



Hieracium racemosum subsp. *amideii* (Asteraceae), a new hawkweed taxon from Montecristo island (Tuscan archipelago, Italy)

VINCENZO GONNELLI^{1,*}, GÜNTER GOTTSCHLICH² & ANTONIO ZOCCOLA³

¹Via Martiri della libertà, 1 52036 Pieve Santo Stefano Arezzo Italy (*corresponding author's e-mail: gonnelli@agrotecnici.it)

²Hermann-Kurz-Straße 35, 72074 Tübingen, Germany

³Arma dei Carabinieri - C.U.F.A. - Reparto Biodiversità di Pratovecchio Arezzo Italy

Abstract

A new hawkweed taxon endemic to the insula Montecristo (Tuscan archipelago, Italy), *Hieracium racemosum* subsp. *amideii*, is described and illustrated. Information on its distribution, ecology and taxonomic relationship is provided.

Keywords: Tuscany, endemism, taxonomy, vascular plant

Introduction

Montecristo is a small uninhabited island of the Tuscan archipelago south of Elba with an area of 10,3 km². The geologic substrate is mainly granite (Aringoli *et al.* 2009). The highest mountain is M. Fortezza (645 m). Since 1971 the whole island is an integral nature reserve. Only 1000 visitors are allowed to visit the island per year.

The first collection of a species from genus *Hieracium* Linnaeus (1753: 799) from Montecristo was collected by George Watson-Taylor and classified as *H. sabaudum* Linnaeus (1753: 804) (Caruel 1860). Subsequently it was collected by Mori in 1902 (FI) and by Fabbri, Bavazzano and Contardo in 1964 (FI) and also named *H. sabaudum*. In the central Italic Herbarium in Florence there are only these three specimens stored. We also checked the herbarium Caruel and the Herbarium Horti Botanici Pisani (PI), Herbarium of the Florence Agricultural Botany Laboratories (FIAF) and Herbarium Universitatis Senensis (SIENA) without finding other specimens of *Hieracium* from the island of Montecristo.

Hence, in the most recent papers reporting data on the Montecristo flora (Paoli & Romagnoli 1976; Chiarucci *et al.* 2017) only *H. sabaudum* is mentioned.

A recent collection, made by the third author, created doubt in the former classification. A morphological study of this collection led us to the result, that it does not belong to *H. sabaudum* but to the *H. racemosum* aggregate with the center of its distribution in Italy and the Balkan Peninsula (distribution map in Meusel & Jäger 1992). Fourty infraspecific taxa are known. In connection with the description of a new taxon Raimondo & Di Gristina (2004) listed comparative characters with 8 other taxa of the *H. racemosum* aggregate, occurring in Italy (dealt by them at species rank). They also provided a key. However, in consideration of the Italian parts of the Alps, 20 taxa are known from Italy (Gottschlich in Pignatti 2019). In Euro+Med (2006–) and Bartolucci & al. (2018) there are listed 22 resp. 21 subspecies, but *H. racemosum* subsp. *tenuifolium* (Host 1831: 411) Zahn (1938: 612) belongs to *H. sabaudum* Linnaeus (Gottschlich, unpubl.) and *H. racemosum* subsp. *todaroanum* Zahn (1922: 979) was synonymized with *H. crinitum* Sm. in Sibthorp (1813: 134) (Di Gristina & al. 2012). With regard to their distribution in Italy these subspecies can be characterized as follows:

- Subspecies with a wide range in Italy:
subsp. *virgaurea* (Cosson 1847: 209) Zahn (1916: 349), incl. subsp. *ageratoides* (Fries 1862: 108) Greuter in Greuter & Raab-Straube (2007: 171), which is only an aberrant morphotype (the most widespread taxon of *H. racemosum* Waldst. & Kit. ex Willd. (1803: 1588) in Italy, occurring throughout the whole Apennines, rare in the Western Alps, records from Corse seems to be erroneous (Tison 2015))
- Subspecies with a scattered range in Italy:
subsp. *crinitum* (Sm.) Rouy (mainly in the middle and southern Apennines, also in Sicilia and Sardinia; frequent in SE-Europe)

- subsp. *barbatum* (Tausch ex Froelich 1838: 223) Zahn (1902: 1925) (mainly along the southern border of the Alps, rare in the Apennines; widespread in E- and SE-Europe)
- subsp. *apenninum* (Levier ex Huter 1887 in schedis) Zahn (1922: 983) (throughout the whole Apennines, but less frequent, rare in Piemonte, probably endemic to Italy if one excludes the doubtful record of *H. racemosum* subsp. *apenninum* var. *rivisicci* Zahn (1922: 984) from Corse, see Tison (2015))
- subsp. *italicum* Fries ex Zahn (1922: 978) (throughout the whole Apennines, but less frequent, rare in Piemonte, also in SE-Europe)
- Subspecies, occurring only in parts of the Apennines, sometimes also recorded from the Western Alps:
- subsp. *alismaticum* (Pospichal 1899: 816) Zahn (1922: 979) (C-Apennines; rare in SE-Europe)
- subsp. *caramanicum* (Zahn 1902: 1) Zahn (1922: 976) (C-Apennines, rare in S-Apennines, endemic to Italy)
- subsp. *sublateriflorum* Zahn (1922: 983) (rare in Piemonte and the N- and C-Apennines, endemic to Italy)
- subsp. *heterospermum* (Arvet-Touvet 1876: 28) Zahn (1922: 981) (rare in NW-Italy, other records to verify)
- Subspecies occurring in Italy only in the lower parts of the Alps:
- subsp. *moesiacum* A. Kerner ex Zahn (1909: 357) (W-Alps, record from Abruzzo to verify; SE-Europe)
- subsp. *provinciale* (Jordan 1849: 41) Rouy (1905: 408) (W-/S-Alps); France: Provence)
- subsp. *racemosum* (W-/S-Alps; SE-Europe)
- subsp. *leiopsis* Murr et Zahn in Koch (1902: 1927) (S-Alps; restricted area around Innsbruck / Tyrol)
- subsp. *stiriacum* (A. Kerner ex Willkomm 1881: 451) Zahn (1927: 391) (S-/SE-Alps; E-Austria, SE-Europe)
- Endemic subspecies with a restricted area:
- subsp. *limbarae* (Arrigoni 1985: 241) Greuter in Greuter & Raab-Straube (2007: 171) (Sardinia: M. Limbara)
- subsp. *oliastrae* (Arrigoni 1985: 245) Greuter in Greuter & Raab-Straube (2007: 171) (Sardinia: Ogliastra)
- subsp. *pignattianum* (Raimondo & Di Gristina 2004: 314) Greuter in Greuter & Raab-Straube (2007: 171) (Sicilia: Madonie)
- subsp. *pulmonariifolium* Gottschlich (2009: 148). (Abruzzi)
- subsp. *substramineum* Zahn (1916: 351) (Piedmont)

The plants of the Montecristo island belong to the last group. They show affinities to widespread *H. racemosum* subsp. *crinitum* Rouy (1905: 410), but differ in some characters which can be interpreted as a result of the insular isolation. So, we describe it as a new subspecies:

***Hieracium racemosum* subsp. *amideii* Gottschl., Gonnelli & Zoccola, subsp. nov. (Figs. 1–2).**

Type:—ITALY. Tuscany, al crinale di Collo dei Lecci, nelle fessure delle rocce in una parete di granito a 450 m s.l.m. con esposizione Est. WGS84: 42.329285 N, 10.312236 E. 24.10.2017, *A. Zoccola* (holotype FI 018698; isotypes Hb. Gonnelli 704, Hb. Gottschlich 71448).

Paratypes:—Isola di Montecristo, Portoferraio, presso la Cima dei Lecci alt. 530–563 m, 5.10.1964, *F. Fabbri, B. Bavazzano, A. Contardo* (FI 055347); Isola di Montecristo, sommità della Fortezza, 6.8.1902, *A. Mori* (FI 055346); lungo il sentiero fra il Convento e il monte della Fortezza, 345–600 m, 25.10.1964, *F. Fabbri, B. Bavazzano, A. Contardo* (FI 055348).

Diagnosis:—*Planta* Hieracio racemoso subsp. *crinito similis sed foliis margine et subtus pilis glanduliferis modice obsitis, pedunculis pilis simplicibus brevibus differt.*

Perennial, scapose hemicryptophyte. Rhizome stout, oblique or vertical. Stem erect, vertical, cylindrical, stout (1.5–2.5 mm in diam.), (15)20–25(30) cm tall, brownish-green, brown at base, striated, moderately covered with 1–2 mm long white simple hairs, glandular hairs few to moderate, stellate hairs lacking. Basal leaves lacking. Cauline leaves 10–20, crowded in the middle of the stem, the lower ones petiolate, petioles 1–3 cm long, often winged, broad elliptical to ovate, lamina 4–8 × 2–4 cm, grass-green above, light green on lower surface, acute, entire or remotely dentate at base, teeth obtuse, remaining stem leaves rapidly decreasing in size upwards (plant hence of pyramidal appearance), ovate or elliptical, sessile, margin and lower surface moderately covered with short simple and glandular hairs. Inflorescence racemiform to paniculate-racemiform; branches (0)1–5, straight, 2–5 cm long, each with 1–2 capitula; capitula (1)2–7(10); acladium 1–2 cm long. Peduncles subdensely covered with 1–2 mm long white simple and 0.5–1 mm long white glandular hairs, stellate hairs lacking. Involucre almost ovoid, 9–10 mm long. Involucral bracts in few series, light green, up to 1.2 mm wide, acute with sparse, 1 mm long, simple hairs and with subdense, 0.2–0.4 mm long, white glandular hairs, stellate hairs lacking. Corolla limb ligulate, yellow, glabrous. Styles yellow. Margins of alveoli with broad teeth. Achenes 3.5 mm long, straw-coloured.

Etymology:—The subspecific epithet *amideii* refers to Gaspare Amidei, physician and botanist, born and died in Volterra Pisa, 1786–1870. He studied the flora of Valtiberina, in Volterra, Val di Cecina and on gabbros of metalliferous hills (Amidei 1841a, 1841b, 1866).

He kept close contact with eminent botanists of his time, including Bertoloni, Parlato and Savi to whom he distributed numerous herbarium samples. His herbarium of about 2.000 specimens is now preserved in Siena at the Accademia dei Sepolti, other specimens are preserved in the herbaria of FI, BOLO, PI. (Pichi Sermolli 1998). In Taxonomic Literature (Stafleu & Cowan 1976, Stafleu & Mennega 1992) an entry for Amidei is lacking.

Phenology:—(August) September to October. Fruiting in October.



FIGURE 1. Holotype of *Hieracium racemosum* subsp. *amideii* preserved in the Herbarium of Natural History Museum, Florence University (FI 018698).



FIGURE 2. *Hieracium racemosum* subsp. *amideii*: involucre (taken from the isotype, Gottschlich 71448).

Distribution and ecology:—Endemic to the Insula Montecristo, *Hieracium racemosum* subsp. *amideii* grows in cracks of granite rocks in the short mountain range that crosses the island of Montecristo, from the top of the Fortezza (645 m) to the top of Collo Fondo (621 m) up to Punta dei Lecci (563 m) in various expositions to a quota between 350 and 600 m s.m. approximately.

It is often associated with *Polypodium cambricum* Linnaeus (1753: 1086), *Saxifraga montis-christi* Mannocci, Ferretti, Mazzoncini & Viciani in Manocci *et al.* (2016: 123), *Umbilicus rupestris* Dandy in Riddellsdell & al. (1948: 611) and *Linaria capraria* Moris & De Notaris (1839: 98).

The current distribution of the population on the island is conditioned by grazing goats that pushes it to inaccessible areas. The potential habitat could also comprise open woods and shrublands.

TABLE 1. Diagnostic characters of *Hieracium racemosum* subsp. *amideii* and *H. racemosum* subsp. *crinitum*.

Character	<i>Hieracium racemosum</i> subsp. <i>amideii</i>	<i>Hieracium racemosum</i> subsp. <i>crinitum</i>
Indument of leaves	glandular hairs on margin and lower surface of leaves	glandular hairs on leaves lacking
Teeth of leaves	obtuse	acute
Simple hairs on peduncles	moderate to subdense, 1–2 mm long	dense, 8–12 mm long

Until 1971, when it passed to the management of the State Forestry Corps, the island of Monte Cristo was managed as a hunting reserve with the consequent control of goats.

Once the main threats deriving from the hunting activity had ceased, the population of goats grew extensively. So, in the period 1975–1997, hunting was resumed consequently to restrict their number (Vagniluca & Quilghini 2009).

Currently, *H. racemosum* subsp. *amideii* has been observed in a few inaccessible stations, divided into three locations: Monte della Fortezza, Collo dei Lecci and Punta dei Lecci, where about a hundred of individuals grow in flower (Fig. 3).

Conservation status:—The restricted area of *Hieracium racemosum* subsp. *amideii* is threatened by excessive grazing by goats. Furthermore, monitoring and research actions are needed to better understand the real population size and demographic trends of the species on the island.

Affinity:—Morphologically *Hieracium racemosum* subsp. *amideii* is similar to *H. racemosum* subsp. *crinitum*. The most remarkable difference is the indumentum of glandular hairs on the margin and lower surface of the leaves.

In this character it shows some similarity to *H. bernardii* Rouy (1905: 34), but this species, interpreted as being intermediate between *H. racemosum* and *H. amplexicaule* Linnaeus (1753: 803), has a quite denser indumentum of glandular hairs. Moreover, its semiamplexicaul stem leaves indicate more influence of *H. amplexicaule*, while in *H. racemosum* subsp. *amideii* the shape of leaves does not resemble *H. amplexicaule* in any way.

Further diagnostic characters are given in Table 1.

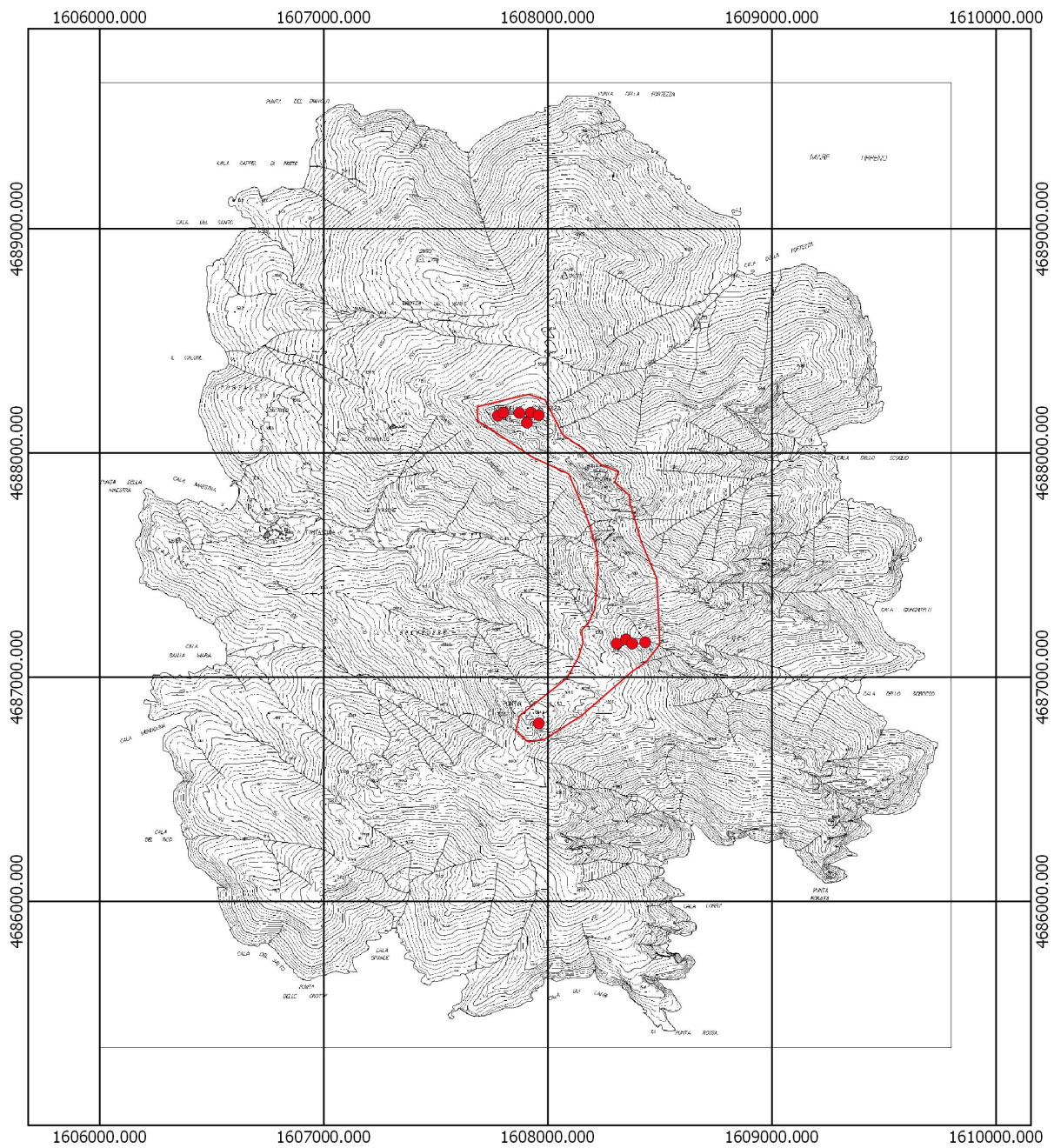


FIGURE 3. Distribution of *Hieracium racemosum* subsp. *amideii* in the Montecristo island.

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