

Chromosome numbers for the Italian flora: 4

Lorenzo Peruzzi¹, Raquel Bezerra Chiavegatto², Marco D'Antraccoli¹,
David Dolci¹, Francesco Roma-Marzio¹

1 *Dipartimento di Biologia, Università di Pisa, Via Derna 1, 56126 Pisa, Italy* **2** *Department of Biology, University of Lavras, Via Doutor Sylvio Menicucci 1001, 37200-000 Minas Gerais State, Brazil*

Corresponding author: *Lorenzo Peruzzi* (lorenzo.peruzzi@unipi.it)

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Abstract

In this contribution new chromosome data obtained on material collected in Italy are presented. It includes 9 chromosome counts for *Polygala* (Polygalaceae), *Dianthus* and *Silene* (Caryophyllaceae).

Keywords

Cytogeography, cytotaxonomy, karyotype

How to contribute

Texts concerning new chromosome data should be submitted electronically to Lorenzo Peruzzi (lorenzo.peruzzi@unipi.it), including indications of voucher specimens and methods used.

Chromosome counts

Polygala flavescens DC. subsp. *flavescens* (Polygalaceae)

Chromosome number. $2n = 22$ (Fig. 1)

Voucher specimen. **ITALY. Toscana.** Cerbaie (Pisa) (WGS84: 43.751228 N, 10.719234 E), 55 m, 7 May 2015, *D. Dolci* (PI n. 000455, 000456, 000457, 000458).

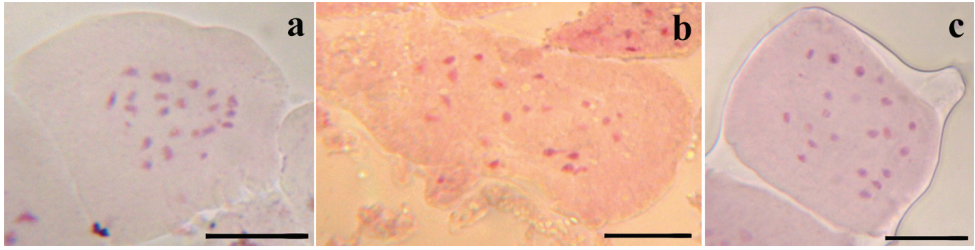


Figure 1. *Polygala flavescens* DC. subsp. *flavescens*, $2n = 22$ from Cerbaie, Tuscany (a), Torano, Lazio (b), and Vallerotonda, Lazio (c). Scale bar: 10 μm .

Lazio. Torano (Rieti) (WGS84: 42.157098 N, 13.270760 E), 760 m, 30 April 2015, *D. Dolci* (PI n. 000453, 000454); Vallerotonda (Frosinone) (WGS84: 41.588942 N, 14.007237 E), 765 m, 3 May 2015, *D. Dolci* (PI n. 000459, 000460).

Method. Squash preparations were made on root-tips taken from plants cultivated in the Botanical Garden of Pisa and obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in HCl 1N at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Polygala flavescens* subsp. *flavescens* is an Italian endemic taxon, described from central Italy and currently recorded from Emilia Romagna to Basilicata (Conti et al. 2005, Del Guacchio 2010). These are the first chromosome counts for this species (Bedini et al. 2010 onwards), and they also represent the first records of $2n = 22$ cytotypes in the genus *Polygala* L. (Rice et al. 2014).

Polygala flavescens DC. subsp. *maremmana* (Fiori) Arrigoni (Polygalaceae)

Chromosome number. $2n = 22$ (Fig. 2)

Voucher specimen. ITALY. Toscana. Monte Argentario (Grosseto) (WGS84: 42.421952 N, 11.140779 E), 130 m, 6 May 2015, *D. Dolci* (PI n. 000466, 000467, 000468, 000469).

Method. Squash preparations were made on root-tips taken from plants cultivated in the Botanical Garden of Pisa and obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in HCl 1N at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Polygala flavescens* subsp. *maremmana* is an Italian endemic, originally described as a form based on plants from Mt. Argentario (Peruzzi et al. 2015). Currently, it is recorded from the coasts of southern Tuscany, from San Vincenzo (Leghorn) to Capalbio (Grosseto) (Arrigoni 2014). Our chromosome count, performed on plants from the *locus classicus*, is the first for this subspecies (Bedini et al. 2010 onwards), and it agrees with the chromosome number reported above for *P. flavescens* subsp. *flavescens*.

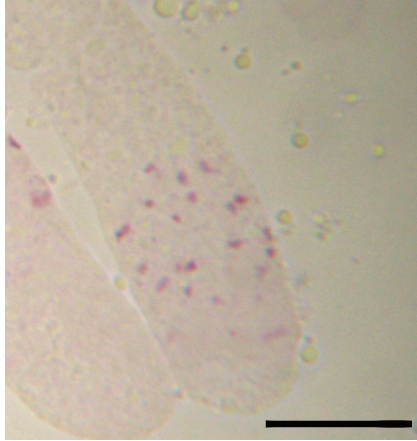


Figure 2. *Polygala flavescens* subsp. *maremmana* (Fiori) Arrigoni, $2n = 22$. Scale bar: 10 μ m.

Polygala flavescens DC. subsp. *pisauensis* (Caldesi) Arcang. (Polygalaceae)

Chromosome number. $2n = 22$ (Fig. 3)

Voucher specimen. ITALY. Marche. Fano (Pesaro e Urbino) (WGS84: 43.864231 N, 12.984113 E), 25 m, 24 April 2015, D. Dolci (PI n. 000461, 000462).

Method. Squash preparations were made on root-tips taken from plants cultivated in the Botanical Garden of Pisa and obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in HCl 1N at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Polygala flavescens* subsp. *pisauensis* is an Italian endemic, originally described as a species based on plants from Pesaro (Peruzzi et al. 2015). Currently, it is recorded for coastal hills of Emilia-Romagna and Marche (Arrigoni 2014). Our chromosome count, performed on plants from the *locus classicus* area, is the first for this subspecies (Bedini et al. 2010 onwards), and it agrees with the chromosome numbers reported above for *P. flavescens* subsp. *flavescens* and *P. flavescens* subsp. *maremmana*.

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Dianthus brutius Brullo, Scelsi & Spamp. subsp. *brutius* (Caryophyllaceae)

Chromosome number. $2n = 30$ (Fig. 4)

Voucher specimen. ITALY. Calabria. Aspromonte, Roccaforte del Greco (Reggio Calabria), near the Menta's artificial basin (WGS84: 38.12427 N, 15.90080 E), metamorphic rock outcrops along the road, 1400 m, 21 August 2017, L. Peruzzi & K.F. Caparelli (seeds collected in the field and stored in the Germplasm Bank of Department of Biology, Pisa, under acc. n. PI-20170073).

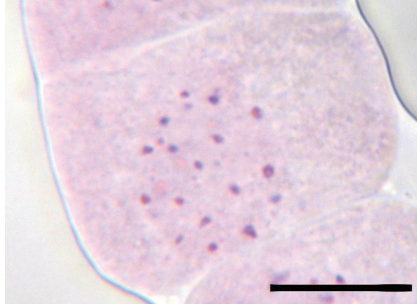


Figure 3. *Polygala flavescens* subsp. *pisaurensis* (Caldesi) Arcang., $2n = 22$. Scale bar: 10 μm .

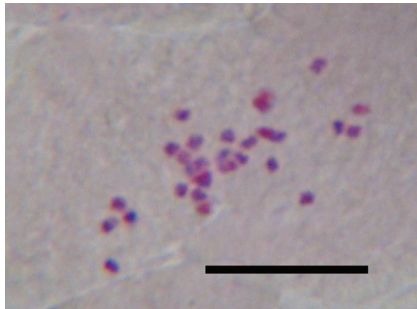


Figure 4. *Dianthus brutius* Brullo, Scelsi & Spamp. subsp. *brutius*, $2n = 30$. Scale bar: 10 μm .

Method. Squash preparations were made on root-tips obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Dianthus brutius* subsp. *brutius* is endemic to Calabria (Peruzzi et al. 2014), occurring in the mountain part of the Aspromonte area, and it belongs to *D. vulturius* Guss. & Ten. group (Brullo et al. 2000). This is the first chromosome count for this species, and the number is consistent with the basic chromosome number ($x = 15$) typical for the genus *Dianthus* L. (Bedini et al. 2010 onwards; Rice et al. 2014).

Dianthus brutius Brullo, Scelsi & Spamp. subsp. *pentadactyli* Brullo, Scelsi & Spamp. (Caryophyllaceae)

Chromosome number. $2n = 30$ (Fig. 5)

Voucher specimen. ITALY. Calabria. Melito di Porto Salvo (Reggio Calabria), Pentidattilo (WGS84: 37.95946 N; 15.76115 E), conglomerate cliffs, 300 m, 21 August 2017, L. Peruzzi & K.F. Caparelli (seeds collected in the field and stored in the Germplasm Bank of Department of Biology, Pisa, under acc. n. PI-20170072).

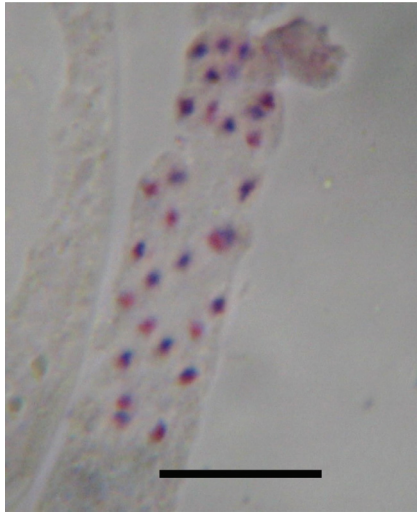


Figure 5. *Dianthus brutius* subsp. *pentadactyli* Brullo, Scelsi & Spamp., $2n = 30$. Scale bar: 10 μm .

Method. Squash preparations were made on root-tips obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Dianthus brutius* subsp. *pentadactyli* is endemic to Calabria (Peruzzi et al. 2014), occurring in the lowest part of the Ionian slope of Aspromonte area (Brullo et al. 2000). This is the first chromosome count for this subspecies (Bedini et al. 2010 onwards), and it agrees with the chromosome number reported above for *D. brutius* subsp. *brutius*.

Dianthus vulturius Guss. & Ten. subsp. *aspromontanus* Brullo, Scelsi & Spamp. (Caryophyllaceae)

Chromosome number. $2n = 30$ (Fig. 6)

Voucher specimen. ITALY. Calabria. Montebello Jonico (Reggio Calabria), along the road to Masella (WGS84: 37.97780 N, 15.75978 E), cliffs, 320 m a.s.l., 21 August 2017, L. Peruzzi & K.F. Caparelli (PI).

Method. Squash preparations were made on root-tips obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Dianthus vulturius* subsp. *aspromontanus* is endemic to Calabria (Peruzzi et al. 2014). It is distributed only in a small area of southern Aspromonte, growing as a chasmophyte (Brullo et al. 2000). This is the first chromosome count for this species, and it is consistent with chromosome numbers reported above for the related *D. brutius* subsp. *brutius* and *D. brutius* subsp. *pentadactyli*.

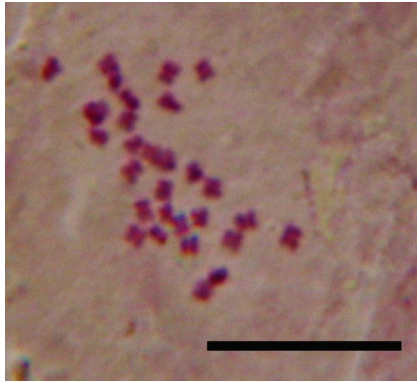


Figure 6. *Dianthus vulturius* Guss. & Ten. subsp. *aspromontanus* Brullo, Scelsi & Spamp., $2n = 30$. Scale bar: 10 μm .



Figure 7. *Silene calabra* Brullo, Scelsi & Spamp., $2n = 24$. Scale bar: 10 μm .

Silene calabra Brullo, Scelsi & Spamp. (Caryophyllaceae)

Chromosome number. $2n = 24$ (Fig. 7)

Voucher specimen. ITALY. Calabria. Melito di Porto Salvo (Reggio Calabria), Pentidattilo (WGS84: 37.95278 N, 15.76156 E), cliffs along the road, 255 m a.s.l., 21 August 2017, Lorenzo Peruzzi & K.F. Caparelli (seeds collected in the field and stored in the Germplasm Bank of Department of Biology, Pisa, under acc. n. PI-20170071).

Method. Squash preparations were made on root-tips obtained from germinating seeds collected in the field. Root-tips were pre-treated with 0.4% colchicine for 3 hours and then fixed in Carnoy fixative solution for 1 hour. After hydrolysis in 1N HCl at 60° C, the tips were stained in leuco-basic fuchsin.

Observations. *Silene calabra* is endemic to Calabria (Peruzzi et al. 2014). According to Brullo et al. (1997), this species belongs to *S.* sect. *Siphonomorpha* Otth., and

it shows a close morphological relationship mainly with taxa of the *S. mollissima* (L.) Pers. group. This is the first chromosome count reported for this species, and it agrees with that reported for the closely related *S. oenotriae* Brullo (Peruzzi et al. 2007), and with those reported for other taxa within *S. sect. Siphonomorpha* (Naciri et al. 2017, and literature cited therein).

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