

TAXONOMIC AND NOMENCLATURAL NOTES ON *HIERACIUM* SECT. *CERNUA* (ASTERACEAE) IN THE ALPS

ZBIGNIEW SZELAĞ

Abstract: According to the literature, *Hieracium* sect. *Cernua* R. Uechtr. is represented in the Alps by *H. grisebachii* A. Kern., *H. sparsum* subsp. *vierhapperi* Zahn, and *H. sparsum* subsp. *paulii* Szelağ. The east Alpine *H. sparsum* subsp. *vierhapperi* is a tetraploid ($2n = 36$; first count) apomictic taxon which, following the customary ranking of apomictic *Hieracia*, is here raised to species rank as *H. vierhapperi*, of which *H. sparsum* subsp. *paulii* is a synonym. A lectotype is designated for the name *H. grisebachii*.

Key words: Asteraceae, *Hieracium* sect. *Cernua*, breeding system, chromosome numbers, typification, taxonomy, Eastern Alps

Zbigniew Szelağ, Institute of Botany, Polish Academy of Sciences, Lubicz 46, PL-31-512 Kraków, Poland; e-mail: azszelağ@wp.pl

INTRODUCTION

According to the literature, *Hieracium* sect. *Cernua* R. Uechtr. as redefined by Szelağ (2003) is represented in the Alps by three taxa: *H. grisebachii* A. Kern., *H. sparsum* subsp. *vierhapperi* Zahn and *H. sparsum* subsp. *paulii* Szelağ. Their relict stations, all situated in the Eastern Alps, are widely separated from the core portion of the European range of the section, in the central part of the Balkan Peninsula and the Southern Carpathians (Bräutigam 1992).

Hieracium grisebachii was described from the Oetz valley in Tyrol, Austria (Kerner 1881). F. Tappeiner collected it in the same locality in 1844 and named it *H. hausmanii* in sched. (cf. Dalla Torre & Sarnthein 1912). The Oetz valley is the only place in the Alps from which herbarium specimens of *H. grisebachii* are known. Zahn (1938) mentions some localities of *H. grisebachii* in the Rhodope Mts in Bulgaria. I saw specimens collected by I. Urumov near Čepalare in the Rhodope Mts (SOM), determined as *H. grisebachii* by Zahn (1938: 648), but they differ morphologically from the Alpine plants, and in my opinion represent a separate taxon. *H. grisebachii* from the *locus classicus* is triploid ($2n = 27$) (Schuhwerk

& Lippert 1999). The chromosome number of the Bulgarian plants is unknown.

Hieracium sparsum subsp. *vierhapperi* was discovered by F. Vierhapper on Kareck Mt. near Schellgaden on the border of Kärnten and Salzburg in Austria (Vierhapper 1926). In August 2003, together with G. Brandstätter and my son Piotr, I visited two of its localities in the Kareck massif. The first, with several hundred individuals, on the east slope of Tschaneck Mt., had been discovered by G. Gottschlich (unpubl.) in 1998. The second, Saraberger Wiesen, has less than a hundred individuals; it is located southeast of Mt. Kareck and was found by G. Brandstätter (unpubl.) in 1992.

Hieracium sparsum Friv. subsp. *paulii* Szelağ was described by Szelağ (2000) from the Val Senales in South Tyrol, Italy, based on specimens collected more than a century before by J. Paul. Attempts by G. Gottschlich in 2000 and by G. Brandstätter in 2002 to rediscover the taxon were unsuccessful. Val Senales is a vast area, Paul's label lacks detailed locality data, and the habitat may have changed due to prolonged, intensive husbandry (G. Brandstätter, pers. comm.).

New stands of *Hieracium* sect. *Cernua*, particularly *H. vierhapperi*, are likely to be discovered in South Tyrol. *Hieracium vierhapperi* has a relatively wide range, with a locality in Streniger Alm (Gottschlich 1994) only about 2 km from the Italian border.

TAXONOMIC CONCEPT

Zahn (1921–1923) adopted a broad species concept in *Hieracium* for both his so-called principal and intermediate species, with numerous infraspecific taxa. According to Zahn, the single principal species in *H.* sect. *Cernua* is *H. sparsum* Friv., under which he placed as subspecies all previously described species (e.g., *H. grisebachii*) as well as his own new taxa.

In *Hieracium* sect. *Cernua*, *H. sparsum* s.str. is the only known diploid (Vladimirov & Szelağ 2001). All other taxa of the section studied to date are apomictic polyploids (Chrtek jun. 1996; Schuhwerk & Lippert 1998, 1999; Vladimirov & Szelağ 2001; Mráz & Szelağ 2004).

The discovery of apomixis in polyploid taxa of *Hieracium* lead to the abandonment of Zahn's concept of a collective species with many infraspecific taxa, in favor of species groups comprising taxa at species rank (cf. Sell & West 1976; Sell *et al.* 1995; Chrtek jun. 1997; Chrtek jun. & Marhold 1998; Mráz 2003). I therefore consider that species rank is appropriate for the apomictic taxa of *Hieracium* sect. *Cernua*.

MATERIAL AND METHODS

Vierhapper's original collection of *Hieracium sparsum* subsp. *vierhapperi* (WU) was studied, as well as G. Brandstätter's and my own herbarium material from Tschaneck Mt. and Saraberger Wiesen in the Kareck massif, which are 2 km apart and close to the *locus classicus*. I also collected seeds and live specimens.

Herbarium specimens, live individuals and seeds of *H. grisebachii* were collected near Poschach in the Oetz valley by G. Brandstätter. Sheets of the original material of *H. grisebachii* from several herbaria (BP, BRNM, CL, KRAM, LI, PR, PRC, W, WRSL, WU) were also examined.

The mode of reproduction in *H. grisebachii* and

H. sparsum subsp. *vierhapperi* was determined by emasculature experiments in three garden-cultivated plants of each. Castration was done by cutting off the whole upper half of the capitula together with the styles (two flower heads per plant). When flower heads produced normal seeds after emasculation, the plants were recognized as apomictic.

The chromosome counts in *H. sparsum* subsp. *vierhapperi* were made by P. Mráz on six juvenile plants obtained from seeds. Root tip cuttings were pretreated with a 0.5% solution of colchicine for 1.5–3 h at room temperature. Subsequently, fixative (absolute ethanol and glacial acetic acid, 3:1) replaced colchicine. Roots were stored in 70% ethanol and hydrolyzed for 10 min in 1N HCl at 60°C. The squash and smear method with cellophane replacing the glass covers followed Murín (1960). Giemsa solution in phosphate buffer was used as stain.

Pollen grains were examined with a light microscope.

RESULTS

It was found that *Hieracium sparsum* subsp. *vierhapperi* is tetraploid ($2n = 36$). In *H.* sect. *Cernua*, in which triploids predominate (Schuhwerk & Lippert 1998, 1999; Vladimirov & Szelağ 2001; Mráz & Szelağ 2004), it is the second tetraploid after *H. silesiacum* E. Krause (Chrtek jun. 1996; Chrtek jun. *et al.* 2004).

Castration of six flower heads from each taxon showed that *H. sparsum* subsp. *vierhapperi* and *H. grisebachii* reproduce apomictically.

All analyzed individuals of *Hieracium sparsum* subsp. *vierhapperi* produced pollen. Pollen production in tetraploid apomictic species has been observed so far in *H.* sect. *Alpina* from the Western Carpathians (Štorchová *et al.* 2002). In triploid *H. grisebachii* no pollen production was observed.

Based on these results, I propose to raise *H. sparsum* subsp. *vierhapperi* to species rank, as follows:

***Hieracium vierhapperi* (Zahn) Szelağ, stat. nov.**

BASIONYM: *Hieracium sparsum* subsp. *vierhapperi* Zahn, Verh. Zool.-Bot. Ges. Wien **74/75**: 42. 1926.

HOLOTYPE: Pöllakette, Zwergstrauchheiden auf der Schulter des Kaareck bei Schellgaden, ca. 1950 m, 7. Sep. 1924, *F. Vierhapper s.n.*, WU (Fig. 1).

= *H. sparsum* subsp. *paulii* Szelag, Feddes Repert. **111**: 251. 2000, *syn. nov.* (HOLOTYPE: *J. Paul 3551*, PR).

DISTRIBUTION. Austria: (1) Hafnergruppe, Mt. Kareck near Schellgaden, MTB 8947/1 (Vierhapper 1926); (2) Gurktaler Alpen, Reichenau, Stangalpe, MTB 9048/4 (Zahn 1938); (3) Karnische Alpen, Stranig, Streniger Alm, MTB 9444/2 (Gottschlich 1994); (4) Italy, Alpi Venoste, Val Senáles, Madonna di Senáles [Unserfrau in Schnals], MTB 9231/3 (Szelag 2000).

NOTES. In the protologue, Vierhapper (1926: 42) quoted the short diagnosis written in Zahn's hand on the herbarium sheet in 1924 (Fig. 1). That sheet is evidently the holotype of *H. sparsum* subsp. *vierhapperi*. As Vierhapper ascribed both the name and the validating diagnosis to Zahn, the authorship of the name is 'Zahn' alone under Art. 46.2 of the *Code* (Greuter *et al.* 2000).

Later, Zahn (1938: 655) altered the description of the taxon, most significantly of the involucre: 'Hülle [...] spärlich bis mässig (kurz) schwarzhaarig und -drüsig, höchstens am Grund schwach flockig.'

The involucral indumentum, and in particular the density of stellate hairs, are variable in *H. vierhapperi*. In the population from the Kareck massif, plants with stellate hairs, mainly along the margins and/or on the base of the outer phyllaries, occur together with single plants lacking such hairs.

In the holotype specimens of *H. vierhapperi* (Fig. 1), the involucre is covered with simple and glandular trichomes plus scattered stellate hairs. For describing *H. sparsum* subsp. *paulii* I had at my disposal three herbarium specimens without stellate hairs on the involucre (cf. Szelaġ 2000); I considered this feature characteristic of *H. sparsum* subsp. *paulii* as opposed to *H. vierhapperi*.

Having examined numerous herbarium specimens of *H. vierhapperi* and having observed live individuals both in the wild and in culture, I regard the features '*involucris magnis, eflocosis et epilosis vel minus pilosis*', reportedly differentiating *H. sparsum* subsp. *paulii* from *H. vierhapperi*, as falling within the variability

range of *H. vierhapperi*. Therefore I propose to reduce *H. sparsum* subsp. *paulii* to synonym status under *H. vierhapperi*.

Hieracium grisebachii A. Kern.

Sched. Fl. Exs. Austro-Hung. **1**: 63. 1881.

INDICATIO LOCOTYPICA: 'Tirolia centralis. In declivitatibus lapidosis et graminosis montium inter Pillberg, Gurgl et Fent in valle fluvii Oetz, solo schistose, 1800–2000 mt.'

LECTOTYPE (selected here): Fl. Exs. Austro-Hung. no. 202 (WU-Kerner). – ISOLECTOTYPES: (other specimens seen) BP, BRNM, CL, KRAM, LI, PR, PRC, W, WRSL, WU.

DISTRIBUTION: Austria, Tirol, Oetz valley, MTB 9132/1 (Kerner 1881).

NOTES. In the protologue, Kerner (1881) does not state the date of collection of the distributed material, nor the name(s) of the collector(s) who gathered it on his behalf. He adds, instead, that the locality of *H. grisebachii* between Pillberg and Gurgl had been discovered by him much earlier, on 18 August 1861, and repeatedly visited since. I have not seen these specimens in Kerner's own herbarium (kept separately at WU), which also belong to the original material.

The plants originating from the 'Ostseite des Stangsattels' were determined, some as *H. vierhapperi* and others as *H. grisebachii* (cf. Zahn 1938). It is unlikely that the two species grow there together (cf. Gottschlich 1994). In the protologue of *H. vierhapperi*, only a few characteristics were given as differentiating it from *H. grisebachii*: '*involucris modice nigropilosis et nigroglandulosis, pedicellis sparsim pilosis, subeglandulosis*.' The involucre in *H. vierhapperi* is covered by simple eglandular and glandular trichomes as well as relatively stellate hairs (see above). *H. grisebachii* differs by having a glabrous involucre. The peduncles in *H. grisebachii* are sparsely covered with stellate hairs, whereas those of *H. vierhapperi* are densely pubescent with stellate hairs and scattered glandular hairs; eglandular trichomes are mostly lacking. All these features remain stable in plants cultivated in the garden.



Fig. 1. Holotype of *Hieracium vierhapperi* (Zahn) Szelag.

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