

## RECORDS OF *NARCISSUS ELEGANS* (FAM. AMARYLLIDACEAE) AND NOTES ON THE WILD *NARCISSUS* IN THE MALTESE ISLANDS

Stephen MIFSUD<sup>1</sup> and Emanuel CARUANA<sup>2</sup>

### ABSTRACT

Substantiated records of *Narcissus elegans* are reported from Malta and for the first time in Gozo. Habitat and ecological analysis of the three different populations and a distribution map is given. Morphological characters between the populations are compared between each other and the described taxa. Also discussed and illustrated are the intermediate range of specimens found in Malta between *N. serotinus*, *N. elegans* and *N. tazetta*

**Keywords:** *Narcissus elegans*; *Narcissus serotinus*; *Narcissus tazetta*; new records; *Narcissus* intermediates; Malta; Gozo

### INTRODUCTION

*Narcissus elegans* (Haw.) Spach [*Hist. Vég. (Phan.)* 12: 452 (1841)], (Syn: *Narcissus autumnalis* Link , *N. oxypetalus* Boiss., *N. cupanianus* Guss., *Hermione autumnalis* (Link) M. Roem., *H. elegans* Haw.) is an Autumn flowering bulbous plant with canalculated leaves 8-25 cm × 2-4-5 mm, appearing before or with the flowers. It produces two to seven fragrant flowers on 15-35 cm long scapes. Flowers have six white tepals, 12-20 × 3-6 mm, narrowly oblong to elliptical, not overlapping and a central corona 1-2 × 3-4 mm yellowish or brownish-green. Fruit are vertically dehiscent capsules forming black seeds (Webb, 1980).

*Narcissus elegans* has a restricted distribution in the central Mediterranean region where it ranges from North West Africa ; reported from Libya, Tunisia (USDA, 2009), Algeria and Morocco (USDA, 2009; GBIF, 2009) to South West Europe; reported from South and West of Italy (Webb, 1980 ; GBIF, 2009), Malaga, south of Spain (Lopez, 2007), the Balearic Islands (HV, 2009), and from France (FN, 2009).

Pignatti (1982) treat the taxon *N. elegans* as a synonym of the highly variable *N. serotinus*. The two species are in fact quite closely related to each other but, Webb (1980) distinguishes *N. elegans* by forming leaves during the flowering period and that are wider than 2mm. A list of morphological characters of these two species is given in Table 1, in which the main differences are highlighted. The variability of *N. elegans* can be reflected in the description of numerous varieties and forms, all previously having the rank of a species level.

*Narcissus elegans* (Haworth) Spach, *Hist. Nat. Vég.* 12: 452 (1846) (*Narcissus*) Section Tazettae. PC 1995

var. *elegans*

f. *elegans*

f. *auranticoronatus* Maire, *Bull. Soc. Hist. Nat. Afr. Nord* 31: 42 (1940)

[syn = *N. auranticoronatus*]

var. *fallax* Font Quer, *Iter Maroc.* 1929: 94 (1940) [syn = *N. fallax*]

var. *flavescens* Maire, *Bull. Soc. Hist. Nat. Afr. Nord* 27: 261 (1936) [syn = *N. flavescens*]

var. *intermedius* Gay, *Bull. Soc. Bot. France* 6: 12 (1859) [syn = *N. intermedius*]

var. *oxypetalus* (Boissier) Maire, *Cat. Pl. Maroc*: 139 (1931) [syn = *N. oxypetalus*]

<sup>1</sup> Gardenia, Triq il-Batterija, Santa Venera, Malta / email: info@maltawildplants.com

<sup>2</sup> Triq San Alwigi, Paola, Malta / email: ep\_caruana@onvol.net

## Historical overview

The records of wild *Narcissus* from the Maltese islands have always been two species, one being *Narcissus tazetta* {Zerafa (1831), Grech Delicata (1853), Sommier & Caruana Gatto (1915), Borg (1927), Haslam (1977), Weber & Kendzior (2006)} locally known as ‘Ranġis’ or ‘Narċis’ and the other is *Narcissus serotinus* {Sommier & Caruana Gatto (1915); Borg (1927), Haslam (1977), Weber & Kendzior (2006)} locally known as ‘Ranċis Imwahħar’ or ‘Narċis Imwahħar’.

Zerafa (1831) did in fact report *N. elegans* (Haw.) Spach as the synonymous taxon “*Narcissus cupanianus* Guss.” and Grech Delicata (1853) also cites this taxon in his flora. These authors insinuate that the plants are frequent and somewhat widespread in Malta: “Wied Babu, Wied Balluta, Wied Ghomor, Corradino, ecc.” (Grech Delicata, 1853). However, Grech Delicata (1853) was the first to note that the species referred to as *N. cupanianus* is instead *N. serotinus*, and in his work he gives *N. cupanianus* and *N. serotinus* for the same plant - ‘Narċis mewahħar’. It is not understood if Grech Delicata meant that both taxa are considered synonyms or if he was still undecided about the determination of this species. This was however clarified later by Sommier & Caruana Gatto (1915) that *N. cupanianus* was a misidentification of *N. serotinus* and wrote that Grech Delicata had suggested Zerafa to substitute the taxon *N. cupanianus* with *N. serotinus*. Moreover, Sommier & Caruana Gatto (1915) reported to have seen in numerous localities the typical forms and rarely the atypical forms of *N. serotinus* that is specimens with leaves forming before the flowers have withered. Sommier & Caruana Gatto (1915) did not include *N. elegans* in their work and so does Borg (1927) and succeeding authors which do not mention *N. elegans* from Malta.

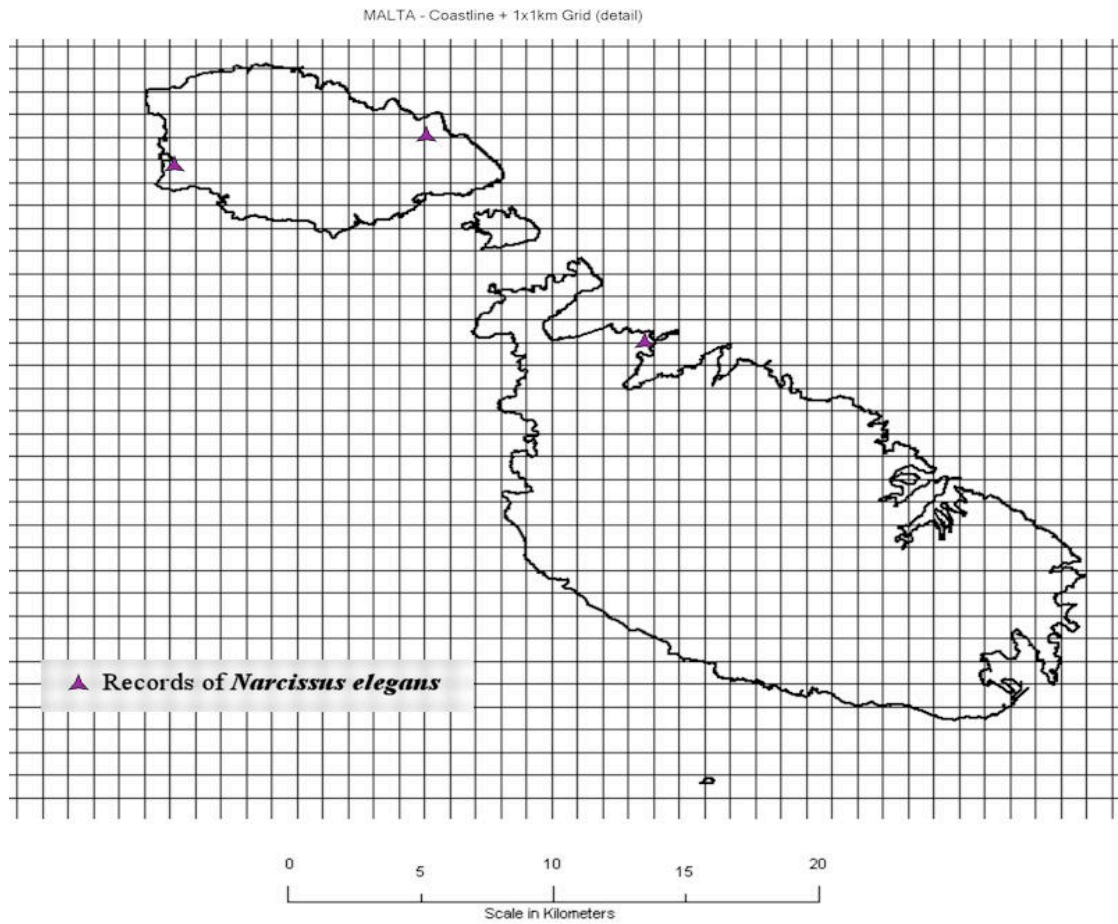
A single specimen of *N. elegans* was found only once by Mr. Hubert J. Spiteri from San Pawl tat-Tarġa (Lanfranco, 1989) in the early 80s (Pers.com. E. lanfranco). Mr. Spiteri has not formally published his record (else cited in Lanfranco, 1989) and we were unable to avail photos or herbarium material of his specimen to confirm it. SM visited San Pawl tat-Tarġa in November 2009 and although there were specimens of *N. serotinus* with two flowers, he failed to observe a specimen that qualifies as *N. elegans*. Apart from Spiteri’s record, *N. elegans* was not reported to be found again in Malta. (Pers.com. E. lanfranco).

## Rediscovery of *Narcissus elegans* in Malta:

### Observations *in situ*

*Narcissus elegans* came to light again in autumn 2008 when one of the present authors (EC) found a tuft of specimens in Selmun, l/o Mellieha in October 2008 with two to six flowered scapes. In this paper this specimen is labelled as specimen [A]. On 2-November-2008, SM found similar specimens at Gebel Sornu, l/o Mosta. Specimens of these populations did not fit with the typical morphology of *N. elegans* and on the other hand, they were very different from *N. serotinus* and different from the typical, later flowering *N. tazetta*. Further taxonomical study was hence carried out in 2009.

During the consecutive year, SM found a typical specimen of *N. elegans* in Dwejra, Gozo on the 17-October-2009 in the consecutive week, while revisiting specimen [A] in Selmun, EC found **two** other similar tufts close by and are labelled in this paper as specimen [B] and specimen [C]. These **three** specimens were lying in a distance of about 120m from each other. Few days later, both authors checked again these three Selmun tufts and recorded several morphological characters and measurements (refer to table 1). SM found another flowering clump with typical characters of *Narcissus elegans* at il-Qortin il-Kbira, l/o Nadur, Gozo on 14-Nov-2009. Several specimens of the early-flowering ‘form’ of *N. tazetta* were also found in flower some 250m away, while significant numbers of *N. serotinus* specimens, of which very few were still in flowers, were present not far from this *N. elegans* locus. This demonstrates that the three species of *Narcissus* can be in flower at the same time in Malta and cross-pollination can occur. The distribution of *N. elegans* on the Maltese islands is given in Figure 1, while Figure 2 shows photographic evidence of such populations. Figures 3 and 4 show morphological comparisons amongst the three *Narcissus* species.



**Figure 1:** Distribution of *Narcissus elegans* in the Maltese islands.



**Figure 2:** The three populations of *Narcissus elegans*: Left: Dwejra (Gozo); Center: Selmun [Specimen C]; Right: Qortin il-Kbira, Nadur (Gozo), Oct-Nov 2009.



**Figure 3:** Comparison of flowers of specimen [C] (*N. elegans*) on the left and flowers of a translocated scape of specimen [B] (*N. cf tazetta*) both at Selmun



**Figure 4:** Comparison of flowers from a translocated scape of *N. tazetta* (above) and *N. elegans* at Qortin il-Kbira, Nadur (Gozo). *N. tazetta* has a pale green longitudinal central band on the outer tepals. Comparing *N. cf tazetta* in figure 3 and *N. tazetta* in this figure, one can note that the former has smaller corona and narrower tepals that do not overlap.

## Further taxonomic identification considerations

Morphological characters and measurements of the six mentioned populations were taken and are listed in Table 1 which also compares them with the described characters of *N. serotinus* and *N. elegans* extracted from Pignatti (1982) and Webb (1980). The characters in bold are the distinctive features to differ *N. elegans* from the closely related *N. serotinus*. The number of specimens, accompanying flora, habitat and other observations of each population of *N. elegans* reported in this paper is summarised in Table 2.

After studying numerous specimens in Malta, the authors have determined that all of the following three characters should be used to distinguish *N. elegans* from *N. serotinus* and from the early-flowering varieties of *N. tazetta*, all of which can be found in flower between October and November.

1: Habit: Plants in clumps of eight to twenty specimens (typically fifteen)

*N. serotinus* is normally found as individual plants or very small groups of two to five individuals.

*N. tazetta* usually form large clumps of numerous plants (<20) but young specimens could have less.

2: Leaves: At least three leaves per clump are well developed during the flowering period and have a caniculate shape between 2-5mm wide.

*N. serotinus* forms leaves after the flowering period and have a (sub-) cylindrical shape, 1-1.5mm thick

*N. tazetta* always forms leaves before flowers are formed which are flat and more than 5mm wide.

3: Inflorescence: The clumps have scapes with different number of flowers, usually from one to seven, but more than half should have more than two flowers.

*N. serotinus* often have one and seldom two flowers

Most scapes of a *N. tazetta* clump have five to ten (+) flowers

**Table 1:** Characters of Maltese specimens compared with descriptions of *N. serotinus* and *N. elegans*.

Character	<i>Narcissus serotinus</i> [1]	<i>Narcissus elegans</i> <sup>[1]</sup>	Selmun Spm. [A] [b]	Selmun Spm. [B] [c]	Selmun Spm. [C] [a]	Dwejra [a]	Qortin il-Kbira [a]	Gebel Sornu [c]
<b>Bulb dimensions</b>	Bulb 15-25 × 12-20 mm.	Bulb up to 35 × 30 mm	n/a <sup>[2]</sup>	n/a <sup>[2]</sup>	n/a <sup>[2]</sup>	n/a <sup>[2]</sup>	n/a <sup>[2]</sup>	n/a <sup>[2]</sup>
<b>Habit</b>	not given	not given	in tufts	in tufts	in tufts	in tufts	in tufts	in tufts
<b>Leaf dimensions (L × W)</b>	10-20 cm × 1 mm	8-25 cm × 2-4-5 mm	2-10cm × 1.5-3mm	15-20cm × 3-5mm	8-11cm × 2mm	4-9cm × 2mm	5-16cm × 3-4.5 mm	15-30cm × 3-7mm
<b>Leaf cross section</b>	Cylindrical	Canaliculate d	Canaliculate d	canaliculate-flat	canaliculate d	Canaliculated	canaliculate	canaliculate-flat
<b>Leaf formation</b>	Absent from a bulb which has flowers.	Before or with the flowers	Few present at anthesis	several present at anthesis	few present at anthesis.	few present at anthesis	several present at anthesis	several present at anthesis
<b>No of scapes per tuft</b>	not given	not given	15	12	22	14	12	5-20
<b>Scape length × diameter</b>	Scape 10-25 cm, slender	15-35 cm	7-10cm × 1.5-2mm, terate.	10-20cm × 2-3mm, terate.	14-15cm × 1.5 - 2mm, terate	12cm [4]	16-22cm × 3-4mm, terate	10-20cm × 2-4mm, terate.
<b>No. of Flowers per scape</b>	Flowers solitary, less often 2(-3)	Flowers in umbels of (2-)3-7	2-4	3-6	2-4	(1-)2-3 (-4)	(2-)3-5(6-7)	3-6
<b>Spathe</b>	15-35 mm, hyaline,tubular in lower half.	20-40mm, scarios	30-35mm, scarios	30-35mm, scarios	28-31mm, scarios	30-36mm, scarios	30-38mm, scarios	30-40mm, scarios
<b>Pedicels</b>	Pedicel 7-20(-30) mm	Up to 45 mm, unequal	12-38mm	10-40mm	10-25mm	11 to 22mm	4-20mm	15-45mm
<b>Hypanthial tube [3]</b>	12-20 mm	11-16 mm	14-16mm	13-17mm	15-17mm	15-17mm	16-18mm	14-16mm
<b>Tepal size</b>	10-16 × 3-7 mm	12-20 × 3-6 mm	15 × 5mm	16× 6mm	15 × 4mm	18 × 5mm	14-19 × 5mm	16 × 7mm
<b>Perianth imbrications</b>	not imbricated	not imbricated	slightly imbricated	Imbricated	not imbricate	not imbricated	not imbricated	Imbricated

Corona colour and shape [4]	Orange, 6-lobed	Yellowish-or brownish-green.	Yolk-yellow	Yolk-yellow, sub-triangular	Yellow green.	Yellow-green, sub-triangular	Yolk-yellow, irregularly round	Yolk-yellow, sub-triangular
Corona Dimensions (height × diameter)	1-1.5 × 3-4 mm	1-2 × 3-4 mm	1.5 × 4.5-5.0mm	2 × 5-6mm	1 × 3mm	1 × 3mm	1.5 × 4.5mm	2.5 × 5-6mm
Placement of stamens	not given	stamens included	included, not protruding out	included, not protruding out	included, not protruding out	included, not protruding out	included, not protruding out	included, not protruding out
Flowering Time	Autumn	Autumn	October	October	October	October	November	November

[1] Adapted from species description by Webb (1980)	[a] - typical <i>Narcissus elegans</i>
[2] Bulb not excavated to avoid harm to this rare species.	[b] - <i>N. tazetta</i> / <i>N. elegans</i> intermediate (hypothetical assumption based on observed features of both species)
[3] Measurement doesn't include ovary below flower tube.	[c] - Atypical early-flowering <i>N. tazetta</i> (hypothetical assumption based on observed features of both species)
[4] The colour of the corona was found to vary in flowers of the same species and sometimes even in flowers of same specimen and therefore this has little significant importance	

Table 2: Habitat data and list of plants accompanying the three populations of *Narcissus elegans* in the observed sites of the Maltese Islands

Population Locality	Selmun [ Spm. C ] (Malta)	Dwejra (Gozo)	Qortin il-Kbira, Nadur (Gozo)
Size	21 scapes	13 scapes	12 scapes
Soil depth	18cm	22cm	16cm
Habitat	Garigue on Karstic rock located on coastal cliff edges.	Degraded garigue on crusted globigerina limestone located on coastal cliff edges.	High garigue on Karstic rock located on a hill top about 500m from the coast
Accompanying flora within 10m from the population (Species in bold are the most frequent in the area)	<b><i>Convolvulus oleifolius</i></b> Desrousseaux	<b><i>Daucus gingidium</i></b> L.	<b><i>Cistus monspeliensis</i></b> L.
	<b><i>Urginea pancration</i></b> (Steinheil) Philippe	<b><i>Urginea pancration</i></b> (Steinheil) Philippe	<b><i>Urginea pancration</i></b> (Steinheil) Philippe
	<b><i>Scilla autumnalis</i></b> L.	<b><i>Galactites tomentosa</i></b> Moench	<b><i>Bromus fasciculatus</i></b> Presl
	<i>Asphodelus aestivus</i> Brotero	<i>Asparagus aphyllus</i> L.	<b><i>Oxalis pes-caprae</i></b> L.
	<i>Arisarum vulgare</i> Targ.-Tozz.	<i>Bromus fasciculatus</i> Presl	<i>Arisarum vulgare</i> Targ.-Tozz.
	<i>Asparagus aphyllus</i> L.	<i>Calendula suffruticosa</i> s.l. Vahl.	<i>Asparagus aphyllus</i> L.
	<i>Atractylis gummifera</i> L.	<i>Colchicum cupanii</i> Gussone	<i>Asphodelus aestivus</i> Brotero
	<i>Bituminaria bituminosa</i> (L.) Stirton	<i>Dactylis</i> L. sp.	<i>Colchicum cupanii</i> Gussone
	<i>Calendula arvensis</i> L.	<i>Helichrysum melitense</i> (Pignatti) Brullo, Lanfranco, Pavone & Ronsisvalle	<i>Galactites tomentosa</i> Moench
	<i>Capparis orientalis</i> L.	<i>Inula crithmoides</i> L.	<i>Leontodon tuberosus</i> L.
	<i>Chiliadenus bocconei</i> Brullo	<i>Lamarckia aurea</i> (L.) Moench	<i>Prasium majus</i> L.
	<i>Colchicum cupanii</i> Gussone	<i>Lobularia maritima</i> (L.) Desvaux	<i>Ranunculus bullatus</i> L.
	<i>Daucus carota</i> L.	<i>Lotus cytisoides</i> L.	<i>Rhamnus oleioides</i> L.
<i>Galactites tomentosa</i> Moench	<i>Ruta chalepensis</i> L.	<i>Scilla autumnalis</i> L.	

	<i>Inula crithmoides</i> L.	<i>Oxalis pes-caprae</i> L.	<i>Teucrium flavum</i> L.
	<i>Leontodon tuberosus</i> L.	<i>Scilla autumnalis</i> L.	<i>Teucrium fruticans</i> L.
	<i>Lotus cytisoides</i> L.	<i>Silene vulgaris</i> (Moench) Garcke	<i>Thymbra capitata</i> (L.) Cav.
	<i>Oxalis pes-caprae</i> L.	<i>Thymbra capitata</i> (L.) Cav.	
	<i>Periploca angustifolia</i> L.		
	<i>Rhamnus oleioides</i> L.		
	<i>Sedum sediforme</i> (Jacquin) Pau		
	<i>Senecio bicolor</i> (Willd.) Todaro		
	<i>Teucrium flavum</i> L.		
	<i>Thymbra capitata</i> (L.) Cav.		
<b>Presence of Ruderals</b>	Low	Moderate	Moderate-Low

### Further discussion about intermediate specimens:

The study of few hundreds of *Narcissus* specimens between 2008 and 2010 in Malta have lead to interesting observations based on isometric morphology and plant ecology. Apart the numerous typical forms of the discussed species, SM found intermediate specimens of various degrees between *N. serotinus* and *N. elegans*, as well intermediates between *N. elegans* and *N. tazetta*, the latter being less evident and difficult to distinguish. *N. elegans* itself shows morphological features which lies perfectly between *N. serotinus* and *N. tazetta*. This can be visualised in Figure 5 with complementary photos in Figure 6. Supporting this hypothesis are the inter-specific hybrids that have already been described in the Mediterranean region.

***Narcissus* × *obsoletus*** (Haworth) Spach, Hist. Nat. Vég. 12: 452 (1846) (*Narcissus*)  
= *N. elegans* (Haworth) Spach × *N. serotinus* Linnaeus - Recorded from Morocco and Spain (GBIF, 2009)

***Narcissus* × *rogendorfü*** Battandier, Fl. Algérie Tunisie: 327 (1904) (*Narcissus*)  
= *N. elegans* (Haworth) Spach × *N. tazetta* - Recorded from Algeria (GBIF, 2009)

Studies on specimens from Malta show that there is a gradual progress of evolution from the 'meagre' *N. serotinus*, to the 'plentiful' *N. tazetta*. Our model is illustrated in Figure 5 where the evolution drift is represented by a resolution of 9 hypothetical evolutionary stages, with *N. serotinus* at one end (stage A), *N. tazetta* at the other end (Stage I) and *N. elegans* lying in the middle (Stage E). Three further evolutionary stages separate one species from the next and refer to intermediates with different affinities to the corresponding parents, where the middle stages of each (C and G) should correspond to the alleged described hybrids.

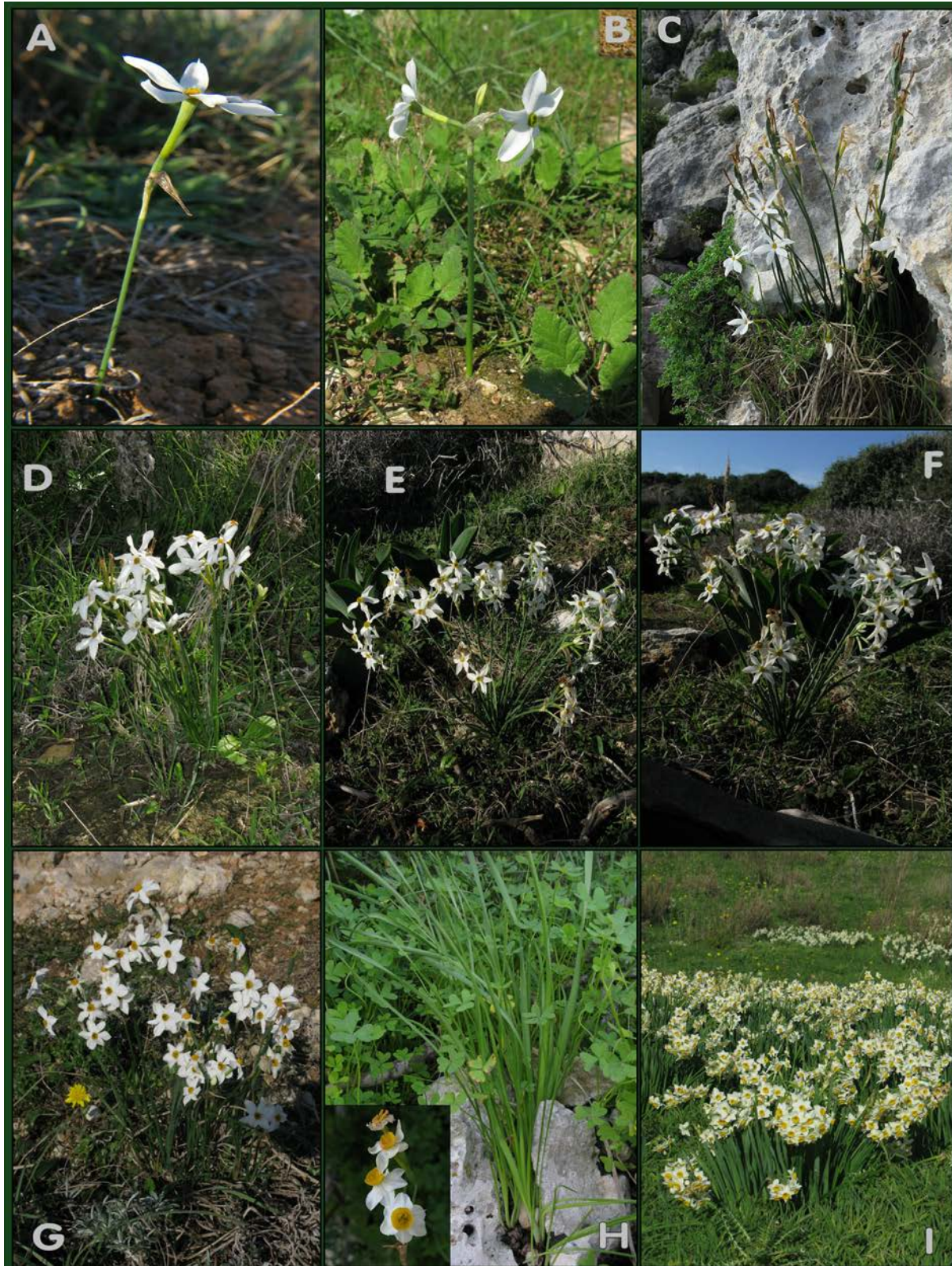
The early flowering *N. tazetta* specimens that appear in flowers from late October, possessing relatively narrow leaves, smaller perianth and corona (compared to typical later-flowering *N. tazetta*) and growing in rocky habitats are considered by the authors to be intermediates between *N. elegans* and *N. tazetta* with affinities to the latter parent species. Such examples were observed in Gebel Sornu (l/o Mosta), Mistra, Selmun and Wied Babu in mainland Malta and in Is-Simar l/o Qala, il-Qortin il-Kbira l/o Nadur, Ta' Cenc and Hondoq ir-Rummien in the island of Gozo (refer to fig. 6G & 6H). This is supported by descriptions of *N. tazetta* which is distinguished as a winter-spring flowering plant not autumnal. In the taxonomical keys given by Webb (1980), *N. tazetta* is keyed as "*Flowering in winter, spring or early summer (January to June)*" opposed to "*Flowering in autumn (September to November)*" for autumnal species like *N. serotinus* and *N. elegans*. Similarly, Pignatti (1982) states that *N. tazetta* flowers in the south of Italy between December and March. Hence, strictly speaking, the October-November flowering 'N. tazetta' specimens are not *N. tazetta* according to the literature cited above.

Interestingly, the habitat also fits in the evolutionary drift. At one end, *N. serotinus* grows in shallow pockets of soil (4-12cm deep) gathered in gaps and basins on karstic rock, on the other end, typical *N. tazetta* is usually found in deep (>50cm), often clayey soil of (abandoned) fields, while *N. elegans* specimens were found growing in garigue with soil level between 15-30cm deep. The trend also applies for the flowering period, number of flowers per scape, tuft size, corona size, tepal imbrication and the general size of the specimens amongst few other minor characters (Fig. 5).

Evolutionary Stages	A	B	C	D	E	F	G	H	I
Taxon	<i>Narcissus serotinus</i>	Intermediates			<i>Narcissus elegans</i>	Intermediates			<i>Narcissus tazetta</i>
		affinity <i>serotinus</i>	hybrids <i>N. x obsoletus</i>	affinity <i>elegans</i>		affinity <i>elegans</i>	hybrids <i>N. x rogendorffii</i>	affinity <i>tazetta</i>	
Flowering time	Earliest End Sep to Oct	Oct - Nov			Later Mid Oct - mid Nov	Nov-Jan			Latest Jan - Mar
Habitat	Shallow soil in rock depressions and basins				Deeper soil in rocky slopes				Deep soil often in clayey fields
Habit	Solitary, small plants average 12cm	Groups of few plants			Tufts of 10-25 plants, average 30cm high	Groups of many plants			Dense tufts of robust plants, average 50-70cm
No. of flowers / scape	1 (2)	2-4			(2)3-5(6-7)	5-8(-10)			(6-)8-10(-12)
Formation of leaves	Always after the flowering period				During flowering period				Always before the flowering period
Leaf cross section	Cylindrical	Sub-cylindrical, grooved			Canaliculate				Flat
Leaf width	1.0-1.5mm	1.5mm			(1.5)2-4(5)mm	(4-)5-9(-10)mm			12-20(-25)mm
Corona diameter	2-3mm	2-3mm			3-5mm	5-7(8)mm			(7)8-12(15)mm
Tepal imbrication	Never				Seldom				Almost always
Fragrance	Own delicate fragrance, rather mild				Moderate 'tazetta-like' fragrance				Strong, characteristic 'tazetta' fragrance
Frequency and examples of locations (unless common)	Common	Locally frequent	Pergla Qala	Dwejra	Selmun [C]	Qortin Kbira [A]	Selmun [A] Gebel Sornu	Locally frequent (eg: Qortin Kbira [B]; Selmun [B])	Common
Interpretation of main taxa in this paper	Evolution stages A-B-(C) = <i>Narcissus serotinus</i>			Evolution stages D-E-F = <i>Narcissus elegans</i>			Evolution stages: (G)-H-I = <i>Narcissus tazetta</i>		

**Figure 5:** Hypothetical model of evolutionary stages from *N. serotinus* to *N. elegans* to *N. tazetta* based on morphological and ecological features studied in specimens occurring in Malta.





**Figure 6:** Composite image showing the observed stages of evolution from *N. serotinus* (A) to *N. elegans* (E) to *N. tazetta* (I) and intermediate specimens (B)(C)(D) and (F)(G)(H).

A: Typical *N. serotinus* with one flower; B: *N. serotinus* with three flowers; C: Clump of seventeen spathes each with one or two flowers; D: *N. elegans* (Dwejra, Gozo); E: *N. elegans* (Selmun, specimen C); F: *N. elegans* (Nadur, Gozo); G: 'early-flowering' *N. tazetta* (Selmun, specimen B); H: 'early-flowering' *N. tazetta* (Gebel Sornu, Mosta); I: Typical *N. tazetta* in dense clumps.

All photographs in this article were taken by **Stephen Mifsud** (info@MaltaWildPlants.com)

## CONCLUSIONS

*N. serotinus*, *N. elegans* and *N. tazetta* are very variable species (Webb, 1980) and from the studied specimens, some of their morphological features can intersect with each other. In addition, both *N. tazetta* and *N. serotinus* are reported to hybridise with *N. elegans* and such hybrids have already been described from the Mediterranean region. The results show that specimen [C] from Selmun, and the Gozitan populations at Dwejra and Qortin il-Kbira are the typical examples of *Narcissus elegans*, while the other specimens examined have more in common with *N. tazetta* but share some characters of *N. elegans*, such as early flowering time, habitat, narrow leaves, and rather smaller coronas from the described *N. tazetta*.

Although the further discussion of intermediate specimens may only have a limited scientific value, it is of good base for further studies using chromosomes and DNA analysis, (which are out of the authors' budget and scope in this paper) on the statement that "*Cytological investigation has helped greatly in establishing the hybrid nature of taxa formerly regarded as independent species*" (Webb, 1980). For this and other reasons, in this paper, there is no confirmation of any hybrids and the specimens in stages (D), (E) and (F) are treated as *Narcissus elegans*. With respect to the habitats where *N. elegans* was observed, the accompanying flora recorded in Table 2, and Figure 5 and 6, show that this species is adapted to grow in a variety of garigue communities. Therefore, such finds further support the theory of hybridisation with the two other *Narcissus* species, which also inhabit similar vegetative communities.

---

## ACKNOWLEDGEMENTS

Special thanks to Edwin Lanfranco for his assistance in providing further information about the status and previous records of *Narcissus elegans* in the Maltese Islands.

---

## REFERENCES

### i) References from printed bibliography

**Borg, G.** (1927). *Descriptive flora of the Maltese Islands*. Malta: Government Printing Office, 846pp.

**Grech Delicata, J.C.** (1853). *Flora Melitensis stirpes phanerogamae in Malta insulisque adjacentibus hucusque detectas secundum systema Candolleianum digestas*. Malta.

**Conti, F., Abbate, G., Alessandrini, A. & Blasi, C.** (eds.) (2005). *An Annotated Checklist of the Italian Vascular Flora*, Palombi Editori, Roma Italy.

**Haslam, S.M., Sell, P.D. & Wolseley, P.A.** (1977). *A Flora of the Maltese Islands*. Malta: Malta University Press, lxxi + 560pp.

**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.

**Pignatti, S.** (1982). *Flora d'Italia*, 3 volumes Edagricole, Bologna.

**Sommier, S. & Caruana Gatto, A.** (1915). *Flora melitensis nova*. Firenze. Talavera Italia.

**Webb, D.A. in Tutin, T. G., Moore, D. M.; Valentine, D. H.; Walters, S. M. & Webb, D. A.** (1980). *Flora Europaea Volume 5 Alismataceae to Orchidaceae (Monocotyledones)*. Cambridge: Cambridge University Press, xxxvi+452pp

**Weber, H.C. & Kendzior B.**, (2006). *Flora of the Maltese Islands. A field Guide*. Margraf Publishers, Weikersheim, Germany.

**Zerapha, S.** (1827-31) *Florae Melitensis Thesaurus, sive planatarum enumeratio quae in Melite Gaulosque insulis aut indigenae aut vulgatissimae*. Malta, 86pp

ii) References from Online sources

**HV** – Harbario Virtual del Mediterraneo Occidental (Last accessed on Nov 2009)  
<http://herbarivirtual.uib.es/eng-med/especie/4909.html>

**FN** – First Nature Wild Flowers (Last accessed on Nov 2009)  
[http://first-nature.com/flowers/narcissus\\_elegans.asp](http://first-nature.com/flowers/narcissus_elegans.asp)

**GBIF** - Global Biodiversity Information Facility website. (Last accessed on Dec 2009)  
<http://data.gbif.org/>

**USDA** - United States Dept. of Agriculture, Plants Database website. (Last accessed on Dec 2009)  
<http://plants.usda.gov>