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Genista demarcoi, a new species from Sicily

Abstract

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Genista demarcoi found on calcareous cliffs near Isnello (N. Sicily), is described and illustrated. This new species is a rare chasmophyte belonging to the *G. ephedroides* group. Its relationships with *G. gasparrinii*, *G. tyrrhena* and *G. ephedroides* are discussed.

Introduction

According to literature (Pignatti 1982, Greuter & al. 1989) the genus *Genista* is represented in Sicily by species, that are either endemic (*G. cupani* Guss., *G. aristata* C. Presl and *G. gasparrinii* Guss.) or have a C. Mediterranean (*G. aetnensis* (Biv.) DC., *G. tyrrhena* Valsecchi) or S-W. Mediterranean distribution (*G. aspalathoides* Lam.).

Among these species *Genista gasparrinii* is critical, as has been emphasized by De Marco & al. (1987) and Brullo & al. (1992). This taxon, that belongs to the cycle of *G. ephedroides* DC., was first described by Gussone (1825) as *Spartium gasparrinii* from Sicily, without precise locality. The following year Presl (1826) transferred it to *Genista* as *G. gasparrinii*. Later Gussone (1828) considered it as a synonym of *G. ephedroides*, a species described from Sardinia by Candolle (1825, 1826), quoting Palermo at Sferracavallo as its only locality. Subsequently, he (Gussone 1834) added further localities: the Madonie Mts. above Isnello (material collected by Gasparrini) and some of the Aeolian islands (Salina, Stromboli, Basiluzzo, Lipari, Vulcano).

Spach (1844) disagreed with Gussone, considering *Genista ephedroides* to be confined to Sardinia and Corsica and attributing Sicilian populations to *G. gasparrinii*. Other authors (Lojacono Pojero 1891, Béguinot 1902, Fiori 1925, Arata 1938, Pizzolongo 1961, Gibbs 1966, 1968, Anzalone & Caputo 1975, Pignatti 1982, etc.) agreed with Gussone (1828, 1843) in referring all Italian populations to *G. ephedroides*.

More recently, on the basis of a biometrical analysis, De Marco & al. (1987) could effectively distinguished different taxa in the group of *Genista ephedroides*: *G. ephedroides* s. str. (Sardinia), *G. numidica* (Algeria and S. Italy) and *G. gasparrinii* (Aeolian and Pontian islands). Valsecchi (1986a) agreed but in a recent contribution (Valsecchi 1986b) further segregated the Aeolian and Pontian populations as belonging to a new species, *G. tyrrhena*, without mentioning *G. gasparrinii*.

As has been emphasized by Brullo & al. (1992), Sicilian plants growing on limestone at Sferracavallo near Palermo (the *locus classicus* of *Genista gasparrinii*) are indeed well differentiated from those of the Aeolian islands. The differences concern ecology, general

Table 1. Comparative characters among the species belonging to *Genista ephedroides* group.

CHARACTERS	<i>Genista ephedroides</i>	<i>Genista tyrrhena</i>	<i>Genista gasparrinii</i>	<i>Genista demarcoi</i>
HABIT	pulvinate shrub, 30-150 cm tall	shrubby to arboreous, up to c. 4 m tall	pulvinate shrub, 25-60 cm tall	pulvinate shrub, 30-80 cm tall
BRANCHES	rigid, robust, erect, mucronate, minutely pubescent, alternate or subopposite	flexuosus, robust, truncate or obtuse, alternate or subopposite, sericeous or sericeo-pubescent	subrigid, slender, obtuse or slightly acute, alternate or dense clustered, very short, sericeous	flexuosus, slender, obtuse or slightly acute, alternate or dense clustered, very short, sericeous
LEAF	3-10 mm long	7-12 mm long	3-7 mm long	4-14 mm long
INFLORESCENCE	2.5-6 cm long, with 5-11 flowers	3-15 cm long, with 10-30 flowers	1-5 cm long, with 3-11 flowers	1.5-7 cm long, with 3-11 flowers
BRACT	linear-lanceolate to ovate-lanceolate, 1-3 mm long	linear-subulate to ovate-lanceolate, 1.5-5 mm long	linear-subulate, leafy, 2.5-2.7 mm long	linear-subulate, 1.5-2.5 mm long
BRACTEOLAS	linear-lanceolate, at the base of the calyx, 0.5-1.5 mm long	lanceolate to ovate, acuminate, a little below the base of the calyx, 2-4.5 mm long	subulate, at the base of the calyx, 0.7-1 mm long	thin, subulate, just at the base of the calyx, 1.5-2 mm long
CALYX	5-7.5 mm long; lower lip longer than the upper, 1.5 mm wide, 2.5-3 mm long, with lateral teeth subequal or shorter than central one, slightly divaricate, lanceolate-subulate, 0.5-2 mm long; upper lip with ovate-triangular, long apiculate teeth, 1.5-3 mm long	4-7 mm long; lower lip subequal or slightly longer than the upper, 2 mm wide, with teeth 1.5-3 mm long, subulate and parallel, the lateral ones subequal or longer than central one; upper lip with ovate-triangular, long acuminate teeth, 2.1-3.5 mm long	2.8-3.2 mm long; lower lip subequal to the upper, 1.5-2 mm wide, 1-1.5 mm long, with teeth 0.5 mm long, triangular, pointleted, subequal, divaricate; upper lip with ovate-triangular, mucronate teeth, c. 1 mm long	3.5-5 mm long; lower lip longer than the upper, 0.8-1 mm wide, 2.5-2.6 mm long, with teeth lanceolate-subulate, divaricate, the lateral ones 0.8-1 mm long, subequal or shorter than the central tooth, 1-1.5 mm long; upper lip with triangular-beaked teeth, 1.5-2 mm long
STANDARD	widely ovate, truncate at base, rounded at apex, c. 7 mm long, 6 mm wide	ovate-subcircular, cordate at base, rounded with short apiculum at apex, 8-12 mm long, c. 8 mm wide	ovate-triangular, clearly retuse at apex, cordate-subcordate at base, 5-7 mm long, 5-7 mm wide	ovate-triangular, subretuse at apex, cordate at base, 8-9 mm long, 7-8 mm wide
WINGS	6-7 mm long, with a tuft of hairs on the basal gibbosity	8-10 mm long, with a tuft of hairs on the basal gibbosity	6-7 mm long, without a tuft of hairs	7-9 mm long, with a tuft of hairs on the basal gibbosity
KEEL	c. 14 mm long	9-11 mm long	8-10 mm long	10-12 mm long
ANTHER	ovate-lanceolate, apiculate	oblong-lanceolate, apiculate 1.2-1.4 mm long	ovate-apiculate, c. 1 mm long	ovate-apiculate, c. 1 mm long
LEGUME	ovate-beaked, pubescent throughout, c. 10 mm long	ovate-beaked, pubescent throughout, 8-10 mm long	subcircular or broadly ovate, glabrous along the lower margin, pubescent elsewhere, 7-8 mm long	subcircular or broadly ovate, glabrous along the lower margin, pubescent elsewhere, 7-8 mm long

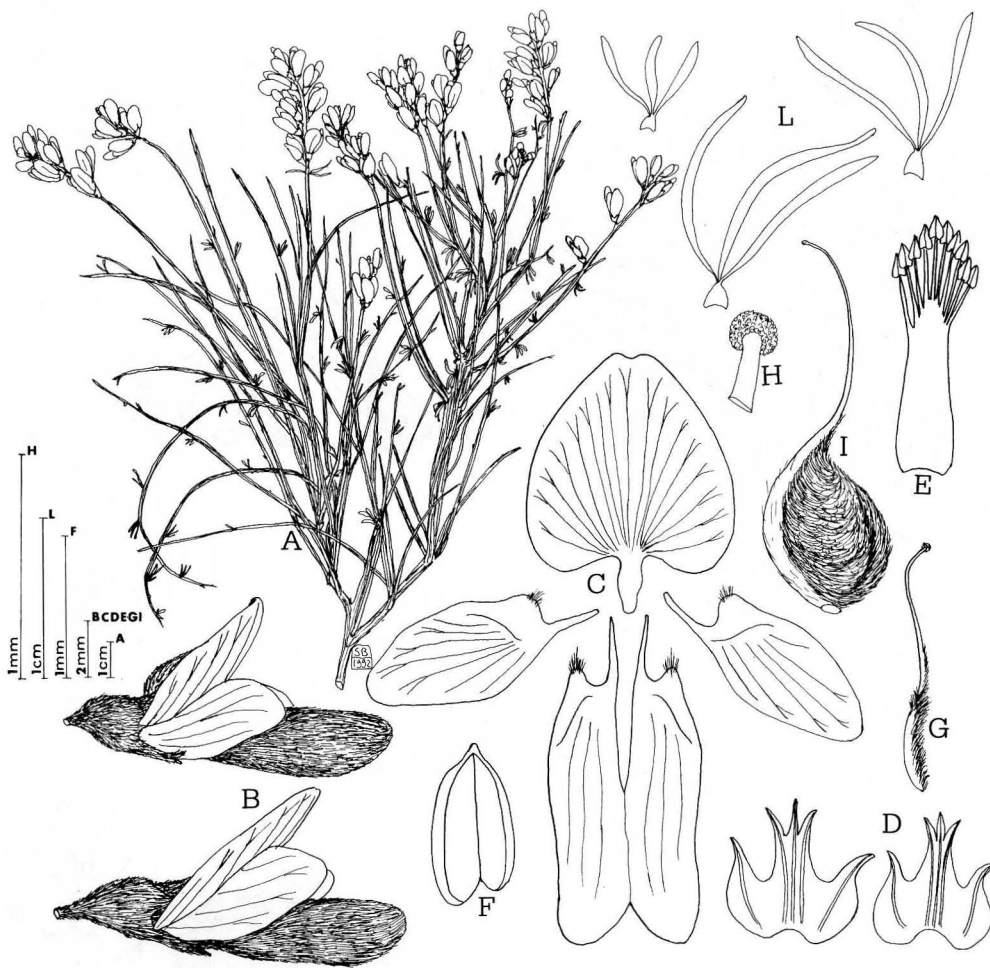


Fig. 1. *Genista demarcoi* Brullo, Scelsi & Siracusa. A: habit; B: flowers; C: corolla pieces; D: opened calyces; E: opened staminal tube; F: anther; G: pistil; H: stigma; I: legume; L: leaves.



Fig. 2. *Genista gasparrinii* (Guss.) C. Presl. A: habit; B: flower; C: corolla pieces; D: opened calyxes; E: opened staminal tube; F: anther; G: pistil; H: stigma; I: legume; L: leaves.

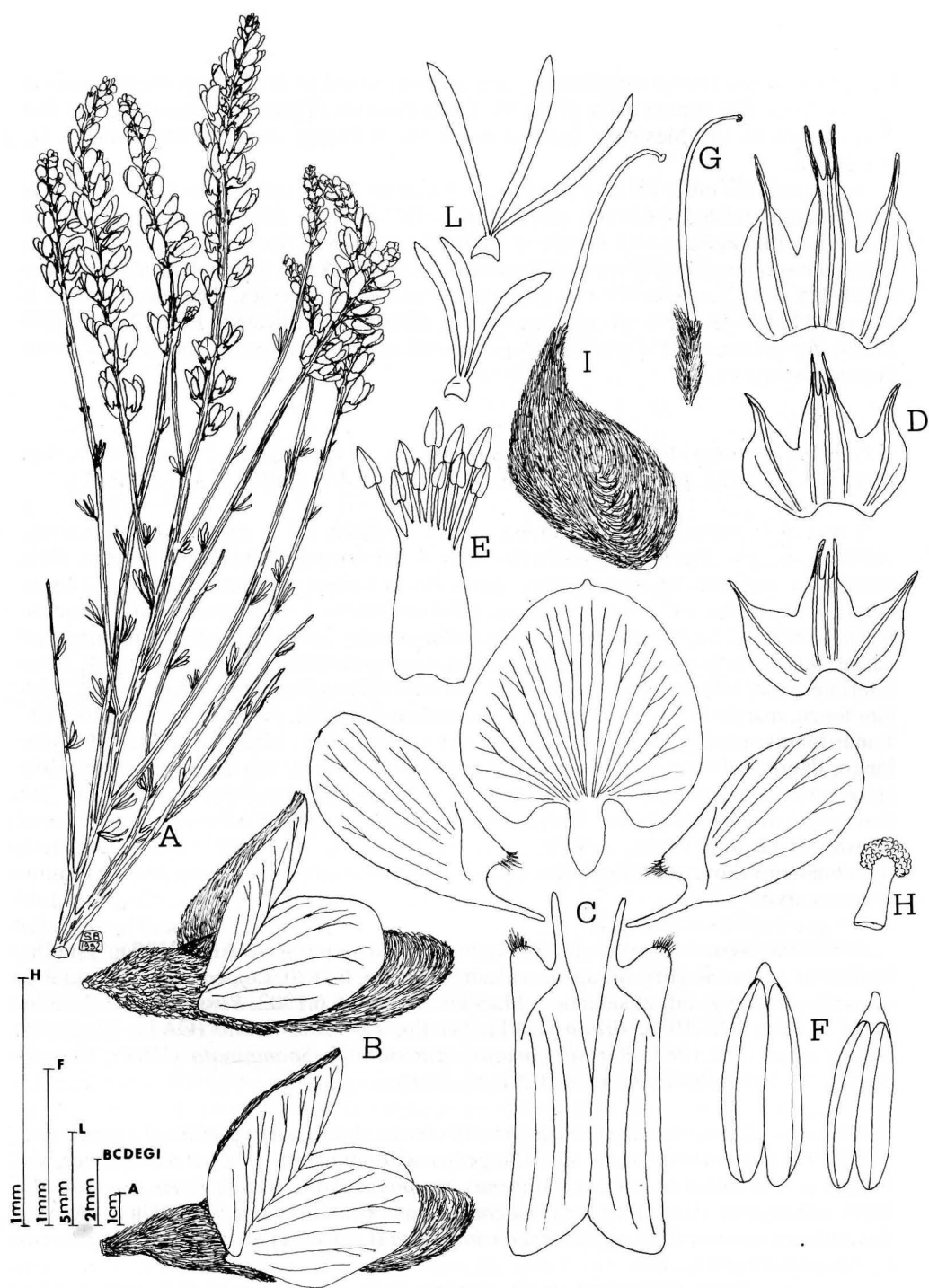


Fig. 3. *Genista tyrrhena* Valsecchi. A: habit; B: flower; C: corolla pieces; D: opened calyxes; E: opened staminal tube; F: anther; G: pistil; H: stigma; I: legume; L: leaves.

habit, branch and flower morphology, and are well suited to distinguish the two taxa at specific level. The correct name of the Sicilian population of pulvinate chasmophytes that is restricted to the Mesozoic limestones of the northern slope of M. Gallo is *G. gasparrinii*.

As regards the other Sicilian population, found on cliffs near Isnello (Madonie), it is indeed closely related to *Genista gasparrinii*. In fact, both are calcicolous plants linked to Mesozoic cliffs and are very similar in habit. Nevertheless a detailed study of numerous herbarium specimens and live material revealed some remarkable morphological differences which led us to consider the two populations as distinct species. The Isnello plant is described below as a new species, that we take pleasure to dedicate to Prof. Giovanni De Marco, the Italian botanist whose paper on the *G. ephedroides* group spurred us in our present investigation.

Genista demarcoi Brullo, Scelsi & Siracusa, *sp. nova* - Fig. 1 - Typus: Sicilia, rupi di Isnello, 3.6.1992, *Brullo & Scelsi s.n.* (holotypus: CAT; isotypi: CAT, FI, PAL).

Frutex pulvinatus, 30-80 cm altus, ramis subtilibus ad 1 mm crassis, flexuosis, brevibus, striatis, obtusis vel acutiusculis, alternis vel conferto-fasciculatis, sericeis. Folia trifoliolata, superiora saepe simplicia, segmentis linearibus, revolutis, pilosis, 4-14 mm longis. Flores numerosi in racemis densis 1,5-7 cm longis, 3-11-floris dispositi. Bractee lineari subulatae, 1,5-2,5 mm longae. Bracteolae subtiles, subulatae, 1,5-2 mm longae, ad basim calycis insertae. Calyx pilosus, conico-campanulatus, 3,5-5 mm longus, labio inferiore quam labium superius longiore vel eum subaequante, 0,8-1 mm lato, 2,5-2,6 mm longo, marginibus rectis, dentibus 3 lanceolato-subulatis, divaricatis, lateralibus 0,8-1 mm longis, medio lateralibus brevioribus vel eos aequante, labio superiore 1,5-2 mm longo, dentibus triangularibus et acuminatis. Corolla lutea, vexillo ovato-triangulari, apice subretuso, basi cordato, 8-9 mm longo, 7-8 mm lato, dorso dense piloso; alis 7-9 mm longis, dimidium carinae obtegentibus, in gibba basali penicillatum, carina dorso pilosa, 10-12 mm longa. Antherae ovatae, apiculatae, c. 1 mm longae. Legumen subrotundum vel ovato-subrotundum, pilosum sed in margine inferiore saepe subglabrum, rostro recurvo.

Specimina visa. - Isnello alle Madonie, s.d., *Gasparrini* (NAP-GUSS); Isnello, 16.6.1870, *Lojacono* (FI); In rupibus calcareis, Isnello, 6.1870, *Lojacono* (FI); In rupibus calcareis aridis reg. inf. et submont., Madonie, Isnello, 5.6.1902, *Ross 321* (FI); Isnello, Pizzo di Pilo, 19.7.1973, *Brullo* (CAT); Isnello, 1.6.1986, *Brullo* (CAT); Madonie, Isnello (rupi), 3.5.1987, *Bartolo, Brullo, Minissale & Spampinato* (CAT); Rupi di Isnello, 3.6.1992, *Brullo & Scelsi* (CAT, FI, PAL).

Ecology. - *Genista demarcoi* occurs on cliffs facies along a short portion of a gorge near Isnello. It grows mainly in the shade, together with numerous other chasmophytes, viz *Centaurea busambarensis* Guss., *Anthemis cupaniana* Tod., *Helichrysum pendulum* C. Presl, *Athamanta sicula* L., *Seseli bocconeii* Guss., *Odontites bocconeii* (Guss.) Walp., *Antirrhinum siculum* Mill., *Hypochoeris laevigata* (L.) Ces. et al., *Iberis semperflorens* L., *Silene fruticosa* L., etc.

From the phytosociological point of view it is a member of the *Anthemido-Centauretum busambarensis*, an association of the *Dianthion rupicolae* described by Brullo & Marcenò (1979).

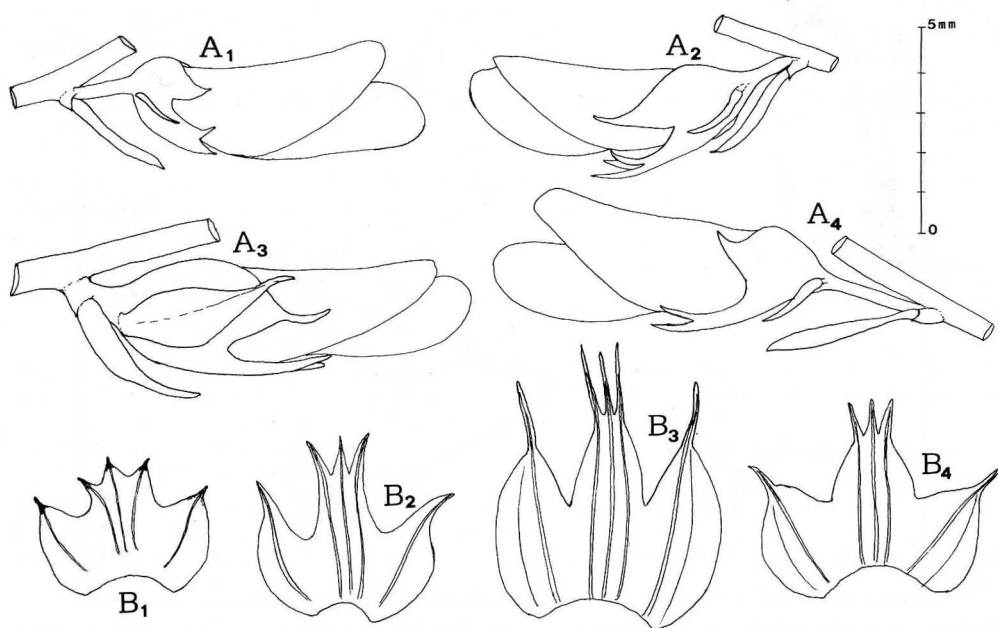


Fig. 4. Floral buds (A) and opened calyces (B) of *Genista gasparrinii* (1), *Genista demarcoi* (2), *Genista tyrrhena* (3), *Genista ephedroides* (4).

Taxonomic relationships. - Within the *Genista ephedroides* group, *G. demarcoi* shows a closer relation with *G. gasparrinii* by its habit and ecology. Both species are pulvinate chasmophytes growing on Mesozoic limestones, but *G. gasparrinii* is more thermophilous, living on cliffs near the sea, being a member of the *Scabioso-Centauretum ucraiae* Brullo & Marcenò 1979 (*Dianthion rupicolae*). *G. demarcoi* grows farther inland at altitudes of 600-700 m, in a more mesophilous plant community. The two species differ substantially in numerous flower characters, mainly the shape of calyx and corolla, as well as the size of bracts and bracteoles (Fig. 1,2,4). *Genista tyrrhena* and *G. ephedroides*, both occurring in thermophilous garrigue or maquis together with various sclerophyllous shrubs, resemble *G. demarcoi* mainly in the shape of the calyx which is characterized by a long lower lip with three teeth at the apex and an upper lip with long apiculate lobes (Fig. 3, 4). There are however numerous differences that allow to distinguish between the three species (Tab. 1). *Genista tyrrhena* differs from *G. demarcoi* in its arborescent habit, thicker and more robust branches, the longer and wider bracts and bracteoles, the larger calyx with a central tooth of lower lip that is subequal or shorter than the lateral ones, all being parallel, longer and more roundish standard, the longer wings that cover two thirds of the length of the keel, and the longer anthers (Fig. 1-3). *G. ephedroides* differs from *G. demarcoi* mainly in its rigid and mucronate branches, the linear-lanceolate to ovate-lanceolate bracts, the linear-lanceolate and shorter bracteoles, the longer calyx and its wider lower lip with convex margins, the smaller standard that is truncate at the base, and the longer keel. From a chorological point of view, the species of *Genista ephedroides* group belong to the Tyrrhenian element (Fig. 5). *G. ephedroides* and *G. tyrrhena* are more widespread occurring in S.-W. and N. Sardinia and on volcanic islands of the Aeolian and Pontian archipelagos respectively. *G. gasparrinii* and *G. demarcoi* are very rare species with a punctiform distribution, each limited to a single restricted locality of Northern Sicily (Fig. 5). According to De Marco & al. (1987), these four species probably arose

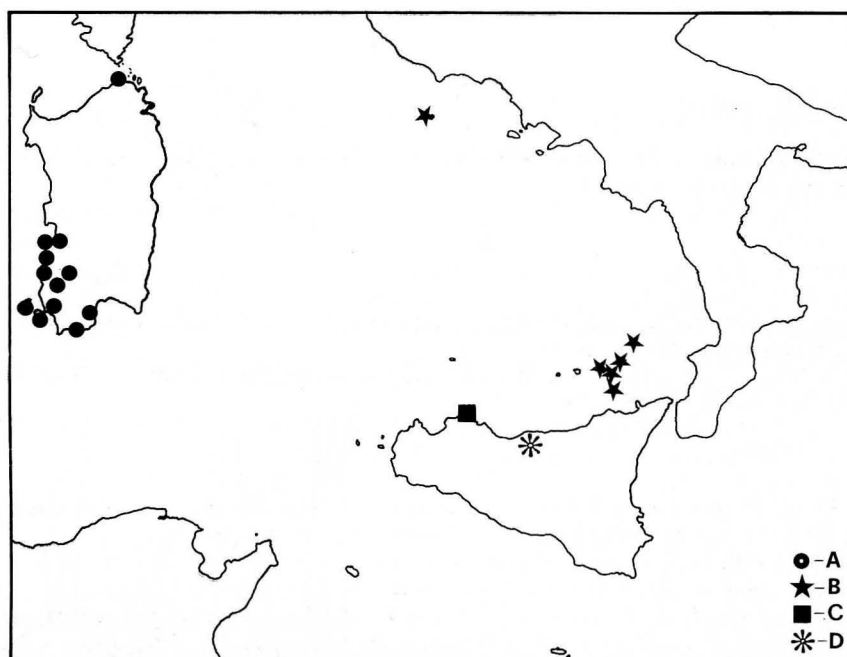


Fig. 5. Geographical distribution of *Genista ephedroides* (A), *Genista tyrrhena* (B), *Genista gasparrinii* (C) and *Genista demarcoi* (D), based on herbarium specimens.

from a common ancestor consequent to the geographical isolation of their respective areas. *G. demarcoi* and *G. gasparrinii* judging from their habit and ecology, are probably the least evolved, an assumption that is consistent with the relict character of their distribution. On the contrary, *G. tyrrhena* seems to be the most advanced species, occurring on Quaternary volcanic islands where it behaves as a pioneer species colonizing the lavic substrate and able to develop into tree-like habit. For the identification of the Italian species of the *Genista ephedroides* group, the following key is given (1):

- 1 Calyx 2.8-3.2 mm long, its lower lip 1-1.5 mm long, with triangular teeth 0.5 mm long.....*G. gasparrinii*
- 1 Calyx 3.5-7.5 mm long, its lower lip 2.5-4.5 mm long, its lanceolate or subulate teeth 0.5-3 mm long.....2
- 2 Branches rigid, mucronate; bracteoles 0.5-1.5 mm long; standard 7 x 6 mm truncate at the base.....*G. ephedroides*
- 2 Branches flexuous, blunt; bracteoles 1.5-4.5 mm long; standard 8-12 x 7-8 mm, cordate at the base.....3
- 3 Branches robust, up to 2 mm in diameter; inflorescence with 10-30 flowers; bracteoles lanceolate to ovate, 2-4.5 mm long; calyx with lower lip 2.6-4.5 mm long and upper lip 2.1-3.5 mm long.....*G. tyrrhena*
- 3 Branches slender, up to 1 mm in diameter; inflorescence with 3-11 flowers; bracteoles subulate, 1.5-2 mm long, calyx with lower lip 2.5-2.6 mm long and upper lip 1.5-2 mm long.....*G. demarcoi*

(1) The populations occurring in the Provincia of Salerno (S: Italy), by Pizzolongo (1961) identified as *G. ephedroides* and by De Marco & al. (1987) attributed to *G. numidica*, are not considered in this paper because they result quite critic and will be successively examined.

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