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Allium karistanum (Liliaceae), a new species from Evvia (Greece)

Abstract

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Allium karistanum, a rare new endemic species only known from the rocky coast of southern Evvia, is described and illustrated. Its karyology, leaf anatomy, taxonomic position, and relationships with other species belonging to the *A. cupanii* group are discussed.

Introduction

In the frame of a cytotaxonomic study of the *Allium cupanii* group, a species new to science was discovered in Evvia (Greece). It grows in the southern part of the island, along the coast near Karistos, which is an area characterized by a very arid climate. Same as the other taxa belonging to the *A. cupanii* group, the new species, here named *A. karistanum,* is characterized by fibrous-reticulate bulb coats, leaves which are more or less densely hairy(mainly in the sheath) and have a linear, cylindrical or semi-cylindrical blade, a unilateral, few-flowered inflorescence with a partially sheathing spathe, a purplish-white, more or less urceolate perigon, stamen filaments that are strongly widened and connate at the base, and an ovary with inconspicuous nectaries. It differs in karyological and anatomical-morphological characters from the other known taxa of the group.

Material and methods

The present study is based on specimens collected in the type locality and cultivated in the Botanical Garden of Catania. For the karyological study, root-tips of bulbs were pretreated with 0.2 % colchicine, fixed in Carnoy, and stained according to the Feulgen technique. The leaf anatomy was studied on live material fixed in Karpetschenko and embedded in paraffin; the cross-sections were stained with ruthenium red and light-green yellowish.

Allium karistanum Brullo, Pavone & Salmeri, **sp. nova.** – Typus: Greece, "Eubea, costa rocciosa a Sud di Karistos, esemplare coltivato", 15 Sep. 1992, *Brullo* (CAT; isotypi: CAT, FI). – Fig. 1.

Bulbi aggregati, ovoidei, 20-25 × 10-13 mm, tunicis externis brunneis, reticulato-fibrosis, ad basim bulbo adhaerentibus. Folia 4-5, pilosa, inflorescentia breviora, 2.5-5 cm longa; lamina cylindrica vel subcylindrica. Scapus solitarius, (5-)7-10 cm altus, glaber, teres, vaginis foliorum per ½ vel ⅔ longitudinis tectus. Inflorescentia erecta, ambitu ellipsoidea, pauciflora, nam floribus 5-7 in bostryces 4 dispositis. Pedicelli inaequales, tenues 5-20 mm longi. Spatha bivalvis, longe vaginans, persistens, 6-10 mm longa, umbella brevior, valvis apiculatis, inaequalibus, breviore 1-2-nervia, longiore 3-nervia. Perigonium cylindrico-urceolatum, 6-6.5 mm longum; tepala albo-rosea purpureo-costata, apice undulato-erosa; exteriora lanceolata, obtusa, interiora anguste oblonga, rotundata. Stamina tepalis breviora; filamenta cuncta simplicia, subulata, interiora basi dilatata,

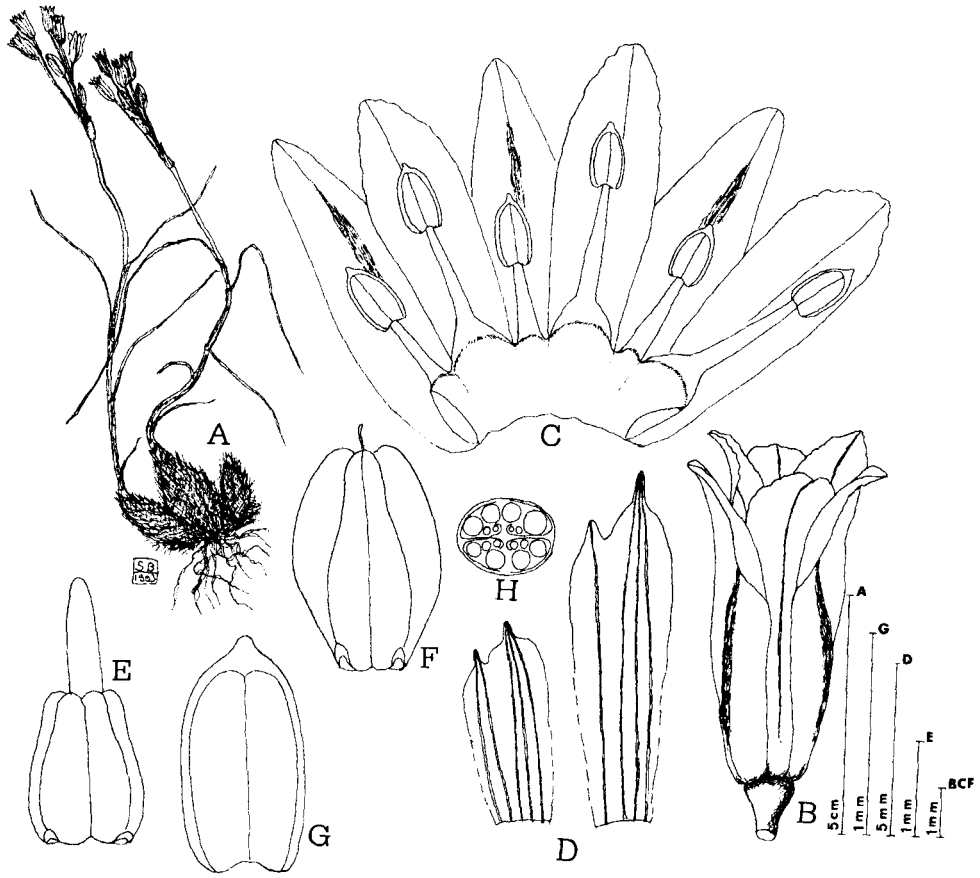

Fig. 1. *Allium karistanum.* – A, habit; B, flower; C, perigon with stamens; D, spathes; E, ovary; F, capsule; G, anther; H, inflorescence diagram.

inferne cum tepalis per c. 1.5 mm in annulum coalita; antherae albo-luteolae, c. 1.2 mm longae. Ovarium pyriforme, 1.5 mm longum, basi foveis nectariferis praeditum; stylus albus, 1-1.2 mm longus. Capsula trivalvis, ellipsoidea, 4.5 × 3 mm.

Fig. 2. Chromosome complement ($2n = 16$) of *Allium karistanum*.

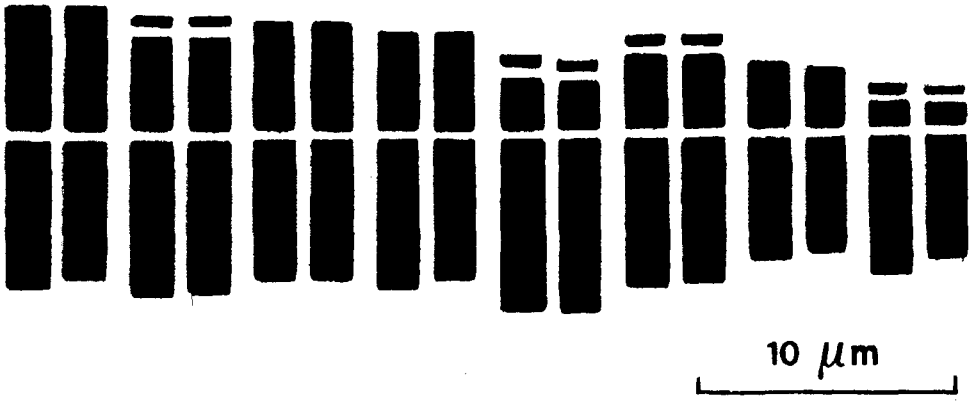

Fig. 3. Karyogram of *Allium karistanum*.

Ecology. – *Allium karistanum* occurs along a short tract of rocky coast, in the south of Evvia, growing exclusively on small flats covered with a thin layer of sand and clay. On such spots, the species grows together with several ephemeral xerophytes interspersed with spiny cushion-like shrubs, mainly *Centaurea spinosa* L. and *Sarcopoterium spinosum* (L.) Spach.

Karyology. – *Allium karistanum* is a diploid species with $2n = 16$ chromosomes (Fig. 2). The karyogram (Fig. 3) shows a chromosome complement characterized by 6 metacentric, 6 submetacentric (including 4 microsatellited) and 4 subtelocentric microsatellited chromosomes. Thus, the chromosome formula is: $2n = 2x = 16 = 6m + 2sm + 4sm^t + 4st^t$.

Within the *Allium cupanii* group, the same chromosome number is known up to now for some populations of *A. cupanii* Raf. (Češmedžiev 1973, Garbari & al. 1979, Strid & Franzén 1981), *A. greuteri* Brullo & Pavone (Brullo & Pavone 1983), *A. pentadactyli* Brullo & al. (Brullo & al. 1989), *A. peroninianum* Aznav. (Brullo & al. 1990, Özhatay 1990), and *A. callidictyon* C. A. Mey. ex Kunth (Araratjan & Tonjan 1945). In many other populations belonging the taxa of this group, the somatic chromosome number is $2n = 14$, 30, or 32 (Garbari & al. 1979, Miceli & Garbari 1987, Brullo & al. 1989, Tzanoudakis & al. 1991).

Leaf anatomy. –Cross-sections of leaf blades show a suborbicular or reniform outline. The epidermis is covered by a well-developed cuticle. Scattered hairs and stomata are distributed over the whole surface. The palisade tissue, of two-tiered cylindrical cells, is regular and compact. The spongy tissue is compact, with bigger cells in its central part

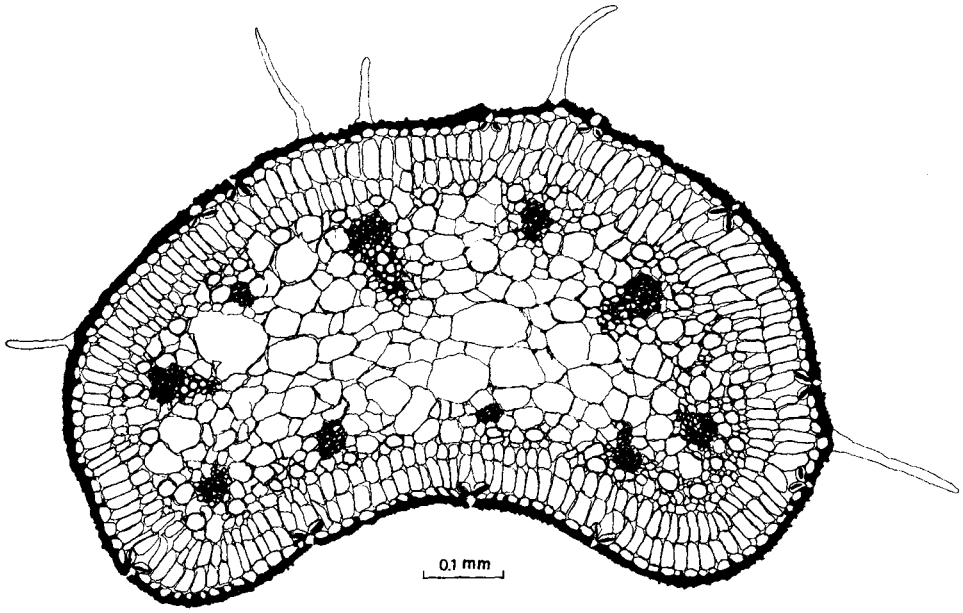

Fig. 4. Leaf cross-section of *Allium karistanum*.

and several secretory canals toward its periphery. The number of vascular bundles is normally 10, of which 6 are abaxial and 4 adaxial (Fig. 4).

Discussion

Allium karistanum shows close relationships with a group of rare species, well differentiated from the other taxa of the *A. cupanii* group, with which it shares the occurrence of numerous, crowded bulbs and bulbils, bulb tunics that are attached at the basis, a bifid spathe, and an inflorescence with few flowers arranged in four bostryces. They are: *A. callidictyon* (E. Central Turkey, Iran), *A. peroninianum* (N.W. Turkey), *A. greuteri* (Cyrenaica), and *A. pentadactyli* (S. Italy). However, *A. karistanum* differs from them all, in particular by its smaller size (7-10 cm), the shape and dimensions of its spathe, tepals, ovary and capsule, as well as in its leaf anatomy.

The fact that *Allium karistanum* also shares the same chromosome number ($2n = 16$) with the aforesaid species lends additional support to the assumption that close phylogenetic affinities exist between them all.

On the basis of their geographical distribution (Fig. 5), which shows marked disjunctions between the known populations of all these taxa, and in view of their ecological preferences and of some of their morphological features, it is plausible to assume that they represent relics of a xerothermic flora linked to constantly arid climatic conditions throughout the year. In the Messinian period (late Tertiary), when the climate in the Mediterranean area was uniformly xeric, these geophytes probably had a wide distribution; due to subsequent climatic changes, their primary area became drastically reduced. The consequent geographical isolation of the populations, and their present confinement to places with very arid edaphic and climatic conditions, must have favoured the speciation process. The most widespread among the present species, *Allium callidictyon,*

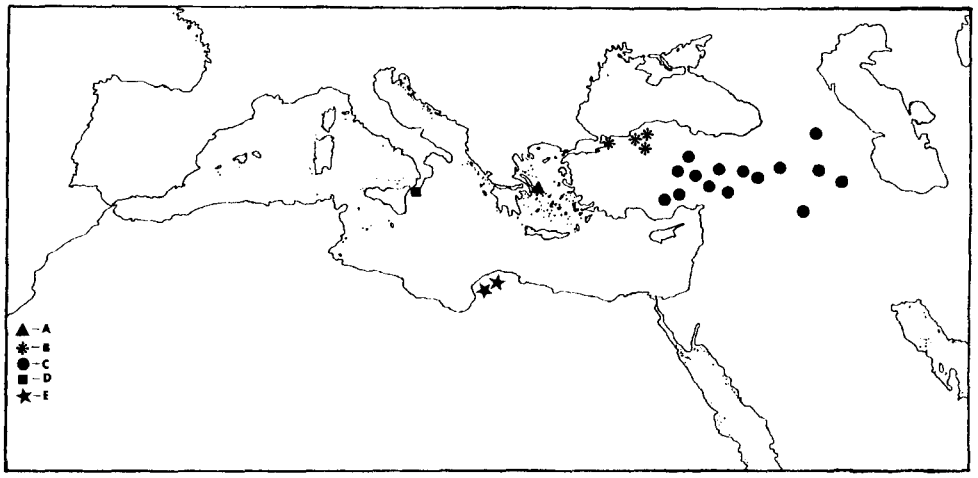

Fig. 5. Geographical distribution of *Allium karistanum* and its closest allies. – A, *A. karistanum;* B, *A. peroninianum;* C, *A. callidictyon;* D, *A. pentadactyli;* E, *A. greuteri.*

which grows in a territory little affected by the Quaternary glaciations and shows some unspecialized some morphological characteristics, is probably closest to the ancestral stock; while *A. karistanum,* with its almost punctiform distribution, may have diverged under the conditions of long-lasting geographical confinement of its population.

Acknowledgement

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