Polish Botanical Journal 51(2): 97–153, 2006

TAXONOMIC REVISION OF *HIERACIUM* SECT. *CERNUA* (ASTERACEAE) IN THE CARPATHIANS, SUDETES AND ALPS

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Abstract. *Hieracium* sect. *Cernua* R. Uechtr. comprises *ca* 40 taxa at the species level and *ca* 30 at the subspecies level. Most taxa occur in the Balkan Peninsula and the Southern Carpathians. This paper presents a taxonomic revision of the Carpathian, Sudetic and Alpine representatives of the section. The current 22 species, 7 subspecies and 13 varieties and forms are reduced to 16 species. A new species, *H. mirekii* Szeląg, is described from the Southern Carpathians, and two other taxa are raised to species rank, as *H. mitkae* Szeląg and *H. polyphyllobasis* (Nyár. & Zahn) Szeląg, giving a total of 19 species recognized in the study area. The taxonomic position of *H. zanogae* Pax remains unexplained. Seventeen names are typified. Ten names are considered as not validly published and 4 names as illegitimate. Altogether 52 names exist for the 19 species recognized in this paper. *Hieracium abietogenum* Szeląg, *H. borbasii* var. *ramiciferum* Nyár., *H. fagarasense* (Nyár. & Zahn) Nyár., *H. perfoliosum* Szeląg and *H. pisaturense* Nyár. are excluded from *H.* sect. *Cernua*. The treatment includes a key for determination, descriptions and illustrations, and distribution maps of the 18 species. Most species are narrow endemics restricted to certain geographic areas. Biogeographical relationships within the section are discussed: (1) the occurrence of *H.* sect. *Cernua* in the South-eastern Carpathians and Apuseni Mountains as well as in the Eastern Alps is presumably a relict originating from a diploid, sexual species with a wider primary range, (2) none of the South-eastern Carpathian species are known to also occur in the Western Carpathians, (3) *H. silesiacum* E. Krause is a common species in the Western Carpathians and the Eastern Sudetes, whereas *H. vierhapperi* (Zahn) Szeląg is a common species for the Alps and the Western Carpathians, (4) the significance of the 'Waldkarpaten' (Forest Carpathians) range is highlighted as a potential ecological barrier limiting migration of subalpine plant species between the South-eastern and the Western Carpathians, (5) the representatives of *H.* sect. *Cernua* were able to reach the Western Carpathians and the Sudetes via the Eastern Alps, and thus circumventing the South-eastern Carpathian path, regarded as the main migration route of the mountain flora from the Balkan Peninsula.

Key words: Asteraceae, distribution, endemics, *Hieracium* sect. *Cernua*, illustrations, migration routes, new species, nomenclature, synonymy, taxonomy, typification

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INTRODUCTION

Hieracium sect. *Cernua* R. Uechtr. was established by Uechtritz (1875) and comprises *ca* 40 taxa at the species level and *ca* 30 at the subspecies level (Szeląg 2003a). Morphologically the section constitutes a fairly uniform complex of mountain, mainly subalpine, silicophilous taxa occurring in South-eastern Europe and Western Asia (the Caucasian region including NE Anatolia). In Europe, two distribution and diversity centres are easily recognisable: the central part of the Balkan Peninsula and the Southern Carpathians. The other isolated, relict localities are situated in the Eastern Alps, Eastern Sudetes, Western Carpathians and Eastern Carpathians. Distribution maps of *H.* sect. *Cernua* were presented by Zahn (1921−1923, as *H.* sect. '*Hololeia*') and by Bräutigam (1992, as '*H. silesiacum*').

The aim of this study is taxonomic revision of *H.* sect. *Cernua* in the Carpathians, as well as in the Alps and Sudetes, to reveal the close floristic links with the Western Carpathians as shown by the presence of common species of the section. According to the literature, *H.* sect. *Cernua* is represented in the Alps by *H. grisebachii* A. Kern. and *H. vierhapperi* (Zahn) Szeląg (Kerner 1881; Vierhapper 1926; Zahn 1938; Gottschlich 1994; Szeląg 2004a), in the Sudetes by *H. silesiacum* E. Krause (Krause 1851; Zahn 1938; Skřivanek 1956; Szeląg 2004b), and in the Western Carpathians by *H. silesiacum* and *H. vierhapperi* (Sagorski & Schneider 1891;

Lengyel & Zahn 1932; Zahn 1938; Pawłowska & Pawłowski 1970; Chrtek jun. *et al*. 2002; Mráz 2005; Szeląg 2004b, 2006a). Most taxa are known from the Romanian Carpathians, especially from the Retezat Mountains in the Southern Carpathians (Zahn 1938, Nyárády 1965, Szeląg 2003b, 2006c). This study has resulted in the recognition of 17 species which occur in, or were reported from, the Romanian Carpathians.

Taxonomic history

Hieracium silesiacum, described from the Hrubý Jeseník Mountains in the Eastern Sudetes (Krause 1851), was one of the first species recognized in *H.* sect. *Cernua*. Only two Balkan species, *H. sparsum* Friv. and *H. cernuum* Friv., were described earlier (Frivaldszky 1836, 1840). The Carpathian species followed later: *H. kotschyanum* Heuff. from the Retezat Mountains (Heuffel 1853) and *H. porphyriticum* A. Kern. from the Bihor Mountains (Kerner 1863). In the Alps, the first species of the section described was *H. grisebachii* from the Oetz valley (Kerner 1881). At the beginning of the 20th century, several more species were described from the Retezat Mountains by Borbás (1904), Pax (1908) and Jávorka (1924−1925), and *H. sparsum* subsp. *vierhapperi* Zahn was described from the Alps (Vierhapper 1926).

The most intensive period of research on *H.* sect. *Cernua* in the Carpathians was in the 1920s and 1930s thanks to the extensive work of E. I. Nyárády. Based on his collections, more than 20 new taxa were described (Nyárády 1929; Zahn 1929, 1934, 1938). During the same period, *H. paltinae* subsp. *alexandri-borzae* Pawł. (Pawłowski 1939) and *H. telekianum* Boros & Lengyel (Boros & Lengyel 1942) were also described.

The most recent study on *H.* sect. *Cernua* in the Carpathians was during preparation of an account of *Hieracium* for the *Flora Republicii Populare Romîne* (Nyárády 1965). Nyárády described several new taxa, based on his specimens collected in the 1920s. However, some of these taxa have been recently considered as conspecific with taxa described earlier (Szeląg 2004c, 2006c), and others are reduced to synonymy in the present paper.

Taxonomic concept

Originally, the new taxa of *Hieracium* sect. *Cernua* were described as species (Krause 1851; Heuffel 1853; Kerner 1863, 1881; Borbás 1904; Pax 1908; Jávorka 1924–1925). In the first half of the 20th century in Central Europe, a concept based on a system of so-called collective species in *Hieracium* was proposed by Nägeli and Peter (1885) and developed by Zahn (1921–1923, 1938). According to this concept, *H.* sect. *Cernua* in the Carpathians, Sudetes and Alps is represented by *H. sparsum s.l*., which in turn encompasses many infraspecific taxa.

The discovery of apomixis in polyploid taxa of *Hieracium* resulted in Zahn's concept of the collective species, with many infraspecific taxa being abandoned in favour of species groups comprising taxa at species rank (cf. Sell & West 1975, 1976; Sell *et al*. 1995; Chrtek jun. 1997; Chrtek jun. & Marhold 1998; Mráz 2003a). I agree that species rank is appropriate for the apomictic taxa of *H.* sect. *Cernua*.

Material and methods

Herbarium specimens in BP, BRNM, CL, KRA, KRAM, LI, PR, PRA, PRC, SOM, W, WU, WRSL and my herbarium have been studied. A list of specimens examined can be found in the taxonomic account below.

During the field work I have also had the opportunity to visit the *loci classici* of all the discussed taxa and studying living plants in the wild, as well as studying the cultivated plants in my garden. Culture observations were indispensable for assessment of the taxonomic ranks of the infraspecific taxa, especially when most of them were described on the basis of quantitative characteristics, such as density of the indumentum of involucres and peduncles, number and size of leaves, and even height of stem (cf. Zahn 1921−1923, 1929; Nyárády 1929). Differentiation of these traits is visible in natural circumstances, but after transplanting to a garden all these differences disappear and thus do not provide a reliable basis for distinguishing taxa.

The mode of reproduction was determined by emasculation experiments. Castration was carried out by cutting off the whole upper half of the capitula together with the styles in the garden-cultivated plants. When flower heads produce normal seeds after emasculation

the plants are recognized as apomictic. Pollen grains were examined with a light microscope.

Digital images of the herbarium specimens of all the names typified in the present paper are available upon request.

TAXONOMIC TREATMENT

Hieracium sect. ***Cernua*** R. Uechtr.

Österr. Bot. Z. **25**: 215. 1875 − TYPE: *H. cernuum* Friv.

= *Hieracium* sect. *Sparsiflora* Gus. Schneid., Deutsch. Bot. Monatsschr. **6**: 122. 1888 − TYPE: *H. sparsiflorum* Fr., *nom. illeg*. (= *H. sparsum* Friv.).

= *Hieracium* sect. *Pseudostenotheca* (Fr.) Juxip in Fl. USSR **30**: 13. 1960 − *Hieracium* [unranked] *Pseudostenotheca* Fr., Epicr. Gen. Hierac.: 7, 138. 1862 − LECTOTYPE (Stace 1998: 438): *H. sparsiflorum* Fr., *nom. illeg*. (= *H. sparsum* Friv.).

= *Hieracium* [unranked] *Oligantha* '*Oliganthae*' A. Kern., Sched. Fl. Exs. Austro-Hung.: 64. 1881 − LECTOTYPE (Szeląg 2003a: 90): *H. grisebachii* A. Kern.

NOTE. *Hieracium* sect. *Hololeia* Zahn (Zahn 1902) and *H*. sect. *Hololeion* Zahn (Zahn 1907) are not included in the synonymy of *H*. sect. *Cernua*, because both names are based on *Hieracium hololeion* Maxim. which is recognized as the separate genus *Hololeion* Kitam. or, recently, as *Crepis hololeion* (Maxim.) Sennik. (Sennikov & Illarionova 2001).

CHARACTERISTIC FEATURES. Capitula containing (12–)25–35 florets, nodding (or almost so) or erect in bud; involucre consisting of few, imbricate involucral bracts arranged in two rows (exceptionally by *H. kotschyanum* in three rows), up to 2.0(–2.5) mm wide at base, obtuse or rarely subacute at apex, usually glabrous or with sparse indumentum, rarely covered by subdense simple and glandular hairs, and mostly without stellate hairs; leaves glaucous, mostly somewhat coriaceous, with protruding midrib; cauline leaves sessile or sometimes semi-amplexicaul; pappus straw-grey; styles mostly dark.

Compared to individuals growing in natural sites, cultivated plants are characterized by larger size, more numerous leaves and more numerous capitula in the synflorescence. The involucre also changes to a much lighter colour in cultivated specimens. The size of capitula, style colour and the number, size and colour of seeds, however, remain stable in cultivation. The ratio of eglandular to glandular hairs in the involucre indumentum generally remains unchanged too, though its overall density may vary in a limited range from one year to another.

Most of the *Hieracium* sect. *Cernua* taxa in the study area are probably of hybrid origin and, apart for *H. grisebachii* and *H. magocsyanum* Ják., are morphologically different from *H. sparsum* or *H. cernuum*, so their affiliation with the section may raise doubts. The sectional placement of the intersectional hybrids is a general problem. For example: *H. pietroszense* agg. and *H. rohacsense* agg. (morphologically intermediate between *H. alpinum* L. and *H. bifidum* Hornem.), as well as *H. fritzei* agg. (morphologically intermediate between *H. alpinum* L. and *H. prenanthoides* Vill.) are included in *H*. sect. *Alpina* (Griseb.) Gremli (cf. Chrtek & Marhold 1998; Stace 1998; Mráz 2002, 2003a).

KARYOLOGY AND MODE OF REPRODUCTION. In the Southern and Eastern Carpathians, triploid taxa predominate (Mráz & Szeląg 2004, Szeląg 2006c), and one tetraploid has been found in the Retezat Mountains (Mráz 2006). In the Western Carpathians and the Eastern Sudetes only tetraploids were found (Chrtek jun. 1996; Chrtek jun. *et al*. 2004; Mráz 2005, Szeląg 2006a). In the Alps, *H. grisebachii* is a triploid (Schuhwerk & Lippert 1999), whereas *H. vierhapperi*, as in the West Carpathians, is tetraploid (Szeląg 2004a). Apomixis has been experimentally found in all polyploid species.

The diploid, sexual species in *H*. sect. *Cernua* is *H. sparsum* (Vladimirov & Szeląg 2001), which occurs in the Balkan Peninsula. The species has been also reported from Mt. Treskovać in Banat by Zahn (1921–1923). In 2002 I visited Mt. Treskovać, but I was unable to find *H. sparsum* although it could occur there. Mt. Treskovać is a site of several Balkan *Hieracia,* with their sole Carpathian stations there. Among them, there is

the endemic *H. jankae* R. Uechtr., most probably a hybrid between *H. sparsum* and Balkan *H. pannosum* Boiss. (cf. Uechtritz 1873; Zahn 1938).

HABITATS. The species of *H.* sect. *Cernua* in the Carpathians, Sudetes and Alps are silicophilous and mostly subalpine, and grow in the grasslands in *Pinus mugo* communities, and in communities of the alliances *Calamagrostion villosae* and *Genistion*, rarely also in openings in mountain forests of the alliance *Piceion abietis*, on granite, quartzite, gneiss or andesite, at of 1250–2300 m a.s.l., with the exception of *H. coldei* and *H. telekianum*, which grow in the beech-forest belt at of 750–1000 m a.s.l. in crevices of andesite rocks, and *H. kotschyanum* which was also observed at of 600 m a.s.l. in the mountain valley. All stations of the taxa of the section known to me in the Carpathians, Sudetes and Alps, as well as on the Balkan Peninsula, were observed mostly on south-west- to south-east-facing slopes, and in the orographically and microclimatically 'safe sides', which suggests the higher thermal demands of these species and the relict character of their habitats.

KEY TO SPECIES

1. Cauline leaves purple-spotted ..... *H. telekianum*
1*. Cauline leaves unspotted 2
2. Florets tubular; involucres ± cylindrical ..... *H. tubulare*
2*. Florets ligulate or semi-tubular (i.e. joined at apex); involucres campanulate or subglobose 3
3. Florets semi-tubular ..... *H. coldei*
3*. Florets ligulate 4
4. Involucres glabrous 5
4*. Involucres with indumentum 6
5. Cauline leaves grass green, 4–8(–10); the middle ones usually glabrous on the margins; involucres grey-green; bracteoles 3–5 (Alps) ..... *H. grisebachii*
5*. Cauline leaves deep green, 8–15; the middle ones usually with sparse, simple hairs on the margins; involucres blackish to black; bracteoles 8–10 (S. Carpathians) ..... *H. magocsyanum*
6. Involucres campanulate, with scattered simple hairs 7
6*. Involucres subglobose, with moderately dense to dense, simple hairs 14
7. Cauline leaves (5–)8–15; at least the upper ones semi-amplexicaul and broadest at the base 8
7*. Cauline leaves 3–7, sessile, attenuate at the base 11
8. Peduncles with sparse stellate hairs; involucral bracts 1.3–1.5 mm wide at the base ..... *H. nigrilacus*
8*. Peduncles with numerous to dense stellate hairs; involucral bracts 1.5–2 mm wide at the base ... 9
9. Involucres 12–13 mm long; involucral bracts in three rows ..... *H. kotschyanum*
9*. Involucres 9–12 mm long; involucral bracts in two rows 10
10. Involucres 10–12 mm long; peduncles (mostly not shorter than involucres) with scattered to numerous, 0.2–0.4 mm long, dark glandular hairs (S. Carpathians) ..... *H. borbasii*
10*. Involucres 9–10 mm long; peduncles (mostly shorter than involucres) with few, 0.2 mm long, yellowish glandular hairs and scattered micro-glands (Alps and W. Carpathians) ..... *H. vierhapperi*
11. Peduncles blackish, shiny, without stellate hairs ..... *H. silesiacum*
11*. Peduncles green, with scattered to moderately dense stellate hairs 12
12. Involucres campanulate; involucral bracts 1.5–2 mm wide at the base, obtuse at apex; basal leaves oblanceolate ..... *H. porphyriticum*
12*. Involucres narrowly campanulate; involucral bracts 1–1.2 mm wide at the base, (sub)acute at apex; basal leaves lanceolate to narrowly elliptic 13
13. Basal leaves on both surfaces glabrous, lanceolate to elliptic, denticulate to remotely dentate; achenes black ..... *H. ostii-bucurae*
13*. Basal leaves on the upper surface hairy, narrowly elliptic to lanceolate, finely denticulate or ± entire; achenes brown ..... *H. lubricicaule*
14. Involucres 9 mm long, with pale, 1–2 mm long simple hairs; styles yellow ..... *H. mirekii*
14*. Involucres 10–13 mm long, with dark, (2–)3–5 mm long, simple hairs; styles dark 15
15. Cauline leaves entire 16
15*. Cauline leaves denticulate to dentate 17
16. Involucres with (2–)3 mm long simple hairs; cauline leaves 1–2 cm long, rapidly reduced in size upwards; synflorescence branches 1–4 cm long, with 1–2 capitula; acladium up to 1 cm long ..... *H. tomiasae*

16*. Involucres with 4–5 mm long simple hairs; cauline leaves longer, gradually reduced in size upwards; synflorescence branches up to 10 cm long; acladium 1.5–3 cm long . . . . . *H. pawlowskianum*

17. Cauline leaves 2–3; synflorescence with 3–10 capitula . . . . . *H. polyphyllobasis*

17*. Cauline leaves 4–6; synflorescence with 20–30 capitula . . . . . *H. mitkae*

List of species

Hieracium borbasii R. Uechtr. (Figs 1–4)

H. borbasii R. Uechtr., Magyar Bot. Lapok **3**: 48. 1904 − *H. borbasii* R. Uechtr., Österr. Bot. Z. **25**: 215. 1875, *nom. nud.* − *H. sparsum* subsp. *borbasii* (R. Uechtr.) Zahn, Magyar Bot. Lapok **32**: 32. 1933 − Holotype: Transylvan. com. Hunyad; Szuszeny, vall. Valeriaska sub alpe Retyezat 4600 ped. 20. Aug. 1874, *V. Borbás s.n.* (ex herb. R. Uechtritz, WRSL) – Isotype: ex herb. Pax (BP 191324).

= *H. pseudokotschyanum* (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 517. 1965, *syn. nov.* − *H. sparsum* [var.] *pseudokotschyanum* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929 − Indicatio locotypica: ‘In valle Zlătuia, 1400−1600 m’ − Lectotype (designated here): Transsilvania, distr. Hunedora. In valle Zlătuia montibus Retezat, alt. ca. 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156236) − Isolectotypes: CL 156230, 156231, 156235 − Syntypes: Transsilvania, mtes Retezatenzes. In valle Zlătuia, alt. ca. 1200−1500 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156233, 156234) − Iconography: Fl. Rep. Pop. Romîne **10**: 524, Tab. 100, figs 2, 2a. 1965.

= *H. sparsiflorum* subsp. *sparsicrinum* Deg. & Zahn, Magyar Bot. Lapok **5**: 79. 1906 − *H. sparsum* subsp. *sparsicrinum* (Deg. & Zahn) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1022. 1922 (Synonymized by Zahn 1938: 652) − Indicatio locotypica: ‘Com. Hunyad Hungariae: Retyezát, in m. Vurfu Pelaga 2000−2300 m, 19. Aug. 1903 leg. A. de Degen’ − Lectotype (designated here): Flora Hungarica. Comit. Hunyad. Retyezát, Vurfu Pelaga, alt. c. 2000−2300 m, 19. Aug. 1903, *A. de Degen* (WRSL) − Isolectotype: BP 191303.

= *H. sparsum* f. *subdentatum* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929 − Holotype: Retezat: Zlătuia 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156272).

= *H. sublubricicaule* (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 517. 1965, *syn. nov.* − *H. sparsum* [var.] *sublubricicaule* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929 − Indicatio locotypica: ‘Inter Gura Zlata et lacum Zănoaga, 1500−1700 m’ − Lectotype (designated here): Transsilvania, mtes Retezatenzes. In valle Zlătuia, alt. ca. 1200−1500 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156271).

− *H. pseudokotschyanum* f. *longidentatum* Nyár., Fl. Rep. Pop. Romîne **10**: 531. 1965, *nom. inval.* (Art. 37.1 of the Code).

− *H. sparsum* [var.] *subtomiasae* Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 652. 1938, *nom. inval.* (Art. 36.1. of the Code).

− *H. sparsum* [var.] *floccicaule* Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 651. 1938, *nom. inval.* (Art. 36.1. of the Code).

= *H. sparsum* [var.] *megalothyrsum* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929, *syn. nov.* − Indicatio locotypica: ‘In valle Zlătuia, 1550 m’ − Original material: not traced.

= *H. sparsum* [var.] *kotschyaniforme* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929 − Indicatio locotypica: ‘In cac. Vrf. Rătezat, 1800−1900 m’ − Original material: not traced.

= *H. sparsum* [var.] *nomophiloides* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929, *syn. nov.* − Indicatio locotypica: ‘In Valle Zlătuia infra Vrf. Rătezat, 1500−1600 m’ − Lectotype (designated here): Mtes Retezatenzes in valle Zlătuia, alt. ca. 1500 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156282) − Isolectotypes: CL 156274, 156275, 156276, 156283.

= *H. evolutum* (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 518. 1965, *syn. nov.* − *H. sparsum* [var.] *evolutum* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 68. 1929 − Indicatio locotypica: ‘In valle Zlătuia, 1400−1600 m; in. cac. Vrf. Rătezat, 1800−1900 m’ − Lectotype (designated here): Transsilvania, montes Retezatenzes in decliv. gram. vallis Zlătuia, alt. ca. 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156253) − Isolectotype: CL 156287.

= *H. pseudotubulare* (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 514. 1965, *syn. nov.* − *H. sparsum* [var.] *pseudotubulare* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 69. 1929 − Indicatio locotypica: ‘In valle Zlătuia infra Vrfu Rătezat, 1600 m’ − Lectotype (designated here): Transsilv. distr. Hunedoara: Mtes Retezatenzes in declivibus graminosis vallis Zlătuia sub cacumine Vrf. Retezat, alt. ca. 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156228).

Fig. 1. Holotype of *Hieracium borbasii* R. Uechtr.

Fig. 2. Representative specimens of *Hieracium borbasii* R. Uechtr. (Retezat Mts, Saua Ciurila pass, 1800 m a.s.l., 6 Aug. 2005, *Z. Szeląg*).

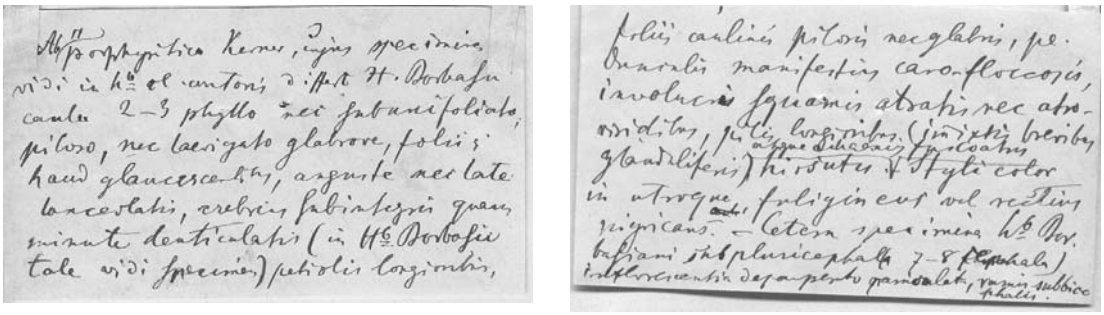

Fig. 3. Uechtritz's hand-written label on the holotype sheet of *Hieracium borbasii* R. Uechtr.: face (left) and reverse (right).

NOTES. The author of *Hieracium borbasii* is R. Uechtritz, because the name is unequivocally credited to him in the protologue: 'Uechtr. in lit. 1875' (cf. Borbás 1904: 49) (W. Greuter, pers. comm.). The protologue of *H. borbasii* does not contain any information about the place, date and collector of the specimens. However, there is no doubt that the protologue refers to specimens collected by Vince de Borbás in the Retezat Mountains in 1874 and sent for consultation to Rudolf von Uechtritz. The specimen deposited in WRSL (ex herb. R. Uechtritz) is the holotype of the name *H. borbasii*. It has a diagnosis and abundant commentary on the relationship to other species of *H*. sect. *Cernua,* written in Uechtritz's own hand. The diagnosis of *H. borbasii* included in the protologue is a repetition of that attached to the holotype by Uechtritz (Fig. 3). The isotype of *H. borbasii* is housed in BP, where it is stored with the Carpathian herbarium of Ferdynand Pax. The isotype sheet comprises one plant evidently separated from the holotype sheet and labeled by Pax.

Zahn overlooked the publication by Borbás of 1904, and in his first monograph treated *Hieracium borbasii* as a *nomen nudum* (cf. Zahn 1921–1923: 1029). However, in the place of validation of *H. sparsum* subsp. *borbasii* (Zahn in Rechinger 1933: 32), the parenthetical mention of '(Uechtr.)' is acceptable as an indirect reference to the 1904 description (W. Greuter, pers. comm.).

Hieracium pseudokotschyanum was described on the basis of specimens with more numerous leaves, synflorescence branches and capitula, as well as longer florets.

I saw a specimen collected by H. Laus in the Vitoša Mts in Bulgaria (PRC), determined as *H. sparsiflorum* subsp. *sparsicrinum* by Zahn (1911: 170), but it differed morphologically from the Carpathian plants, and in my opinion represents a separate, hybridogenous taxon between *H. sparsum* and *H. murorum s.l.*

Hieracium sparsum f. *subdentatum* was described on the basis of specimens with wider and shortly denticulate leaves.

Hieracium sublubricicaule was described on the basis of specimens with densely hairy basal leaves. The valley of Zlătuia extends between the Gemenea and Zanoaga lakes (in the upper part) and Gura Zlata village (in the lower part).

Hieracium sparsum [var.] *megalothyrsum* was described on the basis of specimens with smaller basal and cauline leaves. Synonymized by Nyárády (1965: 497) with *H. sparsum* [var.] *nomophiloides* (Nyár. & Zahn) Nyár.

Hieracium sparsum [var.] *kotschyaniforme* was described on the basis of specimens with fewer capitula and smaller cauline leaves. Not considered by Nyárády (1965) in *Flora Republicii Populare Romîne*.

Hieracium sparsum [var.] *nomophiloides* was described on the basis of specimens with smaller capitula and less hairy peduncles. Synonymized by Nyárády (1965: 497) with *H. borbasii* f. *megalothyrsum* (Nyár. & Zahn) Nyár.

Hieracium evolutum was originally described within *H. tubulare*, from which it is distinguished by the denser indumentum of the peduncles and the shorter acladium.

Hieracium pseudotubulare was originally described as a variety of *H. tubulare*, from which it is differs by having ligulate florets.

Hieracium borbasii is very plastic in terms of the number of capitula and branching of the synflorescence, the shape, pubescence and number of leaves, and the density of the indumentum of the capitula. On the basis of these characteristics, Zahn and Nyárády described over a dozen taxa (see above). All of them were collected in the central part of the Retezat Mountains in the Zlatuia valley and on the slopes of Mt. Retezat towering above the Zlatuia valley. A comparative analysis of the original specimens, which were traced for almost all the analyzed taxa, has shown that they are conspecific with *H. borbasii*. As a result, 9 names were reduced to synonymy of *H. borbasii*, including 8 names for the first time. Three names were considered invalid or illegitimate.

Hieracium borbasii var. *ramiciferum* Nyár. (Bull. Acad. Rep. Pop. Romîne ser. biol. **2**: 80, 1950), described from the Apuseni Mountains, is excluded from *H.* sect. *Cernua*. This taxon belongs to *H. hazslinskyi* Pax, quite frequent in these mountains, a representative of *H.* sect. *Italica* (Fr.) R. Uechtr.

DESCRIPTION. Phyllopodous. Stem 30–60 cm high, robust, within synflorescence with numerous stellate hairs, sparse, 2 mm long, dark-based simple hairs mixed with glandular hairs; in the middle part nearly glabrous, or with few simple hairs and microglands, at the base covered by numerous, pale, 3–4 mm long simple hairs and sparse microglands. Basal leaves 4–6, sometimes withered at anthesis, elliptic to lanceolate, acute at apex, broadest in the half and ± romboid, 8–15 cm long and 1–2.5 cm wide, denticulate, tapered to a winged petiole covered by subdense, 3–4 mm long simple hairs, on the upper surface glabrous or almost so, on the margins and upper surface with numerous, 2–3 mm long simple hairs. Cauline leaves 4–8, usually gradually reduced upwards, semi-amplexicaul, denticulate, lanceolate, acute at apex, on the upper surface glabrous, on the margins and along the midrib with sparse, pale, up to 2 mm long simple hairs and sometimes mixed with few stellate hairs. Synflorescence with 10–25(–40), erect capitula. Synflorescence branches 3–5(–7), up to 5(–8) cm long, confined to upper part of stem, with 1–3 capitula. Acladium (terminal branch of the synflorescence) up to 1 cm. Peduncles green, covered by moderately dense stellate hairs, scattered to numerous, 0.2–0.4 mm long, dark glandular hairs and few to numerous, 2–2.5 mm long, dark-based simple hairs. Bracteoles 0–1(–2) lanceolate, dark-green, covered by sparse simple hairs mixed with glandular hairs. Involucres campanulate, ± subglobose at the base, 10–12 mm long, covered by moderately dense indumentum. Involucral bracts in two rows; the outer bracts dark green, 1.5–2 mm wide at the base, subacute at apex, with scattered to numerous, 1–2(–2.5) mm long, dark-based simple hairs and 0.2–0.4 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs *ca* 1:1); the inner bracts with pale margins and less dense indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes dark brown, 3–3.5 mm long. Pollen in anthers absent. Flowering: end of July and August.

MODE OF REPRODUCTION: apomictic.

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 4).

Zahn (1938: 651) mentioned *H. borbasii* also from the Pojana Rusca Mountains: Mt. Padeş. Unfortunately, I have not traced any specimens cited by Zahn and it is uncertain which taxon was collected on this locality.

FURTHER SPECIMENS EXAMINED: Mtes Retezatenzes: Vrf. Retezat 1800−1900 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156232, 156286 planta b); Pişaturile inter lacum Gemenea et Tăul Negru 1900 m, 6. Aug. 1928, *E. I. Nyárády* (CL 158443, 430094, 430124); in valle Zlătuia 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156243); Fata Retezatului 2100 m, 5. Aug. 1928, *E. I. Nyárády* (W 14382; CL 430121); in valle Zlătuia 1500 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156237); sub lacum Zănoaga 1900 m, 8. Aug. 1928, *E. I. Nyárády* (CL 430122, 430123); in valle Zlătuia 1200−1500 m, 27. Jul. 1927, *E. I. Nyárády* (CL 156238, 156239, 156241, 156246); in valle Zlătuia 1400−1600 m, 27. Jul. 1927, *E. I. Nyárády* (CL 156222, 156240, 156265, 430120); in valle Zlătuia 1200−1500 m, 21. Jul. 1927, *E. I. Nyárády*

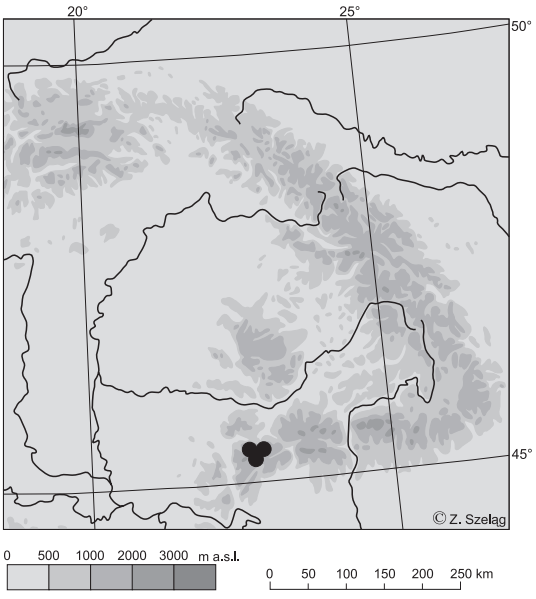

Fig. 4. Distribution of *Hieracium borbasii* R. Uechtr.

(CL 155446); in declivibus graminosis vallis Zlătuia sub Vrf. Retezat 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 155441, 158444, 156254, 156273, 156277, 156279, 156280, 156281; BP 191307 right-hand specimen; W 14454); Comit. Hunyad, inter mughos montis Paltina alp. Retyézat, 11. Aug. 1910, *S. Jávorka* (CL 511281); Comit. Hunyad, Retyezat, in rupestribus infra lacum Bucura in pineto 1600 m, 12. Aug. 1910, *S. Jávorka* (BP 191309 planta a); Retyezat, Felsen unterhalb des Zanogasees, 1900 m, 8. Aug. 1911, *F. Pax* (ex herb. Pax ut *H. paltinae*) (BP 191323); Retezat Mts, Saua Ciurila pass, open grassy places in *Pinus mugo* communities on granite at 1800 m a.s.l., 6 Aug. 2005, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium coldei Szeląg (Figs 5 & 6)

H. coldei Szeląg, Ann. Bot. Fennici **43**: 311. 2006.

HOLOTYPE: Romania, Eastern Carpathians, Hargita Mountains, Mt. Piatra Şoimilor in Băile Tuşnad, crevices of andesite rock, 840 m a.s.l., 26 Jul. 2003, *Z. Szeląg 03/0025* (KRAM) – ICONOGRAPHY: Ann. Bot. Fennici **43**: 311, Fig. 1.; 312, Fig. 2. 2006; Fl. Rep. Pop. Romîne **10**: 515, Tab. 98, figs 2, 2a. 1965 ut *H. tubulare* var. *solyomköense*.

DESCRIPTION. Phyllopodous. Stem 30–50 cm high with numerous to subdense, grey, 4–7 mm long simple hairs which are denser towards the base. Synflorescence branches with sparse simple and stellate hairs, without glandular hairs. Basal leaves 5–8, obovate, entire, rounded at apex, tapered to a winged petiole; the 2–3 outer leaves (withered at anthesis) 3–4 cm long and 1–1.5 cm wide, on both surfaces with dense, 5–6 mm long simple hairs; the inner leaves oblanceolate to narrowly elliptical, subacute at apex, 6–14 cm long and 2–3 cm wide, on the upper surface with scattered, 1.5–2 mm long simple hairs, on the margins and along the midrib with dense, 2–3 mm long simple hairs. Cauline leaves 1–2(–3) sessile to semi-amplexicaul, entire, lanceolate or narrowly lanceolate, acute at apex; the upper cauline leaf (leaves) linear, bract-like. Synflorescence with (3–)5–8(–15) erect capitula. Branches 5–10 cm long. Acladium 1.5–3 cm. Peduncles green, thin, covered by dense 0.1–0.3 mm glandular hairs, numerous to subdense stellate hairs and a few simple hairs. Bracteoles 2–4 linear with scattered stellate, glandular simple hairs. Involucres campanulate, ± subglobose at the base, 10–11 mm long, covered by moderately dense indumentum. Involucral bracts in two rows; the outer ones up to 1.5 mm wide at the base, acute at apex, green with pale margins, lanceolate, with dense, 2.5–3.2 mm long simple hairs and 0.2–0.4 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1) and scattered stellate hairs. Florets yellow, semitubular (joined at apex). Styles laterally exerted, yellowish with dark microtrichomes. Achenes brown, (3.7–)3.9–4.0 mm long. Pollen numerous, spherical and of varying size. Flowering: end of June and July.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004; Szeląg 2006c).

DISTRIBUTION. Eastern Carpathians: Hargitha Mts (Fig. 6).

FURTHER SPECIMENS EXAMINED: Hungaria mer.-or., Comit. Csik, prope Tusnad, in rupibus montis Sólyomkő supra Tusnadfürdő, alt. 800−840 m, 22. Jun. 1943, *L. Vajda* (BP 281179, 281181); Hungaria mer.-or., Comit. Csik, prope Tusnad, in rupibus montis Vártető, alt. 1000 m, 22. Jun. 1943, *L. Vajda* (BP 281180).

Fig. 5. Holotype of *Hieracium coldei* Szeląg.

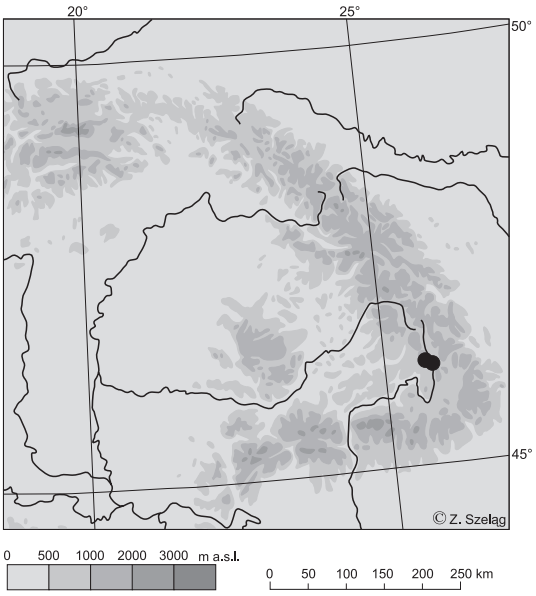

Fig. 6. Distribution of *Hieracium coldei* Szeląg.

Hieracium grisebachii A. Kern. (Figs 7 & 8)

H. grisebachii A. Kern., Sched. Fl. Exs. Austro-Hung. **1**: 63. 1881 − *H. sparsiflorum* subsp. *grisebachii* (A. Kern.) Zahn *in* Koch, Synop. Deut. Schweiz. Fl., ed. 3. **2**: 1930. 1902, *nom. inval.* − *H. sparsum* subsp. *grisebachii* (A. Kern.) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1020. 1922 − LECTOTYPE (Szeląg 2004a: 113): Fl. Exs. Austro-Hung. no. 202 (WU-Kerner) Tirolia centralis. In declivitatibus lapidosis et graminosis montium inter Pillberg, Gurgl et Fent in valle fluvii Oetz, solo schistose, 1800−2000 m − ICONOGRAPHY: Rchb. & Rchb. fil., Icon. Fl. Germ. Helv. **XIX/2**: fig. 304B. 1904−1906; Gustav Hegi, Illustr. Fl. Mitteleur. **VI/4/2**: 1348, fig. 951. 1987.

DESCRIPTION. Apyllopodous. Stem 30–60 cm high, glabrous or only at the base covered by sparse, 1–3 mm long simple hairs. Basal leaves withered at anthesis. Cauline leaves grass green, 4–8(–10), gradually or rapidly reduced upwards, semi-amplexicaul, entire; the lower cauline leaves 6–12 cm long and 1–2 cm wide, broadest in the upper third, lanceolate to elliptic-lanceolate, closely acute or ± rounded at apex, tapered to a winged petiole, on the margins and along the midrib with sparse, pale, 1–2 mm long simple hairs; the middle and upper cauline leaves lanceolate, acute at apex, glabrous. Synflorescence with 3–10(–20), nodding to nearly erect capitula. Synflorescence branches 1–3(–5), short, confined to upper part of stem, with 1–2 capitula. Acladium up to 1 cm long. Peduncles green, mostly shorter than involucres, with very sparse stellate hairs, sometimes with a few microglands. Bracteoles 3–5, linear, blackish-green, with sparse indumentum and a tuft at the apex. Involucres campanulate, 9–10 mm long, glabrous. Involucral bracts in two rows, 2 mm wide at the base, lanceolate, ± obtuse at apex, dark grey, glabrous, the inner bracts with a short tuft at the apex. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, (3.0–)3.3–3.7 mm long. Pollen in anthers absent. Flowering: end of July and August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 (Schuhwerk & Lippert 1999) apomictic (Szeląg 2004a).

DISTRIBUTION. Eastern Alps: Oetz valley (Fig. 8).

NOTE. *Hieracium grisebachii* does not occur in the Rhodope Mountains in Bulgaria as mentioned by Zahn (1921−1923) on the basis of specimens collected by I. Urumov near Čepalare (SOM, W). The plants from the Rhodope Mountains belong to *H. werneri* Szeląg (Szeląg 2006b).

FURTHER SPECIMENS EXAMINED: Fl. Exs. Austro-Hung. no. 202, Tirolia centralis. In declivitatibus lapidosis et graminosis montium inter Pillberg, Gurgl et Fent in valle fluvii Oetz, solo schistose, 1800–2000 mt. (BP, BRNM, PR, PRC, WRSL, KRAM, LI, CL, WU, W); C. H. Zahn, Hieraciotheca Europaea, Tirolia in valle Oetz 2000 m (WU); Tirol, Oetzthal, Zwerchwand, Aug. 1878. *B. Stein* (WU, WRSL); Tirol, Oetzthal, Zwerchwand, 12. Aug. 1877, *B. Stein* (LI 123699, LI s.n., WU); Guegel, 19 Aug. 1919, *J. Vetter* (W 7576); Oetztaler Alpen, bei Poschach, 17 Aug. 1920, *J. Vetter* (W 7577); Oetztal, 16 Aug. 1925, *Plank* (W 15897, 158980); Oetztaler Alpen, W Zwieselstein: Gaislachalm, Pinus-Picea-Waldrand 1900−1950 m, 12. Aug. 1992, *A. Polatschek* (W 1994/1361); Oetztaler Alpen, W Zwieselstein: Gaislach bis Gaislachalm, Pinus cembra-Picea-Waldrand 1850−2050 m, 21. Aug. 1992, *A. Polatschek* (W 1994/1310); Oetztaler Alpen, Gurglar Tal zwischen Poschach und Obergurgl 1850−2000 m, 16. Aug. 1986, *A. Polatschek* (W 1989/3326); Oetztaler Alpen, zwi-

Fig. 7. Representative specimens of *Hieracium grisebachii* A. Kern. (Tirol, Oetztal, Sölden, zwischen Gaislachalm und Gaislach, 1890 m, 25. Aug. 1997, *G. Brandstätter*).

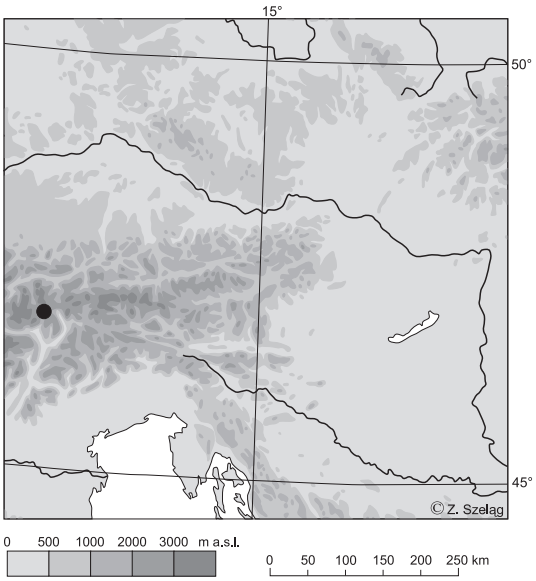

Fig. 8. Distribution of *Hieracium grisebachii* A. Kern.

schen Poschach und Untergurgl 1825 m, 15. Aug. 1941 & 4. Sep. 1946, *W. Freiberg* (BRNM 255209); Tirol, Oetztal, Sölden, zwischen Gaislachalm und Gaislach, Lärchenwald, Zwergstreuchheide, Schiefer, 1890 m, 25. Aug. 1997, *G. Brandstätter 01-4-1* (Herb. G. Brandstätter; Herb. Hierac. Z. Szeląg).

Hieracium kotschyanum Heuff. (Figs 9–11)

H. kotschyanum Heuff., Flora **36**: 618. 1853 − *H. sparsiflorum* subsp. *kotschyanum* (Heuff.) Zahn, Magyar Bot. Lapok **7**: 128. 1908, *nom. inval.* − *H. sparsum* subsp. *kotschyanum* (Heuff.) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1024. 1922 − INDICATIO LOCOTYPICA: 'In lapidosis rupestribusque subalpinis versus alpem Retyezát in Comitatu Hungad Transylvaniae' − LECTOTYPE (designated here): In rupestribus subalpinis versus alpem Retyezát in Cottu Hunyad Transylvaniae. Aug. 1834, *J. Heuffel* (BP 191261) − ISOLECTOTYPE: Drawing by R. v. Uechtritz (original illustration never published, stored at WRSL) − ICONOGRAPHY: Rchb. & Rchb. fil., Icon. Fl. Germ. Helv. **XIX/2**: fig. 307A. 1904−1906; Das Pflanzenreich **IV.280**: 1025, Fig. 72. 1922; Fl. Rep. Pop. Romîne **10**: 524, Tab. 100, figs 3, 3a. 1965; Icon. Fl. Part. Austro-Orient Eu. Centr.: 574, Fig. 4207. 1975.

= *H. sparsum* subsp. *malomvizense* (Deg. & Zahn) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1028. 1922, *syn. nov.* − *H. sparsiflorum* subsp. *malomvizense* Deg. & Zahn, Magyar Bot. Lapok **7**: 127. 1908 − *H. kotschyanum* var. *malomvizense* (Deg. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 513. 1965 − INDICATIO LOCOTYPICA: 'Hungaria. Com. Hunyad: Retyezát, in rupestribus vallis Valye Riu mare pr. Malomviz, c. 500 m, rarissimum, 3. Aug.' − NEOTOTYPE (designated here): Mtes Retezatenzes, in valle Pişaturile sub lacum Tăul Negru 1850−1900 m, 6. Aug. 1928, *E. I. Nyárády* [det. Zahn] (CL 430331).

− *H. kotschyanum* subsp. *longipetiolatum* Nyár., Fl. Rep. Pop. Romîne **10**: 530. 1965, *nom. inval*. (Art. 37.1 of the Code).

NOTES. *Hieracium sparsum* subsp. *malomvizense* was described on the basis of specimens with stellate hairs on the lower cauline leaves and on the involucral bracts. These characters are variable in the species and do not merit taxonomic recognition.

The specimens labelled by Nyárády as *H. kotschyanum* subsp. *longipetiolatum* (CL 430334, 430337) do not differ from *H. kotschyanum s.str*. and therefore validation of this name is unnecessary.

DESCRIPTION. Apyllopodous. Stem 30–70 cm high, robust, in the middle and upper part with numerous microglands and sparse stellate hairs, sometimes with few, pale, 2–3 mm long simple hairs, the base with numerous to subdense, pale, 3–4 mm long simple hairs occasionally mixed with sparse stellate hairs. Basal leaves usually withered at anthesis. Cauline leaves 7–10, gradually reduced upwards, lanceolate, acute at apex, sharply denticulate; the lower cauline leaves 10–15 cm long and 1–2 cm wide, broadest in the upper third, tapered to a long, winged petiole covered by dense, pale, 3–4 mm long simple hairs, on both surfaces with sparse simple hairs, on the margins and along the midrib with numerous, pale, up to 2 mm long simple hairs; the upper cauline leaves sessile or semi-amplexicaul, on the upper surface glabrous, on the lower surface with sparse to scattered stellate hairs or sometimes glabrous, on the margins with sparse, pale, up to 2 mm long simple hairs, and few stellate hairs and microglands, along the midrib on the lower surface with sparse, pale, up to 3 mm long simple hairs and scattered micro-

Fig. 9. Lectotype of *Hieracium kotschyanum* Heuff.

Fig. 10. Representative specimen of *Hieracium kotschyanum* Heuff. (Montes Retezatenzes, in abietis vallis Zlătuia sub cacumine Vrf. Retezat 1400–1600 m, 1. Aug. 1925, *E. I. Nyárády,* CL).

glands. Synflorescence with (3–)5–20(–30) erect capitula. Synflorescence branches 1–3(–5), up to 10 cm long, confined to upper part of stem, with 1–5 capitula. Acladium up to 2 cm long. Peduncles green, thin, with numerous to (sub)dense stellate hairs and numerous microglands, occasionally with few, 1–1.5 mm long, dark-based simple hairs and few to sparse, 0.2 mm long, yellowish glandular hairs. Bracteoles 2–4 lanceolate, green with sparse stellate hairs and microglands and a tuft at the apex. Involucres campanulate, 12–13 mm long, covered by moderately dense indumentum. Involucral bracts in three rows, 1.7 mm wide at the base, lanceolate, ± acute at apex, green, with pale margin, with scattered to numerous, 1–2 mm long, dark-based simple hairs and numerous, 0.2–0.4 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1) and with few stellate hairs at the base; the inner bracts pale green, with sparse indumentum, the outer bracts with few stellate hairs at the base. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.5–3.8(–3.9) mm long. Pollen few of varying size. Flowering: end of July and August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Southern Carpathians: Retezat Mts and Țarcu Mts; Eastern Carpathians: Maramures Mts; Apuseni Mts (Fig. 11). *Hieracium kotschyanum* was also reported from the Calimani Mts in the Eastern Carpathians (Höhn 1998). Unfortunately, due to the lack of herbarium specimens, the locality remains uncertain (M. Höhn, pers. comm. 2006).

Hieracium kotschyanum is a Romanian endemic. The specimens collected by H. Laus in Bulgaria (stored at PRC!) and determined by Zahn as *H. kotschyanum* f. *glabrum* Zahn (Zahn 1911: 170) most probably belong to the recently described *H. werneri* (cf. Szeląg 2006b).

FURTHER SPECIMENS EXAMINED: Montes Retezatenzes: ad rivum Zlătuia in silvis et graminosis 1500−1800 m, 9. Aug. 1928, *E. I. Nyárády* [det. Zahn ut subsp. *malomvizense*] (CL 430332); inter Pinos montanas sub Vrf. Rătezat prope Gemenea 1900 m,

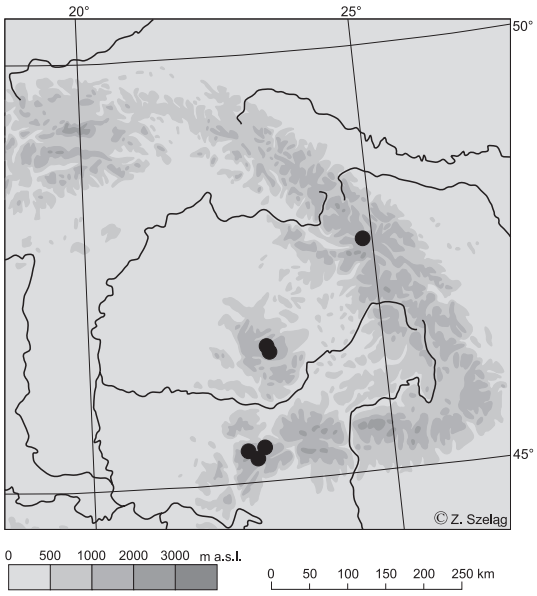

Fig. 11. Distribution of *Hieracium kotschyanum* Heuff.

11. Aug. 1928, *E. I. Nyárády* [det. Zahn ut subsp. *malomvizense*] (CL 430333); sub Vrf. Rătezat prope Gemenea 1900 m, 11. Aug. 1928, *E. I. Nyárády* [det. Zahn ut var. *subkotschyanum*] (CL 430439); in valle Zlătuia montibus Retezat 1500 m, 1. Aug. 1925, *E. I. Nyárády* [det. Zahn ut var. *subkotschyanum*] (CL 156229); in abietis vallis Zlătuia sub cacumine Vrf. Retezat 1400–1600 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156288); in valle Pişaturile sub lacum Tăul Negru 1850−1900 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430336); in valle Zlătuia 1200−1500 m, 21. Jul. 1927, *E. I. Nyárády* (CL 155445); in valle Zlătuia 1550 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156290); inter Gura Zlata et lacum Zănoaga 1400−1500 m, 17. Jul. 1927, *E. I. Nyárády* (CL 156292); Stinisoara gerinc füves sziklás lejtöje a Valea Petrilor balodalán 1650−1720 m, 28. Aug. 1933, *E. I. Nyárády* (CL 131685); in valle Zlătuia 1400 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156289); ad rivum Judele sub lacum Zănoaga 1700 m, 11. Aug. 1933, *A. Borza* & *E. I. Nyárády* (CL 438652); ad rivum Zlătuia 1500−1800 m, 9. Aug. 1928, *E. I. Nyárády* (BP 191266, CL 430335); Lichte Waldstellen im Lepusnikthale bei Lunca Berhina 1200 m, 8. Aug. 1911, *F. Pax* (BP 191265); sub alpe Retyezat, 25. Aug. 1874, *L. Simonkai* (BP 191263); Vale Rea ad confines zonae Piceae et Pini montanae 1650−1750 m, 27. Aug. 1933, *E. I. Nyárády* (CL 131693); in valle Zlătuia 1300−1500 m, 9. Aug. 1929, *E. I. Nyárády* [det. Nyárády ut subsp. *longipe-*

Fig. 12. Lectotype of *Hieracium lubricicaule* (Nyár.) Borza.

tiolatum] (CL 430334); Comit. Hunyad, Retyezat, in abietis supra Gura api, 26. Jul. 1938, *L. Vajda* (BP 281183); Munții Țarcului, Tomiasa ad Gura Apii adversus montibus Retezat 1700 m, 6. Aug. 1925, *E. I. Nyárády* (CL 156313); Tomiasa supra vallem Riu mare adversus montibus Retezat 1900 m, 27. Jul. 1930, *E. I. Nyárády* [det. Nyárády ut subsp. *longipetiolatum*] (CL 430337); Munții Maramureș, Petrova Șerban peculear cu *Genista tinctoria* exp. S–W 1486 m, 26. Jul. 1944, *E. I. Nyárády* (CL 589315, 589316); Țarcu Mts, Mt. Tomeasa, SE rocky slope 1800 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Țarcu Mts, rocky slopes above the dam Gura Apei 1100 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Mt. Buta, grassy slope 1770 m, 9. Aug. 2004, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Muntele Mare Mts, Mt. Dobrin, grassy slope 1550 m, 11. Aug. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Muntele Mare Mts, Măguri-Răcătău, on rocks with *Spiraea ulmifolia* 600−620 m, 11. Aug. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium lubricicaule (Nyár.) Borza
(Figs 12 & 13)

H. lubricicaule (Nyár.) Borza, Bul. Grăd. Bot. Cluj **14**: 59. 1935. − *H. sparsum* subsp. *lubricicaule* Nyár., Bul. Grăd. Bot. Cluj **8**: 66. 1929 − INDICATIO LOCOTYPICA: 'In valle Zlătuia infra Vârfu Rătezat, 1600 m, copiose' − LECTOTYPE (designated here): Fl. Rom. Exs. No. 890. Montibus Retezat. In declivibus graminosis vallis Zlătuia ad Scoaba Rătezatului copiose in societate *H. nomophilii*, *H. sparsicrimii*, *H. magocsyanii* et *H. hoppeanii* 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 158902) − ISOLECTOTYPES: CL 158445, 158903; W 7593, 14455 − SYNTYPES: Fl. Rom. Exs. No. 890 − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 491, Tab. 92, figs 1, 1a.; 495, Tab. 93, figs 2, 2a. 1965.

= *H. sparsum* [var.] *subfloccosum* Nyár., Bul. Grăd. Bot. Cluj **8**: 66. 1929 − INDICATIO LOCOTYPICA: 'In valle Zlătuia infra Vârfu Rătezat, 1600 m, copiose' − ORIGINAL MATERIAL: not traced.

NOTE. *Hieracium sparsum* [var.] *subfloccosum* was described on the basis of specimens with a less dense indumentum on the peduncles and larger leaves.

DESCRIPTION. Phyllopodous. Stem 30–60 cm high, in the middle and upper part glabrous or nearly so, the base with numerous to subdense, pale, 4–5 mm long simple hairs. Basal leaves 3–6, narrowly elliptic to lanceolate, acute at apex, 5–12 cm long and 0.5–1.5 cm wide, finely denticulate or ± entire, tapered to a long, winged petiole, covered by dense, 4–5 mm long simple hairs, on the upper surface, margins and along the midrib with numerous, 2–3 mm long simple hairs. Cauline leaves 4–7, gradually reduced upwards, entire, sessile, lanceolate, acute at apex, narrowed at the base, on the margins with sparse simple hairs; the upper cauline leaf (leaves) linear, glabrous. Synflorescence with 10–20(–30) ± nodding to nearly erect capitula. Synflorescence branches 5–10, up to 5 cm long, confined to upper half of stem, with 1–5 capitula, almost glabrous. Acladium 0.5–1.5 cm long. Peduncles green, thin, with scattered stellate hairs and microglands as well as sparse, yellowish glandular hairs. Bracteoles 2–4, linear, dark, with sparse glandular hairs. Involucres narrowly campanulate, 10–12 mm long, covered by subdense indumentum. Involucral bracts in two rows (the outer ones very short), 1–1.2 mm wide at the base, subacute, dark green, with green margin, with numerous, 1.5–2 mm long, simple hairs and yellowish, 0.2–0.6 mm long glandular hairs (ratio of simple hairs to glandular hairs 1:1); the inner bracts with sparse glandular hairs or glabrous.

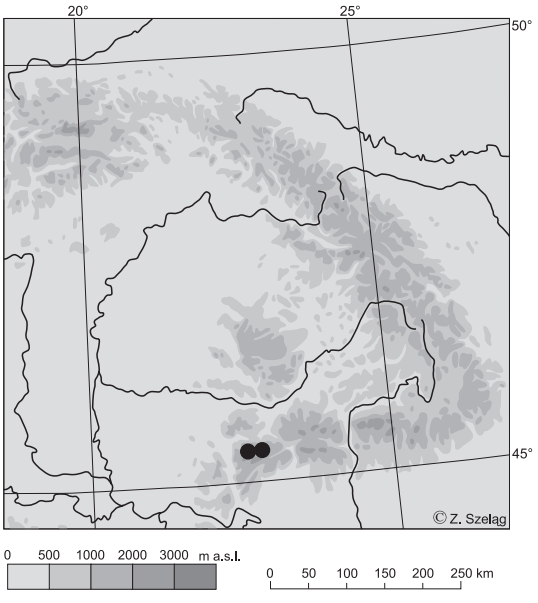

Fig. 13. Distribution of *Hieracium lubricicaule* (Nyár.) Borza.

Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.7–3.9(–4.0) mm long. Pollen few of varying size. Flowering: end of July and August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Southern Carpathians: Retezat Mts and Țarcu Mts (Fig. 13).

FURTHER SPECIMENS EXAMINED: Mtes Rătezat, Pișăturile sub lacum Tăul Negru 1850−1900 m, 6. Aug. 1928, *E. I. Nyárády* (CL 156680, 430310, 430311); Țarcu Mts, Mt. Tomeasa, SE rocky slope 1800 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium magocsyanum Ják. (Figs 14 & 15)

H. magocsyanum Ják., Magyar Fl.: 1224. 1925 − *H. sparsum* subsp. *magocsyanum* (Ják.) Zahn, Bul. Grăd. Bot. Cluj **8**: 67. 1929 − INDICATIO LOCOTYPICA: 'Retyezát' − LECTOTYPE (designated here): In herbidis et pratis vallis Kimpu nyelului ad fontem fl. Oláh Zsil sub alp. Retyezat, comit. Hunyad, alt. ca. 1250 m, 15. Jul. 1909, *S. Jávorka* (BP 191269) − ISOLECTOTYPE: BP 191270 − ICONOGRAPHY: Icon. Fl. Hung.: 574, Fig. 4209. 1934; Fl. Rep. Pop. Romîne **10**: 525, Tab. 100, figs 1, 1a. 1965; Icon. Fl. Part. Austro-Orient Eu. Centr.: 574, Fig. 4207. 1975.

= *H. sparsum* var. *subkotschyanum* (Zahn) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1028. 1922, *syn. nov*. − *H. sparsiflorum* var. *subkotschyanum* Zahn, Ann. Mus. Nat. Hung. **8**: 98. 1910 − INDICATIO LOCOTYPICA: 'Hunyad: in pratis subalpinis Kimpu nyelului ad fontem fl. Oláh Zsil alpium Retyezát 1250 m' − LECTOTYPE (designated here): In herbidis et pratis vallis Kimpu nyelului ad fontem fl. Oláh Zsil sub alp. Retyezat, comit. Hunyad, alt. ca. 1250 m, 15. Jul. 1909, *S. Jávorka* (BP 191270 left-hand specimen).

− *H. magocsyanum* var. *lingulatum* Nyár., Fl. Rep. Pop. Romîne **10**: 529. 1965, *nom. inval*. (Art. 37.1 of the Code).

NOTES. *Hieracium korneliae* Ják. was cited as a synonym under *H. magocsyanum* in 1925 and therefore was not validly published. The original material of *H. magocsyanum* stored at BP is homogeneous and consist of three sheets (no. 191269, 191270, 191272) collected by Sandor Jávorka in 1909. Zahn (1910: 98) described *H. sparsiflorum* var. *subkotschyanum* based on the left-hand specimen of sheet no. 191270. Later, in *Synopsis der Mitteleuropäischen Flora*, Zahn (1938: 659) enumerated two more localities of var. *subkotschyanum* from the Retezat Mts, based on specimens collected by Nyárády: 'See Gemenea versus Verfu Retyezat 1900 m' (CL 430439) and 'Tal Zlatuia 1500 m' (CL 156229). I have had the opportunity to study both specimens, which in my opinion represent *H. kotschyanum* (see above).

The specimens labelled by Nyárády as *H. magocsyanum* var. *lingulatum* (CL 156681, 430225, 430226, 430228, 438653) do not differ from *H. magocsyanum s.str*. and therefore validation of this name is unnecessary.

DESCRIPTION. Aphyllopodous. Stem 30–50(–60) cm high, glabrous or only at the base covered by sparse, pale, 3–4 mm long simple hairs. Basal leaves withered at anthesis. Cauline leaves deep green, 8–15, gradually reduced upwards, lanceolate to elliptic-lanceolate, acute at apex, entire, coriaceous; the lower cauline leaves 7–12 cm long and 0.8–1.5 cm wide, tapered to a winged petiole, on the margins with sparse, pale, 1–2 mm long simple hairs; the middle and upper cauline leaves sessile, lanceolate, acute at apex, glabrous (or the middle ones with sparse, pale, 1–2 mm long simple hairs on the margins). Synflorescence with 10–20(–30), moderately nodding to nearly erect capitula. Synflorescence branches 4–8(–10), short, confined to upper part of stem, with (1–)2–4 capitula. Acladium 0.5–2 cm long. Peduncles green, with sparse stellate hairs and microglands. Bracteoles numerous (up to 10) directly below involucre, darkish, subacute, almost glabrous, only at apex with a tuft. Involucres campanulate, 10 mm long, glabrous. Involucral bracts in two rows, 2–2.5 mm wide at the base, wide, obtuse at apex, blackish to black, glabrous, the inner bracts with a very short tuft at the apex. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.4–3.8(–4.0) mm long. Pollen in anthers absent. Flowering: August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

Fig. 14. Lectotype of *Hieracium magocsyanum* Jáv.

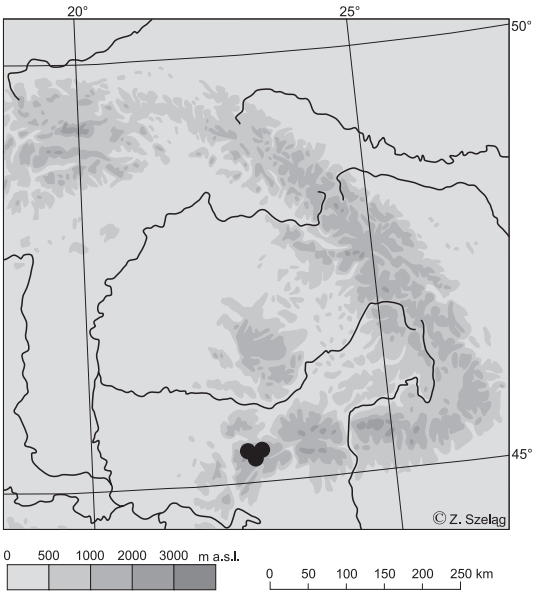

Fig. 15. Distribution of *Hieracium magocsyanum* Jáv.

DISTRIBUTION. Southern Carpathians: widespread throughout the Retezat Mts. In 2002 it was found also on the Mt. Tomeasa in the Ţarcu Mts by Mráz and Szeląg (Fig. 15).

FURTHER SPECIMENS EXAMINED: Fl. Rom. Exs. no. 892. Transsilvania, distr. Hunedoara. Mtibus Rătezat. In declivibus graminosis saxosisque ad 'Scoaba Rătezatului' in valle Zlătuia. Alt. ca 1550−1600 m, 1. Aug. 1925, *E. I. Nyárády* (BP 191273, 191274; CL 158447; CL s.n. W 7594); Mtes Retezatenzes. In valle Zlătuia 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 155452, 155464, 155469); Mtes Retezatenzes. In valle Pişaturile sub lacum Tăul Negru 1850−1900 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430227); Borascu prope stina Galbina 1700−1900 m, 12. Jul. 1924, *E. I. Nyárády* (CL 156353); Mtes Retezatenzes. In graminosis alpinis sub lacum Zănoaga 1900 m, 8. Aug. 1928, *E. I. Nyárády* (BP 191271, 195300; CL 430226, 156681); Mtes Retezatenzes. Supra lacum Zănoguta 1840−1900 m, 10. Aug. 1933, *A. Borza & E. I. Nyárády* (CL 438653); Retezat, ad rivum Bucura supra vallem Lăpusnicul mare 1600−1700 m, 27. Aug. 1930, *E. I. Nyárády* (CL 430228); Mtes Retezatenzes. In sylvis in valle Zlătuia 1300−1500 m, 9. Aug. 1928, *E. I. Nyárády* (CL 430225); Ţarcu Mts, Mt. Tomeasa, SE rocky slope 1800 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Saua Ciurila pass, open grassy places in *Pinus mugo* communities on granite at 1800 m, 6. Aug. 2005, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Mt. Buta, grassy slope 1770 m, 9. Aug. 2004, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium mirekii Szeląg, *sp. nov*.
(Figs 16 & 17)

Species nova e Hieraciorum *sectione* Cernua R. Uechtr., Hieracio polyphyllobasi (Nyár. & Zahn) Szeląg *similis*, *sed foliis glauco-viridibus; capitulis numerosibus; pedicellis tenuibus; involucris minoribus et brevius pilosis; squamis angustioribus et stylo luteo differt.*

HOLOTYPE: Romania, Southern Carpathians, Retezat Mountains, Saua Ciurila pass, open grassy places in *Pinus mugo* communities on granite at 1800 m a.s.l., 6 Aug. 2005, *Z. Szeląg 05/0001* (KRAM) – ISOTYPES: CL, Herb. Hierac. Z. Szeląg.

DESCRIPTION. Phyllopodous. Stem 30–50 cm high, within synflorescence with scattered stellate hairs and pale, dark-based, 1–2 mm long simple hairs mixed with dark, 0.1–0.2 mm long glandular hairs, in the middle almost glabrous or with few, pale, 2–3 mm long simple hairs, at the base with numerous, pale, up to 3 mm long simple hairs. Basal leaves 4–7, glaucous, lanceolate to oblanceolate, 8–12 cm long and 1–2 cm wide, dentate to denticulate, more or less sinuate, acute at apex, gradually tapered to a long, winged petiole, covered by numerous, pale, 3 mm long simple hairs, on both surfaces glabrous, only on the margins and along the midrib with sparse, pale, 1–2 mm long simple hairs mixed with pale microglands. Cauline leaves 2–3, glaucous, gradually reduced upwards, sessile, narrowed at the base; the lower leaves lanceolate, denticulate or dentate with 1–2 teeth on each side, on both surfaces glabrous, only on the margins and along the midrib with sparse, pale, 1–2 mm long simple hairs; the upper leaves lanceolate, entire, only on the margins with few simple hairs; the uppermost bract-like and glabrous. Synflorescence with 5–15 capitula (and usually some capitula aborted). Synflorescence branches 2–4, confined to upper half of stem, with (1–)2–4 capitula. Acladium up to 1 cm long. Peduncles green, thin, erect, with numerous to subdense stellate hairs, numerous to subdense, dark, 0.2–0.6 mm long glandular hairs and scattered, grey, dark-based, 1–2 mm long simple hairs. Bracteoles 1–2, lanceolate, green, covered by nu-

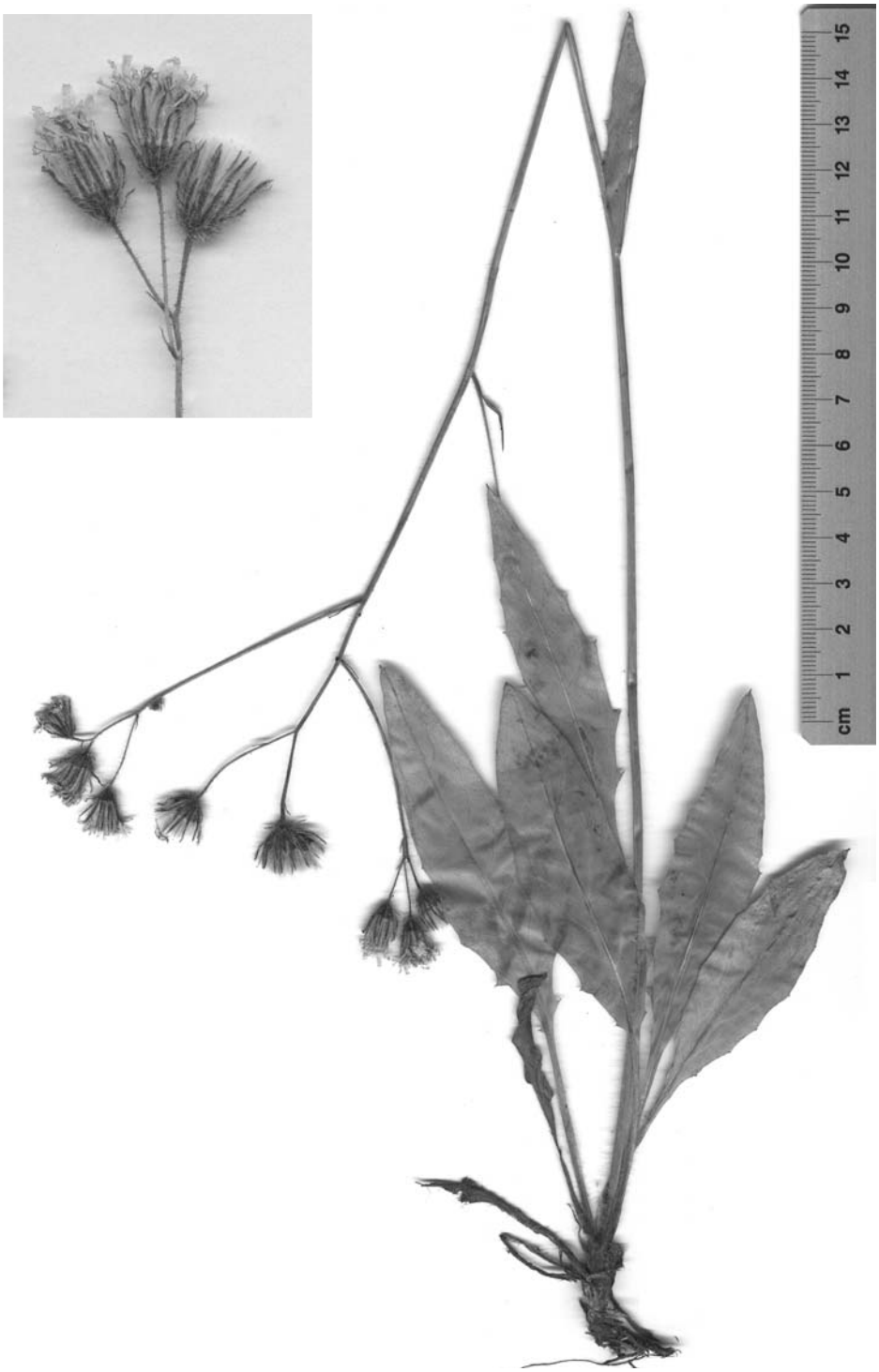

Fig. 16. Holotype of *Hieracium mirekii* Szeląg.

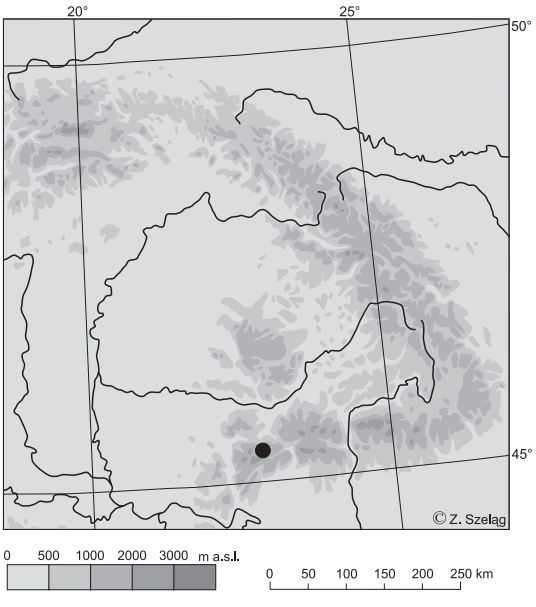

Fig. 17. Distribution of *Hieracium mirekii* Szeląg.

merous simple hairs mixed with glandular hairs, and a tuft at the apex. Involucres campanulate, ± subglobose at the base, 9 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, 1–1.2 mm wide at the base, lanceolate, subacute and with a tuft at the apex; the outer bracts dark green, with numerous, pale, dark-based, 1–2 mm long simple hairs and scattered, grey, 0.2–0.6 mm long glandular hairs (ratio of simple hairs to glandular hairs 2:1); the inner bracts with wide, pale margins and far less dense indumentum. Ligules yellow, glabrous at apex. Styles yellow. Achenes black, 3.2–3.6 mm long. Pollen in anthers absent. Flowering: end of July and August.

MODE OF REPRODUCTION: apomictic.

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 17). *Hieracium mirekii* is a quite frequent species on the Culmea Lolaia ridge, north of the Mt. Retezat, at 1650−1950 m a.s.l.

ETYMOLOGY: The species epithet honours Prof. dr. hab. Zbigniew Mirek, Kraków, for his contribution to knowledge of the flora and vegetation of the Western Carpathians.

Hieracium mitkae Szeląg, *nom. nov.*
(Figs 18 & 19)

TYPONYM: *H. kotschyanum* subsp. *longidentatum* Szeląg, Polish Bot. J. **48**: 11. 2003 – HOLOTYPE: Munții Retezat. Imprejurul iezerului Gemenea, 7. Aug. 1959, *G. Ghişa* (CL 584119) − PARATYPE: Romania, Southern Carpathians, Retezat Mts. In graminosis saxosisque Pişeturile inter lacos Gemenea et Tăul Negru, 1900 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430120 planta b).

DESCRIPTION. Phyllopodous. Stem 50–60 cm high, very robust, within synflorescence covered by scattered to numerous stellate hairs and sparse, dark-based, 4–5 mm long simple hairs, mixed with pale microglands, in the middle glabrous or with few stellate and simple hairs, at the base with numerous, pale, up to 5 mm long simple hairs. Basal leaves 4–7, oblanceolate, acute at apex, dentate with 3–7 mm long, glandular teeth, 10–15 cm long and 2–3 cm wide, tapered to a long, winged petiole, covered by dense, pale, 5 mm long simple hairs, on the upper surface almost glabrous, on the lower surface and on the margins with scattered, pale, 1–3 mm long simple hairs. Cauline leaves 4–6, gradually reduced upwards, lanceolate, sharply denticulate, acute at apex, sessile, attenuate at the base, only on the margins and along the midrib with sparse, 1–1.5 mm long simple hairs. Synflorescence with 20–30 erect capitula. Synflorescence branches 5–7, confined to upper third of stem, 4–8 cm long, with 3–6 capitula. Acladium 1–2 cm long. Peduncles thin, dark green, with scattered to numerous stellate hairs, numerous, dark, 0.2–0.7 mm long glandular hairs, and sparse, dark grey, 2–3 mm long simple hairs. Bracteoles 1–2, dark green, covered by sparse glandular hairs, with a sparse tuft at the apex. Involucres subglobose at the base, 11–13 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, covered by moderately dense indumentum. Involucral bracts in two rows, 1.5 mm wide at the base, lanceolate, subacute at apex, dark green with pale margins, covered by numerous, dark, 2–3 mm long simple hairs, scattered, dark, 0.2–0.7 mm long glandular hairs and sparse, stellate hairs at the base (ratio of simple hairs to glandular hairs 2:1); the inner bracts pale green, with less

Fig. 18. Holotype of *Hieracium mitkae* Szeląg.

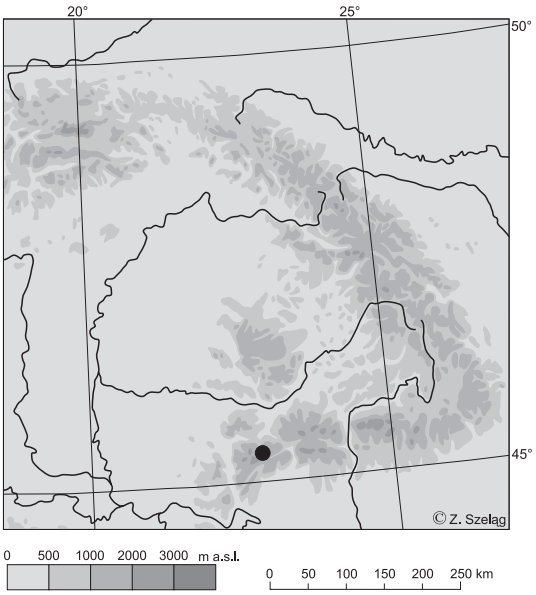

Fig. 19. Distribution of *Hieracium mitkae* Szeląg.

dense indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.3–3.5 mm long. Pollen grains few, of varying size. Flowering: August.

MODE OF REPRODUCTION: apomictic.

NOTE. A conspicuous taxon morphologically, exhibiting transitional features between *H. nigrilacus* and *H. polyphyllobasis*. Assignment of this taxon to *H. kotschyanum* is unjustified from the point of view of the systematics, and a rank of subspecies is inconsistent with the concept adopted for apomictic taxa (see above). As the epithet '*longidentatus*' was often used in the genus *Hieracium*, the change in rank is accompanied by a change in name.

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 19). Very rare, occurring in the glacial cirques of the Gemenea and Taul Negru lakes and in the Zlătuia valley in the central part of the Retezat Mts. Rocky and grassy places in *Pinus mugo* communities.

ETYMOLOGY: The species epithet honours Dr. hab. Józef Mitka, Kraków, for his contribution to knowledge of the genus *Aconitum* in the Carpathians.

FURTHER SPECIMENS EXAMINED: Fl. Rom. Exs. no. 889. [ut *H. sparsum* subsp. *nomophilum*] Transsilvania, distr. Hunedoara. Mtibus Rătezat. In declivibus graminosis vallis Zlătuia, ad Scoaba Rătezatului, alt. ca. 1550 m, solo granitico, 7. Aug. 1925. *E. I. Nyárády* (BP 191307 left-hand specimen).

Hieracium nigrilacus Nyár. (Figs 20 & 21)

H. nigrilacus Nyár., Bul. Grăd. Bot. Cluj **8**: 147. 1929 − *H. sparsum* subsp. *nigrilacus* (Nyár.) Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 657. 1938 − *H. kotschyanum* subsp. *nigrilacus* (Nyár.) Nyár., Fl. Rep. Pop. Romîne **10**: 513. 1965 − INDICATIO LOCOTYPICA: 'Transsilvania, distr. Hunedoara. Mtibus Rătezat. In declivibus graminosis saxosisque supra lacum Tăul Negru. Alt. ca. 2060 m' − LECTOTYPE (designated here): Fl. Rom. Exs. No. 899. Transsilvania, distr. Hunedoara. Mtibus Rătezat. In declivibus graminosis saxosisque supra lacum Tăul Negru. Alt. ca. 2060 m, 6. Aug. 1928, *E. I. Nyárády* (BP195298) − ISOLECTOTYPES: CL 158456, 430434; W 14458 − SYNTYPES: Fl. Rom. Exs. No. 899. (cf. Nyárády 1929: 147) − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 515, Tab. 98, figs 1, 1a. 1965.

DESCRIPTION. Aphyllopodous. Stem 30–50 (–70) cm high, robust, in the upper part glabrous or within synflorescence with few, dark-based, 4–5 mm long simple hairs, the base with numerous to dense, pale, 3–4 mm long simple hairs. Cauline leaves 8–15, gradually reduced upwards, sharply denticulate, acute at apex; the lower cauline leaves 8–15 cm long and 1–1.5(–2) cm wide, lanceolate, sessile, tapered at the base, on both surfaces with sparse, pale, 2–3 mm long simple hairs, on the margins and along the midrib with numerous, pale, 2–3 mm long simple hairs; the middle and upper cauline leaves semi-amplexicaul, triangular-lanceolate, broadest at the base, on both surfaces glabrous, on the margins with scattered to numerous, pale, 2–3 mm long simple hairs. Synflorescence with 15–30(–45) erect capitula. Synflorescence branches 2–6, short, confined to upper part of stem, glabrous, with 3–8 capitula. Acladium up to 1 cm long. Peduncles dark green, thin, mostly shorter than involucres, with sparse stellate hairs, scattered, 2 mm long, dark-based simple hairs and scattered, 0.2–0.4 mm long, blackish glandular

Fig. 20. Lectotype of *Hieracium nigrilacus* Nyár.

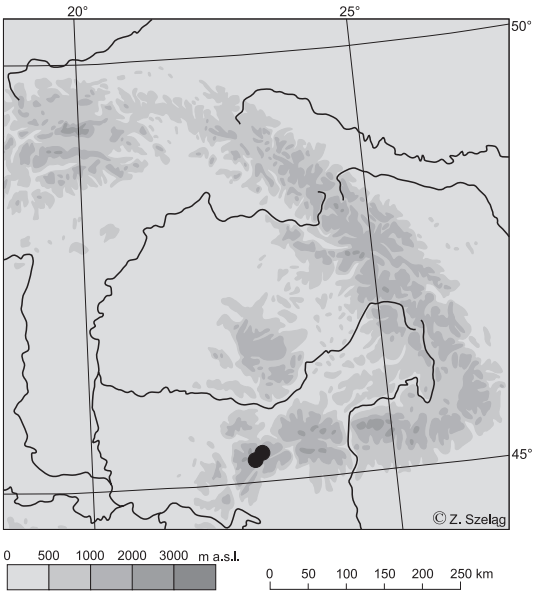

Fig. 21. Distribution of *Hieracium nigrilacus* Nyár.

hairs. Bracteoles 2–3, lanceolate, blackish, glabrous or with few simple and glandular hairs and a tuft at the apex. Involucres campanulate, 10 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, 1.3–1.5 mm wide at the base, lanceolate, subacute at apex, dark green, with numerous, 2–3.5 mm long, dark-based simple hairs and scattered, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1 to 2:1), mixed with microglands and few stellate hairs at the base; the inner bracts with pale margins, less dense indumentum and a short tuft at the apex. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.8–4.0 mm long. Pollen few of varying size. Flowering: end of July and August.

MODE OF REPRODUCTION: apomictic.

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 21).

FURTHER SPECIMENS EXAMINED: Mtes Retezatenzes. In decl. abruptis inter Pinos montanas sub Vrf. Retezat prope Gemenea 1900 m, 11. Aug. 1928, *E. I. Nyárády* (BP 191275, 351862, CL156678, 430258, 430255, 430256, 430257, 430433); Mtes Retezatenzes circa Tăul Negru 1950 m, 9. Aug. 1933, *A. Borza* (CL 438654); La Lacul Tăul Negru in Mtii Retezatului, 7. Aug. 1959, *E. Ghişa* (CL 584126); Retezat Mts, Mt. Buta, grassy slope 1770 m, 9. Aug. 2004, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium ostii-bucurae Szeląg (Figs 22 & 23)

H. ostii-bucurae Szeląg, Polish Bot. J. **48**: 12. 2003. − HOLOTYPE: *E. I. Nyárády* (CL 430221) Montes Retezat, ad rivum Bucura supra vallem Lăpuşnicul Mare, solo granitico, 1600−1700 m, 27. Aug. 1930 − ISOTYPES: CL 430222, 430223, 17752 − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 511, Tab. 97, figs 2, 2a. 1965.

= *H. sparsiflorum* subsp. *sparsiforme* Deg. & Zahn, Magyar Bot. Lapok **5**: 79. 1906, *syn. nov*. − *H. sparsum* subsp. *nomophilum* Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1021. 1922, *nom. illeg*. *superfl.* − INDICATIO LOCOTYPICA: 'Retyezát, in m. Vurvu Pelaga 2000−2300 m, leg. 19. Aug. 1903 de Degen' − LECTOTYPE (designated here): Flora Hungarica. Comit. Hunyad. Retyezát, Vurfu Pelaga, alt. ca. 2000−2300 m, 19. Aug. 1903, *A. de Degen* (BP 191310) − ISOLECTOTYPE: WRSL.

= *H. longifoliosum* Szeląg, Polish Bot. J. **48**: 11. 2003, *syn. nov*. − HOLOTYPE: Montes Retezatenses. In silvis in valle Zlătuia 1300−1500 m, solo granitico, 9. Aug. 1928, *E. I. Nyárády* (CL 430312) − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 519, Tab. 99, figs 1, 1a. 1965.

NOTES. *Hieracium sparsum* subsp. *nomophilum* was published as an illegitimate, superfluous substitute for *H. sparsiflorum* subsp. *sprarsiforme*.

The specimens from Bosnia 'in m. Vlašić [leg.] Brandis' cited in the protologue (Zahn 1906: 79) belong to *H. sparsiflorum* subsp. *sparsiforme* var. *obtusisquamum* Zahn. This taxon does not occur in the Carpathians.

Zahn (1921−1923: 1021) mentioned *H. subvillosum* Freyn as a synonym of *H. sparsiflorum* subsp. *sparsiforme*. After analysing Freyn's original material (stored at BRNM), I am of the opinion that *H. subvillosum* is morphologically closest to *H. borbasii*, and not to *H. ostii-bucurae*. During many years' field studies in Bulgaria I have never encountered plants that could be assigned to *H. borbasii s.str*. Also *H. ostii-bucurae* does not grow outside the Carpathians.

Degen's collection is heterogeneous. The sheet CL 157697 comprised two specimens, one of which belongs to *H. paltinae* subsp. *polyphyllobasis* Nyár. & Zahn.

Fig. 22. Holotype of *Hieracium ostii-bucurae* Szeląg.

The validation of *H. longifoliosum* (Szeląg 2003b) was premature. First, an analysis of the abundant herbarium material and observation of plants in garden cultivation have now shown that *H. longifoliosum* does not differ from *H. ostii-bucurae*. Second, some errors crept into the validation of *H. longifoliosum* as a result of insufficient knowledge about the group at the time; I mistook *H. longifoliosum* for specimens belonging to *H. polyphyllobasis* collected at an early phase of development. As a result, some specimens belonging to *H. polyphyllobasis* were listed among the paratypes of *H. longifoliosum*. I similarly misidentified as *H. longifoliosum* a specimen with undeveloped capitula collected in the Retezat Mts by Patrik Mráz and analyzed karyologically. In consequence, the tetraploid chromosome number published by Mráz (2006: 118) for *H. longifoliosum* refers to *H. polyphyllobasis*.

DESCRIPTION. Phyllopodous. Stem 30–40(–50) cm high, within synflorescence very sparsely covered by simple and stellate hairs, without glandular hairs, in the middle and lower part glabrous or almost glabrous, at the base with sparse, grey, 1–2.5 mm long simple hairs. Basal leaves 3–6, elliptic to lanceolate, acute at apex, tapered to a long, winged petiole, covered by scattered, pale, 1–2 mm long simple hairs, denticulate to remotely dentate, acute at apex, 8–12 cm long and 1–1.5 cm wide, on both surfaces glabrous, on the margins and along the midrib with sparse, 1–2 mm long simple hairs. Cauline leaves 3–6, gradually reduced upwards, sessile, denticulate, lanceolate to narrowly lanceolate, acute at apex, usually glabrous; the upper cauline leaf (leaves) linear, bract-like, entire, glabrous. Synflorescence with (5–)10–25, nodding to almost erect capitula. Synflorescence branches 3–6 (often in the angles of the all cauline leaves), up to 25 cm long. Acladium 1–2 cm long. Peduncles green, thin, covered by scattered to moderately dense stellate hairs and microglands, and sparse, 0.2–0.3 mm long, blackish glandular hairs, mixed with few, 1.5(–2) mm long, dark-based simple hairs. Bracteoles usually 0 or rarely 1–2, linear, blackish, nearly glabrous, directly below involucre. Involucres campanulate, 9–11 mm long, covered by sparse indumentum. Involucral bracts in two rows, dark green to blackish green, lanceolate, 1.2 mm wide at the base, acute at apex; the outer bracts dark green to blackish green, covered by sparse, up to 2 mm long, dark-based simple hairs and scattered to moderately numerous, 0.2–0.4 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:2) and with few stellate hairs at the base; the inner bracts dark green, glabrous or nearly so. Ligules yellow, glabrous at apex. Styles dark. Achenes black, (3.3–)3.5–3.6 mm long. Pollen in anthers absent. Flowering: end of July and August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Southern Carpathians: Retezat Mts, Godeanu Mts and Ţarcu Mts (Fig. 23).

FURTHER SPECIMENS EXAMINED: Mtes Retezatenzes in valle Zlătuia 1400−1500 m, 21. Jul. 1927, *E. I. Nyárády* (CL 158904); Inter Stînile Buta et Piule 1700 m, 1948, *S. Csürös* (CL 559987); Mt. Buta, 1948, *S. Csürös* (CL 562753); Mt. Albele 1800 m, 14. Jul. 1948, *S. Csürös* (CL 562667); Inter Stînile Buta et Piule 1700 m, 22. Jul. 1956, *S. Csürös & I. Gergely* (CL

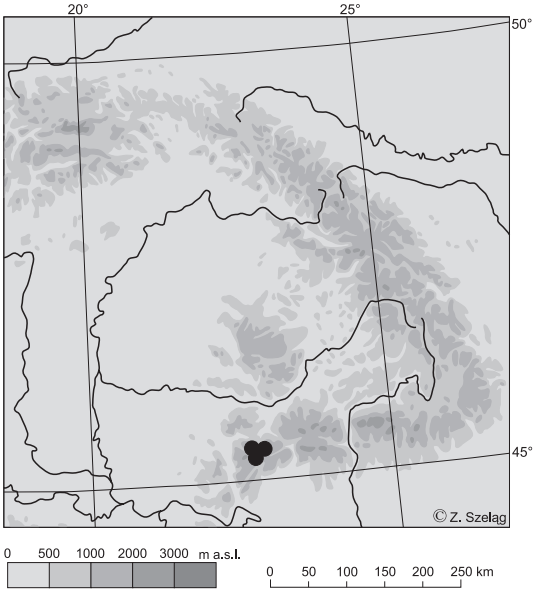

Fig. 23. Distribution of *Hieracium ostii-bucurae* Szeląg.

559986); Mtes Retezatenzes in valle Lăpusnicul mare ad ostium rivi Bucura 1590 m, 13. Aug. 1933, *E. I. Nyárády* (CL 438622, 438680); Montes Ţarcu. In rupibus montis Tomeasa supra vallem Riu Mare adversus montibus Retezat 1900 m, solo schist.-hum., 27. Jul. 1930, *E. I. Nyárády* (CL 430314−430319); Montes Retezat, ad rivum Bucura supra vallem Lăpuşnicul Mare, solo granitico, 1600−1700 m, 27. Aug. 1930, *E. I. Nyárády* (CL 430222, 430223, 17752); Montes Retezat. In ripa abrupta rivi Lăpuşnicul Mare ad ostium rivi Bucura apud limitem *Piceae* 1590 m, 13. Aug. 1933, *A. Borza & E. I. Nyárády* (CL 438655, 438656); In saxosis alpinum Hatszegiertium, Transsilvaniae, 12−21. Aug. 1874, *L. Simonkai* (BP 191296 planta c); Comit. Hunyad, inter mughos montis Paltina alp. Retyezat alt. 1800 m, 11. Aug. 1910, *S. Jávorka* (BP 191313, 191314); Comit. Hunyad, Retyezat, in rupestribus infra lacum Bucura in pineto 1600 m, 12. Aug. 1910, *S. Jávorka* (BP 191309 planta b); Ţarcu Mts, Mt. Tomeasa, SE rocky slope 1800 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Bucura valley, on rocks 1600 m (*locus classicus*) 10. Aug. 2004 *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Mt. Buta, grassy slope 1770 m, 9. Aug. 2004, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium pawlowskianum Nyár.

(Figs 24 & 25)

H. pawlowskianum Nyár., Fl. Rep. Pop. Romîne **10**: 518. 1965 − *H. paltinae* subsp. *alexandri-borzae* Pawł., Bul. Grăd. Bot. Cluj **19**: 11. 1939 − LECTOTYPE (Szeląg 2004c: 11): Karpaty pd.-wsch., góry Retezat: Butea (Mţii Papuşii). Trawiasto-skaliste miejsca wśród kosówki. Granit, 1850−1900 m, 11. Aug. 1937, *B. Pawłowski* (KRA 116112) − ICONOGRAPHY: Polish Bot. J. **49**: 13, fig. 1.; 14, fig. 2. 2004.

= *Hieracium tomiasiforme* '*tomiasaeforme*' Nyár., Fl. Rep. Pop. Romîne **10**: 517. 1965 (synonymized by Szeląg 2004c) − *H. paltinae* subsp. *nigrovirenticeps* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 77. 1929 − *H. paltinae* subsp. *nigrescenticeps* Nyár. & Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 686. 1938, *nom. illeg.* − LECTOTYPE (Szeląg 2004c: 12): Retezat. In locis graminosis saxosisque inter *Pinos montanas* ca. lacum Zanoaga 1850−2100 m, 20. Jul. 1927, *E. I. Nyárády* (CL 155463) − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 519, Tab. 99, figs 2, 2a, 4. 1965.

= *Hieracium riumarense* Szeląg, Polish Bot. J. **48**: 12. 2003 (synonymized by Szeląg 2004c) − HOLOTYPE: Romania, Southern Carpathians, Montes Ţarcu. In rupestribus montis Tomeasa supra vallem Riu Mare, adversus montibus Retezat 1900 m, solo schist.-hum., 27. Aug. 1930, *E. I. Nyárády* (CL 430313) − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 503, Tab. 95, figs 2, 2a. 1965.

DESCRIPTION. Phyllopodous. Stem 30–40 cm high, within synflorescence covered by numerous stellate hairs and microglands, with few, dark-based, 3–3.5 mm long simple hairs, in the middle glabrous, just at the base with sparse, 3 mm long simple hairs mixed with stellate hairs. Basal leaves 3–5, narrowly elliptic to lanceolate, subacute or acute at apex, entire, 8–12 cm long and 1–1.5 cm wide, acute, tapered to a long, winged petiole, on the upper surface glabrous, on the margins and along the midrib on the lower surface with sparse, pale, 1.5–2 mm long simple hairs and few microglands. Cauline leaves 3–5, gradually reduced upwards, sessile, some semi-amplexicaul, entire, lanceolate, acute; the upper cauline leaf (leaves) linear, bract-like, with sparse, pale, 2–3 mm long simple hairs along the midrib on the lower surface. Synflorescence open, with 4–8(–12) erect capitula. Synflorescence branches 2–4(–5), slender up to 10 cm long, confined to upper part of stem, with 1(–2) capitula. Acladium 1.5–3 cm long. Peduncles dark green, thin, moderately densely covered by dark-based, 3–4 mm long simple hairs and yellowish, 0.1–0.3 mm long glandular hairs, and scattered stellate hairs. Bracteoles 2–3, linear, dark green, with sparse, 2–3 mm long simple hairs and glandular hairs. Involucres subglobose at the base, 11–12 mm long, covered by dense indumentum. Involucral bracts in two rows, 1.5–1.7 mm wide at the base, lanceolate, ± obtuse at apex, dark green, with dense, dark, 4–5 mm long simple hairs and dense, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1); the inner bracts with pale margins and sparse indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.4–3.6 mm long. Pollen in anthers absent. Flowering: August.

MODE OF REPRODUCTION: apomictic.

DISTRIBUTION. Southern Carpathians: A very rare species, known from a few localities in the Retezat Mts and the Ţarcu Mts (Fig. 25). It grows in the subalpine zone in open places in *Pinus mugo* communities on granite at 1850−2100 m a.s.l.

Fig. 24. Lectotype of *Hieracium pawlowskianum* Nyár.

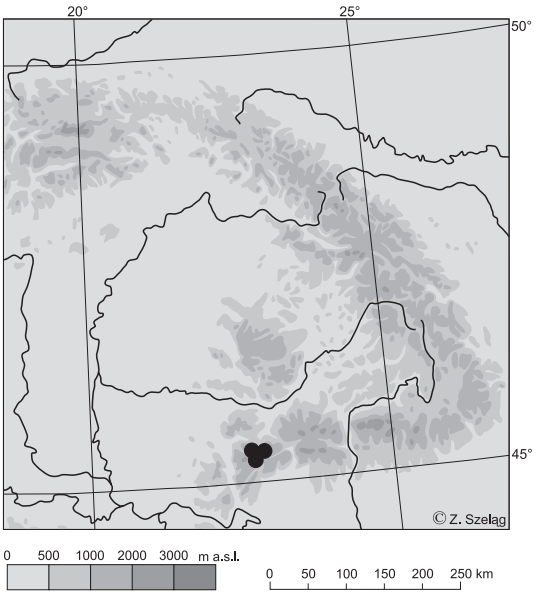

Fig. 25. Distribution of *Hieracium pawlowskianum* Nyár.

FURTHER SPECIMENS EXAMINED: Isolectotype: Karpaty pd.-wsch., góry Retezat: Butea (Mții Papuşii) *B. Pawłowski* (CL 445013); Retezat, na zboczach Valea Butii w *Calamagrostis*, 11. Aug. 1937, *T. Sulma* (KRAM 271290); Retezat. In locis graminosis saxosisque inter *Pinos montanas* ca. lacum Zanoaga 1850−2100 m, 20. Jul. 1927, *E. I. Nyárády* (CL 156596, 156602); Retezat. In graminosis alpinis inter *Pinos mantanas* sub lacum Zanoaga 1900 m solo granit., 8. Aug. 1928, *E. I. Nyárády* (BP 191319, 195301 plante b & c; CL 430371, 430376, 430377).

Hieracium polyphyllobasis (Nyár. & Zahn) Szeląg, *stat. nov.* (Figs 26 & 27)

BASIONYM: *H. paltinae* subsp. *polyphyllobasis* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 77. 1929 − INDICATIO LOCOTYPICA: 'Ad lacum Zănoaga, 1850−2100 m' − LECTOTYPE (designated here): Mtes Retezatenzes. Ad lacum Zănoaga 1850−1900 m, 20. Jul. 1927, *E. I. Nyárády* (CL 156597) − ISOLECTOTYPES: CL 156587, 156588, 156589, 156595, 156599, 156500, 156510, 158449 − ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 519, Tab. 99, figs 3, 3a. 1965.

= *H. paltinae* [var.] *petrilense* Nyár., Bul. Grăd. Bot. Cluj **13**: 65. 1934 − INDICATIO LOCOTYPICA: 'Retezat: Valea Petrile 2040−2200 m' − ORIGINAL MATERIAL: not traced.

− *H. paltinae* f. *simplex* Nyár., Fl. Rep. Pop. Romîne **10**: 529. 1965, *nom. inval*. (Art. 37.1 of the Code).

− *H. paltinae* f. *subfurcatum* Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 687. 1938, *nom. inval*. (Art. 36.1. of the Code).

NOTES. Part of the original material of *H. paltinae* subsp. *polyphyllobasis* has been distributed in Fl. Rom. Exs. no. 894.

Hieracium paltinae [var.] *petrilense* was not included by Nyárády (1965) in *Flora Republicii Populare Romîne*.

The specimens labelled by Zahn as *H. paltinae* f. *subfurcatum* (CL 430372) do not differ from *H. polyphyllobasis s.str*. and therefore validation of this name is unnecessary.

DESCRIPTION. Phyllopodous. Stem 30–40 cm high, robust, in the upper part with scattered, 2 mm long, dark-based simple hairs, scattered stellate hairs and sparse microglands, in the middle part and at the base with scattered to numerous, pale, 2–3 mm long simple hairs, and sparse stellate hairs mixed with microglands. Basal leaves 5–15, lanceolate, acute at apex, remotely dentate, with 3–4 teeth on each side, 10–15 cm long and 0.8–1.5 cm wide, tapered to a long, winged petiole, covered by numerous, pale, 1 mm long simple hairs, on both surfaces with sparse, pale, 1 mm long simple hairs (with time glabrous), on the margins with scattered, 1–1.5 mm long simple hairs, short glandular hairs mixed with stellate hairs. Cauline leaves usually 2, sessile, attenuate at the base, acute at apex; the lower ones lanceolate, with 1–2 teeth on each side; the upper ones linear-lanceolate to linear, entire, bract-like. Synflorescence open, with (3–)5–8(–10) erect capitula. Synflorescence branches 1–3, confined to upper third of stem, 5–8(–10) cm long, with 1–2 capitula. Acladium 1–2 cm long. Peduncles green, with numerous, 2–3 mm long, dark-based simple hairs, scattered to numerous glandular hairs and numerous stellate hairs. Bracteoles 0–2, lanceolate, dark green, covered by sparse simple and glandular hairs. Involucres subglobose at the base, 11–13 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, 1.5–1.7 mm wide at the base, lanceolate, acute at apex, dark green without pale margin,

Fig. 26. Lectotype of *Hieracium polyphyllobasis* (Nyár. & Zahn) Szeląg.

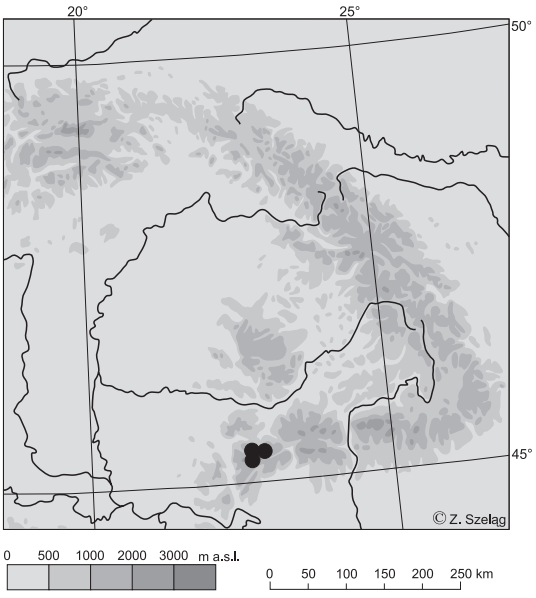

Fig. 27. Distribution of *Hieracium polyphyllobasis* (Nyár. & Zahn) Szeląg.

with subdense, grey, dark-based, 2–3 mm long simple hairs and dense yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1); the inner bracts with less dense indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 3.4–3.7 mm long. Pollen numerous and of varying size. Flowering: August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 4x = 36 (Mráz 2006 as *H. longifoliosum*) apomictic.

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 27).

FURTHER SPECIMENS EXAMINED: Comitat Hunyad, Retyezat, In lapidosis sub cacumine, alt. ca. 2200−2300 m, 2. Aug. 1907, *A. de Degen* (BP 191267); Mtes Retezatenzes. Ad lacum Tăul Negru 2045−2160 m, 16. Aug. 1928, *E. I. Nyárády* (CL 430374, 430375); Mtes Retezatenzes. Inter Tăul Negru si lacul la Pişaturile, 7. Aug. 1959, *E. Ghişa* (CL 584118); Mtes Retezatenzes. Circa lacum Zănoaga 1850−2100 m, 20. Jul. 1927, *E. I. Nyárády* (BP 191318, 191322, 195299; CL 156586); Mtes Retezatenzes. Circa lacum Tăul Negru 2050 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430373); Mti Retezat, pe margine izerului Gemenea 7. Aug. 1959, *E. Ghişa* (CL 584120); Hungaria, Comit. Hunyad Retyezat Vurfu Pelaga 2000−2300 m, 19. Aug. 1903, *A. Degen* (CL 157697); Mtes Retezatenzes. In valle Judele adversus lacum Zănoaga 1700−1800 m, 11. Aug. 1933, *A. Borza & E. I. Nyárády* (CL 438643); Mtes Retezatenzes. Supra vallem Zlătuia sub cacumine montes Retezat 1800 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156598); Mtes Retezatenzes. Supra lacum Zănoaga 1850−2100 m exp. WSW, 10. Aug. 1933, *A. Borza & E. I. Nyárády* (CL 438644); Mtes Retezatenzes. Circa lacum Tăul Negru 2050 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430372); Retezat Mts, Saua Ciurila pass, open grassy places in *Pinus mugo* communities on granite at 1800 m a.s.l., 6. Aug. 2005, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium porphyriticum A. Kern.

(Figs 28–30)

H. porphyriticum A. Kern., Österr. Bot. Z. **13**: 247. 1863 − *H. sparsum* subsp. *porphyriticum* (A. Kern.) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1022. 1922 − INDICATIO LOCOTYPICA: 'In regione alpina Carpatorum orientalium in rupibus porphyriticis montis Cornul muntilor prope Petrosam ad fontes fluvii Körös, qui niger cognominatur.' − LECTOTYPE (designated here): Ungarn. Biharia. An den Porphyritfelsen des Cornul Muntilor bei Petrosa, [sine anno] *A. Kerner s.n.* [sheet with three specimens] (WU-Kerner) − ISOLECTOTYPES: *A. Kerner s.n.* [sheet with two specimens] (WU-Kerner); Drawing by R. v. Uechtritz (original illustration never published, stored at WRSL) − ICONOGRAPHY: Kolozsvár Környékének Fl.: 626, fig. 66. 1941−1944; the same drawing in Fl. Rep. Pop. Romîne **10**: 503, Tab. 95, figs 3, 3a, 3b. 1965.

= *H. porphyriticum* var. *valderamosum* Ujv. & Nyár. Scripta Bot. Mus. Transsyl. **3**: 51. 1944; Kolozsvár Környékének Fl.: 625. 1941−1944 − INDICATIO LOCOTYPICA: 'Lonkavölgy az előbbivel (leg. et herb. Ujvárosi)' − ORIGINAL MATERIAL: not traced.

DESCRIPTION. Phyllopodous. Stem 20–30(–60) cm high, within synflorescence with scattered stellate hairs and microglands, in the middle nearly glabrous, at the base with sparse, pale, 4 mm long simple hairs. Basal leaves 4–7, oblanceolate, 5–7 cm long and 1.5–2 cm wide, acute, remotely denticulate, tapered to a winged petiole, on the upper surface nearly glabrous, on the lower surface as well as with on the margins and along the midrib with scattered to numerous, pale, up to 2 mm long simple hairs. Juvenile rosette leaves covered by dense, grey hairs. Cauline leaves 2–4,

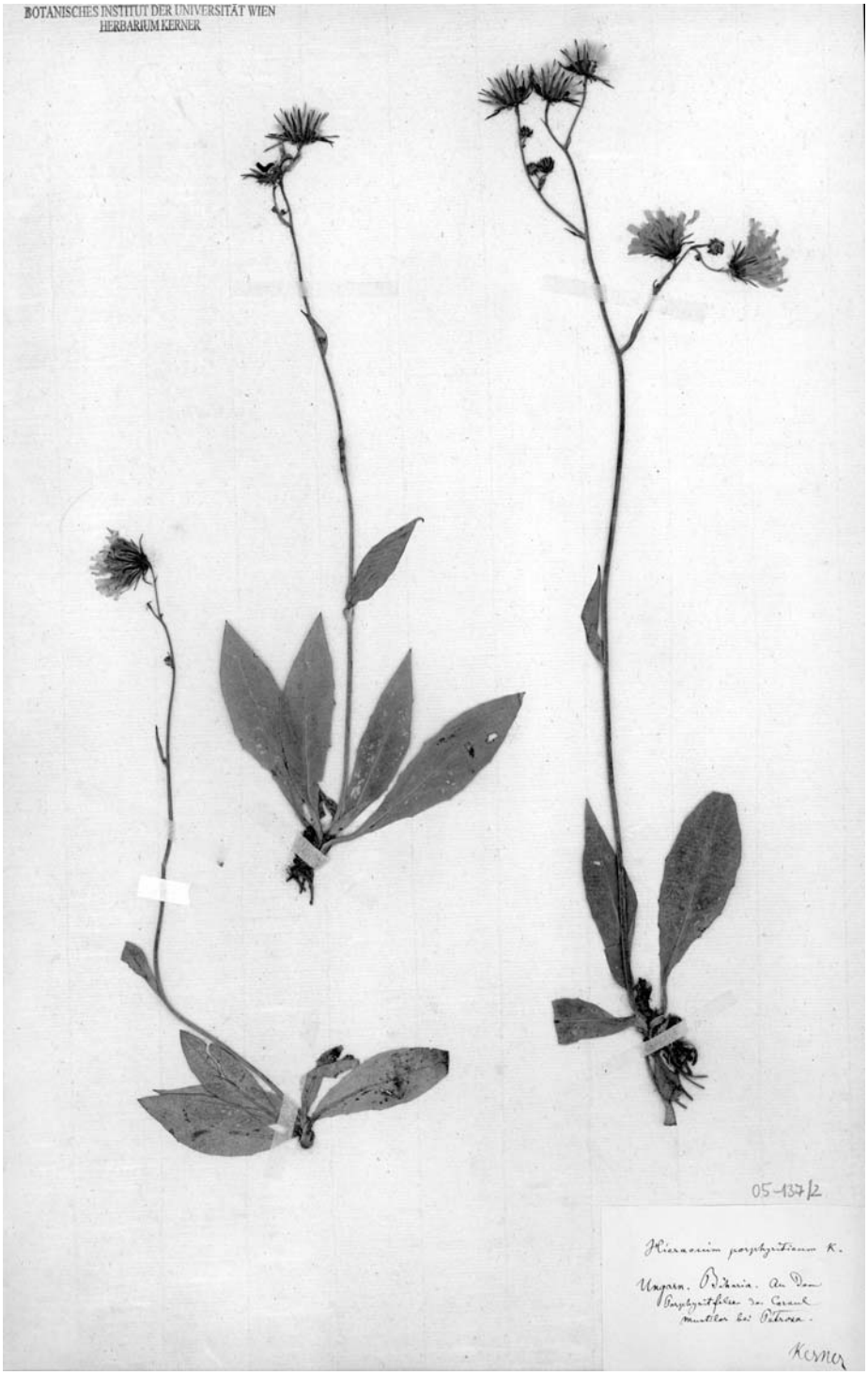

Fig. 28. Lectotype of *Hieracium porphyriticum* A. Kern.

Fig. 29. Representative specimens of *Hieracium porphyriticum* A. Kern. from the *locus classicus* (Munții Bihor, Cornul Muntilor 1460 m, 10. Aug. 2005, *Z. Szeląg*).

rapidly reduced upwards, lanceolate, sessile attenuate at the base, entire, somewhat coriaceous and glaucescent, on both surfaces glabrous, on the margins glabrous or with few, 0.5–1 mm long simple hairs and numerous microglands. Synflorescence with 3–7(–10) capitula. Synflorescence branches 1–5, in the wild populations usually confined to upper part of stem (in cultivated plants

in the angles of the all cauline leaves), with 1–3 capitula, sparsely covered by microglands and scattered stellate hairs. Acladium 1–3 cm long. Peduncles green, erect, with scattered to numerous stellate hairs and sparse microglands, sometimes also with sparse, 2 mm long simple hairs. Bracteoles 2–3, linear, dark green, with sparse glandular hairs and few stellate hairs. Involucres campanulate, 10 mm long, covered by sparse indumentum. Involucral bracts grey-green with green margins, in two rows, 1.5–2 mm wide at the base, lanceolate, obtuse, with sparse 0.3–0.7 mm long, blackish glandular hairs mixed with dark-based, 1.5–2 mm long simple hairs (ratio of simple hairs to glandular hairs 1:2); the inner bracts glabrous or with few glandular hairs. Ligules glabrous at apex. Styles dark. Achenes brown, (3.2–)3.4–3.7 mm long. Pollen few of varying size. Flowering: end of July and August.

MODE OF REPRODUCTION: apomictic.

DISTRIBUTION. Munții Apuseni Mts: Munții Bihor Mts and Muntele Mare Mts (Fig. 30).

NOTES. Zahn did not see original Kerner's material (cf. Zahn 1921−1923, 1938). In 2004, thanks to the kindness of Dr. W. Till, curator of the WU herbarium, I had an opportunity to get to know the collection of *Hieracium* from Kerner's herbarium. To my delight, I found two original sheets of *H. porphyriticum*, the most mysterious representative of *H*. sect. *Cernua* in the Carpathians. In 2003−2005, together with J. Mitka, I carried out field research in the Apuseni Mts, visiting twice Mt. Cornul Muntilor and the neighbouring Mt. Poieni, Mt. Bohodei and Mt. Carligalete. During these field studies I found several isolated localities of *H. porphyriticum*, including the *locus classicus*, whose situation perfectly corresponded to the description included in the protologue (Kerner 1863). The only change that has occurred since 1863 concerns the name of a stream at which Kerner found *H. porphyriticum*. Today it is named Sobişul and treated as a tributary of the Crişul (Körös) river whose source is 1 km further east. I also visited 'Scoborâşul ad montem Dobrin' where Nyárády and Bujorean found in 1926 the second locality of *H. porphyriticum*. I did not refind *H. porphyriticum* but *H. kotschyanum* grew abundantly in the whole area (it is the richest locality of that species in the Carpathians). *H. porphyriticum* is the only representative of *H*. sect. *Cernua* in the Bihor Mts. The locality of *H. kotschyanum* on Mt. Cornul Muntilor mentioned by Zahn (1938: 657) and repeated by Nyárády (1965: 513) is based on incorrectly identified specimens belonging to *H. porphyriticum* (BP 191264) collected in 1879 by Simonkai. The nearest localities of *H. kotschyanum* are in the Muntele Mare Mts, 40 km to the east.

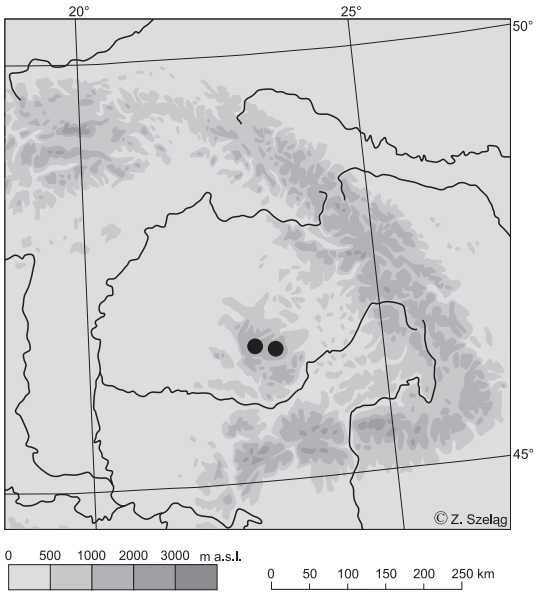

Fig. 30. Distribution of *Hieracium porphyriticum* A. Kern.

Hieracium porphyriticum var. *valderamosum* was described on the basis of specimens with more branched synflorescences.

FURTHER SPECIMENS EXAMINED: Munții Bihor Mts: Vf. Poienii, western slope 1370 m, 5. Aug. 2004, *Z. Szeląg*; Cornul Muntilor near Crişul (Sobişul) stream (*locus classicus*) 1250−1350 m, 10. Aug. 2005, *Z. Szeląg*; Cornul Muntilor on granite rocks 1460 m, 10. Aug. 2005, *Z. Szeląg*; Cornul Muntilor above Somes spring, in open grassy places in *Juniperus nana* communities 1510 m, 10. Aug. 2005, *Z. Szeląg* (all specimens in Herb. Hierac. Z. Szeląg); Distr. Cluj. [Muntele Mare] In callunetis declivi 'Scoborâşul' ad montem Dobrin, supra fluv. Someşul rece, alt. 1540 m, 27.08.1926 *E. I. Nyárády & Gh. Bujorean* (CL 156555−156558); In

saxosis alpium Biharicum, Cornul muntyeluj dictis, 17. Jul. 1879, *L. Simonkai* [det. Zahn ut *H. kotschyanum*] (BP 191264).

Hieracium silesiacum E. Krause

(Figs 31 & 32)

H. silesiacum E. Krause, Jahresber. Schles. Ges. Vaterl. Kultur **28**: 101, 1851 − *H. sparsum* subsp. *silesiacum* (E. Krause) Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1026. 1922 − LECTOTYPE (Szeląg 2004b: 16): Kessel im Gesenke, Jul. 1846, *E. Krause s.n.* (WRSL) − ICONOGRAPHY: Rchb. & Rchb. fil., Icon. Fl. Germ. Helv. **XIX/2**: fig. 305A. 1904−1906; Polish Bot. J. **49**: 17, fig. 1. 2004; Květ. Čes. Rep. **7**: 615, Fig. 111/1, 1a, 1b. 2005.

DESCRIPTION. Phyllopodous. Stem 30–50 cm high, robust, within synflorescence dark green to blackish, with sparse glandular hairs and numerous, dark, 3–4 mm long simple hairs (without microglands and stellate hairs), in the middle with sparse, pale, 2–3 mm simple hairs mixed with dark glandular hairs, the base with pale, 3–4 mm long simple hairs mixed with pale microglands. Basal leaves 3–5, oblanceolate, 8–12(–15) cm long and 1.5–2.5 cm wide, dentate to denticulate, more or less sinuate, ± rounded at apex, gradually tapered to a long, winged petiole, covered by dense, pale, 3 mm long simple hairs, on both surfaces glabrous or almost so, on the margins with sparse, pale, 1–1.5 mm long simple hairs and few microglands. Cauline leaves 4–6, gradually reduced upwards, sessile, narrowed at the base, oblanceolate to lanceolate, acute at apex, closely denticulate, on the upper surface glabrous, on the lower surface glabrous or moderately hairy, on the margins with sparse, pale, 1–1.5 mm long simple hairs mixed with microglands. Synflorescence with 7–15(–25) capitula. Synflorescence branches 3–6, confined to upper part of stem, with 1–3 capitula. Acladium (0.5–)1–2.5 cm long. Peduncles erect, dark green to blackish, with dense, dark, 0.2–0.3 mm long glandular hairs, and numerous black, 2–3 mm long simple hairs without or with sparse stellate hairs. Bracteoles 2–4, linear, blackish, covered by sparse simple hairs mixed with glandular hairs, with a sparse tuft at the apex. Involucres campanulate, 11–13 mm long, covered by sparse to moderately dense indumentum. Involucral bracts in two rows, 1.5 mm wide at the base, lanceolate, obtuse and glabrous at apex, dark green to blackish, with sparse to moderately dense, dark, 1.5–2 mm long simple hairs and sparse to moderately dense, dark, 0.2–0.3 mm long glandular hairs (ratio of simple hairs to glandular hairs 1:1); the inner bracts with pale margins and less dense indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, 4.0–4.2(–4.4) mm long. Pollen few of varying size. Flowering: July and August. (Description based on plants from the Sudetes).

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 4x = 36 (Chrtek jun. 1996; Chrtek jun. *et al*. 2004; Mráz 2005), apomictic.

DISTRIBUTION. Eastern Sudetes: Hrubý Jeseník Mts; Western Carpathians: Vysoké Tatry Mts, Západné Tatry Mts (Fig. 32).

NOTE. *Hieracium silesiacum* was one of the most frequently collected species in the Sudetes. It has also been distributed in five exsiccata series: Kerner Fl. Exs. Austro-Hung. no. 201; Callier Fl. Siles. Exs. no. 862; Magnier Fl. Selecta Exs. no. 3308; Zahn, Hieraciotheca Eur. no. 398; and Behr Herb. Hieraciorum no. 150. Intensive collecting of the plants for herbaria is perhaps to blame for the disappearance of its other historical localities. Nowadays, *H. silesiacum* is a critically endangered species in the Czech Republic (Chrtek jun. 2004).

In the Western Carpathians *H. silesiacum* is a quite frequent species only in the Slovak part of the Západné Tatry Mts. Lengyel and Zahn (1932) described *H. sparsum* var. *vaiskovae* Lengyel & Zahn based on a single collection from the Vajskovská dolina in the Nízke Tatry Mts, and distinguished it from *H. silesiacum* by its longer, minutely denticulate and densely hairy leaves, and by the presence of stellate hairs on the peduncles. More recently, plants from the Nízke Tatry Mts were interpreted as a range of morphological variability of *H. silesiacum* (Chrtek *et al*. 2002), and consequently *H. sparsum* var. *vaiskovae* was reduced to synonym of *H. silesiacum* (Szeląg 2004a).

Fig. 31. Representative specimens of *Hieracium silesiacum* E. Krause from the *locus classicus* (Ostsudeten, Altvatergebirge, Gr. Kessel 1400 m, Aug. 1936, *H. Laus*, BRNM).

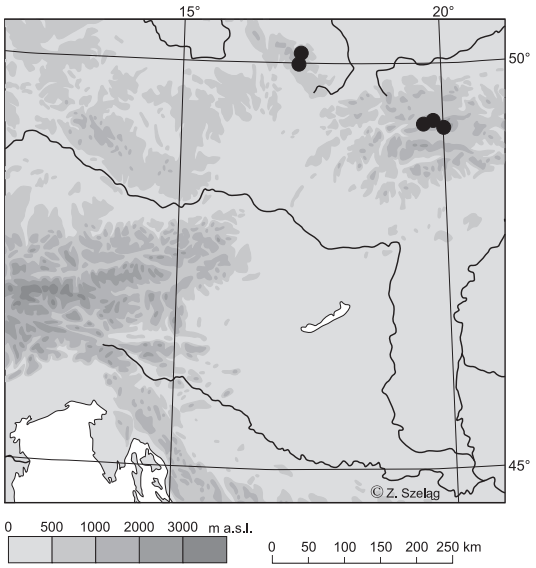

Fig. 32. Distribution of *Hieracium silesiacum* E. Krause.

A re-evaluation of *H. silesiacum* from the Sudetes and Carpathians has resolved this issue. The plants from the Nízke Tatry Mts differ morphologically and genetically from the Sudetian plants and represent a separate taxon (Ronikier & Szeląg, in prep.). Therefore the localities from the Nízke Tatry Mts are not considered on the distribution map of *H. silesiacum* (Fig. 32).

FURTHER SPECIMENS EXAMINED: Cited by Szeląg (2004b), excluding specimens collected in the Nízke Tatry Mts.

Hieracium telekianum Boros & Lengyel (Figs 33 & 34)

H. telekianum Boros & Lengyel, Scripta Bot. Mus. Transsyl. **1**: 8. 1942. − INDICATIO LOCOTYPICA: 'Habitat in rupibus andesiticis mt. Sólyomkő supra balneas Tusnádfürdő (Comitatus Csik Transsilvaniae), leg. die 9. Jul. 1941 Prof. Dr. R. Soó de Bere et Dr. Z. Hargitai, die 16. Jul. 1941 Dr. Á. Boros.' − LECTOTYPE (designated here): Comit. Csik. In rupestribus andesiticus 'Sólyomkő' supra Tusnádfürdő 840 m, 16. Jul. 1941, *Á. Boros* (BP 351923) − ISOLECTOTYPES: BP 193492, 466783, 466784, CL 197951 − ICONOGRAPHY: Scripta Bot. Mus. Transsyl. **1**: 10, fig. 1942; Fl. Rep. Pop. Romîne **10**: 514, Tab. 98, figs 3, 3a, 3b. 1965.

DESCRIPTION. Phyllopodous. Stem 20–30 cm high, robust, within synflorescence with scattered stellate hairs, sparse, 2–3 mm long, dark-based simple hairs, few darkish glandular hairs and sparse microglands, in the middle glabrous, just at the base with sparse, pale, 2–3 mm long simple hairs. Leaves coriaceous, glaucous and dark-purple-spotted on the upper surface, on both surfaces glabrous, on the margins with sparse, 0.5–1 mm long simple hairs mixed with yellowish glandular hairs. Basal leaves 3–5, obovate to oblanceolate, ± spathulate, remotely denticulate, 7–12 cm long and 2.5–3 cm wide, narrowly acute at apex, tapered to a winged petiole, covered by numerous, 3 mm long simple hairs. Cauline leaves 4–8, gradually reduced upwards, ovate to obovate, acute at apex, entire or almost so, semi-amplexicaul. Synflorescence with 3–6(–8) capitula. Synflorescence branches monocephalous, up to 10 cm long. Acladium 1.5–4 cm long. Peduncles thin, erect, green, with sparse to numerous stellate hairs and microglands, numerous to dense, 3–4 mm long, dark-based simple hairs, and numerous, dark, 0.2–0.3 mm long glandular hairs. Bracteoles 2–3, lanceolate to linear, pale green, covered by sparse simple hairs mixed with glandular hairs. Involucres broadly cylindrical and subglobose at the base, 12–13 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, 2 mm wide at the base, lanceolate, obtuse to subacute at apex, the outer bracts dark green, with pale margin, with numerous, 2–4 mm long, dark-based simple hairs and numerous, 0.1–0.4 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:1) and sparse microglands; the inner bracts with wide, pale margins and less dense indumentum. Ligules glabrous at apex. Styles dark. Achenes brown, (4.5–)4.7–4.9 mm long. Pollen numerous, spherical and of varying size. Flowering: second half of June and first half of July.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Eastern Carpathians: Hargitha Mts (Fig. 34) on Mt. Piatra Şoimilor – *locus classicus* ('Solyomkő' in Hungarian) in Băile Tuşnad

Fig. 33. Lectotype of *Hieracium telekianum* Boros & Lengyel.

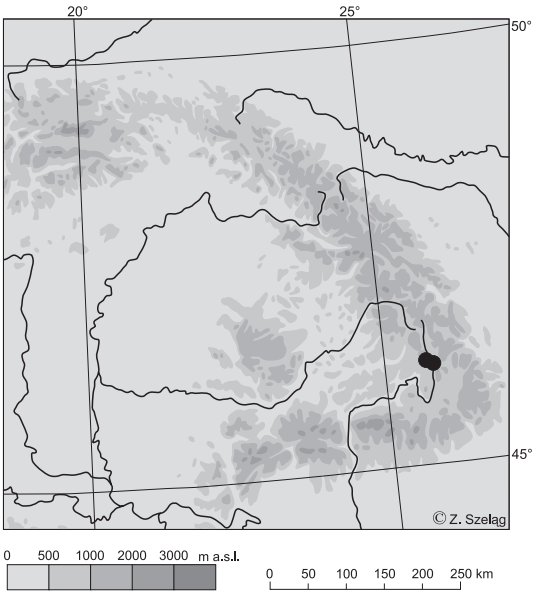

Fig. 34. Distribution of *Hieracium telekianum* Boros & Lengyel.

and on Mt. Cetății (Várteto in Hungarian) in Băile Tuşnad. In crevices of andesite rocks, at 800−1000 m a.s.l.

NOTE. One of the most distinctive Carpathian endemics, which occupies an isolated taxonomic position in *Hieracium* sect. *Cernua*.

FURTHER SPECIMENS EXAMINED: Hungaria mer.-or. Comit. Csik, prope Tusnádfürdő. In rupibus andesiticus mt. Sólyomkő 840 m, 27. Jul. 1942, *L. Vajda* (BP 211963, 211964, 211965); Hungaria mer.-or. Comit. Csik, prope Tusnád. In rupibus montis Várteto 1000 m, 22. Jun. 1943, *L. Vajda* (BP 200030); Hungaria mer.-or. Comit. Csik. In rupium fissuris montis Várteto supra Tusnád 1000 m, 19. Jun. 1943, *L. Vajda* (BP 211562); Hungaria mer.-or. Comit. Csik, prope Tusnád. In rupium fissuris montis Sólyomkő 840 m, 27. Jun. 1943, *L. Vajda* (BP 200049, BP s. n.); Hungaria mer.-or. in rupestribus andesiticus Sólyomkő supra Tusnad 840 m, 21. Jul. 1943, *Á. Boros & G. Lengyel* (BP 524003); Transsylvania, Tusnádfürdő, in rupe andisitico Sólyomkő 800−840 m, 17. et 27. Jun. 1943, *S. Jávorka & I. Keller* (BP 193486, 193487); Transsylvania orient. Ad balneas Tusnádfürdő in rupibus montis Biklea tetö mt. Sólyomkő supra rivum Piliske-patar, 12. Jul. 1943, *I. Keller* (BP 193491); Transsylvania, Tusnádfürdő, in rup. andisiticis m. Sólyomkő, 17. Jun. 1943, *S. Jávorka & I. Keller* (BP 193489); Comit. Csik. In rupibus andesiticis montis Sólyomkő supra pagum Tusnád, 840 m, 21. Jul. 1943, *Z. Kárpáti* (BP 193490); Transsylvania, Várteto 19. Jun. 1943, *S. Jávorka & I. Keller* (BP 193484); Transsylvania, in rupibus andesiticis in latera merid.-occid. montis Várteto ad balneas Tusnádfürdő 950 m, 19. Jun. 1943, *S. Jávorka & I. Keller* (BP 193485); Transsylvania, Tusnádfürdő in rupibus minoribus singularibus supra Sólyomkő (Arant rivulam) 800 m in fageto mixto, 21. Jun. 1943, *S. Jávorka & I. Keller* (BP 193488); Hargita Mts, Mt. Piatra Şoimilor in Băile Tuşnad, crevices of andesite rock 800 m, 26. Jul. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium tomiasae (Nyár. & Zahn) Nyár.
(Figs 35 & 36)

H. tomiasae (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 506. 1965 − *H. sparsum* subsp. *tomiasae* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 68. 1929 − INDICATIO LOCOTYPICA: 'In mte Tomiasa supra Gura apii, ad ripam sinistram fl. Râu mare in montibus Rătezat, 1700 m' − LECTOTYPE (designated here): Transsilvania, distr. Hunedoara. Mtibus Rătezat. In monte Tomiasa ad Gura apii, alt. ca. 1700 m, 6. Aug. 1925, *E. I. Nyárády* (BP 191283) − ISOLECTOTYPES: BP 195296, CL 156223, 156227, 155444, 156226, 156227 – ICONOGRAPHY: Fl. Rep. Pop. Romîne **10**: 495, Tab. 93, figs 3, 3a; Tab. 94, fig. 4. 1965.

DESCRIPTION. Phyllopodous. Stem 15–30(–40) cm high, robust, within synflorescence with scattered stellate hairs mixed with 3 mm long simple hairs, lower with sparse stellate and simple hairs, and sparse microglands, just at the base with numerous, up to 5 mm long simple hairs. Basal leaves 10–15, lanceolate to narrowly lanceolate, gradually tapered to a short, winged petiole, 3–7 cm long and 0.8–1.5 cm wide, entire or the outer ones sparse denticulate, acute at apex, on both surfaces with sparse to numerous, 2–3 mm long simple hairs, on the margins and along the midrib with dense, 2–3 mm long simple hairs. Cauline leaves 3–4(–6), small, rapidly reduced upwards, 1–2 cm long, entire, on the margins with sparse, 2–4 mm long simple hairs, lanceolate or narrowly lanceolate; the upper cauline leaf (leaves) linear, bract-like. Synflorescence compact, with 3–10(–15) erect capitula. Synflorescence branches 1–4 cm long, confined to upper part of stem, with 1–2 capitula.

Fig. 35. Lectotype of *Hieracium tomiasae* (Nyár. & Zahn) Nyár.

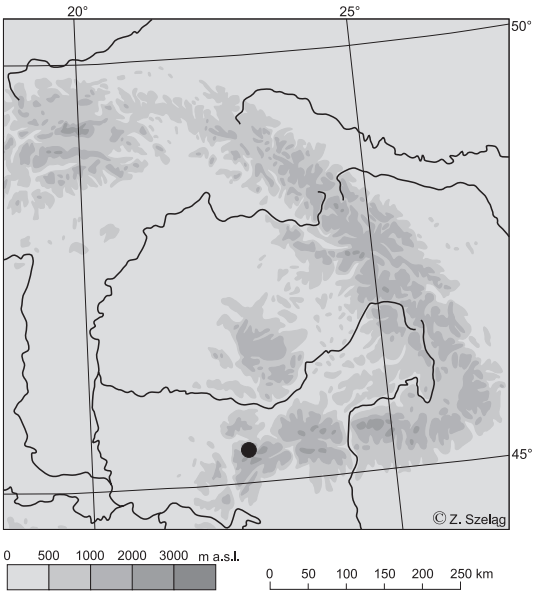

Fig. 36. Distribution of *Hieracium tomiasae* (Nyár. & Zahn) Nyár.

Acladium up to 1 cm long. Peduncles dark to blackish, with numerous to dense, 0.2–0.4 mm long, dark glandular hairs, and scattered to numerous stellate hairs, mixed with few, dark, 3 mm long simple hairs. Bracteoles 2–4, linear, dark green, with sparse glandular and simple hairs, and few stellate hairs. Involucres subglobose at the base, 10–12 mm long, covered by dense indumentum. Involucral bracts in two rows, 1.2–1.5 mm wide at the base, narrowly lanceolate, subacute at apex, dark or blackish, the outer bracts with numerous to dense, black, shiny, 2–3 mm long simple hairs and dense glandular hairs (ratio of simple hairs to glandular hairs 1:1 to 1:2), without stellate hairs, the inner bracts with glabrous margins and less dense indumentum. Ligules glabrous at apex. Styles dark. Achenes dark brown, (3.6–)3.8–4.0(–4.2) mm long. Pollen in anthers absent. Flowering: second half of July.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Southern Carpathians: Ţarcu Mts, known only from the *locus classicus* on the southern slope of Mt. Tomeasa, at 1700−1950 m a.s.l. (Fig. 36).

Hieracium tomiasae was also reported from Serbia (Niketić & Zlatković 1998). I saw a specimen collected by B. Zlatković on Mt. Besna Kobila in Serbia (BEO) and determined as *H. tomiasae*, which in my opinion represents a separate, hybridogenous taxon between *H. sparsum* and *H. pannosum s.l.*

FURTHER SPECIMENS EXAMINED: Fl. Rom. Exs. no. 1600. In rupestribus alpis Tomiasa supra vallem Râul mare, adversus montes Retezat 1900, 27. Jul. 1930, *E. I. Nyárády* (BP 191284, CL 430496, 438190, 619457); Ţarcu Mts, Mt. Tomeasa, SE rocky slope 1800 m, 2. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium tubulare Nyár. (Figs 37 & 38)

H. tubulare Nyár., Bul. Grăd. Bot. Cluj **8**: 144. 1929 − *H. sparsiflorum* subsp. *tubulatum* Zahn, Magyar Bot. Lapok **5**: 81. 1906 − *H. sparsum* subsp. *tubulare* Zahn *in* Engler, Das Pflanzenreich **IV.280**: 1022. 1922, *nom. illeg*. − LECTOTYPE (Szeląg 2006c: 313): Flora Hungarica, Comit. Hunyad. Retyezat, Vurfu Pelaga, alt. c. 2000−2300 m, 19. Aug. 1903, *A. de Degen* (BP 191291) − ICONOGRAPHY: Rchb. & Rchb. fil., Icon. Fl. Germ. Helv. **XIX/2**: fig. 306. 1904−1906; Fl. Rep. Pop. Romîne **10**: 491, Tab. 92, figs 2, 2a; 495, Tab. 93, figs 1, 1a, 1b. 1965; Icon. Fl. Part. Austro-Orient Eu. Centr.: 574, fig. 4221. 1975.

= *H. sparsum* subsp. *chlorocaesioides* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 65. 1929 (synonymized by Szeląg 2006c) − *H. tubulare* var. *chlorocaesioides* (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 501. 1965 − LECTOTYPE (Szeląg 2006c: 313): Mtes Retezatenzes. Inter Gura Zlata et Zănoaga 1500−1700 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156224).

= *H. sparsum* [var.] *pseudoporphyriticum* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 69. 1929 (synonymized by Szeląg 2006c) − LECTOTYPE (Szeląg 2006c: 313): Mtes Retezatenzes. Circa lacum Zănoaga 1850−2100 m, 20. Jul. 1927, *E. I. Nyárády* (CL 156284).

= *H. sparsum* f. *latifolium* Zahn, Bul. Grăd. Bot. Cluj **8**: 68. 1929 (synonymized by Szeląg 2006c) − ORIGINAL MATERIAL: not traced.

= *H. sparsum* f. *subevolutum* Zahn, Bul. Grăd. Bot. Cluj **8**: 68. 1929 (synonymized by Szeląg 2006c) − ORIGINAL MATERIAL: not traced.

− *H. sparsum* [var.] *subkotschyanum* Zahn *in* Ascherson

Fig. 37. Lectotype of *Hieracium tubulare* Nyár.

& Graebner fil., Synop. Mitteleur. Fl. 12(3): 654 [nec 659!]. 1938, *nom. inval*. (Art. 36.1. of the Code).

− *H. borbasii* Jáv. Magyar Fl.: 1225. 1925, *nom. illeg*. (Art. 53.1. of the Code).

NOTES. The author of *H. tubulare* is Nyárády, because *H. sparsum* subsp. *tubulare* Zahn was an illegitimate name for *H. sparsiflorum* subsp. *tubulatum*. The lectotype of *H. tubulare* was chosen, accordingly, from among specimens collected by Degen in 1903. In the protologue of *H. sparsiflorum* subsp. *tubulatum*, Zahn (1906: 82) gave two localities: Mt. Peleaga in the Reteazat Mountains in Romania and Mt. Veternik in the Ljubična Planina Mountains in Bosnia. In the Reteazat Mountains *H. tubulare* is a relatively common species, but its occurrence in Bosnia remains doubtful and field investigations are necessary. Unfortunately, I have not traced any specimens collected by Beck in 1888 on Mt. Veternik in Bosnia.

DESCRIPTION. Phyllopodous. Stem 30–50 cm high, with sparse, pale, 2–3 mm long simple hairs, only at the base with scattered, up to 5 mm long simple hairs, within synflorescence mixed with few stellate hairs and numerous microglands. Basal leaves 4–8, 6–16 cm long and 1.5–2.5 cm wide, remotely denticulate, tapered to a winged petiole, covered by numerous, 3–5 mm long simple hairs, on both surfaces glabrous or almost so, on the margins with scattered, 1–1.5 mm long simple hairs; the 1–3 outer leaves (often absent by anthesis) dark-purple-spotted, shorter, elliptic, rounded at apex; the inner leaves oblanceolate to lanceolate, acute at apex. Juvenile rosette leaves covered by dense, grey hairs. Cauline leaves 1–2(–3), sessile, on both surfaces glabrous, on the margins and along the midrib (to the base of the leaves) with sparse, up to 2 mm long simple hairs; the lower cauline leaf lanceolate, with 1–2 teeth on each side, acute at apex; the upper cauline leaf (leaves) entire, narrowly lanceolate to linear, bract-like. Synflorescence with 3–6(–20) capitula. Synflorescence branches 1–4, 2–6 cm long, confined to upper part of stem, with 1–2 capitula. Acladium 1–3 cm long. Peduncles thin, green, flexuous or erect, with moderately dense, 0.3–0.8 mm long, dark glandular hairs, scattered microglands, sparse to numerous stellate hairs and scattered, dark, 2 mm long simple hairs. Bracteoles 2–3, linear, dark green or blackish, covered by numerous glandular and simple hairs. Involucres cylindrical, (11–)12–13 mm long, covered by moderately dense indumentum. Involucral bracts in two rows, 1.5 mm wide at the base, lanceolate, obtuse to subacute and glabrous at apex, dark green to blackish green with pale margins, covered by numerous, 1–2 mm long, dark-based simple hairs and dense, 0.3–0.6 mm long, yellowish glandular hairs (ratio of simple hairs to glandular hairs 1:2 to 1:3) and sparse stellate hairs at the base of involucres; the inner bracts with pale green margins and sparse indumentum. Florets yellow, tubular, glabrous at apex. Styles dark, included. Achenes brown, (3.4–)3.6–3.8 mm long. Pollen in anthers absent. Flowering: end of July and August.

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 3x = 27 apomictic (Mráz & Szeląg 2004).

DISTRIBUTION. Southern Carpathians: Retezat Mts (Fig. 38).

FURTHER SPECIMENS EXAMINED: Mtes Retezatenzes: Fl. Rom. Exs. no. 1600. In rupestribus alpis Tomiasa supra vallem Râul mare, adversus montes Retezat 1900, 27. Jul. 1930, *E. I. Nyárády* (BP 191284, CL 430496, 438190, 619457); Inter Gura Zlata et Zănoaga 1500−1700 m, 21. Jul. 1927, *E. I. Nyárády* (CL 155443); In decl. cacuminis Vrf. Retezat inter Pinos pumiliones et Juniperos nanas 1800−1900 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156286 planta c); In valle Zlătuia sub cacumine Vrf. Retezat 1800−1900 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156259); In valle Zlătuia supra Gura Zlata 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156260); Retezat, Zlătuia 1500 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156237); Ad rivum Bucura supra vallem Lăpusnicul mare 1600−1700 m, 27. Aug. 1930, *E. I. Nyárády* (CL 430078, 430079); In valle Zlătuia sub cacumine Vrf. Retezat 1800−1900 m, 3. Aug. 1925, *E. I. Nyárády* (CL 156250); Circa lacum Zănoaga 1850−2100 m, 20. Jul. 1927, *E. I. Nyárády* (CL 155442, 156261); Circa lacum Zănoaga 2050 m, 6. Aug. 1928, *E. I. Nyárády* (CL 430075); Sub Vrf. Retezat prope Gemenea 1900 m, 11. Aug. 1928, *E. I. Nyárády* (CL

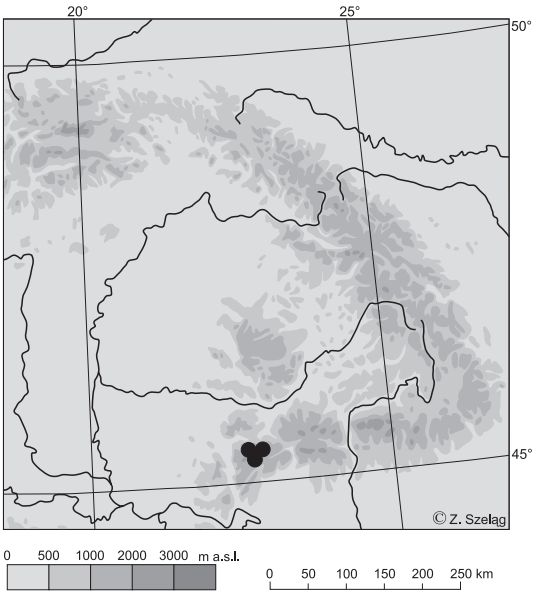

Fig. 38. Distribution of *Hieracium tubulare* Nyár.

430074); Sub cacumine Vrf. Retezat 1400−1600 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156247); In valle Zlătuia supra Gura Zlata 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156248); Inter Gura Zlata et Zănoaga 1500−1700 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156246); Fata Rătezatului 2100 m, 5. Aug. 1928, *E. I. Nyárády* (CL 430077); In valle Zlătuia sub cacumine Vrf. Retezat 1550 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156251, 156252); In valle Zlătuia 1200−1500 m, 21. Jul. 1927, *E. I. Nyárády* (CL 156262); In valle Zlătuia 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156256); In valle Zlătuia sub cacumine Vrf. Retezat 1400−1600 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156264); In valle Zlătuia supra Gura Zlata 1500 m, 1. Aug. 1925, *E. I. Nyárády* (CL 156249, 156257); Sub lacum Zănoaga 1900 m, 8. Aug. 1928, *E. I. Nyárády* (CL 430076); Ad rivum Judele sub lacum Zănoaga 1700 m, 11. Jul. 1933, *A. Borza & E. I. Nyárády* (CL 438617, 438618); Vrf. Tomiasa adversus Retezat 1900 m, 27. Jul. 1930, *E. I. Nyárády* (CL 430082, 430083, 430084); S. decli. Vrf. Gropita adversus Retezat 1750−1800 m, 27. Jul. 1930, *E. I. Nyárády* (CL 430080); Fata Feti supra Gura Api 1200−1600 m, 7. Aug. 1925, *E. I. Nyárády* (CL 156263); Fl. Rom. Exs. no. 891. In valle Pişaturile ad lacum Tăul Negru 1850−1900 m, 6. Aug. 1928, *E. I. Nyárády* (BP 191295, CL 430331); Ad rivum Zlătuia 1500−1800 m, 9. Aug. 1928, *E. I. Nyárády* (CL 156679); Mt. Buta, 26. Jul. 1956, *S. Csürös* (CL 55997, 562752); Flora Hungarica, Comit. Hunyad. Retyezat, Vurfu Pelaga, alt. c. 2000−2300 m, 19. Aug. 1903, *A. de Degen* (BP 191292, 191289, 191290, 351930, CL 157691, WRSL s.n.); Retyezát in graminosis alpinis ad lacum Bucura, 12. Aug. 1910, *S. Jávorka*, (CL 511280); Com. Hunyad, Retyezat, in abietis supra Gura api, 25. Jul. 1938, *L. Vajda* (BP 210422); La Taul Negru in montii Retezatului 7. Aug. 1959, *E. Ghişa* (CL 584124, 584125, 584127); Mtii. Zeicu et vallis Zeicu adversus Retezat 1800 m, 27. Jul. 1930, *E. I. Nyárády* (CL 430081); In saxosis alpinum Hatszegiertium, Transsilvaniae, 12−21. Aug. 1874, *L. Simonkai* (BP 191296 plantae a et c); In saxosis alpinum Retyezat ad lacum Zanoga, 18. Aug. 1874, *L. Simonkai* (BP191294); Retyezat, supra Gura api, 29. Jun. 1932, *L. Vajda* (BP 281184); Comit. Hunyad, Retyezat, in abietis supra Gura api, 26. Jul. 1938, *L. Vajda* (BP 281182); Retezat Mts, Saua Ciurila pass, open grassy places in *Pinus mugo* communities on granite at 1730 m, 6. Aug. 2005, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Mt. Buta, grassy slope 1770 m, 9. Aug. 2004, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Retezat Mts, Mt. Radeşu Mare, E slope 1900 m, 28. Jul. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

Hieracium vierhapperi (Zahn) Szeląg

(Figs 39 & 40)

H. vierhapperi (Zahn) Szeląg, Polish Bot. J. **49**: 112. 2004 − *H. 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) − ICONOGRAPHY: Carinthia II **184/104**: 74, fig. 1. 1994; Polish Bot. J. **49**: 114, fig. 1. 2004.

= *H. sparsum* subsp. *paulii* Szeląg, Feddes Repert. **111**: 257. 2000 (synonymized by Szeląg 2004a) − HOLOTYPE: [Italien, Südtirol] Unsere Frau v Tyrolsku, *J. Paul 3551* (PR) − ICONOGRAPHY: Feddes Repert. **111**: 258, fig. 1; 259, fig. 2. 2000.

DESCRIPTION. Aphyllopodous. Stem 25–45 cm high, within synflorescence very sparsely covered with stellate hairs and sparse microglands, in the middle glabrous, only at the base with sparse, 2 mm long simple hairs. Basal leaves usually withered at anthesis. Cauline leaves 5–8(–10), gradually reduced upwards, entire or almost so, somewhat coriaceous and glaucescent, lanceolate, acute at apex; the lower cauline leaves oblanceolate, 10–15 cm long and 1.5–2 cm wide, gradu-

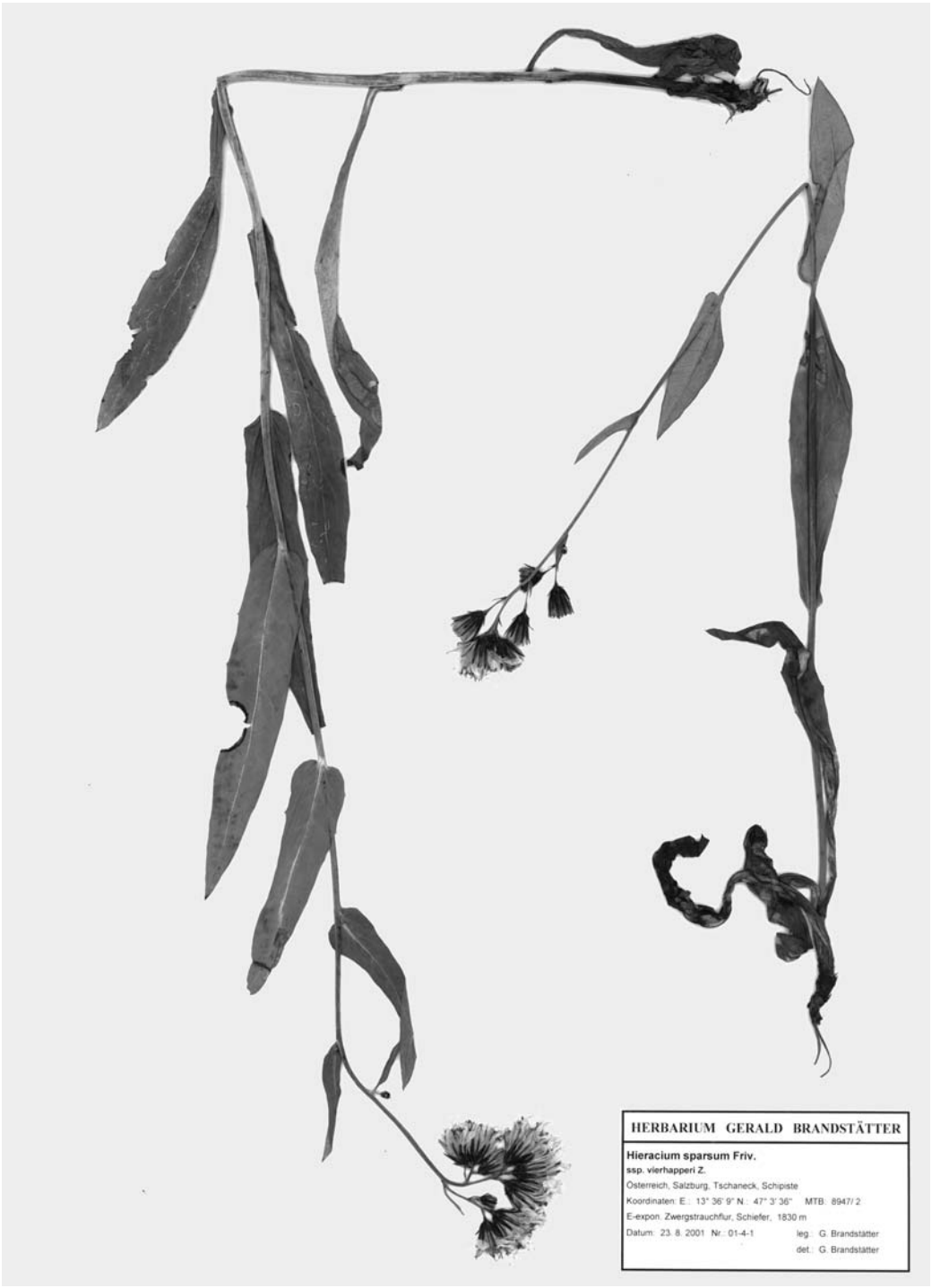

Fig. 39. Representative specimens of *Hieracium vierhapperi* (Zahn) Szeląg (Österreich: Salzburg, Tschaneck, 1830 m, 23. Aug. 2001, *G. Brandstätter*).

ally tapered to a wide, winged petiole, covered by numerous, 1–2 mm long simple hairs; the upper cauline leaves up to 2 cm wide, broadest at the base, semi-amplexicaul, glabrous or with sparse 1–1.5 mm hairs at margins in the lower part. Synflorescence compact with (3–)5–10(–15) capitula. Synflorescence branches confined to upper part of stem, short with 1–4 capitula. Acladium up to 0.5 cm. Peduncles green, mostly shorter than involucres, with numerous to dense stellate hairs, mixed with few, 1 mm long simple hairs and 0.2 mm long, yellowish glandular hairs as well as scattered microglands. Bracteoles 1–2, linear, dark green, with sparse indumentum. Involucres campanulate, 9–10 mm long, covered by sparse indumentum. Involucral bracts in two rows, 1.5(−2) mm wide at the base, lanceolate, obtuse at apex, dark green, the outer bracts without pale margin, with sparse, 1–2(–2.5) mm long simple hairs and yellowish to blackish, 0.3–0.5 mm long glandular hairs (ratio of simple hairs to glandular hairs 1:1 to 1:2) and few stellate hairs mainly at the base, the inner bracts green, with sparse indumentum. Ligules yellow, glabrous at apex. Styles dark. Achenes brown, (3.8–)4.0–4.3 mm long. Pollen few of varying size. Flowering: second half of July and August. (Description based on plants from the Alps).

CHROMOSOME COUNT AND MODE OF REPRODUCTION: 4x = 36 apomictic (Szeląg 2004a, 2006a).

DISTRIBUTION. Eastern Alps: Hafnergruppe, Mt. Kareck near Schellgaden (Vierhapper 1926), Gurktaler Alpen, Reichenau, Stangalpe (Zahn 1938), Karnische Alpen, Stranig, Streniger Alm (Gottschlich 1994), Alpi Venoste, Val Senáles, Madonna di Senáles [Unserfrau in Schnals] (Szeląg 2000); Western Carpathians: Nízke Tatry Mts, massif of Prasiva (Fig. 40).

Hieracium vierhapperi has been for years recognized as an alpine endemic. Recently this species has been found in the Nízke Tatry Mts in the Western Carpathians (Szeląg 2006a).

FURTHER SPECIMENS EXAMINED: Österreich: Salzburg, Tschaneck, Schipiste, 1830 m, 23. Aug. 2001, *G. Brandstätter 01-4-1* (Herb. G. Brandstätter); Hafnergruppe, Kareck massif, E slope of Mt. Tschaneck, 1860 m, 22. Aug. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Hafnergruppe, Kareck massif, Saraberger Wiesen, 1770 m, 22. Aug. 2003, *Z. Szeląg* (Herb. Hierac. Z. Szeląg); Radstädter Tauren-Katschberg, Tachaneck W Katschberghöhe 1750−1780 m, 15. Aug. 1998, *G. Gottschlich & M. Nydygger* (Herb. G. Gottschlich); Kärnten, Stangsattel 30. Jul. 1932, O. & E. Behr (W 1395, 7591). Italy: [Alpi Venoste, Val Senáles, Madonna di Senáles] Unsere Frau v Tyrolsku, *J. Paul 3551* (PR). Slovakia: Nízke Tatry Mts, Horske louky na hřebeni Prašivé, 1700 m, 5. Aug. 1959, *Fr. Černoch* (BRNM 516639); Nízke Tatry Mts, Mt. Prašivá, 1515 m, 16. Aug. 2002, *Z. Szeląg* (Herb. Hierac. Z. Szeląg).

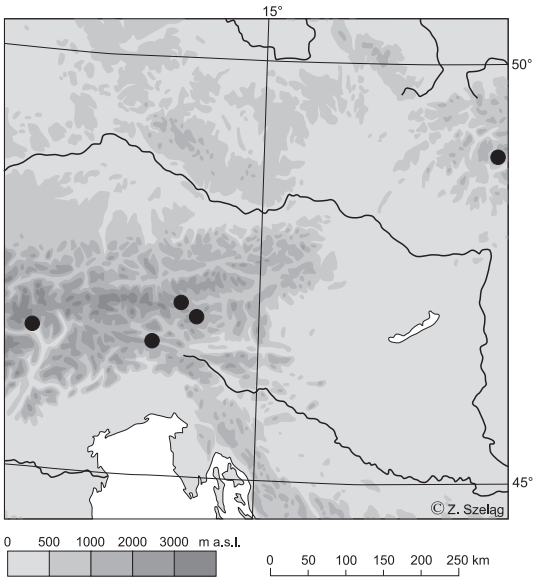

Fig. 40. Distribution of *Hieracium vierhapperi* (Zahn) Szeląg.

Hieracium zanogae Pax

H. zanogae Pax, Grundz. Pfl.-Verbr. Karp. **2**: 98. In: Engler A. & Drude O. (eds), Veget. Erde **10**. 1908 − *H. sparsum* subsp. *zanogae* '*zanoagae*' (Pax) Zahn *in* Ascherson & Graebner fil., Synop. Mitteleur. Fl. **12**(3): 650. 1938 − INDICATIO LOCOTYPICA: 'Retyezát, inter frutices Pini pumilionis ad latera montis Verfu Zanoga dicti alt. fere 2000 m, 15. Aug. 1902 F. Pax' − ORIGINAL MATERIAL: not traced.

DESCRIPTION. Caulis 30–40 cm fere altus, flexuosus, gracilis, basi villoso-pilosus, apicem

versus pilosus, floccosus, glandulosus. Folia basalia petiolata, lanceolata, acuta, mucronata, in petiolum lamina breviorem attenuata, integra vel leviter denticulata, subglaucescentia, juvenilia villosa, mox glabrescentia et tantum sparse pilis albis, longis vestita, margine densius ciliata, 4–5 cm longa, 1,5 cm fere lata; caulina 1–2, inferius basalibus simile, minor, sessile, glabrius, superius bracteiforme. Inflorescentia 3–5-cephala; ramuli erecti vel subflexuosi. Involucrum cylindrico-ovatum; squamae angust[a]e lanceolatae, 12 mm fere longae, acutae vel exteriores paulo obtusiusculae, nigrae, margine pallidae, nigropilosae, glandulosae, subfloccosae. Ligulae luteae [ex descriptione cl. Pax (1908) nam specimina in herbario ejus desunt].

DISTRIBUTION. Southern Carpathians: Retezat Mts: 'Inter frutices Pini pumilionis ad latera montis Verfu Zanoga dicti alt. fere 2000 m, 15. Aug. 1902, *F. Pax*' (non vidi).

NOTES. The species epithet '*zanogae*' given in the protologue (Pax 1908) is related to the old topographic name 'Mt. Zanoga' now spelt 'Mt. Zanoaga'. According to Art. 60 of the Code, the original spelling '*zanogae*' should be kept (Greuter *et al*. 2000).

I have been unable to trace any specimens of Pax's original collection in a number of European herbaria, including the herbaria of the Hungarian Natural History Museums in Budapest (BP) which host the Carpathian herbarium of Pax, and Natural History Museums in Wrocław (WRSL) where Ferdinand Pax worked. Zahn also had not seen Pax's original material and in *Das Pflanzenreich* wrote: 'Hieracium sparsum subsp. nomophilum Zahn. [...] verosimiliter = H. zanogae et sparsiflorum ×transylvanicum Pax, Grundz. Pfl.-Verbr. Karp. II. (1908) 98: forma minor oligocephala, descriptione nullomodo combinationi opinatae respondente' (cf. Zahn 1921−1923: 1021). Later on, in *Synopsis der Mitteleuropäischen Flora*, Zahn made the combination *H. sparsum* subsp. *zanogae* ('*zanoagae*'), simultaneously introducing some important diagnostic changes in comparison to the protologue of *H. zanogae*. The most important change concerns the size of involucres, reduced from 12 mm to 9–10.5 mm (cf. Zahn 1938: 651). In the list of localities Zahn does not mention specimens collected by Pax 'ad latera montis Verfu Zanoga dicti alt. fere 2000 m'. A specimen originating from that locality is, however, placed in the list of localities of *H. sparsum* [var.] *subkotschyanum* Zahn *nom. inval.* (Zahn 1938: 654 [nec 659!]). The description of that taxon suggests that these were plants with tubular florets (cf. Zahn 1938: 654).

In my opinion, the original description of *H. zanogae* indicates neither similarity of *H. zanogae* to *H. sparsum* subsp. *nomophilum* (= *H. borbasii*, see above), as supposed by Zahn (1938), nor connections with *H. transylvanicum*, as suggested by Pax (1908). On the other hand, characteristics included in the description suggest strong similarity of *H. zanogae* to *H. tubulare*: '*Involucrum cylindrico-ovatum; squamae angust[a]e lanceolatae, 12 mm fere longae, acutae vel exteriores paulo obtusiusculae, nigrae, margine pallidae, nigropilosae, glandulosae, subfloccosae*.' This similarity to *H. tubulare* is also indicated by the shape and pubescence of leaves and '*ramuli erecti vel subfexuosi*'.

Unfortunately, due to the lack of the original material, the taxonomic position of *H. zanogae* Pax remains unexplained.

Hieracium sparsum Friv.

H. sparsum Friv, Flora **19**: 436. 1836.

NOTE. The species has been reported from the Mt. Treskovać near Orşova in Banat by Zahn (1921−1923, 1938) on the basis of specimens collected by Frivaldzsky. In 2002 I visited Mt. Treskovać, but I was unable to find *H. sparsum*. Nor have I been able to trace any specimens cited by Zahn. However, the occurrence of *H. sparsum* in Banat is possible. Mt. Treskovać is the site of several Balkan species of *Hieracium*, with their sole Carpathian stations there. Among them, there is an endemic species, *H. bohatschianum* Zahn, which is represented by the formula *H. sparsum* − *H. schmidtii*, and *H. jankae* R. Uechtr., being most probably a hybrid between *H. sparsum* and *H. pannosum* (cf. Uechtritz 1873; Zahn 1910, 1938).

Because Zahn synonymized *H. sparsum* with *H. cernuum*, it is not sure which taxon was collected on Mt. Treskovać and therefore a description is not given.

Excluded taxa

The sectional placement of the putative intersectional hybrids is a general problem discussed above (see 'Taxonomic treatment'). After revision of the original specimens (stored at CL), I conclude that the following species should be excluded from *Hieracium* sect. *Cernua*:

Hieracium abietogenum Szeląg, Polish Bot. J. **48**: 11. 2003.

This species, described from the Retezat Mts, belongs to *H. dacicum* agg., which is morphologically intermediate between *H. prenanthoides s.l.* and *H. sparsum s.l.*

Hieracium fagarasense (Nyár. & Zahn) Nyár., Fl. Rep. Pop. Romîne **10**: 506. 1965 − *H. sparsum* subsp. *fagarasense* Nyár. & Zahn, Bul. Grăd. Bot. Cluj **8**: 66. 1929.

This species, described from the Făgăraş Mts, is very similar to *H. sparsum* subsp. *vestiticeps* (Zahn) Zahn, which occurs in the Stara Planina Mts in Bulgaria. Morphologically both taxa are situated between *H. racemosum s.l.* (probably *H. barbatum* Tausch) and *H. sparsum s.l.*, closer to the former taxon.

Hieracium perfoliosum Szeląg, Polish Bot. J. **48**: 12. 2003.

This species, described from the Godeanu Mts, belongs to *H. retyezatense* agg., a highly polymorphic taxon, morphologically intermediate between *H. bifidum s.l.* and *H. sparsum s.l.*, closer to the former taxon.

Hieracium pisaturense Nyár., Bul. Grăd. Bot. Cluj **8**: 149. 1929.

This species, described from the Retezat Mts, also belongs to *H. retyezatense* agg.

Phytogeographical considerations

The Southern Carpathians

The western part of the Southern Carpathians is an important centre of diversity of *Hieracium* sect. *Cernua* in Europe, the second largest after the Balkan Peninsula. Of particular significance are the Retezat Mountains which support 13 species. The diversity in the Retezat Mountains is interesting as *H.* sect. *Cernua* species do not occur in the central and eastern parts of the Southern Carpathians. What is especially surprising is that they are absent from the Pareng Mountains adjacent to the Retezat Mountains, whose vegetation is strikingly similar to that of Retezat Mountains. The only species shared with the Southern and Eastern Carpathians is *H. kotschyanum*, which beside the Retezat Mountains occurs also in the Apuseni Mountains and Maramures Mountains.

Altogether 14 species of *H.* sect. *Cernua* occur in the Southern Carpathians. Of them, 13 are endemic to Romania. The only non-endemic species is *H. sparsum,* reported from Banat by Zahn (1938). The modern range of *H. sparsum* covers the central part of the Balkan Peninsula and western Anatolia. Its isolated locality in Banat indicates that in the past the species may have occurred farther to the north of the Danube River than it does currently. In my opinion, the present occurrence of *H.* sect. *Cernua* in the Southern Carpathians, and probably also in the Apuseni Mountains, is what has been left of the original range of the diploid *H. sparsum* or another morphologically similar sexual species. All the remaining *H.* sect. *Cernua* species occurring currently in the Romanian Carpathians are polyploid apomicts, which probably originated as the result of hybridization between a supposed diploid species and taxa belonging to other sections. In addition to hybridization leading to the creation of F1 hybrids, other possibilities are (i) backcrossing leading to the creation of introgressive forms, and (ii) crossing between F1 hybrids and third taxa. It is, however, necessary to investigate whether polyploidization played a role in the present morphological differentiation of the section. The possible involvement of all these

processes means that suggestions of parental taxa on morphological features are highly speculative for most modern species of *H.* sect. *Cernua*. It seems, however, that in some cases hybrid origin is possible. One example is the group of species with semi-globose involucres covered by dense, simple hairs, particularly *H. pawlowskianum, H. polyphyllobasis* and *H. tomiasae*. In my opinion, these species may have originated as the result of hybridization and/or introgression between diploid *H. alpinum* L., common in the Southern Carpathians, and *H. sparsum* during a period where the ranges of these two sexual species were contiguous (*H. sparsum* is extinct in the Retezat Mountains).

Taxa with densely hairy, semi-globose involucres also occur in the central part of the Balkan Peninsula. They are *H. sparsum* subsp. *squarrosobracchiatum* Behr & Zahn, *H. sparsum* subsp. *korabense* Behr & Zahn and *H. sparsum* subsp. *naegelianiforme* Behr & Zahn in Macedonia (Zahn 1938). The origin and systematic position of these taxa within *H.* sect. *Cernua* require a future study.

THE EASTERN CARPATHIANS AND THE APUSENI MOUNTAINS

In the Eastern Carpathians, *Hieracium* sect. *Cernua* is represented by 4 species. *H. coldei* and *H. telekianum* occur together in an isolated locality in the Hargita Mountains in central Romania (Figs 6 & 34). The remaining two species, *H. kotschyanum* and *H. porphyriticum*, occur in western Romania (Figs 11 & 30). In western Romania the distribution of species overlaps to a great extent with the so-called Dacian migroelement route (Hendrych & Hendrychová 1979), which may explain their absence in the eastern part of the Southern Carpathians. In my opinion, the Apuseni Mountains, which, due to their geographical situation, are predestined to be a refugial area, were of key importance on that route (cf. Bodnariuc *et al*. 2002). Currently there are two species in the Apuseni Mountains: the endemic *H. porphyriticum,* and *H. kotschyanum* which has the widest range of all the Carpathian species of the section (Fig. 11). *H. kotschyanum* also has the widest ecological requirements and seems to be most able to migrate. It occurs primarily at the upper forest limit but also colonizes eroded, deforested slopes and even gravel pits in river valleys. The lowest situated and simultaneously most abundant localities of *H. kotschyanum* are just in the Apuseni Mountains, at 600 m a.s.l. The remaining Carpathian species of the section, including *H. porphyriticum*, are connected with the subalpine belt and show no propensity to migrate along river valleys. These species, enclosed by a ring of mountain spruce forests, have probably been growing above the forest limit continuously since their origin. The planned genetic studies on *H*. sect. *Cernua* in the Carpathians should perhaps allow us to determine where *H. kotschyanum* originated. It seems, however, that the occurrence of this species in the Maramures Mountains in the north of the range is a result of a late-glacial migration from the supposed refuge in the Apuseni Mountains.

The occurrence of *H. telekianum* and *H. coldei* in the Hargita Mountains in the Eastern Carpathians is connected with another migration wave, probably older than early Holocene. This part of the Eastern Carpathians is characterized by a number of distinguished endemics, including *Andryala levitomentosa* (Nyár.) Sell & West, *Silene zawadzkii* Herbich, diploid *Hieracium pojoritense* Woł. and *H. telekianum* which occupies an isolated taxonomic position in *H.* sect. *Cernua*.

THE WESTERN CARPATHIANS AND THE SUDETES

In the Western Carpathians and Eastern Sudetes, *Hieracium* sect. *Cernua* has been for years represented only by *H. silesiacum*. It is only recently that *H. vierhapperi* was found there in the Nízke Tatry Mountains, though known earlier from the Alps (Szeląg 2006a). The discovery of *H. vierhapperi* in the Carpathians and the absence of *H*. sect. *Cernua* species shared by Western and Eastern Carpathians suggest that its representatives have reached the Western Carpathians by a route leading through the Eastern Alps, and not directly from the South-eastern Carpathians. This supports Pax's (1898, 1908) hypothesis that 'die Waldkarpaten' (Forest Carpathians), a wide

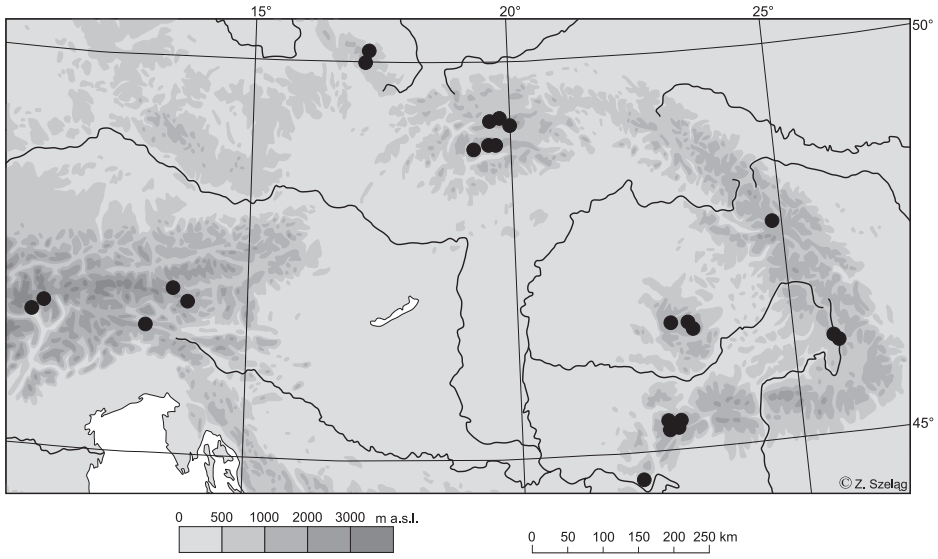

Fig. 41. General distribution of *Hieracium* sect. *Cernua* R. Uechtr. in the Carpathians, Sudetes and Alps.

and comparatively low transition zone between the Western and Eastern Carpathians, was more a barrier than a bridge for the east-west migrations of the subalpine flora between the Eastern and Western Carpathians during the Quaternary. The distribution of *H. kotschyanum* is also indicative of a migration barrier. During the (post)glacial migration to the north, this species was not able to cross the Forest Carpathians and stopped at the southern slopes of the Maramures Mountains.

On the other hand, *H. silesiacum* differs markedly in its morphology from *H. vierhapperi*, being simultaneously very similar to some species from the Romanian Carpathians. *H. silesiacum* is strikingly similar morphologically to *H. porphyriticum* from the Apuseni Mountains. Thus, it is also possible to formulate an alternative hypothesis that only *H. vierhapperi* has reached the Western Carpathians from the eastern alpine refugia, while the occurrence of *H. silesiacum* in the Western Carpathians is the result of migration from the Southern Carpathians, along a route leading through the Apuseni Mountains.

It is also possible that *H. silesiacum* survived the last glacial *in situ* on the southern foreland of the Western Carpathians and colonized the Eastern Sudetes in the early Holocene.

THE ALPS

Two species of *Hieracium* sect. *Cernua* occur in the Alps. One of them, *H. grisebachii*, is endemic to the Oetz valley in Tyrol. The species was also reported from the Rhodope Mountains in Bulgaria by Zahn (1921−1923) but the Bulgarian plants are now treated as *H. werneri* (Szeląg 2006b). The other alpine species is *H. vierhapperi* known from several localities in the Eastern Alps and found recently in the Western Carpathians (see above). Described from South Tyrol, Italy, *H. sparsum* subsp. *paulii* is conspecific with *H. vierhapperi* (cf. Szeląg 2004a). Both alpine species show much morphological similarity to the Balkan *H. sparsum* and *H. werneri* and to the south-Carpathian *H. magocsyanum*. In the Alps the occurrence of *H.* sect. *Cernua* has a relict distribution pattern and, as in the South-eastern Carpathians and Apuseni Mountains, is probably what remains of the old (perhaps even pre-Pleistocene) range of a diploid species.

The general distribution of *Hieracium* sect. *Cernua* in the study area, including the locality of *H. sparsum* in Banat, is presented in Figure 41.

ACKNOWLEDGEMENTS. I am grateful to the Curators of the following herbaria for the loan of, or access to, their collections: BP, BRNM, CL, KRA, KRAM, LI, PR,

PRA, PRC, SOM, W, WU, WRSL; and to Dr. Gheorghe Coldea, Cluj-Napoca, for his hospitality and help during my many visits to Romania. My special thanks are due to Dr. Tim C. G. Rich, Cardiff, for language revision and critical suggestions on an earlier version of the manuscript, and to Professor Werner Greuter, Berlin, for helpful comments and nomenclatural suggestions and corrections of the Latin. Dr. Jan Wójcicki is acknowledged for help at final stage of the munuscript preparation. This study was supported by the Polish State Committee for Scientific Research (KBN grants no. 2 P04G 042 28 and 2 P04G 064 30).

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Received 4 May 2006