

Silvio Fici

Galium rotundifolium* (Rubiaceae) in southern Italy and its relationships with *G. scabrum

Abstract

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The distribution and ecology of critical hairy forms of *Galium rotundifolium* from southern Italy are examined; these variants are not recognized as a separate taxon. A description of the species is given, and its relationships with *G. scabrum* are discussed. The latter taxon is excluded from the flora of southern Italy.

The *Galium rotundifolium* group in *G.* sect. *Platygalium* Koch includes several species, viz. *G. rotundifolium* L., *G. scabrum* L. and *G. thumbergianum* Ecklon & Zeyher (*G. biafrae* Hiern) as well as *G. elegans* Roxb., *G. pilosum* Aiton, *G. obovatum* Kunth, and others distributed in Europe, Africa, Asia, N and S America (Ehrendorfer 1952). In the Mediterranean Region the Eurasian *G. rotundifolium* and the Mediterranean-Macaronesian *G. scabrum* form a closely related species pair.

According to Meusel & Jager (1992) the former taxon is distributed in Europe, NW Africa and W Asia, the latter ranges from Macaronesia to the central Mediterranean, with its eastern limit in Sicily and southern Calabria. This group is still incompletely investigated in some districts of S Italy, because of the presence of populations showing intermediate characters, as reported by Ehrendorfer (1982) for Calabria. Fici & Natali (1991) have underlined the controversial taxonomic status of similar forms from Sicily, characterized by the prostrate-ascendent habit and pauciflorous inflorescence typical of *G. rotundifolium* and the marked hairiness of *G. scabrum*; all populations of the island were referred to hairy variants of *G. rotundifolium*, and *G. scabrum* was excluded from Sicily. The appearance of local hairy forms with doubtful taxonomical value in usually glabrous, wide-ranging species is known elsewhere in the *Rubiaceae*, e. g. in Mediterranean populations of *Cruciata glabra* (L.) Ehrend. (Ehrendorfer 1976; Natali & Deschatres 1988).

With the aim to define the variability within the group in the whole Mediterranean Region, researches in some Italian and European herbaria were carried out (BM, CLU, FI, G, NA, PAL, RO, SEV), and the populations of several mountain ranges of S Italy, (Mt. Pollino, Volturino, Sila and Aspromonte) were studied. The taxonomy and distribution of the forms occurring in this area are discussed in this paper, as well as the relationships between *Galium rotundifolium* and *G. scabrum*.

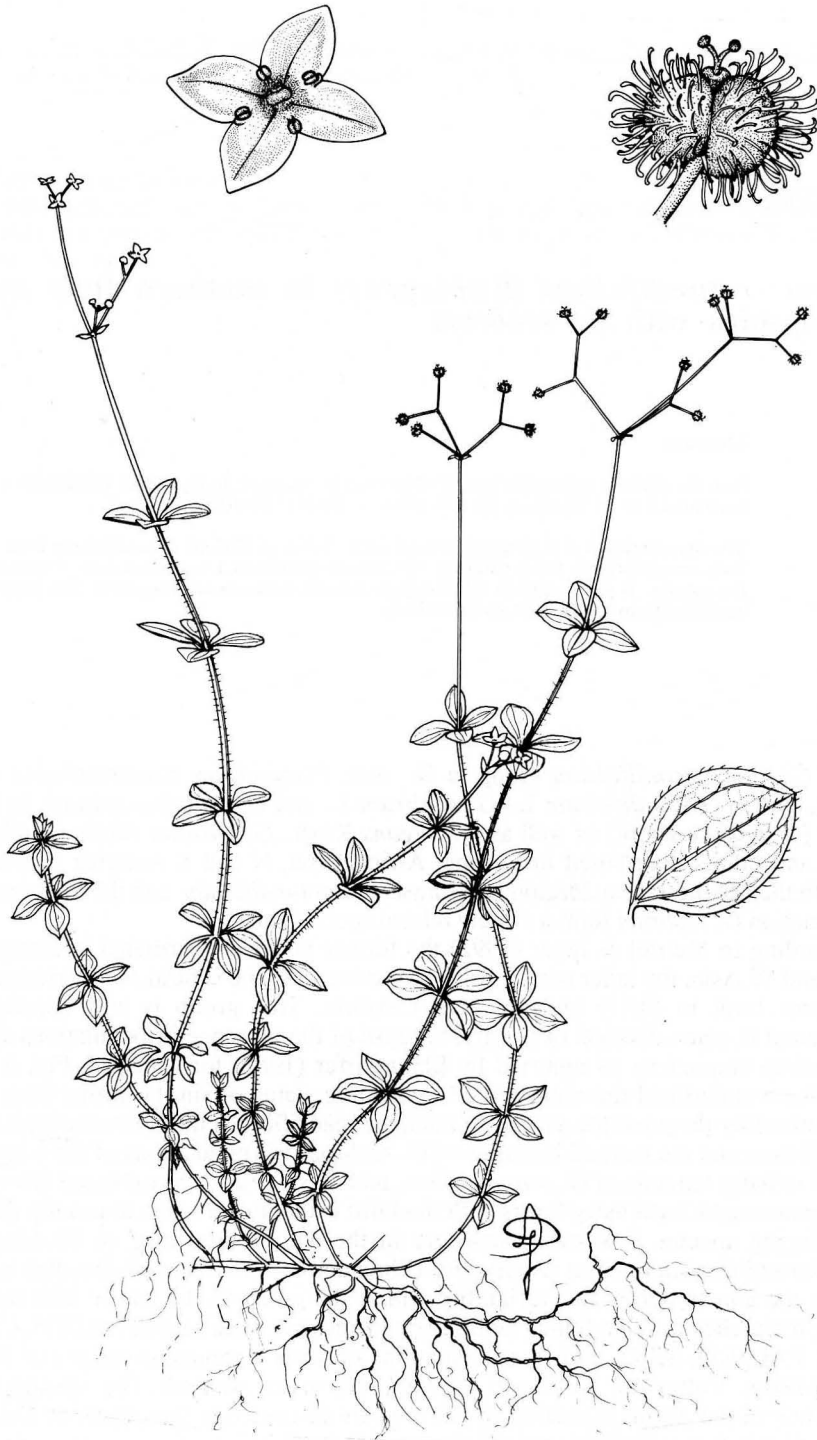


Fig. 1. *Galium rotundifolium*.— A: plant in flower (x 0.4); B: flower (x 5); C: fruit (x 5); D: leaf (x 1.6).

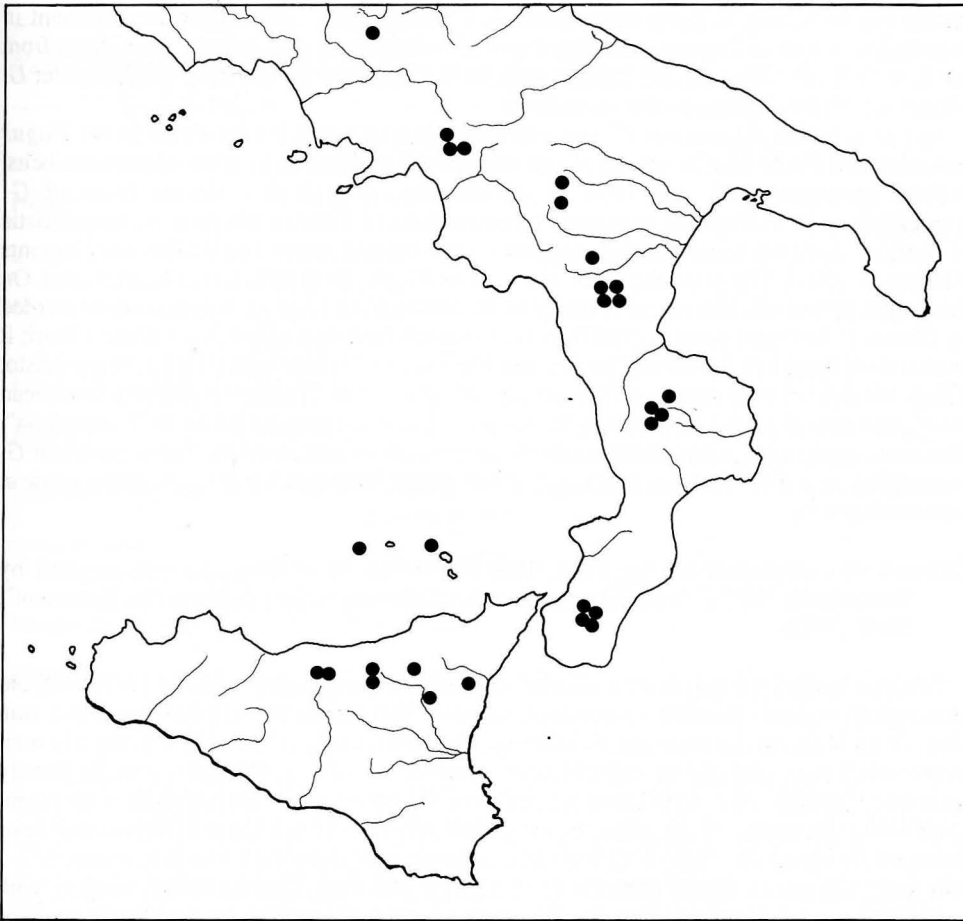


Fig. 2. Distribution of *Galium rotundifolium* in S Italy, Sicily and on the Eolie Islands (records from herbaria).

Discussion

So far the bibliographic record concerning this group in S Italy is controversial. Material from the area was referred by some authors to synonyms of *Galium scabrum* (sub *G. rotundifolium* var. β , by Tenore 1831; *G. rotundifolium* var. *hirsutum* (Nees) Tanf., by Tanfani 1887; *G. rotundifolium* var. *ellipticum* (Willd.) Fiori, by Fiori 1925-1929; *G. rotundifolium* subsp. *ovalifolium* (Schott) Rouy, by Moggi (1954-1955), or by others to *G. rotundifolium* s. str. (Gavioli 1947, Bonin 1978, Corbetta & Pirone 1981, Moraldo & al. 1983-1984, Santangelo 1988).

Grande (1913), who studied several populations in S Italy, stated that *G. scabrum* is to be excluded from the flora of this area where only more or less hairy ("vestite") variants of *G. rotundifolium* occur. As mentioned above Ehrendorfer (1982) stressed the presence in Calabria of critical intermediate forms. The herbarium investigation showed the occurrence of similar forms also in Campania and Basilicata. All the material studied

turned out to belong to hairy variants of *G. rotundifolium*, which become dominant in populations south of Latium, except for sporadic glabrous individuals. Specimens from the Eolie Islands (Alicudi and Salina), kept in N and placed by Gussone (1842) under *G. ellipticum* Willd., belong to the same form.

In the southern Apennines *G. rotundifolium* is a rare species localized in the *Fagus sylvatica* and *Pinus laricio* woods of the supramediterranean and oromediterranean belts, mainly between 1100 and 1950 m of altitude. A typical glabrous form of *G. rotundifolium* is widespread in similar forest habitats of Corsica where it is characteristic of *Galio-Fagenion* communities, together with several other Euro-Siberian elements (Gamisans 1991). The presence of *G. scabrum* in S Italy, therefore, has to be excluded. On the Italian peninsula, this taxon is likely to be restricted to Liguria, where it was recorded by Chiosi (1940) and Ariello (1957) as *G. rotundifolium* var. *ellipticum* (Willd.) Fiori; it is also widespread in Sardinia, Corsica and the Tuscan Archipelago (Giglio, Montecristo, Elba). Mariotti (1990) regarded *G. scabrum* in Liguria as a "Tertiary palaeomediterranean relic", and hypothesized its presence in this area before the disjunction from "Corsardinia". The same author (Mariotti 1984) underlined the lack of intermediate forms between *G. rotundifolium* and *G. scabrum* in Cinque Terre, where both species are present but grow in separate habitats.

***Galium rotundifolium* L., Sp. Pl. 1: 108. 1753 (Fig. 1).** — Neotypus (designated by Ehrendorfer 1952): "Salisburgia: In silvis caeduis ad pagum Aigen prope Juvaviam", Stohl (WU).

Scapose hemicryptophyte with slender, creeping, rooting stolons. Stems 15-30(-40) cm high, quadrangular, prostrate-ascending, slender, hairy with whitish hairs c. 0.6-1 mm long, or glabrescent. Leaves and leaf-like stipules 4-whorled, 10-18(-20) x 5-10(-11) mm, ovate-subelliptic, obovate or suborbicular, acute or rounded at the apex, usually shortly apiculate, cuneate, thin, with three nerves from the base, ciliate and covered with patent hairs along the veins, rarely glabrescent; petiole 0.6-1.5(-2) mm long. Inflorescence few-flowered, corymbose, (2.5-)4-13.5 (-15) cm long, with glabrous branches; bracts c. 2-5 mm long, lanceolate-linear; pedicels (2-)5-13(-15) mm long. Corolla rotate, whitish, with ovate lobes c. 1.5-2 mm long; ovary densely covered with whitish hooked hairs; stamens with filaments c. 1.5 mm long and anthers 0.3-0.4 mm long; style bifid, 1.5 mm long, with capitate stigmas. Fruit 2-2.5 mm long, densely covered with hooked hairs. - Fl.: June to August - $2n = 22$ (Fici & Natali 1991).

Habitat: — *Fagus sylvatica* and *Pinus laricio* woods, on limestone, sandstone and granite, between c. 1000 and 1950 m altitude. — **General distribution:** Europe, north-western Africa and western Asia (Ehrendorfer & Schönbeck-Temesy 1982; Meusel & Jager 1992). — **Distribution in S Italy:** Tyrrhenian districts (Campania, Basilicata, Calabria), on the main mountain ranges (Fig. 2).

Hairy forms of *Galium rotundifolium* are difficult to discriminate from *G. scabrum* when examining herbarium gatherings, whereas the two species are easily recognizable in the field because of their different ecology and habit. The main diagnostic features, derived from comparison of material of *G. rotundifolium* from S Italy and *G. scabrum* from other mediterranean areas, are given in Table 1. The two species are parapatric in Liguria, Corsica, Sardinia and on the Iberian peninsula. Intermediate forms are reported from Morocco, Algeria and Macaronesia, where the *G. rotundifolium* group still has to be more carefully investigated; both species were recorded by Kunkel & Kunkel (1978) from the Canary Islands.

Table 1. Diagnostic features between *Galium rotundifolium* and *G. scabrum*

	<i>G. rotundifolium</i>	<i>G. scabrum</i>
Habit	Prostrate-ascendent	Erect
Length of the stem	up to 40 cm	up to 70 cm
Stem indumentum	scattered at the angles or absent	dense and continuous
Length of the petiole	0.6-1.5(-2) mm	—
Leaf size	10-18(-20) x 5-10(-11) mm	20-35(-40) x 8-12(-18) mm
Leaf indumentum	scattered at the margins and veins or absent	dense and continuous
Inflorescence	few-flowered, racem like	many-flowered, ovoid-pyramidal
Length of the pedicel	(2-)5-13(-15) mm	(2-)3-8(-9) mm
Ecology	supramedit. and oromed. woods	thermomed. and mesomed. woodlands and maquis

Specimens from C and S Italy. — Aspromonte, Valle Oscura sotto Basilicò, 12.7.1827, *Gussone* (NA); Selve di Aspromonte, 12.7.1827, *Gussone* (NA); Boschi di Aspromonte, 10.7.1827, *Gussone* (NA); Calabria I, Piani di Aspromonte, 1100 m, 3.7.1877, *Hutor, Porta & Rigo* (NA); M. Papa, Schiena d'Asino, ca. 1830 m, 19.8.1908, *Cavara & Grande* (NA); Pollino, ... 1907, *Cavara* (NA); Madonna di Pollino, Timpone del Porcaro, ca. 1570 m, 24.8.1908, *Cavara & Grande* (NA); Aspromonte, 22-25.8.1904, *Pasquale* (NA); Aspromonte, 8.1898, *Pasquale* (NA); Giffone, 14.9.1909, *Pasquale* (NA); M. Cucuzzo, s.d., [*Tenore*] (NA); Matese, s.d., *Tenore* (NA); M. Terminio, Piano di Verteglia e Campolasperto, 12.7.1972, *Moraldo & Caputo* (NA); M. Terminio, Faggeta Acqua delle Logge, 3.7.1976, *Moraldo & Caputo* (NA); Raiamagra, 18.7.1976, *Moraldo & Caputo* (NA); Pollino, 29.7.1901, *Longo* (RO); Selve dello Schiapparo, Villavallelonga, 26.9.1923, *Grande* (RO); Monti Lepini, Pian della Faggeta sopra Carpineto, 25.5.1983, *Anzalone* (RO); Monte Alto di Aspromonte, 6.7.1906, *Martelli* (FI); Sila, Fossiata, Longobucco, 26.7/3.8. 1918, *Fiori* (FI); La Sila, faggeta Cozzo Sordillo, 13.7.1951, *Negri, Sarfatti & Contardo* (FI); La Sila, Camigliatello, "nei boschi salendo verso monte Guercio", 7.1951, *Sarfatti & Contardo* (FI); Pollino, sorgente Catusa, 22.11.1990, *Fici* (PAL); Pollino, faggeta presso il Lago del Pesce, 11.7.1991, *Fici* (PAL); Pollino, Serra del Prete, 7.8.1991, *Fici* (PAL); Piano della Giumenta, 15.6.1991, *Fici* (PAL); Sila, faggeta presso Camigliatello, 20.7.1991; *Fici* (PAL); Volturino, 13.6.1991, *Fici* (PAL); Monte Alto, S of Gambari, 26.7.1984, *Brookes, Haddad & Jury* (BM); Aspromonte, Gambari, *Akeroyd, Jury, Miles & Rumsey* (BM); M. Sacro di Novi, 24.7.1914, [*Lacaita*] (BM); M. Accelica, 21.6.1908, [*Lacaita*] (BM).

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Address of the author:

S. Fici, Dipartimento di Biologia, Difesa e Biotecnologie Agro-Forestali, Università della Basilicata, Via N. Sauro 85, I-85100 Potenza, Italy.