbouring territories like Sicily and Tunisia (Pignatti , 2002]. Only one patch of few specimens was found in Dwejra and this is endangered by surrounding invasive and higher vegetation namely *Galactites tomentosa* Moench and *Bituminaria bituminosa* (L.) Stirton.

***Ornithogalum divergens* Boreau**

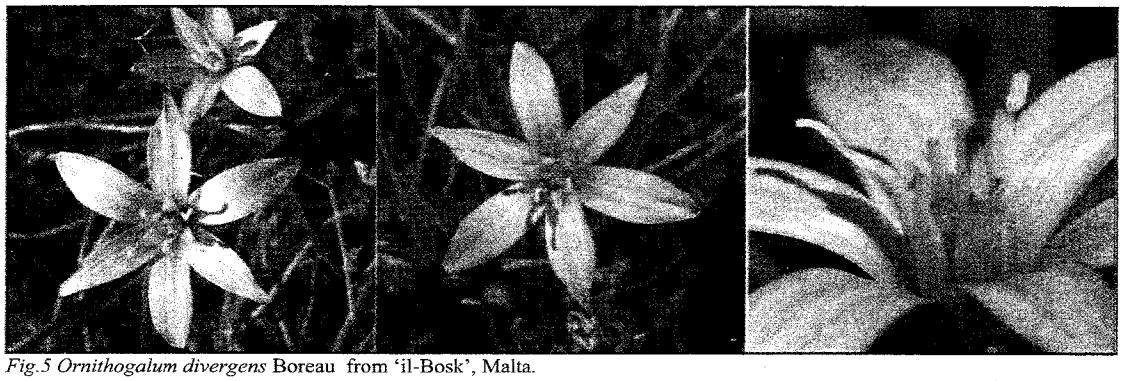

Fig.5 Ornithogalum divergens Boreau from 'il-Bosk', Malta.

Two specimens of *Ornithogalum divergens* Boreau were found on the 2nd April 2006 in a site from which it has never been reported: a garigue known as tal-Bosk, close to Buskett Woodland. This species was believed to be extinct for several decades (Lanfranco, 1989) and was in the recent few years to be

rediscovered at Buskett and Girgenti (Edwin Lanfranco, personal communication). The site where this author found the specimens has a certain importance because it is not easily accessible to the public. On the other hand, the high-growing vegetation of *Asphodelus aestivus* Brotero, and *Bituminaria bituminosa* (L.) Stirton, which are gradually increasing in number and encroaching upon the area taken by the low-growing plants, are serious threatening factors. Monitoring of the area is recommended.

Detailed botanical descriptions and a photo-gallery of this species can be found on www.Maltawildplants.com/HYCN/Ornithogalum_divergens.php

***Iris pseudopumila* Tineo**

The endangered and sub-endemic *Iris pseudopumila* Tineo, is a species listed in the National Red Data Book (Lanfranco, 1989). On the 22nd of April 2007, while exploring Marfa area, the author came across a very large population of *Iris pseudopumila* Tineo. The population covered an area of about 12m x 8m and in some patches it was found as dense populations (ref. Fig 6). This extensive population from Marfa has never been reported, and it is estimated to be the largest population of *Iris pseudopumila* Tineo in Malta in terms of coverage area. It is larger than the population at Selmun or that at Ras il-Pellegrin (decreasing!).

Fig.6: Population of *I. pseudopumila* Tineo discovered at Marfa.

The population of Marfa consists of plants with short leaves like the yellow-coloured variety of Ras il-Pellegrin, but this can be confirmed only in winter (January) when the species is in bloom.

Detailed botanical descriptions and an photo-gallery of this species can be found on www.Maltawildplants.com/IRID/Iris_pseudopumila.php

***Oxalis fontana* Bunge**

Oxalis Fontana Bunge has been very recently discovered by Edwin Lanfranco (Edwin Lanfranco, personal communication) as an introduced alien species. A small group of plants has been surprisingly found growing from a crevice in the pavement of a street in Ta'Xbiex. The plant was still in few blooms in July 2006 when it was first observed. This location is reported for distribution purposes of this new species for the Maltese islands.

Fig. 7: Close up of the small flowers of *Oxalis Fontana* Bunge

The main differences between *Oxalis fontana* Bunge and *Oxalis corniculata* L. - a frequent naturalized alien - are given in the Table 1:

Table 1: Main differences between *Oxalis corniculata* L. and *Oxalis fontana* Bunge

Feature	*Oxalis corniculata*	*Oxalis fontana*
Growth form	Creeping	Ascending to sub-erect
Leaf arrangement	Alternate	Opposite or in whorls of few leaves arising from stem nodes
Rooting at stem nodes	Present	Absent
Leaf Stipules	Small but well visible	Minute, often absent
Fruit stalks (pedicels)	Recurved	Variable, mostly straight
Leaf colour	Leaves often have a purple or maroon coloration, sometimes the entire plant is so.	Green leaves without any trace of violet coloration (except stems).

Detailed botanical descriptions and a photo-gallery of this species can be found on: www.Maltawildplants.com/OXIL/Oxalis_fontana.php

***Muscari neglectum* Gussone**

A few specimens of *Muscari neglectum* Gussone where found on the 19th of March 2005 at Wied Ħanżira, Gozo. This species, which is reported as a rare species with restricted distribution in Malta (Lanfranco, 1989), has never been reported from Gozo (Haslam *et al.*, 1977). This data is hence valuable for distribution purposes.

Not far away from this *Muscari* population, large populations of *Ononis biflora* Desf., another species mentioned in the Red Data Book (Lanfranco, 1989), was encountered and hence its presence reconfirmed on the 6th of April 2007.

Fig.8: Muscari neglectum Guss. From Xewkija, Gozo

Linaria pseudolaxiflora Lojacono

According to a recent Natura 2000 report (Natura 2000), the Pelago-Maltese endemic - *Linaria pseudolaxiflora* Lojacono was mentioned as recorded from the Southern part of Comino, namely, the area near the Tower. This species was seen in late April 2007 in the Northern coast and garigue of Comino, known as the Għemmieri peninsula. The Natura 2000 report does not mention *L. pseudolaxiflora* Lojacono in its account of flora found at the Għemmieri peninsula area and hence it is a new location for this endemic species.

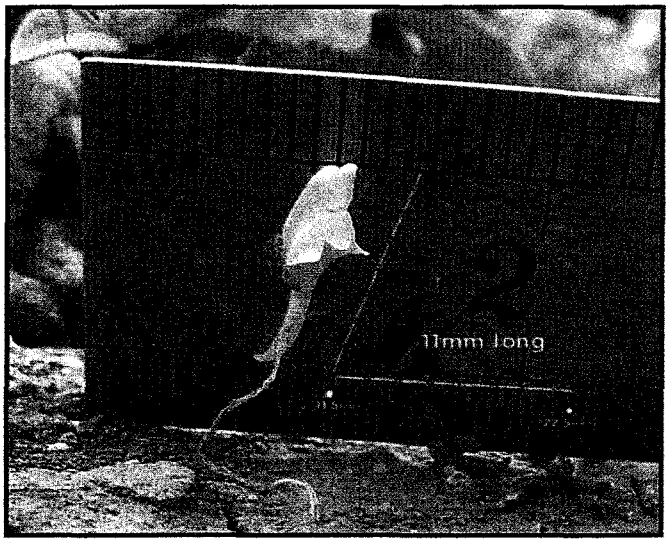

Fig.9: The small corolla of populations of *Linaria pseudolaxiflora* Lojacono from Ghemmieri peninsula, Comino

Some 20 specimens were observed scattered around the sampling area. Dense populations were not observed. Additionally, these specimens had a very small form with flowers measuring only 10-13mm in length. It is the first time that such a small corolla size has been recorded. For example, Haslam *et al.* (1977) give a corolla length of 15-18mm in its description of the species. This may raise doubts about a possible new variety for this particular species on north Comino or otherwise extend further the variable characteristics of this endemic plant so as it should be described that the length of the corolla can be between 10-18mm.

***Abutilon theophrasti* Medicus**

While exploring the arable area of Qormi, the author found a population of 33 specimens of *Abutilon theophrasti* Medicus, scattered along an area of about 30m x 40m in a fallow field. The plants were large, and enjoying the rich soil that they were growing in. The major habitat of this species is arable land, and this finding is important because plants in Malta are decreasing due to agricultural practices (e.g. destruction of 'weeds' by farmers using broad-spectrum herbicides).

This 80-100cm high, annual plant is easily identified from the particular shape of its fruit as seen in Fig.10. It has large sub-cordate to orbicular leaves up to 14cm across with long petioles and bright yellow flowers, which is uncommon for members of the Malvaceae family, often having purple flowers.

Fig.10: Photo of *Abutilon theophrasti* Medicus from fallow fields in Qormi,

***Trifolium pratense* L.**

The only records of *Trifolium pratense* L. (Red clover) in Malta, date back to 19th century by Gavino Gulia and Grech Delicata and never reported again. [Edwin Lanfranco and Michael Briffa, personal communications]. Red clover is a very common plant in the central and northern part of Europe, and it is also the national plant of Denmark.

Trifolium pratense L. is again being recorded from the islands since, on the 30th of June 2007, a small population of *Trifolium pratense* L. was observed in fallow fields at Qormi. The plant is easily distinguished in Malta by being the largest species of *Trifolium*, both in its general size and in the inflorescence. The plant can grow up to 60cm high with its purple flower-heads reaching 2-3cm across. Other remarkable identification features include the pair of conspicuous stipules that are moderately hyaline with anastomosing green veins and pointed tip and also the V-shaped pale patch on the leaves. The fruit is a tiny circumscissile capsule containing only one seed.

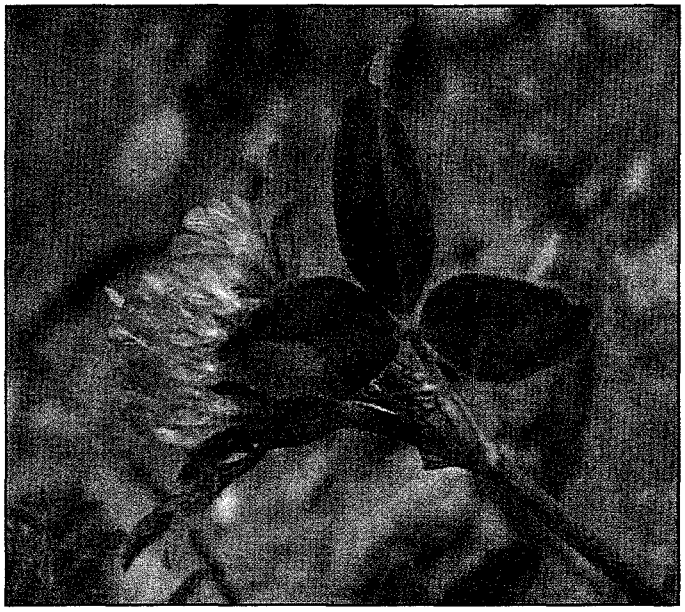

Fig.11: Leaves, stipules and flower-head of *Trifolium pratense* L.

Twenty-one plants have been counted in a single fallow field, in a small area of about 10m x 12m. Neighbouring fields (which were not fallow) did not reveal any plants of the red clover. No more plants were found in surrounding lanes or field paths.

Although it is difficult to establish the origin and age of this population, most probably, these plants might have been very recently reintroduced with agricultural products such as contaminated soil, bird-seed products, or animal feed. It would be an interesting study to determine if the small seeds of *Trifolium*

pratense L. can be found with imported barley and wheat, and furthermore if they can survive the feed-formulating process and hence found viable for germination in cattle feed pellets.

A sample of the plant was deposited at the Argotti Gardens herbarium in July 2007. Identification confirmed by Edwin Lanfranco.

Detailed botanical descriptions and a photo-gallery of this species can be found on www.Maltawildplants.com/FABC/Trifolium_pratense.php

Fig.12: Inflorescence of *Trifolium pratense* L. found in Qormi

***Vicia bithynica* (L.) L.**

The presumably native *Vicia bithynica* (L.) L. is an endangered species for the Maltese islands, and only found in one location in Malta, that is Għajn il-Kbira, Girgenti (Edwin Lanfranco, 1989). On the 3rd of April 2007, a large population of. *Vicia bithynica* (L.) L. was found at Wied Gerżuma, Baħrija. The population growing on a partially shaded and sheltered area comprised of some 60 specimen in a stretch of 30-40m. No previous record ever mentioned this locality. The importance of this record lies both in the fact that it is a large and established population, and also the specimen was found healthy without much competitive vegetation and public disturbance, due to the restricted access to the site to the general public.

The most important identification features of this very rare species are: a leaf with 1 – 3 pairs of narrow-elliptic leaflets having an entire margin and a simple apical tendril, a characteristic conspicuously-dentate stipule, only one, two or rarely three flowers per inflorescence and a corolla with indigo-blue standard and white to lilac keel and wings.

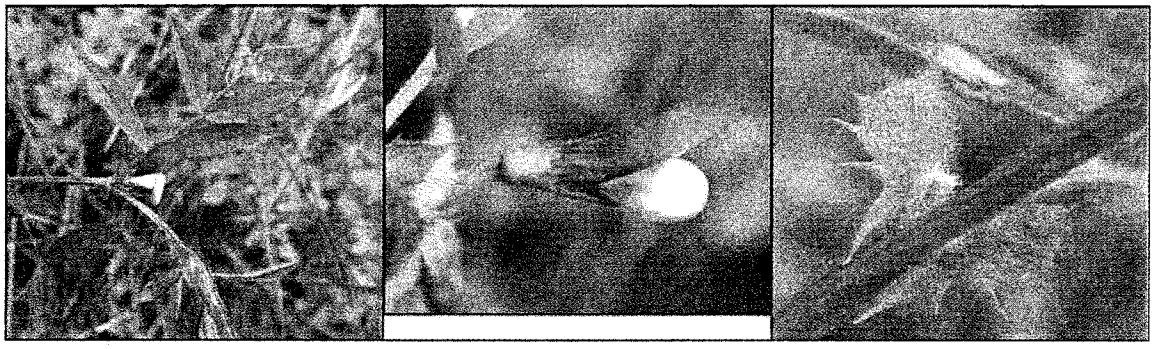

Fig.13: Photos of *Vicia bithynica* (L.) L. from a large population in Wied Gerzuma, Malta.

Cardaria draba (L.) Desvaux

Cardaria draba (L.) Desvaux is considered as a rare to very rare plant, found growing mainly on arable land. It is constantly decreasing from our islands, mainly due to weed control for agricultural practices. This evidence was proved last April 2007, when *C. draba* was searched for in a location where it was present in considerable numbers, some 18 years ago (precisely on 8th May 1989) in fields at Wied il-Ħemsija, Mtarfa. (Michael Briffa, personal communication) Unfortunately no specimens were found in April 2007.

Six specimens were found in March 2007 in a fallow field at Mġarr, Gozo, a location where it was never recorded from. On revisiting the site about 2 weeks later the field was found devoid of plants because it was totally ploughed off. Hopefully, enough seeds would have been shed for next season.

Fig.14: Cardaria draba (L.) Desvaux from Mgarr, Gozo.

Asparagus stipularis Forssk.

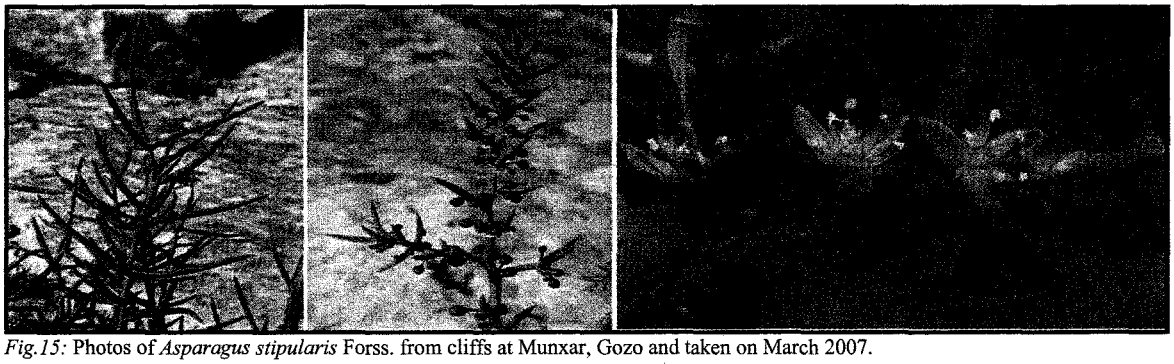

Fig.15: Photos of *Asparagus stipularis* Forss. from cliffs at Munxar, Gozo and taken on March 2007.

A large population of *Asparagus stipularis* Forssk. was found in a rocky habitat at the Sanap Cliffs, Gozo. A specimen of this population was identified and confirmed by Edwin Lanfranco. About 200 specimens of varying sizes were found occupying an area of 125m x 25m along the cliff edges, accompanied mainly by *Darniella melitensis* (Botchantzev) Brullo. The first 2 specimens of this population were found on the 5th of March 2007. So far, this particular population was not previously officially recorded, though I was aware that another population has been previously found a few kilometers away. (Edwin Lanfranco, personal communication)

The main differences between the common *Asparagus aphyllus* L. and *Asparagus stipularis* Forssk. are given in Table 2:

Table 2: Main differences between *Asparagus aphyllus* L. and *Asparagus stipularis* Forssk.

Characteristic	*A. aphyllus* L.	*A. stipularis* Forss.
Flowering season	Spring (Mar-May)	Autumn (Sep-Nov)
Apical cladodes	Borne in clusters	Solitary
Cladodes length	Not more than 2cm	Larger cladodes are between 3-4cm
Colour at the underside of the tepals	Yellow	Reddish brown
Colour of the berries	Black	Bluish black

This species was believed to have become extinct because the last record was dated in 1927 by Borg (1927), and subsequently never recorded again. Some even speculated that Borg may have mistaken it for

the variable *A. aphyllus* L. Recently, a concrete path was laid very close to this population, and it is possible that some specimens of *A. stipularis* may have been destroyed with this unnatural development.

Detailed botanical descriptions and a photo-gallery of this species can be found on www.maltawildplants.com/ASPR/Asparagus_stipularis.php

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Special thanks goes primarily to Edwin Lanfranco for identifying or confirming the identification of many of the species in this article. Mr. Lanfranco was also responsible for revising the article so as it has a scientific style suited for the Central Mediterranean Naturalist. Credit must also be given to Michael Briffa for his devotion with several questions related to this article. Finally, deserved gratitude should also go to my wife for her unstinting support and patience.

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All photographs in this in this were taken by the author himself.
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