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Karyological data of three *Hieracium* (*Asteraceae*) from Sicily and South Italy

Abstract

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Chromosome numbers are given for three endemic *Hieracium* taxa from Sicily and Campania (Southern Italy). All the examined taxa resulted triploid ($2n = 3x = 27$). The triploid chromosome set found in the population of *H. pallidum* from Rocche dell'Argimusco (Peloritani Mountains, NE-Sicily) differs from the previous counts ($2n = 4x = 36$) reported for the same species from its *locus classicus* (Mt. Etna).

Keywords: Agamospermy, chromosome number, endemism, polyploidy, distribution, rediscovery.

Introduction

The genus *Hieracium* L. s. str. (*Asteraceae*) is well known as one of the most species-rich plant group in the world. It includes perennial herbs distributed predominantly in temperate regions of Europe, Asia and North America (Chrtek & al. 2006). In the past, *Hieracium* also included *Pilosella* Vaill. but now they are treated as two separate genera, based on a whole range of morphological, biochemical, cytological and genetical characteristics (Braütigam & Greuter 2007; Di Gristina & al. 2013). *Hieracium* belongs to a group of genera in which diplosporous agamospermy and polyploidy seem to prevail. Hybridization also appears as a very rare phenomenon and is most likely confined to crosses between diploid sexual species (Chrtek & al. 2006). The primitive basic chromosome number for most of the *Asteraceae* and especially for *Hieracium* is x = 9 (Babcock 1947). However, the great majority of *Hieracium* taxa are triploid ($2n = 27$) or tetraploid ($2n = 36$) due to the species being sexual or apomictic or both (Mraz & al. 2001; Niketic & al. 2003). Sexuality is extremely rare and confined to a few diploid species, mostly distributed in South Europe (Merxmüller 1975; Chrtek & al. 2004). Agamospermy, together with sexuality and hybridization, in the past have given rise to a very large number of variants that have been described as subspecies, as has traditionally been the case in Central Europe or at rank of species in British Isles, Scandinavia, East Europe (Mraz & al. 2001; Chrtek & al. 2006).

In order to define the phylogenetic and systematic relationships among the endemic *Hieracium* taxa in Southern Italy, a cytogeographical analyses at population level, is in progress. In this frame, we here report the chromosome number of two *Hieracium* from Sicily and one from Campania.

1997. *Hieracium hypochoeroides* subsp. *lucanicum* (Arv.-Touv.) Di Grist., Gottschl. & Raimondo **—** 2*n* = 3x = 27 (Fig. 1a).

It: Salerno, Parco Nazionale del Cilento e Vallo di Diano, Mt. Sacro, 40° 12' 56,88" N, 15° 20' 08,8" E, granitic conglomerate and sandstone rocks, 1.655 m a.s.l., 06 Jul 2013, *E. Di Gristina s.n.* (PAL).

Hieracium hypochoeroides subsp. *lucanicum* (Arv.-Touv.) Di Grist., Gottschl. & Raimondo is a little known taxon described from Mt. Sacro (Parco Nazionale del Cilento e Vallo di Diano, South Italy). It is a rosulate hemicryptophyte published by Guadagno under *H. sartorianum* var. *lucanicum* Arv.-Touv. and recently reclassified as a subspecies of *H. hypochoeroides* (Di Gristina & al. 2015a). The collective species *H. hypochoeroides* s.l. is a young aggregate of many apomictic microtaxa which have evolved probably during the post-glacial period (Di Gristina & al. 2015b). Many of the taxa described so far have a very restricted distribution and are very narrow endemics (Di Gristina & al. 2015b). In southern Europe there are only local populations and most of them seem to be relict (Di Gristina & al. 2016a).

The chromosome number 2*n* = 3x = 27 (Fig. 1a), found here for the first time on material from its *locus classicus* (Mt. Sacro, Salerno) is included in the variability (2*n* = 3x = 27, 2*n* = 4x = 36) reported for the collective species *H. hypochoeroides* by Sell & West (1976).

1998. *Hieracium pallidum* Biv. **—** 2*n* = 3x = 27 (Fig. 1b).

Si: Messina, Peloritani Mountains, Rocche dell'Argimusco, 37° 59' 19,70" N, 15° 02' 26,24" E, quartzarenitic rocks, 1.225 m a.s.l., 17 Jun 2012, *E. Di Gristina s.n.* (PAL).

Hieracium pallidum Biv. is a rosulate chasmophyte recently considered as an intermediate species between *H. schmidtii* and *H. racemosum* ("*schmidtii* > *racemosum*") (Gottschlich & al. 2013). It was included as a local endemic species of Sicily in *H.* sect. *Grovesiana* which comprehends a complex of similar morphotypes resulting from hybridization processes of *H. grovesianum* Belli and *H. racemosum* Willd. (Di Gristina & al. 2014a). Other records given for *H. pallidum* from various European countries and regions belong to other subspecies of *H. schmidtii* complex, and need a critical revision (Gottschlich & al. 2013). In Sicily, *H. pallidum* has so far been known only from Mt. Etna (E-Sicily). A new population has recently been discovered from Rocche dell'Argimusco (Peloritani Mountains, NE-Sicily).

The chromosome number $2n = 3x = 27$ (Fig. 1b), found here on material from Rocche dell'Argimusco does not agree with the number reported for the same species ($2n = 4x = 36$) from the *locus classicus* (Mt. Etna) by Brullo & al. (2005) and Di Gristina & al. (2005); it also differs with that detected for *H. pallidum* subsp. *aetnense* ($2n = 4x = 36$) (Di Gristina & al. 2014b). These observations suggest that the *H. pallidum* population of Rocche dell'Argimusco needs critical treatment.

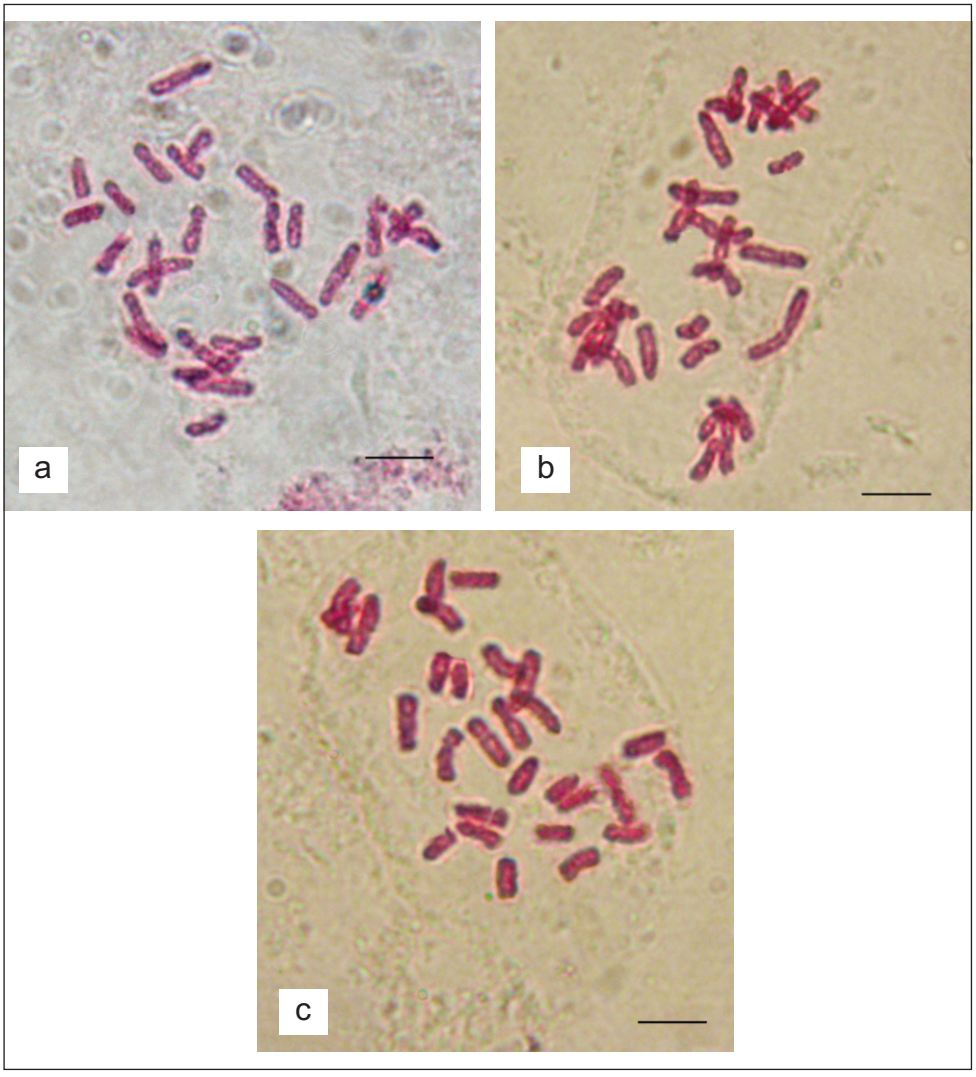

Fig. 1. Microphotographs of mitotic metaphase plates of: **a,** *Hieracium hypochoeroides* subsp. *lucanicum*, $2n = 3x = 27$; **b,** *H. pallidum*, $2n = 3x = 27$; **c,** *H. schmidtii* subsp. *nebrodense*, $2n = 3x = 27$. – Scale bars = 10 μm.

1999. *Hieracium schmidtii* subsp. *nebrodense* (Tineo ex Lojac.) Di Grist., Gottschl. & Raimondo **—** 2*n* = 3x = 27 (Fig. 1c).

Si: Palermo, Madonie Mountains, Mt. Cavallo, 37° 49' 41,75" N, 14° 01' 56,60" E, quartzarenitic rocks, 1.474 m a.s.l., 27 Jun 2012, *E. Di Gristina s.n.* (PAL).

Hieracium schmidtii subsp. *nebrodense* (Tineo ex Lojac.) Di Grist., Gottschl. & Raimondo is a little-known endemic to Sicily and it has been recently rediscovered from the type locality after almost two centuries since its first and only collection made in 1830 in the Madonie Mountains (NC-Sicily) (Di Gristina & al. 2016b). It is a rosulate chasmophyte belonging to the collective species *H. schmidtii* (*H.* sect. *Oreadea*), which includes perennial plants, characterized by glaucous-green leaves in a basal rosette with long and rigid simple hairs at least on the leaf margins or on the surface.

The aggregate includes also the Sicilian endemic subspecies of the Madonie Mountains, *H. schmidtii* subsp. *madoniense* (syn. *H. madoniense*, see Raimondo & Di Gristina 2007).

The chromosome number 2*n* = 3x = 27 (Fig. 1c), found here for the first time on material from its *locus classicus* (Mt. Cavallo, Madonie Mountains) is included in the variability (2*n* = 3x = 27, 2*n* = 4x = 36) reported for the collective species *H. schmidtii* by Sell & West (1976), and it corresponds with the one found for *H. schmidtii* subsp. *madoniense* by Raimondo & Di Gristina (2007).

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