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Allium kollmannianum, a new species from Israel

Abstract

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A new species of *Allium*, *A. kollmannianum*, is described from the Negev desert in Israel. It is confined to sandy loess soils where it flowers in early summer. The caryology and leaf anatomy of this species are presented and its relationships are discussed.

1. Introduction

In spring 1989, during the 2nd expedition of OPTIMA in Israel, several live bulbs of *Allium* were collected in various localities of this country and were subsequently cultivated in the Botanical Garden of Catania. Among the material collected, some specimens from the Negev desert are referable to a species which, because of its peculiar morphological characters, results new to science and had not been collected before. We take pleasure to dedicate it to F. Kollmann, botanist at the Hebrew University of Jerusalem, in recognition of her numerous contributions on the genus *Allium* of the Mediterranean flora.

2. Material and methods

The investigation was based on specimens collected in three localities of the Negev (Beer Sheva, Dimona and Yerokham) and cultivated in the Botanical Garden of Catania (Sicily). For the karyological study, root tips were pretreated with 0.2 % colchicine, fixed in Carnoy and stained according to the Feulgen technique. Leaf anatomy was studied on cultivated material which was fixed in Karpetschenko and embedded in paraffin; the transverse sections were stained with ruthenium red and lightgreen yellowish.

3. Results

Allium kollmannianum Brullo, Pavone & Salmeri, sp. nova — Fig. 1.

Typus: cultivated plant originating from Israel, Negev highlands, 6 km SW of Dimona, 25.6.1989, *Brullo s. n.* (holotypus: CAT; isotypi: CAT, FI, PAL).

Bulbus ovoideus, 14-16 x 10-12 mm, tunicis internis stamineis, externis pallide

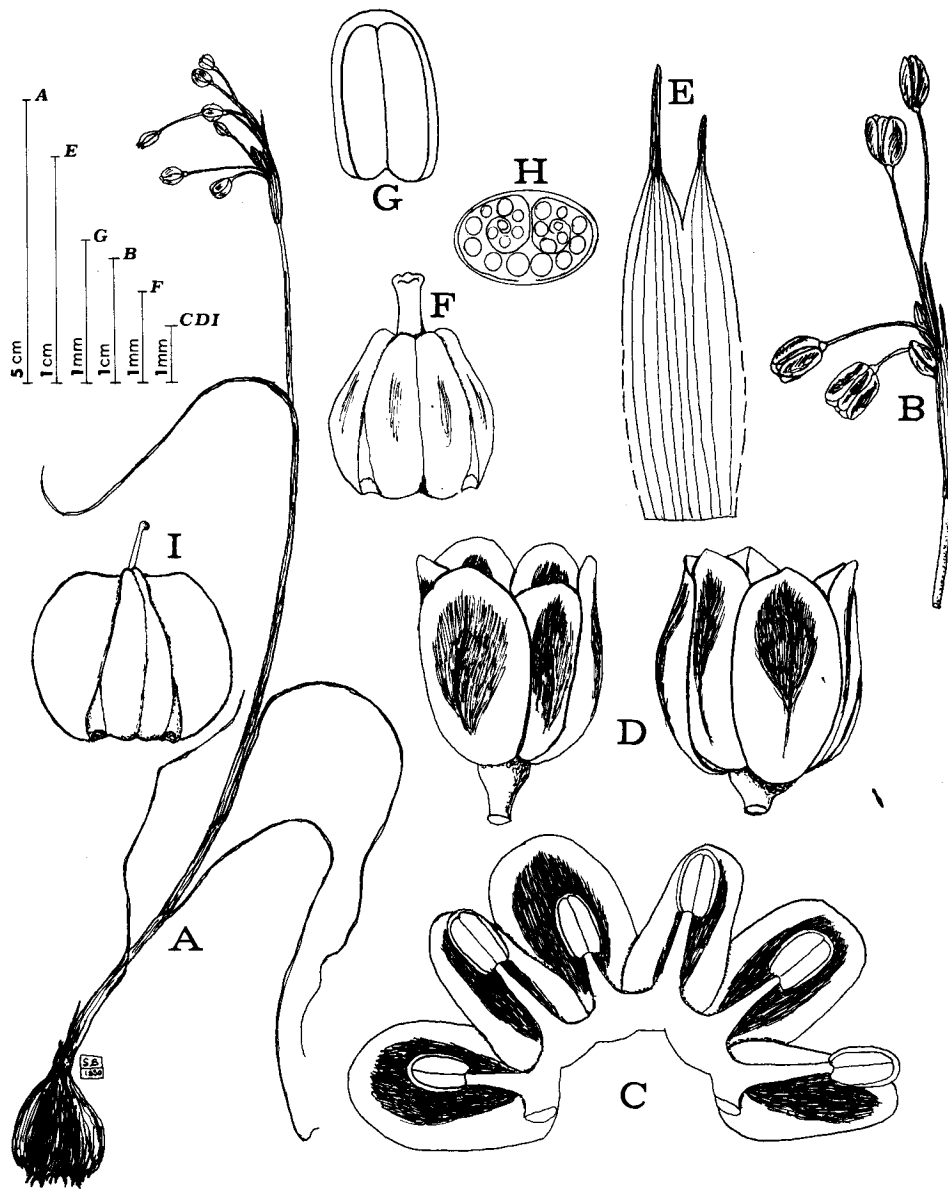


Fig. 1. *Allium kollmannianum* Brullo & al. (from the type locality). — A: Habit; B: Inflorescence; C: Perigon with stamens; D: Flowers; E: Spathe; F: Ovary; G: Anther; H: Inflorescence diagram; I: Capsule.

brunneis vel brunneo-purpureis, fibrosis, in fibras parallelas solutis, e basi secedentibus. Folia 4, filiformia, glabra, glauco-viridia, 5-25 cm longa et c. 1 mm lata, costata, semi-cylindrica. Scapus solitarius, 10-30 cm altus, glaber, teres, erectus, 1-1.2 mm diametro, vaginis foliorum usque ad apicem vel per 3/4 longitudinis tectus. Inflorescentia laxa, pauciflora (floribus 8-12), unilateralis, pedicellis inaequalibus, subtilibus, 1.3-5 cm longis, flexuosis, fructiferis erectis. Spatha bivalvis, persistens, valvis leviter inaequalibus umbella brevioribus, 10-22 mm longis, longe caudatis, 3-5 nervatis, umbellam inferne amplectens. Bostryces 2, bracteis hyalinis, quisque 4-6 flores subtendens. Perigonium cylindricum vel ovatum, c. 4 mm longum, tepalis ad apicem rotundatis, albo-viridibus, dorso macula lata brunneo-viridi, exterioribus ellipticis, 2-2.3 mm latis, interioribus ovatis, ad 1.7 mm latis. Stamina exteriora tepalis breviora, interiora tepalis subaequalia, filamentibus omnibus simplicibus, inferne cum tepalis per 0.5-0.7 mm in anulum connatis, antheris luteis 1.3 x 0.7 mm. Ovarium globoso-subpyriforme, 1.8 x 1.8 mm, viride, macula brunneo-viridi dorso loculorum. Stylus albus, 0.6-1 mm longus, stigmate inconspicuo, lobato. Capsula trivalvis, 3 x 2.5 mm.

Specimina visa. — Israel, Negev highlands, 6 km SW of Dimona, 25.6.1989, cultivated plant, *Brullo s. n.* (CAT, FI, PAL); *ibid.*, 5 km N of Beer Sheva, 26.6.1989, cultivated plant, *Brullo s. n.* (CAT); *ibid.*, 8 km SW of Yerokham, 26.6.1989, cultivated plant, *Brullo s. n.* (CAT).

Ecology. — *Allium kollmannianum* occurs in the desert zone of the Negev highlands, where it mainly grows on sandy loess soils, sometimes among limestone outcrops. This area is characterized by an annual rainfall not exceeding 100 mm, restricted essentially to the winter season. The species is quite frequent in the steppe-vegetation referable to the *Anabasetum articulatae arenarium* (Danin 1983).

Karyology. — *Allium kollmannianum* is characterized by a diploid chromosome complement of $2n = 16$ with a quite regular karyotype (Fig. 2). Its idiogram shows four pairs of metacentric chromosomes (three of which are micro-satellited on the longer arm), one submetacentric pair and three acrocentric pairs with a very long macro-satellite (Fig. 3). According to Leván & al. (1964), the chromosome formula is:

$$z = 2n = 2x = 16: 2m + 6m^t + 2sm + 6t^t.$$

Leaf anatomy. — The epidermis of *Allium kollmannianum* (Fig. 4) shows a well developed cuticle and stomata distributed along the whole perimeter. The one-layered palisade tissue is compact, with big cells in the central portion. In the peripheral part of the spongy tissue numerous secretory canals occur. The maximum number of vascular bundles is 9, of which 5 are abaxial (3 large and 2 small) and 4 small, adaxial.

4. Discussion

On the basis of morphological and karyological characters, *Allium kollmannianum* appears to be a taxonomically very isolated species. Due to its delicate habit with very slender scape and leaves and to its few-flowered inflorescence with a spathe sheathing its lower part and with flowers arranged in two bostryces, *Allium kollmannianum* shows

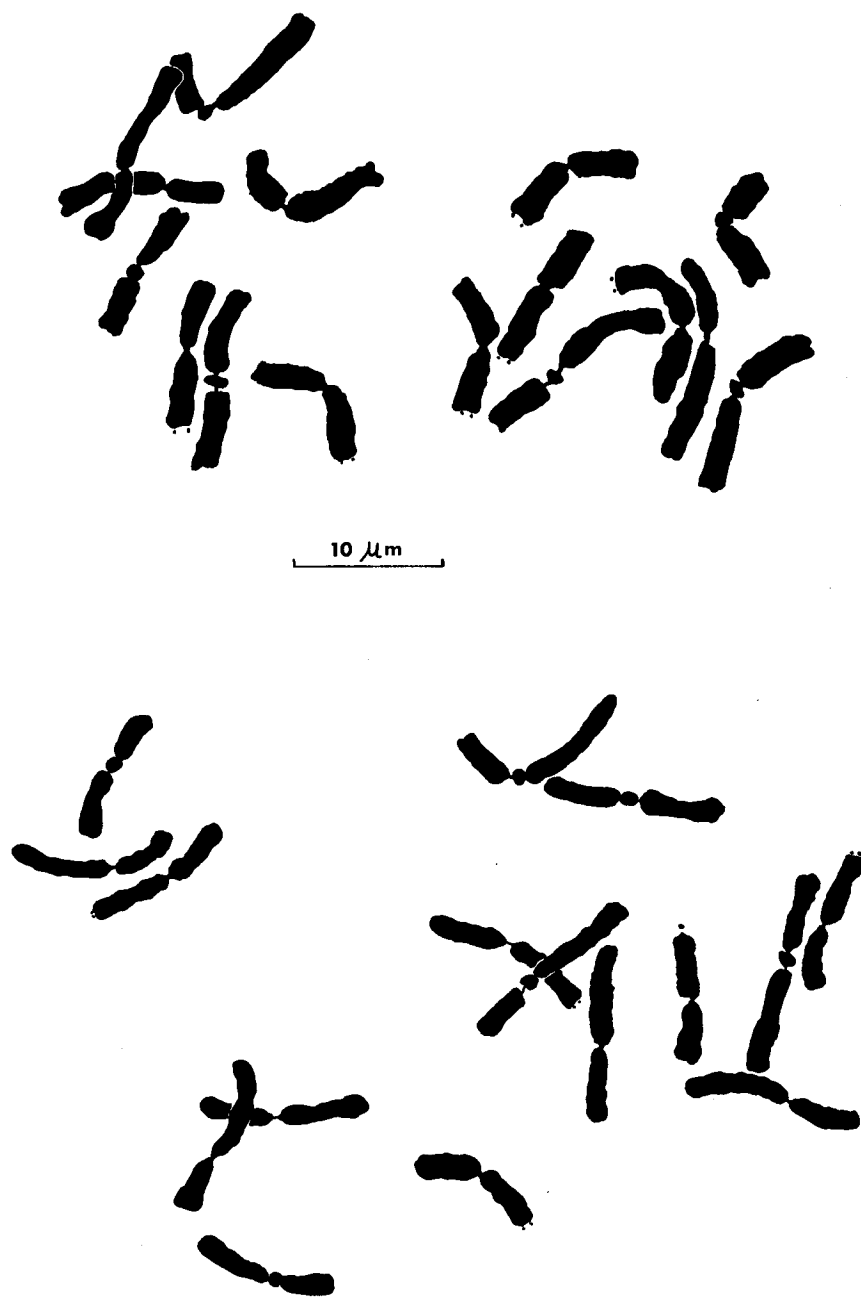
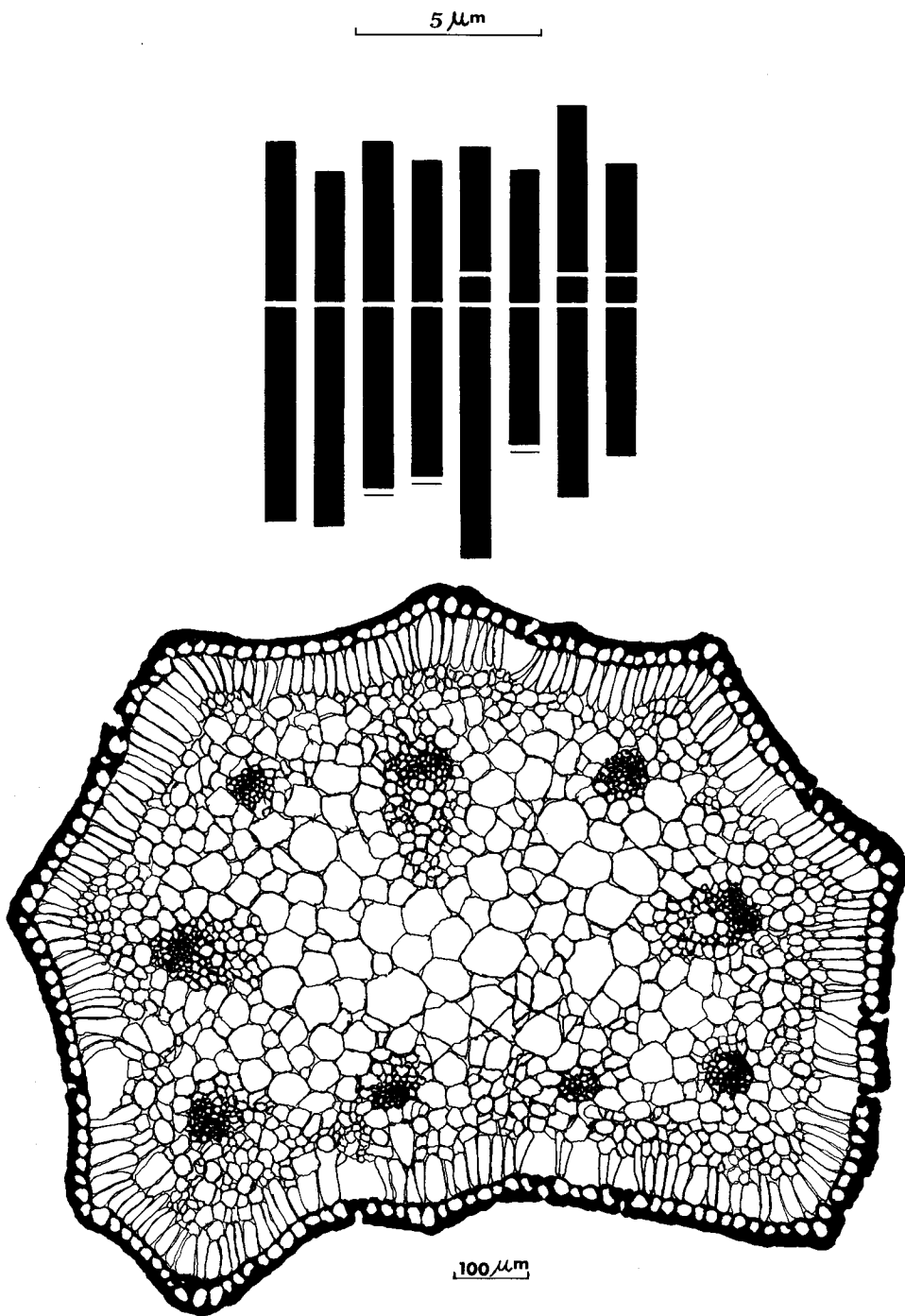


Fig. 2. Mitotic metaphase plates of *Allium kollmannianum*: the upper from Dimona, the lower from Yerokham.



Figs. 3-4. Idiogram of the haploid complement of *Allium kollmannianum*; Leaf cross section of *Allium kollmannianum* (from the type locality).

some resemblance with the species belonging to the cycle of *Allium cupanii* Rafin., from which it is well distinct by its non-reticulate tunics, the lack of hairiness of its leaves, its very small, non-urceolate perigon and its stamen filaments not dilated at their basis. From the taxonomical point of view, it can still be included, together with the *Allium cupanii* group, in *A. sect. Brevispatha* Valsecchi (Brullo & Pavone 1983, Kollmann 1984).

It should be pointed out that, judging from our herbarium investigations (B, FI, G, HUJ, P) and from literature data (Kollmann 1985, 1986), *Allium kollmannianum* had not been collected previously. Probably, its having been overlooked by previous botanists exploring this territory is due to its rarity as well as its small size and tardy flowering period (June-July).

Allium kollmannianum, as most taxa of *A. sect. Brevispatha*, can be considered a paleo-endemic. It is confined to the Negev desert, where it is linked to sandy soils. This area is an important centre of floristic speciation as is borne out by the occurrence of numerous local endemics, mainly of Irano-Turanian affinity (Zohary 1973).

Acknowledgement

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References

- Brullo, S & Pavone, P. 1983: *Allium greuteri* sp. nova (*Liliaceae*) from Cyrenaica and its relationships with the *Allium cupanii* group. — *Willdenowia* 13: 115-122.
- Danin, A. 1983: Desert vegetation of Israel and Sinai. — Jerusalem.
- Kollmann, F. 1984: *Allium*. — Pp. 98-211 in: Davis, P. H. (ed.), *Flora of Turkey and the East Aegean islands*, 8. — Edinburgh.
- 1985: The genus *Allium* in Israel. — *Rotem* 15.
- 1986: *Allium* L. — Pp. 74-99 in: Feinbrun-Dothan, N. (ed.), *Flora Palaestina*, 4. — Jerusalem.
- Levan, A., Fredga, K. & Sanberg, A. A. 1964: Nomenclature for centromeric position on chromosomes. — *Hereditas* 52: 201-220.
- Zohary, M. 1973: Geobotanical foundations of the Middle East. — *Geobot. Selecta* 13.

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