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## **Taxonomic notes on *Anacamptis pyramidalis* var. *urvilleana* (*Orchidaceae*), a good endemic orchid from Malta**

### **Keywords**

*Orchidaceae*; *Anacamptis urvilleana*; *Anacamptis pyramidalis*; *Anacamptis pyramidalis* var. *urvilleana*; Maltese endemics; Flora of Malta; Central Mediterranean region.

### **Summary**

Mifsud S. (2016): Taxonomic notes on *Anacamptis pyramidalis* var. *urvilleana* (*Orchidaceae*), a good endemic orchid from Malta.- J. Eur. Orch. 48 (1): 19-28.

In several global plant species databases the Maltese-endemic *Anacamptis urvilleana* is considered as a synonym of *A. pyramidalis*, hence reflecting the belief of some European authors. A number of morphological differences and phenology differentiate the Maltese pyramidal orchid from *A. pyramidalis*. As a result, it is suggested to maintain the identity of this orchid as *A. pyramidalis* var. *urvilleana* which merits conservation treatments different from the widely distributed *A. pyramidalis* s. str.

### **Zusammenfassung**

Mifsud S. (2016): Taxonomische Anmerkungen zu *Anacamptis pyramidalis* var. *urvilleana* (*Orchidaceae*), eine gute endemische Orchidee von Malta.- J. Eur. Orch. 48 (1): 19-28.

In verschiedenen weltweiten Datenbanken botanischer Namen, die auch die Meinung einiger europäischer Autoren wiedergeben, wird der maltesische Endemit *Anacamptis urvilleana* als Synonym von *A. pyramidalis* geführt. Die maltesische Pyramiden-Hundswurz unterscheidet sich jedoch sowohl in einer Reihe von morphologischen Merkmalen als auch phenologisch von *A. pyramidalis*. Auf dieser Grundlage wird vorgeschlagen, diese Orchidee als *A. pyramidalis* var. *urvilleana* zu führen. Zu ihrem Schutz sind andere Erhaltungsmaßnahmen erforderlich als für die weitverbreitete *A. pyramidalis* s. str.

## 1. Introduction

*Anacamptis urvilleana* Sommier & Caruana Gatto was described in 1915 (refer Fig.1) as an endemic orchid from the Maltese islands. It is related but distinct from *A. pyramidalis* (L.) Rich, the latter also present on Maltese islands (SOMMIER & CARUANA GATTO 1915).

The distinction and hence species identity of *A. urvilleana* is evident by several regional works (e.g. LANFRANCO, 1960; KRAMER et al. 1972; HASLAM 1977; PIGNATTI 1982; DEL PRETE et al. 1991; BARTOLO et al. 2001; BAUMANN et al. 2006; WEBER 2006; LANFRANCO 2007; MIFSUD 2007; LANFRANCO & BONETT 2015). *A. urvilleana* was demoted to the infraspecific rankings of subspecies (LANDWEHR 1977, nom. inval.) and variety (KELLER & SCHLECHTER 1926) of *A. pyramidalis*. BORG (1927) also combined it to *A. pyramidalis* var. *sommeriana*, which, as it has already been expressed by KRAMER et al. (1972), this is an illegitimate name because the variety was already been described one year earlier.

Interestingly, several species databases (IPNI, The Plantslist, Tropicos) attribute the author citation of *A. pyramidalis* var. *urvilleana* to a later work by KREUTZ (2004), which should be regarded as nomen superfluum (pers. comm. Karel Kreutz, Jan, 2016). The Maltese endemic was considered by Delforge (2006) as a variant meriting, together with ‘*brachystachys*’, ‘*tanayensis*’ and ‘*sanguinea*’ a brief account, but such variants were considered to have “little evolutionary significance”.

*A. urvilleana* is recently found synonymised with *A. pyramidalis* by several global biodiversity databases namely: Catalogue of Life, GBIF, eMonocot, Kew’s World Checklist, The Euro+Med PlantBase and the PlantList, possibly reflecting the belief of some European authors like BUTTLER (1991) and KRETZSCHMAR et al. (2007). On the other hand, IPNI and Tropicos recognise *Anacamptis pyramidalis* (L.) Rich. var. *urvilleana* (Sommier & Caruana Gatto) Kreutz. As described below, this synonymisation is considered to be excessive lumping of two entities that are distinct.

**705.** — *Anacamptis pyramidalis* (L.) Rich.; GD. p. 34; Parl. Fl. it. III p. 452; Gulia Barth I p. 283; Duthie Barth p. 542; CG. Medit. Nat. p. 276 et 277; Gulia fil. Nat. Malt. p. 9. *Orchis pyramidalis* D'Urv. p. 119; Z. p. 57; CG. Nat. Malt. p. 8.

Luoghi aprici erbosi. — **Malta, Gozo, Comino e Cominotto**, molto frequente! — Aprile-Giugno.

Vendesì dai fiorai.

Questa specie, nell'Arcipelago Maltese, non presenta la grande variabilità che si osserva altrove. Ha l'infiorescenza, al principio dell'antesi, sempre conico-allungata, ha i fiori di un rosa scuro, ed ha le brattee cuspidate sempre più lunghe dell'ovario ed oltrepassanti assai i bocci, in modo che l'infiorescenza giovane appare molto manifestamente comata, per cui meriterebbe di essere distinta col nome di forma *comata*.

**706.** — *Anacamptis Urvilleana* Nobis. *A. pyramidalis* var. CG. Medit. Nat. p. 276 et 277. *Orchis condensata* D'Urv. p. 119.

Ab *A. pyramidalis* (L.) Rich. differt: floribus minoribus pallide roseis, nonnunquam lacteis, perigonii phyllis interioribus et superiore obtusiusculis, bracteis brevioribus ovarium non vel vix aequantibus, inflorescentia densa breviter ovata deinde oblonga vel ovato-oblonga nunquam conico-pyramidata, nunquam comata, tota planta saepius humiliore et graciliore, athesi precociore.

Luoghi aprici. — **Malta**, qua e là, meno frequente della precedente, *Ħied Babu, Ħied Incita, Ħied Ghomor, Ta Baldu, San Paolo a mare* ecc. ! **Gozo, Mendi** ecc. ! — Febbraio-Maggio.

Nell'Arcipelago Maltese esistono due *Anacamptis* ben distinte l'una dall'altra, che non presentano mai passaggi fra loro benchè spesso crescano insieme, e di cui una è in pieno fiore quando appena sbocciano i primi fiori dell'altra.

Fig. 1: Protologue of *Anacamptis urvilleana* Sommier & Caruana Gatto (Scanned from SOMMIER & CARUANA GATTO 1915: 273).

## 2. Distinction of *Anacamptis pyramidalis* var. *urvilleana* from var. *pyramidalis*.

The situation in Maltese islands gives clear evidence that two distinct phytomorphs exist, hereunder referred for convenience as *A. urvilleana* and *A. pyramidalis*. Both are related and with a wide and slightly overlapping variability. The phenological difference is perhaps the most important distinguishing criterion in the field, where in Malta, *A. urvilleana* flowers as early as in late February, peaking for three weeks in mid-March, with some specimens persisting up to mid or very rarely to the end of April. *A. pyramidalis* starts flowering in Malta by end of April (rarely a week earlier), peaks in May, with some specimens making it to beginning of June. The shift of flowering periods is possibly related to different annual climatic conditions. Different authors (e.g. SOMMIER & CARUANA GATTO 1915) expressed that there is no overlap of the flowering period - which in general is true, but the two species can rarely flower contemporary during the mid- or end of April (Fig. 2E), hence allowing exchange of pollen and possibly, minimal genetic introgression, if the two are genetically compatible.

Morphologically, the early flowering *A. urvilleana* forms flowers with white, pale pink, or mixed colours (Fig. 2A,2C,2D,2F) but never a vivid magenta-purple as in the typical *A. pyramidalis* (Fig. 2B). The latter can sometimes be found in light shades of purple or on the other hand, intense purple. The size of the inflorescence which usually determines the shape of the spike, do vary and overlap between the two species, but the trend is a dense and elongated subcylindrical spike for *A. urvilleana*, and a shorter, typically conical-pyramidal shape for *A. pyramidalis* (Fig. 2E,2A,2B). The flowers of *A. urvilleana* are smaller by about 30%, where for example, the spur of *A. pyramidalis* is 12-16(-19)mm long while in *A. urvilleana* it is only (6-) 8-10mm long (Fig 2G,2H). The shape of the tepals vary considerably (Fig. 2C,2D), both in the shape of the labellar lobes and the sinuses they produce, making it difficult to find diagnostic morphological characters to distinguish both species. The stature of *A. urvilleana* is on average smaller and plants are often found in clumps of three to eight (Fig. 2F) whereas, *A. pyramidalis* is more robust and often singular or occasionally grouped up to four plants in a clump.

Beside the phenological and morphological differences, DEL PRETE et al. (1991) revealed important karyological differences from Maltese material. *A. pyramidalis* has a chromosome number of  $2n=72$  ( $2n=54$  and  $2n=63$  also reported from Italy and France) while that of *A. urvilleana* (collected from Dingli, Malta) is  $2n=36$ .

The authors have highlighted these karyological difference and emphasized the separation of the two species, however, chromosome counts of  $2n=36$  and  $2n=72$  have been later both reported in *A. pyramidalis* collected from Apulia (BIANCO et al. 1991). Another somatic study was carried out by D'EMERICO et al. (1993) who analysed purple, pink and white forms within a two adjacent clumps of *Anacamptis pyramidalis* with a resulting chromosome count of  $2n=36$ ;  $2n=54$  and  $2n=72$  respectively, giving the simple interpretation that the triploid pink plants are a cross of the diploid purple and tetraploid white ones. If the white form of *Anacamptis pyramidalis* is confined to have  $2n=72$ , then the Maltese *A. urvilleana* with  $2n=36$  has a different karyology, giving credit to the conclusions of DEL PRETE et al. (1991)

What's important is that in Malta, the almost complete phenological isolation, possible pollinator incompatibility due to differently sized flowers, and perhaps the different chromosome numbers, collectively act as a strong hybridisation barrier, hence forming two, well conserved, phenotypically distinct orchids: a diploid, March-flowering *A. urvilleana* and a tetraploid, May-flowering *A. pyramidalis*. As described below, this situation is not found elsewhere in Europe.

For instance, according to MARTIN et al. (2015), only *A. pyramidalis* s. str. is present in Tunisia, represented by a May-flowering population forming rose-purple flowers. Similarly, in Sicily, only a late flowering population of *A. pyramidalis* is found (GIARDINA et al. 2007), however, the present author have once found a pyramidal orchid with pink flowers on the 7<sup>th</sup> April 2012 from Cava d'Aliga (Ragusa) which due to large flowers and long spur, it was attributed to an abnormally early flowering *A. pyramidalis*. In Corsica there is one flowering period in April composed of a pale-flowering population of *A. pyramidalis* (pers. comm. Delage Elaine, Jan 2016). In Crete and Greece, there is a prolonged continuous flowering period of white, pink and purple forms from Mar to mid of May (FLOWERSOFCRETE 2015; LENT VAN 2014; LEWIS 2015). Possibly this represents a swarm of *A. pyramidalis* consisting of different coloured and perhaps different somatic count that D'EMERICO et al. (1993) had demonstrated.

DELFORGE (2006) reported the '*urvilleana*' variant also from Crete. The images of *A. pyramidalis* displayed in KRETSCHMAR et al. (2004) and FLOWERSOFCRETE (2015), both of which state an early flowering in March and April, provide some but not conclusive evidence that the early-flowering Cretan population of *A. pyramidalis* resembles the Maltese *A. urvilleana*. These Cretan orchids are ascribed to *A. pyramidalis* var. *brachystachys*, and apart from the geographical separation, they are described to have lax-flowered inflorescence and taller, slender stem (DEL PRETE et al. 1991; DELFORGE 2006; LENT 2014), hence differing from the compact long spikes of *A. urvilleana*.

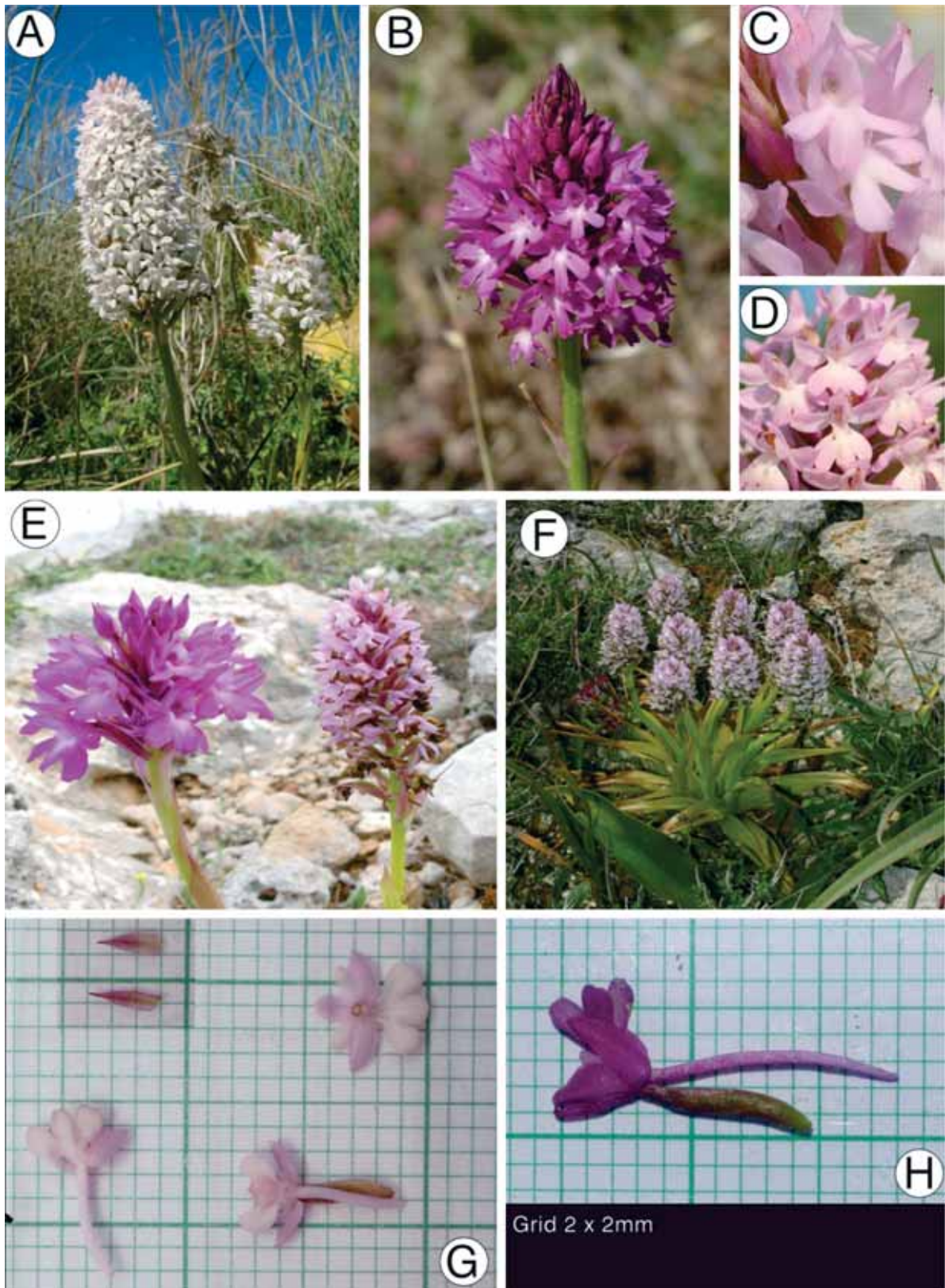


Fig. 2: **A.** White form of *Anacamptis urvilleana*, Wied Anglu, Ghargur (limits of Naxxar), Malta, 100 m. a.s.l., 05-Apr-2006; **B.** *A. pyramidalis*, Ta' Zuta, Dingli, Malta, 220 m. a.s.l., 10-May-2012;

Fig. 2 (continued): **C-D.** Close-up photo of pink flowers of *A. urvilleana* showing variation in sinuses and labellar lobes, Ta'Cenc limits of Ta' Sannat, Gozo, 120 m. a.s.l., 23-Mar-2007; **E.** *A. pyramidalis* (left) and *A. urvilleana* (right) flowering together at Wied Hoxt, Zurrieq, Malta, 80 m. a.s.l., 13-Apr-2005; **F.** *A. urvilleana* in a clump of eight plants, Rđum tal-Madonna/Ahrax tal-Mellieha, Mellieha, Malta, 180 m. a.s.l., 2-Apr-2012; **G.** Dissected flower of *A. urvilleana* on graph grid (2 × 2mm) with a spur measuring 8.5mm; Mistra, Mellieha, Malta, 150 m. a.s.l., 31-Mar-2005; **H.** Flower of *A. pyramidalis* on graph grid (2 × 2mm) with relatively larger flowers and with a spur measuring 19mm long, Ta' Zuta, Dingli, Malta, 220 m. a.s.l., 24-May-2014. All photos by Stephen Mifsud.

### 3. Conclusions

Further phylogenetic and taxonomic studies are suggested to clarify further the separation. These include:

1. Field studies for *A. urvilleana* from the south-east of Sicily; at present assumed that all populations are *A. pyramidalis*;
2. a detailed morphological and perhaps phylogenetic comparison of the early-flowering, urvilleana-like specimens from Crete with *A. urvilleana* from Malta. This helps to understand the relationship, if any, of *A. pyramidalis* var. *brachystachys* with *A. pyramidalis* s. str. and with *A. urvilleana*;
3. an in-depth karyological study of the varieties and colour forms of *A. pyramidalis*. These studies will give a better understanding about the taxonomic status and hence the global range of *A. pyramidalis* s.l. and *A. urvilleana*, so far, to be considered a good endemic orchid from the Maltese islands (SOMMIER & CARUANA GATTO 1915; DEL PRETE et al. 1991; BARTOLO et al. 2001; MIFSUD 2007; LANFRANCO & BONNET 2015).

Due to reasonable morphological similarities with *A. pyramidalis* and since there is no considerable geographic separation (sympatric association), the varietal ranking of the Maltese endemic is the most suitable:

*Anacamptis pyramidalis* var. *urvilleana* (Sommier & Caruana Gatto) Schlechter, Monogr. Iconogr. Orchid. Eur. 1: 153. 1926.

≡ *Anacamptis urvilleana* Sommier & Caruana-Gatto, Boll. Reale Orto Bot. Palermo, n.s. 1 (App.): 273 1915.

≡ *Anacamptis pyramidalis* var. *sommieriana* (Sommier & Caruana-Gatto) Borg, Desc. Fl. Malt. Isl.: 372-373. 1927, comb. illegit.

- ≡ *Anacamptis pyramidalis* subsp. *urvilleana* (Sommier & Caruana-Gatto) Landwehr, Wilde Orchid. Eur. 2: 342 1977, comb. inval.
- ≡ *Anacamptis pyramidalis* var. *urvilleana* (Sommier & Caruana-Gatto) Kreutz, Kompendium Eur. Orchid.: 30. 2004, nom. superfl.

The frequency of *Anacamptis pyramidalis* var. *urvilleana* on the Maltese islands should be considered infrequent or scarce (often locally frequent where present) with some 50 stations recorded in the Maltese islands (SOMMIER & CARUANA GATTO 1915; BORG 1927; BARTOLO ET AL 2001). The populations found by author at Xemxija Roman Tombs (San Pawl il-Bahar, Malta; 23-Mar-2007); San Martin (San Pawl il-Bahar, Malta, 27-Mar-2007); Pembroke Rifle Ranges\* (Pembroke, Malta, 10-Apr-2007); Torri l-Ahmar (Mellieha, Malta, 29-Mar-2011); Rdum tal-Madonna (Mellieha, Malta, 4-Apr-2012); Ahrax tal-Mellieha (Mellieha, Malta, 4-Apr-2012); Ghajn Hadid (Mellieha, Malta, 10-Apr-2012); il-Qawrra (San Pawl il-Bahar, Malta, 21-Mar-2015) and Ta' Cenc (Sannat, Gozo, 2-Apr-2007) are additional new records. [\* pers. comm Darrin Stevens].

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