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Allium garbarii (Alliaceae), a new species endemic to Calabria (S Italy)

Lorenzo Peruzzi

Abstract

PERUZZI, L. (2007). *Allium garbarii* Peruzzi (Alliaceae), a new species endemic to Calabria (S Italy). *Candollea* 62: 17-25. In English, English and French abstracts.

Allium garbarii Peruzzi, a new diploid species ($2n = 16$) from Capo Colonna (Calabria, S Italy), is described. Its habitat and systematic relationships with other closely related species, such as all the Italian taxa belonging to the *Allium paniculatum* group sharing spring flowering, stamens always included in the perigon and absence of interstaminal teeth, are briefly discussed. In particular, the new species seems to show closer affinities with the Sicilian endemics *Allium agrigentinum* Brullo & al., *Allium castellanense* (Garbari & al.) Brullo & al. and *Allium lehmannii* Lojac.

Key-words

ALLIACEAE – *Allium* – Calabria – Karyology – Italian flora – Taxonomy

Résumé

PERUZZI, L. (2007). *Allium garbarii* Peruzzi (Alliaceae), une nouvelle espèce endémique de Calabre (Italie du Sud). *Candollea* 62: 17-25. In English, English and French abstracts.

Allium garbarii Peruzzi, une nouvelle espèce diploïde ($2n = 16$) du Cap Colonna (Calabre, Italie du Sud), est décrite. Ses caractéristiques et ses relations systématiques avec des espèces proches sont discutées. Il s'agit de taxons italiens appartenant au groupe de l'*Allium paniculatum* à floraison printanière, avec des étamines toujours à l'intérieur du périgone et sans dents interstaminales. En particulier, la nouvelle espèce présente des affinités marquées avec les taxons endémiques siciliens *Allium agrigentinum* Brullo & al., *Allium castellanense* (Garbari & al.) Brullo & al. et *Allium lehmannii* Lojac.

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Introduction

Allium subgen. *Allium* sect. *Codonoprasum* Rchb. was largely studied by botanists in the last two decades (GARBARI, 1987; GARBARI & RAIMONDO, 1987; TISON, 1993; GARBARI & al., 1994; BRULLO & al., 1991, 1994, 1994a, 1996a, 1996b, 1997, 1998; JAUZEIN & TISON, 1999, 2001; SOMOGYI, 1999; DUCHOSLAV, 2001; JAUZEIN & al., 2002; FRIESEN & al., 2006).

Moreover, within this section, a throughout revision of the *A. paniculatum* group in Italy was recently published (BRULLO & al., 2001). These authors recognise 11 species in this group, most of them endemic to Italian peninsula (*A. tenuiflorum* Ten., see also BRULLO & al., 2003), to Sicily (*A. lehmannii* Lojac.; *A. castellanense* (Garbari, Miceli & Raimondo) Brullo, Guglielmo, Pavone & Salmeri; *A. agrigentinum* Brullo & Pavone), to Central Italy (*A. anzalonei* Brullo, Pavone & Salmeri) or to Apulia (*A. apulum* Brullo, Guglielmo, Pavone & Salmeri; *A. diomedeam* Brullo, Guglielmo, Pavone & Salmeri). The whole group is marked by two persisting spathe-valves, simple stamens and ovaries with inconspicuous nectaries.

During a field excursion in the area of Capo Colonna (Crotona, Ionian coast of Calabria, S Italy), we gathered an *Allium*, which clearly belongs to the *A. paniculatum* group, but is not referable to any known taxon. This unit is here described.

Allium garbarii Peruzzi, spec. nova (Fig. 1, 2)

Holotype: ITALY. Calabria: Capo Colonna (Crotona), lungo la costa settentrionale, 5 m alt., 29.VI.2003, Peruzzi & Caparelli (CLU n. 12273) [specimen on the left].

Ab Allio castellanense differt tepalis 4.5-5.5 mm longis, anthera 1 mm longa; *ab A. lehmannii* et *A. agrigentino* differt spathis 7-10 nervis, tepalis linearis-oblongis, ovario elliptico 3-4 mm longo; *ab A. tenuifloro* et *A. diomedeo* differt corolla cylindrica, tepalis linearis-oblongis, ovario laeve, non papilloso.

Bulb 10-18 mm long, with coriaceous whitish tunics; scape 19-48 cm tall; 3-7 greyish-green leaves, sheathing ca. half of the stem; cross-sectioned leaf irregularly pentagonal, scarcely fistulose; 2 spathe-valves, the biggest one (with 7-10 nerves, 25-120 mm long) generally longer than inflorescence, the smallest one shorter; fastigate and loose inflorescence; pedicels rose and unequal, usually not more than 20 mm long (up to 30-50 mm at fructifying stage); subcylindric perigon with whitish-rose tepals, linear-oblong, 4.5-5.5 mm long; stamens included within the perigon (3 sub-equaling the tepals, 3 shorter) with elliptical anthers, 1 mm long; smooth ovary, ellipsoid, 3-4 mm long, lightly attenuate at tip; style sub-equal to ovary; capsule subglobose, 3-5 mm long. Black seeds, flat, triangular-pyriform, 3-3.5 x 1-1.5 mm, with colliculate surface.

Paratypes. – ITALY. Calabria: Marchesato crotonese, Capo Colonna, costa NW, 3-5 m alt., prati aridi litoranei, 7.VII.2005, Peruzzi & Caparelli (CLU n. 16839, 16840, 16841).

Etymology. – The new species is dedicated to Prof. Fabio Garbari (University of Pisa), cytotaxonomist and specialist in the genus *Allium*, mentor of the author.

Ecology and phenology. – Coastal thermo-xeric grasslands, on calcareous conglomerates/sands, together with *Atriplex halimus* L., *Atriplex tatarica* L., *Convolvulus lineatus* L., *Crithmum maritimum* L., *Daucus carota* L., *Dianthus sylvestris* subsp. *longicaulis* (Ten.) Greuter & Burdet, *Elymus farctus* (Viv.) Rune-mark, *Eryngium maritimum* L., *Frankenia hirsuta* L., *Glaucium flavum* Crantz, *Lagurus ovatus* L., *Limonium laciniatum* P. V. Arrigoni, *Limonium narbonense* Mill., *Limonium sinuatum* (L.) Mill., *Lolium rigidum* Gaudin, *Lotus cytisoides* L., *Pallenis spinosa* (L.) Cass., *Parapholis incurva* (L.) C. E. Hubb., *Plantago macrorrhiza* Poir., *Salsola soda* L., *Sixalix atropurpurea* (L.) Greuter & Burdet, *Spergularia salina* J. Presl & C. Presl, *Suaeda vera* J. F. Gmel., *Sulla coronaria* (L.) Medik., *Trachynia distachya* (L.) Link and other coastal species.

Allium garbarii is a bulbous geophyte, usually flowering from the beginning of June to the first half of July. Vegetative growth re-starts in September-October.

Distribution. – Presently only known from the *locus typicus*, where it forms three-four main clusters, of 20-30 individuals each. The presence of this species is likely in other areas of Marchesato Crotonese (Ionian coasts of Central Calabria and eastern foothills of the Sila Massif). Indeed, this is not the first signalling of *A. lehmannii* s.l. for Calabria: GARBARI & RAIMONDO (1987) already noticed the existence of one herbarium specimen [Sila, s.d., Thomas (PAL, sub *A. tenuiflorum*)] from the Sila area, identified by them as *A. lehmannii*. Very likely, this record can now be assigned to *A. garbarii*, even if the locality indication is too vague, referring to a vast geographical area.

Karyology. – The studied material revealed a diploid chromosome complement with $2n = 16$ chromosomes (Fig. 3). All the chromosomes are of metacentric type, with two couples showing terminal satellites on the short arms (Fig. 4); this karyotype setting is similar to that reported for the diploid cytotype of *A. castellanense* (GARBARI & al., 1994). Karyotypic formula, according to LEVAN & al. (1964), is $2n = 16 = 8m + 2m^{sat} + 2m + 2m^{sat} + 2m$ (Table 1). Also all the other close Italian taxa (with spring flowering, stamens always included in the perigon and absence of interstaminal teeth) have $2n = 16$ chromosomes, even if detailed karyotypes are lacking: *A. agrigentinum* and *A. diomedeam* (BRULLO & al., 2001); *A. lehmannii* (GARBARI & RAIMONDO, 1987); *A. tenuiflorum* (MARCUCCI & TORNADORE, 1994; BRULLO & al., 2001, 2003; PERUZZI, 2003). Incidentally, also for *A. paniculatum* var. *breviscapum* Lit. & Maire from Morocco (see Discussion) is reported a $2n = 16$ counting (GALLAND, 1988).

Table 1. – Measurements made on five metaphasic plates, belonging to five specimens of *Allium garbarii* Peruzzi (2x). Data were obtained from microphotographs, then reported in μm .

	I	II	III	IV	V	VI	VII	VIII
Long arms (mean length of the homologue chromosomes, 2x)								
Plant 1	5.13	5.08	4.84	4.37	3.57	4.13	2.92	2.92
Plant 2	6.13	5.60	5.78	5.37	4.95	4.74	4.00	3.60
Plant 3	6.15	6.90	6.14	5.49	4.51	4.50	4.42	3.79
Plant 4	6.07	5.77	5.38	5.20	4.81	4.21	3.45	3.48
Plant 5	6.29	6.74	7.21	5.76	5.42	4.79	3.77	3.79
Mean length (L)	5.95	6.02	5.87	5.24	4.65	4.47	3.71	3.52
Short arms (mean length of the homologue chromosomes, 2x)								
Plant 1	4.85	4.33	3.51	3.88	3.31	2.89	2.67	2.47
Plant 2	6.08	4.96	4.64	4.19	3.93	3.23	3.51	2.94
Plant 3	5.95	4.96	5.00	4.76	4.01	3.43	3.12	3.17
Plant 4	5.82	5.06	4.00	4.74	3.54	2.92	2.63	2.97
Plant 5	5.51	5.56	5.29	4.88	4.61	3.23	3.37	3.51
Mean length (S)	5.64	4.97	4.49	4.49	3.88	3.14	3.06	3.01
Total length (TL)	11.60	10.99	10.36	9.73	8.53	7.61	6.77	6.53
				61.76				
Ratio Long arm / Short arm (L/S)	1.06	1.21	1.31	1.17	1.20	1.42	1.21	1.17
Karyotype formula		8m			2m-sat	2m	2m-sat	2m

Table 2. – Comparison of morphological data among all the Italian taxa belonging to *Allium paniculatum* group sharing the following features: spring flowering, stamens always included in the perigon, absence of interstaminal teeth. Data for *A. agrigentinum*, *A. castellanense*, *A. lehmannii* are derived from GARBARI & RAIMONDO, 1987; GARBARI & al., 1994; BRULLO & al., 2001). Data for *A. tenuiflorum* and *A. diomedium* are derived from BRULLO & al., 2001.

	<i>A. agrigentinum</i>	<i>A. castellanense</i>	<i>A. lehmannii</i>	<i>A. garbarii</i>	<i>A. tenuiflorum</i>	<i>A. diomedium</i>
Bulb length (mm)	10-16	8-13	5-16	10-18	12-18	13-18
Plant size (cm)	15-40	10-25	6-38	19-48	10-40	30-65
Portion of stem sheathed by leaves	1/3	1/3	1/2	1/2	1/2	1/2
Maximum length of spathe (cm)	3.5	3.5	12	12	15	12
N° spathe nervatures	3-7	3-7	3-6	7-10	5-7	5-7
Inflorescence type	hemispheric, loose	fastigiate, loose	fastigiate, loose	fastigiate, loose	fastigiate, loose	fastigiate, dense
Corolla shape	subcylindric, lightly reflexed at apex	subcylindric	subcylindric, lightly reflexed at apex	subcylindric	campanulate	campanulate
Perigon length (mm)	6-6.5	7-8	5-6	4.5-5.5	4.5-5	4.5-5
Perigon colour	rose-purplish	whitish-rose to rose-purplish	whitish-rose to rose-purplish	whitish-rose	whitish-rose to rose-purplish	white
Tepals shape	elliptic-oblong	linear-oblong	elliptic-oblong	linear-oblong	elliptic-oblong	elliptic-oblong
Anther length (mm)	1.3	1.4-1.8	1	1	1-1.1	1.5
Ovary length (mm)	2.2-2.5	2.5-3	1.5-2	3-4	2.5-3.5	3.5-4
Ovary shape	smooth, subcylindric	lightly papillose at tip, ovoid-pyriform	smooth ovoid-pyriform	smooth, ellipsoid, lightly attenuate at tip	papillose at tip, ellipsoid	papillose at tip, ovoid
Capsule length (mm)	5	5	3	3-5	3.5-4	4.5

Discussion

Among the Italian taxa with spring flowering, stamens always included in the perigon and absence of interstaminal teeth (Table 2) – whose distribution is reported in Fig. 5 – *A. garbarii* has floral dimensions similar to those of *A. tenuiflorum* and *A. diomedeam*, but it is clearly distinguished from them thanks to its subcylindric perigon, the linear-oblong tepals and the smooth ovary. The corolla shape of the new species approaches instead to the cycle of *A. lehmannii* (including *A. agrigentinum* and *A. castellanense*). All the three latter taxa were described from different areas of Sicily (LOJACONO POIERO, 1908-1909; GARBARI & al., 1994; BRULLO & al., 1991). This group has indeed several intermediate characters among the sect. *Codonoprasum* Rchb. and sect. *Brevispatha* Valsecchi (GARBARI & al., 1994). By examining Table 2, *A. castellanense* is well distinct from *A. garbarii*, by having lightly papillose ovary and bigger tepals, even if the corolla shape is almost identical. *Allium garbarii* shows instead several affinities with *A. agrigentinum* and *A. lehmannii*, from which it is easily distinguishable for the biggest spathe-valve nerve number, the shorter tepals, the different shape of the corolla and the different shape and size of the ovary.

As far anatomy is concerned, *A. garbarii* has more or less pentaedric, lightly fistulose leaves in cross section (Fig. 6). *Allium lehmannii* from several populations in NW Sicily (Gangi, Alimena, Monte Passo del Lupo and Monte Inici) shows very similar leaves (S. Simi, unpubl. data), as does also *A. tenuiflorum* from Apulia, Gargano (JAUZEIN & TISON, 2001; JAUZEIN & al., 2002). *Allium castellanense* (from Castellana Sicula) and *A. agrigentinum* (from Vendicari) instead, as well as other N African units (i.e. the Moroccan *A. paniculatum* var. *breviscapum*, which falls very likely in the *A. lehmannii* cycle too) show much more fistulose and less angled leaves (S. Simi, unpubl. data; J.-M. Tison, pers. comm.). Unfortunately, it was not possible to obtain data about the leaf anatomy of *A. diomedeam*.

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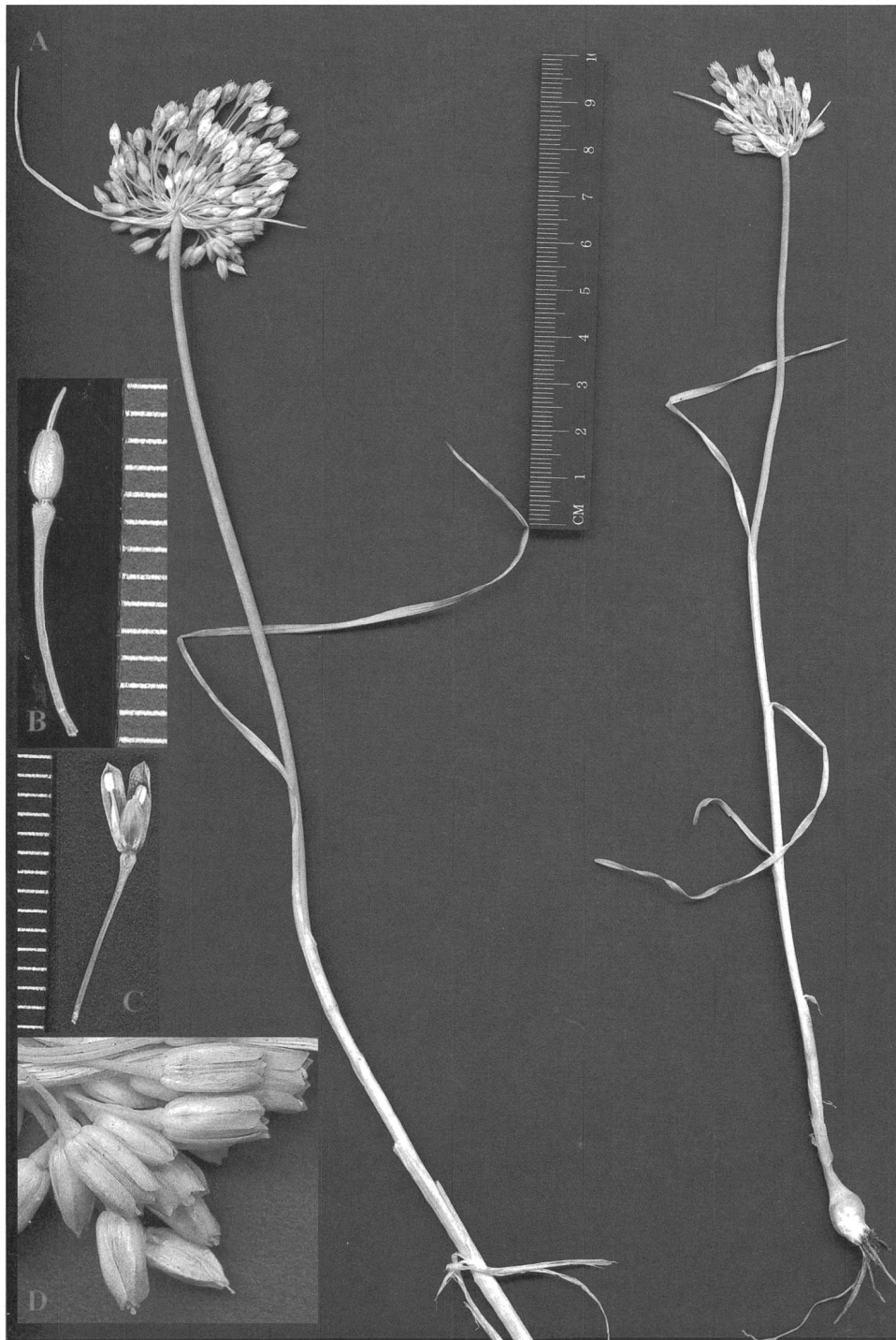


Fig. 1. – Type specimens (scanned when freshly collected) of *Allium garbarii* Peruzzi: general view (A); ovary (B); stamens (C); flowers (D).



Fig. 2. – *Allium garbarii* Peruzzi at the beginning of flowering, in cultivation and originally collected in the *locus classicus*.
[Photo 6 June 2006 by L. Peruzzi]

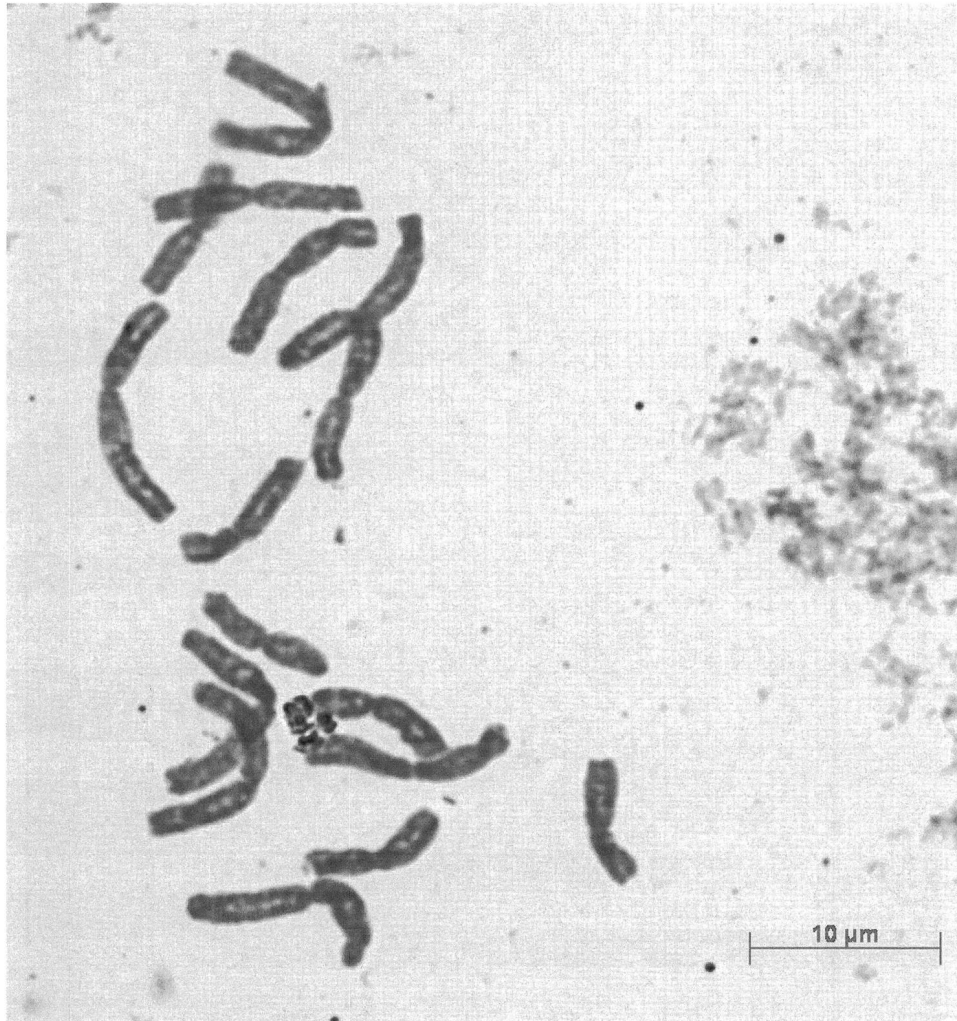


Fig. 3. – *Allium garbarii* Peruzzi: metaphasic plate, showing $2n = 16$ chromosomes.

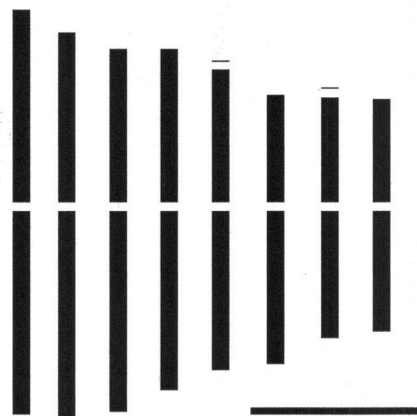


Fig. 4. – *Allium garbarii* Peruzzi: haploid idiogram.
[Scale bar = 5 μm]

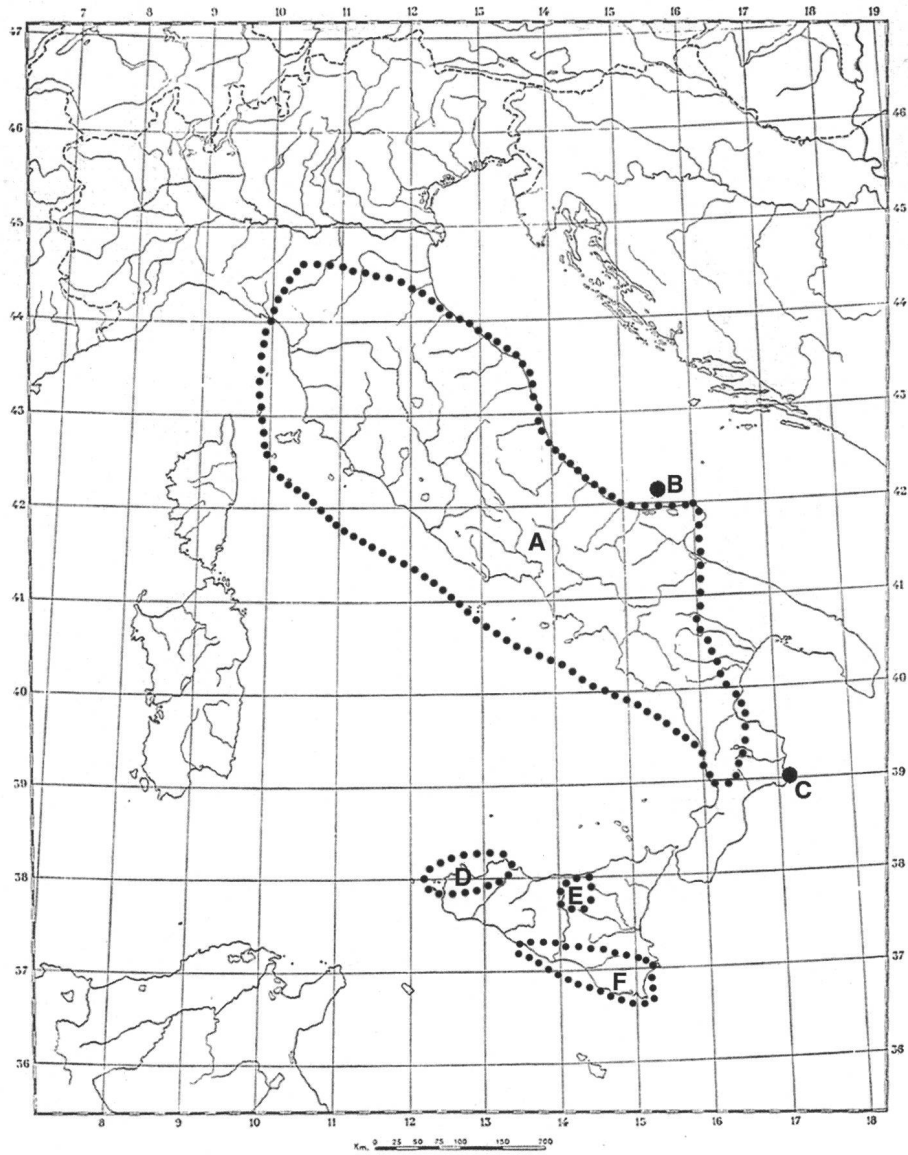


Fig. 5. – Map showing the geographical distribution of *Allium garbarii* Peruzzi and other related Italian taxa: *A. tenuiflorum* (A); *A. diomedea* (B); *A. garbarii* (C); *A. lehmannii* (D); *A. castellanense* (E); *A. agrigentinum* (F).

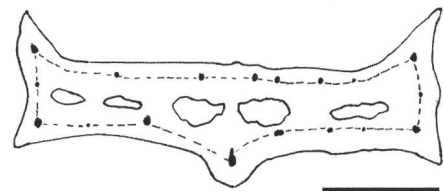


Fig. 6. – Drawing of leaf cross section in *Allium garbarii* Peruzzi.
[Scale bar = 1 mm]

