

D. Tzanoudakis & Z. Kypriotakis

## *Allium platakisii*, a new species of the Greek insular flora

### Abstract

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*Allium platakisii*, a rare species of the Greek flora occurring on the islet of Pondikonisi (NW of Crete), is described as new to science. The morphology and the karyotype of the new species are illustrated, and its relationships are discussed.

### Introduction

In the framework of a project of floristic exploration and study in the Aegean islets, special attention has been given, by the project group in Patras, to the islets of the eastern and southern Aegean area. Many of them have been visited, and for some, floristic studies have been published (Christodoulakis & al. 1990, 1991; Panitsa & Tzanoudakis 1992).

Among the islet groups visited were the Grambouses islets, off the N. W. coast of Crete. In the most remote and smallest islet of this group, Pondikonisi, some *Allium* bulbs have been collected, which in cultivation gave rise to the new species described here.

It is named in the honour of the Cretan naturalist Prof. E. Platakis, who is well known as a spelacologist but, as a real lover of Crete and its nature, has also contributed to the study and the conservation of the wildlife of the island.

### Material and methods

The investigation was made on live material (bulbs) collected in the type locality and cultivated in the experimental gardens at the University of Patras. For caryological study, root-tips from potted bulbs were pre-treated and stained as described by Tzanoudakis (1983).

*Allium platakisii* Tzanoudakis & Kypriotakis, sp. nova (Fig.1). — Typus: Greece, Cretan area, Prov. Chania, islet Pondikonisi c. 10 km W. of the cape Grambousa, coastal limestone cliffs, 20.4.1990, *Kypriotakis s.n.* (UPA).

Planta perennis. Bulbus scapiferus oblongo-ovoideus, c. 3 x 1.8 cm, bulbus sterilis c. 2 x 1.3 cm, tunicis externis membranaceis vel papurascentibus, integris, induratis. Scapus solitarius, c. 30 cm altus, erectus, vaginis foliorum glabris per tertiam vel mediam partem longidutinis tectus. Folia 4-6, fistulosa, glabra, sursum canaliculata, incurvata, linearia, scapum non excedentia, 2.5-5 mm lata. Spatha bivalvis, persistens, valvis inaequalibus liberis oppositis, 5-6 nerviis, oblongo-lanceolatis acuminatis; valva major 5-

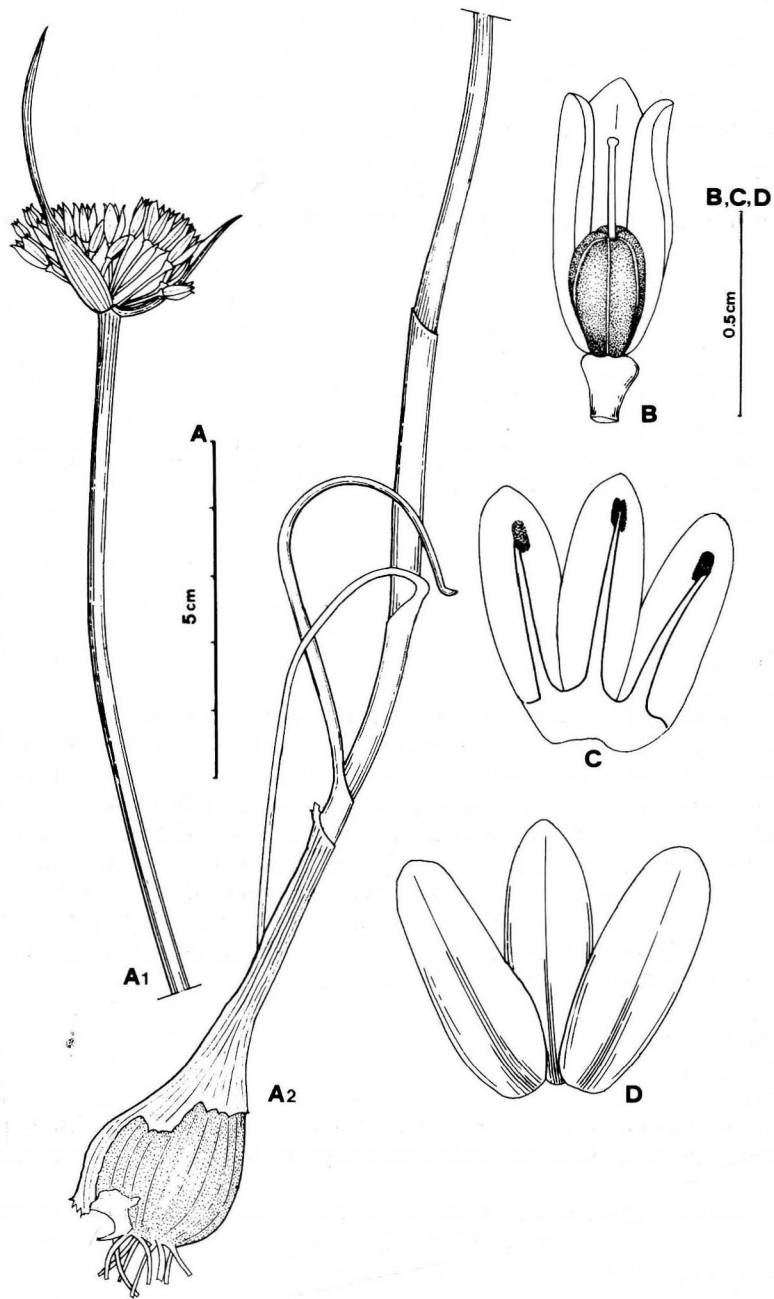


Fig.1. *Allium platakisii*, - A1, A2, habit; B, perianth with ovary; C, inside view of perianth with stamens; D, outer view of perianth segments.

6 cm longa inflorescentiam manifeste superans, valva minor c. 2 cm longa, inflorescentiam subaequans vel parum superans. Inflorescentia fastigiata multiflora (floribus 25-35); bostryces multi, bracteis hyalinis parvis, unaquaque 4-5 flores subtendente; pedicelli subaequales, c. 1 cm longi. Perigonium subcylindricum, leviter urceolatum. Tepala aequilonga, oblonga, 6-7 mm longa et 2-2.3 mm lata, obtusa vel obtusiuscula, alba, nervo mediano purpureo. Stamina inclusa, filamento simplici, inferne cum tepalis per c. 1 mm in anulum connata, anthera luteola. Ovarium obovoideum, apice truncatum c. 3 x 1.7 mm; stylus albidus. Capsula trigona, c. 5 x 4 mm — Numerus chromosomatum:  $2n = 16$ . - Floret mensibus septembri et octobri.

**Ecology** — *Allium platakisii* was found on the rocky coasts of the islet Pondikonisi, c. 10 km W. of the N.W. coast of the island of Crete. The islet consists exclusively of mesozoic limestones, and the new species grows on the almost vertical cliffs of the northwestern side. At this locality *A. platakisii* is associated with other typical chasmophytic species of the Aegean flora as *Achillea cretica* L., *Ptilostemon chamaepeuce* (L.) Less., *Dianthus fruticosus* L., *Inula candida* (L.) Cass., *I. crithmoides* L., *Silene fabaria* (L.) Sm., etc. *A. platakisii*, up to now, is known only from the type locality and may be considered a S. Aegean endemic.

**Caryology** — In the material cytologically investigated the diploid chromosome number  $2n = 2x = 16$  was found. The basic chromosome number  $x = 8$  is the most common in the genus *Allium* and the diploid number  $2n = 16$  occurs in the majority of Greek *Allium* endemics (Tzanoudakis & Vosa, 1988). The karyotype of *A. platakisii* consists of seven more or less isobrachial (m, metacentric) and one anisobrachial (sm, submetacentric) chromosome pairs (Fig. 2C, 3B). The chromosomes of the latter pair are characterized by a nucleolar organizer in a region of the short arm proximal to the telomere.

**Vegetative life cycle** — As a geophyte, *Allium platakisii* maintains its vegetative propagation capacity only by means of the renewal bulbs, since underground bulblets have not been observed. The species shows a characteristic "dichotomous" vegetative reproduction, since each parental bulb, in the following year, gives rise to two new individual plants by activation of a corresponding number of renewal bulbs (Fig. 2A, B). The activation of the renewal bulbs starts before the end of the flowering period, and as a consequence the dormancy phase of the new species is very restricted as compared to the vegetative phase. As in *A. sect. Codonoprasum* the bulbs have been described as producing only one renewal bulb ("melanoallium type", Valdés & Pastor 1986), the bulb structure of *A. platakisii* needs further study.

**Taxonomic relationships** — Based on the morphology of the spathe and spathe valves, the absence of nectariferous pores from the ovary, and the numerous (evidently more than four) bostryces of the inflorescence, *Allium platakisii* should be placed in *A. sect. Codonoprasum* Reichenb.. However, that *A. platakisii* seems to be one more example of a Greek *Allium* species with an intermediate position between typical members of *A. sect. Codonoprasum* and *A. sect. Scorodon* Koch (see also Tzanoudakis & Vosa 1988). Indeed some of its characters, viz. the fastigiate, more or less compact inflorescence and the large (up to 7 mm), urceolate perianth, are characteristic of *A. sect. Scorodon* rather than of *A. sect. Codonoprasum*. Notwithstanding the difficulties of its sectional placement, *A. platakisii* is a distinctive species which, in addition to the morphological features already mentioned, is also characterized by its autumn flowering habit. In its late flowering and in bulb morphology, *A. platakisii* shows some resemblance to *A. tardans* Greuter & Zahar., an autumn flowering species endemic to the S. Aegean area (Crete and Karpathos).

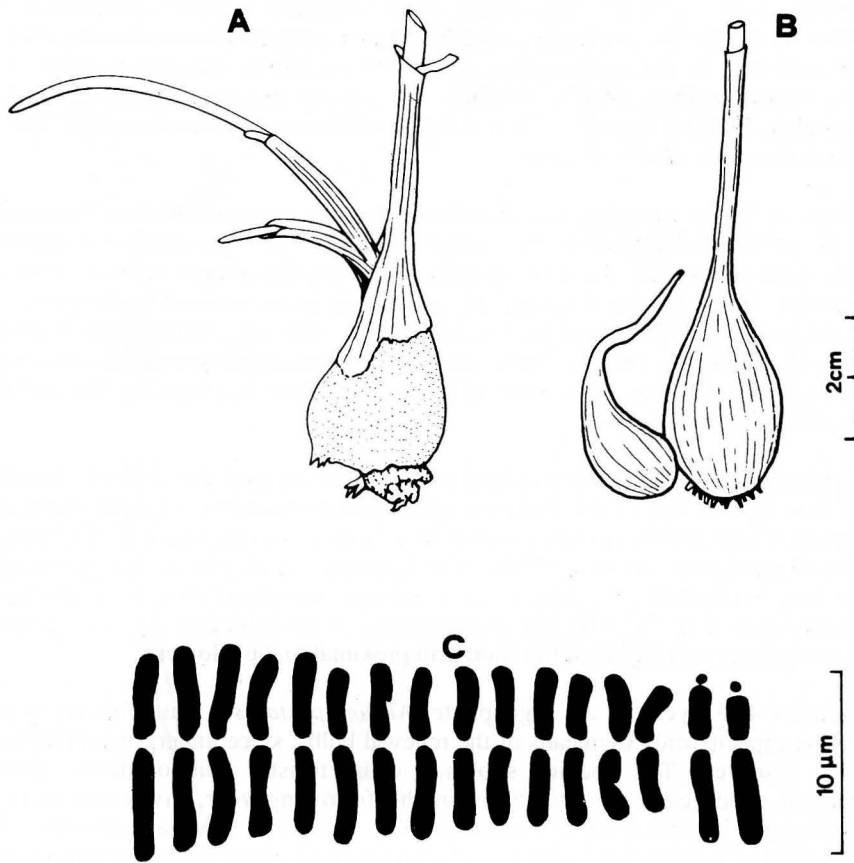


Fig.2. *Allium platakisii*, - A, Parental bulb at the beginning of the growing season, giving rise to two new plants; B, the two bulbs formed at the end of the growing season by the maternal one; C, karyogram.

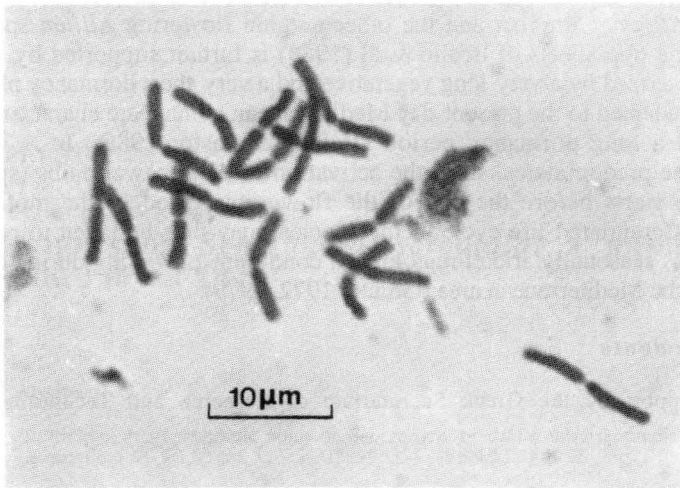


Fig.3. *Allium platakisii*, mitotic metaphase plate.

*A. platakisii* is however well distinct in a number of morphological characters, such as the more robust habit; the wider leaves, which sheathe the lower half or one third of the stem only (up to five sixths in *A. tardans*); the fastigate inflorescence which, as compared to *A. tardans*, consists of more numerous, but shorter pedicellate, flowers; and the larger, whitish and more or less urceolate flowers (pinkish or pink-greenish and campanulate in *A. tardans*).

When compared to other Greek *Allium* species with a 2-valved spathe, a fastigate inflorescence and urceolate flowers, *A. platakisii* shows some resemblance to *A. ionicum* Brullo & Tzanoudakis, known from islands and coasts of the Ionian Sea, in W. Greece. The latter is however a more delicate plant, with hairy leaf sheaths and leaves and with smaller flowers (Brullo & Tzanoudakis 1993).

## Discussion

Contrary to the majority of Greek *Allium* species, which bloom in spring or early summer, *A. platakisii* flowers much later (september-october). The new species therefore adds to the list of four previously known autumn flowering *Allium* species of the Greek flora: *A. callimischon* Link (sect. *Brevispatha*); *A. tardans* Greuter & Zahar. (sect. *Codonoprasum*); *A. dilatatum* Zahar. and *A. chamaespathum* Boiss. (sect. *Allium*). Not only all these species do occur in the area of Crete, but most are (or include) S. Aegean endemics (*A. tardans*, *A. dilatatum*, *A. callimischon* subsp. *haemostictum* Stearn). Considering that other autumn flowering *Allium* species have recently been described from elsewhere in the Mediterranean area (*A. eivisanum* from the Balcanic Islands Miceli & Garbari, 1987; *A. pentadactyli* form S Calabria (S Italy) Brullo & al. 1989), one may conclude that the autumn flowering habit is a life history trait that has characteristically evolved in this genus in the Mediterranean area. Most of these species have some phytogeographical and/or phytosociological features in common (they are local endemics and members of xerophytic or chasmophytic plant communities), and the hypothesis of Brullo & al. (1989) that *A. pentadactyli* is a relict species of tertiary origin may well fit most of them. In the southern Aegean area, in particular, the existence and significance of a relict floristic element has been noted and discussed several times (Greuter 1972, 1979; Tzanoudakis & Vosa 1988).

Regarding *Allium platakisii* and the other autumn flowering *Allium* species of the S. Aegean area, the hypothesis of Brullo & al (1989) is further supported by their life cycle which is characterized by a very long vegetative and a very short dormancy phase. Normally *Allium* species adapted to the present-day Mediterranean climate are characterized by a short vegetative and a long dormancy period (Valdés & Pastor 1986). In *A. platakisii*, the vegetative phase predominates, since the activation of the renewal bulbs (sprouting of the foliage leaves) starts before the end of the flowering period of the mother plant. The relatively undifferentiated life cycle of the species, may thus be taken to reflect the more uniform and less seasonally arid climatological conditions prevailing during the late tertiary (Messinian) in the Mediterranean area (Greuter 1972, 1979).

#### Acknowledgements

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Addresses of the authors:

D. Tzanoudakis, Botanical Institute, The University of Patras, 26500 Patras, Greece.

Z. Kyriotakis, Smpokou 65 str., Iraklion (Crete), Greece.