

Chromosome numbers for the Italian flora: II

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Abstract

In this contribution, new chromosome data obtained on material collected in Italy are presented. It includes counts for *Centaurea aegusae*, *Hieracium racemosum* subsp. *lucanum*, *H. australe* subsp. *australe*, *Lysimachia arvensis* subsp. *arvensis*, *Micromeria graeca* subsp. *graeca*, and *M. graeca* subsp. *consentina*.

Keywords

cytogeography, cytotaxonomy, endemic taxa, polyploidy

How to contribute

Texts concerning new chromosome data should be submitted electronically to Giovanni Astuti (giovanni.astuti@unipi.it), including indications on voucher specimens and methods used.

Chromosome counts

Centaurea aegusae Domina, Greuter & Raimondo (Asteraceae)

Chromosome number. $2n = 18$ (Fig. 1)

Voucher specimen. ITALY. Sicilia. Isola di Favignana, Mt. Santa Caterina, Scindo Passo (Favignana, Trapani) (WGS84: 37.920730°N, 12.307299°E), 50 m a.s.l., maritime carbonate cliffs, 25 July 2019, *G. Domina* (PAL).

Method. Squash preparations were made on root tips obtained from germinating seeds. 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 fuchsine for 7–8 minutes.

Observations. *Centaurea aegusae* is a rosulate chamaephyte endemic to the island of Favignana (Egadi Archipelago, western Sicily). In the past, it has been reported from all the Egadi islands under the name *C. cineraria* L. (Gussone 1843; Lojacono-Pojero 1903). On the basis of a statistical biometric study of the *C. busambarensis* Guss. complex, which represents the *C. cineraria* L. aggregate in Sicily and its offshore islets, *C. aegusae* is now recognized as a distinct species (Domina et al. 2017). The chromosome number $2n = 18$, reported here for the first time, is consistent with previous counts obtained for the other species belonging to the *C. busambarensis* complex (Viegi et al. 1972; Tornadore et al. 1974; Brullo and Pavone 1978; Cela Renzoni and Viegi 1982).



Figure 1. *Centaurea aegusae* Domina, Greuter & Raimondo from Isola di Favignana (Favignana, Trapani), $2n = 18$. Scale bar: 10 μ m.

Hieracium racemosum subsp. *lucanum* Di Grist., Domina, Gottschl. & Scafidi (Asteraceae)

Chromosome number. $2n = 27$ (Fig. 2)

Voucher specimen. ITALY. Basilicata. Timpa Rossa (Lauria, Potenza), in clearings of *Quercus cerris* woods (WGS84: 40.107361°N, 15.934836°E), 846 m a.s.l., 18 August 2019, E. Di Gristina, F. Maturo & F. Scafidi (PAL n°109701).

Method. Squash preparations were made on root tips obtained from germinating seeds. 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 fuchsine for 7–8 minutes.

Observations. *Hieracium racemosum* subsp. *lucanum* is a scapose hemicryptophyte, flowering from August to early September. It is currently known only from Timpa Rossa (Lauria, province of Potenza, Basilicata, S Italy) (Di Gristina et al. 2019). The aggregate of *H. racemosum* Willd. is one of the most polymorphic aggregates in the genus *Hieracium* L. s.str. The chromosome number $2n = 3x = 27$, reported here for the first time on material from the *locus classicus* of this subspecies, is included in the variability ($2n = 27$, $2n = 36$) reported for the *H. racemosum* aggregate by Sell and West (1976), Brullo et al. (2005), Di Gristina et al. (2006) and Geraci et al. (2007).

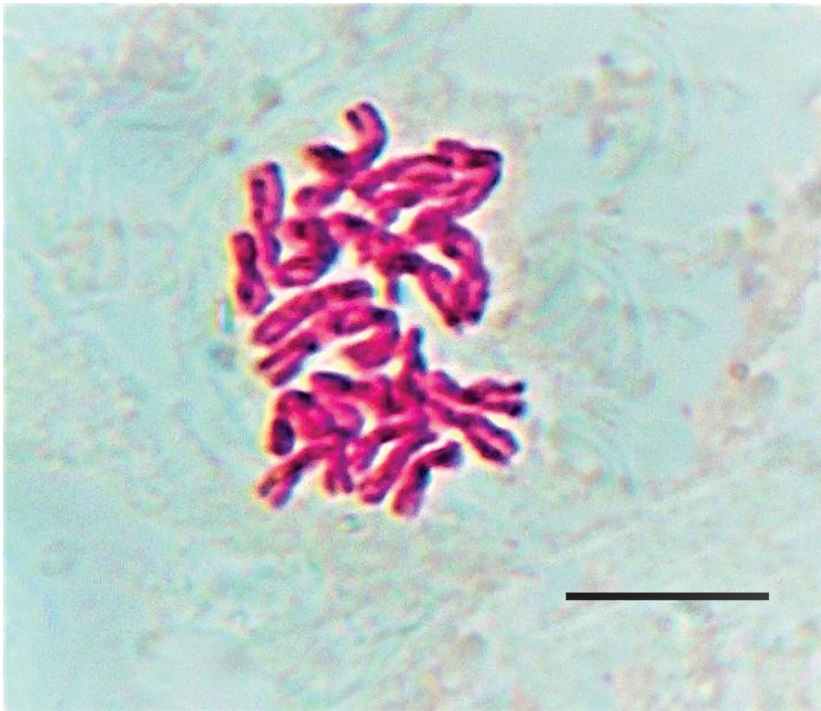


Figure 2. *Hieracium racemosum* subsp. *lucanum* Di Grist., Domina, Gottschl. & Scafidi from Timpa Rossa (Lauria, Potenza) $2n = 27$. Scale bar: 10 μ m.

Lysimachia arvensis (L.) U.Manns & Anderb. subsp. *arvensis* (Primulaceae)

Chromosome number. $2n = 40$ (Fig. 3)

Voucher specimen. ITALY. Sicilia. Fossa della Garofala (Palermo) (WGS84: 38.107529°N, 13.350157°E), 30 m a.s.l., irrigated *Citrus* grove, 28 May 2021, G. Barone (SAF).

Method. Squash preparations were made on root tips obtained from germinating seeds. 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 fuchsine for 7–8 minutes.

Observations. *Lysimachia arvensis* subsp. *arvensis* is an annual plant native to the Mediterranean Basin, but widely distributed around the world (Jiménez-López et al. 2019). It displays a petal colour polymorphism. Indeed, blue- and orange-flowered plants occur in monomorphic and polymorphic populations across its native range in Europe (Sánchez-Cabrera et al. 2021). The chromosome number $2n = 40$, found here in material with orange flowers, agrees with previous reports from Italy and abroad (Löve and Löve 1982; Moneim et al. 2003).

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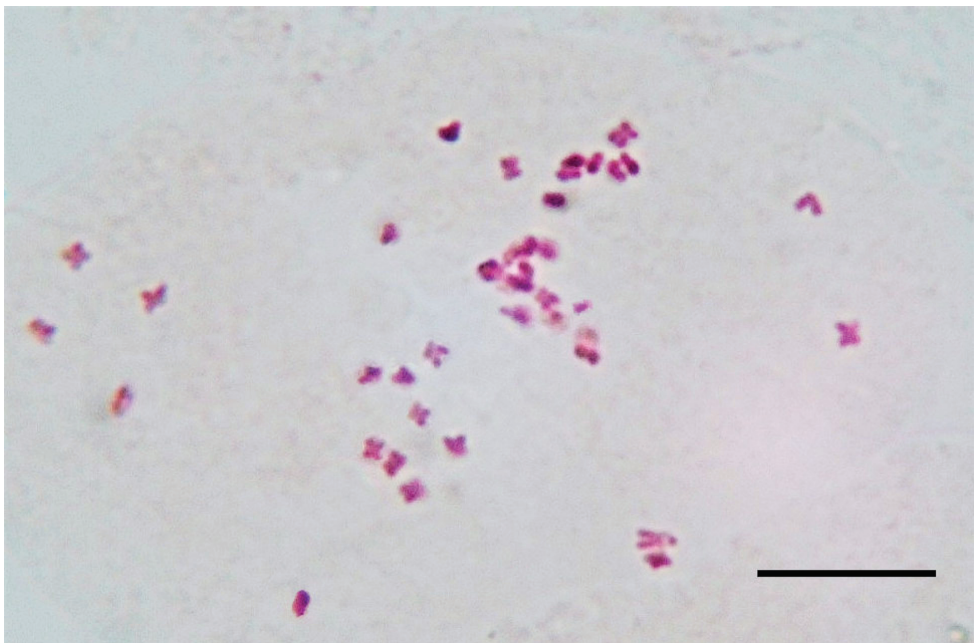


Figure 3. *Lysimachia arvensis* (L.) U.Manns & Anderb. subsp. *arvensis* from Fossa Garofala (Palermo), $2n = 40$. Scale bar: 10 μ m.

Micromeria graeca (L.) Benth. ex Rchb. subsp. *consentina* (Ten.) Guinea

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

Voucher specimen. ITALY. Calabria. Scalo Ferroviario di San Marco Argentano (Cosenza), nei pressi dello svincolo autostradale (WGS84: 39.62092°N, 16.22147°E), gariga a margine strada, 120 m s.l.m., 17 August 2018, L. Peruzzi (FI).

Method. Squash preparations were made on root tips obtained from seeds germinating on 1% agar in Petri dishes. 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 fuchsine.

Observations. This taxon is endemic to Italy, where it occurs in Calabria and Sicily, doubtful in Abruzzo and Basilicata, and no longer found in Campania and Puglia (Bartolucci et al. 2018). We here report the first chromosome count for this subspecies, $2n = 30$, which attests for a diploid status in contrast with the allegedly polyploid chromosome number $2n = 60$ reported for the typical *Micromeria graeca* subsp. *graeca* (Morales Valverde 1990; Luque and Diaz Lifante 1991; see also below). This further attests for an independence at species level for this taxon, as already argued by Peruzzi in Roma-Marzio et al. (2018).

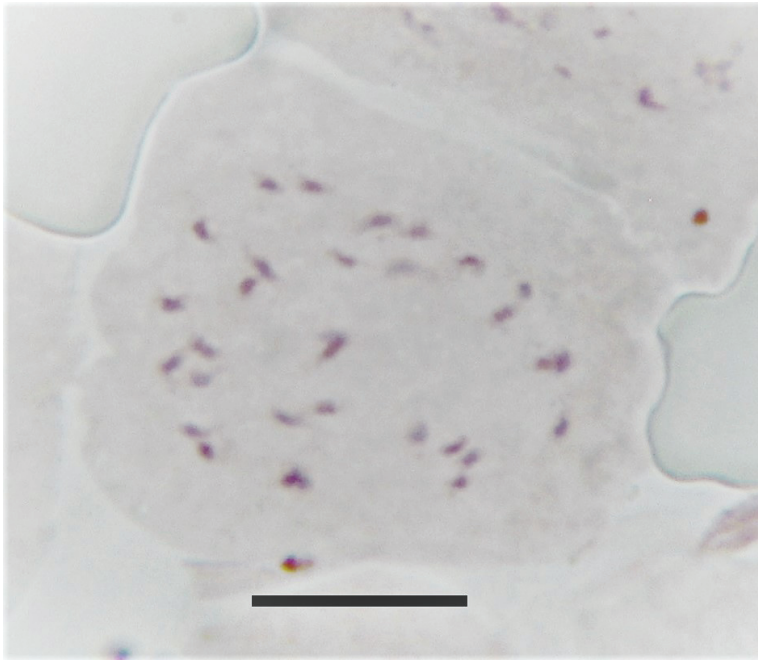


Figure 4. *Micromeria graeca* (L.) Benth. ex Rchb. subsp. *consentina* (Ten.) Guinea from San Marco Argentano (Cosenza), Scalo Ferroviario, $2n = 30$. Scale bar: 10 μ m.

Micromeria graeca (L.) Benth. ex Rchb. subsp. *graeca*

Chromosome number. $2n = 60$ (Fig. 5)

Voucher specimen. ITALY. Calabria. Scalo Ferroviario di San Marco Argentano (Cosenza), nei pressi dello svincolo autostradale (WGS84: 39.62064°N, 16.22079°E), nelle fessure dell'asfalto a margine strada, 118 m s.l.m., 17 August 2018, L. Peruzzi (seeds collected and deposited at the germplasm bank of the Department of Biology, University of Pisa).

Method. Squash preparations were made on root tips obtained from seeds germinating on 1% agar in Petri dishes. 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. This taxon is distributed throughout the Mediterranean region from Morocco to the Near East (Govaerts 2021). This is the first count of this subspecies for Italian populations, whereas other counts have been published for the Iberian Peninsula, where two different chromosome numbers have been reported so far, $2n = 20$ (Bjorkqvist et al. 1969) and $2n = 60$ (Morales Valverde 1990; Luque and Diaz Lifante 1991). Our count confirms the latter number, which seems the commonest for the species. Concerning the genus *Micromeria* Benth., it seems that most counts showing $x = 10$, 11, and 25 have to be referred to species now belonging to *Clinopodium* L. (Rice 2014+), raising some doubts on the reliability of the count published by Bjorkqvist et al. (1969). Assuming $x = 15$, the autonymic subspecies represents a tetraploid unit. It is of particular interest that the population studied here grows a few dozen metres away from the studied population of *M. graeca* subsp. *consentina* (Roma-Marzio et al. 2018).

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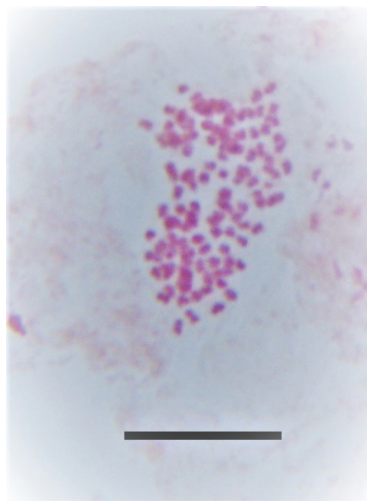


Figure 5. *Micromeria graeca* (L.) Benth. ex Rchb. subsp. *graeca* from San Marco Argentano (Cosenza), Scalo Ferroviario, $2n = 60$. Scale bar: 10 μ m.

Hieracium australe Fr. subsp. *australe* (Asteraceae)

Chromosome number. $2n = 27$ (Fig. 6)

Voucher specimen. ITALY. Lombardia. Milano (WGS84 45.47032°N, 9.17739°E), mura del Castello Sforzesco, 125 m, 2014, S. Orsenigo (Kew Gardens Millennium Seed Bank, Serial No. 808376).

Method. Squash preparations were made on root tips obtained from germinating seeds. 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 for 7–8 minutes.

Observations. *Hieracium australe* is a perennial species distributed in France, Italy, Hungary, and Romania (Greuter and Raab-Straube 2008). *Hieracium australe* subsp. *australe* is narrow endemic to Milan, where it grows on the ancient walls of the city and, in particular, on the walls of the Sforza castle (Orsenigo et al. 2019). The chromosome number $2n = 3x = 27$, reported here for the first time, is consistent with observations made on other species belonging to *H.* sect. *Italica* (Fr.) Arv-Touv., such as those of the *H. racemosum* aggregate (Brullo et al. 2005; Raimondo and Di Gristina 2004; Di Gristina et al. 2006), and to an apomictic (agamospermy) way of reproduction typical of the genus (Mráz and Zdvořák 2019).

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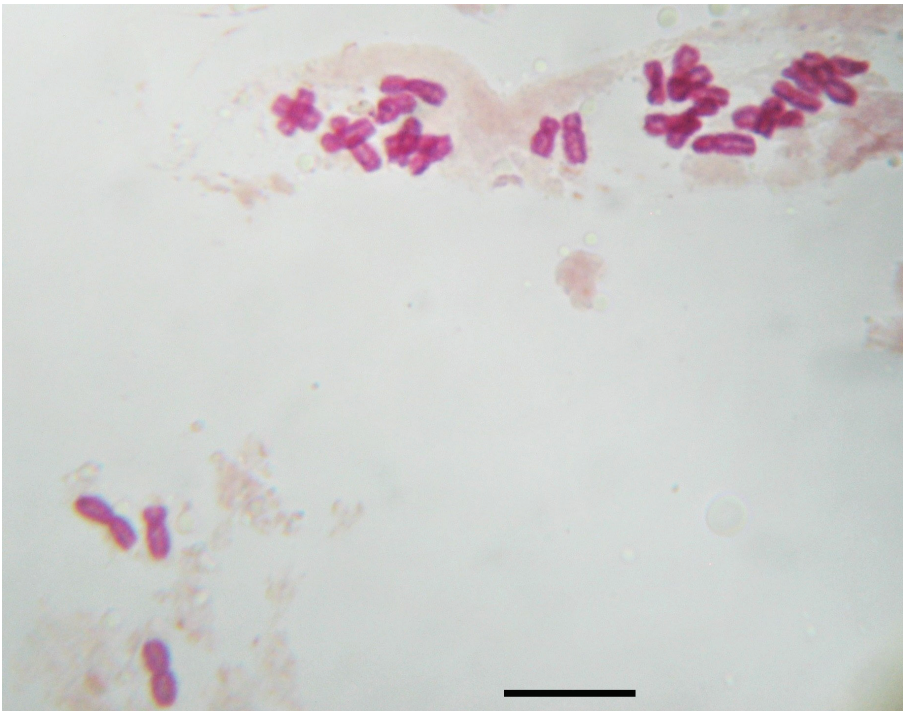


Figure 6. *Hieracium australe* Fr. subsp. *australe* from Sforza Castle (Milano), $2n = 27$. Scale bar: 10 μ m.

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