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The vascular flora of the Argentino River valley, a nature reserve in NW Calabria (Italy)

Abstract

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As a result of the floristic investigations carried out between 1990 and 1993, 846 taxa, belonging to 435 genera and 101 families, are listed. The flora is characterized by the predominance of Mediterranean elements, but the occurrence of euro-asiatic species, even at low altitudes, is favoured locally by colder microclimates. Several species of phytogeographic interest, or new to the Calabrian flora, are reported. A more efficient protection is needed in order to fully preserve the area.

Introduction

A floristic survey of the nature reserve "Valle del Fiume Argentino", a very interesting area in the north-west of Calabria, has been carried out in the general frame of a study of the flora and vegetation of Calabria (S Italy). This reserve encompasses the upper and middle part of the Argentino River basin, in the Orsomarso municipality (Fig. 1). It covers an area of 3980 ha, at altitudes comprised between 150 and 1637 m, the highest top being Mt. Palanuda.

The reserve was instituted by ministerial decree N. 425 (21 Jul 1987), to safeguard the landscape and naturalistic riches. By a further ministerial decree (31 Dec 1990) it was included in the Pollino National Park, Orsomarso being one of the 21 municipalities which surround the park.

Floristic data on the Argentino Valley are very scarce. Some are quoted in Longo (1902, 1905). More recently a study of the lichen flora of the area was made by Puntillo (1993). More numerous are the floristic data on the neighbouring mountains of Pollino and Mula (Terracciano 1891, Longo 1901, 1903) and on the nearby valley of the Lao River (Longo 1902).

Features of the environment

The Argentino River valley, being part of the southern Apennines, comprises two geo-structural formations: the dolomitic limestones of Alburno-Cervati, occupying most of the area, and the dolomitic flint marly limestones of Verbicaro, that tectonically overlie them (Bousquet 1973). Schistose clays, alluvial sandy soils, and higneous rocks occur locally (Fig. 2).

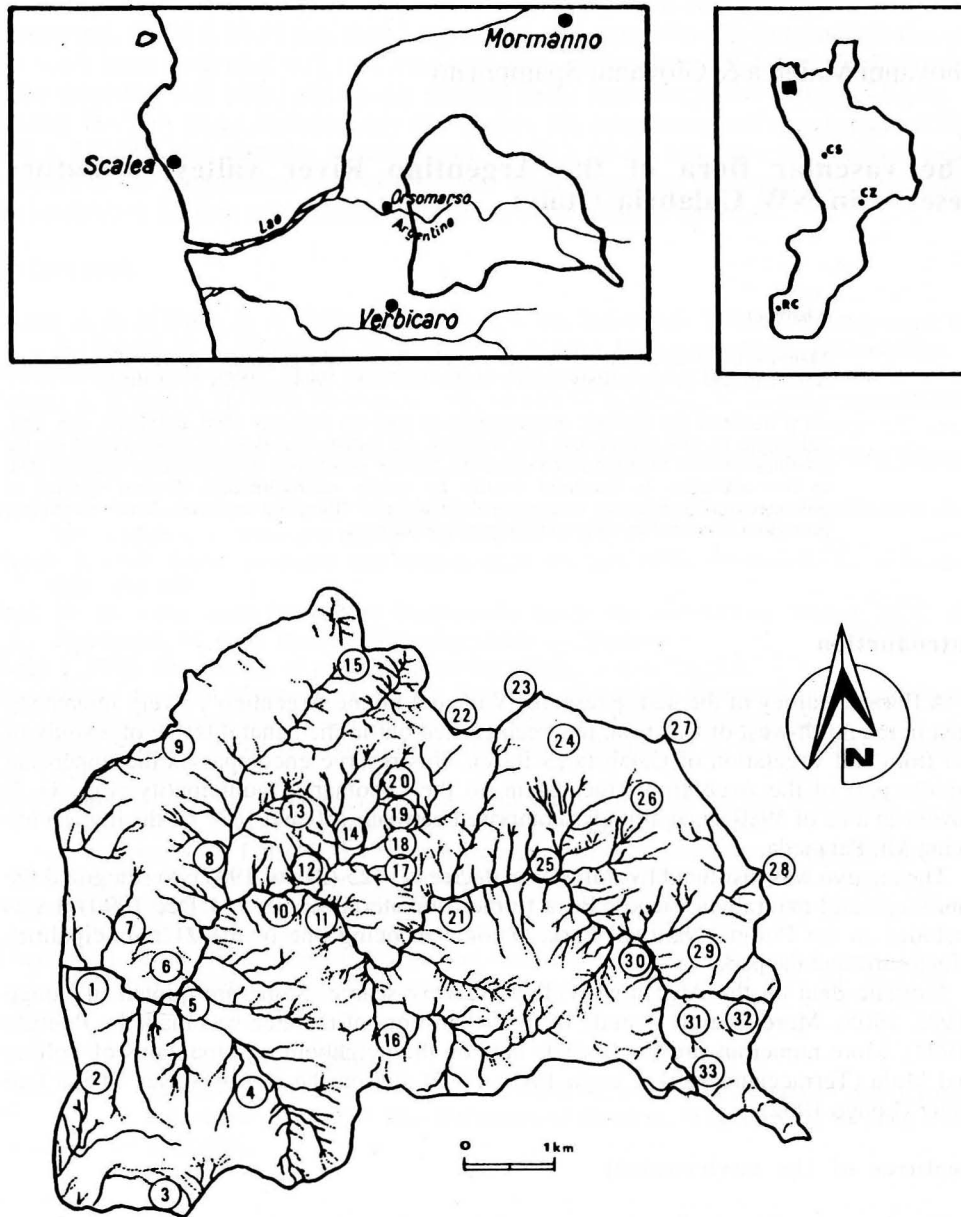


Fig. 1. Location and delimitation of nature reserve. Numbered localities are detailed in Table 1.

Table 1. - Designation (with altitude) of localities in the nature reserve area. The numbering refers to that given on the map in Fig. 1.

1) La Limpida, 190 m	18) Valle Brancato, 500 m
2) Castel Raiona, 969 m	19) Castello Brancato, 920 m
3) La Manca, 1000 m	20) Fonte dei Masseti 908 m
4) Simpisia, 597 m	21) Pantagnoli, 461 m
5) Fonte Guaglianone, 280 m	22) Conte Orlando Refuge, 1230 m
6) Piano di Loro, 200 m	23) Valle Tirata, 1285 m
7) Suglie, 225 m	24) Piano di Cambio, 1388 m
8) Valle della Pietra, 518 m	25) Golfo della Serra, 468 m
9) Timpone Mezzinare, 1091 m	26) Valle Deo Gratias, 1500 m
10) S. Ginosa, 270 m	27) Palanuda Mt., 1632 m
11) Middle Argentino River valley, 316 m	28) Pietra Campanara, 1258 m
12) Povera Mosca, 278 m	29) Timpone I Fornelli, 1025 m
13) Pomareto, 665 m	30) Upper Argentino River valley, 666 m
14) I Milari, 431 m	31) I Fornelli Refuge, 930 m
15) Timpone Grugoleio, 1100 m	32) Fiumarella di Rossale, 1100 m
16) Albaneta, 800 m	33) Fiumarella di Tavolara, 1168 m
17) Castello San Noceto, 724 m	34) Crivi di Mangiacaniglia, 1180 m

Table 2. - Main climatic data, based on the period 1921 - 1968 (from Ciancio 1971)

Metereological station	mean (mm)			mean (°C)				
	annual	annual, maximum	annual, minimum	annual	average, coldest month	average, warmest month	minimum, coldest month	maximum, warmest month
965 m	1585	2435	912	10.7	2.3	20.7	- 0.3	26.3
120 m	1412	2038	844	16.7	8.8	26.5	5.8	31.7

The geomorphology of the area, consequent to the dominance of limestones, is characterized by vertical cliffs, rock towers, steep slopes, and gorges.

The Argentino River and its tributaries have cut deeply into the substrate, giving rise to a narrow, deep valley running from east to west for about 12 km.

The Argentino River is part of the catchment basin of the Lao River, into which it flows. Consequent to its wide altitude range, different climate types prevail in the Argentino valley.

Table 2 gives some climate data for Campotenese (935 m) and Orsomarso (120 m), localities situated close to the reserve (Ciancio 1971).

The rainfall is abundant (1412 mm for Orsomarso, 1585 mm for Campotenese), but decreases drastically in summer (Fig. 3), reaching down to 35-45 mm of mean monthly rainfall.

The mean annual temperature is 10.7°C for Orsomarso and 16.7 for Campotenese. According to the climate classification of Rivas-Martinez (1981), the lower altitudes are characterized by a mesomediterranean humid climate, while the mountain zone has a supramediterranean humid climate.

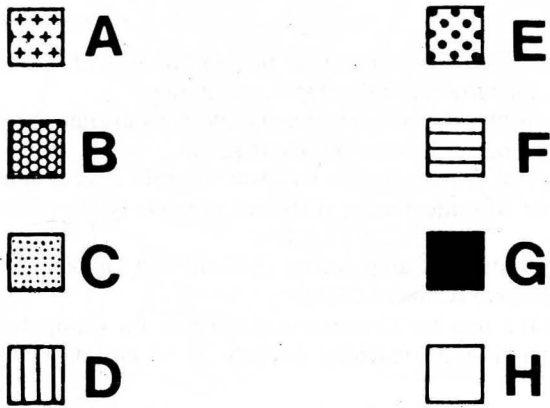
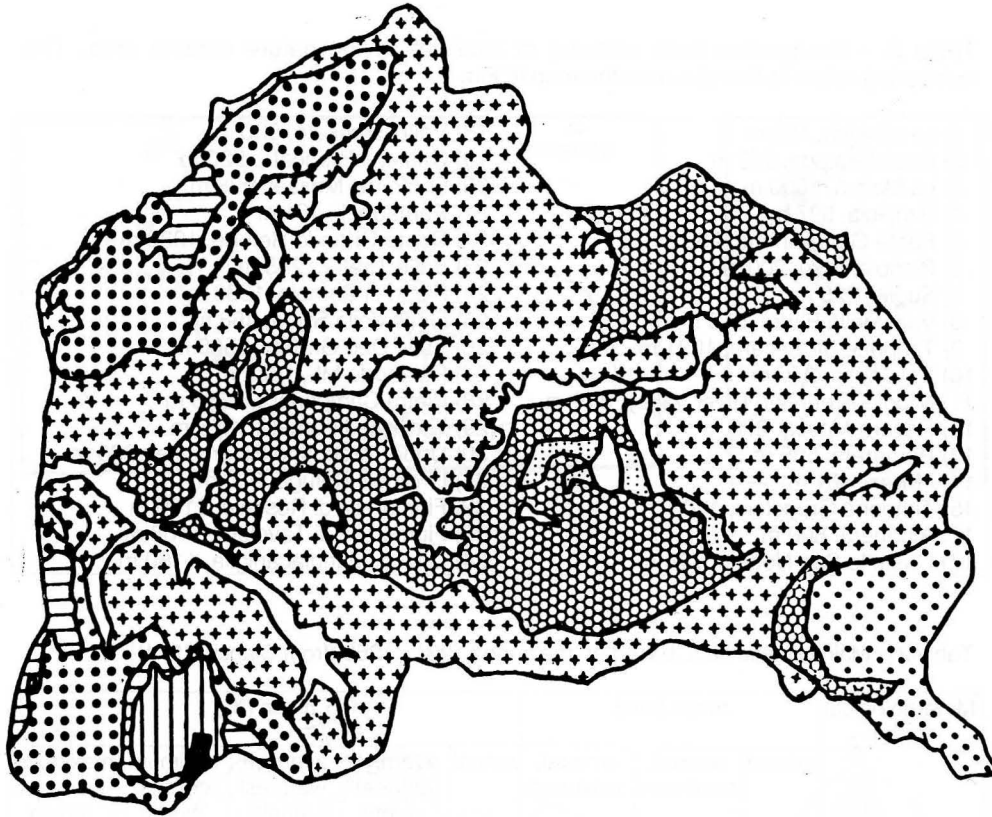


Fig. 2. Geological map of the Argentino River valley. A = dolomitic rocks and dark grey dolomitic limestones, B = pale grey compact limestones, C = stratified dark grey limestones, intercalated by shale, D = calcarenites, E = clayey schists, F = calcareous breccia, G = igneous rocks, H = alluvial soil and talus.

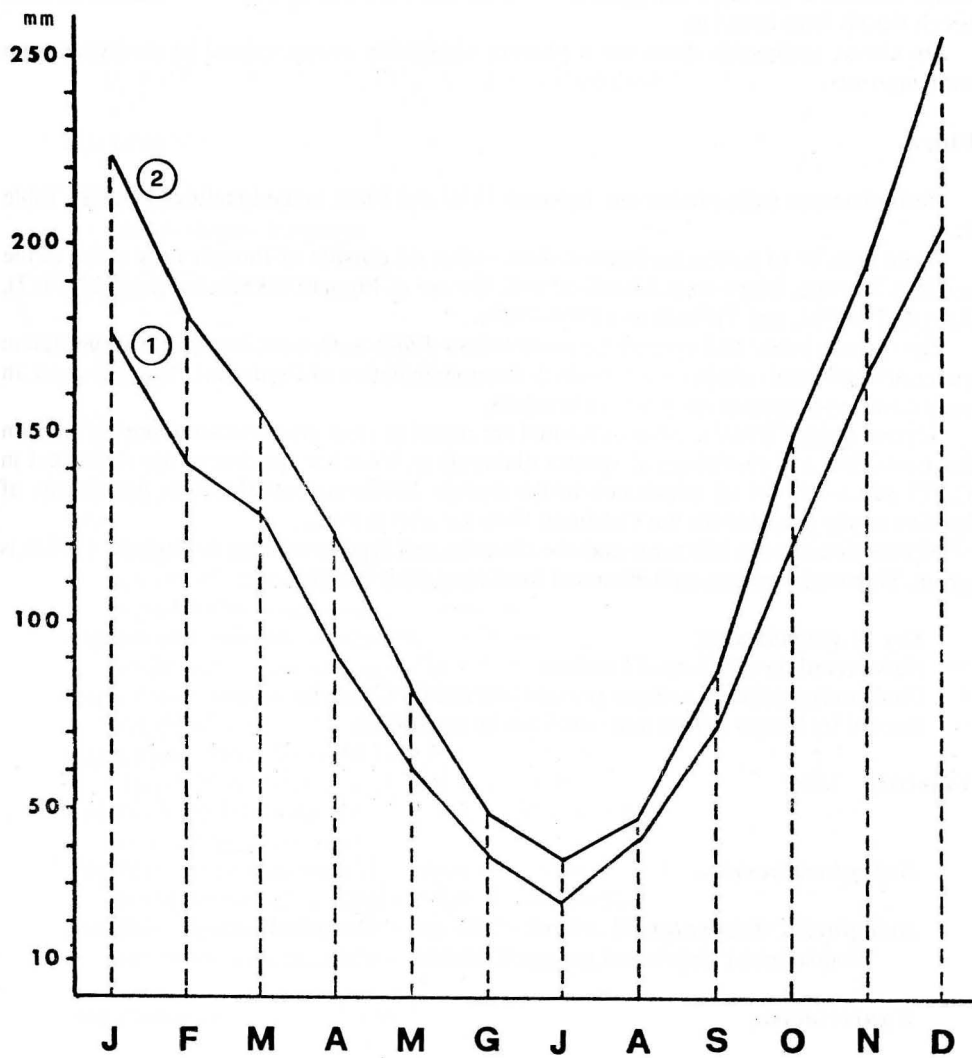


Fig. 3. Mean monthly rainfall recorded at the meteorological stations of Orsomarso (1) and Campotenese (2) during the period 1923 to 1987.

The different climate conditions result in a marked shift of the climax vegetation. Evergreen woods, dominated by *Quercus ilex*, characterize the lowermost vegetation belt.

In the gorges, they are replaced by mesophilous deciduous woods with *Ostrya carpinifolia*, *Acer lobelii* and *A. neapolitanus*. Degraded vegetation types (evergreen scrubs, garigues, pastures) are also widespread. Along the Argentino River one finds riparian woods with *Alnus cordata*.

The *Fagus sylvatica* woods is widespread and characteristic of the montane belt. Scattered pine woods with *Pinus leucodermis* replace the beech woods in rocky, sloping areas. Mountain pastures are present on Palanuda Mt. and in other limited land where beech woods have been cut.

On clastic sediments there are a pioneer vegetation characterized by *Achnatherum calamagrostis*.

Flora

Herborizations were carried out, between 1990 and 1993, in the localities listed in Table 1.

Some species of particular interest were collected outside of though very close to the reserve. The specimens were identified with the aid of Pignatti (1982), Fiori (1923-1927), Zangheri (1976), and Tutin & al. (1964-1980).

The nomenclature and systematic order follow *Flora europaea*, except for some Italian endemics and local subspecies, for which the nomenclature of Pignatti (1982) was used. In such cases, synonymies are given in brackets.

Several species introduced or cultivated are report in clear characters and are escluded in the biological and chorological spectra elaboration. Voucher specimens are deposited in CAT, and a full set of duplicates in the private herbarium of Maiorca. Specimens of species newly recorded for the Calabrian flora are also in PAL.

For each taxon the life form and the chorological type according to Pignatti (1982) is given. Some information on habitat and local frequency is added.

Key to symbols used.

- ** New record for the flora of Calabria.
- * First confirmation of a single previous record for Calabria.
- Record by Longo (1905) that could not be confirmed.

Floristic list

Selaginellaceae

Selaginella denticulata (L.) Link - Ch rept - Stenomedit.
Woods, moist slopes and gorges. Common.

Equisetaceae

Equisetum ramosissimum Desf. - G rhiz - Circumbor.
Damp meadows. Common.

Equisetum palustre L. - G rhiz - Circumbor.
Marshes, damp meadows, streams. Common.

Equisetum arvense L. - G rhiz - Circumbor.
Damp meadows. Common.

Equisetum telmateja Ehrh. - G rhiz - Circumbor.
Marshes, riparian woods. Frequent.

Adiantaceae

Adiantum capillus-veneris L. - G rhiz - Pantrop.
Wet rocks. Common.

Pteridaceae

Pteris cretica L. - H ros - Pantrop.
Wet and shady rocks. Rare, localized near Pantagnoli.

Gymnogrammaceae

Anogramma leptophylla (L.) Link - T caesp - Cosmop. subtrop.
Rocks, slopes. Frequent.

Hypolepidaceae

Pteridium aquilinum (L.) Kuhn - G rhiz - Cosmop.
Fallow land, deforested land, wood clearings. Common.

Aspleniaceae

Asplenium trichomanes subsp. *quadrivalens* D.E.Meyer - H ros - Cosmop.
temp.
Shady rocks and slopes, woods of lower belt. Common. The specimens collected may be referred to this subspecies by the pinnules 0.6 - 1.2 cm long with perpendicular insertion in the upper ones.

Asplenium adiantum-nigrum L. - H ros - Palaeotemp. Subtrop.
Shady rocks, woods of lower belt. Common.

Asplenium onopteris L. - H ros - Subtrop. nesciol.
Woods of lower belt, chiefly holm-oak woods. Common.

Asplenium ruta-muraria L. - H ros - Circumbor.
Crivi di Mangiacaniglia; rock fissures. Rare.

Ceterach officinarum DC. - H ros - Euras. temp.
Rocks, walls. Common.

Phyllitis scolopendrium (L.) Newman - H ros - Circumbor. temp.
Swampy woods, wet slopes and rocks. Frequent.

Phyllitis sagittata (DC.) Guinea & Heywood - H ros - S Medit.
Wet rocks. Rare and localized near Pantagnoli.

Athyriaceae

Athyrium filix-foemina (L.) Roth - H ros - Subcosmop.
Woods of montane belt, chiefly beech woods. Frequent.

Cystopteris fragilis (L.) Bernh. - H caesp - Cosmop.
Rocks, cliffs. Common.

Aspidiaceae

Polystichum aculeatum (L.) Roth - G rhiz - Eurasiat.

Shady woods. Frequent.

Polystichum setiferum (Forsskål) Woyнар - G rhiz - Circumbor.

Shady woods. Frequent.

Dryopteris filix-mas (L.) Schott - G rhiz - Subcosmop.

Woods. Frequent.

Polypodiaceae

Polypodium australe Fée H ros - Eurymedit.

Woods and shaded rocks. Common.

Pinaceae

Abies alba Miller - P scap - Oroph. S Europ.

Pietra Campanara, mountain basin of Argentino River, beech woods. Rare.

Pinus nigra Arnold - P scap - Illyr.

Frequent but localized near Timpone i Fornelli. This species was reported also by Pennacchini & Bonin (1975) for the same locality.

Pinus sylvestris L. - P scap - Oroph. Eurasiat.

Introduced near Timpone Grugoleio.

Pinus leucodermis Antoine - P scap - NE Medit. Mount.

Rocks and calcareous slopes. Frequent, but localized near Crivi di Mangiacaniglia, Pietra Campanara and Timpone I Fornelli.

Pinus halepensis Miller - P scap

Introduced near Castello Brancato.

Pinus radiata Don - P scap

Introduced near Castel Raione.

Cedrus deodara G. Don - P scap

Introduced near I Fornelli refuge.

Cupressaceae

Juniperus communis L. - P caesp - Circumbor.

Brush and scrub. Common

Juniperus oxycedrus L. - P caesp - Eurymedit.

Torrione Uomo Lungo, just outside the reserve. Rare.

* ***Juniperus phoenicea*** L. - P caesp - Eurymedit.

Torrione Uomo Lungo, just outside the reserve. Rare. Already reported for the Calabrian flora by Longo (1902), but not in more recent floras.

Taxaceae

Taxus baccata L. - P caesp - Palaeotemp.

Beech woods. Rare and localized in the upper Argentino Valley near the Fiumarella di Tavolara.

Salicaceae

Salix alba L. - P scap - Palaeotemp.

Riparian woods. Frequent.

Salix brutia Brullo & Spampinato - P scap - Endem.

Riparian woods. Frequent. Species recently described by Brullo & Spampinato (1993), in the past confused with *S. triandra* L.

** *Salix apennina* Skvortsov - P caesp - Endem.

Riparian woods near Pantagnoli and Rossale. Sporadic.

Salix caprea L. - P caesp/P scap - Eurasiat.

Riparian woods, margin of beech woods. Frequent

Salix eleagnos Scop. - P caesp/P scap - Euras. temp.

Riparian woods. Common.

Salix purpurea subsp. *lambertiana* (Sm.) Neumann - P caesp - Euras. temp.

Riparian woods. Frequent but localized near Pantagnoli.

Populus nigra L. - P scap - Palaeotemp.

Riparian woods. Rare and localized near La Limpida.

Populus tremula L. - P scap - Eurosib.

Pioneer vegetation on consolidated scree in the montane belt. Frequent but localized near Crivi di Mangiacaniglia.

Juglandaceae

Juglans regia L. - P scap

Cultivated, sometimes spontaneous in mesophilous or riparian woods.

Frequent.

Betulaceae

Alnus glutinosa (L.) Gaertner - P scap (P caesp) - Palaeotemp.

Riparian woods. Sporadic.

Alnus cordata (Loisel.) Loisel. - P scap - Endem.

Riparian woods, woods on moist slopes. Common

Corylaceae

Ostrya carpinifolia Scop. - P scap - Circumbor.

Mesophilous woods of the lower belt. Common.

Corylus avellana L. - P caesp - Europ. Caucas.

Mesophilous woods of the lower belt. Common.

Fagaceae

Fagus sylvatica L. - P scap - C Europ.

Woods of the montane belt. Common.

Castanea sativa Miller - P scap

Cultivated near La Manca.

Quercus ilex L. - P scap - Stenomedit.

Woods of the lower belt. Common.

Quercus cerris L. - P scap - Eurymedit.

Deciduous woods on clayey schists. Frequent but localized near Mezzinare.

Quercus petraea (Mattuschka) Liebl. - P scap - Europ. (Subatl.)
Simpisia. Mountain woods. Rare.

Quercus pubescens Willd. - P scap - SE Europ.
Piano di Loro, Valle Brancato; woods of lower belt. Sporadic.

Ulmaceae

* *Ulmus glabra* Hudson - P scap - Europ. Caucas.
Pantagnoli, middle Argentino valley; damp woods. Rare. Species recently reported for the Calabrian flora by Bartolo & al. (1992) in the riparian woods of Coscile River.

Ulmus minor Miller - P scap - Europ. Caucas.
Woods of the lower belt. Sporadic.

Moraceae

Morus alba L. - P scap
Valle della Pietra; cultivated. Rare.

Ficus carica L. - P scap - Medit. Turan.
Rocks, riparian woods, cultivated land. Common.

Urticaceae

Urtica dioica L. - H scap - Subcosmop.
Fallow land, nitrophilous vegetation. Common.

** *Parietaria officinalis* L. - H scap - C Europ.
Woods of lower belt. Sporadic. Raffaelli (1977) reports this species for the Italian peninsula to Latium. In the investigate area, *P. officinalis* is different from *P. judaica* by various morphological characters: erect habitus, bigger stems, perianthial bracts free. *P. officinalis* grows in shady habitats while *P. judaica* lives in anthropic habitats.

Parietaria judaica L. [= *P. diffusa* Mert. e Koch] - H scap - Eurymedit.
Macarones.
Anthropic habitats, ruins. Common.

Santalaceae

Osyris alba L. - NP - Eurymedit.
Scrub and brush. Common.

Thesium linophyllum L. - H scap - SE Europ.
Arid and stony slopes. Frequent.

Thesium divaricatum Jan ex Mert. - Ch suffr - Eurymedit.
Garigues and arid pastures. Frequent.

Loranthaceae

Viscum album L. - P ep - Eurasiat.
Hemiparasite on broadleaf trees. Frequent.

Cactaceae

Opuntia ficus-indica (L.) Miller - P succ - Neotrop.
Introduced. Rare and localized near Suglie.

Polygonaceae

Polygonum aviculare L. - T rept - Cosmop.
Fallow and cultivated land. Common.

Polygonum persicaria L. - T scap - Subcosmop.
Damp fallow or cultivated land. Frequent.

Bilderdykia convolvulus (L.) Dumort. [= *Fallopia convolvulus* (L.) Holub] T
scap - Circumbor. Cultivated land. Common.

Rumex acetosella L. - H scap - Subcosmop.
Clearings and border of mountain woods. Frequent.

* *Rumex tenuifolius* (Wallr.) Löve - H scap - Oroph. S Europ. W Asiat.
Rare and localized on siliceous sand near La Manca.

Rumex acetosa L. - H scap - Circumbor.
Mountain pastures. Frequent.

Rumex crispus L. - H scap - Subcosmop.
Fallow and cultivated land. Common.

Rumex sanguineus L. - H scap - Europ. Caucas.
Riparian woods, marshy habitats. Frequent.

Rumex pulcher L. - H scap - Eurymedit.
Fallow land. Common.

Chenopodiaceae

Chenopodium bonus-henricus L. - H scap - Circumbor.
Slopes, borders of mountain woods. Frequent.

Chenopodium album L. - T scap - Subcosmop.
Cultivated land. Common.

Amaranthaceae

** *Amaranthus hybridus* L. [= *A. chlorostachys* Willd.] - T scap - Neotrop.
Fallow land near Uomo Lungo. Sporadic.

Amaranthus retroflexus L. - T scap - Cosmop.
Cultivated land. Common.

Portulacaceae

Portulaca oleracea L. - T scap - Subcosmop.
Irrigated cultivated land. Sporadic.

Caryophyllaceae

Arenaria serpyllifolia L. - T scap - Subcosmop.
Slopes and arid pastures. Common.

Arenaria leptoclados (Rchb.) Guss. - T scap - Palaeotemp.
Arid pastures and garigues. Frequent.

- Moehringia trinervia*** (L.) Clairv. - T scap - Eurasiat.
Beech woods. Frequent.
- Moehringia muscosa*** L. - H caesp - Oroph. S and C Europ.
Rocks, damp gorges, beech woods. Common.
- Stellaria nemorum*** subsp. ***glochidisperma*** Murb. - H scap - Europ. Caucas.
Beech woods. Frequent.
- Stellaria media*** (L.) Vill. - T rept - Cosmop.
Fallow and cultivated land. Common.
- Cerastium tomentosum*** L. - Ch suffr - Endem.
Mountain pastures, stony slopes. Frequent.
- Cerastium glomeratum*** Thuill. - T scap - Subcosmop.
Fallow and cultivated land. Common.
- Cerastium ligusticum*** subsp. ***granulatum*** (Huter & al.) Chiov. [= *C. granulatum* (Huter & al.) Chiov.] - T scap - Endem. Arid slopes. Sporadic.
- Moenchia erecta*** (L.) Gaertn. & al. - T scap - Submedit. Subatl.
Moist slopes. Common.
- ***Herniaria glabra*** L. - T scap - Palaeotemp.
Reported on Palanuda Mt.
 - ***Spergularia rubra*** (L.) J. & C. Presl - Ch suffr (T scap) - Subcosmop. temp.
Reported on Palanuda Mt.
- Lychnis coronaria*** (L.) Desr. - H scap - Medit. Turan.
Arid pastures, wood clearings. Frequent.
- Silene italica*** (L.) Pers. - H ros - Eurymedit.
Clearings, woods. Common.
- Silene paradoxa*** L. - H ros - N Medit. Mount.
Stony slopes, wood clearings. Frequent, but localized near Timpone i Fornelli and Crivi di Mangiacaniglia.
- Silene nutans*** L. - H ros - Palaeotemp.
Pastures and wood clearings. Common.
- Silene viridiflora*** L. - H ros - S Europ. C Asiat.
Holm-oak woods. Frequent.
- Silene vulgaris*** (Moench) Garcke subsp. ***vulgaris*** - H scap - Subcosmop.
Fallow land. Common.
- Silene vulgaris*** subsp. ***commutata*** (Guss.) Hayek - H scap - N Medit.
Palanuda Mt.; beech woods. Sporadic
- Silene alba*** subsp. ***divaricata*** (Rchb.) Walters [= *S. latifolia* Poiret] H bienn - Stenomedit. Fallow land, wood borders. Frequent.
- Saponaria officinalis*** L. - H scap - Eurosiber.
Fallow land and riparian brush. Common.
- Petrorhagia saxifraga*** subsp. ***gasparrinii*** (Guss.) Pignatti- H caesp - Endem.
Stony and arid slopes. Common.
- Petrorhagia prolifera*** (L.) P. W. Ball & Heywood - T scap - Eurymedit.
Stony and arid slopes. Common.
- * ***Dianthus armeria*** L. - H scap - Europ. Caucas.
Woods. Rare and localized near Timpone Grugoleio and La Manca. Reported by Longo (1902) for the Lao River valley.
- Dianthus sylvestris*** subsp. ***longicaulis*** (Ten.) Greuter & Burdet - H scap - Medit Mount. Rocks, rocky habitats, arid slopes. Common.
- Dianthus deltoides*** L. - H caesp - Eurasiat.
Mountain pastures. Sporadic near Piani di Cambio.

Ranunculaceae

- Helleborus foetidus** L. - Ch suffr - Subatl.
Woods. Common.
- Eranthis hyemalis** (L.) Salisb. - G rhiz - S Europ.
Pastures. Frequent, but localized near Conte Orlando refuge.
- Nigella damascena** L. - T scap - Eurymedit.
Fallow and cultivated land. Frequent.
- Actaea spicata** L. - G rhiz - Euras. temp.
Beech woods. Frequent
- Delphinium fissum** Waldst. & Kit. - H scap - Oroph. Euras.
Mountain pastures near Palanuda Mt. Rare.
- ** **Consolida ambigua** (L.) P. W. Ball & Heywood [= *C. ajacis* auct.] T scap -
Eurymedit. Simpisia, I Milari; arid fallow land. Frequent.
- Anemone apennina** L. - G rhiz - SE Europ.
Mountain woods. Frequent.
- Anemone hortensis** L. - G rhiz - N Medit.
Mezzinare; arid pastures and fallow land. Sporadic.
- Hepatica nobilis** Miller - G rhiz - Circumbor.
Woods of lower belt. Sporadic.
- Clematis flammula** L. - P lian - Eurymedit.
Scrub, hedges. Frequent.
- Clematis vitalba** L. - P lian - Europ. Caucas.
Scrub, woods. Common.
- Ranunculus repens** L. - H rept - Palaeotemp Subcosmop.
Damp meadows. Sporadic.
- Ranunculus lanuginosus** L. - H scap - Europ. Caucas.
Woods. Common.
- Ranunculus neapolitanus** Ten. - H scap - NE Medit.
Fallow land. Common.
- Ranunculus millefoliatus** Vahl - H scap - Medit. Mount.
Castello Brancato; arid pastures, garigues. Rare.
- Ranunculus ficaria** L. - H scap - Eurasiat.
Fallow land, pastures. Common.
- Aquilegia viscosa** Gouan - H scap - Oroph. N Medit.
Middle Argentino Valley, I Fornelli refuge; woods. Rare.
- Thalictrum aquilegifolium** L. - H scap - Eurosib.
Beech woods. Sporadic near I Fornelli refuge.

Lauraceae

- Laurus nobilis** L. - P caesp - Stenomedit.
Scrub, holm-oak woods. Frequent.

Papaveraceae

- Papaver rhoeas** L. - T scap - E Medit.
Anthropic habitats, cultivated. Sporadic.
- Corydalis cava** (L.) Schweigg. & Koerte [= *C. bulbosa* auct.] - G bulb - Europ.
Caucas. Beech woods. Frequent.

Fumaria capreolata L. - T scap - Eurymedit.
Fallow land. Common.

Fumaria officinalis L. - T scap - Subcosmop.
Fallow and cultivated land. Frequent.

Cruciferae

Sisymbrium officinale (L.) Scop. - T scap - Subcosmop.
Anthropic habitats, road borders. Common.

Alliaria petiolata (M. Bieb.) Cavara & Grande - H bienn - Palaeotemp.
Wood clearings, anthropic habitats. Frequent.

◦ *Arabidopsis thaliana* (L.) Heynh. - T scap - Cosmop.
Reported on Palanuda Mt.

Bunias erucago L. - T scap - N Medit.
Fallow land and anthropic habitats. Common.

Erysimum majellense Polatschek - H scap - Endem.
Stony mountain pastures. Frequent, but localized on Palanuda Mt.

Alyssum alyssoides (L.) L. - T scap - Eurymedit.
Mezzinare; arid pastures. Rare

Hesperis matronalis L. - H scap - Pont.
Beech woods. Sporadic near Piani di Cambio.

Matthiola fruticulosa (L.) Maire - Ch suffr - Subendem.
Rocks, rocky habitats. Common.

Barbarea bracteosa Guss. - H scap - Oroph. S Medit.
Moist mountain habitats. Sporadic.

Nasturtium officinale R. Br. - H scap - Cosmop.
Marshes, streams. Common.

Cardamine graeca L. - T scap - N. Medit.
Riparian woods. Frequent.

Cardamine chelidonia L. - T scap - Subendem.
Woods of montane belt. Frequent.

Cardamine hirsuta L. - T scap - Cosmop.
Fallow land. Common.

Cardamine bulbifera (L.) Crantz - G rhiz - C Europ.
Rossale; beech woods. Sporadic.

Arabis sagittata (Bertol.) DC. - H scap - SE Europ.
Fallow land, arid pastures. Common.

Arabis muralis Bertol. - H scap - Oroph. Medit.
Rocks, stony slopes. Common.

Arabis collina Ten. - H scap - Endem.
Rocks, stony slopes. Sporadic.

Arabis turrita L. - H scap - S Europ.
Woods. Frequent.

Arabis verna (L.) R. Br. - T scap - Stenomedit.
Sandy slopes, fallow land. Common

Draba muralis L. - T scap - Circumbor.
Fallow land. Common.

Erophila verna subsp. *praecox* (Steven) P. Fourn. - T scap - Circumbor.
Pastures, stony slopes. Common.

Capsella bursa-pastoris (L.) Medicus - H bienn - Cosmop.
Cultivated land. Common.

- *Thlaspi perfoliatum* L. - T scap - Palaeotemp.
Reported on Palanuda Mt.
- Thlaspi alliaceum* L. - T scap - S Europ. Subatl.
I Fornelli refuge; road margins. Rare
- Aethionema saxatile* (L.) R. Br. - Ch suffr - Medit. Mount.
Rocky habitats, arid pastures. Common.
- Iberis pruitii* Tineo - H scap - Medit. Mount.
Rocky habitats, clastic sediments. Common.
- Iberis umbellata* L. - T scap - N Stenomedit.
Brush near Golfo della Serra. Rare and localized.
- Diplotaxis tenuifolia* (L.) DC. - H scap - Submedit. Subatl.
Sandy fallow land. Frequent.
- Brassica oleracea* L. - H bienn
Escape from cultivation on fallow land on the valley bottom.
- Brassica incana* Ten. - Ch suffr - Subendem.
Pitullo Rocks, just outside the reserve; calcareous rocks. Rare.
- Sinapis arvensis* L. - T scap - Stenomedit.
Fallow and cultivated land. Sporadic.
- Calepina irregularis* (Asso) Thell. - T scap - Medit. Turan.
Fallow land, anthropic habitats. Common.
- Raphanus raphanistrum* L. - T scap - Circumbor.
Fallow land. Sporadic.

Resedaceae

- * *Reseda phyteuma* L. - T scap - Eurymedit.
Piano di Loro; sandy fallow land. Rare. Reported by Longo (1894) from Lao River valley and by Macchiati (1884) from nearby Reggio Calabria.
- Reseda lutea* L. - H scap - Europ.
Fallow land. Common.

Crassulaceae

- Umbilicus horizontalis* (Guss.) DC. - G bulb - Stenomedit.
Shaded rocks and slopes. Sporadic.
- ** *Sedum ochroleucum* Chaix [= *S. anopetalum* DC.] Ch succ - Medit. Mount.
Povera Mosca; rocky habitats, stony slopes. Frequent.
- Sedum tenuifolium* (Sibth. & Sm.) Strobl - Ch succ - Stenomedit.
Rocky habitats, arid slopes. Common.
- Sedum acre* L. - Ch succ - Europ. Caucas.
Stony mountain pastures. Rare and localized on Palanuda Mt.
- Sedum dasyphyllum* L. - Ch succ - Eurymedit.
Rocks, walls. Common.
- Sedum cepaea* L. - T scap - Submedit. Subatl.
Fallow land. Common.
- Sedum stellatum* L. - T scap - Stenomedit.
Fallow land, ephemeral terophitic pastures. Frequent.
- Sedum hispanicum* L. - T scap - SE Europ. (Pont.)
Arid slopes, rocks. Common.

Saxifragaceae

Saxifraga rotundifolia L. - H scap - Oroph. S Europ. Caucas.
Beech woods. Common.

- **Saxifraga tridactylites** L. - T scap - Eurymedit.
Reported for the Palanuda Mt.

Saxifraga graeca Boiss. - H scap - NE Medit.
Conte Orlando refuge; arid pastures. Rare.

Saxifraga marginata Sternb. - Ch pulv - Oroph. SE Europ.
Rocks. Rare and localized near Pietra Campanara.

Chrysosplenium dubium Gay - H scap - Stenomedit. Mount.
Fiumarella di Rossale; mountain streams. Rare.

Rosaceae

Rubus idaeus L. - NP - Circumbor.
Clearings of beech woods. Common.

Rubus ulmifolius Schott - NP - Eurymedit.
Woods of the lower belt, hedges. Common.

Rubus canescens DC. - NP - N Medit.
Woods, hedges. Sporadic.

Rubus hirtus Waldst. & Kit. - NP - C Europ.
Woods of the montane belt. Common.

Rubus caesius L. - NP - Eurasiat.
Woods of the montane belt. Common.

Rosa sempervirens L. - NP - Stenomedit.
Scrub and holm-oak woods. Common.

Rosa canina L. - NP - Palaeotemp.
Wood clearings, brush, hedges. Common.

Agrimonia eupatoria L. - H scap - Subcosmop.
Fallow land. Common.

Aremonia agrimonoides (L.) DC. - H ros - Oroph. NE Medit.
Woods. Common.

Sanguisorba minor subsp. *muricata* Briq. - H scap - Subcosmop.
Arid pastures. Common.

Geum urbanum L. - H scap - Circumbor.
Woods. Common.

- * **Geum molle** Vis. & Pancic' - H ros - Oroph. NE Medit.
Piani di Cambio; mountain pastures. Rare.

Potentilla calabra Ten. - H scap - SE Europ.
Mountain pastures. Common.

Potentilla hirta L. - H scap - (Eury) W Medit.
Arid pastures. Frequent.

Potentilla reptans L. - H ros - Subcosmop.
Fallow land, wood borders, pastures. Common.

Potentilla caulescens subsp. *nebrodensis* (Strobl) Arrigoni - Ch suffr -
Endem.

Calcareous rocks. Rare and localized on Pietra Campanara. According to Arrigoni (1979), the collected specimens may be referred to subsp. *nebrodensis* by the glandular leaves on below face, oblong-lanceolate distinctly petiolate and hairy leaflets, glabrous filaments in the upper part.

- Potentilla micrantha** Ramond ex DC. - H ros - Eurymedit.
Woods of the montane belt. Frequent.
- Fragaria vesca** L. - H rept - Cosmop.
Woods, clearings. Common.
- Pyrus amygdaliformis** Vill. - P scap - Stenomedit.
Scrub, brush. Frequent but localized near Castello Brancato and Timpone Mezzinare.
- Pyrus communis** L. - P scap
Cultivated. Sporadic.
- Malus sylvestris** Miller - P scap - C Europ. Caucas.
Fonte Guaglianone, below Crivi di Mangiacaniglia; woods of the lower belt.
Rare.
- Malus domestica** Borkh. - P scap
I Fornelli refuge; cultivated. Rare.
- Sorbus aucuparia** L. - P caesp - Europ.
Beech woods. Rare and localized near Fiumarella di Rossale.
- Sorbus graeca** (Spach) Kotschy - P caesp - S Europ. Pont.
Rocky habitats, arid slopes, pioneer vegetation on consolidated scree. Frequent.
According to Warburg & Kárpáti (1968), the collected specimens show widest leaves above the middle part and cuneated base.
- ** **Sorbus torminalis** (L.) Crantz - P caesp. - Palaeotemp.
Mezzinare; rocky habitats. Rare. Species reported by Pignatti (1982) as doubtful for the Calabrian flora.
- Eriobotrya japonica** (Thunb.) Lindley - P scap - Chin.
Valle Brancato. Cultivated and sometimes subsponaneous in the woods.
- Cotoneaster nebrodensis** (Guss.) C. Koch - NP - S Europ.-Pont.
Crivi di Mangiacaniglia; rocks and stony habitats. Rare.
- Amelanchier ovalis** Medikus - P caesp - Medit. Mount.
Pietra Campanara; rocks and stony habitats. Rare.
- Crataegus monogyna** Jacq. - P caesp - Palaeotemp.
Woods, brush, hedges. Common.
- Crataegus oxyacantha** L. - P caesp - C Europ.
Mezzinare; brush, hedges. Sporadic.
- Prunus persica** (L.) Batsch - P scap
Cultivated and sometimes subsponaneous. Sporadic.
- Prunus spinosa** L. - P caesp - Europ. Caucas.
Brush, hedges. Common.
- Prunus domestica** L. - P scap
I Fornelli refuge; cultivated.
- Prunus cocomilia** Ten. - P scap - NE Medit. Mount.
Wood clearings of the montane belt. Frequent, but localized on Palanuda Mt.
- Prunus avium** L. - P scap
Cultivated and sometimes subsponaneous. Sporadic.

Leguminosae

- Ceratonia siliqua** L. - P caesp - S Europ. W Asiat.
Mauro valley; scrub. Rare
- Laburnum alpinum** (Mill.) Bercht. & J. Presl - P scap - Oroph. S Europ.
Timpone Grugoleio, Pietra campanara, Valle Tirata; border of beech woods. Rare.

- Cytisus sessilifolius* L. - P caesp - SW Europ.
Brush, scrub. Common.
- Cytisus villosus* Pourret - P caesp - W and C Medit.
Scrub and holm-oak woods. Frequent.
- Chamaecytisus spinescens* var. *pollinensis* Terr. - Ch suffr. - Endem.
Brush, garigues. Frequent.
- Spartium junceum* L. - P caesp - Eurymedit.
Scrub, brush. Common.
- Robinia pseudoacacia* L. - P scap
La Limpida. Few trees, introduced.
- Astragalus depressus* L. - H ros - Oroph. S Europ. Pont.
Mountain pastures. Frequent.
- Astragalus glycyphyllos* L. - H rept - Europ. S Siber.
Wood clearings. Sporadic.
- Astragalus hamosus* L. - T scap - Medit.-Turan.
Mezzinare; arid pastures. Sporadic
- Psoralea bituminosa* L. - H scap - Eurimedit.
Arid and fallow land. Common.
- Vicia ochroleuca* Ten. - H scap - Medit. Mount.
Woods of the lower belt. Frequent.
- Vicia cracca* L. - H scap - Circumbor.
Clearings of mountain woods. Frequent.
- Vicia villosa* Roth subsp. *villosa* - T scap - Eurymedit.
Fiumarella di Rossale, Piano di Cambio; mountain pastures, anthropic habitats.
Rare.
- Vicia villosa* subsp. *varia* (Host) Corb. - T scap - Eurymedit.
Fallow land, pastures of the lower belt. Common.
- Vicia hirsuta* (L.) S. F. Gray - T scap - Subcosmop.
Fallow land, pastures. Common.
- Vicia sativa* L. subsp. *sativa* - T scap - Subcosmop.
Cultivated land. Rare.
- Vicia sativa* subsp. *segetalis* (Thuill.) Gaudin - T scap - Subcosmop.
Fallow land. Common.
- Vicia hybrida* L. - T scap - Eurymedit.
Fallow land. Common.
- Vicia bithynica* (L.) L. - T scap - Eurymedit.
Arid pastures. Frequent but localized near Mezzinare
- Lathyrus vernus* (L.) - G rhiz - Eurasiat.
Beech woods. Sporadic.
- Lathyrus venetus* (Miller) Wohlf. - G rhiz - Pont.
Mesophilous woods of the lower belt, beech woods. Common.
- Lathyrus niger* subsp. *jordanii* (Ten.) Arcangeli [= *L. jordanii* (Ten.) Ces. & al.]
- G rhiz - Endem. Valle Brancato. Mesophilous woods of the lower belt. Rare.
- Lathyrus digitatus* (M. Bieb.) Fiori - G rhiz - Pont.
Conte Orlando refuge; mountain pastures. Rare.
- Lathyrus pratensis* L. - H scap - Palaeotemp.
Meadows and mesophilous pastures. Common.
- Lathyrus grandiflorus* Sibth. & Sm. - G rhiz - NE Medit.
Piano di Cambio; hedges. Rare.
- Lathyrus sylvestris* L. - H scand - Europ. Caucas.
Wood borders. Sporadic.

- Lathyrus latifolius* L. - H scand - S Europ.
Fallow land, hedges. Sporadic.
- Lathyrus sphaericus* Retz. - T scap - Eurymedit.
Arid pastures. Frequent.
- Lathyrus annuus* L. - T scap - Eurymedit.
Cultivated land. Frequent.
- Lathyrus hirsutus* L. - T scap - Eurymedit.
Woods of the lower belt. Sporadic.
- Lathyrus cicera* L. - T scap - Eurymedit.
Mezzinare; arid pastures. Sporadic.
- Lathyrus aphaca* L. - T scap - Eurymedit.
Arid fallow land. Common.
- Ononis reclinata* L. - T scap - S Medit. Turan.
Arid pastures, garigues. Frequent.
- Ononis viscosa* subsp. *brevifolia* (DC.) Nyman [= *O. brevifolia* DC.] - T scap
- S Medit.
Arid pastures. Rare and localized near La Manca.
- Ononis pusilla* L. - H scap - Eurymedit.
Arid pastures, garigues. Frequent.
- Ononis alba* Poiret - T scap - SW Medit.
Arid pastures. Frequent, but localized near Castel di Raione.
- * *Melilotus officinalis* (L.) Pallas - H bienn - Subcosmop.
Fallow land. Frequent, but localized near Rifugio Conte Orlando. Reported only
by Longo (1901).
- Melilotus italica* (L.) Lam. - T scap - N Medit.
Arid fallow land. Sporadic.
- Melilotus sulcata* Desf. - T scap - S Medit.
Mezzinare; arid pastures. Sporadic.
- Medicago lupulina* L. - T scap - Palaeotemp.
Pastures. Common.
- Medicago sativa* L. subsp. *sativa* - H scap
Cultivated land and often subspontaneous. Frequent.
- Medicago sativa* subsp. *falcata* (L.) Arcangeli - H scap - Eurasiat.
Arid fallow land. Sporadic.
- Medicago orbicularis* (L.) Bartal. - T scap - Eurymedit.
Arid fallow land. Common.
- Medicago rigidula* (L.) All. - T scap - Eurymedit.
Pastures, fallow land. Common.
- Medicago polymorpha* L. [= *M. hispida* Gaertner] - T scap - Subcosmop.
Fallow land. Common.
- Medicago disciformis* DC. - T scap - Stenomedit.
Arid pastures. Sporadic and localized near Mezzinare
- Medicago minima* (L.) Bartal. - T scap - C Asiat.
Pastures and fallow land. Common.
- Trifolium repens* L. - H rept - Subcosmop.
Pastures. Common.
- Trifolium nigrescens* Viv. - T scap - Eurymedit.
Arid fallow land, pastures. Frequent.
- Trifolium fragiferum* L. - H rept - (W) Palaeotemp.
Pastures and arid fallow land. Common.

- Trifolium resupinatum* L. - T rept - (W) Palaeotemp.
Pastures and arid fallow land. Common.
- Trifolium brutium* Ten. - T scap - Endem.
Piani di Cambio, Palanuda Mt.; arid mountain pastures. Rare.
- Trifolium campestre* Schreber - T scap - W Palaeotemp.
Arid pastures and fallow land. Common.
- Trifolium scabrum* L. - T scap - Eurymedit.
Arid pastures and fallow land. Common.
- Trifolium stellatum* L. - T scap - Eurymedit.
Arid fallow land. Common.
- Trifolium pratense* L. - H scap - Subcosmop.
Pastures. Common.
- Trifolium cherleri* L. - T scap - Eurymedit
Arid pastures. Frequent but localized near Mezzinare and La Manca.
- Trifolium pallidum* L. - T scap - Eurymedit.
Pastures. Sporadic.
- Trifolium lappaceum* L. - T scap - Eurymedit.
Pastures and arid fallow land. Common.
- Trifolium angustifolium* L. - T scap - Eurymedit.
Pastures and arid fallow land. Common.
- Trifolium ochroleucon* Hudson - H caesp - Eurymedit. Pont.
Fiumarella di Rossale; clearings in the mountain woods. Rare.
- Trifolium subterraneum* L. - T rept - Eurymedit.
Arid pastures. Frequent, but localized near La Manca.
- Dorycnium hirsutum* (L.) Ser. - Ch suffr - Eurymedit.
Arid pastures, garigues. Common.
- Dorycnium pentaphyllum* subsp. *herbaceum* (Vill.) Rouy - H scap - S
Europ. Garigues, arid pastures, fallow land. Common.
- Lotus corniculatus* L. - H scap - Cosmop.
Pastures. Common.
- Lotus edulis* L. - T scap - Stenomedit.
Fallow land. Frequent.
- Lotus ornithopodioides* L. - T scap - Stenomedit.
Pastures and fallow land. Common.
- Anthyllis vulneraria* subsp. *praepropera* (Kerner) Bornm. - H scap -
Eurymedit.
Arid pastures. Common.
- Coronilla emerus* L. - NP - C Europ.
Holm-oak woods, scrub and brush. Common.
- Coronilla valentina* L. - NP - SW Medit.
Valle Brancato; rocky habitats, consolidated scree. Rare.
- Coronilla scorpioides* (L.) Koch - T scap - Eurymedit.
Arid pastures, garigues. Common.
- Hippocrepis glauca* Ten. - H caesp - S Europ.
Pastures, garigues. Common.
- Hippocrepis unisiliquosa* L. - T scap - Stenomedit.
Ephemeral therophytic pastures. Frequent
- Scorpiurus muricatus* L. - T scap - Eurymedit.
Fallow land. Common.

Oxalidaceae

Oxalis corniculata L. - H rept - Cosmop.

Fallow and cultivated land. Common.

Oxalis acetosella L. - G rhiz - Circumbor.

Beech woods. Frequent.

Geraniaceae

Geranium sanguineum L. - H scap - Europ. Caucas.

Wood borders. Rare and localized near Timpone Grugoleio and Mezzimare.

Geranium versicolor L. - G rhiz - NE Medit. Mount.

Mesophilous woods, beech woods, gorges. Common.

Geranium pyrenaicum Burm. f. - H scap - Eurymedit.

Mountain pastures. Common.

Geranium rotundifolium L. - T scap - Palaeotemp.

Fallow land. Common.

Geranium molle L. - T scap - Subcosmop.

Fallow land. Common.

Geranium columbinum L. - T scap - Europ. S Siber.

Fallow land, road and path margins. Common.

Geranium dissectum L. - T scap - Subcosmop.

Fallow land. Frequent.

Geranium lucidum L. - T scap - Eurymedit.

Riparian woods, gorges. Common.

Geranium robertianum L. - H bienn - Subcosmop.

Riparian and mountain woods, gorges. Common.

Geranium purpureum Vill. - T scap - Eurymedit.

Road borders, arid fallow land. Common.

Erodium cicutarium (L.) L'Hér. - T scap - Subcosmop.

Fallow land. Common.

Linaceae

Linum bienne Miller - H bienn - Eurymedit. Subatl.

Arid pastures. Common.

Linum tenuifolium L. Ch suffr - Submedit. Pont.

Rocky habitats, garigues. Common.

Linum strictum L. subsp. *strictum* - T scap - Stenomedit.

Arid pastures, garigues. Common.

Linum strictum subsp. *corymbulosum* (Rchb.) Rouy - T scap - Stenomedit.

Garigues, arid pastures. Common.

Linum catharticum L. - Eurymedit. Europ.

Pastures. Frequent.

Euphorbiaceae

Mercurialis annua L. - T scap - Palaeotemp.

Fallow land and anthropic habitats. Common.

Mercurialis perennis L. - G rhiz - Europ. Caucas.

Mesophilous woods. Common.

Euphorbia dendroides L. - NP - Stenomedit. Macarones.

Torrione dell'Uomo Lungo; rocks. Rare.

Euphorbia spinosa L. - Ch suffr - N Medit.

Rocky habitats, garigues. Frequent.

Euphorbia pubescens Vahl - G rhiz - Medit. Macarones.

Piano di Cambio, Fonte dei Massetti; fallow land, brush. Rare.

Euphorbia helioscopia L. - T scap - Cosmop.

Fallow land and anthropic habitats. Common.

Euphorbia myrsinites L. - Ch rept - S Europ. Pont.

Arid mountain pastures. Frequent.

Euphorbia peplus L. - T scap - Cosmop.

Fallow land, anthropic habitats. Common.

* ***Euphorbia barrelieri*** Savi - Ch suffr - NE Medit.

Rocky habitats. Frequent, but localized near Castello Brancato. Reported only by Longo (1905).

Euphorbia amygdaloides subsp. ***arbuscula*** Meusel - Ch suffr - C Europ.

Caucas.

Woods. Common.

Euphorbia characias L. - NP - Stenomedit.

Holm-oak woods, scrub. Rare and localized near Fonte dei Massetti.

Rutaceae

Citrus sinensis (L.) Osbeck - P scap

Cultivated. Sporadic.

Simaroubaceae

Ailanthus altissima (Miller) Swingle - P scap

Piano di Loro; riparian woods. Rare.

Polygalaceae

Polygala major Jacq. - H scap - Medit. Pont.

Arid slopes, garigues, clastic sediments. Common.

Polygala nicaeensis subsp. ***mediterranea*** Chodat - H scap -Eurymedit.

Arid slopes, garigues. Common.

Anacardiaceae

Pistacia terebinthus L. - P caesp - Eurymedit.

Brush, scrub. Frequent.

Pistacia lentiscus L. - P caesp - Stenomedit.

Scrub. Common.

Aceraceae

Acer lobelii Ten. - P scap - Endem.

Mesophilous woods. Frequent.

Acer campestre L. - P scap - Europ. Caucas.

Woods. Rare and localized near S. Ginosa and Timpone Mezzinare.

Acer pseudoplatanus L. - P scap - Europ. Caucas.

Valle Deo Gratias, Palanuda Mt.; beech woods. Rare.

Acer obtusatum Waldst. & Kit. - P scap - SE Europ.

Fonte dei Massetti, Crivi di Mangiacaniglia; woods of the montane belt. Rare.

Acer neapolitanum Ten. - P scap - Endem.

Mesophilous woods of the lower belt. Common.

Balsaminaceae

** *Impatiens noli-tangere* L. - T scap - Eurasiat.

Fiumarella di Rossale; streams, beech woods. Rare.

Aquifoliaceae

Ilex aquifolium L. - P caesp/P scap - Submedit. Subatl.

Beech woods and other mesophilous woods. Common.

Celastraceae

Euonymus europaeus L. - P caesp - Eurasiat.

Woods, hedges. Frequent.

Euonymus latifolius (L.) Miller - P caesp - Medit. Mount.

Povera Mosca; woods, beech woods. Rare.

Staphyleaceae

Staphylea pinnata L. - P caesp - SE Europ. Pont.

Middle valley of Argentino River; rocks and woods. Rare.

Rhamnaceae

Rhamnus alaternus L. - P caesp - Stenomedit.

Scrub and holm-oak woods. Common.

Rhamnus saxatilis subsp. *infectarius* (L.) P. Fourn. - P caesp - SE Europ.

Castello Brancato; rocky habitats, garigues. Rare.

Rhamnus pumilus Turra - NP - Oroph. S Europ.

Rocks. Rare and localized on Pietra Campanara.

Vitaceae

Vitis vinifera L. subsp. *vinifera* - P lian

Cultivated and subsponaneous in the riparian woods. Frequent.

Vitis vinifera subsp. *sylvestris* (Gmelin) Hegi - P lian - Eurymedit.

Riparian woods along the Argentino River. Rare.

Tiliaceae

Tilia platyphyllos Scop. - P scap - Europ. Caucas.

Golfo della Serra, upper Argentino Valley; mesophilous woods, gorges. Rare.

Malvaceae

- Malva cretica** Cav. - T scap - Stenomedit.
Pastures and arid fallow land . Sporadic.
- Malva moschata** L. - H scap - Eurymedit.
Clearings, pastures. Frequent.
- Malva nicaeensis** All. - T scap - Stenomedit
Mezzinare; ruderal habitats. Rare
- Malva sylvestris** L. - H scap - Subcosmop.
Pastures and arid fallow land . Common.
- Lavatera thuringiaca** subsp. *ambigua* (DC.) Nyman - H scap - S. Siber.
Arid pastures. Sporadic.

Thymelaeaceae

- Daphne laureola** L. - P caesp - Submedit. Subatl.
Woods. Frequent.
- Daphne oleoides** Schreber - NP - Oroph. C Asiat. Medit.
Rocky habitats, rocks. Rare and localized near Pietra Campanara.

Guttiferae

- Hypericum hircinum** subsp. *majus* (Aiton) N. K. B. Robson - NP -
Stenomedit.
Gorges, riparian woods. Common.
- Hypericum androsaemum** L. - NP - W Europ.
Moist woods. Frequent.
- ** **Hypericum montanum** L. - H caesp - Europ. Caucas.
Valle Tirata; mountain woods. Sporadic.
- Hypericum barbatum** Jacq. - H scap - SE Europ.
Rossale; border of mountain woods. Sporadic.
- Hypericum tetrapterum** Fries - H caesp - Palaeotemp.
Fallow land. Common.
- Hypericum perforatum** L. subsp. *perforatum* - H scap - Subcosmop.
Pastures and arid fallow land. Common.

Violaceae

- Viola odorata** L. - H ros - Eurymedit.
Woods. Common.
- Viola alba** subsp. *dehnhardtii* (Ten.) W. Becker - H ros - Eurymedit.
Woods. Frequent.
- Viola reichenbachiana** Jordan ex Boreau - H scap - Eurosib.
Woods. Common.
- Viola aetnensis** subsp. *messanensis* (W. Becker) Merxm. & Lippert - H scap -
Endem Stony slopes, arid pastures of the montane belt. Common
- Viola tricolor** L. - T scap - Eurasiat.
Mountain pastures. Common.

Cistaceae

Cistus incanus L. - NP - Stenomedit.

Scrub and garigues. Frequent.

Cistus salviifolius L. - NP - Stenomedit.

Scrub, hedges and garigues. Common.

Helianthemum nummularium subsp. **obscurum** (Celak.) Holub - Ch suffr -

Europ. Caucas. Arid pastures. Common.

Helianthemum canum (L.) Baumg. - Ch suffr - Europ. Caucas.

Clastic sediments, rocks. Rare and localized near Timpone Grugoleio, Pietra Campanara and Crivi di Mangiacaniglia.

Fumana procumbens (Dunal) Gren. & Godron - Ch suffr - Eurymedit. Pont.

Arid pastures, garigues. Common.

Fumana thymifolia (L.) Spach ex Webb - Ch suffr - Stenomedit.

Arid pastures, garigues. Common.

Cucurbitaceae

Bryonia cretica subsp. **dioica** (Jacq.) Tutin [= *B. dioica* Jacq.] G rhiz -

Eurymedit. Woods, hedges. Common.

Lythraceae

Lythrum junceum Banks & Sol. - H scap - Stenomedit. Macarones.

Swampy habitats. Rare and localized near La Limpida.

Myrtaceae

Myrtus communis L. - P caesp - Stenomedit.

Scrub. Common.

Onagraceae

Circaea lutetiana L. - H scap - Circumbor.

Riparian woods, gorges. Frequent.

Epilobium angustifolium L. - H scap - Circumbor.

Clearings in beech woods. Common.

Epilobium hirsutum L. - H scap - Subcosmop.

Riversides. Frequent.

Epilobium parviflorum Schreber - H scap - Palaeotemp.

Marshes. Rare and localized near Tavolara pond.

Epilobium montanum L. - H scap - Euras.

Beech woods, streams. Common.

Epilobium lanceolatum Seb. & Mauri - H scap - W Europ.

Argentino riversides near Golfo della Serra. Rare.

Cornaceae

Cornus sanguinea L. - P caesp - Eurasiat. temp.

Woods of the lower belt, hedges. Common.

Araliaceae

Hedera helix L. - P lian - Submedit. Subatl.
Woods, rocks. Common.

Umbelliferae

Sanicula europaea L. - H scap - Oroph. Paleotemp. Trop.
Mesophilous woods, beech woods. Common.

Eryngium amethystinum L. - H scap - NE Medit.
Arid pastures. Sporadic.

Eryngium campestre L. - H scap - Eurymedit.
Arid pastures. Common.

Chaerophyllum hirsutum var. ***calabricum*** (Guss.) Paoletti H scap - Endem.
Tavolara, Rossale; montane belt. Rare.

Chaerophyllum temulum L. - T scap - Eurasiat.
Wood clearings. Common.

Anthriscus nemorosa (M. Bieb.) Sprengel - H scap - S Europ. Pont.
Wood clearings in the montane belt. Common.

Smyrniolum perfoliatum L. - H bienn - Eurymedit.
I Fornelli refuge; road margins. Sporadic.

Bunium alpinum subsp. ***petraeum*** (Ten.) Rouy & Camus [= *B. petraeum* Ten.]
- G bulb - Endem. Piano di Cambio, Palanuda Mt.; mountain pastures. Rare.

Pimpinella peregrina L. - H bienn - Eurymedit.
Arid pastures. Common.

Pimpinella tragiolum Vill. - Ch suffr - Medit. Turan.
Arid and stony slopes. Common.

Seseli montanum subsp. ***tommasinii*** (Rch. f.) Arcangeli - H scap - Endem.
Valle Brancato; arid and stony slopes, garigues. Rare.

Oenanthe pimpinelloides L. - H scap - Medit. Atl.
Hedges and brush. Common.

- * ***Portenschlagiella ramosissima*** (Portenschl.) Tutin - H scap - Illyr. C Ital.
Castel di Raione, Rupe dell'Uomo Lungo, just outside of the reserve. Rare and localized. Interesting species recently reported for Calabria near Papisidero, by Bianchini & Di Carlo (1992), where it grows in analogous habitats.

Foeniculum vulgare Miller - H scap - S Medit.
Arid fallow land, anthropic habitats. Frequent.

Physospermum verticillatum (Waldst. & Kit.) Vis. - H scap - Medit. Mount.
Riparian woods. Frequent.

Conium maculatum L. - H scap (bienn) - Subcosmop.
Wood borders of the montane belt. Sporadic.

Bupleurum baldense Turra - T scap - Eurymedit.
Ephemeral therophytic pastures. La Manca. Sporadic.

Bupleurum falcatum subsp. ***cernuum*** (Ten.) Arcangeli - H scap - Eurasiat.
Arid mountain pastures. Common.

Apium nodiflorum (L.) Lag. - H scap - Eurymedit.
Streams, rivers. Common.

Sison amomum L. - H bienn - Submedit. Subatl.
Humid fallow land. Sporadic.

Angelica sylvestris L. - H scap - Eurosib.
Riparian woods, gorges. Common.

Slopes, fallow land. Rare and localized near La Manca.

Peucedanum schottii Besser ex DC. - H scap - SE Europ.

Mountain pastures. Rare and localized on Palanuda Mt.

Peucedanum austriacum (Jacq.) Koch - H scap - SE Europ.

Wood clearings. Rare and localized near Palanuda Mt.

Peucedanum oreoselinum (L.) Moench - H scap - Europ. Caucas.

Arid and stony slopes. Frequent, but localized near Timpone i Fornelli.

Tordylium apulum L. - T scap - Stenomedit.

Arid pastures and fallow land. Common.

Elaeoselinum asclepium (L.) Bertol. - H scap - Stenomedit.

Arid pastures. Sporadic.

Laserpitium siler subsp. *garganicum* (Ten.) Arcangeli [= *L. garganicum* (Ten.) Bertol.] - H scap - Endem.

Timpone I Fornelli, Timpone Grugoleio, Crivi di Mangiacaniglia; arid slopes, clastic ediments. Rare.

Torilis arvensis (Hudson) Link - T scap - Subcosmop.

Arid fallow land. Common.

Orlaya kochii Heyw. - T scap - Stenomedit.

Pastures and fallow land. Common.

Daucus carota L. - H bienn - Subcosmop.

Arid fallow land. Common.

Pyrolaceae

Orthilia secunda (L.) House - Ch rept - Circumbor.

Beech woods. Frequent.

Monotropa hypopitys L. - G par - Circumbor.

Valle Brancato; woods. Rare.

Ericaceae

Erica arborea L. - P caesp - Stenomedit.

Scrub, garigues. Common.

Erica multiflora L. - NP - Stenomedit.

Scrub, garigues. Common.

Arbutus unedo L. - P - Stenomedit.

Scrub, brush. Common.

Primulaceae

Primula vulgaris Hudson - H ros - Europ. Caucas.

Woods. Common.

Cyclamen hederifolium Aiton - G bulb - N Medit.

Woods. Common.

Cyclamen repandum Sibth. & Sm. - G bulb - N Medit.

Holm-oak woods, scrub. Common.

Lysimachia nemorum L. - H scap - Europ. Caucas.

Springs, streams. Common.

Anagallis arvensis L. - T rept - Subcosmop.

Cultivated and fallow land. Common.

Samolus valerandi L. - H scap - Subcosmop.

Samolus valerandi L. - H scap - Subcosmop.

Marshes. Sporadic.

* *Coris monspeliensis* L. - T scap - W Stenomedit.

Rocky habitats, garigues. Rare and localized near Castello di S. Noceto and Timpone Mezzinare.

Plumbaginaceae

Armeria majellensis subsp. *ausonia* Bianchini - H ros - Oroph. S Europ.

Mountain pastures. Frequent.

Ebenaceae

Diospyros kaki L. f. - P scap

Simpisia; cultivated land. Rare

Oleaceae

Fraxinus ornus L. - P scap - Eurymedit. Pont.

Woods of the lower belt. Common.

Fraxinus oxycarpa M. Bieb. - P scap - Europ. Caucas.

Pietra Campanara; pioneer vegetation on consolidated scree. Sporadic.

Ligustrum vulgare L. - NP - Europ. W Asiat.

Woods of the lower belt. Common.

Olea europaea L. var. *europaea* - P scap - Stenomedit.

Cultivated land. Sporadic.

Olea europaea var. *sylvestris* Brot. - P caesp - Stenomedit.

Scrub. Sporadic.

Phillyrea latifolia L. - P caesp - Stenomedit.

Scrub, holm-oak woods. Common.

Gentianaceae

Blackstonia perfoliata (L.) Hudson - T scap - Eurymedit.

Ephemeral therophytic pastures. Common.

Centaureum erythraea Rafn - T scap - Palaeotemp.

Ephemeral therophytic pastures, arid fallow land. Common.

Gentiana lutea L. - H scap - Oroph. S Europ.

Mountain pastures; near Piani di Novacco just outside of the reserve.

Apocynaceae

Vinca minor L. - Ch rept - C Europ. Caucas.

Woods. Common.

Vinca major L. - Ch rept - Eurymedit.

Woods. Frequent.

Asclepiadaceae

Gomphocarpus fruticosus (L.) Aiton f. - P caesp - S Afric.

Arid fallow land. Rare and localized near Suglie.

Vincetoxicum hirundinaria Medikus - H scap - Eurasiat.
Woods, brush. Sporadic.

Rubiaceae

Putoria calabrica (L. f.) DC. - NP - S Medit.

Rocks and rocky habitats. Rare and localized near Suglie.

Sherardia arvensis L. - T scap - Subcosmop.

Fallow and cultivated land. Common.

Crucianella angustifolia L. - T scap - Eurymedit.

Castel Raione; arid and stony pastures. Rare.

Crucianella latifolia L. - T scap - Stenomedit.

Ephemeral therophytic pastures. Common.

Asperula aristata subsp. *scabra* (C. Presl) Nym. - H scap - Medit. Mount.

Rocks, rocky environment, stony slopes, garigues. Common.

Asperula taurina L. - G rhiz - Oroph. S Europ. SW Asiat.

Mesophilous woods. Common.

Asperula laevigata L. - H scap - WC Medit.

Woods. Frequent.

Galium rotundifolium L. - H scap - Oroph. W Eurasiat.

Beech woods. Frequent.

Galium odoratum (L.) Scop. - G rhiz - Eurasiat.

Beech woods. Frequent.

Galium verum L. - H scap - Eurasiat.

Border of mountain woods. Sporadic.

Galium album Miller - H scap - W Eurasiat.

Wood borders, brush. Frequent.

Galium corrudifolium Vill. - H scap - Stenomedit.

Arid pastures. Rare and localized on Palanuda Mt.

Galium lucidum All. - H scap - Eurymedit.

Rocky habitats, clastic sediments. Common.

Galium aparine L. - T scap - Stenomedit. SW Asiat.

Woods, hedges. Common.

Galium divaricatum Pourret ex Lam. - T scap - Stenomedit.

Arid fallow land. Sporadic.

Cruciata laevipes Opiz - H scap - Eurasiat.

Mountain pastures, clearings. Common.

Valantia muralis L. - T scap - Stenomedit.

Stony slopes, arid fallow land. Common.

Rubia peregrina L. - P lian - Stenomedit. Macarones.

Woods of the lower belt. Common.

Convolvulaceae

Cuscuta europaea L. - T par - Palaeotemp.

Parasitic on various species. Sporadic.

Cuscuta epithymum (L.) L. - T par - Eurasiat.

Parasitic on *Thymus*. Sporadic.

Calystegia sylvatica (Kit.) Griseb. - H scand - SE Europ.

Hedges, riparian woods. Common.

Convolvulus cantabrica L. - H scap - Eurymedit.

Rocky habitats, arid fallow land. Sporadic.

Convolvulus arvensis L. - G rhiz - Cosmop.

Fallow and cultivated land. Common.

Convolvulus althaeoides L. - H scand - E Stenomedit.

Arid fallow land. Localized near Timpone Grugoleio.

Boraginaceae

Heliotropium europaeum L. - T scap - Eurymedit. Turan.

Arid fallow and cultivated land. Sporadic.

Buglossoides calabra (Ten.) Johnston - H rep - Endem.

Pietra Campanara, Crivi di Mangiacaniglia; border of beech woods. Rare

Buglossoides purpureocaerulea (L.) Johnston - H scap - S Europ. Pont.

Woods of the lower belt. Common.

Onosma echioides L. - Ch suffr - SE Europ.

Rocky habitats, garigues. Common.

◦ *Onosma stellulata* Waldst. & Kit. - Ch suffr - Illyr.

Reported for Castello Brancato, but probably confused with the foregoing species.

Cerithe minor subsp. *auriculata* (Ten.) Domac [= *C. auriculata* Ten.] H scap -

Subendem. Border of mountain woods. Frequent.

Cerithe major L. - T scap - Stenomedit.

Anthropic habitats, cultivated land. Sporadic.

Echium italicum L. - H bienn - Eurymedit.

Pastures and arid fallow land. Sporadic.

Echium vulgare L. - H bienn - Europ.

Arid fallow land, brush. Common.

Symphytum bulbosum Schimper - G rhiz - SE Europ.

Woods, hedges. Sporadic.

Anchusa cretica Miller - T scap - NE Stenomedit.

Hedges, road margins. Frequent.

Borago officinalis L. - T scap - Eurymedit.

Cultivated and fallow land. Sporadic.

Myosotis arvensis (L.) Hill - T scap - Europ. W Asiat.

Fallow land. Common.

Myosotis sylvatica subsp. *elongata* (Strobl) Grau - H scap - Palaeotemp.

Clearings in beech woods. Common.

** *Cynoglossum columnae* Ten. - H bienn - Oroph. NE Medit.

Mountain pastures. Rare and localized near Palanuda Mt.

Cynoglossum creticum Miller - H bienn. Eurymedit.

Arid fallow land. Sporadic.

Solenanthes apenninus (L.) Fischer & C.A. Meyer - H bienn - Endem.

Fiumarella di Rossale; clearings in mountain woods. Rare.

Verbenaceae

Verbena officinalis L. - H scap - Cosmop.

Fallow land, anthropic habitats. Common.

Labiatae

- Ajuga reptans** L. - H rept - Europ. Caucas.
Riparian woods, marshes. Common.
- Ajuga chamaepitys** (L.) Schreber - T Scap - Eurymedit.
Mezzinare; arid pastures. Rare.
- Teucrium siculum** (Rafin.) Guss. - H scap - Endem.
La Manca; woods of the lower belt. Rare.
- Teucrium chamaedrys** L. - Ch suffr - Eurymedit.
Arid pastures, garigues. Common.
- Teucrium flavum** L. - Ch frut - Stenomedit.
Rocks, scrub. Common.
- Teucrium montanum** L. - Ch suffr - Oroph. S Europ.
Rocky habitats, arid pastures, garigues. Common.
- Teucrium polium** subsp. **capitatum** (L.) Arcangeli - Ch suffr - Stenomedit.
Garigues, arid pastures. Common.
- Scutellaria columnae** subsp. **gussonei** (Ten.) Rech. f. - H scap - Endem.
Woods of the lower belt. Common.
- Sideritis syriaca** L. - Ch suffr - Medit. Turan.
Arid pastures, stony slopes. Frequent.
- Sideritis romana** L. - T scap - E Stenomedit.
Arid fallow land. Common.
- Melittis melissophyllum** subsp. **albida** (Guss.) P. W. Ball. [= *M. albida* Guss.] - H scap - NE Medit. Mount. Woods. Common.
- Galeopsis tetrahit** L. - T scap - Eurasiat.
Clearings in beech woods. Frequent.
- Lamium flexuosum** Ten. - H scap - W Medit. Mount.
Fallow land, woods. Common.
- Lamium bifidum** Cyr. - T scap - Stenomedit.
Brush. Common.
- Lamium amplexicaule** L. - T scap - Palaeotemp.
Cultivated land. Frequent.
- Lamiastrum galeobdolon** subsp. **montanum** (Pers.) Ehrend. & Polatschek - H scap - Europ. Caucas.
Riparian woods. Common.
- Stachys tymphaea** Hausskn. - H scap - NE Medit. Mount.
La Manca; arid pastures. Rare.
- Stachys cretica** subsp. **salvifolia** (Ten.) Rech. f. [= *S. salviifolia* Ten.] - H scap - NE Medit.
Arid fallow land, scrub. Frequent.
- Stachys sylvatica** L. - H scap - Eurosibir.
Mesophilous woods, riparian woods. Common.
- Stachys recta** L. - H scap - Oroph. N Medit.
Rocky habitats, clastic sediments, garigues. Frequent.
- Prunella laciniata** (L.) L. - H scap - Eurymedit.
Pastures and fallow land. Common.
- Prunella vulgaris** L. - H scap - Circumbor.
Riparian woods, marshes. Common.
- Melissa officinalis** subsp. **altissima** (Sibth. & Sm.) Arcangeli [= *M. romana* Miller] - H scap - Stenomedit.
Riparian woods. Common.

Satureja montana L. - Ch suffr - Oroph. W Medit.

Castel Raione; rocky habitats and arid slopes. Rare.

Satureja alpina subsp. *meridionalis* (Nyman) Greuter & Burdet Ch suffr - Oroph. S Europ.

Arid slopes and pastures. Common. The collected specimens may be referred to *Acinos granatensis* subsp. *aetnensis* (Strobl) Pignatti, by calix with bent hairs, upper teeth 1 mm long and corolla 10 - 12 mm long. Greuter (1985) placed this taxon as synonym of *S. alpina* subsp. *meridionalis*.

Calamintha grandiflora (L.) Moench - H scap - Oroph. Medit. Submedit.

Beech woods. Sporadic.

Calamintha sylvatica Bromf. - H scap - Europ. Caucas.

Woods, hedges. Common.

Calamintha nepeta (L.) Savi - H scap - Medit. Mount.

Arid fallow land. Common.

Micromeria juliana (L.) Bentham ex Rchb. - Ch suffr - Stenomedit.

Stony slopes, pastures, garigues. Frequent.

Micromeria graeca (L.) Bentham ex Rchb. - Ch suffr - Stenomedit.

Rocks, rocky habitats, garigues. Frequent.

Clinopodium vulgare L. - H scap - Circumbor.

Woods, hedges. Common.

Origanum heracleoticum L. - H scap - Eurasiat.

Pastures, brush. Common.

Thymus striatus Vahl - Ch rept - SE Europ.

Arid slopes, rocky habitats. Frequent.

Thymus longicaulis C. Presl - Ch rept - Eurymedit.

Pastures. Common.

Mentha pulegium L. - H scap - Subcosmop.

Moist fallow land, damp meadows. Frequent.

Mentha aquatica L. - H scap - Subcosmop.

Rivers, marshes. Common.

Mentha suaveolens Ehrh. - H scap - Eurymedit.

Riparian woods, damp habitats. Common.

Mentha longifolia (L.) Hudson - H scap - Palaeotemp.

Rare and localized near the spring of Conte Orlando Refuge.

Salvia officinalis L. - Ch suffr - E Stenomedit.

Rocky habitats, scrub, garigues, clastic sediments. Common.

Salvia glutinosa L. - H scap - Eurasiat.

Riparian woods. Common.

Salvia verbenaca L. - H scap - Medit. Atl.

Fallow land. Sporadic.

Solanaceae

Atropa bella-donna L. - H scap - Medit. Mount.

Clearings in beech woods. Frequent.

Solanum nigrum L. - T scap - Cosmop.

Fallow and cultivated land of the lower belt. Common.

Solanum dulcamara L. - NP - Palaeotemp.

Riparian woods. Sporadic.

Scrophulariaceae

- Verbascum macrurum** Ten. - H bienn - Stenomedit.
Arid and stony pastures. Frequent.
- Verbascum thapsus** L. - H bienn - Europ. Caucas.
Fiumarella di Rossale; border of the beech woods. Rare.
- Verbascum sinuatum** L. H bienn - Eurymedit.
Arid fallow land, road margins. Common.
- ** **Verbascum lychnitis** L. - H bienn - Europ. Caucas.
Arid mountain pastures. Rare and localized on Palanuda Mt.
- Verbascum pulverulentum** Vill. - H bienn - CS Europ.
Arid fallow land. Frequent.
- Scrophularia vernalis** L. - H scap - Europ. Caucas.
Piano di Cambio; beech woods. Rare.
- Scrophularia peregrina** L. - T scap - Stenomedit.
Fallow land. Common.
- Scrophularia scopoli** Hoppe - H scap - Oroph. Euras.
Wood borders. Sporadic.
- Scrophularia canina** L. - H scap - Eurymedit.
Pastures, arid fallow land, clastic sediments. Common.
- Misopates orontium** (L.) Rafin. - T scap - Palaeotemp.
Fallow and cultivated land. Sporadic.
- Chaenorhinum minus** (L.) Lange - T scap - Eurymedit.
Fallow land. Frequent.
- Linaria purpurea** (L.) Miller - H scap - Endem.
Border of mountain woods, clastic sediments. Common.
- Linaria vulgaris** Miller - H scap - Eurasiat.
Fallow land. Frequent but localized near Fiumarella di Tavolara.
- Cymbalaria muralis** subsp. *visianii* D.A.Webb [= *C. muralis* var. *pilosa* (Vis.) Degen.] - H scap - Subcosmop.
Rocks. Sporadic.
- Kickxia elatine** (L.) Dumort. - T scap - Eurymedit.
Arid fallow land. Common.
- Kickxia spuria** (L.) Dumort. - T scap - Eurasiat.
Arid fallow land. Common.
- Digitalis lutea** subsp. *australis* (Ten.) Arcangeli [= *D. micrantha* Roth] - H scap - Endem. Woods of the montane belt. Common
- Digitalis ferruginea** L. - H scap - Oroph. NE Medit.
Pastures and borders of mountain woods. Frequent.
- * **Veronica austriaca** susp. *dentata* (Schmidt) Watzl - H scap - CS Europ.
Mountain pastures. Rare and localized near Piani di Cambio.
- Veronica officinalis** L. - H rept - Eurasiat. Mount.
Beech woods. Frequent but localized near Fiumarella di Rossale.
- Veronica chamaedrys** L. - H scap - Eurosib.
Mountain woods. Frequent.
- Veronica montana** L. - H rept - CW Europ.
Rossale; beech woods. Rare
- Veronica beccabunga** L. - H rept - Eurasiat
Rare and localized in the spring of Fonte dei Massetti.
- **Veronica praecox** All. - T scap - C Europ. Submedit.
Reported on Palanuda Mt.

- Veronica polita* Fries - T scap - Subcosmop.
Fallow land. Sporadic.
- Veronica persica* Poiret - T scap - Subcosmop.
Fallow land. Common.
- Veronica hederifolia* L. - T scap - Eurasiat.
Fallow land. Common.
- Veronica cymbalaria* Bodard - T scap - Eurymedit.
Fallow land. Common.
- Parentucellia latifolia* (L.) Caruel - T Scap - Eurymedit.
Mezzinare; arid pastures. Sporadic
- Melampyrum italicum* (Beauverd) Soó - T scap - Endem.
Woods. Frequent but localized near Timpone I Fornelli.
- Euphrasia stricta* D. Wolff - T scap - C Europ.
Mountain pastures. Frequent but localized near Rossale.
- ** *Euphrasia italica* Wettst. - T scap - Endem.
Arid mountain pastures. Frequent but localized near Castello di S. Noceto, Pietra Campanara and Albaneta.
- Odontites verna* (Bell.) Dumort. [= *O. rubra* Opiz subsp. *rubra*] T scap -
Eurasiat. Arid fallow land. Sporadic.
- Rhinanthus minor* L. - T scap - Circumbor. Euroamer.
Pastures, fallow land. Common.
- Lathraea squamaria* L. - G rhiz - Eurasiat.
La Limpida; parasitic on broadleaf trees. Rare.

Acanthaceae

- Acanthus mollis* L. - H scap - W Stenomedit.
Arid fallow land. Sporadic.

Orobanchaceae

- Orobanche alba* Stephan ex Willd. - T par - Oroph. Eurasiat.
Parasitic on *Labiatae*. Sporadic.
- Orobanche hederæ* Duby - T par - Eurymedit.
Parasitic on *Hedera helix*. Frequent.
- Orobanche gracilis* Sm. - T par - Europ. Caucas.
Parasitic on *Leguminosae*. Common.

Globulariaceae

- Globularia meridionalis* (Podp.) O. Schwarz - Ch rept - Illyr. Ital.
Rare and localized on clastic sediments near Pietra Campanara.

Plantaginaceae

- Plantago major* L. - H ros - Subcosmop.
Fallow land, pastures. Common.
- Plantago lanceolata* L. - H ros - Cosmop.
Arid fallow land, pastures. Common.

Caprifoliaceae

- Sambucus ebulus*** L. - G rhiz - Eurymedit.
Anthropic habitats, wood borders. Common.
- Sambucus nigra*** L. - P caesp - Europ. Caucas.
Brush, riparian woods. Common.
- Viburnum tinus*** L. - P caesp - Stenomedit.
Woods of the lower belt, holm-oak woods. Common.
- Lonicera implexa*** Aiton - P lian - Stenomedit.
Scrub, holm-oak woods. Sporadic.

Valerianaceae

- Valerianella locusta*** (L.) Laterrade - T scap - Eurymedit.
Riparian woods, fallow land. Frequent, but localized near La Limpida.
- Valerianella eriocarpa*** Desv. - T scap - Stenomedit.
Fallow land, arid pastures, garigues. Common.
- Valeriana officinalis*** L. - H scap - Europ.
Mountain pastures, clearings. Frequent.
- Valeriana tuberosa*** L. - H scap - Medit. Mount.
Arid pastures. Rare and localized on Palanuda Mt.
- Centranthus ruber*** (L.) DC. - Ch suffr - Stenomedit.
Povera Mosca, La manca; rocks and rocky habitats, clastic sediments. Rare.

Dipsacaceae

- Dipsacus fullonum*** L. - H bienn - Eurymedit.
Pastures, fallow land. Frequent.
- Knautia integrifolia*** (L.) Bertol. - T scap - Eurymedit.
Arid fallow land. Common.
- Scabiosa crenata*** Cyr. - Ch suffr - Oroph. S Medit.
Rocks and rocky habitats, clastic sediments. Frequent.
- Scabiosa atropurpurea*** L. [= *S. maritima* L.] - H bienn - Stenomedit.
Arid fallow land. Common.
- Scabiosa uniseta*** Savi - H scap - Endem.
Fiumarella di Rossale, Crivi di Mangiacaniglia; border of mountain woods, clastic sediments. Rare.

Campanulaceae

- Campanula dichotoma*** L. - T scap - W Stenomedit.
Arid fallow land, ephemeral therophytic pastures. Frequent.
- Campanula fragilis*** Cyr. - Ch suffr - Endem.
Rocks, walls. Common.
- Campanula trachelium*** L. - H scap - Palaeotemp.
Woods. Common.
- Campanula trichocalycina*** Ten. - H scap - NE Medit. Mount.
Beech woods. Frequent.
- Legousia speculum-veneris*** (L.) Chaix - T scap - Eurymedit.
Cultivated and fallow land. Frequent.

Trachelium coeruleum L. - Ch suffr - W Medit.
Shaded rocks along the Argentino River. Frequent.

Compositae

Eupatorium cannabinum L. - H scap - Palaeotemp.
Riparian woods, marshes. Common.

Solidago virgaurea L. - H scap - Circumbor.
Woods. Common.

Bellis perennis L. - H ros - Circumbor.
Fallow land, pastures. Common.

Bellis sylvestris Cyr. - H ros - Stenomedit.
Woods. Common.

Conyza canadensis (L.) Cronq. - T scap - Cosmop.
Arid fallow land. Common.

Conyza bonariensis (L.) Cronq. - T scap - Amer. Trop..
Fallow land. Frequent.

◦ *Logfia arvensis* (L.) Holub [= *Oglifa arvensis* (L.) Cass.] - T scap - Eurymedit.
Sudsiber. Reported on Palanuda Mt.

Helichrysum italicum (Roth) G. Don f. - Ch suffr - S Europ.
Clastic sediments, garigues, stony and arid slopes. Frequent.

Inula conyza DC. - H bienn - C. Europ W Asiat.
Hedges and arid fallow land, clearings. Frequent.

Dittrichia viscosa (L.) Greuter [= *Inula viscosa* (L.) Aiton] - H scap - Eurymedit.
Arid fallow land. Frequent.

Pulicaria odora (L.) Rchb. - H scap - Eurymedit.
Scrub, clearings. Common.

Pulicaria dysenterica (L.) Bernh. - H scap - Eurymedit.
Marshes, muddy soil. Sporadic.

Pallenis spinosa (L.) Cass. - T scap - Eurymedit.
Arid fallow land, arid slopes. Common.

Helianthus tuberosus L. - G bulb - N Amer.
S. Ginosa, fallow land. Rare.

Anthemis arvensis subsp. *incrassata* (Loisel.) Nyman - T scap - Subcosmop.
Fallow and cultivated land. Common.

Achillea collina Becker ex Rchb. - H scap - SE Europ.
Arid mountain pastures. Sporadic.

Achillea moscata var. *calcarea* Hutter - Ch suffr - Endem.
Crivi di Mangiacaniglia; rocks and rocky habitats. Rare. Reported by Pignatti (1982) to be the hybrid *A. rupestris* Huter x *A. lucana* Pignatti.

Achillea ligustica All. - H scap - W Stenomedit.
Arid pastures. Sporadic.

Chamomilla recutita (L.) Rauschert [= *Matricaria chamomilla* L.] - T scap - Subcosmop. Fonte dei Massetti; fallow land. Rare.

Leucanthemum vulgare Lam. - H scap - Eurosib.
Fallow land. Common.

Tussilago farfara L. - G rhiz - Palaeotemp.
River beds, damp slopes. Common.

Petasites hybridus (L.) Gaertn. & al. - G rhiz - Eurasiat.
River beds, muddy soil, riparian woods. Common.

- Adenostyles australis* (Ten.) Nyman - H scap - Illyr. Apennin.
River beds. Sporadic.
- Doronicum columnae* Ten. - G rhiz - Oroph. SE Europ. Caucas.
Rocky habitats. Rare and localized on Palanuda Mt.
- Doronicum orientale* Hoffm. - G rhiz - Oroph. SE Europ. Caucas.
Mountain woods. Frequent.
- Senecio nemorensis* subsp. *stabianus* (Lacaita) Pignatti - H scap - C Europ
Caucas.
Beech woods. Common.
- Senecio squalidus* L. [= *S. rupestris* Waldst. & Kit.] H bienn - Oroph. S Europ.
Mountain woods. Common.
- Senecio vulgaris* L. - T scap - Cosmop.
Fallow and cultivated land. Common.
- Carlina corymbosa* L. - H scap - Stenomedit.
Arid fallow land. Common.
- Carlina vulgaris* L. - H scap - Eurosib.
Pastures, arid slopes, fallow land. Common.
- Carlina acaulis* subsp. *simplex* (Waldst. & Kit.) Nyman [= *C. acaulis* var.
caulescens DC.] - H ros - C Europ.
Arid slopes and wood borders. Rare and localized near Timpone I Fornelli.
- Carlina acanthifolia* All. subsp. [= *C. utzka* Hacq.] - H ros - Oroph. S Europ.
Pastures. Sporadic.
- ** *Xeranthemum cylindraceum* Sibth. & Sm. - T scap - S Siber. S Europ.
Arid fallow land, stony slopes. Frequent, but localized near Castel di Raione and
Mezzinare.
- ** *Echinops ritro* subsp. *ruthenicus* (M. Bieb.) Nyman - H scap - SE Europ.
Arid slopes, wood borders. Frequent.
- ** *Artium nemorosum* Lej. & Court. - H bienn - Europ.
Woods, road and path margins. Frequent.
- ** *Jurinea mollis* (L.) Rchb. subsp. *mollis* - H scap - SE Europ.
Castello di S. Noceto, Timpone I Fornelli, Crivi di Mangiacaniglia; arid slopes,
clastic sediments. Rare. The collected specimens may be referred to the subsp.
mollis by simple stems with leaves in the lower half and inflorescence with only
one capitula.
- Carduus nutans* L. - H bienn - W Europ.
Arid pastures. Common.
- Carduus pycnocephalus* L. - H bienn - Eurymedit. Turan.
Fallow land, road margins. Common
- ** *Cirsium tenoreanum* Petrak - H bienn - Endem.
Mountain pastures. Frequent.
- Cirsium vulgare* (Savi) Ten. - H bienn - Subcosmop.
Fallow land. Common
- Cirsium creticum* subsp. *triumfettii* (Lacaita) Werner - H bienn - NE Medit.
Marshes, riparian woods. Frequent.
- Cirsium arvense* (L.) Scop. - G rad - Subcosmop.
Fallow land. Common.
- Ptilostemon strictus* (Ten.) Greuter - H scap - SE Europ.
Woods, scrub. Common.
- Ptilostemon stellatus* (L.) Greuter - T scap - N Stenomedit.
Ephemeral therophytic pastures. Frequent.

- Tyrimnus leucographus* (L.) Cass. - T scap - Stenomedit.
S. Ginosa; arid fallow land. Rare.
- Galactites tomentosa* Moench - H bienn - Stenomedit.
Fallow land. Sporadic.
- Onopordum illyricum* L. - H bienn - Stenomedit.
Fallow land, arid pastures. Sporadic.
- Crupina vulgaris* Cass. - T Scap - S Europ. S Sib.
Mezzinare; arid pastures. Rare.
- Centaurea solstitialis* L. - H bienn - Subcosmop.
Arid fallow land. Frequent, but localized near Castel Raione.
- Centaurea alba* subsp. *deusta* (Ten.) Nyman [= *C. deusta* Ten.] - H bienn -
Endem. Rocks and arid slopes. Common.
- Centaurea bracteata* Scop. - H scap - SE Europ.
Arid fallow land, wood borders. Common.
- Carthamus lanatus* L. - T scap - Euryedit.
Arid and stony pastures. Frequent.
- Cichorium intybus* L. - H scap - Cosmop.
Pastures, fallow land. Frequent.
- Tolpis virgata* subsp. *grandiflora* (Ten.) Pignatti - H scap - Endem.
S. Ginosa; pastures. Rare.
- Hedypnois rhagadioloides* (L.) Schmidt - T scap - Stenomedit.
Fallow land, ephemeral therophytic pastures. Common.
- Rhagadiolus edulis* Gaertner - T scap - Euryedit.
Fallow and cultivated land. Common.
- Hypochoeris laevigata* (L.) Cesati & al. - H ros - SW Medit.
Rocks, stony slopes. Common.
- Hypochoeris achyrophorus* L. - T scap - Stenomedit.
Ephemeral therophytic pastures, scrub. Common.
- Hypochoeris cretensis* (L.) Chaub. & Bory - H scap - Oroph. NE Medit.
Pastures, arid slopes. Sporadic.
- Hypochoeris radicata* L. - H ros - Europ. Caucas.
Fallow land, pastures. Frequent.
- Urospermum dalechampii* (L.) Scop. ex Schmidt - H scap - CW Euryedit.
Arid fallow land. Sporadic.
- Urospermum picroides* (L.) Scop. ex Schmidt - T scap - Euryedit.
Fallow land. Common.
- Leontodon hispidus* L. - H ros - Europ. Caucas.
Fallow land, garigues, clastic sediments. Common.
- Leontodon crispus* Vill. - H ros - S Europ.
Torrione dell'Uomo Lungo, Pietra Campanara; rocks. Rare.
- Leontodon tuberosus* L. - H ros - Stenomedit.
Fallow land, arid pastures. Common.
- Picris echioides* L. - T scap - Euryedit.
Hedges, arid fallow land. Sporadic.
- Picris hieracioides* L. - H scap - Eurosib.
Arid fallow land, brush. Common.
- Tragopogon porrifolius* L. - T scap - Euryedit.
Fallow land. Sporadic.
- Tragopogon crocifolius* L. - T scap - Stenomedit.
Mountain pastures. Sporadic.

- Reichardia picroides*** (L.) Roth - H scap - Stenomedit.
Arid fallow land, pastures, rocky habitats. Common.
- Sonchus asper*** (L.) Hill - H bienn - Subcosmop.
Pastures, fallow land. Common.
- Sonchus oleraceus*** L. - H bienn - Subcosmop.
Cultivated land. Common.
- Lactuca viminea*** (L.) J. & C. Presl - H bienn - Eurymedit.
Stony and arid slopes. Common.
- Lactuca serriola*** L. - H bienn - Eurymedit. S Siber.
Fallow and cultivated land. Sporadic.
- Mycelis muralis*** (L.) Dumort. - H scap - Europ. Caucas.
Mesophilous woods. Common.
- Taraxacum officinale*** Weber - H Ros - Circumbor.
Anthropic habitats near Rifugio I Fornelli. Sporadic.
- Taraxacum megalorrhizon*** (Forsskål) Hand.-Mazz. - H ros - Eurymedit.
Pastures. Common.
- Chondrilla juncea*** L. - H scap - Eurymedit.
Arid fallow land. Common.
- Lapsana communis*** L. - T scap - Palaeotemp.
Border of beech woods. Common.
- Crepis leontodontoides*** All. - H ros/H scap - W Medit.
Fallow land, brush, woods. Common.
- Crepis biennis*** L. - H bienn - C Europ.
Fallow land and wood borders. Sporadic.
- Crepis lacera*** Ten. - H scap - Endem.
Stony and arid pastures of the montane belt, clastic sediments. Frequent.
- Crepis rubra*** L. - T scap - NE Stenomedit.
Pastures, fallow land. Common.
- Crepis neglecta*** L. - T scap - NE Eurymedit.
Fallow land. Common.
- Hieracium pilosella*** L. - H ros - Europ. Caucas.
Arid slopes, stony pastures. Common.
- Hieracium* x *florentoides*** Arvet-Touvet [= *H. aridum* Freyn] - H scap
Pomareto; arid pastures. Rare.
- Hieracium piloselloides*** Vill. [= *H. florentinum* All.] - H scap - Europ. Caucas.
Arid pastures. Frequent.
- Hieracium crinitum*** Sm. [= *H. racemosum* Waldst. & Kit.] - H scap - Europ.
Caucas. Woods. Common.

Potamogetonaceae

- Potamogeton natans*** L. - I rad - Subcosmop.
Rare and localized in the Tavolara pond.

Liliaceae

- Asphodelus albus*** Miller - G rhiz - Medit. Mount. Subatl.
Mountain pastures. Common.
- Asphodeline lutea*** (L.) Rchb. - G rhiz -E Medit.
Arid pastures. Sporadic.

- Asphodeline liburnica* (Scop.) Rehb. - G rhiz - NE Medit. Amphiadriat.
Rocky habitats. Rare and localized near Castel di Raione.
- Anthericum liliago* L. - G bulb - Submedit. Subatl.
Arid slopes, garigues. Frequent.
- Colchicum alpinum* DC. - G bulb - Oroph. NW Medit.
Fiumarella di Rossale; mountain pastures. Rare.
- Lilium bulbiferum* var. *croceum* (Chaix) Pers. - G bulb - Oroph. C Europ.
Pietra Campanara; woods of the montane belt. Sporadic.
- Ornithogalum montanum* Cyr. - G bulb - NE Medit. Mount.
Pastures. Frequent.
- Ornithogalum gussonei* Ten. - G bulb - Stenomedit.
La Limpida; fallow land. Rare.
- Ornithogalum exscapum* Ten. - G bulb - S Europ.
Timpone i Fornelli; arid pastures. Rare.
- Ornithogalum comosum* L. - G bulb - Medit. Mount.
Arid pastures. Rare and localized near Valle Brancato.
- Urginea maritima* (L.) Baker - G bulb - Stenomedit. Macarones.
Scrub, garigues and arid pastures. Frequent.
- Scilla bifolia* L. - G bulb - C Europ. Caucas.
Beech woods. Common.
- Muscari comosum* (L.) Miller [= *Leopoldia comosa* (L.) Parl.] - G bulb -
Eurymedit.
Fallow land. Common.
- Muscari botryoides* (L.) Miller - G bulb - Eurymedit.
Mountain pastures, wood borders. Frequent.
- Muscari atlanticum* Boiss. & Reuter - G bulb - Eurymedit. Turan.
Arid pastures. Frequent.
- Muscari commutatum* Guss. - G bulb - CE Medit.
Rocky environments. Rare and localized near Castello Brancato.
- Allium pendulinum* Ten. - G bulb - W Stenomedit.
Woods of the lower belt. Common.
- Allium ursinum* L. - G bulb - Eurasiat.
Beech woods. Frequent.
- Allium paniculatum* L. - G bulb - Palaeotemp.
Rocky habitats, stony pastures. Sporadic near La Manca and Castel Raione.
- Allium flavum* L. - G bulb - Eurymedit.
Castel S. Noceto, Palanuda Mt.; rocky habitats, stony mountain pastures.
Sporadic.
- Allium ampeloprasum* L. - G bulb - Eurymedit.
Fallow land. Frequent.
- Allium sphaerocephalon* L. - G bulb - Palaeotemp.
Rocky habitats, garigues. Common.
- Allium vineale* L. - G bulb - Eurymedit.
Arid fallow land. Frequent.
- Polygonatum multiflorum* (L.) All. - G rhiz - Eurasiat.
Mountain woods. Frequent.
- Polygonatum odoratum* (Miller) Druce - G rhiz - Circumbor.
Woods of the lower belt. Frequent.
- Asparagus acutifolius* L. - G rhiz - Stenomedit.
Holm-oak woods. Sporadic.

Ruscus aculeatus L. - G rhiz/Ch frut - Eurymedit.

Woods of the lower belt. Sporadic.

Smilax aspera L. - NP - Palaeosubtrop.

Scrub, holm-oak woods. Common.

Amaryllidaceae

Galanthus nivalis L. - G bulb - Europ. Caucas.

Mesophilous woods. Sporadic.

Narcissus poeticus L. - G bulb - Oroph. S Europ.

Mountain pastures. Frequent, but localized near Conte Orlando Refuge.

Dioscoreaceae

Tamus communis L. - G rad - Eurymedit.

Woods of the lower belt, scrub, hedges. Common.

Iridaceae

Iris germanica var. *florentina* Dykes [= *I. florentina* L.] - G rhiz

Arid slopes. Introduced near Suglie.

Crocus vernus (L.) Hill [= *C. napolitanus* Mord. & Loisel.] - G bulb -

Eurymedit. Mountain pastures. Frequent.

Crocus biflorus Miller - G bulb - NE Medit. Turan.

Conte Orlando refuge; mountain pastures. Rare.

Crocus longiflorus Rafin. - G bulb - Subendem.

Pomareto; arid pastures, garigues. Rare.

Romulea bulbocodium (L.) Seb. & Mauri - G bulb - Stenomedit.

Arid pastures. Frequent near Castel Raione.

Gladiolus italicus Miller - G bulb - Eurymedit.

Fallow land. Sporadic.

Juncaceae

Juncus inflexus L. - H caesp - Palaeotemp.

Muddy soil, marshes. Common.

Juncus bufonius L. - T caesp - Cosmop.

Muddy soil. Frequent, but localized near Simpisia.

Juncus hybridus Brot. - T caesp - Medit. Atl.

Muddy soil. Frequent.

Juncus articulatus L. - G rhiz - Circumbor.

Marshes, muddy soil. Frequent.

Luzula sieberi subsp. *sicula* (Parl.) Pignatti - H caesp - Oroph. S Europ.

Woods. Common.

Luzula forsteri (Sm.) DC. - H caesp - Eurymedit.

Woods. Common.

Gramineae

Festuca drymeia Mert. & Koch - G rhiz - Medit. Mount.

Woods. Common.

Festuca arundinacea Schreber - H caesp - Palaeotemp.

Marshes. Frequent.

Festuca calabrica Huter & al. - H caesp - Endem.

- Festuca calabrica* Huter & al. - H caesp - Endem.
Rocks, clastic sediments, arid mountain slopes. Frequent.
- Festuca heterophylla* Lam. - H caesp - Europ. Caucas.
Mountain woods. Sporadic.
- Festuca rubra* L. - H caesp - Subcosmop.
Fiumarella di Rossale; meadows. Rare.
- Festuca circumediterranea* Patzke - H caesp - Eurymedit.
Mountain pastures. Common.
- Lolium perenne* L. - H caesp - Circumbor.
Pastures, fallow land. Common.
- Lolium multiflorum* Lam. - H scap - Eurymedit.
Fallow land. Common.
- Vulpia ciliata* Dumort. - T caesp - Eurymedit.
Fallow land, ephemeral therophytic pastures. Common.
- Desmazeria rigida* (L.) Tutin [= *Catapodium rigidum* (L.) Hubb.] T scap - Eurymedit.
Arid fallow land, ephemeral therophytic pastures. Common.
- Poa annua* L. - T caesp - Cosmop.
Fallow land, anthropic habitats. Frequent.
- Poa trivialis* L. subsp. *trivialis* - H caesp - Eurasiat.
Fallow land. Frequent.
- Poa trivialis* subsp. *sylvicola* (Guss.) H. Lindb. f. [= *P. sylvicola* Guss.] - H caesp - Eurymedit. Brush, holm-oak woods. Sporadic.
- Poa pratensis* L. - H caesp - Circumbor.
Pastures, fallow land. Frequent.
- Poa compressa* L. - H caesp - Circumbor.
Fallow land, marshes. Frequent.
- Poa nemoralis* L. - H caesp - Circumbor.
Valle Tirata; woods of the montane belt. Rare.
- Poa bulbosa* L. - H caesp - Palaeotemp.
Arid pastures, fallow land. Common.
- Poa alpina* L. - H caesp - Circumbor.
Mountain pastures. Frequent on Palanuda Mt.
- Dactylis hispanica* Roth - H caesp - Stenomedit.
Fallow land, arid pastures, scrub. Frequent.
- Dactylis glomerata* L. - H caesp - Palaeotemp.
Pastures, fallow land. Common.
- Cynosurus cristatus* L. - H caesp - Europ. Caucas.
Pastures, fallow land. Common.
- Cynosurus echinatus* L. - T scap - Eurymedit.
Arid fallow land. Common.
- Briza maxima* L. - T scap - Palaeosubtrop.
Fallow land, scrub. Common.
- Sesleria tenuifolia* Schrader - H caesp - Illyr. Apennin.
Torriente dell'Uomo Lungo; rocks, stony slopes. Rare.
- Sesleria autumnalis* (Scop.) Schultz - H caesp - SE Europ.
Brush. Frequent.
- * *Sesleria argentea* (Savi) Savi [= *S. cylindrica* (Balbis) DC.] - H caesp - W Medit.
Border of beech woods. Rare and localized near Timpone Grugoleio. Reported only by Longo (1901) for the Lao River valley.

- Glyceria plicata*** (Fries) Fries - G rhiz (I rad) - Subcosmop.
Marshes, springs. Sporadic.
- Melica uniflora*** Retz. - H caesp - Palaeotemp.
Woods. Common.
- Melica ciliata*** L. - H caesp - Eurymedit. Turan.
Arid slopes, garigues, arid pastures. Common.
- Bromus sterilis*** L. - T scap - Eurymedit. Turan.
Arid fallow and cultivated land. Common.
- Bromus madritensis*** L. - T scap - Eurymedit.
Ephemeral therophytic pastures. Common.
- Bromus ramosus*** Hudson - H caesp - Eurasiat.
Suglie; riparian woods. Rare.
- Bromus erectus*** Hudson - H caesp - Palaeotemp.
Pastures. Common.
- Bromus caprinus*** Kerner - H caesp - Endem.
Arid pastures, rocks. Frequent.
- Bromus arvensis*** L. - T scap - Eurosib.
Arid fallow land. Common.
- Bromus hordeaceus*** L. - T scap - Subcosmop.
Arid fallow land. Common.
- Brachypodium sylvaticum*** (Hudson) P. Beauv. - H caesp - Paleotemp.
Woods. Common.
- Brachypodium pinnatum*** (L.) P. Beauv. - H caesp - Eurasiat.
Stony arid pastures. Common.
- Brachypodium rupestre*** (Host) Roemer & Schultes - H caesp - Subatl.
Rupe dell'Uomo Lungo; clastic sediments and garigue. Sporadic.
- Elymus caninus*** (L.) L. [= *Agropyron caninum* (L.) P. Beauv.] - H caesp -
Circumbor.
Beech woods. Sporadic.
- Aegilops genicula*** Roth - T scap - Stenomedit. Turan.
Arid fallow land. Common.
- Triticum aestivum*** L. - T scap
Cultivated near Conte Orlando Refuge.
- Dasyphyrum villosum*** (L.) P. Candargy - T scap - Eurymedit. Turan.
Pastures and arid fallow land. Common.
- Secale strictum*** (Presl) Strobl - H scap - Medit. Mount.
Border of mountain woods. Sporadic.
- Hordeum murinum*** L. - T scap - Circumbor.
Fallow and cultivated land. Common.
- Hordeum bulbosum*** L. - H caesp - Palaeosubtrop.
Fallow land. Frequent.
- Hordelymus europaeus*** (L.) Harz - H caesp - Europ. Caucas.
Beech woods. Sporadic.
- Avena barbata*** Pott. ex Link - T scap - Eurymedit. Turan.
Fallow land. Common.
- Avena sativa*** L. - T scap
Subspontaneous near Suglie.
- Avenula praetutiana*** (Parl.) Pignatti - H caesp - Endem.
Stony mountain pastures. Frequent, but localized on Palanuda Mt.
- Koeleria macrantha*** (Ledeb.) Sprengel - H caesp - Circumbor.
Arid pastures. Frequent.

- Koeleria splendens*** C. Presl - H caesp - Medit. Mount.
Garigues, arid slopes, pastures. Common.
- Lophochloa cristata*** (L.) Hyl. - T caesp - Subcosmop.
Arid fallow land. Common.
- Lophochloa hispidula*** (Savi) Jonsell - T scap - SW Stenomedit.
Cultivated land. Rare and localized near Simpisia.
- Lagurus ovatus*** L. - T scap - Eurymedit.
Arid fallow land. Sporadic.
- Deschampsia caespitosa*** (L.) P. Beauv. - H caesp - Subcosmop.
Marshy meadow. Frequent but localized near the Tavolara pond.
- Aira caryophyllea*** L. - T scap - Palaeosubtrop.
Arid pastures. Common.
- Anthoxanthum odoratum*** L. - H caesp - Eurasiat.
Pastures. Common.
- Holcus lanatus*** L. - H caesp - Circumbor.
Fallow land. Common.
- Agrostis stolonifera*** L. - H rept - Circumbor.
Marshes, moist fallow land. Common.
- Gastridium ventricosum*** (Gouan) Schinz & Thell. - T scap - Medit. Atlant.
Fallow land, scrub. Common.
- Polypogon viridis*** (Gouan) Breistr. - H caesp - Palaeosubtrop.
Moist fallow land, muddy soil. Frequent.
- Phleum pratense*** subsp. *bertolonii* (DC.) Bornm. [= *P. bertolonii* DC.] - H caesp - Eurymedit. Arid pastures. Common.
- Phleum ambiguum*** Ten. - G rhiz - Endem.
Arid pastures. Common.
- Phleum subulatum*** (Savi) Ascherson & Graebner - T scap - Stenomedit.
Arid fallow land. Sporadic.
- Alopecurus pratensis*** L. - H caesp - Eurosib.
Meadows. Frequent, but localized near the Tavolara pond.
- Alopecurus myosuroides*** Hudson - T scap - Subcosmop.
Meadows, fallow land. Common.
- Milium effusum*** L. - G rhiz - Circumbor.
Beech woods. Frequent.
- Milium vernale*** M. Bieb. - T scap - Medit. Mount.
Meadows, border of mountain woods near I Fornelli refuge. Rare.
- Piptatherum miliaceum*** (L.) Cosson [= *Oryzopsis miliacea* (L.) Benth. & Hooker ex Ascherson & Schweinf.] - H caesp - Stenomedit. Turan. -
Fallow land, wood borders. Common.
- Achnatherum calamagrostis*** (L.) P. Beauv. - H caesp - Oroph. S Europ.
Stony and arid slopes, clastic sediments. Common.
- Ampelodesmos mauritanica*** (Poiret) Dur. & Schinz - H caesp - SW Stenomedit.
Arid slopes. Sporadic.
- Arundo donax*** L. - G rhiz - Subcosmop.
Cultivated and sometime subsponaneous in anthropic habitats.
- Arundo plinii*** Turra - G rhiz - Stenomedit.
Simpisia; damp slopes. Rare.
- Danthonia decumbens*** (L.) DC. - H caesp - Europ.
Mountain pastures. Rare and localized near Fiumarella di Rossale.
- ** ***Sporobolus poiretii*** (Roemer & Schultes) Hitchc. - H caesp - N Amer.
Fallow land. Rare and localized near Povera Mosca.

- Cynodon dactylon* (L.) Pers. - G rhiz/H rept - Thermocosmop.
Arid fallow land. Common.
- Echinochloa crus-galli* (L.) P. Beauv. - T scap - Subcosmop.
Marshes, muddy soil. Sporadic.
- Digitaria sanguinalis* (L.) Scop. - T scap - Cosmop.
Fallow and cultivated land. Common.
- Setaria pumila* (Poir.) Schultes [= *S. glauca* (L.) P. Beauv.] T scap -
Subcosmop.
Cultivated land. Frequent.
- Setaria viridis* (L.) P. Beauv. - T scap - Subcosmop.
Fallow and cultivated land. Common.
- Saccharum ravennae* (L.) Murray [= *Erianthus ravennae* (L.) P. Beauv.] - H caesp
Medit. Turan. Rare and localized near La Limpida.
- Sorghum halepense* (L.) Pers. - G rhiz - Thermocosmop.
Fallow and cultivated land. Sporadic near Piano di Loro.
- Dichanthium ischaemum* (L.) Roberty [= *Bothriochloa ischaemon* (L.) Keng] -
H caesp - Cosmop. Arid pastures. Localized near Castel Raione.
- Hyparrhenia hirta* (L.) Stapf [= *Cymbopogon hirtus* (L.) Janchen] - H caesp -
Palaeotrop. Rocky habitats, arid and stony slopes. Common.

Araceae

- Arum italicum* Miller - G rhiz - Stenomedit.
Scrub, woods. Sporadic.
- Arisarum vulgare* Targ.-Tozz. - G rhiz - Stenomedit.
Fallow land, holm-oak woods. Frequent.
- Arisarum proboscideum* (L.) Savi - G rhiz - Endem.
Mesophilous woods of the lower belt. Frequent, but localized near La Limpida.

Cyperaceae

- Scirpus holoschoenus* var. *australis* (L.) Koch [= *Holoschoenus australis* (L.)
Rchb.] - G rhiz - Eurymedit. Marshes, damp habitats. Common.
- Scirpus cernuus* Vahl [= *Isolepis cernua* (Vahl) Roemer & Schultes] - T scap -
Subcosmop. Spring. Rare and localized near Fonte Guaglianone.
- Cyperus esculentus* L. - G rhiz - Subcosmop. trop. subtrop.
Cultivated land. Sporadic.
- Schoenus nigricans* L. - H caesp - Subcosmop.
Damp fallow land, streams. Frequent.
- Carex distachya* Desf. - H caesp - Stenomedit.
Holm-oak woods. Sporadic.
- Carex otrubae* Podp. - H caesp - Eurymedit. Atl.
Marshes, damp meadows. Frequent.
- Carex divulsa* Stokes - H caesp - Eurymedit.
Woods of the lower belt. Common.
- Carex remota* L. - H caesp - Europ. Caucas.
Middle Argentino Valley; riparian woods. Frequent.
- Carex hirta* L. - G rhiz - Europ. Caucas.
Fiumarella di Rossale; riparian woods. Rare
- Carex pendula* Hudson - H caesp - Eurasiat.
Riparian woods. Sporadic.

- Carex sylvatica* Hudson - H caesp - Europ. W Asiat.
Woods of the lower belt. Frequent.
- ** *Carex strigosa* Hudson - H caesp - Europ. W Asiat.
Wood borders. Localized near Fiumarella di Rossale.
- Carex flacca* subsp. *serrulata* (Biv.) Greuter - G rhiz - Europ.
Scrub, holm-oak woods, garigues. Common.
- Carex distans* L. - H caesp - Eurymedit.
Povera Mosca; river beds, damp habitats. Rare.
- Carex halleriana* Asso - H caesp - Eurymedit.
Holm-oak woods, scrub. Common.
- Carex digitata* L. - H caesp - Eurasiat.
Woods. Common.
- Carex caryophyllea* La Tourr. - H scap - Euroasiat.
Piani di Cambio; moist pastures. Sporadic.
- Carex macrolepis* DC. - H caesp - Subendem.
Timpone i Fornelli; arid and stony slopes, clastic sediments. Frequent but localized.

Orchidaceae

- *Epipactis palustris* (L.) Crantz - G rhiz - Circumbor.
Reported by Longo (1901) for the Argentino River.
- Epipactis helleborine* (L.) Crantz - G rhiz - Palaeotemp.
Woods. Common.
- Epipactis atrorubens* (Hoffm.) Besser [= *E. atropurpurea* Rafin.] - G rhiz - Europ.
Caucas. Arid stony slopes. Rare and localized near Pietra Campanara.
- Cephalanthera longifolia* (L.) Fritsch - G rhiz - Eurasiat.
Woods. Frequent.
- Cephalanthera rubra* (L.) L. C. Rich. - G rhiz - Eurasiat.
Valle Brancato, Pietra Campanara; woods of the montane belt. Rare.
- Limodorum abortivum* (L.) Swartz - G rhiz - Eurymedit.
Valle Brancato; woods of the lower belt. Rare.
- Neottia nidus-avis* (L.) L. C. Rich. - G rhiz - Eurasiat.
Woods. Frequent.
- Listera ovata* (L.) R. Br. - G rhiz - Eurasiat.
Valle Brancato; woods of the lower belt. Rare.
- Platanthera bifolia* (L.) L. C. Rich. - G bulb - Palaeotemp.
Scrub, holm-oak woods, brush. Sporadic.
- Platanthera chlorantha* (Custer) Rchb. - G bulb - Eurosib.
Valle Brancato; woods of the lower belt. Rare.
- Gymnademias conopsea* (L.) R. Br. - G bulb - Eurymedit
Crivi di Mangiacaniglia; mountain pastures. Rare
- Dactylorhiza sambucina* (L.) Soó [= *Orchis sambucina* L.] - G bulb - Europ.
Caucas. Pastures, wood clearings. Common.
- Dactylorhiza saccifera* (Brongn.) Soó [= *Orchis maculata* subsp. *saccifera* (Brongn.) Soó] - G bulb - Palaeotemp.
Damp meadows. Common.
- Orchis morio* L. - G bulb - Europ. Caucas.
Castello Brancato; arid and stony pastures. Rare.
- Orchis coriophora* L. - G bulb - Eurymedit.
Brush, garigues. Common.

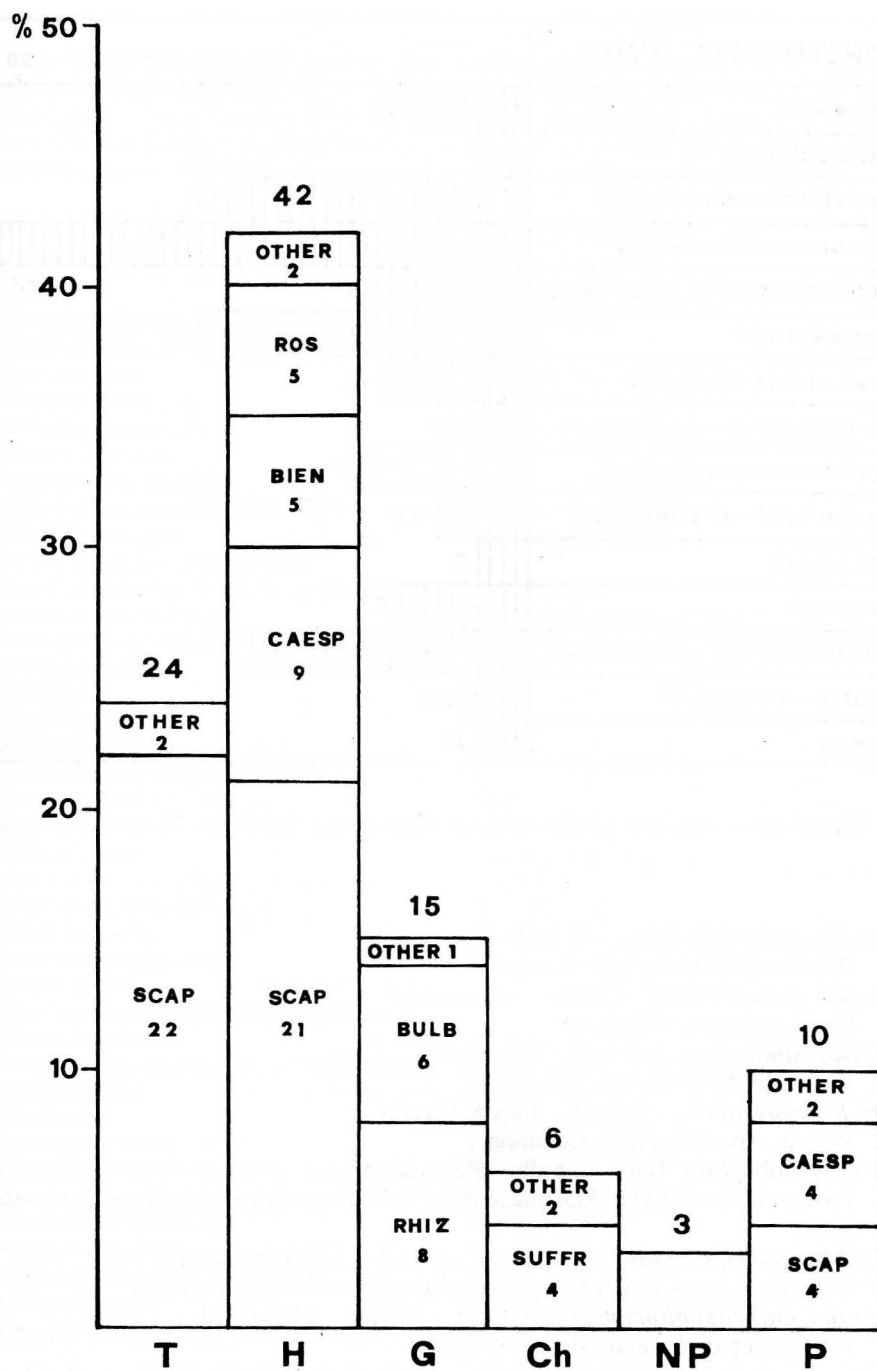


Fig. 4. Biological spectrum of the vascular flora of the Argentino River valley nature reserve. - T = therophytes, H = hemicryptophytes, G = geophytes, Ch = chamaephytes, NP = nanophanerophytes, P = phanerophytes; scap = scapose, caesp = caespitose, bien = biennial, ros = rosulate, rhiz = rhizomatous, bulb = bulbous, suffr = suffrutescent.

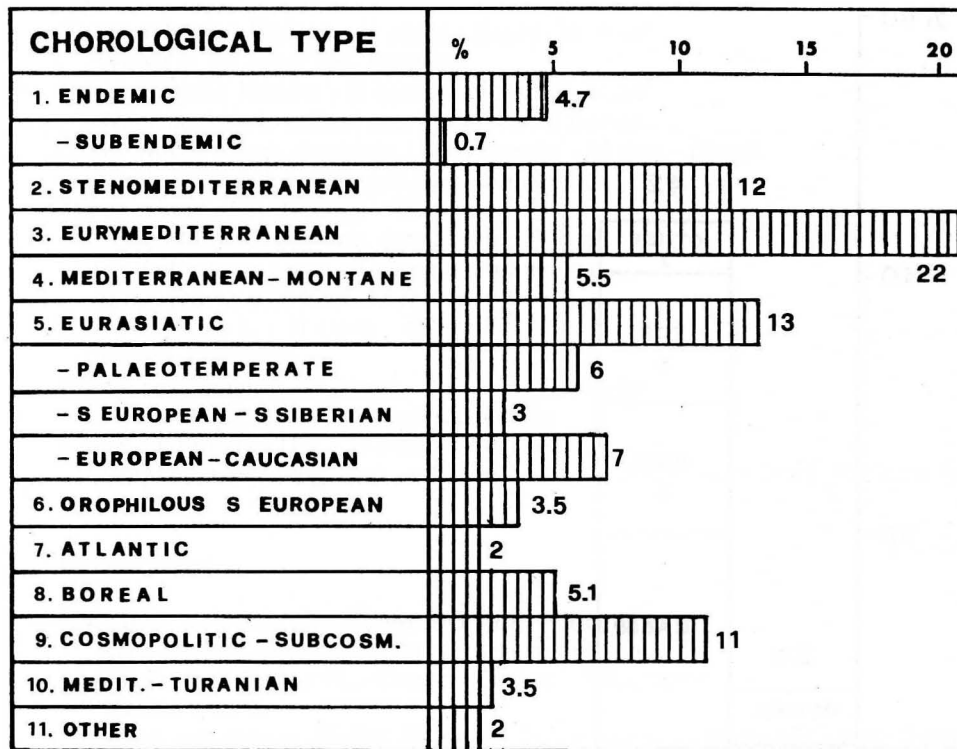


Fig. 5. Chorological spectrum of the vascular flora of the Argentino River valley nature reserve.

Orchis tridentata Scop. - G bulb - Eurymedit.

Woods of the lower belt. Common.

Orchis italica Poiret - G bulb - Stenomedit.

Scrub, pastures. Common.

Orchis simia Lam. - G bulb - Eurymedit.

Woods of the lower belt. Sporadic.

Orchis mascula L. - G bulb - Europ. Caucas.

Woods, wood clearings. Common.

Orchis pauciflora Ten. - G bulb - Stenomedit.

Povera Mosca, Crivi di Mangiacaniglia, Valle Brancato; arid pastures, garigues.

Rare.

Orchis quadripunctata Cyr. ex Ten. - G bulb - NE Stenomedit.

Valle Brancato, Crivi di Mangiacaniglia; arid pastures, scrub. Rare.

Aceras anthropophorum (L.) Aiton f. - G bulb - Medit. Atl.

Pietra campanara; stony slopes. Sporadic.

Himantoglossum hircinum (L.) Sprengel [= *Loroglossum hircinum* (L.) L. C.

Rich.] - G bulb - Medit. Atl. Pastures. Frequent.

Anacamptis pyramidalis (L.) L. C. Rich. - G bulb - Eurymedit.

Pastures. Common.

Serapias vomeracea (Burm.) Briq. - G bulb - Eurymedit.

Arid pastures. Common.

Tab 3 - Regional distribution of the endemic taxa found in the Argentino River valley (Cal = Calabria; Bas = Basilicata; Cam = Campania; Apu = Apulia; Abr = Abruzzo and Molise; Lat. = Latium; Tus = Tuscany; Umb = Umbria; Mar = Marches; Sic = Sicily; Sar = Sardinia; Cor = Corsica; S Italy = Cal Bas Apu Cam; C Italy = Lat Abr Umb Mar Tus; Italy = CS Italy and other region of N Italy)

Taxa	Regional distribution
<i>Acer</i>	Abr Cam Bas Cal
<i>Acer neapolitanum</i>	Lat Abr SItaly
<i>Achillea moscata</i> var. <i>calcarea</i>	Bas Cal
<i>Alnus cordata</i>	Abr Cam Bas Cal Sar Cor
<i>Arisarum proboscideum</i>	CS Italy
<i>Avenula praetutiana</i>	CS Italy
<i>Bromus caprinus</i>	Abr Cam Bas Cal
<i>Buglossoides calabra</i>	Cal
<i>Bunium alpinum</i> subsp. <i>petraeum</i>	Mar Abr Cam Bas Cal Sic
<i>Campanula fragilis</i>	Lat Cam Bas Cal
<i>Centaurea alba</i> subsp. <i>deusta</i>	Italy
<i>Cerastium ligusticum</i> subsp. <i>granulatum</i>	Cam Bas Cal
<i>Cerastium tomentosum</i>	Mar Umb Lat Abr Cam Bas Cal Sic
<i>Chaerophyllum hirsutum</i> var. <i>calabricum</i>	CS Italy
<i>Chamaecytisus spinescens</i> var. <i>pollinensis</i>	Bas Cal
<i>Cirsium tenoreanum</i>	CSItaly
<i>Crepis lacera</i>	CS Italy
<i>Digitalis lutea</i> subsp. <i>australis</i>	Italy
<i>Erysimum majellense</i>	Italy
<i>Euphrasia italica</i>	Lat Abr Cal
<i>Festuca calabra</i>	Cam Bas Cal
<i>Laserpitium siler</i> subsp. <i>garganicum</i>	CS Italy
<i>Lathyrus niger</i> subsp. <i>jordanii</i>	Cam Bas Cal
<i>Linaria purpurea</i>	CS Italy Sic
<i>Melampyrum italicum</i>	Italy
<i>Ophrys lacaitae</i>	Sic S Italy
<i>Petrorhagia saxifraga</i> subsp. <i>gasparinii</i>	S Italy Sic Sar Cor
<i>Phleum ambiguum</i>	CS Italy
<i>Potentilla caulescens</i> subsp. <i>nebrodensis</i>	Lat Cam Bas Cal Sic Sar
<i>Salix apennina</i>	Italy
<i>Salix brutia</i>	Cal
<i>Scabiosa uniseta</i>	Italy
<i>Scutellaria columnae</i> subsp. <i>gussonei</i>	Bas Cal Sic
<i>Seseli montanum</i> subsp. <i>tommasinii</i>	Mar Abr Cam Bas Cal
<i>Solenanthus apenninus</i>	Sic CS Italy
<i>Teucrium siculum</i>	Italy
<i>Tolpis virgata</i> subsp. <i>grandiflora</i>	S Italy Sic
<i>Trifolium brutium</i>	Abr Cam Bas Cal Sic
<i>Viola aetnensis</i> subsp. <i>messanensis</i>	Bas Cal Sic

** *Ophrys insectifera* L. - G bulb - Europ.

Garigue. Rare and localized near Castello Brancato. Reported by Lorenz & Künkele (1990) for the slopes of Mt. Pollino, Basilicata

Ophrys sphegodes subsp. *atrata* (Lindl.) E. Mayer - G bulb - Eurymedit.

Fallow land, scrub, garigues. Common.

Ophrys fuciflora (Schmidt) Moench - G bulb - Eurymedit.

Povera Mosca; pastures, garigues. Rare.

Ophrys tenthredinifera Willd. - G bulb - Stenomedit.

Povera Mosca; scrub, garigues. Rare.

Ophrys apifera Hudson - G bulb - Eurymedit.

I Milari; fallow land. Rare.

Ophrys lacaitae Lojac. - G bulb - Endem.

Timpone Mezzinare; arid pastures. Rare.

Conclusions

The flora of the Argentino River valley reserve consist of 846 taxa, belonging to 435 genera and 101 families. This list may well be increased by further research, because the impenetrable nature of the territory has hindered its complete exploration.

One third of the species found belong to three families, *Compositae*, *Gramineae* and *Leguminosae*. The *Labiatae*, *Rosaceae*, *Liliaceae* and *Orchideaceae* are also well represented, the latter by 31 species. This remarkable floristic richness (more than 800 species in less than 40 square kilometers) may be explained by great variety of habitats present.

Fig. 4 - 5 show the biological and chorological spectra, respectively; the figures given exclude introduced plants.

The biological spectrum, while relating to an extensive range of altitude, is nevertheless informative. The hemicriptophytes are the largest group (42 %), while therophytes, which in the Mediterranean area are predominant, come second with 24 %.

The phanerophytes and nanophanerophytes (13 % altogether) are remarkably numerous due to the abundance and variety of woodlands. The relatively large percentage of geophytes (15 %), mostly occurring in hill and mountain woods (Pignatti 1988), confirms this first, with well picture.

The chorological spectrum ranges Mediterranean species over 30 %. The Eurymediterranean element (22 %) is best represented.

The Stenomediterranean element is scanty (12 %), less or than the Eurasiatic (13 %), mainly bound to woodlands. A small percentage of Mediterranean - Turanian species, such as *Ononis reclinata*, *Sideritis syriaca*, *Lychnis coronaria* and *Melica ciliata*, reflects the presence of very dry habitats, like rocks, garigues, arid and stony slopes.

A fair presence of Mediterranean - Montane (5.5 %) and orophilous S European species (3.5 %) documents the close link between the Pollino mountain complex with the high mountains of southern Europe, especially the Balkans and Caucasus.

A finer breakdown would reveal that in every chorological group the south-eastern component prevails over the south-western one.

However, the presence of *Coris monspeliensis* establishes a link with the W Mediterranean. The endemic flora (Table 3) comprises 39 species (4.7 %). There is a single exclusively calabrian endemic (*Buglossoides calabra*), 10 species are strictly endemic to the southern Apennines, while most are endemic to the Apennines as a whole. The area is not as rich in endemics as the nearby Pollino chain, because of its lower altitude. The high areas of Pollino chain (1600 to 2267 m) shows indeed the richest endemism.

Altogether, the chorological as well as the biological spectrum show moderately Mediterranean features, in agreement with what has previously been said about the climate.

Finally, the discovery of 18 species and 2 subspecies that are new for the Calabrian flora must be emphasized, among wich the most interesting are *Salix apennina*, *Euphrasia*

italica, *Sporobolus poiretii*, *Carex strigosa*, and *Ophrys insectifera*. Moreover, the finding of several taxa that are rare in Calabrian flora, having been reported for few localities only, like *Coris monspeliensis*, *Ulmus glabra*, *Portenschangiella ramosissima*, *Ophrys lacaitae*, etc., is important.

Its interesting flora, added to the presence of rare vegetation types such as *Taxus baccata* stands and *Pinus leucodermis* woods increase the naturalistic value of this territory and fully justify its inclusion in the Pollino National Park.

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