

## THE *HIERACIUM PIETROSZENSE* GROUP IN THE CARPATHIANS

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**Abstract:** Three taxa are recognized at the species level within the *Hieracium pietroszense* group in the Carpathians. Each of them is likely to be a stenoendemic of the particular mountain range. *H. pietroszense* DEGEN et ZAHN is a tetraploid species ( $2n=36$ , first karyological report) confined to the relict rocky biotopes in the subalpine belt of the Munții Rodnei (Romanian East Carpathians). *H. borsanum* ZAHN ex MRÁZ growing on the more-or-less disturbed sites in the supramontane and subalpine belt of the same mountain range, is closely related to *H. pietroszense*. This triploid ( $2n=27$ ) apomictic species prefers tourist paths and their margins, or it can be found on the secondarily formed subalpine pastures. *Hieracium deylii* MRÁZ is a new taxon found in the relict subalpine grassy-rocky biotopes in the Svydovets' Mts. (Ukrainian East Carpathians). It is tetraploid ( $2n=36$ , first report) with apomictic formation of seeds. Detailed morphological descriptions, with figures, nomenclature and the main distinguishable characters for all three species, are given. The other taxa included in this collective intermediate species by Zahn are discussed. The neotype for *H. pietroszense* is selected. Lectotypes are chosen for some other names.

**Keywords:** Apomixis, Breeding system, Chromosome numbers, *Hieracium*, *Hieracium* sect. *Alpina*, Taxonomy

### INTRODUCTION

The concept of the intermediate species in the genus *Hieracium* created by Nägeli and Peter and followed by Zahn is based on the presence of the morphologically well-defined taxa (the so-called main or basic species, Hauptarten, species principales) and intermediate relatives (Zwischenarten, species intermediae). Each “basic” species is characterized by a unique set of characters, by which it differs from other “basic” species. The intermediate species possess the features usually from two (or more) basic species and are thought to be of hybrid origin. If the basic or intermediate species contain more than one taxon, ZAHN (1922–1939) called them basic collective species or intermediate collective species (species principales collectivae, species intermediae collectivae). According to this concept, *Hieracium pietroszense* represents the intermediate collective species morphologically standing between two “basic” species – *H. alpinum* L. and *H. bifidum* HORNEM., and this position can be expressed by the following morphological formula  $H. alpinum \geq bifidum$  (ZAHN 1936, SELL & WEST 1976). SELL & WEST (1976) adopted another informal taxonomic unit – the species group, which generally corresponds to Zahn’s basic collective or intermediate collective species.

The present study is a continuation of the recent taxonomic investigation in the *Hieracium* sect. *Alpina* (GRISEB.) GREMLI in Central Europe (CHRTEK 1997, CHRTEK & MARHOLD 1998, MRÁZ 2002).

### SYSTEMATIC POSITION AND DELIMITATION OF THE GROUP

Due to a reticulate pattern of variation within the genus, generally, it is difficult to draw the boundaries between species groups in the genus *Hieracium* (or between other taxonomic units between genus and species, e.g. section). The *Hieracium pietroszense* group, belonging to the *Hieracium* sect. *Alpina* (for recent infrageneric division see STACE 1998), is very poorly known from a taxonomic point of view. The members of the group are well separated from the *Hieracium alpinum* group in their habit, in having broadly elliptic, ovate or ovate-lanceolate basal leaves with often denticulate to dentate margins, and with a truncate to cuneate base to the leaf lamina; they have usually more than one head with scattered to subnumerous stellate trichomes on the involucre bracts. The taxa of the *H. pietroszense* group more resemble *H. bifidum* than *H. alpinum* because of the presence of stellate trichomes on the involucre, the shape of basal leaves and having more than one head. They differ, however, from the *H. bifidum* group in having usually a little bigger heads, a higher density of longer simple glandular trichomes on the involucre and peduncles, small yellowish glandular trichomes on the leaves, and by the presence of very short simple glandular trichomes on the ligule teeth. Delimitation of the *H. pietroszense* group from the representatives of the *H. atratum* group (*H. murorum* > *alpinum*) is rather difficult and arbitrary in some cases (e.g. *H. deylii*, see below). However, the presence of the stellate trichomes and the lower density of glandular ones on the flower heads in the plants of the *H. pietroszense* group can be useful discriminative characters. According to SELL & WEST (1976) the *Hieracium rohacsense* group is a parallel species group to the *H. pietroszense* group. The taxa of the *H. rohacsense* group differ in having usually oblong to narrowly elliptic basal leaves with an attenuate base of leaf lamina. They usually occupy subalpine meadows on acid ground, while the members of the *H. pietroszense* group usually prefer more relict – rocky biotopes with alkaline soil reaction, and have broadly elliptic, ovate or ovate-lanceolate basal leaves with a truncate to cuneate base of leaf lamina. Although ZAHN (1936) supposes that the collective intermediate species *H. pietroszense* is closer to *H. alpinum* than to *H. bifidum* (morphological formula  $H. alpinum \geq bifidum$ ), it is evident from the species groups set of morphological characters that it is more related to *H. bifidum*. In the present taxonomic concept, the triploid species *H. borsanum* MRÁZ has been included in this species group on the base of a putative evolutionary history shared with *H. pietroszense* (see below), although ZAHN (1936) put it in *Hieracium rohacsense* at the rank of subspecies. However, morphologically *H. borsanum* probably occupies an intermediate position between the *H. pietroszense* and *H. rohacsense* groups.

### TAXONOMIC HISTORY

The last taxonomic study of the *Hieracium pietroszense* group in Central Europe (ZAHN 1936) includes 6 taxa treated at the subspecies level. Besides *H. pietroszense* subsp. *pietroszense* and subsp. *bifidifolium* DEGEN et ZAHN, both described from the Munții Rodnei

(the Romanian East Carpathians), the rest of the taxa have been described from geographically rather distant areas. *H. pietroszense* subsp. *subbifidifolium* NYÁR. et ZAHN, and subsp. *spathophorum* NYÁR. et ZAHN from the Munții Retezatului (the South Carpathians); *H. pietroszense* subsp. *jarzabczynum* PAWL. et ZAHN from the Tatra Zachodnie Mts. (the West Carpathians); and *H. pietroszense* subsp. *crocydeilema* HARZ et ZAHN, nom. inval. (Art. 36.1., German diagnosis, cf. GREUTER et al. 2000) from the Bayerische Alpen.

NYÁRÁDY (1965) recognized 7 infraspecific entities within *Hieracium pietroszense* in the Romanian flora, all in the rank of variety. Three new names were, however, published invalidly (NYÁRÁDY 1965: 733, in Addenda): *Hieracium pietroszense* var. *sinuosifrons* PROD. ex NYÁR., nom. inval., *H. pietroszense* var. *ocolasense* ["ocolaşense"] PROD. ex NYÁR., nom. inval. and *H. pietroszense* var. *crassifolium* PROD. ex NYÁR., nom. inval. At first, these names, two at subspecies level (subsp. *crassifolium* and subsp. *ocolasense*) and one at the rank of variety (var. *sinuosifrons*), were published with Romanian diagnoses (PRODAN 1939). NYÁRÁDY (1965) attempted to validate these names, all in the rank of variety, giving them Latin diagnoses, but without indication of the type specimens. The other varieties, besides the typical one, are *H. pietroszense* var. *spathophorum* (NYÁR. et ZAHN) NYÁR., *H. pietroszense* var. *subbifidifolium* (NYÁR. et ZAHN) NYÁR. and *H. pietroszense* var. *bifidifolium* (DEGEN et ZAHN) NYÁR. (NYÁRÁDY 1965). The name *H. pietroszense* (without infraspecific taxa) has been mentioned also by POPESCU & SANDA (1998) and CIOCÂRLAN (2000) in the list of Romanian taxa. The *H. pietroszense* group was included neither in the Flora of the USSR (YUKSIP 1960), nor in the Chopyk's Identification key of plants of the Ukrainian Carpathians (CHOPYK 1977), nor in the most recent Ukrainian checklist (MOSYAKIN & FEDORONCHUK 1999).

The aim of the present study is to contribute to the solving of some taxonomical, nomenclatural and chorological problems within this species group. In the present study only those taxa are included for which I had corresponding living material. In addition notes on another taxa recognized by ZAHN (1936) are added.

## MATERIALS AND METHODS

The results are based on the study of populations in the wild, plants cultivated on the experimental fields at the Institute of Botany, Bratislava (1997–1998), in the Botanical garden, P.J. Šafárik University, Košice (1998–2002), and on the examination of herbarium specimens deposited in the following institutions (acronyms according to HOLMGREN et al. 1990): B, BM, BP, BRA, BRNM, BRNU, BUC, BUCA, CL, KRA, KRAM, LW, LWE, LWS, M, PR, PRA, PRC, SAV, SB, SLO, W, WRSL, WU and my collection (Herbarium PM).

Nomenclatural ( $\equiv$ ) and taxonomic ( $=$ ) synonyms, as well as invalid names or misidentifications ( $-$ ) are presented for the taxa. The information concerning the locality cited in the protologue is given after Ind. loc. Beneath the type headings the data from the label of type specimen are presented. Chromosome numbers for each studied taxon are provided; two of them are new counts. They are followed by data on mode of reproduction, pollen shape, ecology and distribution. The nomenclature of the taxa given in the ecological part of

Table 1. Main diagnostic characters useful for determination of three species from the *H. pietroszense* group.

Character/taxon	<i>H. pietroszense</i>	<i>H. borsanum</i>	<i>H. deylii</i>
Shape of lamina of rosette leaves (see also Fig. 2, 4, 6)	ovate to ovate-lanceolate; cuneate to contracted or sometimes truncate at base; denticulate to dentate (mainly in basal part of leaf lamina)	broadly elliptic or oblong to lanceolate (mainly inner leaves); cuneate or long attenuate at base or with winged petioles; basal part of lamina deeply dentate, often nearly cut to the central vein	elliptic, ovate to ovato-lanceolate; truncate to attenuate at base; denticulate to dentate mainly at the base of leaf-lamina
Length of the involucre	(10–)13–14(–16) mm	9–11 (–12) mm	10–11(–13) mm
Density of black glandular trichomes on the peduncles and involucre	rare	scattered	scattered to numerous
Simple eglandular trichomes on the involucre	dense, often curved, 1.5–2.0 mm long	numerous, patent, (1.0–)1.5–2.0(–2.5) mm long	numerous, slightly curved at the apex, up to 1.5 mm long
Ploidy level	tetraploid	triploid	tetraploid
Habitats	relict subalpine rocky biotopes, with alkaline soil reaction	disturbed biotopes in the subalpine meadows, along the tourist paths in spruce forests, with more acid soil reaction	relict subalpine grassy-rocky biotopes, with alkaline soil reaction

particular species follows mostly POPESCU & SANDA (1998) and MOSYAKIN & FEDORONCHUK (1999).

### Karyological investigations

Chromosome counts were made on the pot-grown plants. Root tip cuttings were pre-treated with 0.5% solution of colchicine for 1–2 hours at room temperature. Subsequently a mixture of absolute ethanol and acetic acid (3 : 1) replaced the colchicine. Roots were stored in 70% ethanol and hydrolyzed for 10 minutes in 1N HCl at 60 °C. The squash and smear method with cellophane replacing the glass covers followed MURÍN (1960). Giemsa solution in phosphate buffer was used as a stain. Selected permanent slides are stored at the Department of Experimental Botany and Genetics, P.J. Šafárik University, Košice. The number in the brackets after the locality means the number of plants in cultivation. Voucher specimens are deposited in SAV and in Herbarium P. Mráz.

The breeding system for *H. deylii* was determined by emasculation experiments. The “decapitulation” was carried out by using a razor blade to cut off the whole upper half of the unopened capitulum before anthesis (including the styles). Those flower heads (see *H. deylii*) producing apparently “normal” seeds after emasculation were treated as apomictic.

The pollen (its shape and size) was observed using a light microscope. After acetolysis following ERDTMAN (1960) the pollen grains from wild and cultivated plants were mounted in glycerol jelly or put directly into the distilled water and observed.

### Cultivation experiments

The phenotypic plasticity comparing plants from the field and those from the cultivation was recorded. Generally, the plants from the field, from more shady sites, are usually higher with larger leaf lamina. The denticulation of the leaf margin is more deep (compare Fig. 1 and Fig. 2), the number of stem leaves and capitula is usually a little higher in comparison with the plants cultivated in almost full sunshine. The cultivation under identical field conditions lowers morphological variability within the same agamospecies to a minimum. For these reasons, the cultivation experiments are inevitable for taxonomic study of agamic complexes (for detailed observations in the genus *Hieracium* see paper by SCHUHWERK & LIPPERT 1998).

### ACCOUNT OF THE *HIERACIUM PIETROSZENSE* GROUP

The present taxonomic concept includes three species. They can be distinguished on the base of characters summarized in Table 1.

#### 1. *Hieracium pietroszense* DEGEN et ZAHN

(Fig. 1, 2)

*H. pietroszense* DEGEN et ZAHN in ZAHN, Magyar Bot. Lapok 5: 72, 1906.

Ind. loc.: “Rodnaer Alpen: Pietrosz, Nordseite 1800 m (ADE [=ARPÁD VON DEGEN])”.

**Neotypus (hoc loco designatus):** Romania septentrionalis, Montes Rodnenses, situ meridionali a pago Borşa, in declivio septentr.-orientali montis Pietrosul Mare (2303), 0.3 km situ septentr.-occidentali ad lacum glaciale “La Iezer”, loco petroso calcareo, ca. 1835–1850 m s.m., 24.VII.1997, P. MRÁZ & P. TURIS (neotypus: SAV; isoneotypi: BRA, Herbarium PM).

– *H. pietroszense* subsp. *eupietroszense* ZAHN in GRAEBNER f. (ed.), Syn. Mitteleurop. Fl. 12(3): 207, 1936; nom. inval. (Art. 24.3.).

**Icones:** MURR et al. in REICHENBACH & REICHENBACH f. Icon. Fl. Germ. Helv. Pars II, Tabulae 82–174, 1909: tab. 149 A 1–3.

**Note on the neotypification:** No original material has been found in any of the herbaria studied. From the cross reference to the illustration in the text part of the Icones Florae .... (MURR et al. 1909: 192) it is obvious that the plants collected by A. Degen at the locus classicus had served as a model according to which this illustration was made. As there is no extant original material and there is no proof that Zahn saw the illustration during the preparation of the description (ZAHN 1906), the selection of a neotype in the sense of Art. 9.6 of the ICBN (GREUTER et al. 2000) is inevitable. I chose my own collection coming from the locus classicus as a neotype specimen.

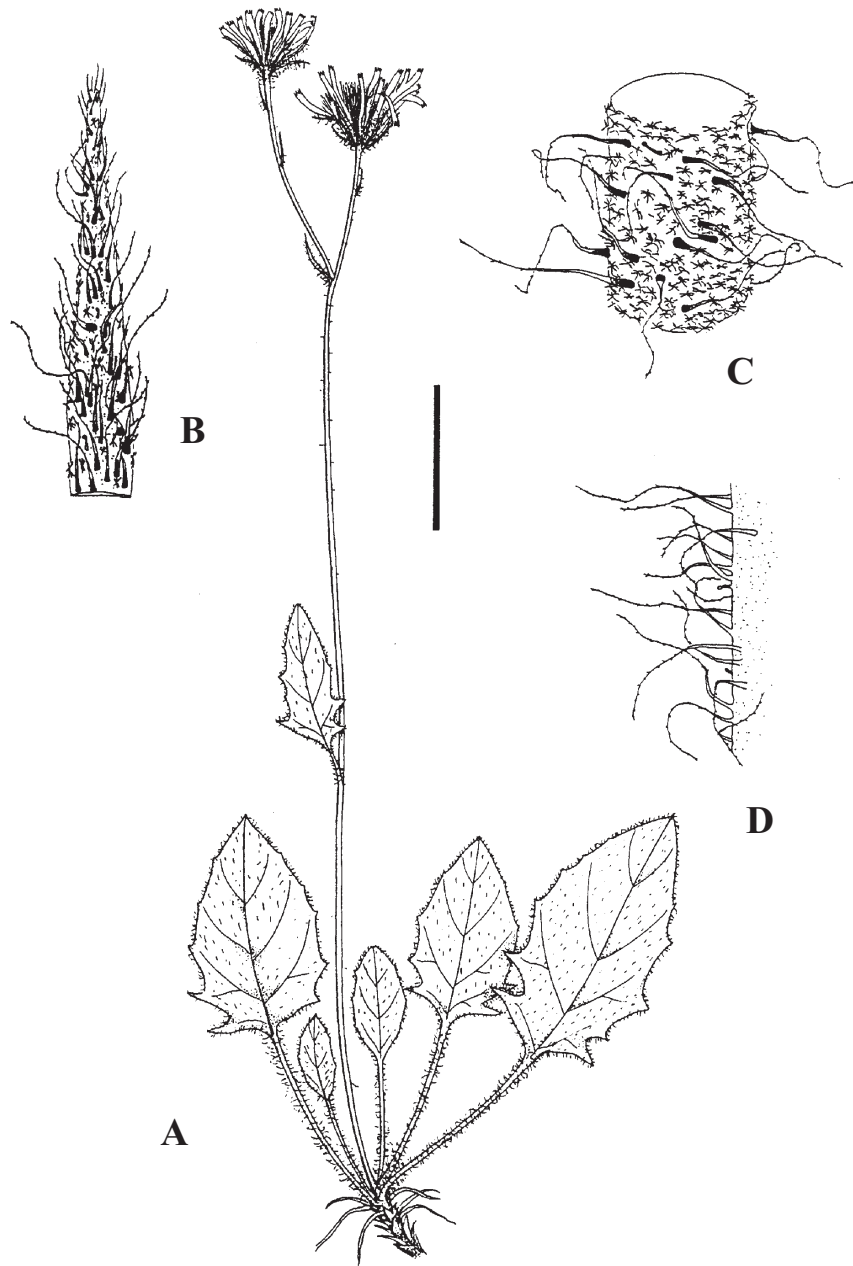


Fig. 1. *Hieracium pietroszense* – A whole plant (del. Z. Komárová), B – involucre, C – peduncle, D – leaf margin. Scale bar = A: 3 cm, B: 4 mm, C: 2 mm, D: 1 mm.

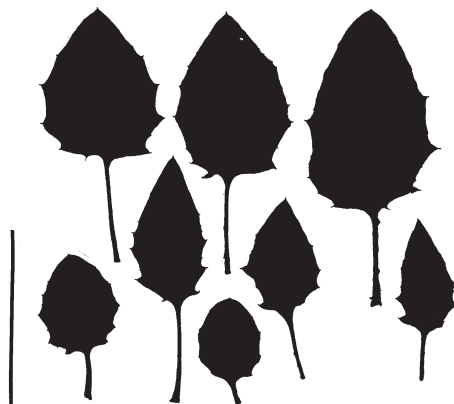


Fig. 2. *Hieracium pietroszense* – leaf spectrum of rosette leaves (from several cultivated plants). Scale bar = 5 cm. Note that plants from the field (Fig. 1) have the leaves usually more deeply denticulated at margin in comparison with cultivated plants (Fig. 2).

**Description:** Phyllopodous. Stem (15–)20–35(–40) cm high, in the upper part usually with 1–2 (rarely 3) single headed branches, at the base with 3–5 mm long scattered simple eglandular trichomes and with scattered stellate trichomes. Leaves with scattered, on the abaxial side on midrib numerous, 2.0–2.5 mm long, eglandular trichomes, on the margins with numerous and curved, up to 2 mm long simple eglandular trichomes, with scattered yellowish glandular trichomes and rare stellate trichomes. Rosette leaves usually 3–5(–7) at the time of flowering, ovate to ovate-lanceolate; leaf lamina (2.2–)3–5(–6) × (1.1–)2–3(–3.2) cm, mucronate-acute or mucronate-obtuse-acute at apex, cuneate to contracted or sometimes truncate at base, denticulate to dentate (mainly in basal part of leaf lamina) (teeth 2–5 mm long), petiolate; petiole 4–5(–8) cm long. “Proper” cauline leaf usually 1, ovate-lanceolate (like basal leaves) to lanceolate, petiolate; petiole (0.7–)2–4 cm long. Bract-like leaf at the point of branching linear lanceolate. Heads usually 2, sometimes 1 or very rarely 3. Acladium 1.7–6.0 cm long; peduncles with dense stellate trichomes, scattered to numerous, slightly curved simple eglandular trichomes, and rare glandular trichomes. Involucre (10–)13–14(–16) mm long, obviously greyish; involucre bracts linear lanceolate with dense simple eglandular trichomes very curved and flattened against bracts and 1.5 to 2.0 mm long, their base black to 1/5–1/4(–1/3) of their length, with scattered to numerous stellate trichomes and very rare glandular trichomes. Ligules ciliate at the apex with up to 0.2 mm long simple eglandular trichomes, on the outer basal part with longer ones (up to 0.5 mm long). Styles black. Achenes dark brown, (3.0–)3.5 mm long. Flowering from the second half of July to the end [?] of August.

**Pollen grains:** The plants usually do not produce normally developed pollen. I have observed only a small number of degenerated pollen grains of irregular shape with sporopollenin remnants.

**Chromosome number:**  $2n=36$ , tetraploid (hoc loco). Locality: Romania, Munții Rodnei, small calcareous rocks by the tourist path Borșa – Stația Meteo, ca. 0.3 km NW of the Stația Meteo, northern slope of Mt. Pietrosul Mare, ca. 1835–1850 m a.s.l., 47°39' N, 24°39' E, (locus classicus), coll. P. MRÁZ, 5.VII.2001 (6 plants; no. 992 – an approximate chromosome number count, 993, 994, 995, 996 – an approximate count, 997).

**Breeding system:** It has not been studied yet, but the fact that the analyzed tetraploid plants usually produce no pollen indicates, with high probability, an apomictic mode of reproduction.

**Distribution:** For the time being, *H. pietroszense* is known only from the Munții Rodnei, where it has been collected in the massif of Pietrosul Mare, Piatra Rea and Piatra Rosie. However, its presence in other neighbouring mountain ranges in Romania or adjacent part of Ukraine is probable. The following herbarium specimens are the only available ones.

**Specimina visa:** Piatra Rea mézszkőzirt [Piatra Rea calcareous rock], 1690 m, det. E.I. NYÁRÁDY ut *Hieracium rohácsense* subsp. *eu-rohácsense* (9.VII.1942 A. & E.I. NYÁRÁDY CL 201983); Piatra Rosie mészsziklákon a Galacsúcs és a Piatra Rea átlójában [calcareous rocks Piatra Rosie between Mt. Galațiu and Mt. Piatra Rea], 1600 m, det. E.I. NYÁRÁDY ut *Hieracium rohácsense* subsp. *eu-rohácsense* (9.VII.1942 A. & E.I. NYÁRÁDY CL 201984); Montes Rodnenses, situ meridionali a pago Borșa, in declivio septentr.-orientali montis Pietrosul Mare (2303), 0.3 km situ septentr.-occidentali ad lacum glaciale “La Iezer”, loco petroso calcareo, ca. 1835–1850 m (24.VII.1997 P. MRÁZ & P. TURIS BRA, SAV, Herbarium PM); Munții Rodnei, small calcareous rocks by the tourist path Borșa – Stația Meteo, ca. 0.3 km NW of the Stația Meteo, northern slope of Mt. Pietrosul Mare (locus classicus), ca. 1835–1850 m, 47°39' N, 24°39' E (5.VII.2001 P. MRÁZ Herbarium PM).

ZAHN (1921: 699) reported *H. pietroszense* s.str. (subsp. *pietroszense*), besides the locus classicus, from another locality from the Munții Rodnei Mts.: “am Galacz und Stiol bei Borsa (Pax)”. These data refer to PAX (PAX 1908: 95). However, no corresponding specimens were found either in herbarium BP, where the collection connected with the publication PAX (1908) is deposited, or in any other visited herbarium.

**Misidentified specimens:** After Flora of Romania (NYÁRÁDY 1965: 572) *H. pietroszense* occurs also in the Mții Nămirei, Mții Bîrsei (Postavaru), Mții Retezatului and Mții Bucegi. Some of these data, based on revised herbarium specimens (see below), should be considered as misidentifications with other taxa. In addition to the Munții Rodnei, ZAHN (1921: 699, 1936: 207) included in the distribution of *H. pietroszense* subsp. *pietroszense* the other Carpathian mountains (Munții Retezatului, Munții Postavaru) and the Alps (Kärnten, Alps of Bergamo). I saw no voucher specimens identified as *H. pietroszense* from the Alps, and the presence of this species (in a strict sense) there seems to be highly improbable.

**Ecology:** *H. pietroszense* occurs at the locus classicus on rocks and in rocky cracks between partly open canopies of *Pinus mugo*, *Alnus viridis*, *Salix hastata* and *Juniperus sibirica*, on the very sheer slopes (40–50°) at 1800–1850 m a.s.l. The locality is situated near tourist path Borșa – Stația Meteo, ca 0.4 km northwest of the glacial lake Lacul Iezer. The substrate is built from the mineral rich schist and crystalline limestone. *H. pietroszense* is mainly accompanied on the rock sites by the following taxa: *Campanula kladniana*, *Carex sempervirens*, *Saxifraga luteoviridis*, *Scabiosa lucida*. Other species such as *Achillea schurii*,

*Arabis alpina*, *Asplenium viride*, *Bartsia alpina*, *Calamagrostis villosa*, *Campanula alpina*, *Cardaminopsis arenosa* s.l., *Carex capillaris*, *Clematis alpina*, *Coeloglossum viride*, *Cystopteris fragilis*, *Festuca supina*, *Geranium sylvaticum*, *Luzula luzuloides*, *Parnassia palustris*, *Pedicularis verticillata*, *Phyteuma vagnerii*, *Pinguicula alpina*, *Rhododendron myrtifolium*, *Saxifraga aizoides*, *S. paniculata*, *Vaccinium vitis-idaea*, *Valeriana tripteris*, *Veronica baumgartenii*, *Viola biflora* have been recorded in the same places. Most of them belong to the group of petrophytes indicating alkaline substrate. The community can be evaluated as *Cystopteridetum fragilis* OBERD. 1938 belonging to the alliance *Cystopteridion* RICHARD 1972 (cf. COLDEA 1990, 1997).

#### Closely related, probably as yet undescribed taxa

(1) Transsilvania, La Omu (mons) apud Rosenau [Rîșnov], det. K. POLÁK ut *H. atratum* var. *nigricans* (23.VII.1890 L.J. PAUL PR P4S417/9403); La Omu blîze Rosenau v Sedmihradsku [La Omu near Rosenau in Transsilvania], det. K. POLÁK ut *H. atratum* var. *nigricans* (25.VII.1890 L.J. PAUL PR P4S417/9398); Kronstadt [Brașov], Schuler, ut *H. pleiophyllum*, rev. K.H. ZAHN ut *H. pietroszense* subsp. *pietroszense* (“Bearbeitet für das Pflanzenreich”) (8.VII.[18]87 L. SIMONKAI BP 191250).

Three specimens, which could be morphologically placed to the *Hieracium pietroszense* group, from Mt. La Omu and Mt. Schuler (the South Carpathians, Romania) are close to *H. pietroszense* s.str., but they differ from it by having slightly smaller heads and by shorter simple, ± patent eglandular trichomes on the involucre bracts. Moreover, it seems that the colour of the basal leaves is grey-green (glaucous), while *H. pietroszense* has green or dark green leaves.

(2) Marmaroș, in declivi orientali inter montibus Berlebășka et Pop Ivan prope Trebușany, solo calcareo, 1550 m (VII.1935 M. DEYL PR P4 S 417/9441, 417/9442, 417/9443, 417/9444, 417/9445, 417/9446, 417/9447, 417/9449, 417/9450, 417/9453, 417/9454).

The specimens from the Marmarosh Mts. (the East Carpathians, Ukraine) represent another “morphotype”, with high probability an undescribed taxon, characterized by very deeply dentate leaves. The plants are similar to *H. bifidum* s.l., although they have small yellowish glandular trichomes on the leaves, the base of leaf lamina is more attenuate and the heads are bigger (the length of involucre bracts up to 13–15 mm).

## 2. *Hieracium borsanum* ZAHN ex MRÁZ

(Fig. 3, 4)

*H. borsanum* ZAHN ex MRÁZ, Folia Geobot. 36: 329, 2001.

Typus (MRÁZ 2001: 329): Romania septentrionalis, montes Rodnenses, situ meridionali a pago Borșa, 0.4 km situ septentr.-occidentali ad lacum glaciale “La Iezer”, in declivio septentr.-orientali montis Pietrosul Mare, ca. 1780 m s. m., 47°39' N, 24°39' E, coll. P. MRÁZ & P. TURIS, 25.VII.1997 (Holotypus: SAV; isotypi: BRA, Herbarium PM).

= *H. rauzense* var. *floccinervum* ZAHN, Magyar Bot. Lapok 6: 221, 1907.

Ind. loc.: “Repede, regio Mughî (PANT.) [PANTOCSEK]”.

**Lectotypus (hoc loco designatus):** Repede, regio mughî, det. K.H. ZAHN ut *H. rauzense* subsp. *rauzense* var. *floccinervum* (note: “Folia supra in nervo mediano subfloccosa!” K.H. ZAHN) (s.d., J. PANTOCSEK BP 192425).

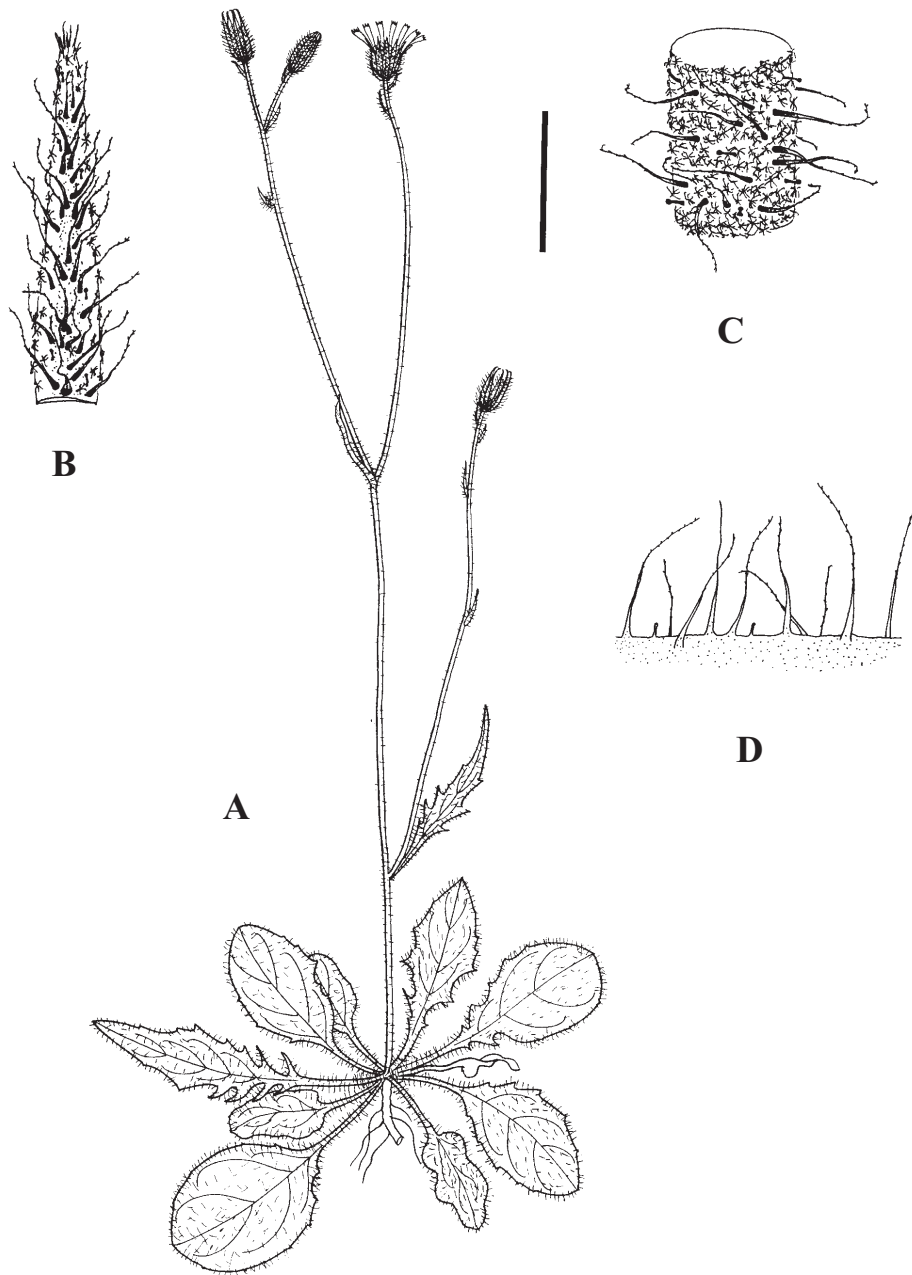


Fig. 3. *Hieracium borsanum* – A whole plant (del. Z. Komárová), B – involucre, C – peduncle, D – leaf margin. Scale bar = A: 3 cm, B: 4 mm, C: 2 mm, D: 1 mm.



Fig. 4. *Hieracium borsanum* – leaf spectrum of rosette leaves (from several cultivated plants). Scale bar = 5 cm.

- ≡ *H. rohacsense* f. *floccinervum* (ZAHN) NYÁR., Fl. Rep. Pop. Rom. 10: 576, 1965.  
 = *H. rauzense* var. *rauzaense* f. *pilosius* ZAHN, Magyar Bot. Lapok 6: 221, 1907 [”var. *genuinum*”].  
 Ind. loc.: “In m. Pietrosz, regio Mughii (PANT.) [PANTOCSEK]”.  
**Lectotypus (hoc loco designatus):** Pietrosz, in reg. mughii, det. K.H. ZAHN ut *H. rauzense* subsp. *rauzaense* f. *subpilosa* (VII.[1]905 J. PANTOCSEK BP 192429).  
 - *H. rohacsense* subsp. *borsanum* ZAHN in GRAEBNER f. (ed.), Syn. Mitteleurop. Fl., Band XII(3), Liefer. 2.: 218, 1936, “borsánum”, nom inval. [Art. 36.1., diagnosis germanica].  
 - *H. rohacsense* var. *borsanum* (ZAHN) NYÁR. in BORZA, Consp. Fl. Rom.: 324, 1947, nom. inval.  
 - *H. conspurcans* subsp. *farinifloccum* auct. (p.p.), non (DEGEN et ZAHN) ZAHN in ENGLER (ed.), Pflanzenreich, Heft 77: 703, 1921: ZAHN in ENGLER (ed.), Pflanzenreich, Heft 77: 703, 1921.  
 - *H. rauzense* auct. (p.p.), non MURR, Deutsche Bot. Monatschr. 15: 281, 1897: ZAHN, Ann. Hist.-Nat. Mus. Hung. 8: 77, 1910 (ut *H. rauzense* subsp. *rauzaense*).  
 - *H. rauzense* subsp. *farinifloccum* auct., non DEGEN et ZAHN, Magyar Bot. Lapok 5: 73, 1906: ZAHN, Ann. Hist.-Nat. Mus. Hung. 8: 77, 1910 (p.p.); MRÁZ & MARHOLD, Willdenowia 29: 41, 43, 1999.  
 - *H. rohacsense* subsp. *farinifloccum* auct. (p.p.), non (DEGEN et ZAHN) JÁV., Magyar Fl. 2: 1257, 1925: ZAHN in GRAEBNER f. (ed.), Syn. Mitteleurop. Fl., Band XII(3), Liefer. 2: 213, 1936.  
 - *H. rohacsense* var. *farinifloccum* auct. (p.p.), non (DEGEN et ZAHN) NYÁR. in BORZA, Consp. Fl. Rom.: 324, 1947: NYÁRÁDY, Fl. Rep. Pop. Rom. 10: 575, 1965.

**Description:** Phyllopodous. Stem (18–)20–30(–35) cm high (plants in cultivation usually shorter, about 20 cm), with 2(–3) lateral branches from the axils of cauline leaves, slender

rarely to ± robust, at base with scattered eglandular 3–5 mm long, pale towards the top of stem dark-based 1.0–2.5 mm long patent trichomes, with scattered or numerous stellate trichomes becoming dense towards the top, and on the upper part of stem scattered dark glandular trichomes. Leaves on the margins with scattered, on the abaxial side at the base, on midrib and on petioles with numerous eglandular pale trichomes, with few, mainly on the margins, short yellowish glandular trichomes, and on the abaxial side with scattered and on the midrib to numerous stellate trichomes. Basal leaves 5–8 at the time of flowering; outer ones broadly elliptical, at the apex rounded and obtusely acute, at the base cuneate; lamina 3–7 × (1.3–)2–2.5 cm, on the upper margins subentire to mucronate-denticulate, at the base dentate, petiolate; petiole (1.0–)1.5–4 cm long; inner basal leaves oblong to lanceolate, at the apex acute, at the base long attenuate to winged petioles; basal part of lamina deeply dentate, often cut to the central vein, some of the narrow triangulate or falcate teeth often nearly free. Cauline leaf usually one, similar to basal inner leaves, narrowly elliptic or lanceolate, at the base dentate or mucronato-denticulate, or linear lanceolate and “bract like”, with 2–4 short narrowly linear “bract like” leaves below the heads. Heads 2 to 7; peduncles with scattered 1.5 mm long patent eglandular trichomes with the apex only slightly curved, rare to scattered long dark glandular trichomes, and dense stellate trichomes. Involucre 9–11(–12) mm long, greyish-black; involucre bracts linear-lanceolate, long narrowly acute at apex, with numerous patent (1.0–)1.5–2.0(–2.5) mm long simple eglandular trichomes, with rare to scattered glandular trichomes and scattered stellate trichomes (mainly on the margins). Ligule yellow with very short pale trichomes on the apex (apex ciliate) and longer on outer surface. Styles black at anthesis. Achenes dark brown to blackish, 2.25–2.5 mm long. Flowering from the first half of July to the end [?] of August.

**Pollen grains:** the plants do not produce normally developed pollen. I observed only a small number of degenerated pollen grains of irregular shape with sporopollenin remnants.

**Chromosome number:**  $2n=27$ , triploid (MRÁZ 2001: 329; counted on four plants from two localities situated on the northern slope of the massif of Mt. Pietrosul Mare).

**Breeding system:** apomictic (MRÁZ 2001: 329).

**Distribution:** According to the currently available data it seems that *H. borsanum* is an endemic species of the Munții Rodnei (the Rodna Mts., Romanian East Carpathians).

**Specimina visa:** Pietrosz, in reg. mughii, det. K.H. ZAHN ut *H. rauzense* subsp. *rauzense* f. *subpilosa* (VII.[1]905 J. PANTOCSEK BP 192429); Repede, regio mughii, det. K.H. ZAHN ut *H. rauzense* subsp. *rauzense* var. *floccinervum* (s.d. J. PANTOCSEK BP 192425); Nagy Pietrosz [Pietrosul Mare] havas, az alsó tó körül, det. S. JÁVORKA ut *H. pietroszense?*, rev. K.H. ZAHN ut *H. rauzense* subsp. *farinifloccum* (22.VII.1906 N. FILARSZKY & S. JÁVORKA BP 0493608); Nagy Pietrosz havas, az alsó tó körül, det. S. JÁVORKA ut *H. pietroszense?*, rev. K.H. ZAHN ut *H. rauzense* (22.VII.1906 N. FILARSZKY & S. JÁVORKA BP 0493611, BP 0493612); Nagy Pietrosz havas, Bucuiescu völgy, a Bikahegy fölött, det. S. JÁVORKA ut *H. pietroszense*, rev. K.H. ZAHN ut *H. rauzense* subsp. *farinifloccum* (21.VII.1906 N. FILARSZKY & S. JÁVORKA BP 0493609, BP 0493610); Felsige Stellen am Vurfu Pietrosu bei Borșa, Glimmerschiefer, 1750 m, det. K.H. ZAHN 1929 ut *H. rauzense* subsp. *borsanum* (7.VIII.1906 F. PAX BP 195852); Borșa, Pietros, La iezer, inhalt 1871 m, ut *H. krasanii*, rev. E.I. NYÁRÁDY ut *H. rohacsense* var. *eu-rohacsense* (16.VIII.1938 A. KOMAN CL 589318);

Mt. Pietrosul Mare, east-northern slope, by the path Borșa – Stația Meteo, 1560 m, 47°39' N, 24°39' E (24.VII.1997 P. MRÁZ & P. TURIS SAV); Mt. Pietrosul Mare, rocky slopes by the path Borșa – Stația Meteo, 1780–1800 m, 47°39' N, 24°39' E (24.VII.1997 P. MRÁZ & P. TURIS SAV); Situ meridionali a pago Borșa, 0.4 km situ septentr.-occidentali ad lacum glaciale “La Iezer”, in declivio septentr.-orientali montis Pietrosul Mare, ca. 1780 m, 47°39' N, 24°39' E (25.VII.1997 P. MRÁZ & P. TURIS SAV, BRA, Herbarium PM); Situ meridionali a pago Borșa, 0.4 km situ septentr.-occidentali ad lacum glaciale “La Iezer”, in declivio septentr.-orientali montis Pietrosul Mare, ca. 1780 m, 47°39' N, 24°39' E (5.VII.2001 P. MRÁZ SAV, BRA, Herbarium PM).

Zahn mentioned also another locality, besides the classical one, from Mt. Stiol: “Siebenbürgen: Vurfu Pietroszu, 1750 m, bei Borșa [Glimmerschiefer]! Stiolu 1500 m [Kalk]!” ZAHN (1936: 218); and also locality from Piatra Alba (ut *H. rauzense* var. *floccinervum*, coll. FILARSKY & JÁVORKA; cf. ZAHN 1910: 77).

**Ecology:** *H. borsanum* grows abundantly on the northern slopes of the Massif Pietrosul Mare in the disturbed biotopes: on and along the path from Borșa to Stația Meteo, from ca. 1250–1300 m a.s.l. (spruce forests) up to 1850 m a.s.l. in the vicinity of the meteorological station. It prefers acid soils on schist.

**Note:** Some morphological characters (particularly the shape of the rosette leaves and involucral bracts) and low content of flavonoid luteolin 7-glucoside (ŠVEHLÍKOVÁ et al. 2002) indicate affinities to *Hieracium transsilvanicum* HEUFF. The low quantity of the luteolin 7-glucoside has been previously reported by PETROVIĆ et al. (1999) in a wild population of diploid taxon *H. transsilvanicum* growing in shady forest. ŠVEHLÍKOVÁ & MRÁZ (unpubl. data) have confirmed these data on the plants of *H. transsilvanicum* cultivated in almost full sunshine in experimental field. *Hieracium borsanum*, however, is morphologically closely related to *H. pietroszense* (much more than to *H. transsilvanicum*). *H. borsanum* co-occurs along the forest path with *H. transsilvanicum* (in the upper part of supramontane and in the lower part of subalpine belts), and it can be found also near *H. pietroszense* (e.g. near the meteorological station, at 1750–1850 m a.s.l.). From the above-mentioned facts I suppose that the triploid apomict *H. borsanum* could be of a hybrid origin between diploid sexual *H. transsilvanicum* and tetraploid *H. pietroszense*. Because *H. borsanum* is not exactly morphologically intermediate between *H. transsilvanicum* and *H. pietroszense*, it is likely that introgression could be involved. Analysis at the molecular level could confirm or exclude the hypothesis of hybrid origin of *Hieracium borsanum*.

ZAHN (1922–1939) recognized three other taxa in morphological position simplified by following formula *alpinum* – *bifidum* (*caesium*) – *transsilvanicum*: *Hieracium napaeum* ZAHN, *H. pseudovagneri* ZAHN, nom. inval. and *H. stenodontophyllum* NYÁR. & ZAHN. All these taxa were described from East and South Romanian Carpathians.

### 3. *Hieracium deylii* MRÁZ sp. nov.

(Fig. 5, 6)

**Typus:** Ukraina occidentalis, Montes Svydovets', situ septentr.-occidentali a pago Rakhiv, in declivio septentr.-orientali montis Blyznytsya, solo calcareo, alt. 1800–1850 m s. m., 48°13' N, 24°14' E., 10.VIII.1999, P. MRÁZ & V. JURKOVIČOVÁ (Holotypus SAV; isotypus BRA).

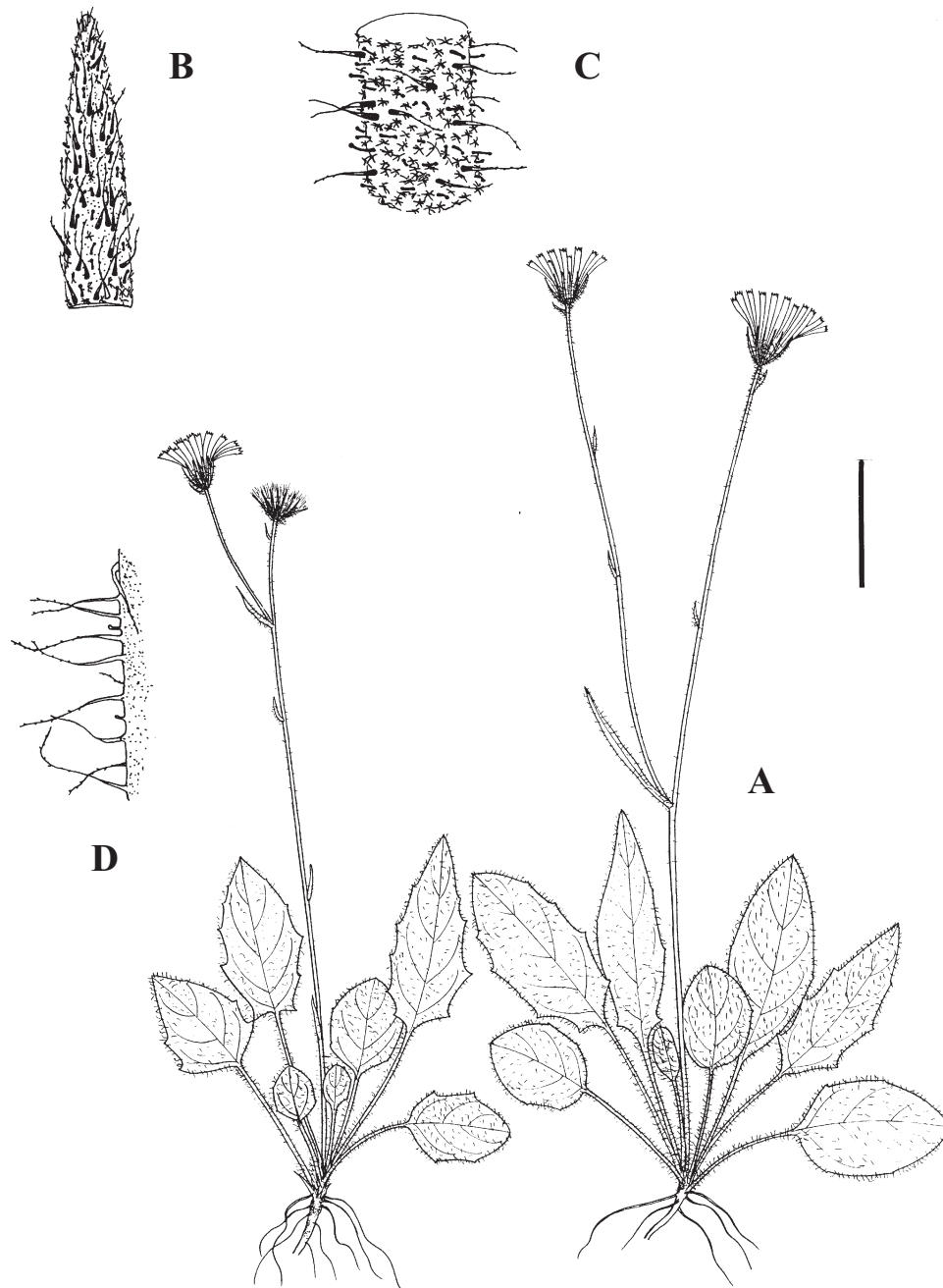


Fig. 5. *Hieracium deylii* – A whole plant (del. Z. Komárová), B – involucre, C – peduncle, D – leaf margin. Scale bar = A: 3 cm, B: 4 mm, C: 2 mm, D: 1 mm.

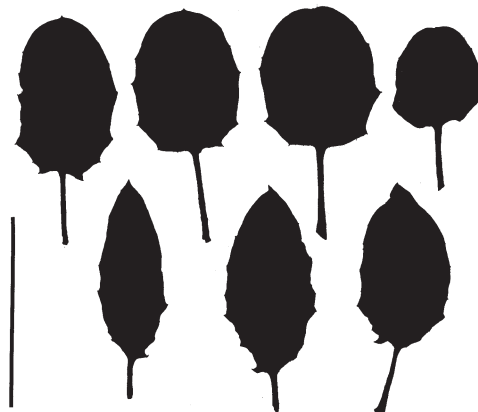


Fig. 6. *Hieracium deylii* – leaf spectrum of rosette leaves (from several cultivated plants). Scale bar = 5 cm.

**Diagnosis:** *Hieracium deylii*, *Hieracii pietroszense* primo adpectu maxime simile, sed ab ea specia, quae habet involucria (10–)13–14(–16) mm longa et canescentia et pedunculum raro glandulosum, involucris suis (10–)11–13 mm longis et atris atque pedunculis pilis glanduliferis numerosis vestitis distinguitur.

**Etymology:** The taxon is named in the honour of the outstanding Czech botanist Miloš Deyl (1906–1985), who studied the flora and vegetation of the Ukrainian part of the East Carpathians between the two world wars. At that time (1920–1939), a part of the Western Ukraine (so called Subcarpathian Russia or Ruthenia) was a part of the former Czechoslovakia.

**Description:** Phyllopodous. Stem (18–)20–28(–30) cm high, in the upper part usually with (1–)2(–3)-headed branches, at the base with scattered 2.0–3.0 mm long simple eglandular trichomes, short yellow glandular trichomes and rare to scattered stellate trichomes. Leaves with scattered to subnumerous, on the abaxial side on midrib and on the margins with numerous, (1.5–)2.0–2.5 mm long simple eglandular trichomes, and with rare short yellow glandular trichomes. Rosette leaves usually (3–)5–9 at the time of flowering, outer primordial ones widely elliptic to subcircular, mucronato-subentire, rarely denticulate, sometimes with involute borders, rounded to obtuse-acute at apex, truncate at base; central leaves usually elliptic to ovate, acute at apex, obtuse or truncate at base; the inner ones (the most young) ovate to ovato-lanceolate, acute at apex, attenuate to cuneate at base, both central and the most inner ones denticulate to dentate mainly at the base of leaf-lamina; leaf-lamina 2.5–4.0(–6.0) × (1.5–) 2.0–3.0 cm; all leaves with 1.5–6.0 cm long petiole. “Proper” cauline leaves usually missing, or rarely one, then usually situated 1–2 cm from the stem base, similar to the most inner basal leaves; narrowly lanceolate bract-like leaf at the branch; 1–3 bract-like leaves in the upper part of the stem. Heads usually 2, or sometimes 1 or 3. Acladium 2–7(–12) cm. Peduncles scattered with simple eglandular trichomes up to 1.5 mm long, subnumerous to numerous stellate trichomes, and scattered to numerous glandular trichomes up to

0.3–0.4(–0.6) mm long. Involucres 10–11(–13) mm long; involucre bracts linear-lanceolate, with subnumerous simple eglandular trichomes up to 1.5 mm long, with subnumerous stellate trichomes mainly along the border of the bracts and at their base, and with subnumerous black glandular trichomes. Ligule yellow with very short pale trichomes on the apex (apex ciliate) and longer on outer surface. Styles black. Achenes brown-black, (3.0–)3.5(–4.0) mm long. Flowering from second half of July to the end of August.

**Pollen grains:** plants produce pollen grains of heterogeneous size with normal echinolophate structure of the exine; a small proportion of the pollen is degenerated.

**Chromosome number:**  $2n = 36$ , tetraploid (hoc loco) (Fig. 7). Localities: 1. Ukraine, Svydovets' Mts., Mt. Blyznytsya, N–NE rocky slopes, ca. 1800 m a.s.l., 48°13'30" N, 24°14' E, coll. P. MRÁZ & V. JURKOVIČOVÁ, 10.VIII.1999 (6 plants; 667, 668, 670, 671, 672, 675). 2. Ukraine, Svydovets' Mts., limestone rocky slopes between Mt. Stih and Blyznytsya, 48°14' N, 24°14' E, coll. P. MRÁZ & V. JURKOVIČOVÁ, 10.VIII.1999 (2 plants; 679, 680).

**Breeding system:** Breeding system has been studied in four heads from four cultivated plants. Although some seeds in the heads after emasculation were obviously empty and light brown, the rest of seeds (about 85–98%) were normally developed. The species is considered to be apomictic.

**Variability:** The plants vary in the density of glandular hairs on the peduncles and on the involucres, but this variability does not deserve taxonomic recognition.

**Note:** I found other specimens collected by A. ZLATNÍK [kept on separate sheets: Svidovec, travnaté svahy kotlů Bliznice (1936 A. ZLATNÍK SAV, 2 sheets); Svidovec, skály Bliznice “žlaz.” (9.VIII.1929 A. ZLATNÍK SAV, 1 sheet)] at the same locality as *H. deylii*, which differ from *H. deylii* by having much more dense glandular trichomes on peduncles; also the density of the simple eglandular trichomes on the leaf petioles and on the lower part of stem is obviously higher than on *H. deylii*. Zlatník recognized this character, because he noted on one label that the plants are very glandular [“žlaz.” = glandular]. On the other hand, “glandular” plants have fewer stellate trichomes on the peduncles than *H. deylii*. The same trichome type is rare on the involucres of “glandular” plants, while the stellate trichomes are subnumerous on *H. deylii*. The slight differences can be observed also in the shape of basal leaves. In some characters (indumentum of leaf petioles, shape of the leaves, indumentum of the peduncles) the plants show some affinity to the diploid sexual *H. transsilvanicum*, but generally the “glandular” plants are much more closely related to *H. deylii* than to *H. transsilvanicum*.

**Distribution:** It seems that *H. deylii* is restricted to the calcareous massif of Mt. Blyznytsya and Mt. Trojaska in the mountain range of the Svydovets' Mts. (Ukrainian East Carpathians). One collection from Mt. Stioli in the Mții Rodnei, Romanian East Carpathians [Felsen des Stioli, Kalk, 1500–1600 m, ut *H. subcaesium* (21.VIII.1895 WEBERBAUER, WRSL)] is very probably conspecific with *H. deylii*, but more plant material should be reviewed.

**Specimina visa:** Svydovets' Mts: Bliznica (1929 A. ZLATNÍK SAV) [ZLATNÍK collected here altogether 185 [!] plants]; Mt. Blyznytsya, N – NE rocky slopes, ca. 1800 m, 48°13'30" N, 24°14' E, (10.VIII.1999 P. MRÁZ & V. JURKOVIČOVÁ BRA, SAV); Limestone rocky slopes between Mts. Stih and Blyznytsya, 48°14' N, 24°14' E (10.VIII.1999 P. MRÁZ

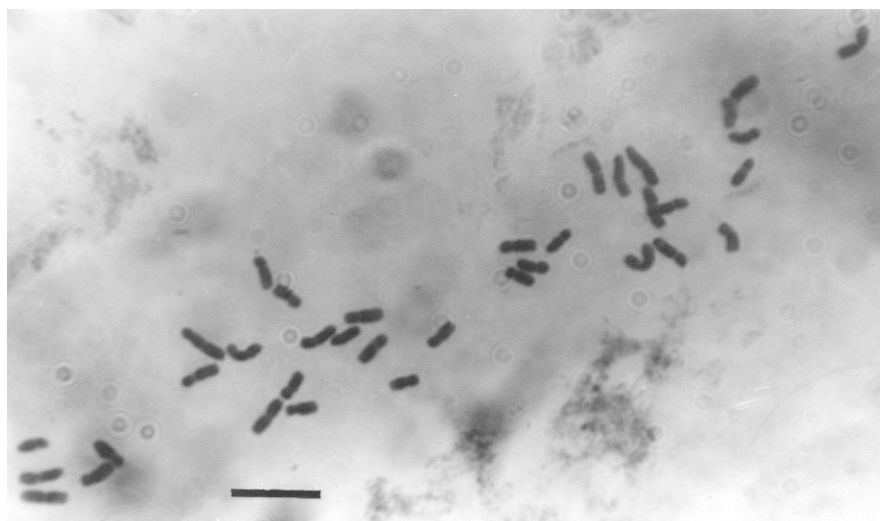


Fig. 7. Photomicrograph of metaphase of *Hieracium deylii*,  $2n=36$  (cultivation number of the plant: 670). Scale bar = 10  $\mu\text{m}$ .

& V. JURKOVIČOVÁ Herbarium PM); In valle glacialis cotae 1766 prope montis Trojaska, solo calcareo, 1700 m (VII.1935 M. DEYL PR P4S417/9460) [ad mixtum *H. cernaeglavae* – *H. rohacsense* group, ZLATNÍK noted: “atratum chlupaté” = “atratum hairy”].

**Ecology:** *H. deylii* grows in grassy islands on the sheer rocky limestone slopes on the northern and the northeastern exposition of the massif of Mt. Blyznytsya and Mt. Stih. The dominating species in the communities is *Carex sempervirens*; from the other taxa co-occurring at the locality *Achillea schurii*, *Bartsia alpina*, *Campanula alpina*, *C. kladniana*, *Carduus kernerii*, *Cerastium eriophorum*, *Doronicum carpaticum*, *Dryas octopetala*, *Festuca versicolor*, *Gentiana laciniata* (syn. *G. pyrenaica* auct. non. L.), *Leontodon croceus*, *Myosotis alpestris*, *Parnassia palustris*, *Phyteuma orbiculare*, *Sesleria coerulans* (syn. *S. bielzii*), *Veronica baumgartenii* could be mentioned (for detailed description of the locality see DOMIN 1930, 1931).

#### Notes on the other taxa recognized by ZAHN (1936) as part of the *H. pietroszense* collective species

1. *H. pietroszense* subsp. *bifidifolium* DEGEN et ZAHN in ZAHN, Magyar Bot. Lapok 5: 72, 1906.

Ind. loc.: “Am Berg Galatiu bei Rodna (v. D.[= VON DEGEN])”.

Typus: ignotus.

≡ *H. pietroszense* var. *bifidifolium* (DEGEN et ZAHN) NYÁR. in BORZA, Consp. Fl. Rom. 324, 1949.

The taxonomic position of this subspecies is uncertain. The original material in all probability does not exist, as in the case of the nominate subspecies. I did not visit its locus classicus in the Mt. Galațiu. The collections of the Nyárady father and son from the vicinity of Mt. Galațiu I have determined as *H. pietroszense* s.str. (see above).

2. *H. pietroszense* subsp. *jarzabczynum* PAWŁ. et ZAHN in ZAHN, Bull. Int. Acad. Sci. Cracovie, Cl. Sci. Math., Ser. B, Sci. Nat., 1928: 211–212, 1929, “*jarzabczynum*”.

Ind. loc.: “Tatra occident.: Infra montem Jarzabczy Wierch versus vallem Jarzabcza, in rupibus graniticis”.

**Lectotypus (hoc loco designatus):** West-Tatra: unterhalb des Jarzabczy Wierch gegen das Jarzabcza Tal. Granitfelsen, det. K.H. ZAHN 1928 ut *H. pietroszense* subsp. *jarzabczynum* PAWŁ. et ZAHN (10.VIII.1922 B. PAWŁOWSKI KRAM 396119).

Icones: JASIEWICZ, Fl. Pol. XIV, Rys. 12/2, p. 243, 1980.

This taxon does not belong to the *H. pietroszense* (or *H. rohacsense*) group at all, but to the *Hieracium nigrescens* group. The peduncles are covered by dense stellate trichomes, scattered to numerous eglandular trichomes and scattered glandular trichomes. The stellate trichomes are absent or very rare on the involucre, while the simple eglandular trichomes are numerous and long; the glandular hairs are numerous too. The collection: Tatra Zachodnie, Baniste nad Pyszna, skaliste uplawy – granit, ok. 1800 m, “*H. pietroszense* subsp. *jarzabczynum* for. *grandidens* n.f.” 18.VII.1936 B. PAWŁOWSKI KRAM 336732) belongs to the same subspecies. *H. pietroszense* subsp. *jarzabczynum* is a tetraploid taxon, very widespread in the Západné Tatry Mts. (cf. MRÁZ 2001 ut *H. nigrescens* s.l.).

3. *H. pietroszense* subsp. *spathophorum* NYÁR. et ZAHN in ZAHN, Bull. Grăd. Bot. Univ. Cluj 8 (1928): 52–53, 1929.

Ind. loc.: “Ad lacum Zănoaga, 1850–2100 m et in mte Boreescu, 1900–2100 m; supra stina Galbina in m. Rătezat 1900 m”.

**Lectotypus (hoc loco designatus):** Transsilvania, mtes Retezatenses. In locis graminosis saxosisque inter Pinos montanas cca. lacum Zănoaga, alt. cca. 1850–2100 m s.m., det. K.H. ZAHN 1927 ut *H. pietroszense* subsp. *spathophorum* (20.VII.1927 E.I. NYÁRÁDY BP 192487).

≡ *H. pietroszense* var. *spathophorum* (NYÁR. et ZAHN) NYÁR. in BORZA, Consp. Fl. Rom. 324, 1949.

Icones: NYÁRÁDY (ed.), Fl. Rep. Pop. Rom. X, planşa 111, fig. 4, 4a., p. 573.

This taxon does not belong to the *H. pietroszense* group at all. By the shape of the leaves (oblong-spathulate or lanceolate-spathulate), by the indumentum of the involucre (the stellate trichomes only just at the base of the involucre, simple eglandular trichomes dense), and by the 1-headed stem it is closely related to the *H. alpinum* group. From *H. alpinum* s.str. it differs in having black styles (*H. alpinum* yellow), the basal leaves are more acute at the apex, the leaf margins are more denticulate, and generally the plants have less numerous and shorter simple eglandular trichomes than *H. alpinum*. Some morphological characters of *H. pietroszense* subsp. *spathophorum* [less numerous and shorter simple eglandular trichomes on involucre and peduncles, obviously elongated leaf lamina of rosette and cauline leaves, usually with more than one “proper” cauline leaf (often 3–4)] indicate possible relationships also to the *H. sparsum* group. This very widespread species group in the Mții Retezatului represents a very important taxonomic entity involved in the microevolution of other alpine

taxa of the genus *Hieracium* in this mountain range, such as *H. fritzei* subsp. *stanisoare* JÁV. & ZAHN and *H. brevopiliferum* MRÁZ.

The Botanical Museum in Cluj distributed to many European herbaria the exsiccata of *H. pietroszense* subsp. *pietroszense*. However the herbarium revision revealed that these specimens belong to *H. pietroszense* subsp. *spathophorum* or they are very close to this taxon. In any case the specimens cannot be included, on the basis of morphological characters, in the *Hieracium pietroszense* group.

**Specimina visa:** Fl. Rom. Exsicc., No. 875, Transsilvania, distr. Hunedoara. Mtibus Rătezat. In decl. graminosis saxosisque supra lacum Gemenea, versus “Poarta Bucurii”, solo granitico, cca 2000 m (10.VIII.1928 E.I. NYÁRÁDY BM 508120, BM 508121, BRNU 189139, BUC 360319, BUCA 43420); In graminosis alpinis inter Pinos montanas sub lacum Zănoaga, solo granit., cca 1900 m, det. K.H. ZAHN (8.VIII.1928 E.I. NYÁRÁDY BP 493607, M 31734); In locis graminosis saxosisque inter Pinos montanas cca. lacum Zănoaga, cca. 1850–2100 m, coll., det. K.H. ZAHN 1927 (20.VII.1927 E.I. NYÁRÁDY M 31733). The same plant, as the exsiccata specimens, is illustrated in the Flora of Romania (NYÁRÁDY 1965: 573, Fig. 111: 2, 2a).

**Note:** No new combinations or elevations to the rank of species are provided here for the latter three cases as they require more detailed study.

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