

**LIVID HAWKWEED (*HIERACIUM BIFIDUM* KIT. EX HORNEM), A NEW SPECIES  
FOR THE RED LIST OF LOWER SILESIA, IN THE PEŁCZNICA GORGE  
(WAŁBRZYCH-BOLKÓW FOOTHILLS, SUDETES)**

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**ABSTRACT:** The paper provides detailed information on a locality of *Hieracium bifidum* in the Pełcznica Gorge (Wałbrzych-Bolków Foothills, Lower Silesia, SW. Poland), with particular reference to the population size and role of the species in the plant communities. The studied population of *H. bifidum* is a part of the community classified as *Asplenietum trichomano-rutae-murariae* Kuhn 1937 association. In other regions of Central Europe the species prefers high-altitude dry swards and rocky swards on calcareous substrata. Distribution analysis of all sites in the Sudetes shows that *H. bifidum* should be included in the red list of endangered species of Lower Silesia as a vulnerable species (VU).

**KEY WORDS:** *Hieracium bifidum*, rocky and wall plant communities, vulnerable plant species, red list, Lower Silesia, Sudetes Mts.

### ***Introduction***

Research on the distribution of species of *Hieracium* in the Sudetes focuses on areas which are famous for their great diversity, occurrence of endemic taxa or of taxa limited to extremely small areas in Poland (Szeląg 2001; Szeląg 2003; Pender 2003). Although many hawkweeds species are known to reach their north-eastern distribution border in the Sudetes and their foothills or occurs in extrazonal sites there (Szeląg – pers. comm.), the region is still insufficiently studied. The gaps in knowledge pertain to *Hieracium bifidum* and *H. schmidtii* which have been observed in single sites in the foothills. The absence of comprehensive studies on the population dynamics and conservation status of local populations is the main reason for inadequate assessment of the risk degree on both

local and regional scale. In the red list of the Sudetes (Fabiszewski and Kwiatkowski 2002), *Hieracium bifidum* has been included as an endangered species (EN) while country-wide it is regarded as vulnerable [V] (Mirek et al. 2006). However, it has not been included in the Red List of Lower Silesia (Kački et al. 2003).

### **Species diversity**

According to Zahn (1953), *Hieracium bifidum* is one of the main collective species („*species collectivae principales*”), within which he distinguished 177 subspecies. According to contemporary views the *Hieracium bifidum* group represents a polymorphic complex of taxa and requires a syntaxonomic review involving modern research techniques (Mraz and Szelağ 2004). Diplo-, tri- and tetraploid taxa have been recognized among the members of this group; the varied ploidy causes a high morphological variability and greatly impedes identification of taxa (Mraz and Marhold 2001; Chrtek et al. 2004). The identification is further complicated by the fact that the holotype of *H. bifidum* collected by Hornemann is no longer in existence. Consequently, the species has been neotypified (based on Kitaibel’s material, collected in Croatia and kept at the herbarium of the Hungarian Museum of Natural History, Budapest) by Mraz and Marhold in 2002.

The Polish literature and data do not enable an easy identification of hawkweeds of this group. One of the major hawkweed identification keys (Jasiewicz 1980) provides the following information: “*blue-green leaves, usually with black spots on the surface*” are characteristic only for *H. schmidtii* and for intermediate species from the *Oradea* section. In fact the leaf spot may occur both in *Hieracium schmidtii* and in *H. wiesbaurianum*, *H. glaucinum* and *Hieracium bifidum*.

### **Methods**

In 2009 a set of relevés was made to characterise community structure. The Braun-Blanquet approach (Westhoff and van der Maarel 1978) was used during vegetation sampling and the plot size was matched depending on the vegetation type (Chytrý and Otypková 2003). Names of plant communities follow Matuszkiewicz et al. (2004), except for *Asplenietum rutae-murariae-trichomanis* Kuhn 1937 (after Świerkosz 2004). Plant names are in accordance with Mirek et al. (2002), and the bryophyte names follow Ochyra et al. (1992).

### **Results**

#### **Site description**

The locality of *Hieracium bifidum* in the Pełcznica Gorge was known to German researchers (Fiek 1881; Schube 1903). Fiek (1881) mentioned “*alte Burg b. Fursteinstein*”, which suggests that the species had persisted in the site for over 130 years. The site is located at the path leading from the artificial ruins (Old Książ) to the vantage point, about 60 m above the Pełcznica River Valley (50°50'17,12"N; 16°17'49,54"E), at the altitude of 425 m a.s.l. Tourist trails provide access to the site, making it subject to intense anthropogenic pressure.

*Hieracium bifidum* occurs on a low, partly bonded lime mortar, stone walls on both sides of the path, at the foot of the low walls and also in the thermophilous oak forest which grows on the rocks on the southern slope with 45° inclination (approximately 10 metres from the previous site). Single specimens (5 leaf rosettes) persist till today on a steep rock east of the vantage point (50°50'17,4"N; 16°17'52,9"E), however in 1994 a dozen specimens were observed here. The site has been almost completely destroyed by trampling.

### **Population abundance**

In the site near the artificial ruins of the Książ castle, 173 leaf rosettes of *Hieracium bifidum* were observed. In 2008 approximately 30% of them produced shoots with flowers, the remainder were young rosettes, usually combined with blooming rosettes. Most of them (146 rosettes – 84%) occurred on the low wall between the artificial ruins and the vantage point, both south- and north-facing (table 1). Twenty two rosettes (13%) were found on the conglomerate rock within a community of thermophilous, acidophilous oak forest on the southern slope and 5 rosettes within a dry sward with *Festuca pallens* located below the vantage point.

### **Occurrence in plant communities**

*Hieracium bifidum* was found within three types of plant communities. Most of the rosettes occurred on the low wall, as a part of *Asplenietum rutae-murariae-trichomanis* Kuhn 1937 community (table 1), and also at the foot of the wall, usually alone or accompanied by *Hieracium murorum*, *Thymus pulegioides*, *Hypericum perforatum*, *Inula conyza* and other thermophilous and synanthropic species. *Hieracium bifidum* was noted also in two other plant communities

1. Dry grassland with *Festuca pallens* temporarily classified as the community of *Hyperico perforati-Scleranthion perennis* Moravec 1967

Plot size: 100m<sup>2</sup>, Altitude 425 m a.s.l., Inclination: 10°, Exposure: SE, Cover of layers: B: 5%, C: 20%, D: 10%

**B:** *Quercus petraea* +, *Fagus sylvatica* +, *Rosa canina* 1, *Betula pendula* +

**C:** *Hieracium bifidum* +, *Achillea millefolium* +, *Agrostis capillaris* 1, *Anthemis tinctoria* +, *Arenaria serpyllifolia* +, *Barbarea vulgaris* +, *Campanula rotundifolia* +, *Cerastium arvense* +, *Deschampsia flexuosa* +, *Elymus repens* +, *Festuca ovina* +, *Festuca pallens* 2, *Genista tinctoria* +, *Hieracium pilosella* +, *Hypericum perforatum* r, *Inula conyza* +, *Rosa canina* r, *Rumex acetosella* +, *Sedum maximum* +, *Silene nutans* +, *Solidago virga aurea* r, *Taraxacum sect. Vulgaria* r, *Thymus pulegioides* +

**D:** *Polytrichum piliferum* +, *Hypnum cupressiforme* 1, *Ceratodon purpureus* +

2. Thermophilous, acidophilous oak forest without clear syntaxonomic status

Plot size: 200m<sup>2</sup>, Altitude 425m a.s.l., Inclination: 45°, Exposure: S, Cover of layers: A2: 70%, B: 10%, C: 60%, D: +

**A2:** *Pinus sylvestris* 2, *Quercus petraea* 3, *Tilia cordata* 2, *Tilia platyphyllos* +

**B:** *Acer platanoides* +, *Cornus sanguinea* r, *Euonymus europaeus* r, *Quercus petraea* 2, *Tilia cordata* +, *Tilia platyphyllos* +

**C:** *Hieracium bifidum* +, *Acer platanoides* +, *Acer pseudoplatanus* r, *Achillea millefolium* +, *Alliaria petiolata* r, *Asplenium trichomanes* +, *Brachypodium sylvaticum* r, *Calamagrostis arundinacea* 2, *Campanula persicifolia* +, *Clinopodium vulgare* +, *Convallaria majalis* r, *Cornus sanguinea* +, *Deschampsia flexuosa* +, *Euonymus europaeus* +, *Euphorbia cyparissias* r, *Fagus sylvatica* +, *Festuca ovina* 3, *Fragaria vesca* +, *Galium schultesii* +, *Hedera helix* +, *Hieracium murorum* +, *Hieracium vulgatum* +, *Hypericum perforatum* r, *Inula conyza* r, *Origanum vulgare* +, *Poa nemoralis* r, *Polygonatum odoratum* +, *Pyrus communis* r, *Quercus petraea* +, *Ribes uva-crispa* +, *Rosa canina* r, *Silene vulgaris* +, *Sorbus aucuparia* +, *Thymus pulegioides* +, *Ulmus minor* r, *Vaccinium myrtillus* +, *Veronica officinalis* r, *Sedum maximum* +, *Viscaria vulgaris* +

**D:** *Hypnum cupressiforme* +

## Discussion

### *Hieracium bifidum* in plant communities of Central Europe

The ecological range of hawkweeds of the *Hieracium bifidum* group is very wide. In Poland the livid hawkweed is regarded as one of the differential species of the alliance *Seslerio-Festucion duriusculae* Klika (1931) 1948 (Matuszkiewicz 2001), in Slovakia (Bernátová et al. 2003; Kliment 2005; Šibík et al. 2005; Surina 2005a) is a constant component of high-altitude dry rocky swards such as *Dryado octopetalae-Caricetum firmae* Sillinger 1933, *Seslerio calcariae-Festucetum tatrae* Sillinger 1933, *Festucetum pallentis carpaticum* Sillinger 1933, *Seslerio variaae-Caricetum approximatae* Bernátová et Kliment 1982, *Globulario cordifoliae-Caricetum humilis* Bernátová et Uhlířová 1994 and rocky plant communities of the *Asplenieta trichomanis* class (*Bellidiastro michelii-Seslerietum calcariae* Sillinger ex Šmarda 1970, *Cystopteridetum fragilis* Oberd. 1938, *Leontopodio alpini-Campanuletum cochleariifoliae* Unar in Unar, Unarová and Šmarda 1985). Occasionally it also occurs in phytocenoses of oak forests ass. *Luzulo luzuloidis-Quercetum* Hilitzer 1932 and *Genisto pilosae-Quercetum* Zólyomi et al. ex Soó 1963 (Ciriaková and Hegedúšová 2003), in *Agropyro caninae-Petasitetum kablikiani* Pawłowski et Walas 1949 (Jarolímek and Kliment 2004) and in *Digitali ambiguae-Calamagrostietum arundinaceae* Sillinger 1933 (Šibíková et al. 2009).

In the Alps, like in the Carpathians, *Hieracium bifidum* is a constant component of high-altitude dry swards (Maurer 2005; Surina 2005a; Miller-Aichholz 2007). However, according to Dullinger et al. (2001) it is one of the differential species of the alliance *Cephalanthero-Fagion*; Eichberger and Heiselmayer (1997) regard it as typical for ass. *Erico-Pinetum sylvestris* BR.-BL. in BR.-BL. et al. 39, and Greimler and Dirnböck (1996) – as a species characteristic for the class *Asplenieta trichomanis*. *Hieracium bifidum* was occasionally recorded also in communities of *Epilobietea angustifolii* and *Mulgedio-Aconitetea* classes (Miller-Aichholz 2007), at calcareous springs, as a component of ass. *Cratoneuretum falcati* Gams 1927 (Surina 2005b), in stony pine forests *Carici serpervirentis-Pinetum nigrae* (Accetto 1996) Accetto 1999 (Accetto 1999) and in the phytocenosis *Pinetum mughii* on calcareous substrata (Hoppflinger 1957).

In Germany the species was observed in dry swards on polymetallic dumps (Maier et al. 1981) and in Austria and the Czech Republic also in serpentine swards (Justin 1993).

Probably the major source of this ecological variability should be sought in the internal genetic variability of the species. While generally *Hieracium bifidum s. lato* often occurs on alkaline and even ultrabasic substrates (Maier et. al. 1981; Justin 1993), some of the taxa of the group prefer acidic substrata and grow in higher mountain locations (Schuhwerk 2008).

On the site in the Pełcznica Gorge, the major part of the population of *Hieracium bifidum* occurs within the phytocenosis ass. *Asplenietum rutae-murariae-trichomanis* Kuhn 1937, from which the species has not been reported so far in Central Europe, and within the dry sward of the alliance *Hyperico perforati-Scleranthion perennis* Moravec 1967, where it has not been reported until now either.

### ***State of the Sudetic population and the prospect of its preservation***

In pre-war times the livid hawkweed was reported from the Karkonosze Mts (Fiek 1881; Schube 1903), Śnieżnik Massif (Schube 1903), Mt. Miłek (Schube 1903), Książ Gorge (Fiek 1881) and from the rocks near Olszyniec in the Bystrzyca river valley (Fiek 1881).

Today we know about its sites in Mały Śnieżny Kocioł in the Karkonosze Mts (Szeląg pers. comm.) and in the Kleśnica river valley in the Śnieżnik Massif (Szeląg 2001). At lower altitudes in the Sudetes *Hieracium bifidum* was observed in 11 sites in the Kaczawa Mts. (Kwiatkowski 2006); precise location was given only for 6 of them (Połom, Miłek-Cisowa, Miłek-Wroniec, Lipa, Gruszka quarry and Sobocin quarry; Kwiatkowski 2001, 2002, 2003) and in the Pełcznica Gorge. The rocks near Olszyniec in the Bystrzyca river valley are the only site that disappeared within the past 130 years, where *Hieracium bifidum* (as well as co-occurring *Woodsia ilvensis*) has not been found since the war. Already Schube (1903) had questioned the existence of the species on that site.

In most of its preserved sites *Hieracium bifidum* forms numerous and stable populations, persisting since the 19th century and in the Kaczawa Mts. it seems to have extended the range and number of sites.

The main threat to populations from lower altitudes in the mountains and foothills are quarries (existing and planned), natural succession resulting in shading of the rocky dry swards and - in the case of the population from the Pełcznica Gorge - also increasing tourism impact and possible renovation works of the wall along the path.

At present, the species does not seem to be endangered in its entire range in the Sudetes and their foothills, and according to the IUCN guidelines (2001) should be entered in the Red List of Lower Silesia as vulnerable (VU). The criterion of such classification is D1 (IUCN 2001), because not more than 1000 plants occur in the Sudetes and their foothills.

### ***Conclusions***

1. The livid hawkweed *Hieracium bifidum* has persisted in the site in the Pełcznica Gorge near Old Książ for over 130 years.
2. In 2009 the occurrence of 173 leaf rosettes was observed. Approximately 30% of them produced shoots with flowers, which indicates the population stability.
3. The main threat to the sustainability of population might be possible repairs of the stone walls along the path leading to the vantage point and trampling of the specimens.

4. Most of specimens (84 rosettes) occur within the phytocenosis *Asplenietum rutaemurariae-trichomanis* Kuhn 1937, which has not been reported so far in the literature.
5. The degree of risk to the taxon, which occurs in the Sudetes and their foothills in four mesoregions, in 14 (including 8 fully documented) sites, indicates the need of its inclusion in the Red List of endangered species of Lower Silesia as vulnerable (VU).

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**Phot. 1.** *Hieracium bifidum* in the Pelcznica George. (photo K. Świerkosz, 14.05.2009)



**Phot. 2.** *Asplenietum rutae-murariae-trichomanis* Kuhn 1937 with the occurrence of *Hieracium bifidum* (photo K. Świerkosz 07.09.2009).

**Table 1.** Participation of *Hieracium bifidum* in the phytocenosis *Asplenietum rutae-murariae trichomanis* in the site in Old Książ.

Number of releve	1	2	3	4	5	Constancy
Area of releve [m <sup>2</sup> ]	2	4	2	6	1	
Exposure	N	N	N	S	S	
Inclination	90	90	90	90	90	
Altitude m a.s.l.	425	425	425	425	425	
Cover of c layer [%]	15	10	5	10	10	
Cover of d layer [%]	60	20	50	10	40	
Day	7	7	7	7	7	
Month	9	9	9	9	9	
Year	2009	2009	2009	2009	2009	
Number of species	15	15	11	8	8	
Ch. et D. Ass. <i>Asplenietum rutae-murariae-trichomanis</i>						
<i>Asplenium ruta muraria</i>	+	1	+	+	+	V
<i>Asplenium trichomanes</i>	+	+	+	.	.	III
<i>Polypodium vulgare</i>	+	r	r	.	.	III

Accompanying species						
<i>Hieracium bifidum</i>	+	+	+	+	1	V
<i>Hieracium murorum</i>	+	+	+	r	.	IV
<i>Sedum maximum</i>	+	r	.	r	.	III
<i>Festuca ovina</i>	r	+	.	.	1	III
<i>Silens nutans</i>	r	.	.	r	r	III
<i>Fagus sylvatica juv.</i>	+	+	.	.	.	II
<i>Taxus baccata juv.</i>	r	r	.	.	.	II
<i>Galium schultesii</i>	.	r	+	.	.	II
<i>Inula conyza</i>	.	.	+	+	.	II
<i>Festuca rubra</i>	.	.	.	r	r	II
<i>Hypnum cupressiforme</i>	3	2	3	1	3	V
<i>Tortula muralis</i>	1	.	+	.	1	III
<i>Bryum sp.</i>	+	+	.	.	.	II
Sporadic species: <i>Achillea millefolium</i> 2 r; <i>Acinos arvensis</i> 5 r; <i>Dactylis glomerata</i> 3 (+); <i>Hypericum laevigatum</i> 2 r; <i>Hypericum perforatum</i> 2 r; <i>Poa nemoralis</i> 1(+); <i>Rosa canina juv.</i> 1 (+); <i>Taraxacum sect. Vulgaria</i> 3 r.						

## Bibliography

- Accetto M. 1999. Asocijacija *Carici serpervirentis–Pinetum nigrae* (Accetto 1996) Accetto 1999 nom. nov. v Sloveniji. Zbornik gozdarstva in lesarstva 60: 107-151.
- Bernátová D., Kliment J., Uhlířová J. 2003. K cenológii lipnice osobitej (*Poa sejuncta*) a lipnice babiohorskej (*Poa babiogorensis*). Bull. Slov. Bot. Spoločn., Bratislava 25: 231-237.
- Chrtek J., Mraz P., Severa M. 2004. Chromosome number in selected species of *Hieracium* s. str. (*Hieracium* subgen. *Hieracium*) in the Western Carpathians. Preslia 76: 119-139.
- Chytry M., Otypkova Z. 2003. Plot sizes used for phytosociological sampling of European vegetation. – Journal of Vegetation Science 14: 563–570.
- Ciriaková A., Hegedúšová K. 2003. Lesné spoločenstvá severozápadnej časti Štiavnických vrchov. Bull. Slov. Bot. Spoločn., Bratislava 25: 185-198.
- Dullinegr S., Dirnböck T., Essl F., Wenzl M. 2001. Syntaxonomie und Zonation der flussbegleitenden Vegetation der Salza (Steiermark). Joannea Bot. 2: 13–82.
- Eichenberg Ch., Heiselmayer P. 1997. Die Erika-Kiefernbestände (*Erico-Pinetum sylvestris* BR.-BL. in BR.-BL. et al. 39) bei Mandling (Salzburg und Steiermark, Österreich). Linzer biol. Beitr. 29(1): 507-543.
- Fabiszewski J., Kwiatkowski P. 2002. Threatened vascular plants of The Sudeten Mountains. Acta Soc. Bot. Poloniae 71(4): 339-350.
- Fiek E. & Uechtritz R. 1881. Flora von Schlesien preusischen und österreichischen Anteils, enthaltend die wildwachsenden, verwilderten und angebauten Phanerogamen und Gefäss-Cryptogamen, J. U. Kern, Breslau, 571 pp.
- Gottschlich G., Pericin G. 1999. Das Artenspektrum der Gattung *Hieracium* L. (*Compositae*) in Istrien. Bauhinia 13: 29-40.
- Greimpler J., Dirnböck TH. 1996. Die subalpine und alpine Vegetation des Schneebergs, Niederösterreich. Vegetationskarte im Maßstab 1:10.000 und Beschreibung der Vegetation. Linzer biol. Beitr. 28(1): 437-482.



- Hoppflinger G. 1957. Die Pflanzengesellschaften des Grimminggebietes. Mitt.Nat. Verein Steiermark, Bd. 87: 74-113.
- IUCN Red List Categories and Criteria Ver 3.1. IUCN – The World Conservation Union. 2001.
- Jarolímek I., Kliment J. 2004. Nitrofilné širokolisté vysokobylinné spoločenstvá v horskom a podhorskom stupni Nízkyh Tatier. Príroda Nízkyh Tatier 1: 147 – 163, Banská Bystrica.
- Jasiewicz A. 1980. *Hieracium*. In: Flora Polska. Rośliny naczyniowe Polski i ziem ościennych. 14: 199-335. Państwowe Wydawnictwo Naukowe, Warszawa-Kraków.
- Justin CH. 1993. Über bemerkenswerte Vorkommen ausgewählter Pflanzensippen auf Serpentinstandorten Österreichs, Sloweniens sowie der Tschechischen Republik. Linzer biol. Beitr. 25(2): 1033-1091.
- Kącki Z. (eds.) 2003. Zagrożone gatunki flory naczyniowej Dolnego Śląska. Instytut Biologii Roślin UWr. Polskie Towarzystwo Przyjaciół Przyrody „Pro Natura”, Wrocław.
- Kliment J. 2005. *Bellidiastro michelii-Seslerietum calcariae* – spoločenstvo zväzu *Astero-Seslerion calcariae* alebo *Cystopteridion fragilis*? Bull. Slov. Bot. Spoločn., Bratislava 27: 171-180.
- Kwiatkowski P. 2000. Notatki florystyczne z Gór Kaczawskich i ich Pogórza (Sudety Zachodnie). Cz. I. Fragm. Flor. Geobot. Pol. 7: 105-116.
- Kwiatkowski P. 2001. Projekt ochrony szaty roślinnej Gór Kaczawskich i ich Pogórza. Annales Silesiae 31: 5-26.
- Kwiatkowski P. 2002. Flora naczyniowa Masywu Połomu (Góry Kaczawskie). Przyroda Sudetów Zachodnich 5: 35-50.
- Kwiatkowski P. 2006. Current state, separateness and dynamics of vascular flora of the Góry Kaczawskie (Kaczawa Mountains) and Pogórze Kaczawskie (Kaczawa Plateau). I. Distribution atlas of vascular plants. W. Szafer Institute of Botany of the Polish Academy of Sciences, 467 pp.
- Maier R., Punz W. Sieghardt H., Domschitz E., Nagl A., Wiener S., Kulhanek A, Muhlebner W. 1981. Zur Ökologie einiger Pflanzen auf den schwermetallhaltigen Halden in Bleiberg/Kärnten. Carinthia II 171(91): 201-222.
- Matuszkiewicz J. M. i in. 2004. Założenia do „Atlasu rozmieszczenia zespołów roślinnych w Polsce” – systematyka jednostek (praca zespołowa, npbl.)
- Matuszkiewicz W. 2001. Przewodnik do oznaczania zbiorowisk roślinnych Polski. Wydawnictwo Naukowe PWN, Warszawa, 536 pp.
- Maurer K. 2005. Natural and anthropogenic determinants of biodiversity of grasslands in the Swiss Alps. Inauguraldissertation zur Erlangung der Würde einer Doktorin der Philosophie vorgelegt der Philosophisch-Naturwissenschaftlichen Fakultät der Universität Basel, Basel.
- Miller-Aichholz F. 2007. Vegetationsökologische Analysen unterschiedlich intensiv bewirtschafteter Almen im Nationalpark Gesäuse. Diplomarbeit, Univeristat Wien 115 pp.
- Mirek Z., Piękoś-Mirkowa H., Zając A., Zając M. 2002: Flowering plants and pteridophytes of Poland a checklist. Krytyczna lista roślin naczyniowych Polski.

- Biodiversity of Poland. vol. 1. W. Szafer Institute of Botany PAN, Kraków. ss. 442.
- Mirek Z., Zarzycki K., Wojewoda W., Szelağ Z. (eds.). Red list of plants and fungi in Poland. Czerwona lista roślin i grzybów Polski. Kraków: Instytut Botaniki im. W. Szafera, Polska Akademia Nauk.
- Mraz P., Marhold K. 2002. Neotypification of the Name *Hieracium bifidum* Kit. ex. Hornem (*Asteraceae*). *Phyton* 42: 117-124.
- Mraz P., Szelağ Z. 2004. Chromosome number and reproductive system in selected species of *Hieracium* and *Pilosella* (*Asteraceae*) from Romania. *Ann. Bot. Fennici* 41: 405-414.
- Ochyra R., Szmaajda P. & H. Bednarek-Ochyra. 1992. List of mosses to be published in ATMOS. In: OCHYRA R. & P. SZMAAJDA (eds), *Atlas of the geographical distribution of spore plants in Poland. Series V. Mosses (Musci)*. 8: 9–14. W. Szafer Institute of Botany, Polish Academy of Sciences and Poznań Adam Mickiewicz University, Kraków–Poznań.
- Pender K. 2003. Gatunki endemiczne, reliktowe i wysokogórskie w Sudetach. [In:] Kački Z. (eds.) *Zagrożone gatunki flory naczyniowej Dolnego Śląska*. Instytut Biologii Roślin – PTPP „pro Natura”: 175-197.
- Schube T. 1903. Die Verbreitung der Gefäßpflanzen in Schlesien preussischen und österreichischen Anteils. R. Nischowsky, Breslau, 363 pp.
- Schuhwerk F. 2008. Zur Gliederung der *Hieracium bifidum*-Gruppe in Bayern und benachbarten Gebieten. [In:] DENGLER, J., DOLNIK, C., TREPEL M. (eds.) *Flora, Vegetation und Naturschutz zwischen Schleswig-Holstein und Südamerika – Festschrift für Klaus Dierßen zum 60. Geburtstag*. – Mitt. Arbeitsgem. Geobot. Schleswig-Holstein Hamb., 65: 375-392, Kiel.
- Šibík J., Petřík A., Krajčiová-Šibíková I, Dúbravcová Z. 2005. Asociácia *Dryado octopetalae-Caricetum firmae Sillinger* 1933 v Západných Karpatach. *Bull. Slov. Bot. Spoločn., Bratislava* 27: 181-198.
- Šibíková I., Šibík J., Jarolímek I. 2009. Plant communities of the alliance *Calamagrostion arundinaceae* in the Krivánska Malá Fatra Mts. *Thaiszia - J. Bot., Košice* 19: 1-19.
- Surina B. 2005a. Some novelties in the flora and vegetation of Mt Sneznik (SW Slovenia, Liburnian karst). *Acta Bot. Croat.* 64(2): 341-356.
- Surina B. 2005b. Contribution to the spring vegetation of the Julian Alps. The association *Cratoneuretum falcati* Gams 1927. *Hacquetia* 4(1): 53-59.
- Świerkosz K. 2004. Notes on the syntaxonomy of the *Asplenietea trichomanis* class in Poland. – *Polish Botanical Journal* 49(2): 203–213.
- Szelağ Z. 2000. Rośliny naczyniowe Masywu Śnieżnika i Gór Bialskich. *Fragm. Flor. Geobot. Polonica. Suppl.* 3: 3-255.
- Szelağ Z. 2003. Górskie gatunki rodzaju *Hieracium* w Sudetach. Przemiany i zagrożenie. In: Kački Z. (eds.) *Zagrożone gatunki flory naczyniowej Dolnego Śląska*. Instytut Biologii Roślin – PTPP „pro Natura”: 197-215.
- Westhoff V., van der Maarel E. 1978. The Braun-Blanquet approach. In: Whittaker, R. H. (ed.) *Classification of plant communities*, pp. 289-299, W. Junk, The Hague.

Zahn K. H. 1935. *Hieracium bifidum*. In: Graebner P. fil. (eds.) Synopsis der mitteleuropäischen Flora, 12 (2): 605-675. Leipzig.

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