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Chromosome numbers of flowering plants from Calabria, S Italy, II.

Abstract


Chromosome numbers of nine taxa from nine families of Calabrian angiosperms are reported: Aizoon hispanicum 2n = 32, Aristida adscensionis subsp. coerulescens 2n = 22, Galium palaoitalicum 2n = 20, Lavandula multifida 2n = 22, Ludwigia palustris 2n = 16, Menyanthes trifoliata 2n = 54, Rumunculus fontanus 2n = 48, Salsola oppositifolia 2n = 72, Soldanella calabrella 2n = 40. The reports for Aizoon hispanicum, Aristida adscensionis subsp. coerulescens, Lavandula multifida and Salsola oppositifolia are the first from Italian populations. Mitotic metaphase microphotographs and drawings are presented for all taxa studied. Brief comments are given on karyotype morphology, cytogeography and relationships of selected taxa.

This contribution supplements Peruzzi & Cesca (2002), also dealing with Calabrian species of particular phytogeographical interest. Both contributions are part of a wider study on the biosystematics and phytogeography of the Calabrian flora (Peruzzi 2003). The standard techniques applied are described in the first instalment. Vouchers of all taxa are preserved at CLU. The taxa are arranged alphabetically by family.

Aizoon hispanicum L. (Aizoaceae) – 2n = 32 (Fig. 1-2)
Italy, Calabria, dry clays between Palizzi Marina and Capo Spartivento, 37°55’N, 16°03’E, 9.4.2003, Peruzzi, Passalacqua & Gargano, from seeds collected in situ.

Aizoon hispanicum is an annual, taxonomically rather isolated species, distributed in the S Mediterranean basin from SE Spain across N Africa and S Italy to Crete (Pignatti 1982, Greuter & al. 1984, Gonçalves 1990). In Italy (Guissone 1826, Tenore 1831, Fiori 1923-26, Pignatti 1982, Scelsi & Spaminato 1992) it is restricted to coastal habitats between Capo dell’Armi and Capo Spartivento in Calabria.

Our count of 2n = 32 chromosomes is the first from Italy and confirms a previous report on non-Italian material (Bittrich 1986). Chromosome size ranges from 0.5 to 1.5 µm.

Salsola oppositifolia Desf. (Chenopodiaceae) – 2n = 72 (Fig. 3-4)
Salsola oppositifolia Desf. is a S Mediterranean species, widespread from Morocco to Palestine (Greuter & al. 1984), which belongs to S. sect. Cocosalsola Fenzl (Botschantzev 1976). Several authors (Fiori 1923-26, Aellen in Tutin & al. 1964, Ricceri & Rizzotto 1980, Pignatti 1982) considered the binomial Salsola oppositifolia as a synonym of S. verticillata Schousboe or of S. longifolia Forssk., but Brullo (1982) demonstrated that the three species are completely different, and included

Fig. 1-6. Chromosome complements – microphotographs and drawings of: 1-2: Aizoon hispanicum, 2n = 32 (scale bar = 2 µm); 3-4: Salsola oppositifolia, 2n = 72 (scale bar = 5 µm); 5-6: Lavandula multifida, 2n = 22 (scale bar = 5 µm).

Salsola oppositifolia Desf. is a S Mediterranean species, widespread from Morocco to Palestine (Greuter & al. 1984), which belongs to S. sect. Cocosalsola Fenzl (Botschantzev 1976). Several authors (Fiori 1923-26, Aellen in Tutin & al. 1964, Ricceri & Rizzotto 1980, Pignatti 1982) considered the binomial Salsola oppositifolia as a synonym of S. verticillata Schousboe or of S. longifolia Forssk., but Brullo (1982) demonstrated that the three species are completely different, and included

Our count of 2n = 72 chromosomes (probably octoploid) in Calabrian plants from the only known locality on peninsular Italy is the first one from Italy and confirms a previous report from the Iberian peninsula (Castroviejo & Lago 1992). Chromosome size ranges between 1.5 and 2.5 µm. Concerning related species, we have no knowledge of counts published for S. verticillata, while S. longifolia has shown to be diploid with 2n = 18 chromosomes (Batthacharya & al. 1971).

Lavandula multifida L. (Lamiaceae) – 2n = 22 (Fig. 5-6)
Italy, Calabria, Capo dell’Armi (prov. Reggio Calabria), old road on the right of the tunnel, calcareous cliffs, 37°57’N, 15°41’E, 8.4.2003, Peruzzi, Passalacqua & Gargano, cult. Hort. Bot. Calabria University, acc. no. 95, 96.

While Guinea (in Tutin & al. 1972) reports Lavandula multifida only for the W Mediterranean basin, Greuter & al. (1986) give this species for the Iberian peninsula, Morocco, Algeria, Tunisia, Italy and also for Egypt. In Italy the species occurs only in Sicily and in Calabria at Capo dell’Armi (Pignatti 1982).

Our count of 2n = 22 chromosomes is the first from Italy and confirms previous reports by Larsen (1960), Dalgaard (1986), Baltisberger & Charpin (1989) from non-Italian material. Some reports of 2n = 24 cited by Fedorov (1969) have to be considered as erroneous or referable to a different taxon. Chromosome size ranges between 2 and 3 µm.

Menyanthes trifoliata L. (Menyanthaceae) – 2n = 54 (Fig. 7-8)
Italy, Calabria, Piano della Lacìna, Serre Calabre, Brognaturo (prov. Vibo Valentia), along the Alaco river, on marsh habitats, 990 m, 38°36’N, 16°25’E, 6.4.2002, Cesca & Peruzzi, root tips collected in situ.

The family Menyanthaceae, often included in Gentianaceae, is represented by five genera (Mabberley 1997), of which Menyanthes is unispecific. M. trifoliata is circumboreal (linked to humid places and bogs) and widespread in Europe. In the Mediterranean, it is restricted to montane areas (Tutin in Tutin & al. 1972). Pignatti (1982) gives the species for peninsular Italy up to Campania, near Avellino. The Calabrian stand represents the southern European limit of M. trifoliata, which otherwise occurs further south only in the Rif (N Morocco) at over 2000 m (Meusel & Jäger 1978).

The chromosome number of 2n = 54 was also reported in plants from central Italy (Amadei & al. 1982) as well as from all provenances across the entire distribution range of the species (Fedorov 1969, Moore 1973, Goldblatt 1981, 1984, 1985, 1988, Goldblatt & Johnson 1991, 1994, 1996, 2000). Chromosome size ranges between 1 and 4.5 µm.

Ludwigia palustris (L.) Elliot (Onagraceae) – 2n = 16 (Fig. 9-10)
Italy, Calabria, Piano della Lacina (Brognaturo, prov. di Vibo Valentia), along the Alaco river, on marsh habitats, 990 m, 38°36’N, 16°25’E, 8.7.2002, Peruzzi & Gargano, root tips collected in situ.

According to Raven (1963, in Tutin & al. 1968) and Zardini & Raven (1992) the genus Ludwigia L. comprises 82 species, grouped in 22 sections. It is taxonomically isolated within the family Onagraceae, being the only genus of the tribe Jussiaeae. L. palustris is the type of L. sect. Dantia (DC.) Munz, which is characterised by opposite leaves, four sepals and stamens and often absent petals. L. palustris is a subcosmopolitan temperate species and grows on the banks of lakes, along streams and humid places. In Italy (Pignatti 1982) it occurs in Sardinia and in a few disjunct localities in N central and S Italy (Calabria: Sila and Serre Calabre).

Our count of 2n = 16 chromosomes confirms a previous one in plants from Tuscany (Ficini & al. 1981) and agrees with several other reports from non-Italian provenances (Gregory & Klein 1960, Queiros 1976, Raven & Tai 1979). Chromosome size ranges between 0.5 and 1 µm.
Aristida adscensionis subsp. coerulescens (Desf.) Bourreil & Trouin (Poaceae) – 2n = 22 (Fig. 11-12)


This subspecies is distinct from Aristida adscensionis subsp. adscensionis (Auquier & Duviqneaud 1976) for the tendency to be perennating, some features of the inflorescence and for the mainly Mediterranean distribution. Both subspecies are sympatric only in the Canary Islands.
A. adscensionis subsp. coerulescens, previously known in Italy only from Sicily (Pignatti 1982), was recorded recently from Calabria, between Reggio Calabria and Capo Spartivento (Brullo & al. 1987, Scelsi & Spampinato 1992).

Our count of 2n = 22 chromosomes is the first from Italy and also for this subspecies. The same chromosome number is reported for subsp. adscensionis (Bir & Sahni 1983, 1985, Yan & al. 1995, Sánchez-Ken & Davila Aranda 1995). Chromosome size ranges between 1 and 2 µm.

Soldanella calabrella Kress (Primulaceae) – 2n = 40 (Fig. 13-14)
Italy, Calabria, prov. di Cosenza, Sila Grande, c. 6 km S of Camigliatello Silano, Fontana del Colonnello, c. 1 km W of M. Botte Donato, 1800-1840 m, 39°17’N, 16°26’E, 15.11.2002, Peruzzi & Caparelli, root tips collected in situ.

This interesting rare species of the Soldanella chrysosticta group (Greuter & al. 1989) is endemic to Calabria, where it occurs in Sila, Aspromonte (Kress 1988), and Serre Calabre (Crisafulli & al. 2003). Before its description as a new species, the corresponding populations were considered as conspecific with S. hungarica Simonkai, a species from the Balkans (Cristofolini & Pignatti 1962, Pignatti 1982). According to a recent morphological and molecular survey of the genus Soldanella (Zhang & Kadereit 2002), S. calabrella Kress belongs to the “S Balkans-S Italy-Tatras” clade together with S. chrysosticta. Following the same authors, S. calabrella has the same habit at S. alpina L. and S. major (Neir.) Vierh. and glandular hairs like those of S. pindicolor Hausskn. and S. chrysosticta.

Our count of 2n = 40 chromosomes seems to be the second for this species, agrees with the previous one (reported by Zhang & Kadereit 2002 for material of unspecified origin) and is the same as in all other closely related species (Zhang & Kadereit 2002). Chromosome size ranges between 2 and 3 µm.

Ranunculus fontanus J. & C. Presl (Ranunculaceae) – 2n = 48 (Fig. 15-16)
Italy, Calabria, prov. di Cosenza, Sila Grande, c. 6 km S of Camigliatello Silano, Fontana del Colonnello, c. 1 km W of M. Botte Donato, 1800-1840 m, 39°17’N, 16°26’E, 15.11.2002, Peruzzi & Caparelli, root tips collected in situ.

This species of Ranunculus sect. Flammula is confined to the NE Mediterranean basin (Pignatti 1982, Tutin in Tutin & al. 1993). In S Italy it can be found in marshy and humid habitats of the montane belt.

Our counts in the material from both localities revealed 2n = 48 chromosomes and corroborate reports by D’Ovidio & Marchi (1990) for Calabrian plants from Sila Piccola (Ciricilla) and by Ferrarella & al. (1981) for plants of Sicilian provenance (Madonie). According to D’Ovidio & Marchi (1990), the closely related R. ophioglossipholius Vill. and R. flammula L. subsp. flammula are diploid with 2n = 16 chromosomes and tetraploid with 2n = 32 chromosomes, respectively. Chromosome size ranges between 2.5 and 6.5 µm.

Galium palaeoitalicum Ehrend. (Rubiaceae) – 2n = 20 (Fig. 17-18)
Italy, Calabria, Serra del Prete, along the rocks at SW of the top, 2100-2160 m, 19.7.2001, 39°55’N, 16°09’E, Peruzzi, Gargano & Passalacqua, young ovaries collected in situ.

This species is endemic to peninsular Italy (Ehrendorfer & Krendl 1974, Ehrendorfer in Pignatti 1982). Our count of 2n = 20 chromosomes agrees with those by Ehrendorfer & Krendl (1974) for plants of unspecified origin and by Bechi & al. (1991), Bechi & Garbari (1992) on material from the Apuan Alps (Tuscany). According to Bechi & al. (1996), this species can be considered as a paleo-apoendemic, being a diploid descendant (both related species have 2n = 22 chromosomes). Chromosome size ranges between 1 and 2 µm.
Fig. 13-18. Chromosome complements – microphotographs and drawings of: 13-14: Soldanella calabrella, 2n = 40; 15-16: Ranunculus fontanus, 2n = 48; 17-18: Galium palaeoitalicum, 2n = 20. – Scale bars = 5 µm

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