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Taxonomy & Inventories

An annotated nomenclatural checklist of endemic vascular plants distributed in the Ukrainian Carpathians

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Abstract

Background

The current paper presents a nomenclatural checklist for vascular plants validated being (sub)endemic to and present in the flora of the Ukrainian Carpathians. This checklist is a part of the work targeted on an inventory of endemic plants distributed in the Ukrainian Carpathians. It is mainly based on the analysis of primary sources (i.e. original protologues and monographic works), but also uses the data provided in the recent online taxonomic aggregators, such as the Global Biodiversity Information Facility (GBIF), Catalogue of Life (CoL), Plants of the World Online (POWO), Euro+Med PlantBase, World Flora Online (WFO) and others. Over 7,000 specimens deposited in the leading Ukrainian herbaria were also revised and used as a supporting data source during the work on the checklist.

New information

The checklist provides a revised nomenclature, including corrections on publication dates, rediscovered taxonomic protologues, corrected authorships and revised taxonomic status for (sub)endemic (sub)species of vascular plants occurring in the Ukrainian Carpathians. It

contains 1,101 names, from which 78 species and subspecies have been accepted as valid and 1023 species and infraspecific taxa are provided as synonyms. It is completed with critical notes on the nomenclature of problematic taxa and brief annotations regarding their distribution in the Ukrainian Carpathians, indicating the endemicity range and sozological status for all analysed (sub)species.

The current checklist is linked with the GBIF taxonomic backbone, provides notes on detected issues and primarily focuses on its update and correction of the nomenclatural issues and taxonomic inconsistencies, but also aims at discussing issues in other popular taxonomic databases.

Sabulina pauciflora is proposed as a new combination to comply with a recent revision of the genus *Sabulina*.

Keywords

GBIF, IPNI, CoL, taxonomic databases, endemic flora, Ukrainian Carpathians, nomenclature, *Sabulina pauciflora*, *comb. nov*.

Introduction

The Ukrainian Carpathians are part of the Eastern Carpathians located on the territory of four western regions (i.e. Lviv, Ivano-Frankivsk, Zakarpattia and Chernivtsi) of Ukraine. These mountains stretch for over 280 km and cover about 24,000 km^2 (Kondracki 1989, Tasenkevich 2004, Novikov 2021). The floristic diversity of the Ukrainian Carpathians consists of over 2500 species and subspecies of vascular plants. It comprises nearly 50% of the flora of the whole Carpathian Mountains range and almost 39% of the entire flora of Ukraine (Tasenkevich 2003, Chopyk and Fedoronchuk 2015). This is one of the most important centres of floristic diversity in Ukraine, having several confirmed glacial refugia and hosting many rare, relict and endemic plant species (Malynovskiy et al. 2002, Kricsfalusy and Budnikov 2007, Mitka et al. 2014). Amongst them, many species have minimal distribution. Some authors report 125 or even more endemic plant taxa from the region, including stenoendemics and microtaxa (Stojko and Tasenkevich 1993, Tasenkevich 2003, Chorney 2006, Chorney 2011).

During our initial analysis, 70 endemic and subendemic taxa (species and subspecies) of vascular plants were selected as those taxonomically non-ambiguous and confirmed as present in the flora of the Ukrainian Carpathians (Novikoff and Hurdu 2015). Since that, the initial list has been critically revised, based on newly-available published sources and routine elaboration of herbarium material. As a result, nine taxa (i.e. *Aconitum firmum* subsp. *fussianum* Starmühl., *Leontodon kulczynskii* Popov, *Oxytropis carpatica* R.Uechtr., *Trisetum macrotrichum* Hack., *Carduus kerneri* Simk. subsp. *kerneri*, *Dactylorhiza maculata* (L.) Soó subsp. *schurii* (Klinge) Soó, *Dianthus carthusianorum* subsp. *tenuifolius* (Schur) Hegi, *Euphorbia carpatica* Woł. and *Festuca rupicola* Heuffel. subsp. *saxatilis*

(Schur) Rauschert) were excluded from the initial list because their distribution was not limited to the Carpathian region and/or due to problematic taxonomic interpretation and chorology. Some more taxa (e.g. *Astragalus australis* subsp. *krajinae* (Domin) Domin, *Carduus kerneri* Simk. subsp. *kerneri*, *Erysimum wahlenbergii* (Asch. & Engl.) Borbás, *Festuca psammophila* subsp. *dominii* (Krajina) P.Šmarda and *Leucanthemopsis alpina* subsp. *tatrae* (Vierh.) Holub,) were considered as potential candidates for the current list, but excluded from further processing due to their unclear taxonomy and/or chorology. *Viola jooi* Janka, which is a south-eastern Carpathian endemic, has also been excluded because it had been erroneously reported for the flora of the Ukrainian Carpathians (Sheliag-Sosonko et al. 1980, Chorney 2011). *Scabiosa columbaria* L. subsp. *pseudobanatica* (Schur) Jáv. & Csapody mentioned in the initial list (Novikoff and Hurdu 2015) was excluded from the current list due to unclear taxonomic status and chorology. Seventeen taxa and their verified synonyms were newly added, so the current list contains 78 accepted species from 51 genera, 29 families, 15 orders and two classes of vascular plants supported with 1023 synonyms (including the orthographical variants).

During the work with herbarium material, the need for a comprehensive taxonomic checklist became apparent because many specimens were deposited under different names and had different taxonomic interpretations depending on the identifier. Unfortunately, available online databases and published sources did not entirely fill the gap in nomenclature and synonymy and sometimes even provide controversial interpretations. To solve this issue, the checklist with complete nomenclatural citations was compiled, based on comprehensive data analysis. I believe that this checklist will be useful for other scientists conducting taxonomic revisions of certain plant groups and it will fulfil the missing data in existing checklists and databases, especially those focused on biodiversity and conservation.

Dedication

The work is dedicated to the bright memory of my teacher and friend, Prof. Dr. hab. Kazimierz Szczepanek from the Jagiellonian University in Kraków.

Materials and methods

The accepted taxa's names are typefaced in bold italicised font. The synonyms are typefaced in italicised font. The identity sign (≡) indicates homotypic synonyms. The equality sign (=) indicates the heterotypic regular synonyms. The N-dash sign (–) indicates the names with the types which do not belong to the present taxon, i.e. partial heterotypic synonyms (synonyms *pro parte*), names in the interpretation of a certain author (synonyms *sensu*) or misapplied names. The names applied in the Ukrainian herbaria are marked by an asterisk. Additional information required to clarify or better understand the provided name is indicated in the square brackets [].

In some cases, the same name has been published twice in the same year by the same author(s), but in different works or it was published first as *nomen nudum* and soon

supported with comments and/or protologue. In such cases, extended nomenclature citation is provided with an indication of both such works delimited by the term ‘et’. The term ‘et’ is applied to avoid confusion with an ampersand (&), which delimits different authors of the same taxon. In other words, in the nomenclature citation, ampersand delimits authors, while the term ‘et’ delimits publications. For example, *Chrysanthemum rotundifolium* has been published by two authors, Franz Waldstein and Pál Kitaibel. Therefore its nomenclature citation is ‘*Chrysanthemum rotundifolium* Waldst. & Kit., Descr. Icon. Pl. Rar. Hung. 3: 262, t. 236 (1812)’. The name *Thlaspi dacicum* subsp. *dacicum* has been published by János Heuffel twice in the same year, but in two different journals – in the Oesterreichische botanische Zeitschrift and in the Verhandlungen der Kaiserlich-Koniglichen Zoologisch-Botanischen Gesellschaft in Wien. Hence, the providded nomenclature citation is ‘*Thlaspi dacicum* subsp. *dacicum* Heuff., Oesterr. Bot. Z. 8: 26 (1858) et Verh. K.K. Zool.-Bot. Ges. Wien 8 (Abh.): 61 (1858)’. The name *Silene transsilvanica* was first published by Philipp Schur in 1858 and later, in 1860, supported with details in the same journal Oesterreichische botanische Zeitschrift as nomen nudum. Hence, the provided nomenclature citation is ‘*Silene transsilvanica* Schur, Oesterr. Bot. Z. VIII: 22 (1858) [nom. nudum] et Oesterr. Bot. Z. 10: 181 (1860)’.

Recently, for the flora of Ukraine, the assessments following criteria of the International Union for Conservation of Nature (IUCN 2022) were conducted and published by Onyshchenko et al. (2022); ascertained threat categories are indicated here for all analysed (sub)species. The national threat categories follow the last edition of the Red Book of Ukraine (Didukh 2009).

Data resources

The present checklist has been compiled in 2017–2022, based on the elaboration of such principal monographic works as Flora of USSR (Komarov 1934), Flora of UkrSSR (Bordzilovskiy 1938, Zerov 1950), Flora of the European Part of USSR (Fedorov 1974, Tzvelev 1989), Flora of the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015), Flora of Poland (Szafer and Raciborski 1919, Szafer 1921, Szafer and Pawłowski 1955, Pawłowski 1963, Pawłowski and Jasiewicz 1971, Jasiewicz 1980, Jasiewicz 1985), Flora of Romania (Săvulescu 1952), Flora of Slovakia (Futák 1966, Michalko 1984, Feráková 1993), Synopses of the flora of the Czech Republic (Opiz 1852, Domin 1935); Flora of Hungary (Jávorka 1924), Flora of Bucovina (Herbich 1859), Conspects of the lora of Galicia (Zawadski 1835, Błocki 1883a, Błocki 1883b, Błocki 1883c, Błocki 1883d, Błocki 1883e, Błocki 1883f, Błocki 1883g, Błocki 1883h, Błocki 1883i, Błocki 1884a, Błocki 1884b, Błocki 1884c, Błocki 1884d, Błocki 1884e, Błocki 1884f, Zapałowicz 1906b), Synopses of the Central European flora (Ascherson and Graebner 1896, Soó 1972) and Conspects of the Flora of Transylvania (Baumgarten 1816b, Fuss 1866, Schur 1866, Simonkai 1886). Such checklists as Czerepanov (1995), Tasenkevich (1998), Mosyakin and Fedoronchuk (2015), Mirek et al. (2020) and other specific publications cited directly in the text were also applied. The Biodiversity Heritage Library (BHL 2022), Biblioteca del Real Jardín Botánico (RJB-CSIC 2023), Repository of the Library and Information Centre of the Hungarian

Academy of Sciences (REAL-J 2023), Google Books (Google 2023), Internet Archive (2022), Hungaricana (Országgyűlési Könyvtár 2023), E-Periodica (ETH Library 2023), Biblioteca Digitala BCU Cluj (Lucian Blaga Central University Library 2022), Elektronikus Periodika Archívum (Hungarian Electronic Library 2023), Digitální knihovna AV ČR (Akademie věd České republiky 2023), Wielkopolska Biblioteka Cyfrowa (WBC 2023) and Guide to the plant species descriptions published in seed lists from Botanic Gardens for the period 1800−1900 (Lut and Veldkamp 2023) have been used as a source of old printed materials containing the initial protologues of taxa.

Besides this, such databases as the International Plant Name Index (IPNI 2023), Catalogue of Life (Bánki et al. 2023), Euro+Med PlantBase (Euro+Med 2023), Plants of the World Online (POWO 2023), Worldplants (Hassler 2023), Global Biodiversity Information Facility (GBIF 2023), Wikispecies (Wikimedia 2023), World Flora Online (WFO 2023), Florenliste von Deutschland (Gefäßpflanzen) (Hand et al. 2023) and Global Compositae Database (Compositae Working Group 2023) were also intensively used to construct the initial taxonomic backbone of the present checklist and to verify listed names.

The repositories JACQ (JACQ consortium 2023) and Global Plants (JSTOR 2023) were used to reveal existing type material for all analysed taxa, including those listed as synonyms. The TreatmentBank (Plazi 2023) was used to locate digitised taxonomic treatments for all valid taxa.

Finally, over 7,000 vouchers deposited in the leading Ukrainian herbaria (i.e. KW, KWHA, KWU, CHER, UU, LW, LWS and LWKS – see Thiers (2022) for abbreviations) were processed. Additional information gathered from KRA and KRAM Herbaria and Domin's Card Index deposited at the Institute of Botany of the SAS in Bratislava was also integrated into the checklist. The dataset of processed specimens has been published in GBIF (Novikov and Sup-Novikova 2022a, Novikov and Sup-Novikova 2022b).

Below is the extended list of the analysed endemic species and subspecies of vascular plants distributed in the Ukrainian Carpathians, with some critical remarks and full nomenclature citations. The brief alphabetic list compiled for quick navigation and routine work with herbarium material is provided in Suppl. material 1. The hierarchically organised checklist with collapsed homotypic synonyms for easier nomenclatural work is provided in Suppl. material 2. The links and accession numbers for DNA sequences for all species revealed using the European Nucleotide Archive (EMBL-EBI 2023) facilities and cross-checked with Barcode of Life Data Systems (Ratnasingham and Hebert 2007, BOLD 2023) are provided in Suppl. material 3. The draft table version of this checklist (with some working Cyrillic annotations) used to create the current paper is deposited and freely available from Zenodo (Novikov 2023).

Endemic vascular plants distributed in the Ukrainian Carpathians

Class Liliopsida

Order Asparagales

Family Asparagaceae

Scilla kladnii Schur, Enum. Pl. Transsilv.: 668 (1866)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4VJH7
- GBIF https://www.gbif.org/species/2767548
- IPNI urn:lsid:ipni.org:names:540858-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000740952
- POWO https://powo.science.kew.org/taxon/540858-1
- Wikispecies https://species.wikimedia.org/wiki/Scilla_kladnii
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/43877abc-2ef9-4cbf-afaf-d18e92f3cf63
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Scilla-bifolia
- BHL https://www.biodiversitylibrary.org/page/10544719#page/690/

Nomenclature:

≡ *Scilla bifolia* var. *kladnii* (Schur) Nyman, Consp. Fl. Eur.: 730 (1882); GBIF: https://www.gbif.org/species/2767528; IPNI: https://www.ipni.org/n/77291211-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000802907; POWO: https://powo.science.kew.org/taxon/77291211-1; BHL: https://www.biodiversitylibrary.org/page/11015874#page/741

= *Scilla alpina* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 3: 90 (1852); GBIF: https://www.gbif.org/species/2767537; IPNI: https://www.ipni.org/n/540643-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000734709; POWO: https://powo.science.kew.org/taxon/540643-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/961

= *Scilla bifolia* subsp. *alpina* (Schur) Nyman, Consp. Fl. Eur.: 730 (1882); GBIF: https://www.gbif.org/species/2767527; IPNI: https://www.ipni.org/n/77258410-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000772133; POWO: https://powo.science.kew.org/taxon/77258410-1; BHL: https://www.biodiversitylibrary.org/page/11015874#page/741

= *Scilla bifolia* var. *alpina* (Schur) C.Zahariadi in Nyár., Fl. Rep. Pop. Rom. 11: 314 (1966)

= *Scilla bifolia* β [unranked] *gracillima* Grecescu, Consp. Fl. Rom.: 565 (1898), non alior

= *Scilla bifolia* subsp. *subtriphylla* (Schur) Domin, Preslia 13–15: 19 (1936); GBIF: https://www.gbif.org/species/6316610; IPNI: https://www.ipni.org/n/77258137-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000915343; POWO: https://powo.science.kew.org/taxon/77258137-1

= *Scilla bifolia* var. *subtriphylla* (Schur) T.Simon, Ann. Biol. Univ. Debrecen. n.s., 1: 154 (1950); GBIF: https://www.gbif.org/species/5952322; IPNI: https://www.ipni.org/n/77291428-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000915344; POWO: https://powo.science. kew.org/taxon/77291428-1

= *Scilla subtriphylla* Schur, Enum. Pl. Transsilv.: 668 (1866) *; GBIF: https://www.gbif.org/species/2767536; IPNI: https://www.ipni.org/n/541057-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000741455; POWO: https://powo.science.kew .org/taxon/541057-1; BHL: https://www.biodiversitylibrary.org/page/10544719#page/690

= *Scilla trifolia* Schur, Enum. Pl. Transsilv.: 668 (1866); GBIF: https://www.gbif.org/species/2767525; IPNI: https://www.ipni.org/n/541069-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000741409; POWO: https://powo.science.kew .org/taxon/541069-1; BHL: https://www.biodiversitylibrary.org/page/10544719#page/690

– *Scilla bifolia* L., Sp. Pl. 1: 309 (1753) [p. p., tantum quod plantas ucrain. carpat.], non alior *; GBIF: https://www.gbif.org/species/2767506; IPNI: https://www.ipni.org/n/540689-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000741049; POWO https://powo.science.kew.org/taxon/540689-1; BHL: https://www.biodiversitylibrary.org/page/358328#page/321

– *Scilla bifolia* var. *nivalis* auct. fl. carpat, non Baker

– *Scilla bifolia* subsp. *nivalis* (Boiss.) K.Richt., Pl. Eur., 1: 220 (1890) sensu Fodor [non sensu orig.]

– *Scilla praecox* auct. fl. carpat, non Willd.

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: It was shown that *Scilla bifolia* L. is represented in the Ukrainian Carpathians by single subspecies – subsp. *subtriphylla* (Schur) Domin, which is a synonym to *S. kladnii* (Kricsfalusy and Vajnagi 1994, Kolesnyk 2001, Kolesnyk 2003).

Family Iridaceae

Crocus banaticus J.Gay, Bull. Sci. Nat. Géol. (Bull. Férussac), 25: 220, Nr. 178 (1831), non Heuff.

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/ZKSS
- GBIF https://www.gbif.org/species/2747589
- IPNI urn:lsid:ipni.org:names:436477-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000788544

- POWO https://powo.science.kew.org/taxon/436477-1
- Wikispecies https://species.wikimedia.org/wiki/Crocus_banaticus
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d631ff50-1df9-4cff-8d91-1dacd8c44ed2
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Crocus-banaticus
- BHL https://www.biodiversitylibrary.org/item/25919#page/718
- JACQ https://hal.jacq.org/HAL0134213
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499181
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499180
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499179
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499183
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499182
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.mo-202890

Nomenclature:

= *Crocus herbertianus* Körn., Index Seminum (B, Berolinensis) 1854 (App.): 15 (1855); GBIF: https://www.gbif.org/species/2747686; IPNI: https://www.ipni.org/n/436554-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000788677; POWO: https://powo.science.kew.org/taxon/436554-1

= *Crocus iridiflorus* Heuff. ex Rchb., Ic. Fl. Germ. 9: 10, figs. 802, 803 (1847); GBIF: https://www.gbif.org/species/8465903; GBIF: https://www.gbif.org/species/2747687; IPNI: https://www.ipni.org/n/436571-1; WFO: http://www.worldfloraonline.org/taxon/wfo-000 0788697; POWO: https://powo.science.kew.org/taxon/436571-1; BHL: https://www.biodiversitylibrary.org/item/28666#page/20; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499176; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000499177

= *Crocus nudiflorus* Schult., Oestr. Fl., ed. 2, 1: 101 (1814) [nom. illeg.], non alior; GBIF: https://www.gbif.org/species/7380666; IPNI: https://www.ipni.org/n/436632-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000788771; POWO: https://powo.science.kew.org/taxon/436632-1

= *Crocus speciosus* Baumg., Enum. Stirp. Transsilv. 1: 60 (1816), non alior

= *Crocus speciosus* (Baumg.) Host, Fl. Austr. 1: 43 (1827), non alior [nom. illeg.]

= *Crocus speciosus* var. *transsylvanicus* Hooker, Curt. Bot. Mag. 67: t. 3861 (1840–1841); GBIF: https://www.gbif.org/species/2747724; IPNI: https://www.ipni.org/n/77271176-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000803365; POWO: https://powo.science.kew.org/taxon/77271176-1; BHL: https://www.biodiversitylibrary.org/item/14345#page/205

= *Crociris iridiflora* (Heuff. ex Rchb.) Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 73 (1853); GBIF: https://www.gbif.org/species/2747450; IPNI: https://w ww.ipni.org/n/436423-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000782650; POWO: https://powo.science.kew.org/taxon/436423-1; BHL: https://www.biodiversity library.org/page/11525300#page/959

= *Crociris speciosa* (Host) Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 73 (1853); GBIF: https://www.gbif.org/species/2747453; IPNI: https://w ww.ipni.org/n/436424-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000782651; POWO: https://powo.science.kew.org/taxon/436424-1; BHL: https://www.biodiversity library.org/page/11525300#page/959

– *Crocus byzantinus* Ker Gawl., Bot. Mag. 28: t. 1111 (1808) [p. p.]; GBIF: https://www.gbif.org/species/2747452; GBIF: https://www.gbif.org/species/11347665; IPNI: https://www.ipni.org/n/436488-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000788579; POWO: https://powo.science.kew.org/taxon/436488-1; BHL: https://www.biodiversitylibrary.org/item/14316#page/152

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian subendemic.

Notes: In Ukraine, this species occurs in Transcarpathia only and is listed in the Red Book of Ukraine as vulnerable (Mihály and Komendar 1993, Mygal 2009, MEPNR of Ukraine 2021). In his paper, Hooker (1840), in table 3861, indicated that *C. speciosus* var. *transsylvanicus* is a synonym of *C. speciosus* mentioned by Lindley (1839) in table 40. However, Lindley clearly stated that he considered *C. speciosus* sensu Baumg. (not sensu M.Bieb.) and also mentioned these plants under the name *C. nudiflorus*. Both taxa, *C. speciosus* sensu Baumg. and *C. nudiflorus* are known synonyms of *C . banaticus* . Consequently, *C. speciosus* var. *transsylvanicus* is also considered here as a synonym of *C. banaticus*. Danciu and Golban (2009) on page 131 also mentioned *C. speciosus* Rochel, non alior as a synonym of *C. banaticus.* However, in the original work of Rochel (1828), there is no evidence of its synonymy with *C . banaticus*.

GBIF (https://www.gbif.org/species/2747449, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/436685-1, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000788843, accessed on 05.06.2023) and Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/719bcaf0-a50e-4a66-86b9-fc4b2a73352f, accessed on 05.06.2023) mistakenly indicate *Crociris iridiflora* Schur and *C. speciosa* Schur as synonyms for *Crocus salzmannii* J.Gay occurring in Spain, Morocco and Algeria. Both Schur's species were described from the Carpathian region (Schur 1853) and have no relation to *C. salzmannii*, which is sometimes recognised as a subspecies, *C. serotinus* subsp. *salzmannii* (J.Gay) B.Mathew). It was shown that *C. banaticus*, which, for a long time, was considered belonging to the independent subgenus *Crociris* Schur, is a morphological variant within section Crocus, but still distinct from *C. salzmannii* (Surányi et al. 2010, Harpke et al. 2013). This mistaken synonymisation has been resolved in the Worldplants database (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Crocus-salzmannii, accessed on 07.06.2023).

Family Orchidaceae

Gymnadenia carpatica (Zapał.) Teppner et E.Klein, Phyton (Horn) 38 (1): 221 (1998)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/3HP3F
- GBIF https://www.gbif.org/species/2840452
- IPNI urn:lsid:ipni.org:names:1003516-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000976550
- POWO https://powo.science.kew.org/taxon/1003516-1
- Wikispecies https://species.wikimedia.org/wiki/Gymnadenia_carpatica
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d0bda98f-b0f8-4192-a6fa-e8ce84a65cf6
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Nigritella-nigra

Nomenclature:

≡ *Nigritella carpatica* (Zapał.) Teppner, E.Klein & Zag., Phyton (Horn) 34: 171 (1994) *; GBIF: https://www.gbif.org/species/5323915; IPNI: https://www.ipni.org/n/981684-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000976550; POWO: https://powo.science.kew.org/taxon/981684-1

≡ *Nigritella angustifolia* var. *carpatica* Zapał., Consp. Fl. Gallic. Crit. 1: 215 (1906); GBIF: https://www.gbif.org/species/5323917; IPNI: https://www.ipni.org/n/50989850-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000251887; POWO: https://powo.science.kew.org/taxon/50989850-1

≡ *Nigritella nigra* subsp. *carpatica* (Zapał.) H.Baumann & R.Lorenz, J. Eur. Orch. 37: 717 (2005); GBIF: https://www.gbif.org/species/8213444; IPNI: https://www.ipni.org/n/77070561-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000806174; POWO: https://powo.science.kew.org/taxon/77070561-1

≡ *Nigritella nigra* var. *carpatica* (Zapał.) Pawł., Bull. Int. Acad. Polon. Sci., Cl. Sci. Math., Sér. B 1, Bot. 1947: 85, 96 (1947); GBIF: https://www.gbif.org/species/5323916; WFO: http://www.worldfloraonline.org/taxon/wfo-0000839712; POWO: https://powo.science.kew.org/taxon/377060-4

≡ *Nigritella rubra* f. *carpatica* (Zapał.) Soó, Repert. Sp. Nov. Regni Veg. 24: 33 (1927); GBIF: https://www.gbif.org/species/5950762; POWO: https://powo.science.kew.org/taxon/376651-4

– *Gymnadenia nigra* auct. fl. ucrain. carpat., non (L.) Rchb.f.

– *Nigritella nigra* auct. fl. ucrain. carpat., non (L.) Rchb.f. *

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic

Notes: The Red Book of Ukraine lists this species as obsolescent (Chorney 2009c, MEPNR of Ukraine 2021).

Nigritella rubra f. *carpatica* (Zapał.) Soó is a homonym of *Gymnadenia carpatica*. However, GBIF (https://www.gbif.org/species/2840596, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/636560-1, accessed on 05.06.2023) and WFO (https://list.worldfloraonline.org/wfo-0000976634, accessed on 07.06.2023) mistakenly provide *Nigritella rubra* f. *carpatica* amongst synonyms to *G. miniata* (Crantz) Hayek. *Gymnadenia miniata* (= *Gymnadenia rubra* Wettst.) as a distinct West-South-Central European red-flowered species of vanilla orchid (Baumann and Lorenz 2011) that does not occur in the Carpathians (https://powo.science.kew.org/taxon/636560-1, accessed on 07.07.2023).

Order Poales

Family Juncaceae

Luzula alpinopilosa subsp. *obscura* S.E.Fröhner, Preslia 40: 426 (1968)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5JFTM
- GBIF https://www.gbif.org/species/7870156
- GBIF https://www.gbif.org/species/8067039
- WFO http://www.worldfloraonline.org/taxon/wfo-0000777604
- POWO https://powo.science.kew.org/taxon/50966612-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/0a2c93e4-408c-4767-84b9-214de6f3ce86
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Luzula-alpinopilosa

Nomenclature:

≡ *Luzula obscura* (S.E.Fröhner) Novikov, Byull. Moskovsk. Obshch. Isp. Prir., Otd. Biol. 95(6): 66 (1990); GBIF: https://www.gbif.org/species/4204323; IPNI: https://www.ipni.org/n/962193-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000778005; POWO: https://powo.science.kew.org/taxon/962193-1

= *Luzula carpatica* Kitt. ex Kanitz, Linnaea 32: 327 (1863); GBIF: https://www.gbif.org/species/9058223; GBIF: https://www.gbif.org/species/7559197; IPNI: https://www.ipni.org/n/443753-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000777735; POWO: https://powo.science.kew.org/taxon/77242868-1; BHL: https://www.biodiversitylibrary.org/page/118417#page/330

= *Luzula spadicea* var. *carpatica* (Kitt. ex Kanitz) Nyman, Consp. Fl. Eur., Suppl. 2: 314 (1890); GBIF: https://www.gbif.org/species/7629382; IPNI: https://www.ipni.org/n/772826 94-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000803768; POWO: https://powo.science.kew.org/taxon/77282694-1

= *Luzula spadicea* [unranked] *carpatica* (Kitt. ex Kanitz) Asch. & Graebn., Syn. Mitteleur. Fl. 2(2): 513 (1904); GBIF: https://www.gbif.org/species/9651841; BHL: https://www.biodiversitylibrary.org/page/25150622#page/523

= *Luzula spadicea* f. *carpatica* (Kitt. ex Kanitz) I.Grinț., Fl. Rep. Soc. Rom. 11: 594 (1966); GBIF: https://www.gbif.org/species/7942645; WFO: http://www.worldfloraonline.org/taxon/wfo-0000778119; POWO: https://powo.science.kew.org /taxon/316684-4

= *Juncus spadiceus* [unranked] β *glabratus* Wahlenb., Fl. Carp. Princip.: 102 (1814), non Hoppe nec Host

– *Juncus alpinopilosus* Chaix, Hist. Pl. Dauphiné (Villars) 1: 318 (1786) [p. p., tantum quod plantas carpat.]; GBIF: https://www.gbif.org/species/2700949; IPNI: https://www.ipni.org/n/442659-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000775785; POWO: https://powo.science.kew.org/taxon/442659-1; BHL: https://www.biodiversitylibrary.org/page/50324360#page/416

– *Juncus spadiceus* All., Fl. Pedem. 2: 216 (1785) [nom. invalid., p. p., tantum quod plantas carpat.], non alior; GBIF: https://www.gbif.org/species/7420868; IPNI: https://www.ipni.org/n/443494-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000777249; POWO: https://powo.science.kew.org/taxon/443494-1

– *Luzula alpinopilosa* (Chaix) Breistr., Bull. Soc. Sci. Dauph. 61: 609 (1947) [p. p., tantum quod plantas carpat.] *; GBIF: https://www.gbif.org/species/2700948; IPNI: https://www.ipni.org/n/443701-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000777600; POWO: https://powo.science.kew.org/taxon/443701-1

– *Luzula spadicea* (All.) Lam. & DC., Fl. Franc. [de Candolle & Lamarck], ed. 3. 3: 159 (1805) [p. p., tantum quod plantas carpat.] *; GBIF: https://www.gbif.org/species/9449570; IPNI: https://www.ipni.org/n/443937-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000778114; POWO: https://powo.science.kew.org/taxon/443937-1; BHL: https://www.biodiversitylibrary.org/page/49712877#page/169

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/443701-1, accessed on 05.06.2023), there are three subspecies of *L. alpinopilosa* (Chaix) Breistr – subsp. *alpinopilosa* (distributed in Western and Central Europe), subsp. *deflexa* (Kožuharov) Kirschner (native to South Europe) and subsp. *obscura* (the only subspecies occurring in the Carpathians). Chopyk and Fedoronchuk (2015), on page 544, considered *L. spadicea* (All.) DC. a synonym of *L. alpinopilosa subsp. obscura* and *L. alpinopilosa*. Similarly, Mirek et al. (2020), on page 112, considered *L. spadicea* a synonym of *L. alpinopilosa* without clarification of the subspecies. Considering the absence of other subspecies in the range, all plants from the Carpathian Mts. identified as *L. alpinopilosa* and *L. spadicea* should be regarded as belonging to *L. alpinopilosa* subsp. *obscura*.

Family Poaceae

Alopecurus pratensis subsp. *laguriformis* (Schur) Tzvelev, Novosti Sist. Vyssh. Rast. 8: 19 (1971)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FJ2M
- GBIF https://www.gbif.org/species/5672026
- IPNI urn:lsid:ipni.org:names:881439-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000845668
- POWO https://powo.science.kew.org/taxon/881439-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/9c3dfa16-2a37-49e2-b6c0-7e576959f9d3
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Alopecurus-pratensis
- JACQ https://w.jacq.org/W0025395
- JACQ https://w.jacq.org/W19160035870
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000913477
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.k000913476

Nomenclature:

≡ *Alopecurus laguriformis* Schur, Verh. Siebenb. Ver. Naturw. 1: (1850) 182 [nom. nudum] et Schur ex Gris., Iter. Hung: 362 (1852) *; GBIF: https://www.gbif.org/species/5672208; IPNI: https://www.ipni.org/n/387117-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000845668; POWO: https://powo.science.kew.org/taxon/387117-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/190; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.w0025395

= *Alopecurus laguriformis* [unranked] a abbreviatus Schur, Oesterr. Bot. Z. 9: 13 (1859); BHL: https://www.biodiversitylibrary.org/item/36437#page/19

= *Alopecurus laguriformis* [unranked] b *elongatus* Schur, Oesterr. Bot. Z. 9: 13 (1859) et Enum. Pl. Transsilv.: 727 (1866); GBIF: https://www.gbif.org/species/5943426; IPNI: https://www.ipni.org/n/77263212-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000845589; POWO: https://powo.science.kew.org/taxon/77263212-1; BHL: https://www.biodiversitylibrary.org/item/36437#page/19

= *Alopecurus transsilvanicus* Schur, Enum. Pl. Transsilv.: 727 (1866); GBIF: https://www .gbif.org/species/5671949; IPNI: https://www.ipni.org/n/387210-1; WFO: http://www. worldfloraonline.org/taxon/wfo-0000845481; POWO: https://powo.science.kew.org/taxon/387210-1; BHL: https://www.biodiversitylibrary.org/page/10544778#page/749

– *Alopecurus brachystachyus* auct. [e.g., Janka], non M.Bieb.

– *Colobachne gerardi* Schur, Enum. Pl. Transsilv.: 728 (1866), non Link.; BHL: https://www.biodiversitylibrary.org/page/10544778#page/750

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Three (https://powo.science.kew.org/taxon/387176-1, accessed on 05.06.2023) to five (https://europlusmed.org/cdm_dataportal/taxon/1d82b70c-8685-4ea4-a6d2-296864770429, accessed on 05.06.2023) subspecies of *A. pratensis* L. are recognised viz. subsp. *pratensis* (cosmopolite), subsp. *alpestris* (Wahlenb.) Selander (occurs in Northern Eurasia), subsp. *laguriformis* (occurs in Romania and, probably, in Ukraine), subsp. *songaricus* (Fisch. & C.A.Mey.) N.V.Vlassova (questionable taxon declared for Asia) and subsp. *pseudonigricans* O.Schwarz. (dubious taxon mentioned for Germany and Czech republic). WFO (https://list.worldfloraonline.org/wfo-0000845656, accessed on 05.06.2023) also recognises *A. pratensis* var. *aquaticus* (Dumort.) Mathieu (≡ *A. aquaticus* Dumort.), which is, however, synonymised by the rest of the databases with the widely distributed *A. arundinaceus* Poir. Presence of *A. pratensis* subsp. *laguriformis* in the Ukrainian Carpathians is doubtful and requires confirmation (Chopyk and Fedoronchuk 2015).

GBIF (https://www.gbif.org/species/5672406, accessed on 05.06.2023) POWO (https://powo.science.kew.org/taxon/387039-1, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000845481, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Alopecurus-brachystachyus, accessed on 07.06.2023), mistakenly indicate *A. laguriformis* var. *elongatus* Schur and *A. transsilvanicus* Schur as synonyms of *A. brachystachyus* M.Bieb. Schur (1866), on page 727, indeed synonymised *A. transsilvanicus* with *A. laguriformis* var. *elongatus* distributed in Făgăraș (Schur 1859) and Rodna Mts. (Schur 1866). Schur (1866), on pages 727 and 728, also pointed out that Neilreich (1861) believed that *A. transsilvanicus*, *A. colobachnoides* Trin. and *A. vlassovii* Trin are synonyms of *A. brachystachyus* distributed in the Carpathians (Făgăraș, Rodna and Kronstadt [= Brașov]). However, Neilreich's taxonomic interpretation of the mentioned taxa was mistaken because he relied on Janka (1858), who concluded that revised specimens of *A. laguriformis* are identical to the plants of *A. vlassovii* from the Altai and Baikal. In fact, this Janka's conclusion led to the synonymisation of *A. laguriformis* with *A. vlassovii* and, consequently, with *A. colobachnoides*, which are morphologically different and geographically isolated taxa *Tzvelev (1976).* Such Janka's misinterpretation of *A. laguriformis* was first outlined by Simonkai (1886). Later, Tzvelev (1971), in his revision of the genus *Alopecurus* distinguished *A. brachystachyus* and *A. laguriformis* and downgraded the last one to the rank of subspecies *A. pratensis subsp. laguriformis* Tzvelev (1974), Tzvelev (1976), Tzvelev (1978) and Tzvelev (1978) also pointed out that *A. pratensis* subsp. *laguriformis* is known exclusively from the Carpathians, while *A. brachystachyus* (≡ *A. colobachnoides* and = *A. vlassovii*) occurs out of Europe far to the east, in the Caucasus, Siberia, China and Mongolia.

Festuca amethystina subsp. *orientalis* Krajina, Acta Bot. Bohem. 9: 214 (1930), non alior

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5HC6W
- GBIF https://www.gbif.org/species/5940986
- IPNI urn:lsid:ipni.org:names:77188270-1

- WFO http://www.worldfloraonline.org/taxon/wfo-0000869748
- POWO https://powo.science.kew.org/taxon/77188270-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/aa72de8f-989c-48f8-b841-662e5460634b
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Festuca-amethystina

Nomenclature:

= *Festuca amethystina* subsp. *inarmata* (Schur) Krajina, Veröff. Geobot. Inst. Rübel Zürich 10: 29 (1933); GBIF: https://www.gbif.org/species/7651353; WFO: https://list.worldfloraonline.org/wfo-0001097471

= *Festuca amethystina* subsp. *amethystina* var. *amethystina* f. *marmarossica* (Zapał.) Beldie, Fl. Rep. Pop. Soc. Rom. 12: 557 (1972)

= *Festuca amethystina* subsp. *amethystina* var. *amethystina* f. *pauciflora* (A.Nyár. & Nyár.) Beldie, Fl. Rep. Soc. Rom. 12: 557 (1972)

= *Festuca amethystina* [unranked] a marmarossica Zapał., Consp. Fl. Galic. Crit. 1: 65 (1906) [ortho. var.] *

= *Festuca amethystina* [unranked] a marmarossiensis Zapał., Consp. Fl. Galic. Crit. 3: 230 (1911)

= *Festuca amethystina* [unranked] a marmarossiensis f. *doamnensis* Zapał., Consp. Fl. Galic. Crit. 3: 230 (1911)

= *Festuca amethystina* f. *pauciflora* A.Nyár. & Nyár., Studii Cercet. Biol. Ser. Bot. 16(2): 109 (1964)

= *Festuca heterophylla* var. *inarmata* Schur ex Schur, Enum. Pl. Transsilv.: 792 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/812

= *Festuca heterophylla* var. *setifolia* Schur ex Schur, Enum. Pl. Transsilv.: 792 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/812

= *Festuca inarmata* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 177 (1859) *; GBIF: https://www.gbif.org/species/4122548; IPNI: https://www.ipni.org/n/402888-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000870754; POWO: https://powo.science.kew.org/taxon/402888-1; BHL: https://www.biodiversitylibrary .org/page/11528081#page/421

– *Festuca amethystina* L., Sp. Pl. 1: 74 (1753) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/4113725; IPNI: https://www.ipni.org/n/402336-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000869744; POWO: https://powo.science.kew.org/taxon/402336-1; BHL: https://www.biodiversitylibrary.org/page/358093#page/86

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Two (https://powo.science.kew.org/taxon/402336-1, accessed on 05.06.2023) to four (https://europlusmed.org/cdm_dataportal/taxon/4427a965-d232-4346-97dd-5275c9dbdb31, accessed on 05.06.2023) subspecies of *Festuca amethystina* L. are recognised – subsp. *amethystina* (distributed almost in the whole of Europe), subsp. *orientalis* (= subsp. *inarmata*, endemic to the south-eastern Carpathians; its presence in the Balkans doubted by Kliment et al. (2016)), subsp. *kummeri* (Beck) Markgr.-Dann. (sporadically represented in South and Central Europe) and subsp. *ritschlii* (Hack.) Markgr.-Dann. (occurs in Germany, Czech Republic, Slovakia, Poland and Romania – see Jakubowska-Gabara (1994), Indreica (2007), Kiedrzyński et al. (2015), Łazarski (2016), Rewicz et al. (2018)). Euro+Med, based on personal communication with B. Valdés in 2004, but without any further confirmation, also declares the presence of *F. amethystina* subsp. *ritschlii* (https://europlusmed.org/cdm_dataportal/taxon/d2e8901d-25eb-420d-8c69-3b4b93a622d9, accessed on 05.06.2023), as well as subsp. *orientalis* (https://europlusmed.org/cdm_dataportal/taxon/aa72de8f-989c-48f8-b841-662e5460634b, accessed on 05.06.2023) in Ukraine. Roleček et al. (2019) also suggest the presence of *F. amethystina* subsp. *orientalis* in the Ukrainian Carpathians instead of *F. amethystina subsp. A.ethystina.* However, at the moment, there is no evidence confirming the presence of *F. amethystina* subsp. *ritschlii* or *F. amethystina* subsp. *orientalis* in the flora of the Ukrainian Carpathians. Only *F. amethystina* subsp. *orientalis* is mentioned by Chopyk and Fedoronchuk (2015) and other Ukrainian authors (e.g. Bednarska (2007)). On the other hand, Rewicz et al. (2018) recently stressed the applicability of morphological traits for the delimitation of infraspecific taxa within *F. amethystina.* They pointed out the need for a taxonomic revision of this species to clarify its biogeography.

Festuca carpatica F.Dietr., Nachtr. Vollst. Lex. Gärtn. 3: 333 (1817)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6HRFT
- GBIF https://www.gbif.org/species/4126785
- IPNI urn:lsid:ipni.org:names:402534-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000870071
- POWO https://powo.science.kew.org/taxon/402534-1
- Wikispecies https://species.wikimedia.org/wiki/Festuca_carpatica
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/a38544a4-ae62-4ae4-8ce0-b9ad24647ffc
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Festuca-carpatica

Nomenclature:

≡ *Amphigenes carpathica* (F.Dietr.) Janka, Linnaea 30(5): 619 (1859) & Janka ex Hack., Monogr. Fest. Eur.: 187 (1882); GBIF: https://www.gbif.org/species/7541275; GBIF: https://www.gbif.org/species/5671784; IPNI: https://www.ipni.org/n/387285-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000870071; POWO: https://powo.science.kew.org/taxon/387285-1; BHL: https://www.biodiversitylibrary.org/page/117103#page/622; BHL: https://www.biodiversitylibrary.org/item/52923#page/205

≡ *Leucopoa carpatica* (F.Dietr.) H.Scholz, Willdenowia 35: 242 (2005); GBIF: https://www.gbif.org/species/4136004; IPNI: https://www.ipni.org/n/77071608-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000870071; POWO: https://powo.science.kew.org/taxon/77071608-1

= *Amphigenes nutans* (Wahlenb.) Janka, Linnaea 30(5): 619 (1859); GBIF: https://www.gbif.org/species/5671783; IPNI: https://www.ipni.org/n/387286-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000870071; POWO: https://powo.science.kew.org/taxon/387286-1; BHL: https://www.biodiversitylibrary.org/page/117103#page/622

= *Festuca carpatica* var. *bucegica* (Krajina) Beldie, Fl. şi veg. Bucegi: 330 (1967)

= *Festuca carpatica* var. *carpatica* f. *subflavescens* (Zapał.) Beldie, Fl. Rep. Soc. Rom. 12: 484 (1972)

= *Festuca carpatica* var. *carpatica* f. *umbrosa* Beldie, Fl. şi veg. Bucegi: 329 (1967)

= *Festuca carpatica* f. *elatior* Krajina, Rozpr. Wydz. Mat.-Przyr. Akad. Umiejetn., Dzial B, Nauki Biol. 9: 219 (1930); GBIF: https://www.gbif.org/species/8335125; POWO: https://powo.science.kew.org/taxon/477638-4

= *Festuca carpatica* f. *pseudolaxa* (Schur) Jáv., Magyar Bot. Lapok 10: 266 (1911); BHL: https://www.biodiversitylibrary.org/item/201840#page/298

= *Festuca carpatica* f. *subflavescens* Zapał., Bull. Int. Acad. Sci. Cracovie, Cl. Sci. Math. 4B: 184. (1904); GBIF: https://www.gbif.org/species/7815522; POWO: https://powo.science.kew.org/taxon/477639-4

= *Festuca dimorpha* Janka, Oesterr. Bot. Z. 16: 101 (1866), non Guss.; GBIF: https://www.gbif.org/species/8004377; IPNI: https://www.ipni.org/n/402651-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000870071; POWO: https://powo.science.kew.org/taxon/402651-1; BHL: https://www.biodiversitylibrary.org/page/28749984#page/109

= *Festuca laxa* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 177 (1859), non Host; BHL: https://www.biodiversitylibrary.org/item/42663#page/421

= *Festuca nutans* Wahlenb., Fl. Carpat. Princ.: 28 (1814), non Host nec Moench; IPNI: https://www.ipni.org/n/403175-1; GBIF: https://www.gbif.org/species/7994264

= *Festuca pseudolaxa* Schur, Oesterr. Bot. Z. 8: 22 (1858); GBIF: https://www.gbif.org/species/4116805; IPNI: https://www.ipni.org/n/403338-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000871712; POWO: https://powo.science.kew.org/taxon/403338-1; BHL: https://www.biodiversitylibrary.org/page/28724891#page/30

= *Festuca pseudonutans* Schur, Enum. Pl. Transsilv.: 796 (1866); GBIF: https://www.gbif.org/species/4116775; IPNI: https://www.ipni.org/n/403341-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000871740; POWO: https://powo.science.kew .org/taxon/403341-1; BHL: https://www.biodiversitylibrary.org/page/10544847#page/818

= *Festuca pulchella* subsp. *scheuchzeriformis* var. *bucegica* Krajina, Veröff. Geobot. Inst. ETH Stiftung Rübel Zürich 10: 52 (1933)

= *Festuca scheuchzeriformis* Schur, Enum. Pl. Transsilv.: 796 (1866); GBIF: https://www.gbif.org/species/4145715; IPNI: https://www.ipni.org/n/403491-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000871740; POWO: https://powo.science.kew.org/taxon/403491-1; BHL: https://www.biodiversitylibrary.org/page/10544847#page/818

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: GBIF (https://www.gbif.org/species/4116614, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/403363-1, accessed on 05.06.2023), Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/e9bc861f-d097-45a6-bd73-706befdd5fc1, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Leucopoa-pulchella, accessed on 07.06.2023) mistakenly consider *F. pseudonutans* Schur and *F. scheuchzeriformis* Schur as synonyms of *F. pulchella* Schrad. (≡ *Leucopoa pulchella* (Schrad.) H.Scholz & Foggi). Schur (1866), who described *F. scheuchzeriformis* and *F. pseudonutans*, later indicated them to be synonymic with *F. carpatica* and joined under the name *F. scheuchzeriformis*. Schur (1866) noted that this species occurs in the outskirts of Kronstadt (= Brașov). Merging of *F. scheuchzeriformis* with *F. pulchella*, perhaps, resulted from recombinations made by Krajina (1933) on page 51, who downgraded *F. scheuchzeriformis* to the rank of subspecies (i.e. *F. pulchella* subsp. *scheuchzeriformis* (Schur) Krajina) and delimited two varieties within this subspecies – var. *bucegica* Krajina (Muntii Bucegi, Transsylvania) and var. *plicata* (Huter. in Hackel) Krajina (south Austria and Yura, Switzerland). At the same time, Krajina (1933), on page 52, described the second subspecies within *F. pulchella* – *F. pulchella* subsp. *eu-pulchella* Krajina, distributed in Italy, Austria, Slovenia, Croatia and Germany. Hence, following Krajina (1933), only *F. pulchella* subsp. *scheuchzeriformis* var. *bucegica* occurs in the Carpathians. Therefore, only this variety corresponds to *F. scheuchzeriformis* in the sense of Schur (1866). Consequently, this variety corresponds to *F. carpatica*, endemic to the Carpathians (Kliment et al. 2016).

Festuca porcii Hack., Bot. Centralbl. 2(8): 407 (1881)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6HSGL
- GBIF https://www.gbif.org/species/4117145
- IPNI urn:lsid:ipni.org:names:403318-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000871666
- POWO https://powo.science.kew.org/taxon/403318-1
- Wikispecies https://species.wikimedia.org/wiki/Festuca_porcii
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/a01bf487-a40c-48e8-aa7b-b8f6eb79215a
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Festuca-porcii
- BHL https://www.biodiversitylibrary.org/page/3095011#page/427
- JACQ https://kfta.jacq.org/KFTA0002813

- JACQ https://dr.jacq.org/DR052737
- JACQ https://w.jacq.org/W19160014841
- JACQ https://w.jacq.org/W19160014842
- JACQ https://w.jacq.org/W19160014843
- JACQ https://je.jacq.org/JE00007301
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160014841
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00007301
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160014843
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.kfta0002813
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160014842
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.cas0027412
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.mpu027818

Nomenclature:

= *Festuca porcii* f. *hirsuta* (A.Nyár.) Beldie, Fl. Rep. Soc. Rom. 12: 524 (1972); GBIF: https://www.gbif.org/species/4117144; IPNI: https://www.ipni.org/n/882242-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000871667; POWO: https://powo.science .kew .org/taxon/882242-1

= *Festuca porcii* var. *hirsuta* A.Nyár., Not. Bot. Cluj 2: 83 (1966); GBIF: https://www.gbif .org/species/6312934; WFO: http://www.worldfloraonline.org/taxon/wfo-000 1098406; WFO: http://www.worldfloraonline.org/taxon/wfo-0000871668; POWO: https://powo. science.kew.org/taxon/416327-4

= *Festuca porcii* f. *longiaristata* Krajina, Veröff. Geobot. Inst. ETH Stiftung Rübel Zürich 10: 32 (1933)

= *Festuca porcii* f. *vestita* (Hack.) Krajina, Veröff. Geobot. Inst. ETH Stiftung Rübel Zürich 10: 31 (1933)

= *Festuca porcii* var. *vestita* Hack. ex Zapał., Consp. Fl. Galic. Crit. 1: 67 (1906)

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: A vulnerable species listed by the Red Book of Ukraine (Bednarska and Kagalo 2009, MEPNR of Ukraine 2021).

Festuca versicolor subsp. *versicolor* Tausch, Flora 4(2): 559 (1821) et Tausch ex Kraj., Publ. Fac. Sc. Univ. Charles, Prague 106: 25 (1930), non J.Presl ex Kunth

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5HCKN
- GBIF https://www.gbif.org/species/6085148
- IPNI urn:lsid:ipni.org:names:403706-1
- IPNI urn:lsid:ipni.org:names:403707-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000872522
- POWO https://powo.science.kew.org/taxon/77173355-1

- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/0b134a8c-3aa4-4e34-bdd2-b82875b30957
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Festuca-versicolor
- BHL https://www.biodiversitylibrary.org/page/42515894#page/414
- JACQ https://w.jacq.org/W0033070
- JACQ https://w.jacq.org/W0033071
- JACQ https://wu.jacq.org/WU0062243

Nomenclature:

= *Festuca minor* Schur, Enum. Pl. Transsilv.: 795 (1866), non St.-Lag.; GBIF: https://www.gbif.org/species/8351667; IPNI: https://www.ipni.org/n/403091-1; POWO: https://powo.science.kew.org/taxon/403091-1; BHL: https://www.biodiversitylibrary.org/page/10544846#page/817

= *Festuca varia* f. *acuminata* Sagorski & Schneider, Fl. Centralkarp. 2: 554 (1891), non (Gaudin) Bolzon

= *Festuca varia* [unranked] *giewontica* Zapał., Consp. Fl. Galic. Crit. 1: 71 (1906)

= *Festuca varia* [unranked] *flavescens* Zapał., Consp. Fl. Galic. Crit. 1: 70 (1906), non Gaudin

= *Festuca varia* subsp. *pumila* [unranked] *spiculis flavescentibus* Gaudin ex Hack. in Sagorski & Schneider, Fl. Centralkarp. 2: 554 (1891)

= *Festuca varia* var. *scopariaeformis* Kotula, Rozmieszczenie roślin naczyniowych w Tatrach: 456 (1890)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. rodnensis Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 37 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. rodnensis f. *minor* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 38 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. rodnensis f. *typica* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 38 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. transsilvanica Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 38 (1930); JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160032081

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. transsilvanica f. *Kotschyi* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 39 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. transsilvanica f. *pallens* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 39 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. transsilvanica f. *typica* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 39 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 31 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *chrysantha* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 32 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *curvala* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 32 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *debilis* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 33 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *giewontica* (Zapał.) Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 33 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *glaucophylla* Krajina, Spisy Přír. Fak. Karlovy Univ.: 33 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *mutica* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 33 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *robustior* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 32 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *scopariaeformis* (Kotula) Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 32 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *typica* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 32 (1930)

= *Festuca versicolor* subsp. *eu-versicolor* var. *genuina* subvar. vulgaris f. *zapalowiczii* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 33 (1930); JACQ: https://w.jacq.org/W19160013707; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160013707

= *Festuca versicolor* var. *minor* (Schur) Krajina, Veröff. Geobot. Inst. ETH Stiftung Rübel Zürich 10: 40 (1933)

= *Festuca versicolor* subsp. *pseudosulcata* Krajina, Spisy Přír. Fak. Karlovy Univ. 106: 43 (1930), non Drobow; JACQ: https://w.jacq.org/W19160038597; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19160038597

= *Festuca versicolor* var. *versicolor* f. *chrysantha* (Krajina) Beldie, Fl. Rep. Soc. Rom. 12: 491 (1972)

= *Festuca versicolor* var. *versicolor* f. *debilis* (Krajina) Beldie, Fl. Rep. Soc. Rom. 12: 491 (1972)

– *Festuca varia* f. *pallidula* auct., non Hack.

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Two (https://powo.science.kew.org/taxon/403706-1, accessed on 05.06.2023) to four (https://europlusmed.org/cdm_dataportal/taxon/0c5f7c03-e2bc-42b0-8fd0-7dc8fcc48491, accessed on 05.06.2023) subspecies are recognised within *F. versicolor* Tausch, including subsp. *versicolor* (occurs in the Carparpathians and rarely in the

Sudetes – Kliment (1999)), subsp. *dominii* Krajina (endemic of the Rodna Mts. – Kliment et al. (2016)), subsp. *pallidula* (Hack.) Markgr.-Dann. (endemic of the Austrian Alps occurring on the rocks and screes up to 1700 m a.s.l. – Šmarda (2008), Essl et al. (2009)) and subsp. *brachystachys* (Hack.) Markgr.-Dann. (another endemic of the Austrian Alps occurring in the alpine habitats up to 2200 m a.s.l. – Essl et al. (2009)).

Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/0b134a8c-3aa4-4e34-bdd2-b82875b30957, accessed on 05.06.2023) indicates the presence of *F. versicolor* subsp. *dominii* in Ukraine, based on personal communication with B. Valdés in 2003. However, no confirmed evidence of its presence in Ukraine has appeared since then. In the original description of *F. versicolor* subsp. *dominii*, Krajina (1930) mentioned the existence of this subspecies only in Rodna Mts. Šmarda et al. (2007) revised this subspecies as belonging to the non-endemic *F. psammophila* subsp. *dominii* with distribution in Austria, Slovakia, the Czech Republic and Poland. At the same time, Šmarda et al. (2007) considered specimens of *F. dominii* var. *margittaii* Krajina belonging to *F. vaginata* Waldst. & Kit. ex Willd., which is distributed in Austria, Slovakia, Hungary, Romania, Bulgaria and Croatia. Unfortunately, Šmarda et al. (2007) did not revise specimens from Ukraine. In Ukraine, the only discovered specimen of *F. dominii* var. *margittaii* from the Szomotor Village (Hungary) is deposited at the KW Herbarium. Therefore, the presence of *F. versicolor* subsp. *dominii* in Ukraine remains unclear.

Koeleria transsilvanica Schur, Oesterr. Bot. Wochenbl. 7: 313 (1857), non Barth.

- GBIF https://www.gbif.org/species/4136486
- IPNI urn:lsid:ipni.org:names:406727-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000877370
- POWO https://powo.science.kew.org/taxon/406727-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/5170b18f-e88e-413f-ae0e-8f146fd69611
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Koeleria-macrantha
- BHL https://www.biodiversitylibrary.org/page/29953152#page/314/mode/1up

Nomenclature:

≡ *Koeleria cristata* [unranked] d) *transsilvanica* (Schur) K.Richt., Pl. Eur. 1: 75 (1890); GBIF: https://www.gbif.org/species/9550970; IPNI: https://www.ipni.org/n/77260252-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200013144; POWO: https://powo.science.kew.org/taxon/77260252-1; BHL: https://www.biodiversitylibrary.org/page/10641492#page/81

≡ *Koeleria cristata* subsp. *ciliata* var. *transsilvanica* (Schur) Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 358 (1900); GBIF: https://www.gbif.org/species/9528021; IPNI: https://www.ipni.org/n/77280772-1; POWO: https://powo.science.kew.org/taxon/77280772-1; BHL: https://www.biodiversitylibrary.org/page/25261416#page/370

≡ *Koeleria gracilis* subsp. *transsilvanica* (Schur) Domin, Monographie d. Gattung *Koeleria*, Biblioth. Bot. 14(65): 239 (1907) et Flora Romaniae Exsiceatae; GBIF: https://www.gbif.org/species/7496966; IPNI: https://www.ipni.org/n/77260417-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001234481; POWO: https://powo.science.kew.org/taxon/77260417-1; BHL: https://www.biodiversitylibrary.org/page/47145556#page/257

≡ *Koeleria gracilis* var. *transsilvanica* (Schur) Jáv., Magyar Fl.: 87 (1925)

≡ *Koeleria macrantha* subsp. *transsilvanica* (Schur) Beldie, Fl. Rom. Det.: 342 (1977) [nom. illeg.]

≡ *Koeleria macrantha* subsp. *transsilvanica* (Schur) A.Nyár. (1965) [nom. nudum ?]; CoL: https://www.catalogueoflife.org/data/taxon/5J7J2; GBIF: https://www.gbif.org/species/9358421; IPNI: https://www.ipni.org/n/77190062-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001428176; POWO: https://powo.science. kew.org/taxon/77190062-1

= *Koeleria gracilis* var. *rohlenae* Domin, Biblioth. Bot. 65: 193 (1907); GBIF: https://www.gbif.org/species/5946130; IPNI: https://www.ipni.org/n/77280623-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877079; POWO: https://powo.science.kew.org/taxon/77280623-1; BHL: https://www.biodiversitylibrary.org/page/47145 510#page/211

= *Koeleria gracilis* var. *typica* Domin, Biblioth. Bot. 65: 230 (1907); IPNI: https://www.ipni.org/n/290732-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0001397716; BHL: https://www.biodiversitylibrary.org/page/47145510#page/248

= *Koeleria tenuipes* (Schur) Ujhelyi, Ann. Hist.-Nat. Mus. Natl. Hung. 57: 191 (1965); GBIF: https://www.gbif.org/species/4136561; IPNI: https://www.ipni.org/n/406721-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877153; POWO: https://powo.science.kew.org/taxon/406721-1

= *Koeleria transsilvanica* subsp. *tenuipes* (Schur) Soó, Acta Bot. Acad. Sci. Hung. 17(1–2): 122 (1972); GBIF: https://www.gbif.org/species/4136485; IPNI: https://www.ipni.org/n/882519-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877371; POWO: https://powo.science.kew.org/taxon/882519-1

= *Koeleria transsilvanica* var. *tenuipes* (Schur) Domin, Magyar Bot. Lapok 3: 259 (1904); GBIF: https://www.gbif.org/species/6313425; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877372; POWO: https://powo.science.kew .org/taxon/421794-4; BHL: https://www.biodiversitylibrary.org/item/202566#page/281

= *Koeleria transsilvanica* var. *tenuipes* f. *discolor* Degen ex Domin, Magyar. Bot. Lap. 3: 259 (1904) et Bibl. Bot. 14: 240 (1907); BHL: https://www.biodiversitylibrary.org/item/202566#page/281; BHL: https://www.biodiversitylibrary.org/item/181274#page/258

= *Koeleria transsilvanica* [unranked] a *tenuipes alpestris* Schur, Enum. Pl. Transsilv.: 750 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/770

= *Koeleria transsilvanica* [unranked] b *tenuipes alpestris* Schur, Oesterr. Bot. Wochenbl. 7: 313 (1857); BHL: https://www.biodiversitylibrary.org/item/94863#page/314

– *Koeleria colorata* (Heuff.) Nyár. ex Degen, Gramina Hungarica: nr 368 (1911) [p. p.]; GBIF: https://www.gbif.org/species/8083069; WFO: http://www.worldfloraonline.org/taxon/wfo-0001098441

– *Koeleria cristata* var. *colorata* Heuff., Verh. K.K. Zool.-Bot. Ges. Wien 8: 228 (1858) [p. p.]; GBIF: https://www.gbif.org/species/5946095; IPNI https://www.ipni.org/n/77279977-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000876905; POWO: https://powo.science.kew.org/taxon/77279977-1; BHL: https://www.biodiversitylibrary.org/item/137035#page/412

– *Koeleria cristata* var. *glabra* Kotschy [ex herb., nom. nudum], non alior.

– *Koeleria cristata* [unranked] *foliis vaginisque glabris* Andrä [ex herb., nom. nudum]

– *Koeleria gracilis* Pers, Syn. Pl. [Persoon] 1: 97 (1805) [p. p., ex herb.], non Guss.; GBIF: https://www.gbif.org/species/2705920; IPNI: https://www.ipni.org/n/406567-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877004; POWO: https://powo.science.kew.org/taxon/406567-1; BHL: https://www.biodiversitylibrary.org/page/234882#page/109

– *Koeleria gracilis* f. *colorata* (Heuff.) Domin, Biblioth. Bot. 65: 232 (1907) [p. p.]; GBIF: https://www.gbif.org/species/4137722; IPNI: https://www.ipni.org/n/290733-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877009; POWO: https://powo.science.kew.org/taxon/290733-2; BHL: https://www.biodiversitylibrary.org/page/47145549#page/250

– *Koeleria gracilis* var. *colorata* (Heuff.) Domin, Magyar Bot. Lapok 3: 268 (1904) [p. p.], non alior; BHL: https://www.biodiversitylibrary.org/item/202566#page/290

– *Koeleria macrantha* var. *colorata* (Heuff.) Ghisa, Fl. Rep. Soc. Rom. 12: 237 (1972) [p. p.]; GBIF: https://www.gbif.org/species/4137206; IPNI: https://www.ipni.org/n/882504-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000877163; POWO: https://powo.science.kew.org/taxon/882504-1

– *Koeleria setacea* DC. sensu Nyman, Consp. Fl. Eur.: 816 (1878–1882); BHL: https://www.biodiversitylibrary.org/page/11015136#page/827

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Deyl (1934) and Deyl (1940) indicated this species for Petros Mt. in the Ukrainian part of the Maramures Mts. However, there are neither recent field confirmations (Kricsfalusy and Budnikov 2007, Kobiv et al. 2017) nor herbarium vouchers discovered during my investigations. Therefore, the presence of this species in the flora of the Ukrainian Carpathians is questionable.

GBIF (https://www.gbif.org/species/7262109), POWO (https://powo.science.kew.org/taxon/77188152-1, accessed on 05.06.2023), Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/5170b18f-e88e-413f-ae0e-8f146fd69611, accessed on 05.06.2023) and WFO (https://list.worldfloraonline.org/wfo-0000877153, accessed on 05.06.2023) consider *K. tenuipes* (Schur) Ujhelyi and its homotypic derivates as synonyms for *K. macrantha* subsp. *macrantha*. However, Ujhelyi (1965), on pages 191–193, indicated that this species occurs exclusively in Transylvania and South Carpathians (Făgăraș Mts.). Ujhelyi (1965) noted that *K. tenuipes* differs from *K. transsilvanica* by generally larger sizes, larger leaves, larger and loose panicles and larger spikelet parts, but similar by lack of stomata in the coastal zone of the juvenile leaves and ciliate auriculae of the sheaths. Moreover, the mentioned databases confuse the authorship of the epithet '*tenuipes'*. Ujhelyi (1965) pointed out that it was Schur who first applied this epithet in 1857, while Domin applied it only in 1903 when he described *K. transsilvanica* var. *tenuipes* f. *hirsuta* (Ujhelyi re-identified Domin's plants as *K. eriostachya* Pancic).

Poa carpatica subsp. *carpatica* (V.Jirásek) Bernátová, Májovský, Kliment & Topercer, Biologia (Bratislava), Sect. Bot. 61(4): 389-390 (2006)

- IPNI urn:lsid:ipni.org:names:77084794-1
- WFO http://www.worldflora online.org/taxon/wfo-0000908275
- POWO https://powo.science.kew .org/taxon/77084794-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/3cdfaf21-83dd-4c76-96bf-a7333f269f7f
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Leucopoa-carpatica

Nomenclature:

≡ *Poa carpatica* (V.Jirásek) Chopik, Visokogirna Fl. Ukrains'k. Karpat: 174 (1976); CoL: https://www.catalogueoflife.org/data/taxon/4KLGZ; GBIF: https://www.gbif.org/species/4137163; IPNI: https://www.ipni.org/n/77084794-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000908275; POWO: https://powo.science.kew.org /taxon/77084794-1; JACQ: https://prc.jacq.org/PRC450819; JACQ: https://prc.jacq.org/PRC450820; JACQ: https://prc.jacq.org/PRC450821; JACQ: https://prc.jacq.org/PRC450822; JACQ: https://prc.jacq.org/PRC450823; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc450823; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc450822; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc450820

≡ *Poa nemoralis* subsp. *carpatica* V.Jirásek, Veda Prir. 15: 207 (1934) *; GBIF: https://www.gbif.org/species/6313736; IPNI: https://www.ipni.org/n/77084793-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000908275; POWO: https://powo.science.kew.org/taxon/77084793-1

≡ *Poa nemoralis* subsp. *nemoralis* var. *carpatica* (V.Jirásek) Soó, Acta Bot. Acad. Sci. Hung. 17(1–2): 118 (1972); GBIF: https://www.gbif.org/species/4116723; IPNI: https://

www.ipni.org/n/882819-1; WFO: http://www.worldflora online.org/taxon/wfo-0000908275; POWO: https://powo.science.kew.org/taxon/882819-1

= *Poa balfourii* f. *carpatica* Zapał., Spraw. Komis. Fizjogr. 39: 33 (1906)

= *Poa nemoralis* subsp. *carpatica* f. *minoriformis* V.Jirásek, Veda Prir. 15: 208 (1934); JSTOR Global Plants:https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc450819; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc450821

– *Poa balfourii* auct. fl. ucrain. carpat., non Parn. *

– *Poa janczewskii* auct., non Zapał. [tantum quod plantas ucrain. carpat., alp. et subalp. altitud. solum]

– *Poa nemoralis* subsp. *montana* auct., non (Gaudin) Chrtek & V.Jirásek

– *Poa nemoralis* var. *montana* auct. fl. ucrain. carpat., non Gaudin *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: Two subspecies of *P. carpatica* (V.Jirásek) Chopik are recognised: subsp. *carpatica* (endemic to the Western and Eastern Carpathians – Bernátová et al. (2006)) and subsp. *supramontana* Bernátová, Májovský, Kliment & Topercer (narrow endemic to the Veľká Fatra Mts and Krivánska Malá Fatra Mts – Bernátová et al. (2006)).

Chopyk and Fedoronchuk (2015), on page 567, mention *P. janczewskii* Zapał. for rocks and screes in subalpine and alpine belts of the Ukrainian Carpathians, with synonyms *P. balfourii* auct., non Parn. and *P. nemoralis* subsp. *carpatica* V.Jirásek. At the same time, POWO (https://powo.science.kew.org/taxon/204398-2, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000893213, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Poa-palustris, accessed on 07.06.2023), as well as Tzvelev (1974), Tzvelev (1976) and Tzvelev (1995) suggest that *P. janczewskii* is a synonym not for *P. carpatica* but for *P. palustris* L. Chopyk and Fedoronchuk (2015), on page 568, also independently recognise *P. palustris*, but indicate that it is widely distributed in the forests (i.e. lower altitudes), flooded meadows and other wet habitats of the Ukrainian Carpathians. Hence, Chopyk and Fedoronchuk (2015) delimit *P. janczewskii* and *P. palustris* by morphology and habitat preferences. In the original protologue of *P. janczewskii*, Zapałowicz (1906a), on pages 34–35, wrote that it occurs in wet places at the beginning of the River Chorniy Cheremosh near Mt. Koman in Chyvchyny Mts. at 1700 m altitude together with *P. nemoralis* var. *pocutica* Zapał. Simultaneously, Zapałowicz (1906a), on page 33, delimited *P. balfourii* f. *carpatica* Zapał. from the alpine and subalpine habitats. Hence, Zapałowicz's original description of *P. janczewskii* is close to *P. palustris*, while his consideration of *P. balfourii* is consistent with *P. carpatica*. Nevertheless, in the Ukrainian Carpathians, many specimens from the alpine and subalpine belts are identified as *P. janczewskii*, suggesting that this species can probably reach much higher altitudes and can be confused with *P.*

carpatica. Therefore, I include *P. janczewskii* as a misapplied synonym of *P. carpatica* subsp. *carpatica*.

Poa granitica subsp. *disparillis* (Nyár.) Nyár., Rev. Roumaine Biol., Sér. Bot. 10: 355 (1965)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5KJCS
- GBIF https://www.gbif.org/species/5947645
- IPNI urn:lsid:ipni.org:names:77189564-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001250652
- POWO https://powo.science.kew.org/taxon/77189564-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/4479d756-9abe-4d15-a1a4-5d97bffc921e
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Poa-granitica

Nomenclature:

≡ *Poa cenisia* subsp. *granitica* var. *disparillis* (Nyár.) Nyár. & Borza, Consp. Fl. Roman. 1: 16 (1947); WFO: http://www.worldfloraonline.org/taxon/wfo-0001284854

≡ *Poa granitica* var. *disparillis* Nyár., Veröff. Geobot. Inst. Rübel Zürich 10: 173 (1933); WFO: http://www.worldfloraonline.org/taxon/wfo-0001250690

= *Poa breazensis* Nyár., Veröff. Geobot. Inst. Rübel Zürich 10: 173 (1933); GBIF: https://www.gbif.org/species/4136051; IPNI: https://www.ipni.org/n/416647-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000891305; POWO: https://powo.science.kew.org/taxon/416647-1

= *Poa cenisia* [unranked] b *pietrosuana* Zapał., Consp. Fl. Gallic. Crit. 6: 227 (1911) *; GBIF: https://www.gbif.org/species/5947644; IPNI: https://www.ipni.org/n/77288143-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000891923; POWO: https://powo.science.kew.org/taxon/77288143-1

= *Poa deylii* Chrtek&V.Jirásek, Feddes Repert. Spec. Nov. Regni Veg. 69: 177 (1964) *; GBIF: https://www.gbif.org/species/4124344; IPNI: https://www.ipni.org/n/416895-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892132; POWO: https://powo.science.kew.org/taxon/416895-1

= *Poa deylii* var. *deylii* f. *breazensis* (Nyár.) Ghișa & Beldie, Fl. Rep. Soc. Rom. 12: 399 (1972); GBIF: https://www.gbif.org/species/4124343; IPNI: https://www.ipni.org/n/882798-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892133; POWO: https://powo.science.kew.org/taxon/882798-1

= *Poa deylii* var. *deylii* f. *pietrosuana* (Zapał.) Ghișa & Beldie, Fl. Rep. Soc. Rom. 12: 399 (1972); GBIF: https://www.gbif.org/species/4139450; IPNI: https://www.ipni.org/n/882799-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892134; POWO: https://powo.science.kew.org/taxon/882799-1

= *Poa deylii* var. *deylii* f. *subgranitica* (Nyár.) Ghișa & Beldie, Fl. Rep. Soc. Rom. 12: 399 (1972); GBIF: https://www.gbif.org/species/4139468; IPNI: https://www.ipni.org/n/

882801-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892135; POWO: https://powo.science.kew.org/taxon/882801-1

= *Poa deylii* subsp. *retezatensis* (A.Nyár.) Chrtek, Oesterr. Bot. Z., 115 (4–5): 424 (1968); GBIF: https://www.gbif.org/species/7826350

= *Poa deylii* var. *retezatensis* (A.Nyár.) Ghișa & Beldie, Fl. Rep. Soc. Rom. 12: 399 (1972); GBIF: https://www.gbif.org/species/4139461; IPNI: https://www.ipni.org/n/882800-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892136; POWO: https://powo.science.kew.org/taxon/882800-1

= *Poa granitica* var. *disparillis* f. *pietrosuana* (Zapał.) Nyár., Veröff. Geobot. Inst. Rübel Zürich 10: 173 (1933)

= *Poa granitica* subsp. *disparillis* var. *subgranitica* Nyár., Rev. Roumaine Biol., Sér. Bot. 10: 355 (1965); GBIF: https://www.gbif.org/species/5947643; IPNI: https://www.ipni.org/n/77288847-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892475; POWO: https://powo.science.kew.org/taxon/77288847-1

= *Poa granitica* subsp. *retezatensis* A.Nyár., Rev. Roumaine Biol., Sér. Bot. 10: 356 (1965); GBIF: https://www.gbif.org/species/5947642; IPNI: https://www.ipni.org/n/77260385-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892474; POWO: https://powo.science.kew.org/taxon/77260385-1

= *Poa granitica* subsp. *subcarpatica* (V.Jirásek) Fodor, Flora Zakarpattia: 182 (1974)

= *Poa granitica* var. *subcarpatica* V.Jirásek, Vest. Král. Ceské Spol. Náuk 1935: 11 (1936)

= *Poa granitica* var. *typica* Nyár., Veröff. Geobot. Inst. Rübel Zürich 10: 171–172 (1933)

= *Poa granitica* var. *typica* f. *deminuta* Nyár., Veröff. Geobot. Inst. Rübel Zürich 10: 172 (1933)

– *Poa cenisia* All., Auct. Fl. Pedem.: 40 (1789) [p. p., tantum quod plantas ucrain. carpat.]; GBIF: https://www.gbif.org/species/4137228; IPNI: https://www.ipni.org/n/30482705-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000891913; POWO: https://powo.science.kew.org/taxon/30482705-2; BHL: https://www.biodiversitylibrary.org/page/52551645#page/52

– *Poa granitica* Braun-Blanq., Arch. Bot., Caen, Bull. 3: 46 (1929) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/4121637; IPNI: https://www.ipni.org/n/417145-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000892473; POWO: https://powo.science.kew.org/taxon/417145-1

– *Poa granitica* subsp. *granitica* Braun-Blanq., Arch. Bot., Caen, Bull. 3: 46 (1929) sensu Tasenkevich [non sensu orig, ex herb. LWS] *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022). Global – DD (Bilz 2011b).

Distribution: SE Carpathian endemic.

Notes: Two (https://powo.science.kew.org/taxon/417145-1, accessed on 05.06.2023) to three (https://europlusmed.org/cdm_dataportal/taxon/b36321f1-3c80-4639-aa91-71b74301d317, accessed on 05.06.2023) subspecies are recognised within *P. granitica* Braun-Blanq. viz subsp. *granitica* (distributed in the Polish and Slovakian Carpathians), subsp. *disparillis* (= *P. deylii* Chrtek & V.Jirásek; distributed in the Polish, Ukrainian and Romanian Carpathians) and subsp. *retezatensis* Nyár. (distributed exclusively in the Romanian Carpathians and is sometimes considered a synonym of *P. granitica* subsp. *disparillis*).

POWO (https://powo.science.kew.org/taxon/417145-1, accessed on 05.06.2023) indicates the presence of both subspecies (i.e. subsp. *granitica* and subsp. *disparillis*) in the Ukrainian Carpathians. These two subspecies seem to be phylogenetically close, but considered to be geographically isolated (Chrtek and Jirásek 1964, Filipaş et al. 2009, Băcilă et al. 2010). However, there are no confirmed occurrences of *P. granitica* subsp. *granitica* from the Ukrainian Carpathians yet. Only a few specimens in LWS were identified by Tasenkevich as *P. granitica* subsp. *granitica* (without further published mentions), but she also indicated on the specimens' labels that *P. granitica* subsp. *granitica* is a synonym of *P. deylii*.

Poa pannonica subsp. *scabra* (Asch.) Soó, Acta Bot. Acad. Sci. Hung. 5: 483 (1959)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7KNSV
- GBIF https://www.gbif.org/species/4932360
- IPNI urn:lsid:ipni.org:names:77188273-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000893233
- POWO https://powo.science.kew.org/taxon/77188273-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/c6d5f874-9541-44c9-8061-0101aaae6d93
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Poa-pannonica

Nomenclature:

≡ *Poa pratensis* var. *scabra* (Asch.) Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 414 (1900); GBIF: https://www.gbif.org/species/5947834; IPNI: https://www.ipni.org/n/77288290-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000893466; POWO: https://powo.science.kew.org/taxon/77288290-1; BHL: https://www.biodiversitylibrary.org/page/25261472#page/426

≡ *Poa scabra* Asch., Verh. K.K. Zool.-Bot. Ges. Wien 17: 568 (1867), non Ehrh.; GBIF: https://www.gbif.org/species/7933600; BHL: https://www.biodiversitylibrary.org/item/86029#page/772

≡ *Poa scabra* Kit. ex Steud., Nomencl. Bot. [Steudel], ed. 2. 2: 362 et Linnaea, 32: 311 (1863) [nom. nudum], non Ehrh. *; GBIF: https://www.gbif.org/species/8481689; GBIF: https://www.gbif.org/species/8162992; IPNI: https://www.ipni.org/n/417977-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000893691; WFO: http://www.worldflora

online.org/taxon/wfo-0001250823; POWO: https://powo.science.kew .org/taxon/417977-1; BHL: https://www.biodiversitylibrary.org/page/392077#page/1218

≡ *Poa sterilis* subsp. *eu-sterilis* var. *scabra* (Asch.) Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 414 (1900), non alior; WFO: http://www.worldfloraonline.org/taxon/wfo-0001250670

= *Poa perscabra* Holub, Folia Geobot. Phytotax. 18(2): 204 (1983); GBIF: https://www.gbif.org/species/4114872; IPNI: https://www.ipni.org/n/907580-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000893298; POWO: https://powo.science.kew.org/taxon/907580-1

= *Poa sterilis* Kerner, Oesterr. Bot. Z. 14: 85 (1864), non M.Bieb.; BHL: https://www.biodiversitylibrary.org/item/91290#page/92

Conservation status: In Ukraine – NE (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/417674-1, accessed on 05.06.2023), there are two subspecies of *P. pannonica* A.Kern. – subsp. *pannonica* (distributed in Serbia, Moldova, Hungary, Romania, Slovakia and, probably, Ukraine) and subsp. *scabra* (distributed in Slovakia, Hungary, Romania and, presumably, Ukraine). Both subspecies are mentioned for Ukraine in most online databases. However, reports of *P. pannonica* subsp. *pannonica* are, instead, related to *P. podolica* (Asch. & Graebn.) Błocki ex Zapał., the taxonomic status of which is unclear since it is considered a synonym of *P. versicolor* Bess. subsp. *versicolor* by Tzvelev (1976) on page 472 and Ghişa and Beldie (1972) on page 407. Regarding *P. pannonica* subsp. *scabra*, there is no recent evidence of its presence in the flora of the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015, Kliment et al. 2016).

In online databases, the authorship of the epithet *scabra* is cited as Ascherson & Graebner (e.g. *P. pannonica* subsp. *scabra* (Asch. & Graebn.) Soó). This is incorrect because it was Ascherson (1867) who, on page 568, validly published the name *P. scabra* and, only later, it reappeared in the synopsis of Ascherson and Graebner (1896) . Moreover, IPNI (https://www.ipni.org/n/77288290-1, accessed on 05.06.2023) gives an incorrect nomenclature citation *P. pratensis* var. *scabra* Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 414 (1900) that should be avoided. Ascherson and Graebner (1896) did not apply such a combination; instead, they used *P. sterilis* subsp. *eu-sterilis* var. *scabra*.

Poa rehmannii (Asch. et Graebn.) Woł., Fl. Polon. Exs., 10-11: Nr 1020 (1904)

- GBIF https://www.gbif.org/species/8323860
- IPNI urn:lsid:ipni.org:names:417893-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000893588
- POWO https://powo.science.kew.org/taxon/417893-1

- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d953d4b2-c291-43ab-a284-e929b36ba37f
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Poa-rehmannii

Nomenclature:

≡ *Poa caesia* [unranked] d) *rehmannii* K.Richt., Pl. Eur. 1: 83 (1890); BHL: https://www.biodiversitylibrary.org/item/40428#page/89

≡ *Poa nemoralis* subsp. *rehmannii* Asch. & Graebn., Syn. Mitteleur. Fl. 2(1): 412 (1900); GBIF: https://www.gbif.org/species/5947595; IPNI: https://www.ipni.org/n/77260518-1; WFO: https://list.worldfloraonline.org/wfo-0000893079; POWO: https://powo.science.kew.org/taxon/77260518-1; BHL: https://www.biodiversitylibrary.org/page/25261470#page/424

≡ *Poa rehmannii* (Asch. & Graebn.) K.Richt., Pl. Eur. 1: 83 (1889) [nom. nudum]; CoL: https://www.catalogueoflife.org/data/taxon/4KMN8; GBIF: https://www.gbif.org/species/4112622; IPNI: https://www.ipni.org/n/417893-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000893588; POWO: https://powo.science.kew.org/taxon/417893-1; BHL: https://www.biodiversitylibrary.org/item/40428#page/89

= *Poa anceps* Rehmann, Spraw. Komis. Fizjogr. 7: 5 (1873), non G.Forst.; GBIF: https://www.gbif.org/species/7789150; IPNI: https://www.ipni.org/n/416483-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000891485; POWO: https://powo.science.kew.org/taxon/416483-1

– *Poa rehmannii* Asch. & Gürke sensu Woł. [nom. confus., ex herb. LWS]

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: A rare species with only a few known occurrences in the Ukrainian Carpathians (Chorney et al. 2009, MEPNR of Ukraine 2021).

POWO (https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:417893-1, accessed on 05.06.2023), CoL (https://www.catalogueoflife.org/data/taxon/4KMN8, accessed on 05.06.2023) and GBIF (https://www.gbif.org/species/4112622, accessed on 05.06.2023) incorrectly provide the nomenclature citation *P. rehmannii* (Asch. & Graebn.) K.Richt., Pl. Europ. 1: 83 (1889). Richter (1889) did not apply such a name to the rank of species. Instead of this, he delimited unranked taxon (= variety) within *P. caesia* Sm. Therefore, the correct citation should be *P. caesia* [unranked] d) *rehmanii* K.Richt., Pl. Eur. 1: 83 (1890).

Sesleria bielzii Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 1: 109 (1850) et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 84 (1853)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4WZRV

- GBIF https://www.gbif.org/species/4119647
- IPNI urn:lsid:ipni.org:names:421321-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000898769
- POWO https://powo.science.kew.org/taxon/421321-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/e8373e56-70c0-40aa-8e9d-6e546996ae0b
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Sesleria-caerulans
- BHL https://www.biodiversitylibrary.org/page/11525300#page/119
- BHL https://www.biodiversitylibrary.org/page/11525300#page/970

Nomenclature:

≡ *Sesleria coerulans* subsp. *bielzii* (Schur) Gergely & Beldie, Fl. Rep. Soc. Rom. 12: 223 (1972) *; GBIF: https://www.gbif.org/species/4119544; IPNI: https://www.ipni.org/n/883025-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000 898813; POWO: https://powo.science.kew.org/taxon/883025-1

≡ *Sesleria rigida* [unranked] β *bielzii* (Schur) Heuff., Enum. Pl. Banat.: 227 (1858); BHL: https://www.biodiversitylibrary.org/item/40084#page/195

= *Sesleria caerulea* Janka, Linnaea 30: 615 (1859), non Ard.

= *Sesleria capitata* (Schur) Schur, Enum. Pl. Transsilv.: 743 (1866); GBIF: https://www.gbif.org/species/4119575; IPNI: https://www.ipni.org/n/421326-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898807; POWO: https://powo.science.kew.org/taxon/421326-1; BHL: https://www.biodiversitylibrary.org/page/10544794#page/765

= *Sesleria coerulans* var. *borsae* Deyl, Opera Bot. Čechina 3: 139 (1946); GBIF: https://www.gbif.org/species/5948416; IPNI: https://www.ipni.org/n/77291267-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898814; POWO: https://powo.science.kew.org/taxon/77291267-1

= *Sesleria coerulans* f. *pseudorigida* (Schur) Beldie, Bul. Şt. Acad. R.P.R. 2(5): 248 (1950)

= *Sesleria haynaldiana* [unanked] g *pseudorigida* Schur, Verh. K.K. Zool.-Bot. Ges. Wien 6: 209 (1856); GBIF: https://www.gbif.org/species/5948414; IPNI: https://www.ipni.org/n/77291730-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898 840; POWO: https://powo.science.kew.org/taxon/77291730-1; BHL: https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p16414644|p42929929|p11712977

= *Sesleria pseudorigida* Schur, Enum. Pl. Transsilv.: 745 (1866); GBIF: https://www.gbif.org/species/4118994; IPNI: https://www.ipni.org/n/421386-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898890; POWO: https://powo.science.kew. org/taxon/421386-1; BHL: https://www.biodiversitylibrary.org/page/10544796#page/767

= *Sesleria rigida* Griseb., Arch. Naturgesch. (Berlin) 18(1): 361 (1852), non Heuff. ex Rchb.; BHL: https://www.biodiversitylibrary.org/item/31352#page/369

= *Sesleria rigida* [unranked] a capitata Schur, Verh. K.K. Zool.-Bot. Ges. Wien 6: 201 (1856); BHL: https://www.biodiversitylibrary.org/item/137255#page/359

= *Sesleria rigida* [unranked] b *ovoidea* Schur, Verh. K.K. Zool.-Bot. Ges. Wien 6: 201 (1856); BHL: https://www.biodiversitylibrary.org/item/137255#page/359

– *Sesleria caerulea* Scap. sensu Rehman [nom. confus. ex herb. LWS] *

– *Sesleria coerulans* Friv., Flora 19(2): 438 (1836) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/4119531; IPNI: https://www.ipni.org/n/421329-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898810; POWO: https://powo.science.kew.org/taxon/421329-1; BHL: https://www.biodiversitylibrary.org/page/34154#page/58

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: A problematic taxon with unclear chorology and phylogeny. Ambiguous interpretation of *S. bielzii* has been pointed out in the Flora of Romania (Gergely and Beldie 1972), where two subspecies of *S. coerulans* Friv. are represented – subsp. *coerulans* and subsp. *bielzii* (Schur) Gergely & Beldie. For both subspecies, *S. bielzii* has been indicated as a synonym with the only difference being in its consideration by Shur – *S. bielzii* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 1: 109 (1850) has been indicated as a synonym for *S. coerulans* subsp. *bielzii*, while *S. bielzii* Schur, Enum. Pl. Transsilv.: 743 (1866) has been indicated as a synonym for *S. coerulans subsp. coerulans* Later, Chorney (2011) noted that *S. bielzii*, being, in fact, a Carpatho-Balcanic species, is erroneously considered endemic and referenced to Deyl (1980). Tzvelev (1976) and Chopyk and Fedoronchuk (2015) also considered *S. bielzii* a synonym of the non-endemic *S. coerulans*. On the other hand, Comănescu and Ştefănuţ (2010) showed that these two species have similar distribution ranges; nevertheless, they treated these two species independently. Similarly, Lazarević et al. (2015), Kuzmanović et al. (2015) and Kuzmanović et al. (2017) conducted phylogenetic studies with *S. bielzii* considered an independent species within *the Coerulans* group.

Sesleria heufleriana subsp. *heufleriana* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 84 (1853) et Verh. Zool.-Bot. Ges. Wien 6: 203 (1856)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5L62R
- GBIF https://www.gbif.org/species/9445568
- IPNI urn:lsid:ipni.org:names:421353-1
- IPNI urn:lsid:ipni.org:names:421352-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001428678
- POWO https://powo.science.kew.org/taxon/421353-1
- Wikispecies https://species.wikimedia.org/wiki/Sesleria_heufleriana
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/33685685-5a35-47ea-851e-4c6506dce56f
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Sesleria-heufleriana
- BHL https://www.biodiversitylibrary.org/page/16414642#page/367

- BHL https://www.biodiversitylibrary.org/page/11525300#page/970
- JACQ https://w.jacq.org/W0030257
- JACQ https://w.jacq.org/W0030258
- JACQ https://w.jacq.org/W19120010887
- JACQ https://w.jacq.org/W19490014837
- JACQ https://w.jacq.org/W18970006748
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w0030257
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.ny01842943
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w19490014837
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.w0030258
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.b%2010%200367408

Nomenclature:

≡ *Sesleria heufleriana* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 84 (1853) et Verh. Zool.-Bot. Ges. Wien 6: 203 (1856); GBIF: https://www.gbif.org/species/4119290; IPNI http://ipni.org/urn:lsid:ipni.org:names:421353-1; IPNI: http://ipni.org/urn:lsid:ipni.org:names:421352-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898845; POWO: https://powo.science.kew. org/taxon/421353-1; BHL: https://www.biodiversitylibrary.org/page/16414642#page/367; BHL: https://www.biodiversitylibrary.org/page/11525300#page/970

≡ *Sesleria heufleriana* Schur ex Błocki, Oesterr. Bot. Z. 39: 155 (1889) [nom. inval.] *; IPNI: https://www.ipni.org/n/421354-1; BHL: https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p28750462|p8721928

= *Sesleria caerulea* [unranked] a interrupta Schur, Enum. Pl. Transsilv.: 743 (1866); GBIF: https://www.gbif.org/species/5948424; IPNI: https://www.ipni.org/n/77291477-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898788; POWO: https://powo.science.kew.org/taxon/77291477-1; BHL: https://www.biodiversitylibrary.org/page / 10544794#page/765

= *Sesleria caerulea* [unranked] b *prorepens* Schur, Enum. Pl. Transsilv.: 743 (1866); GBIF: https://www.gbif.org/species/5948423; IPNI: https://www.ipni.org/n/77291959-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898790; POWO: https://powo.science.kew.org/taxon/77291959-1; BHL: https://www.biodiversitylibrary.org/page/10544794#page/765

= *Sesleria caerulea* [unranked] c *praelonga* Schur, Enum. Pl. Transsilv.: 743 (1866); BHL: https://powo.science.kew.org/taxon/77291959-1

= *Sesleria caerulea* var. *transilvanica* (Schur) Jáv., Magyar Fl. 1: 84 (1924)

= *Sesleria heufleriana* [unranked] b *digitata* Schur, Verh. Zool.-Bot. Ges. Wien 6: 204 (1856) et Enum. Pl. Transsilv.: 744 (1866); BHL: https://www.biodiversitylibrary.org/item/137255#page/361; BHL: https://www.biodiversitylibrary.org/item/7364#page/764

= *Sesleria heufleriana* [unranked] c *elongata* Schur, Verh. Zool. -Bot. Ges. Wien 6: 204 (1856), non Host; BHL: https://www.biodiversitylibrary.org/item/137255#page/361

= *Sesleria heufleriana* var. *insignis* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 84 (1853); BHL: https://www.biodiversitylibrary.org/item/42660#page/970

= *Sesleria heufleriana* f. *interrupta* (Schur) Soó, ActaBot. Acad.Sci. Hung. 17(1–2): 119 (1972); GBIF: https://www.gbif.org/species/6312632; IPNI: https://www.ipni.org/n/883029-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898842; POWO: https://powo.science.kew.org/taxon/883029-1

= *Sesleria heufleriana* [unranked] a polydactyla Schur, Verh. Zool.-Bot. Ges. Wien 6: 204 (1856); BHL: https://www.biodiversitylibrary.org/item/137255#page/361

= *Sesleria heufleriana* [unranked] a praelonga Schur, Enum. Pl. Transsilv.: 744 (1866); GBIF: https://www.gbif.org/species/5948422; IPNI: https://www.ipni.org/n/77291902-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898848; POWO: https://powo.science.kew.org/taxon/77291902-1; BHL: https://www.biodiversitylibrary.org/page/10544795#page/766

= *Sesleria heufleriana* f. *praelonga* (Schur) Gergely & Beldie, Fl. Rep. Soc. Rom. 12: 224 (1972); GBIF: https://www.gbif.org/species/6312633; GBIF: https://www.gbif.org/species/4119322; IPNI: https://www.ipni.org/n/883030-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898843; POWO: https://powo.science.kew. org/taxon/883030-1

= *Sesleria heufleriana* f. *prorepens* (Schur) Soó,Acta Bot.Acad. Sci. Hung. 17(1–2): 119 (1972); GBIF: https://www.gbif.org/species/6312631; IPNI: https://www.ipni.org/n/883031-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898844; POWO: https://powo.science.kew.org/taxon/883031-1

= *Sesleria nitida* Heldr. ex Nyman, Consp. Fl. Eur. 4: 796 (1882) [nom. illeg.], non Ten.; GBIF: https://www.gbif.org/species/8701233; GBIF: https://www.gbif.org/species/7576396; IPNI: https://www.ipni.org/n/421373-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898876; POWO: https://powo.science.kew.org/taxon/421373-1; BHL: https://www.biodiversitylibrary.org/page/11015940#page/807

= *Sesleria prorepens* Schur ex Schur, Enum. Pl. Transsilv.: 743 (1866); BHL: https://www.biodiversitylibrary.org/page/10544795#page/765

= *Sesleria robusta* Pávai, Oesterr. Bot. Z. 12: 214 (1862) [nom. nudum], non Schott et al.; GBIF: https://www.gbif.org/species/7612267; IPNI: https://www.ipni.org/n/421392-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898904; POWO: https://powo.science.kew.org/taxon/421392-1; BHL: https://www.biodiversitylibrary.org/page/28679508#page/222

= *Sesleria transilvanica* Schur, Verh. Zool.-Bot. Vereins Wien 6: 205 (1856) et Enum. Pl. Transsilv.: 745 (1866); GBIF: https://www.gbif.org/species/4118752; IPNI: https://www.ipni.org/n/421414-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000898933; POWO: https://powo.science.kew.org/taxon/421414-1; BHL: https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p16414640|p42929925|p11712973; BHL: https://www.biodiversitylibrary.org/item/7364#page/767

– *Sesleria caerulea* Baumg., Enum. Stirp. Transsilv. 3: 228, Nr 2013 (1816) [p. p.], non (L.) Ard.

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/421353-1, accessed on 05.06.2023), two subspecies of *S. heufleriana* Schur are delimited – subsp. *heufleriana* (occurs in Slovakia, Hungary, Romania and Ukraine) and subsp. *hungarica* (Ujhelyi) Deyl (occurs in Hungary and Slovakia). In the Ukrainian Carpathians, only *S. heufleriana* subsp. *heufleriana* is present. Therefore, all reports of *S. heufleriana* from the Ukrainian Carpathians should be considered to belong to this subspecies.

In the Worldplants database (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Sesleria-sadleriana, accessed on 07.06.2023), *S. transilvanica* Schur is erroneously indicated amongst synonyms of *S. sadleriana* Janka. Janka (1882), on pages 309–310 and Janka (1884), on pages 28–29, pointed out that plants described as *S. sadleriana* differ from those occurring in Transylvania. Ascherson and Graebner (1898), on page 320, outlined peculiar Janka's treatment of *S. heufleriana* and, at the same time, synonymised *S. sadleriana* Janka and *S. heufleriana* Janka non Schur under the name *S. budensis* (Borbás) Asch. & Graebn. Hence, *S. sadleriana* Janka and *S. heufleriana* Janka, non Schur are not synonyms of *S. transilvanica*.

Trisetum fuscum (Kit. ex Schult.) Schult. in Roem. et Schult., Syst. Veg. 2: 664 (1817)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/592G5
- GBIF https://www.gbif.org/species/4112815
- IPNI urn:lsid:ipni.org:names:425205-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000905167
- POWO https://powo.science.kew.org/taxon/425205-1
- Wikispecies https://species.wikimedia.org/wiki/Trisetum_fuscum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/2c4b09cd-03d0-47a5-8d13-9874fe36f8c2
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Trisetum-fuscum
- BHL https://www.biodiversitylibrary.org/page/720353#page/672

Nomenclature:

≡ *Avena fusca* Kit. ex Schult., Oesterr. Fl. ed. 2, 1: 268 (1814), non Ard.; GBIF: https://www.gbif.org/species/7744598; GBIF: https://www.gbif.org/species/9231558; IPNI: https://www.ipni.org/n/391464-1; IPNI: https://www.ipni.org/n/77236898-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000851919; POWO: https://powo.science.kew.org/taxon/77236898-1; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0210842

≡ *Trisetum flavescens* subsp. *fuscum* (Kit. ex Schult.) Hack., Magyar Bot. Lap. 2: 111 (1903); GBIF: https://www.gbif.org/species/12096667; IPNI: https://www.ipni.org/n/77260262-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200013147; POWO: https://powo.science.kew.org/taxon/77260262-1; BHL: https://www.biodiversitylibrary.org/page/50241353#page/141

≡ *Trisetaria fusca* (Kit. ex Schult.) Banfi & Soldano, Atti Soc. Ital. Sci. Nat. Mus. Civico Storia Nat. Milano 135(2): 383 (1996); GBIF: https://www.gbif.org/species/4114671; IPNI: https://www.ipni.org/n/77065416-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000904909; POWO: https://powo.science.kew.org/taxon/77065416-1

= *Avena ciliaris* Kit. ex Schult., Oesterr. Fl. ed. 2, 1: 268 (1814); GBIF: https://www.gbif.org/species/4154500; GBIF: https://www.gbif.org/species/7470202; IPNI: https://www.ipni.org/n/391393-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000851780; POWO: https://powo.science.kew.org/taxon/391393-1

= *Trisetum ciliare* (Kit. ex Schult.) Domin, Preslia 13-15: 41 (1935) *; GBIF: https://www.gbif.org/species/4113396; IPNI: https://www.ipni.org/n/425167-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000905078; POWO: https://powo.science.kew. org/taxon/425167-1

= *Trisetum flavescens* [unranked] c *carpaticum f. majus* Zapał., Rozpr. Wydz. Mat.-Przyr. Akad. Umiejetn., Dzial B, Nauki Biol. 4: 108 (1904) et Consp. Fl. Galic. Crit. 1: 35 (1906), non Asch. & Graebn.; GBIF: https://www.gbif.org/species/12027006; POWO: https://powo.science.kew.org/taxon/528276-4

= *Trisetum transylvanicum* Steud., Syn. Pl. Glumac. 1(3): 226 (1855), non Schur; GBIF: https://www.gbif.org/species/4109945; IPNI: https://www.ipni.org/n/425412-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000905488; POWO: https://powo.science.kew.org/taxon/425412-1; BHL: https://www.biodiversitylibrary.org/page/44974147#page/240

= *Trisetum varium* var. *violaceum* Schur, Oesterr. Bot. Z. 10: 75 (1860); GBIF: https://www.gbif.org/species/7770879; IPNI: https://www.ipni.org/n/77294779-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200021275; POWO: https://powo.science.kew.org/taxon/77294779-1; BHL: https://www.biodiversitylibrary.org/page/28597118#page/83

– *Trisetum tenue* Baumg. ex Steud., Syn. Pl. Glumac. 1(3): 226 (1854) [nom. illeg., pro syn. *T. transylvanicum* Steud.], non Leers; GBIF: https://www.gbif.org/species/8461326; GBIF: https://www.gbif.org/species/8061303; IPNI: https://www.ipni.org/n/425400-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000905475; POWO: https://powo.science.kew.org/taxon/425400-1; BHL: https://www.biodiversitylibrary.org/page/44974147#page/240

– *Avena carpatica* auct. [e.g., Błocki ex herb.], non Host

– *Trisetaria carpatica* auct. fl. carpat., non (Host) Baumg

– *Trisetum carpathicum* auct., non (Host) Roem. & Schult. *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: Steudel (1855), on page 226, mentioned the name *T. tenue* twice, which may confuse. First, he mentioned it as an independent species in the sense of Roemer & Schultes. *Trisetum tenue* Roem. & Schult. (= *Avena tenuis* Moench) is currently recognised as a synonym for *Ventenata dubia* (Leers) Coss. & Durieu, which, following POWO (https://powo.science.kew.org/taxon/426312-1, accessed on 13.06.2023), has pan-European distribution, reaches the north of Africa and is widely introduced in North America. The second time, Steudel (1855) mentioned *T. tenue* in the sense of Baumgarten (concerning herbarium material) as a synonym for a newly-described species *T. transylvanicum* Steud. Barberá et al. (2018) conducted the revision of *Trisetum* sect. Trisetum and synonymised *T. transylvanicum* with *T. fuscum*. Therefore, *T. tenue* Baumg. ex Steud. should be considered a synonym for *T. fuscum*.

Class Magnoliopsida

Order Apiales

Family Apiaceae

Heracleum carpaticum Porcius, Magyar Növénytani Lapok 2: 25 (1878) et Fl. Naséud.: 144 (1881)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/3KXBD
- GBIF https://www.gbif.org/species/7358227
- IPNI urn:lsid:ipni.org:names:77221836-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000745368
- POWO https://powo.science.kew.org/taxon/77221836-1
- Wikispecies https://species.wikimedia.org/wiki/Heracleum_carpaticum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/616ef7e8-6c89-4d43-8f5b-b52b0bb164b0
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Heracleum-carpaticum

Nomenclature:

≡ *Heracleum sphondylium* subsp. *carpaticum* (Porcius) Soó, Acta Bot. Acad. Sci. Hung. 23(3–4): 380 (1978); GBIF: https://www.gbif.org/species/3642778; IPNI: https://www.ipni.org/n/892101-1; WFO: http://www.worldfloraonline.org/taxon/wfo-000136 5022; POWO: https://powo.science.kew.org/taxon/892101-1

= *Heracleum alpinum* Baumg., Enum. Stirp. Transsilv. 1: 215 (1816), non alior

= *Heracleum carpaticum* f. *alpinum* (Baumg.) Borza, Consp. Fl. Rom. 2: 204 (1949)

= *Heracleum carpaticum* f. *palmatifidum* Jáv., Magyar Bot. Lapok 9: 162 (1910); BHL: https://www.biodiversitylibrary.org/item/201903#page/582

= *Heracleum carpaticum* f. *porcii* Pax, Grundz. Pfl. Karp. 2: 70 (1908)

= *Heracleum carpaticum* f. *typicum* Nyár & Todor, Fl. Rep. Pop. Roman. 6: 625, 660 (1958)

– *Heracleum carpaticum* var. *aconitifolium* M.Pop. & Chrshan. [ex herb., nom. inval.], non Woronow

– *Heracleum pollinianum* Nyman, Consp. Fl. Eur. 2: 289 (1879) [p. p., tantum quod plantas ucrain. carpat.], non Bertol.; BHL: https://www.biodiversitylibrary.org/item/41446#page/300

– *Heracleum simplicifolium* Herb. ex Nyman sensu Borza

– *Heracleum simplicifolium* Herb., Fl. Bucov.: 302 (1859) et Herb. ex Nyman, Consp. Fl. Eur. 2: 289 (1879) [p. p., tantum quod plantas ucrain. carpat.]; GBIF: https://www.gbif.org/species/8444536; GBIF: https://www.gbif.org/species/7724113; IPNI: https://www.ipni.org/n/843167-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000720209; POWO: https://powo.science.kew.org/taxon/843167-1; BHL: https://www.biodiversitylibrary.org/item/41446#page/300

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Heracleum sphondylium subsp. *transsilvanicum* (Schur) Brummitt, Feddes Repert. 79: 65 (1968)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5HNL9
- GBIF https://www.gbif.org/species/4928236
- IPNI urn:lsid:ipni.org:names:77251611-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000745371
- POWO https://powo.science.kew.org/taxon/77251611-1
- Wikispecies https://species.wikimedia.org/wiki/Heracleum_sphondylium_subsp._transsilvanicum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/e3a9655b-ed59-4a19-ab5f-0e8f6165eeb0
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Heracleum-sphondylium

Nomenclature:

≡ *Heracleum palmatum* subsp. *transsilvanicum* (Schur) Nyman, Consp. Fl. Eur. 2: 289 (1879); GBIF: https://www.gbif.org/species/7497351; IPNI: https://www.ipni.org/n/77314722-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000745373; POWO: https://powo.science.kew.org/taxon/2898300-4; BHL: https://www.biodiversitylibrary.org/page/11015433#page/300

≡ *Heracleum sphondylium* subsp. *transsilvanicum* (Schur) Thellung, Oesterr. Bot. Z. 73: 211 (1924) [nom. invalid.]

≡ *Heracleum transsilvanicum* Schur, Enum. Pl. Transsilv.: 267 (1866); GBIF: https://www.gbif.org/species/3642249; IPNI: https://www.ipni.org/n/843216-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000720253; POWO: https://powo.science.kew.org/taxon/843216-1; BHL: https://www.biodiversitylibrary.org/page/10544318#page/289

= *Heracleum alpinum* subsp. *palmatum* (Baumg.) Briquet, Candollea 2: 16 (1924), non Crantz nec Rchb.; GBIF: https://www.gbif.org/species/8099962; IPNI: https://www.ipni.org/n/77314723-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000745374; POWO: https://powo.science.kew.org/taxon/2898301-4

= *Heracleum palmatum* Baumg., Enum. Stirp. Transsilv. 1: 215 (1816), non Crantz nec Rchb. *; GBIF: https://www.gbif.org/species/3628887; IPNI: https://www.ipni.org/n/843117-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000720157; POWO: https://powo.science.kew.org/taxon/843117-1

= *Pastinaca palmata* (Baumg.) Calest., Webbia 1: 245 (1905); GBIF: https://www.gbif.org/species/5538686; IPNI: https://www.ipni.org/n/845748-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000391732; POWO: https://powo.science.kew. org/taxon/845748-1; BHL: https://www.biodiversitylibrary.org/page/51613911#page/265

– *Heracleum simplicifolium* Herb., Fl. Bucov.: 302 (1859) et Herb. ex Nyman, Consp. Fl. Eur. 2: 289 (1879) [p. p., tantum quod plantas ucrain. carpat.]; GBIF: https://www.gbif.org/species/8444536; GBIF: https://www.gbif.org/species/7724113; IPNI: https://www .ipni.org/n/843167-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000720209; POWO: https://powo.science.kew.org/taxon/843167-1; BHL: https://www.biodiversity library.org/item/41446#page/300

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/843179-1, accessed on 05.06.2023), *Heracleum sphondylium* L. comprises 15 subspecies in the World's flora. However, only three subspecies (i.e. *H. sphondylium* subsp. *sphondylium, H. sphondylium subsp. sibiricum* (L.) Simonk. and *H. sphondylium* subsp. *transsilvanicum*) occurs in Ukraine and, in particular, are present in the flora of the Ukrainian Carpathians. From these three subspecies, only *H. sphondylium* subsp. *transsilvanicum* is endemic and the other two subspecies have narrow distribution ranges.

Order Asterales

Family Asteraceae

Achillea oxyloba subsp. *schurii* (Sch.Bip.) Heimerl, Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl. 48: 137 (1884)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FD98
- GBIF https://www.gbif.org/species/4215221
- IPNI urn:lsid:ipni.org:names:60439416-2
- WFO http://www.worldfloraonline.org/taxon/wfo-0000112464
- POWO https://powo.science.kew.org/taxon/60439416-2
- Wikispecies https://species.wikimedia.org/wiki/Achillea_oxyloba_subsp._schurii
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/c3b2ad2f-00dd-4d16-8000-e8509b369fe3
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Achillea-oxyloba
- BHL https://www.biodiversitylibrary.org/page/7107159#page/225
- JACQ https://je.jacq.org/JE00010937
- JACQ https://je.jacq.org/JE00010938
- JACQ https://je.jacq.org/JE00010939

Nomenclature:

≡ *Achillea schurii* Sch.Bip., Oesterr. Bot. Wochenbl. 6: 300 (1856) *; GBIF: https://www.gbif.org/species/4214718; IPNI: https://www.ipni.org/n/174249-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000103154; POWO: https://powo.science.kew.org/taxon/174249-1; BHL: https://www.biodiversitylibrary.org/page/9838510#page/320

≡ *Anthemis schurii* Sch.Bip., Oesterr. Bot. Wochenbl. 6: 300 (1856) et Sch.Bip. ex Heimerl, Denkschr. Acad. Wien 48: 137 (1884) [nom. nudum]; GBIF: https://www.gbif.org/species/3120193; IPNI: https://www.ipni.org/n/177603-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000000716; POWO: https://powo.science.kew.org/taxon/177603-1; BHL: https://www.biodiversitylibrary.org/item/37783#page/320; BHL: https://www.biodiversitylibrary.org/item/31429#page/225

≡ *Ptarmica schurii* Sch.Bip., Oesterr. Bot. Wochenbl. 6: 300 (1856); BHL: https://www.biodiversitylibrary.org/item/37783#page/320

≡ *Anthemis tenuifolia* (Schur) Schur., Verh. Siebenb. Ver. Naturw. 2: 171 (1851) [nom. inval.], non *Achillea tenuifolia* Lam.; GBIF: https://www.gbif.org/species/4240009; IPNI: https://www.ipni.org/n/177647-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000091513; POWO: https://powo.science.kew.org/taxon/177647-1; BHL: https://www.biodiversitylibrary.org/item/42660#page/382

≡ *Ptarmica tenuifolia* (Schur) Schur, Enum. Pl. Transsilv.: 327 (1866), non *Achillea tenuifolia* Lam. *; GBIF: https://www.gbif.org/species/4215545; IPNI: https://www.ipni.org/n/240127-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000072630;

POWO: https://powo.science.kew.org/taxon/240127-1; BHL: https://www.biodiversitylibrary.org/page/10544378#page/349

= *Achillea atrata* Baumg., Enum. Stirp. Transsilv. 3: 141 (1816), non L.

= *Achillea dacica* Simonk., Termesz. Füzet. 10: 181 (1886) et Enum. Fl. Transsilv.: 317 (1886); GBIF: https://www.gbif.org/species/3120195; IPNI: https://www.ipni.org/n/173928-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000016766; POWO: https://powo.science.kew.org/taxon/173928-1; BHL: https://www.biodiversitylibrary.org/item/97426#page/203

= *Achillea schurii* var. *dacica* (Simonk.) Prodan & Nyár., Fl. Rep. Pop. Rom. 9: 369 (1964)

= *Achillea schurii* f. *pleiocephala* Bommüller, Mitt. Thüringischen Bot. Vereins 30: 56 (1913); BHL: https://www.biodiversitylibrary.org/page/14324023#page/422

= *Achillea schurii* var. *polycephala* (Schur) Prodan & Nyár., Fl. Rep. Pop. Rom. 9: 369 (1964)

= *Anthemis alpina* Baumg., Enum. Stirp. Transsilv. 3: 145 (1816), non alior

= *Anthemis caespitosa* Herbich, Flora 40: 509 (1857); GBIF: https://www.gbif.org/species/4242092; IPNI: https://www.ipni.org/n/177199-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000029120; POWO: https://powo.science.kew.org/taxon/177199-1; BHL: https://www.biodiversitylibrary.org/page/50749#page/510; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00010937

= *Anthemis oxyloba* Schur, Enum. Pl. Transsilv.: 884 (1866), non *Achillea oxyloba* (DC.) Sch.Bip.; GBIF: https://www.gbif.org/species/3120196; IPNI: https://www.ipni.org/n/177490-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000079117; POWO: https://powo.science.kew.org/taxon/177490-1; BHL: https://www.biodiversitylibrary.org/page/10544378#page/906

= *Anthemis pseudo-atrata* Schur ex Schur, Enum. Pl. Transsilv.: 327 (1866); GBIF: https://www.gbif.org/species/4240513; IPNI: https://www.ipni.org/n/177530-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000124115; POWO: https://powo.science.kew.org/taxon/177530-1; BHL: https://www.biodiversitylibrary.org/page/10544378#page/349

= *Anthemis tenuifolia* [unranked] a *simplex monocephala* Schur., Verh. Siebenb. Ver. Naturw. 4: 40 (1851); BHL: https://www.biodiversitylibrary.org/item/42660#page/926

= *Anthemis tenuifolia* [unranked] b *ramosa polycephala* Schur., Verh. Siebenb. Ver. Naturw. 4: 40 (1851); BHL: https://www.biodiversitylibrary.org/item/42660#page/926

= *Anthemis tenuifolia* [unranked] c *pilosa minima polaris* Schur., Verh. Siebenb. Ver. Naturw. 4: 40 (1851); BHL: https://www.biodiversitylibrary.org/item/42660#page/926

= *Ptarmica oxyloba* Schur, Enum. Pl. Transsilv.: 326 (1866), non DC., non *Achillea oxyloba* (DC.) Sch.Bip.; BHL: https://www.biodiversitylibrary.org/page/10544378#page/348/

= *Ptarmica pseudo-atrata* Schur ex Schur, Enum. Pl. Transsilv.: 327 (1866); GBIF: https://www.gbif.org/species/4215659; IPNI: https://www.ipni.org/n/240111-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000130464; POWO: https://powo.science.kew.org/taxon/240111-1; BHL: https://www.biodiversitylibrary.org/page/10544378#page/349

= *Ptarmica tenuifolia* [unranked] a macrocephala Schur, Enum. Pl. Transsilv.: 327 (1866), non alior; BHL: https://www.biodiversitylibrary.org/item/7364#page/347; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00010939; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00010938

= *Ptarmica tenuifolia* [unranked] b *polycephala* (Schur) Schur, Enum. Pl. Transsilv.: 327 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/347

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Sometimes *A. oxyloba* subsp. *schurii* is confused with *A. tenuifolia* Schur, which is a separate species. Despite the LC status given to it by Onyshchenko et al. (2022), *Ptarmica tenuifolia* (= *A. oxyloba* subsp. *schurii*) is considered a rare species by Zyman and Chorney (2009) and was recently approved for inclusion in the new edition of the Red Book of Ukraine (MEPNR of Ukraine 2021).

CoL (https://www.catalogueoflife.org/data/taxon/5FD98, accessed on 08.06.2023), GBIF (https://www.gbif.org/species/3120193, accessed on 08.06.2023), IPNI (https://www.ipni.org/n/177603-1, accessed on 08.06.2023) and other databases designate the authorship of *Anthemis schurii* to Anton Heimerl and indicate the place of publication – Denkschr. Acad. Wien 48: 137 (1884). However, Heimerl is not the author of this name. In his paper, Heimerl (1884), on page 137, indicates that the correct author of this name is Carl Schultz Bipontius and references Oesterr. Bot. Wochenbl. 6: 300 (1856). Schultz Bipontius (1856) applied even three names on the same page as an alternative – *Achillea schurii, Anthemis schurii* and *Ptarmica schurii*.

Antennaria carpatica subsp. *carpatica* (Wahlenb.) Hook. in Bluff et Fingerh., Comp. Fl. German. 2: 348 (1825)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FN57
- GBIF https://www.gbif.org/species/7222270
- IPNI urn:lsid:ipni.org:names:77091531-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000005645
- POWO https://powo.science.kew.org/taxon/77091531-1
- Wikispecies https://species.wikimedia.org/wiki/Antennaria_carpatica_subsp._carpatica
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d2ef5c0a-f220-4ebf-9676-b6d11e7feb9a
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Antennaria-carpatica
- BHL https://www.biodiversitylibrary.org/page/6111900#page/370

- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.goet001007
- Plazi https://treatment.plazi.org/id/12F27F67-D6B0-A929-B3DC-162A02D4248C

Nomenclature:

Antennaria carpatica (Wahlenb.) Hook., Fl. Bor.-Amer. 1(suppl.): 329 (1834); GBIF: https://www.gbif.org/species/8243354; IPNI: https://www.ipni.org/n/1086760-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000003726; BHL: https://www.biodiversitylibrary.org/page/413406#page/340

≡ *Antennaria carpatica* (Wahlenb.) Hook. in Bluff & Fingerh., Comp. Fl. German. 2: 348 (1825); GBIF: https://www.gbif.org/species/7847414; IPNI: https://www.ipni.org/n/77091531-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000005645; POWO: https://powo.science.kew.org/taxon/77091531-1; BHL: https://www.biodiversitylibrary.org/page/6111900#page/370

≡ *Antennaria carpatica* (Wahlenb.) R.Br., Trans. Linn. Soc. London 12: 123 (1818) [nom. inval.] *; GBIF: https://www.gbif.org/species/8252547; IPNI: https://www.ipni.org/n/176874-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000084027; BHL: https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p758681|p12904620

≡ *Antennaria carpatica* (Wahlenb.) Trautv., Acta Horti Petropolitani 6(1): 24 (1879); BHL: https://www.biodiversitylibrary.org/item/53600#page/26

≡ *Chamaezelum carpaticum* (Wahlenb.) Link, Handbuch Erkennung nutz. häufigsten vorkomm. Gewachse 1: 719 (1829); GBIF: https://www.gbif.org/species/3088158; IPNI: https://www.ipni.org/n/192559-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000034028; POWO: https://powo.science.kew.org/taxon/192559-1; BHL: https://www.biodiversitylibrary.org/page/53335348#page/729

≡ *Gnaphalium carpathicum* Wahlenb., Fl. Carpat. Princ.: 258, tab. 3, 260 (1814) et Fl. Suec., ed. 2, 2: 515 (1833); GBIF: https://www.gbif.org/species/5697227; IPNI: https://www.ipni.org/n/209230-1; IPNI: https://www.ipni.org/n/326707-2; IPNI: https://www.ipni.org/n/60445618-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000037729; POWO: https://powo.science.kew.org/taxon/60445618-2; POWO: https://powo.science.kew.org/taxon/326707-2; BHL: https://www.biodiversitylibrary.org/item/97776#page/93

= *Gnaphalium wahlenbergii* Sieber ex Steud., Nomencl. Bot., ed. 2. 1: 696 (1841); GBIF: https://www.gbif.org/species/5385621; IPNI: https://www.ipni.org/n/210219-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000042044; POWO: https://powo.science.kew.org/taxon/210219-1; BHL: https://www.biodiversitylibrary.org/page/391920#page/699

– *Antennaria alpina* Ledeb., Fl. Ross. 2(2): 612 (1845–1846) [p. p., tantum quod plantas ucrain. carpat.], non (L.) Gaertn.; BHL: https://www.biodiversitylibrary.org/page/6104581#page/642

– *Antennaria alpina* auct fl. carpat. [e.g., Baumg.; Schur], non (L.) Gaertn.

– *Gnaphalium alpinum* Willd., Sp. Pl., ed. 4 3(3): 1883 (1803), non L. [p.p., tantum quod plantas ucrain. carpat.]; GBIF: https://www.gbif.org/species/7859021; IPNI:

https://www.ipni.org/n/209074-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000118765; POWO: https://powo.science.kew.org/taxon/209074-1; BHL: https://www.biodiversitylibrary.org/page/667272#page/409

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: *Antennaria carpatica* subsp. *carpatica* is listed in the Red Book of Ukraine as a rare taxon (Zyman and Bulakh 2009). However, its threat status has recently been increased to an 'obsolescent' level (MEPNR of Ukraine 2021).

There are two commonly recognised subspecies of *A. carpatica* (Wahlenb.) Bluff & Fingerh. – subsp. *carpatica* and subsp. *helvetica* (Chrtek & Pouzar) Chrtek & Pouzar. Only *A. carpatica* subsp. *carpatica* occurs in Carpathians, while *A. carpatica* subsp. *helvetica* is present in the Alps. Chrtek and Pouzar (1985) also described *A. carpatica* subsp. *amphilanata* Chrtek & Pouzar occurring in the Alps and Pyrenees, but it was later synonymised with *A. carpatica* subsp. *helvetica* (Greuter 2006). It is worth noting that many collectors and authors out of Carpathians, under the name *A. carpatica*, considered it exactly as *A. carpatica* subsp. *helvetica*.

Moreover, there is a close species, *A. lanata* Greene (= *A. carpatica* var. *lanata* Hook., = *A. carpatica* var. *laestadiana* Trautv., = *A. villifera* Boris.) that occurs not only in Eurasia, but also in North America (https://powo.science.kew.org/taxon/14721-2, accessed on 07.07.2023; Greene (1898)). Another close species, *A. lanatula* Chrtek & Pouzar, occurs exclusively in the south-west of North America (Chrtek and Pouzar 1985).

Centaurea maramarosiensis (Jáv.) Czerep., Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR. 20: 395 (1960)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/S6XN
- GBIF https://www.gbif.org/species/4251406
- GBIF https://www.gbif.org/species/3089524
- IPNI urn:lsid:ipni.org:names:190962-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000136824
- POWO https://powo.science.kew.org/taxon/190962-1
- Wiispecies https://species.wikimedia.org/wiki/Centaurea_maramarosiensis
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/212de873-0e21-48a1-9fc3-2c6cc9c17f2f
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Centaurea-maramarosiensis

Nomenclature:

≡ *Centaurea mollis* subsp. *marmarosiensis* (Jáv.) Soó, Acta Bot. Acad. Sci. Hung. 13: 309 (1967); GBIF: https://www.gbif.org/species/6450873; GBIF: https://www.gbif.org/

species/10972838; GBIF: https://www.gbif.org/species/6293888; WFO: http://www.worldfloraonline.org/taxon/wfo-0000102373

≡ *Centaurea mollis* f. *maramarosiensis* Jáv., Magyar Fl. 3: 1170 (1925); GBIF: https://www.gbif.org/species/6076144; WFO: http://www.worldfloraonline.org/taxon/wfo-0001403923; POWO: https://powo.science.kew.org/taxon/50909566-1

≡ *Centaurea montana* subsp. *maramarosiensis* (Jáv.) Soják, Čas. Nár. Mus., Odd. Přír. 140(3–4): 131 (1972); GBIF: https://www.gbif.org/species/9594652

≡ *Centaurea montana* subsp. *mollis* var. *typica* f. *maramarosiensis* (Jáv.) Dostál, Acta Bot. Bohem. 10: 69 (1931)

≡ *Cyanus maramarosiensis* (Jáv.) Dostál, Folia Mus. Rerum Nat. Bohemiae Occid., Bot. 21: 14 (1984); GBIF: https://www.gbif.org/species/9145130

≡ *Cyanus montanus* subsp. *maramarosiensis* (Jáv.) Soják, Čas. Nár. Mus., Odd. Přír. 140 (3–4): 131 (1972); GBIF: https://www.gbif.org/species/5701665; IPNI: https://www.ipni.org/n/877128-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000059604 ; POWO: https://powo.science.kew.org/taxon/877128-1

≡ *Cyanus mollis* subsp. *marmarosiensis* (Jáv.) Soó [nom. et. des. invalid]; GBIF: https://www.gbif.org/species/9700012

= *Centaurea mollis* f. *ramosa* Czakó in Jáv., Magyar Fl. 3: 1170 (1925), non *Centaurea ramosa* (Gugler) Hayek

= *Centaurea montana* subsp. *mollis* var. *ramosa* (Czakó) Dostál, Acta Bot. Bohem. 10: 69 (1931), non *Centaurea ramosa* (Gugler) Hayek

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Centaurea phrygia subsp. *carpatica* (Porcius) Dostál, Bot. J. Linn. Soc. 71(3): 207 (1976)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7JJJ4
- GBIF https://www.gbif.org/species/4249913
- IPNI urn:lsid:ipni.org:names:876940-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000109781
- POWO https://powo.science.kew.org/taxon/876940-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/ac14c1f6-ac44-401e-b7ce-4517235d6760
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Centaurea-phrygia

Nomenclature:

≡ *Centaurea carpatica* (Porcius) Porcius, Magyar Növényt. Lapok 9: 128 (1885) *; GBIF: https://www.gbif.org/species/8237713; IPNI: https://www.ipni.org/n/190150-1;

WFO: http://www.worldfloraonline.org/taxon/wfo-0000007134; POWO: https://powo.science.kew.org/taxon/190150-1

≡ *Centaurea carpatica* (Porcius) Wagner, Cent. Hung.: 157 (1910)

≡ *Centaurea carpatica* (Porcius) Formánek, Oesterr. Bot. Z. 37: 153 (1887); GBIF: https://www.gbif.org/species/3097081; IPNI: https://www.ipni.org/n/190151-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000001725; BHL: https://www.biodiversitylibrary.org/page/28752056#page/159

≡ *Centaurea plumosa* var. *carpatica* Porcius, Enum. Pl. Phanerogam. Distr. Quondam Naszódiensis: 34 (1878) [nom. inval.]; GBIF: https://www.gbif.org/species/6076567; WFO: http://www.worldfloraonline.org/taxon/wfo-0000107278; POWO: https://powo.science.kew.org/taxon/50921977-1

≡ *Centaurea pseudophrygia* f. *intercedens* subf. carpatica (Porcius) Gugler, Ann. Hist.-Nat. Musei Nat. Hungarici 6: 92 (1908); BHL: https://www.biodiversitylibrary.org/item/256063#page/104

≡ *Jacea carpatica* (Porcius) Soják, Čas. Nár. Mus., Odd. Přír. 140(3–4): 132 (1972); GBIF: https://www.gbif.org/species/5695987; IPNI: https://www.ipni.org/n/226482-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000092877; POWO: https://powo.science.kew.org/taxon/226482-1

≡ *Jacea phrygia* subsp. *carpatica* (Porcius) Dostál, Folia Mus. Rer. Nat. Bohem. Occid., Bot. 21: 14 (1984); GBIF: https://www.gbif.org/species/5695845; IPNI: https://www.ipni.org/n/923452-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000108795; POWO: https://powo.science.kew.org/taxon/923452-1

= *Centaurea plumosa* β [unranked] *polycephala* Porcius, Enum. Pl. Phanerogam. Distr. Quondam Naszódiensis: 34 (1878)

= *Centaurea rodnensis* Simonk., Enum. Fl. Transsilv.: 620 (1886) *; GBIF: https://www.gbif.org/species/7223238; WFO: http://www.worldfloraonline.org/taxon/wfo-0000117428; BHL: https://www.biodiversitylibrary.org/page/10524121#page/684

– *Centaurea montana* subsp. *mollis* (Waldst. & Kit.) Gugler, Ann. Hist.-Nat. Mus. Natl. Hung. 6: 104 (1907) sensu Katina

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/191259-1, accessed on 05.06.2023), *Centaurea phrygia* L. includes 14 subspecies. From this number, only three subspecies (i.e. subsp. *phrygia*, subsp. *carpatica* and subsp. *melanocalathia* (Borbás ex Czakó) Dostál) occur in the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015). Even though the last subspecies has a limited distribution and is considered as a Pancarpathian endemic (Tasenkevich 2003), Carpathian subendemic (Kricsfalusy and Budnikov 2002) or Carpatho-Balcanic taxon (Dostál 1989, Malynovskiy et al. 2002), it has a hybridogenous origin (Koutecký et al. 2012, Kliment

et al. 2016) and, therefore, is not considered here. Hence, the only endemic representative in the Ukrainian Carpathians from the *C. phrygia* complex is *C. phrygia* subsp. *carpatica*.

The Euro+Med PlantBase (Greuter 2006), amongst the homotypic synonyms of *C. phrygia* subsp. *carpatica*, provides *C. plumosa* var. *carpatica* Porcius that is supposed to be published on p. 34 of "Enumeratio plantarum phanerogamicarum districtus quondam naszódiensis" (Porcius 1878). Similarly, this combination is also mentioned by Prodan and Nyárády (1964) on page 890 and Czerepanov (1994) on page 276. However, in this publication, there is no such combination published. Instead, Porcius (1878) on page 34, published a new combination *C. plumosa* β *polycephala* Porcius and only indicated *C. carpatica* as its synonym. I was also unable to detect where *C. plumosa* var. *carpatica* had been published by Porcius. Most probably, the combination *C. plumosa* var. *carpatica* Porcius arose mistakenly due to misinterpretation of this name by other authors and has never been published by Porcius.

Doronicum carpaticum (Griseb. et Schenk) Nyman, Syll. Fl. Eur. suppl.: 1 (1865)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/37DTP
- GBIF https://www.gbif.org/species/3142985
- IPNI https://www.ipni.org/n/1016070-2
- WFO http://www.worldfloraonline.org/taxon/wfo-0000094993
- POWO https://powo.science.kew.org/taxon/1016070-2
- Wikispecies https://species.wikimedia.org/wiki/Doronicum_carpaticum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/087b010f-cb20-410d-bab5-5a1211f34564
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Doronicum-carpaticum

Nomenclature:

≡ *Aronicum carpaticum* (Griseb. & Schenk) Schur, Bot. Rundr.: 71 (1853) et Verh. Siebenb. Ver. Naturw. 10: 137 (1859) *; GBIF: https://www.gbif.org/species/3142986; IPNI: https://www.ipni.org/n/1017626-2; POWO: https://powo.science.kew.org/taxon/1017626-2; BHL: https://www.biodiversitylibrary.org/item/42663#page/381

≡ *Aronicum carpathicum* (Griseb. & Schenk) Schur, Bot. Rundr.: 71 (1853) et Verh. Siebenb. Ver. Naturw. 10: 137 (1859) [ortho. var.] *; GBIF: https://www.gbif.org/species/3142986; IPNI: https://www.ipni.org/n/1017626-2; POWO: https://powo.science.kew.org/taxon/1017626-2; BHL: https://www.biodiversitylibrary.org/item/42663#page/381

≡ *Aronicum carpathicum* (Griseb. & Schenk) Fuss, Progr. Gymn. Hermannstadt: 12 (1854)

≡ *Aronicum scorpioides* var. *carpaticum* Griseb. & Schenk in Wiegm., Arch. Naturgesch. 18(1): 342 (1852); GBIF: https://www.gbif.org/species/4232202; IPNI: https://www.ipni.org/n/329148-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000027914; POWO: https://powo.science.kew.org/taxon/329148-2; BHL: https://

www.biodiversitylibrary.org/page/13707751#page/350; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.goet011169

≡ *Doronicum columnae* subsp. *carpaticum* (Griseb. & Schenk) Sóo, Scripta Bot. Mus. Transsilv. 3(3–5): 10 (1944); GBIF: https://www.gbif.org/species/10954590; IPNI: https://www.ipni.org/n/60459784-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0001360332; POWO: https://powo.science.kew.org/taxon/60459784-2

≡ *Doronicum grandiflorum* subsp. *carpaticum* (Griseb. & A. Schenk) Rouy, Rev. Bot. Syst. Geogr. Bot. 1: 53 (1903); GBIF: https://www.gbif.org/species/4231483; IPNI: https://www.ipni.org/n/1162227-2; WFO: http://www.worldfloraonline.org/taxon/wfo-4000012446; POWO: https://powo.science.kew.org/taxon/1162227-2; BHL: https://www.biodiversitylibrary.org/page/14597664#page/81

= *Aronicum barcense* Simonk., Enum. Fl. Transsilv.: 322 (1886); GBIF: https://www.gbif.org/species/3142997; IPNI: https://www.ipni.org/n/179115-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000106373; POWO: https://powo.science.kew.org/taxon/179115-1; BHL: https://www.biodiversitylibrary.org/page/10524457#page/386

= *Aronicum carpaticum* [unranked] a polyphyllum Schur, Enum. Pl. Transsilv.: 341 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/361

= *Aronicum latifolium* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 2: 171 (1851) [nom. nudum], non Rchb.; BHL: https://www.biodiversitylibrary.org/item/42660#page/382

= *Doronicum carpaticum* var. *barcense* (Simonk.) Borbás, Termr. Füz. 19: 219 (1896); BHL: https://www.biodiversitylibrary.org/item/96856#page/589

= *Doronicum cordatum* var. *asperum* Borbás, Oesterr. Bot. Z. 28: 311 (1878); BHL: https://www.biodiversitylibrary.org/item/91412#page/327

= *Doronicum pardalianches* Heuff., [Enum. Pl. Banat. Temes.] Verh. K.K. Zool.-Bot. Ges. Wien 8: 137 (1858), non alior; BHL: https://www.biodiversitylibrary.org/item/137035#page/321

= *Doronicum orientale* Kotschy, Verh. Zool.-Bot. Vereins Wien 3: 140 (1853) [nom. nudum], non alior; BHL: https://www.biodiversitylibrary.org/item/86007#page/394

– *Arnica scorpioides* Baumg., Enum. Stirp. Transsilv. 3: 135 (1816), non alior

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Leucanthemum rotundifolium (Waldst. et Kit. in Willd.) DC., Prodr. 6: 46 (1838), non Opiz

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6PRWY
- GBIF https://www.gbif.org/species/5400956
- IPNI urn:lsid:ipni.org:names:230081-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000137878

- POWO https://powo.science.kew.org/taxon/230081-1
- Wikispecies https://species.wikimedia.org/wiki/Leucanthemum_rotundifolium
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/f0573a53-5b02-442d-a43e-e60605a4ff11
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Leucanthemum-rotundifolium

Nomenclature:

≡ *Leucanthemum rotundifolium* (Waldst. & Kit. in Willd.) Baumg., Enum. Stirp. Transsilv. 3: 107 (1817)

≡ *Leucanthemum rotundifolium* (Waldst. & Kit. in Willd.) Schur, Enum. Pl. Transsilv.: 339 (1866); GBIF: https://www.gbif.org/species/8333000; IPNI: https://www.ipni.org/n/230080-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000048186; POWO: https://powo.science.kew.org/taxon/230080-1; BHL: www.biodiversitylibrary.org/page/10544390#page/361

≡ *Chrysanthemum rotundifolium* Waldst. & Kit. in Willd., Sp. Pl. 3(3): 2144 (1803) *; BHL: https://www.biodiversitylibrary.org/item/14564#page/670

≡ *Chrysanthemum rotundifolium* Waldst. & Kit., Descr. Icon. Pl. Rar. Hung. 3: 262, t. 236 (1812); GBIF: https://www.gbif.org/species/3134081; IPNI: https://www.ipni.org/n/193725-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000096787; POWO: https://powo.science.kew.org/taxon/193725-1

≡ *Matricaria rotundifolia* (Waldst. & Kit. in Willd.) Poir., Encycl. [J. Lamarck et al.] Suppl. 3.: 608 (1814); GBIF: https://www.gbif.org/species/4232595; IPNI: https://www.ipni.org/n/231991-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000035953; POWO: https://powo.science.kew.org/taxon/231991-1; BHL: https://www.biodiversitylibrary. org/page/738767#page/611

≡ *Tanacetum rotundifolium* (Waldst. & Kit. in Willd.) Simonk., Enum. Fl. Transsilv.: 313 (1886), non DC. *; GBIF: https://www.gbif.org/species/8145981; IPNI: https://www.ipni.org/n/252496-1; POWO: https://powo.science.kew.org/taxon/252496-1; BHL: https://www.biodiversitylibrary.org/page/10524448#page/377

= *Leucanthemum waldsteinii* (Sch.Bip.) Pouzar, Preslia 47: 158 (1975); GBIF: https://www.gbif.org/species/5400957; IPNI: https://www.ipni.org/n/230104-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000061727; POWO: https://powo.science.kew.org/taxon/230104-1

= *Pyrethrum waldsteinii* (Sch.Bip.) Janka, Bot. Jahresber. (Just) 4: 1062 (1878); GBIF: https://www.gbif.org/species/5692501; IPNI: https://www.ipni.org/n/241003-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000073828; POWO: https://powo.science.kew.org/taxon/241003-1; BHL: https://www.biodiversitylibrary.org/page/2232018#page/366

= *Tanacetum waldsteinii* Sch.Bip., Tanaceteen: 35 (1844); GBIF: https://www.gbif.org/species/3134080; IPNI: https://www.ipni.org/n/252569-1; WFO: http://www.world

floraonline.org/taxon/wfo-0000076302; POWO: https://powo.science.kew.org/taxon/252569-1

= *Tanacetum waldsteinii* var. *ramosum* Ilse &. Fritze, Verh. K.K. Zool.-Bot. Ges. Wien 20: 488 (1870); BHL: https://www.biodiversitylibrary.org/item/137000#page/626

– *Chrysanthemum montanum* Csató, Erd. Muz. [Az Erdélyi Múzeum-Egylet Évkönyveiben] 4: 82 (1868), non alior

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Saussurea porcii Degen, Magyar Bot. Lapok 3: 311 (1904)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6Y3D4
- GBIF https://www.gbif.org/species/5404478
- IPNI urn:lsid:ipni.org:names:242550-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000009499
- POWO https://powo.science.kew.org/taxon/242550-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/4f83275a-2213-4d2a-8b89-f016fc1c308d
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Saussurea-porcii
- BHL https://www.biodiversitylibrary.org/page/50401658#page/333
- JACQ http://herbarium.bgbm.org/object/B101113971

Nomenclature:

= *Saussurea alata* Porcius & Czetz, Transilvania 15–16: 118 (1881), non DC.

= *Saussurea serrata* Janka, Oesterr. Bot. Z. 8: 200 (1858), non DC.; BHL: https://www.biodiversitylibrary.org/item/91263#page/208

– *Saussurea parviflora* auct., non (Poir.) DC.

– *Saussurea serrata* auct. Transsilv., non DC.

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: This species is listed as rare in the last edition and has been recently approved for the new edition of the Red Book of Ukraine (Chorney and Danylyk 2009, MEPNR of Ukraine 2021). IPNI, POWO,and WFO (see links above; accessed on 05.06.2023) incorrectly indicate the page of the protologue – it should be 311 instead of 811.

Scorzoneroides pseudotaraxaci (Schur) Holub, Folia Geobot. Phytotax. 12: 307 (1977)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4VXKC

- GBIF https://www.gbif.org/species/3133494
- IPNI urn:lsid:ipni.org:names:243487-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000001257
- POWO https://powo.science.kew.org/taxon/243487-1
- Wikispecies https://species.wikimedia.org/wiki/Scorzoneroides_pseudotaraxaci
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/1a39d5e8-1034-4c66-aa01-25c0381eae52
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Scorzoneroides-pseudotaraxaci
- JACQ https://je.jacq.org/JE00017817
- JACQ https://je.jacq.org/JE00017818
- JACQ https://je.jacq.org/JE00017819

Nomenclature:

≡ *Leontodon pseudotaraxaci* Schur, Enum. Pl. Transsilv.: 357 (1866) *; GBIF: https://www.gbif.org/species/3133496; IPNI: https://www.ipni.org/n/229460-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000061097; POWO: https://powo.science.kew.org/taxon/229460-1; BHL: https://www.biodiversitylibrary.org/page/10544408#page/379

≡ *Leontodon montanus* subsp. *pseudotaraxaci* (Schur) Finch & P.D.Sell, Bot. J. Linn. Soc. 71: 242 (1976); GBIF: https://www.gbif.org/species/4253414; IPNI: https://www.ipni.org/n/877573-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000110905; POWO: https://powo.science.kew.org/taxon/877573-1

≡ *Scorzoneroides montana* (Lam.) J.Holub subsp. *pseudotaraxaci* [des. et nom. inval.]; GBIF: https://www.gbif.org/species/6082260

= *Leontodon clavatus* Sagorski & Schneider, Fl. Centralkarpath. 2: 254 (1890–1891) *; GBIF: https://www.gbif.org/species/3133495; IPNI: https://www.ipni.org/n/229281-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000123339; POWO: https://powo.science.kew.org/taxon/229281-1; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017818; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017819; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017817

= *Leontodon medius* Simonk., Enum. Fl. Transsilv.: 352 (1886) et Bot. Centralbl. 49: 268 (1892), non *Apargia media* Host; GBIF: https://www.gbif.org/species/4253470; IPNI: https://www.ipni.org/n/229408-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000095956; POWO: https://powo.science.kew.org/taxon/229408-1; BHL: https://www.biodiversitylibrary.org/page/2119961#page/278; BHL: https://www.biodiversitylibrary.org/item/40105#page/416

= *Leontodon taraxaci* var. *tatricus* Kotula, Distr. Pl. Vasc. Mont. Tatr.: 356 (1890)

= *Leontodon tatricis* (Kotula) Woł., Fl. Pol. Exs.: 545 (1897) [ortho. var.]

= *Leontodon tatricus* (Kotula) Woł., Fl. Pol. Exs.: 545 (1897)

– *Apargia aurea* Baumg., Enum. Stirp. Transsilv. 3: 16 (1816), non (L.) F.W.Schmidt, non *Leontodon aureum* L., nec *Ceracium aureum* Schur.

– *Apargia taraxaci* Wahlenb., Fl. Carpat. Princ.: 235 (1814), non Willd.

– *Leontodon taraxaci* auct., non (L.) Loisel.

– *Leontodon taraxaci* R.Uechtr., Oesterr. Bot. Z. 14: 386 (1864) [nom. illeg] , non Loisel.; BHL: https://www.biodiversitylibrary.org/item/36417#page/378

– *Leontodon pyrenaeus* R.Uechtr., Oesterr. Bot. Wochenbl. 7: 370 (1857) [nom. illeg], non Gouan; BHL: https://www.biodiversitylibrary.org/item/94863#page/371

– *Leontodon pyrenaicus* Hoborski, Oesterr. Bot. Wochenbl. 3: 19 (1853) [nom. illeg], non Gouan; BHL: https://www.biodiversitylibrary.org/item/91226#page/29

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: All databases, except Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/1a39d5e8-1034-4c66-aa01-25c0381eae52, accessed on 15.06.2023), indicate *Leontodon clavatus* Sagorsky & Schneider. as a synonym for *Scorzoneroides hispidula* (Delile) Greuter & Talavera. This confusion, perhaps, resulted from the fact that Sagorski and Schneider (1891), on page 254, supported the newly-described species with several controversial synonyms, i.e. *Apargia taraxaci*, *Leontodon taraxaci* and *Leontodon pyrenaicus*, which led to the further nomenclatural collapse of these names. Following POWO (https://powo.science.kew.org/taxon/77075521-1, accessed on 15.06.2023) and other databases, *Apargia taraxaci* Willd. and *Leontodon taraxaci* Loisel. are both synonyms for *Scorzoneroides hispidula*. In addition, following POWO (https://powo.science.kew.org/taxon/77180809-1, accessed on 15.06.2023), *Leontodon pyrenaicus* Gouan is a synonym for *Scorzoneroides pyrenaica* (Gouan) Holub subsp. *pyrenaica*. Neither *Scorzoneroides hispidula* nor *S. pyrenaica* occurs in the Carpathians. At the same time, Sagorski and Schneider (1891) clearly indicated that their species is described from the Carpathians and even included specimens from the Ukrainian part of the Carpathians (i.e. Volovets town). Sagorski and Schneider (1891), later in the text, indicated differences between newly-described *L. clavatus* from *Apargia taraxaci* Willd., *Leontodon taraxaci* Loisel. and *Leontodon pyrenaicus* Gouan that occurs out of the Carpathians. They also pointed out that they consider *Apargia taraxaci*, *Leontodon taraxaci* and *Leontodon pyrenaicus* as synonyms for *L. clavatus* exclusively in the meaning of authors from the Carpathian region. In particular, they mentioned *Apargia taraxaci* Wahlenb., Fl. Carpat. Princ.: 235 (1814), non Willd.; *Leontodon taraxaci* R.Uechtr., Oesterr. Bot. Z. 14: 386 (1864), non Loisel.; *Leontodon pyrenaeus* R.Uechtr., Oesterr. Bot. Wochenbl. 7: 370 (1857); and *Leontodon pyrenaicus* Hoborski, Oesterr. Bot. Wochenbl. 3: 19 (1853), non Gouan. Therefore, *L. clavatus* is not a synonym, neither for *Scorzoneroides hispidula* nor for *S. pyrenaica*; it is a synonym for *S. pseudotaraxaci* as indicated by Euro+Med.

Senecio hercynicus subsp. *ucranicus* (Hodálová) Greuter, Willdenowia 33: 247 (2003)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5L5FB
- GBIF https://www.gbif.org/species/4232604
- IPNI urn:lsid:ipni.org:names:50426498-2
- WFO http://www.worldfloraonline.org/taxon/wfo-0000112942
- POWO https://powo.science.kew.org/taxon/50426498-2
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/facab36a-04e8-4d3b-bfcc-65805e2cf833
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Senecio-hercynicus

Nomenclature:

≡ *Senecio ucranicus* Hodálová, Folia Geobot. 34 (3): 334 (1999), non Besser. *; GBIF: https://www.gbif.org/species/4215062; IPNI: https://www.ipni.org/n/1011450-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000135296; POWO: https://powo.science.kew.org/taxon/1011450-1

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: *Senecio ucranicus* Hodálová has been described from the montane and subalpine belts. In the Ukrainian Carpathians, it is mentioned for Chyvchyny and Chornohora Mts. (Hodálová 1999). Unfortunately, I found no specimen of *S. ucranicus* (≡ *S. hercynicus* subsp. *ucranicus*) in the Ukrainian herbaria.

Family Campanulaceae

Campanula carpatica Jacq., Hort. Bot. Vindob. 1: 22, tab. 57 (1770), non *C. carpatha* Halácsy

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5X8SY
- GBIF https://www.gbif.org/species/5410826
- IPNI urn:lsid:ipni.org:names:140068-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000826758
- POWO https://powo.science.kew.org/taxon/140068-1
- Wikispecies https://species.wikimedia.org/wiki/Campanula_carpatica
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/6a581420-8d46-4fb2-986f-4bb346a00d02
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Campanula-carpatica
- BHL https://www.biodiversitylibrary.org/page/307434#page/32

Nomenclature:

≡ *Campanula cordifolia* Vuk., Linnaea 26(3): 328 (1854), non K.Koch; GBIF: https://www.gbif.org/species/7407199; IPNI: https://www.ipni.org/n/140151-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826972; POWO: https://powo.science.kew.org/taxon/140151-1; BHL: https://www.biodiversitylibrary.org/page/113484#page/330

≡ *Neocodon carpaticus* (Jacq.) Kolak. & Serdyuk, Zametki Sist. Geogr. Rast. 40: 28 (1984); GBIF: https://www.gbif.org/species/3163033; IPNI: https://www.ipni.org/n/914284-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000816913; POWO: https://powo.science.kew.org/taxon/914284-1

= *Campanula carpatica* Baumg. ex Schur, Enum. Pl. Transsilv.: 440 (1866) [nom. inval.]; BHL: https://www.biodiversitylibrary.org/item/7364#page/460

= *Campanula carpatica* L. ex Schur, Enum. Pl. Transsilv.: 440 (1866) [nom. inval.]; BHL: https://www.biodiversitylibrary.org/item/7364#page/460

= *Campanula carpatica* [unranked] *alba* (Voss) J.R.Duncan & V.C.Davies, Nursery Cat. (Duncan & Davies) 1925: 17 (1925)

= *Campanula carpatica* var. *brachyphylla* Morariu, Fl. Rep. Pop. Rom. 9: 76, 960 (1964)

= *Campanula carpatica* var. *dasycarpa* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5410828; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826759; POWO: https://powo.science.kew.org/taxon/364196-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/460

= *Campanula carpatica* f. *dasycarpa* (Schur) Tacik, Fl. Polska 12: 84 (1971); GBIF: https://www.gbif.org/species/7665609; IPNI: https://www.ipni.org/n/875483-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826760; POWO: https://powo.science.kew.org/taxon/875483-1

= *Campanula carpatica* var. *grandiflora* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5410836; IPNI: https://www.ipni.org/n/77267465-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826761; POWO: https://powo.science.kew.org/taxon/77267465-1; BHL: https://www.biodiversitylibrary.org/page/10544491#page/462

= *Campanula carpatica* var. *hemisphaerica* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5410841; IPNI: https://www.ipni.org/n/77267638-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826762; POWO: https://powo.science.kew.org/taxon/77267638-1; BHL: https://www.biodiversitylibrary.org/page/10544491#page/462

= *Campanula carpatica* var. *longifolia* Morariu, Fl. Rep. Pop. Rom. 9: 79, 960 (1964)

= *Campanula carpatica* var. *longifolia* f. *parviflora* Săvul. ex Morariu & Nyár., Fl. Rep. Pop. Rom. 9: 79, 960 (1964)

= *Campanula carpatica* var. *oreophila* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5410842; IPNI: https://www.ipni.org/n/77266926-1; WFO:

http://www.worldfloraonline.org/taxon/wfo-0000826766; POWO: https://powo.science.kew.org/taxon/77266926-1; BHL: https://www.biodiversitylibrary.org/page/10544491#page/462

= *Campanula carpatica* [unranked] *pelviformis* Froebel ex André, Rev. Hort. (Paris) 54: 509 (1882); GBIF: https://www.gbif.org/species/5410840; IPNI: https://www.ipni.org/n/77267279-1; POWO: https://powo.science.kew.org/taxon/77267279-1; BHL: https://www.biodiversitylibrary.org/page/49658684#page/559

= *Campanula carpatica* [unranked] *riverslea* J.R.Duncan & V.C.Davies, Nursery Cat. (Duncan & Davies) 1925: 17 (1925)

= *Campanula carpatica* var. *porrecta* Morariu, Fl. Rep. Pop. Rom. 9: 76, 959 (1964)

= *Campanula carpatica* var. *porrecta* f. *minor* Morariu, Fl. Rep. Pop. Rom. 9: 76, 959 (1964)

= *Campanula carpatica* var. *schuriana* Săvul. ex Morariu & Nyár., Fl. Rep. Pop. Rom. 9: 76, 960 (1964)

= *Campanula carpatica* var. *subdasycarpa* Morariu & Nyár., Fl. Rep. Pop. Rom. 9: 79, 960 (1964)

= *Campanula carpatica* [unranked] b *subpilosa* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5410838; WFO: https://list.worldfloraonline.org/wfo-0000826768; POWO: https://powo.science.kew.org/taxon/364203-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/460

= *Campanula carpatica* f. *subpilosa* (Schur) Tacik, Fl. Polska 12: 84 (1971); GBIF: https://www.gbif.org/species/8353661; IPNI: https://www.ipni.org/n/875484-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826769; POWO: https://powo.science.kew.org/taxon/875484-1

= *Campanula carpatica* var. *tomentosa* Kotschy, Verh. Zool.-Bot. Ges. Wien 3: 140 (1853); BHL: https://www.biodiversitylibrary.org/item/86007#page/394

= *Campanula carpatica* var. *transsilvanica* Schur, Bot. Rundreise [unpublished work]: 108 (1853) [nom. illeg.] et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 174 (1859), non *Campanula transsilvanica* Schur ex Andrae; BHL: https://www.biodiversitylibrary.org/item/42663

= *Campanula carpatica* subsp. *turbinata* (Schott, Nyman & Kotschy) Nyman, Consp. Fl. Eur. 482 (1879); GBIF: https://www.gbif.org/species/5410830; IPNI: https://www.ipni.org/n/77258441-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826770; POWO: https://powo.science.kew.org/taxon/77258441-1; BHL: https://www.biodiversitylibrary.org/page/11015626#page/493

= *Campanula carpatica* var. *turbinata* (Schott, Nyman & Kotschy) Fuss, Fl. Transsilv. Exc.: 420 (1866)

= *Campanula carpatica* var. *turbinata* (Schott, Nyman & Kotschy) Nichols, Garden (London, 1871–1927) 45: 171 (1893); GBIF: https://www.gbif.org/species/11989529; GBIF: https://www.gbif.org/species/168085137; IPNI: https://www.ipni.org/n/

77267254-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826771; POWO: https://powo.science.kew.org/taxon/77267254-1; BHL: https://www.biodiversitylibrary.org/page/25626743#page/207

= *Campanula carpatica* var. *turbinata* f. *rotundata* Morariu, Fl. Rep. Pop. Rom. 9: 79, 960 (1964)

= *Campanula dasycarpa* Schur ex Schur, Enum. Pl. Transsilv.: 440 (1866) [nom. illeg.], non Kit. ex Schult.; GBIF: https://www.gbif.org/species/7907817; IPNI: https://www.ipni.org/n/140187-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827018; POWO: https://powo.science.kew.org/taxon/140187-1; BHL: https://www.biodiversitylibrary.org/page/10544491#page/462

= *Campanula dasycarpa* Fuss. ex Schur, Enum. Pl. Transsilv.: 440 (1866), non Kit. ex Schult.; BHL: https://www.biodiversitylibrary.org/item/7364#page/460

= *Campanula oreophila* Schur ex Schur, Enum. Pl. Transsilv.: 441 (1866); GBIF: https://www.gbif.org/species/5410835; IPNI: https://www.ipni.org/n/140769-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828027; POWO: https://powo.science.kew.org/taxon/140769-1; BHL: https://www.biodiversitylibrary.org/page/10544492#page/463

= *Campanula pseudocarpatica* Schur, Enum. Pl. Transsilv.: 441 (1866); GBIF: https://www.gbif.org/species/5604956; IPNI: https://www.ipni.org/n/140887-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828286; POWO: https://powo.science.kew.org/taxon/140887-1; BHL: https://www.biodiversitylibrary.org/page/10544492#page/463

= *Campanula reniformis* Schur, Enum. Pl. Transsilv.: 440 (1866); GBIF: https://www.gbif.org/species/5604927; IPNI: https://www.ipni.org/n/140968-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828484; POWO: https://powo.science.kew.org/taxon/140968-1; BHL: https://www.biodiversitylibrary.org/page/10544492#page/463

= *Campanula turbinata* Schott, Nyman & Kotschy, Analect. Bot.: 14 (1854); GBIF: https://www.gbif.org/species/5410839; IPNI: https://www.ipni.org/n/141258-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000829252; POWO: https://powo.science.kew.org/taxon/141258-1; BHL: https://www.biodiversitylibrary.org/page/10488333#page/26

= *Campanula turbinata* f. *alba* Voss, Vilm. Blumengärtn. ed. 3, 1: 570 (1894); GBIF: https://www.gbif.org/species/5410827; WFO: http://www.worldfloraonline.org/taxon/wfo-0000829253; POWO: https://powo.science.kew.org/taxon/366618-4; BHL: https://www.biodiversitylibrary.org/item/134968#page/662

= *Campanula turbinata* f. *lilacina* Voss, Vilm. Blumengärtn. ed. 3, 1: 570 (1894); GBIF: https://www.gbif.org/species/5410832; WFO: http://www.worldfloraonline.org/taxon/wfo-0000829254; POWO: https://powo.science.kew.org/taxon/366619-4; BHL: https://www.biodiversitylibrary.org/item/134968#page/662

= *Campanula turbinata* f. *pelviformis* (Froebel ex André) Voss, Vilm. Blumengärtn. ed. 3, 1: 570 (1894); GBIF: https://www.gbif.org/species/5410833; GBIF: https://www.gbif.org/species/7407199; WFO: http://www.worldfloraonline.org/taxon/wfo-0000829256; POWO: https://powo.science.kew.org/taxon/366620-4; BHL: https://www.biodiversitylibrary.org/item/134968#page/662

– *Campanula carpatica* var. *hendersonii* (C.Wolley Dod) W.T.Mill., Cycl. Amer. Hort. 231 (1900) [hort.]; GBIF: https://www.gbif.org/species/5410837; IPNI: https://www.ipni.org/n/77267624-1; POWO: https://powo.science.kew.org/taxon/77267624-1

– *Campanula fergusonii* A.M.Ferguson, Rev. Hort. 76: 557 (1904) [pro hybr., hort]; GBIF: https://www.gbif.org/species/11265590; IPNI: https://www.ipni.org/n/140301-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827170; POWO: https://powo.science.kew.org/taxon/140301-1; BHL: https://www.biodiversitylibrary.org/item/197157#page/607

– *Campanula hendersonii* C.Wolley Dod, Gard. Chron. n.s., 18: 502 (1882) [hort.]; GBIF: https://www.gbif.org/species/12053643; IPNI: https://www.ipni.org/n/140413-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827394; POWO: https://powo.science.kew.org/taxon/140413-1; BHL: https://www.biodiversitylibrary.org/page/32986798#page/517

– *Campanula trans[s]ilvanica* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 174 (1859), non *C. transsilvanica* Schur ex Andrae (1855) nec Schur (1866); BHL: https://www.biodiversitylibrary.org/item/42663#page/418

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: This species is listed in the last edition (Kagalo and Sytschak 2009a) and has been approved for the new edition (MEPNR of Ukraine 2021) of the Red Book of Ukraine with a status ‘rare’.

Schur (1859b) described *C. carpathica* var. *trans[s]ilvanica* and indicated among its synonyms *C. trans[s]ilvanica* Schur. He also noted "affinis valde *C. dasycarpae* Kit." [very similar to *C. dasycarpae* Kit.]. However, later Schur (1866) delimited *C. transilvanica* (p. 436) as independent species from *C. carpathica* [unranked] c *dasycarpa* (p. 440). Amongst the synonyms of *C. transilvanica*, Schur (1866) indicated *C. transsilvanica* Schur ex Andrae. Amongst the synonyms of *C. carpathica* [unranked] c *dasycarpa*, Schur (1866) provided *C. dasycarpae* Schur and *C. dasycarpa* Fuss and pointed out that he considers this species not in the sense of Pál Kitaibel. Besides this, amongst the synonyms of *C. carpathica* [unranked] c *dasycarpa*, Schur (1866) also provided *C. carpathica* var. *transsilvanica*, but did not mention *C. transsilvanica* Schur in a rank of species anymore, as he did in 1859. Therefore, *C. transsilvanica* in sense of Schur (1859b) is not the same as *C. transsilvanica* in the sense of Schur ex Andrae (1855) and Schur (1866) and requires extra attention to avoid confusion.

Campanula kladniana (Schur) Witasek, Abh. Zool.-Bot. Ges. Wien 1: 39 (1902)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5X8SK
- GBIF https://www.gbif.org/species/5411315
- IPNI urn:lsid:ipni.org:names:140522-1

- WFO http://www.worldfloraonline.org/taxon/wfo-0000827551
- POWO https://powo.science.kew.org/taxon/140522-1
- Wikispecies https://species.wikimedia.org/wiki/Campanula_kladniana
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/2d7ebdb9-7c6e-4197-848c-924879558528
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Campanula-carnica

Nomenclature:

≡ *Campanula scheuchzeri* var. *kladniana* Schur, Enum. Pl. Transsilv.: 443 (1866); GBIF: https://www.gbif.org/species/5411313; IPNI: https://www.ipni.org/n/77268441-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828844; POWO: https://powo.science.kew.org/taxon/77268441-1; BHL: https://www.biodiversitylibrary.org/page/10544494#page/465; Plazi: https://treatment.plazi.org/id/DFCA53C1-A804-B864-9D6D-9BA3B82B505B

≡ *Campanula rotundifolia* subsp. *kladniana* (Schur) Tacik in Pawł. & Jasiewicz, Fl. Polska 12: 76 (1971); GBIF: https://www.gbif.org/species/5411317; IPNI: https://www.ipni.org/n/875512-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828636; POWO: https://powo.science.kew.org/taxon/875512-1

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: *Campanula kladniana* is a rare alpine species listed by the Red Book of Ukraine (Zyman et al. 2009, MEPNR of Ukraine 2021).

Campanula serrata (Kit. ex Schult.) Hendrych, Taxon 11: 123 (1962)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/QBXQ
- GBIF https://www.gbif.org/species/5411208
- IPNI urn:lsid:ipni.org:names:141081-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000828909
- POWO https://powo.science.kew.org/taxon/141081-1
- Wikispecies https://species.wikimedia.org/wiki/Campanula_serrata
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/e349678d-60b7-4d07-a437-99a950e91334
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Campanula-serrata
- JACQ https://je.jacq.org/JE00007049

Nomenclature:

≡ *Thesium serratum* Kit. ex Schult., Oesterr. Fl. ed. 2, 1: 437 (1814); GBIF: https://www.gbif.org/species/7614045; GBIF: https://www.gbif.org/species/7390879; IPNI: https://www.ipni.org/n/781116-1; POWO: https://powo.science.kew.org/taxon/781116-1

≡ *Thesium serratum* Kit. ex D.Dietr., Syn. Pl. [D. Dietrich] 1: 878 (1839); GBIF: https://www.gbif.org/species/8101990; IPNI: https://www.ipni.org/n/781115-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001290288; BHL: https://www.biodiversitylibrary.org/page/678847#page/897

= *Campanula arcuata* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 138 (1859); GBIF: https://www.gbif.org/species/5411245; IPNI: https://www.ipni.org/n/139919-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000826522; POWO: https://powo.science.kew.org/taxon/139919-1; BHL: https://www.biodiversitylibrary.org/page/11528081#page/382

= *Campanula hornungiana* Schur, Enum. Pl. Transsilv.: 442 (1866); GBIF: https://www.gbif.org/species/5411233; IPNI: https://www.ipni.org/n/140450-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827447; POWO: https://powo.science.kew.org/taxon/140450-1; BHL: https://www.biodiversitylibrary.org/page/10544493#page/464

= *Campanula kitaibeliana* Roem. & Schult., Syst. Veg., ed. 15 bis 5: 90 (1819); GBIF: https://www.gbif.org/species/5411255; IPNI: https://www.ipni.org/n/140521-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827550; POWO: https://powo.science.kew.org/taxon/140521-1; BHL: https://www.biodiversitylibrary.org/page/714802#page/149

= *Campanula lanceolata* Neilr., Aufzählung Ungarn Slavonien Gefässpflanzen: 145 (1866), non alior; BHL: https://www.biodiversitylibrary.org/item/40087#page/293

= *Campanula lanceolata* subsp. *arcuata* (Schur) Simonk., Enum. Fl. Transsilv.: 385 (1887); GBIF: https://www.gbif.org/species/5411228; IPNI: https://www.ipni.org/n/77258608-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827597; POWO: https://powo.science.kew.org/taxon/77258608-1; BHL: https://www.biodiversitylibrary.org/page/10524520#page/449

= *Campanula lanceolata* var. *hornungiana* (Schur) Simonk., Enum. Fl. Transsilv.: 385 (1887); GBIF: https://www.gbif.org/species/5411242; IPNI: https://www.ipni.org/n/77267534-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827599; POWO: https://powo.science.kew.org/taxon/77267534-1; BHL: https://www.biodiversitylibrary.org/page/10524520#page/449

= *Campanula microphylla* Kit. ex Schult., Oesterr. Fl. ed. 2: 400 (1814), non Cav. [nom. illeg.]; GBIF: https://www.gbif.org/species/5411213; GBIF: https://www.gbif.org/species/7654241; IPNI: https://www.ipni.org/n/140679-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827871; POWO: https://powo.science.kew.org/taxon/140679-1

= *Campanula napuligera* Schur, Enum. Pl. Transsilv.: 444 (1866) *; GBIF: https://www.gbif.org/species/5411231; IPNI: https://www.ipni.org/n/140729-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827943; POWO: https://powo.science.kew.org/taxon/140729-1; BHL: https://www.biodiversitylibrary.org/page/10544495#page/466

= *Campanula napuligera* f. *albiflora* Raclaru, Analele Univ. Bucureşti, Biol. Veg. 22: 125 (1973) [nom. nudum]; GBIF: https://www.gbif.org/species/5604644; IPNI: https://www.ipni.org/n/875497-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001325946

= *Campanula napuligera* var. *alpiniformis* Nyár. ex Morariu, Fl. Rep. Pop. Rom. 9: 96 (1964); GBIF: https://www.gbif.org/species/8554545; GBIF: https://www.gbif.org/species/5411220; IPNI: https://www.ipni.org/n/77267043-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827944; POWO: https://powo.science.kew. org/taxon/77267043-1

= *Campanula napuligera* f. *angustifrons* Hruby, Magyar Bot. Lapok 29: 217 (1930); GBIF: https://www.gbif.org/species/5411211; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827945; POWO: https://powo.science.kew.org/taxon/365333-4

= *Campanula napuligera* subf. angustifrons Hruby, Magyar Bot. Lapok 29: 217 (1930); POWO: https://powo.science.kew.org/taxon/365332-4

= *Campanula napuligera* f. *arcuata* (Schur) Hruby, Magyar Bot. Lapok 29: 217 (1930); GBIF: https://www.gbif.org/species/7645517; WFO: https://list.worldfloraonline.org/wfo-0000827946; POWO: https://powo.science.kew.org/taxon/365334-4

= *Campanula napuligera*. var. *arcuata* (Schur) Morariu, Fl. Rep. Pop. Rom. 9: 93 (1964); GBIF: https://www.gbif.org/species/5411239; IPNI: https://www.ipni.org/n/77267658-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827947; POWO: https://powo.science.kew.org/taxon/77267658-1

= *Campanula napuligera* subf. brachyantha Hruby, Magyar Bot. Lapok 29: 220 (1930); POWO: https://powo.science.kew.org/taxon/365336-4

= *Campanula napuligera* var. *elatior* (Săvul.) Morariu, Fl. Rep. Pop. Rom. 9: 94 (1964); GBIF: https://www.gbif.org/species/5411225; WFO: https://list.worldfloraonline.org/wfo-0000827948; POWO: https://powo.science.kew.org/taxon/365337-4

= *Campanula napuligera* f. *genuina* Hruby, Magyar Bot. Lapok 29: 220 (1930); GBIF: https://www.gbif.org/species/5411250; GBIF: https://www.gbif.org/species/12125287; POWO: https://powo. science.kew.org/taxon/365338-4; POWO: https://powo.science.kew.org/taxon/365339-4

= *Campanula napuligera* f. *glabrescens* Hruby, Magyar Bot. Lapok 29: 218 (1930); GBIF: https://www.gbif.org/species/5411229; GBIF: https://www.gbif.org/species/12159969; WFO: https://list.worldfloraonline.org/wfo-0000827950; POWO: https://powo.science.kew.org/taxon/365340-4; POWO: https://powo.science.kew.org/taxon/365341-4

= *Campanula napuligera* var. *hirsuta* Hruby, Magyar Bot. Lapok 29: 220 (1930); GBIF: https://www.gbif.org/species/5411217; IPNI: https://www.ipni.org/n/77267234-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827951; POWO: https://powo.science.kew.org/taxon/77267234-1

= *Campanula napuligera* var. *hornungiana* (Schur) Morariu, Fl. Rep. Pop. Rom. 9: 97 (1964); GBIF: https://www.gbif.org/species/5411209; IPNI: https://www.ipni.org/n/772

66939-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827952; POWO: https://powo.science.kew.org/taxon/77266939-1

= *Campanula napuligera* f. *humilis* Hruby, Magyar Bot. Lapok 29: 218 (1930); GBIF: https://www.gbif.org/species/5411252; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827953; POWO: https://powo.science.kew.org/taxon/365344-4

= *Campanula napuligera* f. *intermedia* Hruby, Magyar Bot. Lapok 29: 218 (1930); GBIF: https://www.gbif.org/species/5411243; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827954; POWO: https://powo.science.kew.org/taxon/365345-4

= *Campanula napuligera* f. *latifrons* Hruby, Magyar Bot. Lapok, 29: 216 (1930); GBIF: https://www.gbif.org/species/5411221; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827955; POWO: https://powo.science.kew.org/taxon/365347-4

= *Campanula napuligera* subf. latifrons Hruby, Magyar Bot. Lapok 29: 218 (1930); POWO: https://powo.science.kew.org/taxon/365346-4

= *Campanula napuligera* f. *longisepala* (Nyár.) Morariu, Fl. Rep. Pop. Rom. 9: 101 (1964); GBIF: https://www.gbif.org/species/8397712; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827957; POWO: https://powo.science. kew.org/taxon/365349-4

= *Campanula napuligera* var. *longisepala* Nyár., Bul. Grad. Bot. Univ. Cluj 14: 95 (1934); GBIF: https://www.gbif.org/species/5411212; IPNI: https://www.ipni.org/n/77267556-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827956; POWO: https://powo.science.kew.org/taxon/77267556-1

= *Campanula napuligera* f. *minima* (Săvul.) Morariu, Fl. Rep. Pop. Rom. 9: 97 (1964); GBIF: https://www.gbif.org/species/5411247; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827959; POWO: https://powo.science.kew.org/taxon/365350-4

= *Campanula napuligera* f. *parvula* Morariu, Fl. Rep. Pop. Rom. 9: 96 (1964); GBIF: https://www.gbif.org/species/5411240; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827960; POWO: https://powo.science.kew.org/taxon/365351-4

= *Campanula napuligera* var. *redux* (Schott, Nyman & Kotschy) Hruby, Magyar Bot. Lapok 29: 219 (1930) [nom. inval.]; GBIF: https://www.gbif.org/species/7690740; IPNI: https://www.ipni.org/n/77267368-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827962; POWO: https://powo.science.kew.org/taxon/77267368-1

= *Campanula napuligera* var. *redux* (Schott, Nyman & Kotschy) Nyman, Consp. Fl. Eur.: 479 (1879); GBIF: https://www.gbif.org/species/5411226; IPNI: https://www.ipni.org/n/77267203-1; WFO: http://www.worldfloraonline.org/taxon/wfo- 0000827961; POWO: https://powo.science.kew.org/taxon/77267203-1; BHL: https://www.biodiversitylibrary.org/page/11015623#page/490

= *Campanula napuligera* f. *robusta* Hruby, Magyar Bot. Lapok 29: 220 (1930); GBIF: https://www.gbif.org/species/5411216; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827963; POWO: https://powo.science.kew.org/taxon/365354-4

= *Campanula napuligera* f. *savulescui* Morariu, Fl. Rep. Pop. Rom. 9: 97 (1964); GBIF: https://www.gbif.org/species/5411251; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827964; POWO: https://powo.science.kew.org/taxon/365355-4

= *Campanula napuligera* var. *savulescui* Morariu, Fl. Rep. Pop. Rom. 9: 96 (1964); GBIF: https://www.gbif.org/species/7891049; IPNI: https://www.ipni.org/n/77267146-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827965; POWO: https://powo.science.kew.org/taxon/77267146-1

= *Campanula napuligera* f. *scheuzeriformis* (Nyár.) Morariu, Fl. Rep. Pop. Rom. 9: 98. (1964); GBIF: https://www.gbif.org/species/5411230; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827967; POWO: https://powo.science. kew.org/taxon/365358-4

= *Campanula napuligera* var. *scheuzeriformis* Nyár., Bul. Grad. Bot. Univ. Cluj 14: 95 (1934); GBIF: https://www.gbif.org/species/7733859; IPNI: https://www.ipni.org/n/77267493-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827966; POWO: https://powo.science.kew.org/taxon/77267493-1

= *Campanula napuligera* f. *semiamplexicaulis* (Vladescu & Săvul.) Morariu, Fl. Rep. Pop. Rom. 9: 98 (1964); GBIF: https://www.gbif.org/species/5411218; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827968; POWO: https://powo.science.kew.org/taxon/365359-4

= *Campanula napuligera* f. *setulosa* Morariu, Fl. Rep. Pop. Rom. 9: 97 (1964); GBIF: https://www.gbif.org/species/5411254; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827970; POWO: https://powo.science.kew.org/taxon/365360-4

= *Campanula napuligera* f. *simplex* Hruby, Magyar Bot. Lapok 29: 216 (1930); GBIF: https://www.gbif.org/species/5411244; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827971; POWO: https://powo.science.kew.org/taxon/365361-4

= *Campanula napuligera* f. *stenophylloides* Nyár., Bul. Grad. Bot. Univ. Cluj 14: 96 (1934); GBIF: https://www.gbif.org/species/5411232; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827972; POWO: https://powo.science. kew.org/taxon/365362-4

= *Campanula napuligera* var. *stenophylloides* (Nyár.) Morariu, Fl. Rep. Pop. Rom. 9: 98 (1964); GBIF: https://www.gbif.org/species/7996662; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827973; POWO: https://powo.science. kew.org/taxon/365363-4

= *Campanula napuligera* var. *stricta* Hruby, Magyar Bot. Lapok 29: 216 (1930); GBIF: https://www.gbif.org/species/5411222; IPNI: https://www.ipni.org/n/77267597-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827974; POWO: https://powo.science.kew.org/taxon/77267597-1

= *Campanula napuligera* subf. tenella Hruby, Magyar Bot. Lapok 29: 220 (1930); POWO: https://powo.science.kew.org/taxon/365365-4

= *Campanula napuligera* var. *transsilvanica* (Săvul.) Morariu, Fl. Rep. Pop. Rom. 9: 93 (1964); GBIF: https://www.gbif.org/species/5411241; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827975; POWO: https://powo.science. kew.org/taxon/365366-4

= *Campanula napuligera* var. *umbrosa* Hruby, Magyar Bot. Lapok 29: 218 (1930); GBIF: https://www.gbif.org/species/5411236; IPNI: https://www.ipni.org/n/77267720-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827976; POWO: https://powo.science.kew.org/taxon/77267720-1

= *Campanula polymorpha* f. *pseudolanceolata* (Pant.) Hruby, Magyar Bot. Lapok 29: 203 (1930); GBIF: https://www.gbif.org/species/5411248; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828232; POWO: https://powo.science.kew. org/taxon/365612-4

= *Campanula pseudolanceolata* Pant., Magyar Növényt. Lapok 6: 162 (1882) et Pant. ex A.Kern., Sched. Fl. Exs. Austro-Hung. [Kerner] 9: 37 (1902) *; GBIF: https://www.gbif.org/species/5411219; IPNI https://www.ipni.org/n/140889-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828274; POWO: https://powo.science.kew.org/taxon/140889-1; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.kfta0001704; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00007049; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.kfta0001705

= *Campanula pseudolanceolata* f. *albiflora* Săvul., Stud. Sp. *Campanula*: 81 (1916); GBIF: https://www.gbif.org/species/5411210; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828275; POWO: https://powo.science.kew.org/taxon/365654-4

= *Campanula pseudolanceolata* var. *arcuata* (Schur) Porcius, Analele Acad. Romane ser. 2, 14: 196 (1893); GBIF: https://www.gbif.org/species/5411256; IPNI: https://www. ipni.org/n/77268680-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828276; POWO: https://powo.science.kew.org/taxon/77268680-1

= *Campanula pseudolanceolata* f. *elatior* Săvul., Stud. Sp. *Campanula*: 78 (1916); GBIF: https://www.gbif.org/species/5411246; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828277; POWO: https://powo.science.kew.org/taxon/365656-4

= *Campanula pseudolanceolata* var. *hornungiana* (Schur) Porcius, Anal. Acad. Rom., Ser. 2 14: 202 (1893); GBIF: https://www.gbif.org/species/5411238; IPNI: https://www.ipni.org/n/77268124-1; WFO: http://www.worldfloraonline.org/taxon/wfo- 0000828278; POWO: https://powo.science.kew.org/taxon/77268124-1

= *Campanula pseudolanceolata* f. *minima* Săvul., Stud. Sp. *Campanula*: 81 (1916); GBIF: https://www.gbif.org/species/5411234; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828279; POWO: http://www.worldfloraonline.org/taxon/wfo-0000828279

= *Campanula pseudolanceolata* var. *porcii* Săvul., Stud. Sp. *Campanula*: 84 (1916); GBIF: https://www.gbif.org/species/5411224; IPNI: https://www.ipni.org/n/77268764-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828280; POWO: https://powo.science.kew.org/taxon/77268764-1

= *Campanula pseudolanceolata* subsp. *semiamplexicaulis* Vladescu & Săvul., Stud. Sp. *Campanula*: 86 (1916); GBIF: https://www.gbif.org/species/5411257; IPNI: https://www.ipni.org/n/77258837-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828282; POWO: https://powo.science.kew.org/taxon/77258837-1

= *Campanula pseudolanceolata* f. *transsilvanica* Săvul., Stud. Sp. *Campanula*: 78 (1916); GBIF: https://www.gbif.org/species/5411249; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828283; POWO: https://powo.science. kew.org/taxon/365661-4

= *Campanula pseudolanceolata* f. *umbraticola* Săvul., Stud. Sp. *Campanula*: 78 (1916); GBIF: https://www.gbif.org/species/5411237; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828284; POWO: https://powo.science.kew.org/taxon/365662-4

= *Campanula redux* Schott, Nyman & Kotschy, Analect. Bot.: 9 (1854); GBIF: https://www.gbif.org/species/5411223; IPNI: https://www.ipni.org/n/140961-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828474; POWO: https://powo.science.kew.org/taxon/140961-1; BHL: https://www.biodiversitylibrary.org/page/10488366#page/21

= *Campanula rhomboidalis* var. *angustifolia* Neilr., Aufz. Ungarn Slavon. Gefässpfl.: 145 (1866); GBIF: https://www.gbif.org/species/5411227; IPNI: https://www.ipni.org/n/77268806-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828500; POWO: https://powo.science.kew.org/taxon/77268806-1; BHL: https://www.biodiversitylibrary.org/item/40087#page/293

= *Campanula rhomboidalis* subsp. *pseudolanceolata* (Pant.) Nyman, Consp. Fl. Eur. Suppl. 2: 208 (1889); GBIF: https://www.gbif.org/species/5411215; IPNI: https://www.ipni.org/n/77258595-1; WFO: http://www.worldfloraonline.org/taxon/wfo- 0000828514; POWO: https://powo.science.kew.org/taxon/77258595-1; BHL: https://www.biodiver sitylibrary.org/page/11015350#page/217

= *Campanula rhomboidea* [unranked] β *foliis ovato-oblongis* Wahlenberg, Fl. Carpat.: 60 (1814), non L.

= *Campanula rotundifolia* var. *alpina* Schur, Enum. Pl. Transsilv.: 444 (1866) [nom. illeg.], non Tuck.; GBIF: https://www.gbif.org/species/8234052; POWO: https://powo.science.kew.org/taxon/365931-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/464

= *Campanula rotundifolia* var. *arcuata* (Schur) Nyman, Consp. Fl. Eur.: 479 (1879); GBIF: https://www.gbif.org/species/5411253; IPNI: https://www.ipni.org/n/77267922-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828565; POWO: https://powo.science.kew.org/taxon/77267922-1; BHL: https://www.biodiversitylibrary.org/page/11015623#page/490

= *Campanula rotundifolia* var. *dentata* Schur, Enum. Pl. Transsilv.: 444 (1866), non N.Coleman; GBIF: https://www.gbif.org/species/5410676; POWO: https://powo.science.kew.org/taxon/365967-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/464

= *Campanula rotundifolia* var. *grandiflora* J.A.Knapp, Pfl. Galiz.: 173 (1872) [nom. illeg.], non alior; GBIF: https://www.gbif.org/species/7764236; IPNI: https://www.ipni.org/n/77268584-1; POWO: https://powo.science.kew.org/taxon/77268584-1

– *Campanula serrata* var. *elatior* (Săvul.) Tasenkevych [nom. provis. et inval., ex herb. LWS]

– *Campanula serrata* var. *elatior* f. *latifrons* Hruby [comb. inval. ex herb. CHER] *

– *Campanula serrata* var. *hornungiana* (Schur.) Tasenkevych [nom. provis. et inval., ex herb. LWS]

– *Campanula lancifolia* Schur, Enum. Pl. Transsilv.: 445 (1866) [nom. illeg.] sensu Błocki, non Witasek

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022). GLobal – LC (Bilz 2011a).

Distribution: Pancarpathian endemic.

Notes: This morphologically variable complex basically includes three hardly distinguishable species – *C. serrata*, *C. napuligera* and *C. pseudolanceolata*. CoL (https://www.catalogueoflife.org/data/taxon/QBXQ, accessed on 07.06.2023), GBIF (https://www.gbif.org/species/5411208, accessed on 07.06.2023), POWO (https://powo.science.kew.org/taxon/141081-1, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000828909, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Campanula-serrata, accessed on 07.06.2023) also include *C. arcuata, C. hornungiana, C. kitaibeliana, C. microphylla, C. redux* and some infraspecific taxa from *C. rotundifolia* to this complex, making it one of the most saturated by synonyms. POWO (https://powo.science.kew.org/taxon/140550-1, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000828550, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Campanula-rotundifolia, accessed on 07.06.2023) consider *C. lancifolia* Schur, non Witasek as a synonym of *C. rotundifolia* L. subsp. *rotundifolia*. However, Błocki in the original label on the specimen LWS 92206, probably mistakenly, indicated *C. lancifolia* Schur as a synonym of *C. pseudolanceolata* Pant.

Campanula serrata subsp. *recta* (Dulac) Podlech (≡ *C. recta* Dulac) is a confusing name applied for Pyreneinian plants that do not belong to *C. serrata* s.str., but rather to *C. scheuchzeri* subsp. *lanceolata* (Lapeyr.) J.-M.Tison.

Campanula tatrae subsp. *tatrae* Borbás, Magyar Bot. Lapok 1: 319 (1902)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7JFNM
- GBIF https://www.gbif.org/species/7222073
- IPNI urn:lsid:ipni.org:names:141196-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000829119
- POWO https://powo.science.kew.org/taxon/77168970-1
- Wikispecies https://species.wikimedia.org/wiki/Campanula_tatrae
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/c454d5af-c66c-4d0a-b009-a0e8754e9c9c
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Campanula-tatrae
- BHL https://www.biodiversitylibrary.org/page/50326303#page/345

Nomenclature:

= *Campanula kladniana* subsp. *polymorpha* Witasek, Magyar Bot. Lapok 5: 239 (1906); GBIF: https://www.gbif.org/species/5410038; IPNI: https://www.ipni.org/n/77255487-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827554; POWO: https://powo.science.kew.org/taxon/77255487-1; BHL: https://www.biodiversitylibrary.org/page/50344447#page/645; JACQ: https://wu.jacq.org/WU0071526

= *Campanula kladniana* var. *polymorpha* (Witasek) Pawł., Acta Soc. Bot. Pol. 1: 5 (1923); GBIF: https://www.gbif.org/species/8038018; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827555; POWO: https://powo.science. kew.org/taxon/364966-4

= *Campanula kladniana* subsp. *stenophylla* (Schur) Witasek, Magyar Bot. Lapok 5: 238 (1906); GBIF: https://www.gbif.org/species/5410040; IPNI: https://www.ipni.org/n/77256020-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827556; POWO: https://powo.science.kew.org/taxon/77256020-1; BHL: https://www.biodiversitylibrary.org/page/50344446#page/644

= *Campanula polymorpha* (Witasek) Prain, Index Kew. Suppl. 4: 35 (1913), non Banks & Sol. ex A.DC. *; GBIF: https://www.gbif.org/species/5410057; IPNI: https://www.ipni.org/n/77237988-1; WFO: http://www.worldfloraonline. org/taxon/wfo-0000828219; POWO: https://powo.science.kew.org/taxon/77237988-1; BHL: https://www.biodiversity library.org/item/133932#page/47

= *Campanula polymorpha* var. *intercedens* Hruby, Magyar Bot. Lapok 29: 199 (1930), non *C. witasekiana* var. *intercedens* Hruby; GBIF: https://www.gbif.org/species/5410061; IPNI: https://www.ipni.org/n/77266950-1; WFO: http://www.worldfloraonline. org/taxon/wfo-0000828224; POWO: https://powo.science. kew.org/taxon/77266950-1

= *Campanula polymorpha* var. *intercedens* f. *angustifolia* Hruby, Magyar Bot. Lapok 29: 200 (1930); GBIF: https://www.gbif.org/species/5410043; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828220; POWO: https://powo.science.kew. org/taxon/365601-4

= *Campanula polymorpha* var. *intercedens* f. *exigua* Hruby, Magyar Bot. Lapok 29: 200 (1930); GBIF: https://www.gbif.org/species/5410058; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828222; POWO: https://powo.science. kew.org/taxon/365603-4

= *Campanula polymorpha* var. *intercedens* f. *latifolia* Hruby, Magyar Bot. Lapok 29: 199 (1930); GBIF: https://www.gbif.org/species/5410046; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828226; POWO: https://powo.science. kew.org/taxon/365607-4

= *Campanula polymorpha* var. *intercedens* f. *reflectans* Hruby, Magyar Bot. Lapok 29: 200 (1930); GBIF: https://www.gbif.org/species/5410039; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828233; POWO: https://powo.science.kew. org/taxon/365614-4

= *Campanula polymorpha* var. *intercedens* f. *umbrosa* Hruby, Magyar Bot. Lapok 29: 200 (1930); GBIF: https://www.gbif.org/species/5410036; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828236; POWO: https://powo.science. kew.org/taxon/365619-4

= *Campanula polymorpha* var. *lepida* Nyár. ex Hruby, Magyar Bot. Lapok 29: 201 (1930)

= *Campanula polymorpha* var. *pluriflora* Nyár. ex Hruby, Magyar Bot. Lapok 29: 198 (1930)

= *Campanula polymorpha* var. *praticola* Hruby, Magyar Bot. Lapok 29: 198 (1930), non *C. witasekiana* var. *praticola* Hruby; GBIF: https://www.gbif.org/species/5410053; IPNI: https://www.ipni.org/n/77268347-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828231; POWO: https://powo.science.kew.org/taxon/77268347-1

= *Campanula polymorpha* var. *praticola* f. *hirta* (Nyár.) Hruby, Magyar Bot. Lapok 29: 199 (1930)

= *Campanula polymorpha* var. *praticola* f. *pluriflora* (Nyár.) Hruby, Magyar Bot. Lapok 29: 199 (1930)

= *Campanula polymorpha* var. *stenophylla* (Schur) Hruby, Magyar Bot. Lapok 29: 205 (1930); GBIF: https://www.gbif.org/species/5410054; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828235; POWO: https://powo.science. kew.org/taxon/365616-4

= *Campanula polymorpha* var. *stenophylla* f. *brachyphylla* Hruby, Magyar Bot. Lapok 29: 206 (1930); GBIF: https://www.gbif.org/species/5410056; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828221; POWO: https://powo.science.kew.org/taxon/365602-4

= *Campanula polymorpha* var. *stenophylla* f. *genuina* Hruby, Magyar Bot. Lapok 29: 206 (1930)

= *Campanula polymorpha* var. *stenophylla* f. *gracilis* Hruby, Magyar Bot. Lapok 29: 206 (1930); GBIF: https://www.gbif.org/species/5410050; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828223; POWO: https://powo.science. kew.org/taxon/365604-4

= *Campanula polymorpha* var. *typica* Hruby, Magyar Bot. Lapok 29: 198, 201 (1930); GBIF: https://www.gbif.org/species/5410048; POWO: https://powo.science.kew.org/taxon/365617-4

= *Campanula polymorpha* var. *typica* f. *fasciculata* Nyár. ex Hruby, Magyar Bot. Lapok 29: 202 (1930)

= *Campanula polymorpha* var. *typica* f. *fasciculata* subf. deltoidea Hruby, Magyar Bot. Lapok 29: 203 (1930)

= *Campanula polymorpha* var. *typica* f. *kladnianioides* Nyárady ex Hruby, Magyar Bot. Lapok 29: 201 (1930); GBIF: https://www.gbif.org/species/8517923; GBIF: https://www.gbif.org/species/5410051; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828225; POWO: https://powo.science.kew.org/taxon/365606-4

= *Campanula polymorpha* var. *typica* f. *latifolia* Hruby, Magyar Bot. Lapok 29: 201 (1930); GBIF: https://www.gbif.org/species/5410046; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828226; POWO: https://powo.science. kew.org/taxon/365607-4

= *Campanula polymorpha* var. *typica* f. *latifolia* subf. umbrosa Hruby, Magyar Bot. Lapok 29: 202 (1930); GBIF: https://www.gbif.org/species/5410036; POWO: https:// powo.science.kew.org/taxon/365618-4

= *Campanula polymorpha* var. *typica* f. *lepida* (Nyár.) Hruby, Magyar Bot. Lapok 29: 202 (1930); GBIF: https://www.gbif.org/species/5410037; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828227; POWO: https://powo.science. kew.org/taxon/365608-4

= *Campanula polymorpha* var. *typica* f. *lepida* subf. reflectans Hruby, Magyar Bot. Lapok 29: 202 (1930); GBIF: https://www.gbif.org/species/5410039; POWO: https://powo.science.kew.org/taxon/365613-4

= *Campanula polymorpha* var. *typica* f. *saxiphila* Hruby, Magyar Bot. Lapok 29: 204 (1930)

= *Campanula polymorpha* var. *typica* f. *saxiphila* subf. reflectans Hruby, Magyar Bot. Lapok 29: 205 (1930)

= *Campanula rotundifolia* subsp. *polymorpha* (Witasek) Tacik in Jasiewicz, Monogr. Bot. 20: 254 (1965); GBIF: https://www.gbif.org/species/7685150; IPNI: https://www.ipni.org/n/77255879-1; WFO: http://www.worldfloraonline.org/taxon/wfo- 0000828685; POWO: https://powo.science.kew.org/taxon/77255879-1

= *Campanula scheuchzeri* [unranked] β *dacica* Porcius, Enum. Pl. Phan. Naszód.: 37 (1878)

= *Campanula scheuchzeri* var. *dacica* Porcius, Fl. Naseud.: 98 (1885); GBIF: https://www.gbif.org/species/5410055; IPNI: https://www.ipni.org/n/77268262-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828824; POWO: https://powo.science.kew.org/taxon/77268262-1

= *Campanula scheuchzeri* var. *stenophylla* Schur, Enum. Pl. Transsilv.: 443 (1866); GBIF: https://www.gbif.org/species/5410059; IPNI: https://www.ipni.org/n/77268259-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828864; POWO: https://powo.science.kew.org/taxon/77268259-1; BHL: https://www.biodiversitylibrary.org/page/10544494#page/465

= *Campanula stenophylla* (Schur) Prain, Index Kew. Suppl. 4: 35 (1913) [nom. inval.]; GBIF: https://www.gbif.org/species/5410042; IPNI: https://www.ipni.org/n/77238117-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000829052; POWO: https://powo.science.kew.org/taxon/77238117-1; BHL: https://www.biodiversitylibrary.org/item/133932#page/47

= *Campanula stenophylla* (Schur) Witasek, Magyar Bot. Lapok 5: 238 (1906), non Boiss. & Heldr.; GBIF: https://www.gbif.org/species/7633288; IPNI: https://www.ipni.org/n/141149-1; BHL: https://www.biodiversitylibrary.org/item/202161#page/644

– *Campanula carnica* auct. fl. transsilv., non Schiede

– *Campanula consanguinea* Simonk., Enum. Fl. Transsilv.: 385 (1886) [p. p.], non Schott; BHL: https://www.biodiversitylibrary.org/item/40105#page/449

– *Campanula kladniana* (Schur) Witasek, Abh. Zool.-Bot. Ges. Wien 1: 39 (1902) [p. p. min.non sensu Schur orig.]; GBIF: https://www.gbif.org/species/5411315; IPNI: https://www.ipni.org/n/140522-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000827551; POWO: https://powo.science.kew.org/taxon/140522-1

– *Campanula linifolia* auct. [e.g., Wahlenb.], non Jacq.

– *Campanula polymorpha* f. *sciaphila* Hruby, Magyar Bot. Lapok 29: 204 (1930) [nom. et des. inval.]; GBIF: https://www.gbif.org/species/5410041; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828234; POWO: https://powo.science.kew.org/taxon/365615-4

– *Campanula rotundifolia* L., Sp. Pl. 1: 163 (1753) [p. p. *minor*, tantum quod plantas ucrain. carpat.], non alior *; GBIF: https://www.gbif.org/species/5410907; IPNI: https://www.ipni.org/n/30036649-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000828550; POWO: https://powo.science.kew.org/taxon/30036649-2; BHL: https://www.biodiversitylibrary.org/page/358182#page/175

– *Campanula pusilla* auct. fl. ucrain. carpat., non Haenke

– *Campanula scheuchzeri* auct. [e.g., Reuss, Května Slov.: 278 (1853); Sagorski & Schneider, Fl. Centralkarp.: 369 (1891)], non Vill. *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: In general, there are three subspecies of *C. tatrae* (https://powo.science.kew.org/taxon/141196-1, accessed on 05.06.2023) – subsp. *tatrae*, subsp. *mentiens* (Witasek) Kovanda and subsp. *sudetica* (Hruby) Kovanda. The last two subspecies occur exclusively in the Western Carpathians; therefore, only *C. tatrae* subsp. *tatrae* is represented in the flora of the Ukrainian Carpathians.

However, *C. tatrae* subsp. *tatrae* has a long and complex naming history. In the Ukrainian Carpathians, it combines two main taxa that are often distinguished as independent species (i.e. *C. polymorpha* (Witasek) Prain and *C. rotundifolia* L., p.p.) by certain authors (e.g. Dremliuga and Zyman (2012), Chopyk and Fedoronchuk (2015)). However, Kovanda (1975) conducted nomenclatural explorations and stressed the taxonomic concept that Witaseks applied to Schur's *C. kladniana* in her early publication (Witasek 1902). To avoid misinterpretation of plants from the Tatrae Mts. that were often incorrectly identified as *C. kladniana* (Schur) Witasek and synonymised with *C. polymorha*, Kovanda (1975) proposed using the name *C. tatrae* that has been published earlier by Borbás (1902) and had an unambiguous sense. Many infraspecific taxa from *Campanula scheuchzeri* auct., non Vill. seem to be a part of *C. tatrae* subsp. *tatrae* too (Geslot 1971). On the other hand, in the recent checklists (e.g. POWO, WFO and Euro+Med – https://powo.science.kew.org/taxon/77168970-1, https://list.worldfloraonline.org/wfo-0000838737, https://europlusmed.org/cdm_dataportal/taxon/c454d5af-c66c-4d0a-b009-a0e8754e9c9c, all databases being accessed on 05.06.2023), *C. scheuchzeriformis* Hayek and derived *C. balcanica* var.

scheuchzeriformis (Hayek) Hruby are wrongly listed amongst synonyms of *C. tatrae* subsp. *tatrae*. *Campanula scheuchzeriformis* occurs in North Albania (Hayek 1921, Hruby 1930). Such synonymisation probably results from confusion because Hayek (1921), in the protologue of *C. scheuchzeriformis*, mentioned that it is similar to *C. scheuchzeri*. Another taxon, *C. rotundifolia* var. *alpicola* Hayek (≡ *C. rotundifolia* f. *alpicola* (Hayek) Hruby), is also mistakenly indicated as a synonym of *C. tatrae* subsp. *tatrae* in the Worldplants checklist (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Campanula-tatrae, accessed on 07.06.2023) and GBIF (https://www.gbif.org/species/7222073, accessed on 05.06.2023). Finally, Worldplants wrongly indicate the presence of *C. carnica* subsp. *carnica* Mert. & W.D.J.Koch for Ukraine. This species and subspecies do not occur in Ukraine. Such confusion of *C. rotundifolia* f. *alpicola* probably results from the mistaken synonymisation of *C. kladniana* with *C. carnica* subsp. *carnica* due to ambiguous interpretation of the taxonomic limits of *C. kladniana* (Podlech 1965, Kovanda 1975).

Phyteuma tetramerium Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 47 (1853)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4HK3D
- GBIF https://www.gbif.org/species/3166600
- IPNI urn:lsid:ipni.org:names:144500-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000816731
- POWO https://powo.science.kew.org/taxon/144500-1
- Wikispecies https://species.wikimedia.org/wiki/Phyteuma_tetramerum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/a0297a55-f260-4c09-b97f-adcf68c1f1ee
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Phyteuma-tetramerum
- BHL https://www.biodiversitylibrary.org/page/11525300#page/933

Nomenclature:

≡ *Phyteuma tetramerum* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 47 (1853) [ortho. var.]; IPNI: https://ipni.org/n/144500-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000816731; POWO: https://powo.science.kew.org/taxon/144500-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/933

= *Phyteuma spicatum* Baumg., Enum. Stirp. Transsilv. 1: 158 (1816), non L. nec Lapeyr.

= *Phyteuma spicatum* Nyman, Consp. Fl. Eur.: 484 (1879) [nom. illeg.], non L. nec Lapeyr.; GBIF: https://www.gbif.org/species/3166601; BHL: https://www.biodiversitylibrary.org/item/41446#page/495

– *Phyteuma spicatum* var. *tetramerum* (Schur) Nyman sensu auct. multipl. [nom. nudum]; IPNI: https://www.ipni.org/n/77287349-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000821849; POWO: https://powo.science. kew.org/taxon/77287349-1; BHL: https://www.biodiversitylibrary.org/page/11015628#page/495

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: This species has several nomenclatural issues. All databases (accessed on 05.06.2023), except for IPNI, as well as most of the publications (e.g. Tzvelev (1995), Tasenkevich (1998), Chorney (2011), Chopyk and Fedoronchuk (2015), Mosyakin and Fedoronchuk (2015), Kliment et al. (2016) and Kliment et al. (2016)) indicate the name *P. tetramerum* as introduced by Schur (1853). This orthographical variant is the most abundant and commonly applied by botanists. However, in the original protologue and further (Schur 1866), Schur applied a slightly different name – *P. tetramerium*. It is unclear why and when the specific epithet lost the letter 'i'. Another issue with this species is that GBIF (https://www.gbif.org/species/3166601, accessed on 05.06.2023), WFO (http://www.worldfloraonline.org/taxon/wfo-0000821849, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/77287349-1, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Phyteuma-tetramerum, accessed on 07.06.2023) provide the synonym *P. spicatum* var. *tetramerum* (Schur) Nyman. IPNI (https://www.ipni.org/n/77287349-1, accessed on 05.06.2023) even has a link to the 'protologue' of *P. spicatum* var. *tetramerum* on BHL (https://www.biodiversitylibrary.org/page/11015628#page/495, accessed on 05.06.2023). However, Nyman never made such a combination and, in the original publication, Nyman (1878) only indicated that *P. tetramerium* is a synonym for *P. spicatum*.

Phyteuma vagneri A.Kern in Vágner, Máram. Növ.: 192 (1875) et A.Kern., Sched. Fl. Exs. Austro-Hung. [Kerner] 3: 107 (1884)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4HK3J
- GBIF https://www.gbif.org/species/3166602
- IPNI urn:lsid:ipni.org:names:144507-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000816776
- POWO https://powo.science.kew.org/taxon/144507-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/9b4fe0e6-8050-4e83-9efa-3e4a9024bd53
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Phyteuma-vagneri
- JACQ https://je.jacq.org/JE00020985
- JACQ https://wu.jacq.org/WU0066442
- JACQ https://wu.jacq.org/WU0066443
- JACQ https://wu.jacq.org/WU0066444
- JACQ https://wu.jacq.org/WU0066445
- JACQ https://wu.jacq.org/WU0066446
- JACQ https://w.jacq.org/W18870004173
- JACQ https://w.jacq.org/W19260020726
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00020985
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.dao000457292
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.kw000115548

Nomenclature:

≡ *Phyteuma atropurpureum* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 3: 88 (1852) [nom. nudum], non Hoppe; GBIF: https://www.gbif.org/species/8164990; IPNI: https://ipni.org/n/77245178-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000821850; POWO: https://powo.science. kew.org/taxon/77245178-1; BHL: https://www.biodiversitylibrary.org/page/11526224#page/538

≡ *Phyteuma nigrum* var. *atropurpureum* Schur, Enum. Pl. Transsilv.: 430 (1866); GBIF: https://www.gbif.org/species/3166605; IPNI: https://ipni.org/n/77287825-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000821851; POWO: https://powo.science.kew.org/taxon/77287825-1; BHL: https://www.biodiversitylibrary.org/page/10544481#page/452

≡ *Phyteuma spiciforme* Rochel, Bot. Reise Banat: 69 (1838) [nom. nudum] et Rochel ex Domin & Podp., Klic Ulpne Kvet. Rep. Ceskoslov.: 542 (1928); GBIF: https://www.gbif.org/species/7536094; IPNI: https://ipni.org/n/144491-1; IPNI: https://ipni.org/n/77244339-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001351008; POWO: https://powo.science.kew.org/taxon/77244339-1

= *Phyteuma michelii* Sternh., Fl. Sieb.: 20 (1846), non alior

= *Phyteuma vagneri* f. *alpinum* Rich. Schulz, Monogr. *Phyteuma*: 79 (1904); GBIF: https://www.gbif.org/species/3166606; WFO: https://list.worldfloraonline.org/wfo-0000821855; POWO: https://powo.science.kew.org/taxon/359508-4

= *Phyteuma vagneri* f. *brevibracteatum* Rich. Schulz, Monogr. *Phyteuma*: 78 (1904); GBIF: https://www.gbif.org/species/3166603; WFO: https://list.worldfloraonline.org/wfo-0000821852; POWO: https://powo.science.kew.org/taxon/359505-4

= *Phyteuma vagneri* f. *grossidentatum* Rich. Schulz, Monogr. *Phyteuma*: 78 (1904); GBIF: https://www.gbif.org/species/3166604; WFO: https://list.worldfloraonline.org/wfo-0000821853; POWO: https://powo.science.kew.org/taxon/359506-4

= *Phyteuma vagneri* f. *latibracteatum* Rich. Schulz, Monogr. *Phyteuma*: 78 (1904); GBIF: https://www.gbif.org/species/3166608; WFO: https://list.worldfloraonline.org/wfo-0000821854; POWO: https://powo.science.kew.org/taxon/359507-4

= *Phyteuma vagneri* var. *pallida* Porcius, Enum. Pl. Phanerogam. Distr. Quondam Naszódiensis: 37 (1878)

– *Phyteuma betonicaefolium* Baumg., Mant.: 16 (1846) et auct. transsilv., non Vill. [nom. nudum ?]

– *Phyteuma halleri* auct. transsilv., non All.

– *Phyteuma nigrum* auct. [e.g., Baumg.], non Schmalh.

– *Phyteuma ovatum* auct. [e.g., Baumg.], non Schmalh.

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Order Boraginales

Family Boraginaceae

Pulmonaria filarszkyana Jáv., Bot. Közlem. 15: 52 (1916)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4QGPK
- GBIF https://www.gbif.org/species/9193276
- GBIF https://www.gbif.org/species/7506258
- IPNI urn:lsid:ipni.org:names:120366-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001215442
- POWO https://powo.science.kew.org/taxon/120366-1
- Wikispecies https://species.wikimedia.org/wiki/Pulmonaria_filarszkyana
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/f2a7dc7e-0988-4764-a575-9d361ab223ed
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Pulmonaria-filarszkyana
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.s12-12742

Nomenclature:

≡ *Pulmonaria rubra* subsp. *filarszkyana* (Jáv.) Domin, Preslia 13-15: 175, in adnot. (1935); GBIF: https://www.gbif.org/species/7763716; IPNI: https://ipni.org/n/77252395-1; WFO: https://list.worldfloraonline.org/wfo-0001215862; POWO: https://powo.science.kew.org/taxon/77252395-1

≡ *Pulmonaria rubra* var. *filarszkyana* (Jáv.) Guşul., Bul. Fac. St. Cern. 3: 330 (1929) *

– *Pulmonaria angustifolia* Kern., Monogr. Pulm.: 9 (1878) [p. p., quoad plantas marmaros. et rodn.], non L.

– *Pulmonaria dacica* (Simonk.) Simonk., Enum. Fl. Transsilv.: 406 (1886) [p. p.] *; GBIF: https://www.gbif.org/species/8393929; IPNI: https://ipni.org/n/120357-1; POWO: https://powo.science.kew.org/taxon/120357-1; BHL: https://www.biodiversitylibrary.org/page/10524541#page/470

– *Pulmonaria dacica* (Simonk.) Porcius [p. p., nom et des. invalid]; GBIF: https://www.gbif.org/species/5660545; IPNI: https://ipni.org/n/120358-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000397437

– *Pulmonaria rubra* var. *dacica* Simonk., Math. Termeszettud. Közlem. 15: 583 (1878) [p. p.]; GBIF: https://www.gbif.org/species/7372640; POWO: https://powo.science.kew.org/taxon/3234704-4

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Symphytum cordatum Waldst. et Kit. ex Willd., Neue Schriften Ges. Naturf. Freunde Berlin 2: 121 (1799), non M.Bieb.

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/53QF8
- GBIF https://www.gbif.org/species/7377391
- IPNI urn:lsid:ipni.org:names:120768-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000432288
- POWO https://powo.science.kew.org/taxon/120768-1
- Wikispecies https://species.wikimedia.org/wiki/Symphytum_cordatum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/cfeda693-ff16-478b-85e7-6ce6913583b1
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Symphytum-cordatum
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0188157

Nomenclature:

≡ *Symphytum cordatum* Waldst. & Kit., Descr. Icon. Pl. Hung. 1: 6, t. 7 (1799–1802), non M.Bieb.; GBIF: https://www.gbif.org/species/4067440; IPNI: https://www.ipni.org/n/120770-1; POWO: https://powo.science.kew.org/taxon/120768-1

= *Symphytum cordifolium* Baumg., Enum. Stirp. Transsilv. 1: 126 (1816) *; GBIF: https://www.gbif.org/species/4067436; IPNI: https://ipni.org/n/120771-1; WFO: http://www. worldfloraonline.org/taxon/wfo-0000432289; POWO: https://powo.science.kew.org/taxon/120771-1

= *Symphytum pannonicum* Pers., Syn. Pl. [Persoon] 1: 161 (1805) *; GBIF: https://www.gbif.org/species/4067084; IPNI: https://ipni.org/n/120821-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000432232; POWO: https://powo.science.kew.org/taxon/120821-1; BHL: https://www.biodiversitylibrary.org/page/234946#page/173

– *Symphytum cordatum* M.Bieb., Fl. Taur.-Caucas. 1: 130 (1808) [p. p., nom. inval.]; GBIF: https://www.gbif.org/species/7937522; IPNI: https://ipni.org/n/120769-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001350379; POWO: https://powo.science.kew.org/taxon/120769-1; BHL: https://www.biodiversitylibrary.org/page/11268210#page/138

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: This species is closely and primarily associated with the Carpathian Mts. (Novikoff and Hurdu 2015); however, it also rarely occurs in the Ukrainian lowland areas in Volhyn (Chopyk 1976) and Podillia (Kobiv 2007, Chorney 2011) going far from the mountain range. As a result, Malynovskiy et al. (2002) considered it Carpathian-Volhynia-Podolian species and Chorney (2011) treated it as a non-endemic taxon with a Central European distribution range. Nevertheless, numerous authors (e.g. Pawłowski (1961), Tasenkevich (2003), Kobiv (2007), Piękoś-Mirkowa and Mirek (2011), Hurdu et al. (2012), Negrean et al. (2015), Novikoff and Hurdu (2015), Mráz et al. (2016) and Kliment et al. (2016)) treated *S. cordatum* as a Carpathian endemic or

subendemic species. Considering the extension of *S. cordatum*'s distribution range to the lowlands, it cannot be considered endemic and, therefore, it is listed here as a subendemic. However, further phylogeographical studies of this species are of great interest and would clarify its disjunctive distribution pattern.

Order Brassicales

Family Brassicaceae

Arabidopsis neglecta (Schult.) O'Kane et Al-Shehbaz, Novon 7(3): 326 (1997)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/G266
- GBIF https://www.gbif.org/species/3052529
- IPNI urn:lsid:ipni.org:names:997561-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000541803
- POWO https://powo.science.kew.org/taxon/997561-1
- Wikispecies https://species.wikimedia.org/wiki/Arabidopsis_neglecta
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/9d2eec80-d9a2-459d-a2fc-ec92315eca7d
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Arabidopsis-neglecta
- BHL https://www.biodiversitylibrary.org/page/640143#page/326

Nomenclature:

≡ *Arabis neglecta* Schult., Oesterr. Fl., ed. 2: 248 (1814) *; GBIF: https://www.gbif.org/species/5377122; IPNI: https://ipni.org/n/278429-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000542551; POWO: https://powo.science. kew.org/taxon/278429-1

≡ *Cardaminopsis neglecta* (Schult.) Hayek, Fl. Steiermark 1: 480 (1908) *; GBIF: https://www.gbif.org/species/3052532; IPNI: https://ipni.org/n/280774-1; WFO: http://www. worldfloraonline.org/taxon/wfo-0000587713; POWO: https://powo.science. kew.org/taxon/280774-1; BHL: https://www.biodiversitylibrary.org/page/10560532 #page/516

≡ *Erysimum neglectum* (Schult.) Kuntze, Revis. Gen. Pl. 2: 933 (1891); GBIF: https://www.gbif.org/species/3692864; IPNI: https://ipni.org/n/284014-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000678999; POWO: https://powo.science. kew.org/taxon/284014-1; BHL: https://www.biodiversitylibrary.org/page/4355#page/559

= *Arabis transsilvanica* Schur, Enum. Pl. Transsilv.: 43 (1866); GBIF: https://www.gbif.org/species/5377124; IPNI: https://ipni.org/n/278696-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000542956; POWO: https://powo.science. kew.org/taxon/278696-1; BHL: https://www.biodiversitylibrary.org/page/10544094 #page/65

= *Arabis floribunda* Schur, Enum. Pl. Transsilv.: 44 (1866); GBIF: https://www.gbif.org/species/5377121; IPNI: https://ipni.org/n/278219-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000542213; POWO: https://powo.science. kew.org/taxon/278219-1; BHL: https://www.biodiversitylibrary.org/page/10544095#page/66

= *Arabis glareosa* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 1: 106 (1850) et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 59 (1853); GBIF: https://www.gbif.org/species/5377123; IPNI: https://ipni.org/n/278235-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000542238; POWO: https://powo.science.kew.org/taxon/278235-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/116; BHL: https://www.biodiversitylibrary.org/page/11525300#page/711; JACQ: https://gzu.jacq.org/GZU000054862; JACQ: https://gzu.jacq.org/GZU 000276989; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.speci men.gzu000054862; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.gzu000276989

= *Cardaminopsis neglecta* subsp. *glareosa* (Schur) Soó, Acta Bot. Acad. Sci. Hung. 16 (3–4): 371 (1971); GBIF: https://www.gbif.org/species/3689071; IPNI: https://ipni.org/n/879116-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000587714; POWO: https://powo.science.kew.org/taxon/879116-1

– *Cardamine enneaphyllos* Turcz. [nom. inval., ex herb. KW], non (L.) Crantz ex Crantz

– *Dentaria enneaphyllos* auct. flora ucrain. carpat., non L. [ex herb. LWS] *

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: The distribution of *A. neglecta* in the Ukrainian Carpathians remains unclear due to frequent confusion with *A. arenosa* (L.) Lawalrée, which is widely spread both in mountains and lowlands (Pachschwöll and Pachschwöll 2019). Schmickl et al. (2012) recognised two cytotypes of *A. neglecta* – subsp. *neglecta* (diploid from the alpine habitats) and subsp. *robusta* Schmickl et al. [nom. illeg.] (tetraploid occurring in different vegetation belts, including montane and submontane). Contrary to Schmickl et al. (2012), Knotek et al. (2020) reported that tetraploids are more successful in colonising alpine habitats, but, in general, both cytotypes can be present at different elevations. For Ukraine, Kolář et al. (2016) used only three diploid samples of *A. arenosa subsp. arenosa* sampled in lowermost altitudes near road and railway banks in the Lviv region (Ciscarpathia and Beskyds). Similarly, Knotek et al. (2020) used only two tetraploid alpine samples from the only mesoregion of the Ukrainian Carpathians, Svydovets Mts. Therefore, the ploidy level and diversity of *Arenosa* group in the Ukrainian Carpathians remain unclear, but it seems that *A. neglecta* is associated here with subalpine and alpine habitats only (Chopyk and Fedoronchuk 2015).

Cardamine glanduligera O.Schwarz, Repert. Spec. Nov. Regni Veg. 46: 188 (1939)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5WZN4
- GBIF https://www.gbif.org/species/3045875
- IPNI urn:lsid:ipni.org:names:280334-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000586858
- POWO https://powo.science.kew.org/taxon/280334-1
- Wikispecies https://species.wikimedia.org/wiki/Cardamine_glanduligera
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/66346298-7ce1-4e25-b8f9-5488fd71f965
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Cardamine-glanduligera

Nomenclature:

≡ *Dentaria glandulosa* Waldst. & Kit., Descr. Icon. Pl. Hung. 3: 302, t. 272 (1801); GBIF: https://www.gbif.org/species/5374792; IPNI: https://ipni.org/n/281965-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000641631; POWO: https://powo.science.kew.org/taxon/281965-1; JACQ: https://www.jacq.org/detail.php?ID=557296; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.speci men.bm000750037; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lecb0001853

≡ *Cardamine glandulosa* (Waldst. & Kit.) Schmalh., Fl. Sredn. Yuzhn. Rossii 1: 50 (1895) [nom. illeg.], non Blanco; GBIF: https://www.gbif.org/species/3045876; IPNI: https://ipni.org/n/280336-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000586860; POWO: https://powo.science.kew.org/taxon/280336-1

≡ *Crucifera novemfolia* E.H.L.Krause, Deutschl. Fl. (Sturm), ed. 2 6: 118 (1902); GBIF: https://www.gbif.org/species/5551108; IPNI: https://ipni.org/n/281820-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000626932; POWO: https://powo.science.kew.org/taxon/281820-1; BHL: https://www.biodiversitylibrary.org/page/55369098# page/120

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Erysimum witmanni subsp. *transsilvanicum* (Schur) P.W.Ball, Feddes Repert. 69: 151 (1964)

- GBIF https://www.gbif.org/species/8043371
- WFO http://www.worldfloraonline.org/taxon/wfo-0001217687
- POWO https://powo.science.kew.org/taxon/3007567-4
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/24dbb669-b2b9-4190-af4b-74f414833444
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Erysimum-witmannii

Nomenclature:

≡ *Erysimum transsilvanicum* Schur, Enum. Pl. Transsilv.: 57 (1866) *; CoL: https://www.catalogueoflife.org/data/taxon/3BBTL; GBIF: https://www.gbif.org/species/3048278; IPNI: https://ipni.org/n/284236-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000679281; POWO: https://powo.science.kew.org/taxon/284236-1; BHL: https://www.biodiversitylibrary.org/page/10544108#page/79; JACQ: https://www.jacq.org/detail.php?ID=365438; JACQ: https://www.jacq.org/detail.php?ID=365584; JACQ: https://www.jacq.org/detail.php?ID=365589; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00206088; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00206058; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00206087

= *Erysimum baumgartenianum* Jáv., Magyar Bot. Lapok 11: 30 (1912), non Schur

= *Erysimum czetzianum* Schur, Enum. Pl. Transsilv.: 57 (1866); GBIF: https://www.gbif.org/species/3048279; IPNI: https://ipni.org/n/283752-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000678651; POWO: https://powo.science.kew.org/taxon/283752-1; BHL: https://www.biodiversitylibrary.org/page/10544108#page/79

= *Erysimum czetzianum* Schur ex Jáv., Magyar Bot. Lapok 11: 29 (1912); BHL: https://www.biodiversitylibrary.org/item/201840#page/553

= *Erysimum pannonicum* f. *viridis* Simonk., Termesz. Fuzet. 5: 55 (1881); BHL: https://www.biodiversitylibrary.org/item/96887#page/63

= *Erysimum pumilum* var. *transilvanica* Schur, Verh. Mitth. Siebenburg. Vereins Naturwiss. Hermannstadt 10: 143 (1859); BHL: https://www.biodiversitylibrary.org/item/42663#page/387

= *Erysimum transsilvanicum* f. *czetzianum* (Schur) Nyár., Fl. Rep. Pop. Roman. 3: 177 (1955)

= *Erysimum transsilvanicum* f. *luxurians* Nyár., Fl. Rep. Pop. Roman. 3: 177, 640 (1955)

= *Erysimum transsilvanicum* f. *rarifolium* Nyár., Fl. Rep. Pop. Roman. 3: 177, 640 (1955)

= *Erysimum witmannii* subsp. *czetzianum* (Schur) Zapał. [ex herb. Mądalski, nom. inval. ?]

= *Erysimum witmannii* var. *czetzianum* (Schur) Borza, Bul. Grăd. Bot. Cluj 26: (1946)

= *Erysimum witmannii* var. *czetziano* Nyár., Fl. Rep. Pop. Roman. 3: 174 (1955)

– *Erysimum cheiranthus* Herbich, Fl. Bucovina: 354 (1859), non alior

– *Erysimum odoratum* Baumg., Enum. Stirp. Transsilv. 2: 262 (1816) [p. p.], non Ehr.; GBIF: https://www.gbif.org/species/7699439; IPNI: https://ipni.org/n/284036-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000679040; POWO: https://powo.science.kew.org/taxon/284036-1

– *Erysimum pannonicum* auct. carpat., non Crantz

– *Erysimum wahlenbergii* Simonk., Enum. Fl. Transsilv.: 85 (1886), non Asch. & Engl.; GBIF: https://www.gbif.org/species/7583006; IPNI: https://ipni.org/n/284262-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001034410; BHL: https://www.biodiversitylibrary.org/page/10524220#page/149

– *Erysimum witmannii* auct. flora ucrain. carpat. et Grec., Consp. Fl. Rom.: 61 (1891) [p. p.], non Zaw. *

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Kliment et al. (2016) recognise three subspecies within *E. witmanni* – subsp. *witmanni* (Pancarpathian endemic), subsp. *pallidiflorum* (Szepligeti ex Jav.) Soó (Western Carpathian endemic) and subsp. *transsilvanicum* (south-eastern Carpathian endemic). In the Ukrainian Carpathians, only *E. witmanni* subsp. *transsilvanicum* is very narrowly present in the Chorniy Dil mountain range (Chopyk and Fedoronchuk 2015). During my explorations, I have found in KW herbarium a few specimens collected by Ilyinska from lowlands (Brody and Zolochiv Districts of Lviv region and Tlumach District of Ivano-Frankivsk region) that were mistakenly identified as *E. witmanni*.

Noccaea dacica subsp. *dacica* (Heuff.) F.K.Mey, Feddes Repert. 84(5-6): 464 (1973)

- GBIF https://www.gbif.org/species/7225610
- IPNI urn:lsid:ipni.org:names:287746-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001217939
- POWO https://powo.science.kew.org/taxon/77224759-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/279426f5-029b-419c-9000-f56c8dad0bff
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Noccaea-dacica

Nomenclature:

≡ *Noccaea dacica* (Heuff.) F.K.Mey., Feddes Repert. 84(5-6): 464 (1973); CoL: https://www.catalogueoflife.org/data/taxon/47KQH; GBIF: https://www.gbif.org/species/8622945; IPNI: https://www.ipni.org/n/287746-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001217939; POWO: https://powo.science.kew.org/taxon/287746-1

≡ *Thlaspi dacicum* Heuff., Oesterr. Bot. Z. 8: 26 (1858) et Verh. K.K. Zool.-Bot. Ges. Wien 8 (Abh.): 61 (1858) *; GBIF: https://www.gbif.org/species/3045405; IPNI: https://www.ipni.org/n/290543-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000407340; POWO: https://powo.science.kew.org/taxon/290543-1; BHL: https://www.biodiversitylibrary.org/page/12053912#page/257

= *Thlaspi dacicum* [unranked] β *rodnense* Porcius, Enum. Pl. Phanerogam. Distr. Quondam Naszódiensis: 7 (1878)

= *Thlaspi dacicum* [unranked] β *transsilvanicum* Porcius, Fl. Năsăud: 169 (1881)

= *Thlaspi commutatum* Rochel, Bot. Reise Banat: 83 (1838), non Reiche; GBIF: https://www.gbif.org/species/3045398; IPNI: https://www.ipni.org/n/290525-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001037431; POWO: https://powo.science.kew.org/taxon/290525-1

= *Thlaspi corongianum* Czetz ex Nyman, Consp. Fl. Eur. 1: 63 (1878) [ortho. var.]; GBIF: https://www.gbif.org/species/8492602; GBIF: https://www.gbif.org/species/3692457; IPNI: https://www.ipni.org/n/290531-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000407352; POWO: https://powo.science.kew.org/taxon/290531-1; BHL: https://www.biodiversitylibrary.org/page/11015205#page/72

= *Thlaspi korongianum* Czetz ex Nyman, Syll. Suppl.: 37 (1865); GBIF: https://www.gbif.org/species/8601316; GBIF: https://www.gbif.org/species/3045399; IPNI: https://www.ipni.org/n/290605-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000407324; POWO: https://powo.science.kew.org/taxon/290605-1; JACQ: https://wu.jacq.org/WU0034620

= *Thlaspi trojagense* Zapał., Rozprawy Wydziału Mat.-Przyrod. Akad. Um., Dział B. Nauki Biol. 13: 316, 317 (1913); GBIF: https://www.gbif.org/species/3045402; IPNI: https://www.ipni.org/n/290749-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001037439; POWO: https://powo.science.kew.org/taxon/290749-1

= *Thlaspi trojagense* f. *abbreviatum* Zapał., Rozprawy Wydziału Mat.-Przyrod. Akad. Um., Dział B. Nauki Biol. 13: 317 (1913)

– *Thlaspi alpestre* auct. [e.g., Schur, Fuss., Baumg.], non L.

– *Thlaspi rotundifolium* auct. fl. transsilv., non Gaud

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Following POWO (https://powo.science.kew.org/taxon/287746-1, accessed on 05.06.2023), there are two subspecies of *N. dacica* – subsp. *dacica* (occurs in Romania and Ukraine) and subsp. *montenegrina* F.K.Mey. (the distribution is limited to Montenegro – Meyer (1973)). The close species, *N. banatica* (R.Uechtr.) F.K.Mey. (≡ *Thlaspi dacicum* subsp. *banaticum* (R.Uechtr.) Nyár.), is sometimes included in *N. dacica* subsp. *dacica* (e.g. in the Worldplants database – https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Noccaea-dacica, accessed on 07.06.2023). However, Al-Shehbaz (2014) distinguished *N. banatica* as an independent species, while Kliment et al. (2016) outlined it as a South Carpathian endemic taxon. Therefore, only *N. dacica* subsp. *dacica* occurs in the Ukrainian Carpathians.

Order Caryophyllales

Family Caryophyllaceae

Dianthus spiculifolius Schur, Enum. Pl. Transsilv.: 98 (1866), non Borbás

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/35B4J
- GBIF https://www.gbif.org/species/3808113
- IPNI urn:lsid:ipni.org:names:153899-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000644280
- POWO https://powo.science.kew.org/taxon/153899-1
- Wikispecies https://species.wikimedia.org/wiki/Dianthus_spiculifolius
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/1b8d3f50-2765-46fd-a107-6f489b247cad
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Dianthus-spiculifolius
- BHL https://www.biodiversitylibrary.org/page/10544149#page/120

Nomenclature:

≡ *Dianthus kitaibelii* subsp. *spiculifolius* (Schur) Novák, Sborník Klubu Přírodověd. v Praze. Sv. 4. 1914–1920, Č. 4: 23(1) (1922) et Věst. Král. české spol. nauk. Tř. mat.-přírod. 1923(11): 30 (1924)

≡ *Dianthus petraeus* subsp. *spiculifolius* (Schur) Ciocârlan, Illustr. Fl. Rom.: 217-223 (2000); GBIF: https://www.gbif.org/species/7886591

≡ *Dianthus plumarius* subsp. *spiculifolius* (Schur) Baksay, Symposia Biol. Hung. 12: 153 (1972)

= *Dianthus acicularis* Schur, Enum. Pl. Transsilv.: 98 (1866), non Fisch. ex Ledeb.; GBIF: https://www.gbif.org/species/3815472; IPNI: https://www.ipni.org/n/153009-1; BHL: https://www.biodiversitylibrary.org/page/10544149#page/120

= *Dianthus brachyanthus* Schur, Enum. Pl. Transsilv.: 96 (1866), non Boiss.; GBIF: https://www.gbif.org/species/7371609; IPNI: https://www.ipni.org/n/153147-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000643176; POWO: https://powo.science.kew.org/taxon/153147-1; BHL: https://www.biodiversitylibrary.org/page/10544147#page/118; JACQ: https://www.jacq.org/detail.php?ID=366863; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203891

= *Dianthus carpathicus* Borbás, Termesz. Fuzet. 12: 44 (1889), non Woł. [nom. inval.]; GBIF: https://www.gbif.org/species/3813900; IPNI: https://www.ipni.org/n/153199-1; BHL: https://www.biodiversitylibrary.org/page/31106623#page/620

= *Dianthus hungaricus* (Andrae) Simonk., Enum. Fl. Transsilv.: 121 (1886), non alior; BHL: https://www.biodiversitylibrary.org/item/40105#page/185

= *Dianthus microche[i]lus* B.S.Williams, Pinks Centr. Eur.: 37 (1890) et B.S.Williams ex Wettst., Oesterr. Bot. Z. 41: 176 (1891); GBIF: https://www.gbif.org/species/3810687;

IPNI: https://www.ipni.org/n/153597-1; WFO: https://list.worldfloraonline. org/wfo-0000643859; POWO: https://powo.science.kew.org/taxon/153597-1; BHL: https://www.biodiversitylibrary.org/page/28710681#page/182

= *Dianthus petraeus* Janka, Bot. Közlem. 12: 187 (1913), non Waldst. & Kit. nec M.Bieb.

= *Dianthus petraeus* Kerner, Oesterr. Bot. Z. 18: 18, 126 (1868) [nom. nudum], non Waldst. & Kit. nec M.Bieb.; BHL: https://www.biodiversitylibrary.org/item/91216#page/26

= *Dianthus plumarius* Baumg., Enum. Stirp. Transsilv. 1: 390 (1816) et auct. transsilv., non L. nec Gunnerus

= *Dianthus plumarius* var. *erythrocalyx* Schott ex Simonk., Enum. Fl. Transsilv.: 121 (1886); BHL: https://www.biodiversitylibrary.org/item/40105#page/185

= *Dianthus plumarius* var. *hungaricus* Andrae, Bot. Zeitung 11: 436 (1853), non alior; BHL: https://www.biodiversitylibrary.org/item/105829#page/230

= *Dianthus serotinus* Barth, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 19: 144 (1868) [nom. nudum], non Waldst. & Kit.; BHL: https://www.biodiversitylibrary.org/item/110590#page/442

= *Dianthus serotinus* Salzer, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 15: 50 (1864) [nom. nudum], non Waldst. & Kit.; BHL: https://www.biodiversitylibrary.org/item/105000#page/546

= *Dianthus spiculifolius* f. *petraeiformis* Novák, Sborník Klubu Přírodověd. v Praze. Sv. 4. 1914–1920, Č. 4: 25(3) (1922)

Conservation status: In Ukraine – DD (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: This species is probably absent in the recent flora of the Ukrainian Carpathians since no new finding confirms its presence. It was mentioned for Chyvchyny Mts. (south Bukovina), based on old herbarium specimens by Fedoronchuk and Chorney (2005). However, it is not listed for the flora of the Ukrainian Carpathians by Chopyk and Fedoronchuk (2015). While working in the Ukrainian herbaria, I could not locate any specimen of *D. spiculifolius* Probably such specimens could be refined in the Schur's collection hosted at LW, but, unfortunately, this collection has remained permanently unavailable for the last few years.

Borbás (1889), on page 44, indicated that *D. carpathicus* Borbás (*D. callizonus* × *D. tenuifolius*) is a synonym of *D. brachyanthus* Schur, non Boiss. and indicated it in the protologue "in rupibus calcareis alp. Kyrálikő (i.e. Piatra Craiului Mts. in Hungarian), circa 2000 mt. s.m. Aug. 1858 (Schur !)". Schur (1866), on page 96, as the protologue to *D. brachyanthus* wrote "Auf Kalkfelsen des Königstein (i.e. Piatra Craiului Mts. in German) bei Kronstadt (i.e. Brașov). 6000–7000'. Aug." Williams (1890), on page 37

and Williams (1893), on page 415, synonymised *D. brachyanthus* with *D. microchelus* Williams, and also cited it for Kronstadt in Transylvania.

It is unclear why CoL (https://www.catalogueoflife.org/data/taxon/6CQ3R, accessed on 07.06.2023), GBIF (https://www.gbif.org/species/7267406, accessed on 07.06.2023), WFO (http://www.worldfloraonline.org/taxon/wfo-0000643860, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:153598-1, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Dianthus-microlepis, accessed on 05.06.2023), as well as *Fassou et al. (2022)*, provide *D. brachyanthus* Schur amongst synonyms for *D. microlepis* Boiss., because Boissier (1843), on page 22, described *D. microlepis* out of the Carpathian region, i.e. from Rumelia, Balkans. The current known distribution of *D. microlepis* is limited to Bulgaria, Greece, Montenegro, Bosnia and Herzegovina, North Macedonia, Serbia, Slovenia, Croatia and Kosovo (Marhold 2022). Perhaps, the synonymisation of the Carpathian *D. brachyanthus* Schur with Balcanian *D. microlepis* is a result of a confusion of *D. brachyanthus* in the sense of Schur (1866) [= *D. microchelus* Williams] with *D. brachyanthus* in the sense of earlier Boissier's publication (Boissier 1837: p. 85). Therefore, *D. brachyanthus* Schur, non Boiss. should be considered a synonym of *D. microchelus* Williams and *D. carpathicus* Borbás, non Woł. and, consequently, a synonym of *D. spiculifolius* Schur.

Interestingly, in all mentioned databases, including IPNI (https://www.ipni.org/n/153597-1, accessed on 05.06.2023), *D. microchelus* is misspelled as *D. microche[i]lus* and the incorrect place of publication of this name is indicated. It is wrongly stated that Williams published this species in 1891 in Oesterreichische Botanische Zeitschrift. Instead, Williams published it a year before, in 1890, in his monography “The pinks of Central Europe” (Williams 1890: p. 37), while later, in Oesterreichische Botanische Zeitschrift, the editor of this journal, Richard R. von Wettstein, published a brief review on Williams' book with the indication of newly-proposed taxa (Wettstein 1891: p. 176). Thus, Williams never personally published this name in Oesterreichische Botanische Zeitschrift.

Sabulina oxypetala (Woł.) Mosyakin & Fedor., Phytotaxa 231(1): 96 (2015)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/78YD9
- GBIF https://www.gbif.org/species/8565536
- IPNI urn:lsid:ipni.org:names:77150589-1
- POWO https://powo.science.kew.org/taxon/77150589-1
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Sabulina-oxypetala

Nomenclature:

≡ *Alsine oxypetala* Woł., Spraw. Komis. Fizjograf. 22(2): 214 (1888); GBIF: https://www.gbif.org/species/7758064; IPNI: https://www.ipni.org/n/150666-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001291954; POWO: https://powo.science.

kew.org/taxon/2630520-4; JACQ: https://www.jacq.org/detail.php?ID=392011; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00059883

≡ *Alsine verna* [unranked] *oxypetala* Zapał. [nom. inval. ?]

≡ *Alsine zarencznyi* var. *oxypetala* Woł., Sprawozd. Kom. Fizjograf. 21(2): 111–139 (1887) [?]

≡ *Minuartia oxypetala* (Woł.) Kulczyński, Fl. Polska 2: 231 (1921) *; GBIF: https://www.gbif.org/species/7504529; WFO: http://www.worldfloraonline.org/taxon/wfo-0001292114; POWO: https://powo.science.kew.org/taxon/3007630-4

≡ *Minuartia verna* subsp. *oxypetala* (Woł.) G.Halliday, Feddes Repert. 69: 13 (1964); GBIF: https://www.gbif.org/species/8333640; WFO: http://www.worldfloraonline.org/taxon/wfo-0001292121; WFO: http://www.worldfloraonline.org/taxon/wfo-0000734418; POWO: https://powo.science.kew.org/taxon/2869879-4

≡ *Minuartia verna* var. *oxypetala* (Woł.) Prodan, Fl. Rep. Pop. Rom. 2: 86 (1953)

≡ *Minuartia verna* [unranked] B *attica* [unranked] *oxypetala* Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 745 (1918)

≡ *Sabulina verna* subsp. *oxypetala* (Woł.) Dillenb. & Kadereit, Taxon 63(1): 88 (2014); GBIF: https://www.gbif.org/species/7684653; IPNI: https://www.ipni.org/n/77137604-1; POWO: https://powo.science.kew.org/taxon/77137604-1

= *Alsine zarencznyi* var. *neglecta* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Alsine zarencznyi* var. *neglecta* f. *ramificans* Zapał., Consp. Fl. Galic. Crit. 3: 27 (1911)

= *Alsine zarencznyi* var. *neglecta* f. *subcaespitosa* Zapał., Consp. Fl. Galic. Crit. 3: 27 (1911)

= *Alsine zarencznyi* var. *neglecta* f. *subcolorata* Zapał., Consp. Fl. Galic. Crit. 3: 27 (1911)

= *Alsine zarencznyi* [unranked] c *oxypetala f. acutissima* Zapał., Consp. Fl. Galic. Crit. 3: 27 (1911)

= *Alsine zarencznyi* [unranked] c *oxypetala f. micropetala* Zapał., Consp. Fl. Galic. Crit. 3: 28 (1911)

= *Minuartia verna* var. *oxypetala* f. *micropetala* (Zapał.) Prodan, Fl. Rep. Pop. Rom. 2: 86 (1953)

– *Minuartia zarencznii* auct. [i.e., Chopyk 1976], non (Zapał.) Klokov

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: A rare stenoendemic, which occurs in the Ukrainian Carpathians only in the Chyvchyny Mts. (Fedoronchuk and Chorney 2009, Chorney 2011).

Sabulina pauciflora (Kit.) A.Novikov, *comb. nov.*

- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Minuartia-pauciflora

Nomenclature:

≡ *Alsine pauciflora* Kit. ex Nyman, Consp. Fl. Eur. 1: 119 (1878); GBIF: https://www.gbif.org/species/8455786; GBIF: https://www.gbif.org/species/3807842; IPNI: https://www.ipni.org/n/150674-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000527884; POWO: https://powo.science.kew.org/taxon/150674-1; BHL: https://www.biodiversitylibrary.org/page/11015261#page/128

≡ *Arenaria pauciflora* Kit., Linnaea 32(4–5): 510 (1864), non Prodan; GBIF: https://www.gbif.org/species/7644104; IPNI: https://www.ipni.org/n/151539-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000546400; POWO: https://powo.science.kew.org/taxon/151539-1; BHL: https://www.biodiversitylibrary.org/page/118601#page/513

≡ *Minuartia pauciflora* (Kit.) Dvořaková, Preslia 75(4): 350 (2003) *; CoL: https://www.catalogueoflife.org/data/taxon/43KDB; GBIF: https://www.gbif.org/species/3811893; IPNI: https://www.ipni.org/n/60435605-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0000378331; POWO: https://powo.science. kew.org/taxon/60435605-2

= *Alsine verna* [unranked] δ *carpatica* Porcius, Enum. Pl. Phanerogam. Distr. Quondam Naszódiensis: 11 (1878) et Anal. Acad. Rom.: 54 (1893)

= *Alsine verna* [unranked] a. zarencnyi (Zapał.) Hermann, Fl. Deutschl. Fennoskand.: 185 (1912)

= *Alsine zarencznyi* Zapał., Bull. Int. Acad. Sci. Cracovie, Cl. Sci. Math. 1910(3B): 168 (1910) et Consp. Fl. Galic. Crit. 3: 25 (1911) [excl. var. c]; GBIF: https://www.gbif.org/species/3817114; IPNI: https://www.ipni.org/n/150829-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001291956; POWO: https://powo.science. kew.org/taxon/150828-1

= *Alsine zarencznyi* var. *divestita* Zapał., Consp. Fl. Galic. Crit. 3: 27 (1911); GBIF: https://www.gbif.org/species/8108754; GBIF: https://www.gbif.org/species/11110050; POWO: https://powo.science.kew.org/taxon/3298158-4

= *Alsine zarencznyi* var. *pseudogerardiana* Zapał., Consp. Fl. Galic. Crit. 3: 28 (1911)

= *Alsine zarencznyi* var. *zarencznyi* f. *bryophila* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Alsine zarencznyi* var. *zarencznyi* f. *minima* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Alsine zarencznyi* var. *zarencznyi* f. *paucicaulis* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Alsine zarencznyi* var. *zarencznyi* f. *subpurpuea* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Alsine zarencznyi* var. *zarencznyi* f. *supraglandulosa* Zapał., Consp. Fl. Galic. Crit. 3: 26 (1911)

= *Minuartia verna* subsp. *gerardii* [unranked] b. *carpatica* (Porcius) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 749 (1918) *

= *Minuartia zarecznyi* (Zapał.) Klokov, Fl. UkrSSR 4: 480 (1952) *; GBIF: https://www.gbif.org/species/7267413; IPNI: https://www.ipni.org/n/155697-1; WFO: http://www .worldfloraonline.org/taxon/wfo-0001292126; POWO: https://powo.science.kew.org/taxon/155697-1

= *Minuartia zarencznii* (Zapał.) Klokov, Fl. UkrSSR 4: 480 (1952) [ortho. var.]; GBIF: https://www.gbif.org/species/7267413; IPNI: https://www.ipni.org/n/155697-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001292126; POWO: https://powo.science.kew.org/taxon/155697-1

= *Minuartia zarecznyi* var. *divestita* (Zapał.) Tzvelev, Bot. Zhurn. 87(3): 125 (2002); GBIF: https://www.gbif.org/species/3810712; IPNI: https://www.ipni.org/n/20006371-1; POWO: https://powo.science.kew.org/taxon/20006371-1

– *Alsine gerardii* auct. flora carpat., non Willd.

– *Arenaria gerardii* auct. fl. carpat., non Willd.

– *Alsine verna* auct. fl. carpat., non (L.) Wahlenb. nec Bartl

– *Alsine verna* Knapp, Pfl. Galic. u. Bukov.: 331 (1872) [p. p.], non Wahlenb. s. str. *

– *Minuartia gerardii* auct. fl. carpat., non (Willd.) Hayek *

– *Minuartia verna* auct. flora carpat., non (L.) Hiern *

– *Minuartia verna* Kulczyński, Fl. Polska 2: 230 (1921), non (L.) Hiern.

– *Minuartia verna* [unranked] α *caespitosa* (Ehrn.) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 742 (1918) sensu Tovt [ex herb. UU] *

– *Minuartia verna* subsp. *gerardii* (Willd.) Graebn. in Asch. & Graebn., Syn. Mitteleur. Fl. 5(1): 747 (1918) [p. p., tantum quod plantas carpat.], non *Sabulina verna* subsp. *gerardii* (Willd.) Dillenb. s. str. *

– *Minuartia verna* var. *gerardi* Kulczyński, Fl. Polska 2: 230 (1921), non Schinz. & Keller

– *Sabulina gerardii* auct. fl. carpat., non (Willd.) Rchb.

– *Sabulina verna* subsp. *gerardii* auct. fl. carpat., non (Willd.) Dillenb.

– *Tryphane gerardi* auct. fl. carpat., non (Willd.) Rchb.

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: A rare species mentioned (as *M. pauciflora*) only for three regions of the Ukrainian Carpathians – Chornohora, Maramures and Svydovets (Chorney and Fedoronchuk 2009, MEPNR of Ukraine 2021).

In general, *Sabulina verna* (L.) Rchb. (= *Minuartia verna* (L.) Hiern) has a wide distribution and branched infraspecific subdivision with variable acceptance by different authors. In particular, *M. verna* auct. fl. carpat., together with *M. zarecznyi* (Zapał.) Klokov, is considered a synonym of *M. pauciflora* (Mirek et al. 2020). Moreover, *M. pauciflora* is often wrongly reported from the Carpathians as *M. gerardii* (Willd.) Hayek, which is a species from the Alps (Chorney 2011, Kliment et al. 2016, Nunvářová Kabátová et al. 2019). Inconsistency in the taxonomic interpretation and unclear chorology of *M. gerardii* led to its consideration, including Carpathian plants, as a synonym of *M. verna* s. str. (i.e. *M. verna* subsp. *verna* or *Sabulina verna* subsp. *verna*) (Fedoronchuk and Mosyakin 2016). However, recent investigations showed that *M. pauciflora* is clearly distinguished from *M. verna* s. str. *Nunvářová Kabátová et al. (2019)* also confirmed the belonging of Carpathian plants identified as *M. gerardii* to *M. pauciflora*.

CoL (https://www.catalogueoflife.org/data/taxon/43KDB, accessed on 07.06.2023), GBIF (https://www.gbif.org/species/3811893, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/60435605-2, accessed on 07.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Minuartia-pauciflora, accessed on 07.06.2023) still provide *M. pauciflora* as an independent species from the genus *Minuartia*, while *M. verna* was reconsidered as belonging to the genus *Sabulina* Rchb. as *S. verna* (Fedoronchuk and Mosyakin 2016). To keep the nomenclatural consistency within *S. verna* group, the new combination *Sabulina pauciflora* (Kit.) A. Novikov, *comb. nov.* is proposed here.

Only two taxa from the *Sabulina verna* group are present in the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015) viz. *S. pauciflora, comb. nov.* (≡ *M. pauciflora*) and *S. oxypetala* (Woł.) Mosyakin & Fedor. (≡ *M. oxypetala* (Woł.) Kulczyński). Both species were previously interpreted as belonging to *Alsine* L. and were recently reconsidered within the genus *Sabulina* Rchb. (Mosyakin and Fedoronchuk 2015, Fedoronchuk and Mosyakin 2016, Nunvářová Kabátová et al. 2019).

Silene nutans subsp. *dubia* (Herbich) Zapał., Bull. Int. Acad. Sci. Cracovie, Cl. Sci. Math., Sér. B, Sci. Nat. 11: 151 (1911)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7J3SQ
- GBIF https://www.gbif.org/species/7719003
- IPNI urn:lsid:ipni.org:names:77250338-1
- WFO https://list.worldfloraonline.org/wfo-0000734610
- POWO https://powo.science.kew.org/taxon/77250338-1
- Wikispecies https://species.wikimedia.org/wiki/Silene_dubia
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/0d4533cf-8151-49a6-9c83-2a8a5b067164
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Silene-nutans

Nomenclature:

≡ *Silene dubia* Herbich, Fl. Bucovina: 388 (1859), non alior; GBIF: https://www.gbif.org/species/7592009; POWO: https://powo.science.kew.org/taxon/2488403-4; JACQ: https://www.jacq.org/detail.php?ID=442588; JACQ: https://www.jacq.org/detail.php?ID=442591; JACQ: https://www.jacq.org/detail.php?ID=442592; JACQ: https://www.jacq .org/detail.php?ID=442595; JACQ: https://www.jacq.org/detail.php?ID=442597; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200022; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200023; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200019; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200020; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555 / al.ap.specimen.cher0200021

≡ *Silene dubia* Herbich ex Rohrb., Monogr. *Silene*: 217 (1869), non alior; GBIF: https://www.gbif.org/species/8297181; IPNI: https://www.ipni.org/n/157265-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000440631; BHL: https://www.biodiversitylibrary.org/page/15321329#page/229

≡ *Silene nutans* var. *dubia* (Herbich) Zapał., Sprawozd. Kom. Fizjograf. 24: 111 (1889)

= *Silene dubia* var. *glabriuscula* (Zapał.) Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* f. *acaulis* Guşul., Fl. Rep. Pop. Rom. 2: 179, 665 (1953) [monster forma]

= *Silene dubia* var. *hormuzakii* f. *apricorum* (Zapał.) Graebn. in Asch. & Graebn. emend. Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* f. *herbichii* (Zapał.) Graebn. in Asch. & Graebn. emend. Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* f. *kelemenensis* (Zapał.) Graebn. in Asch. & Graebn. emend. Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* f. *lilacina* (Zapał.) Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene dubia* var. *hormuzakii* f. *robustior* (Schur) Graebn. in Asch. & Graebn. emend. Guşul., Fl. Rep. Pop. Rom. 2: 179 (1953)

= *Silene nutans* subsp. *dubia* var. *dubia* f. *apricorum* Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* subsp. *dubia* [unranked] b *herbichii* Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* subsp. *dubia* [unranked] a kelemenensis Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* subsp. *dubia* [unranked] a kelemenensis f. *lilacina* Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* subsp. *dubia* var. *dubia* f. *luxuriosa* Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* subsp. *dubia* var. *dubia* f. *tenuis* Zapał., Consp. Fl. Galic. Crit. 3: 195 (1911)

= *Silene nutans* [unranked] c. *glabriuscula* Zapał., Consp. Fl. Galic. Crit. 3: 192 (1911); GBIF: https://www.gbif.org/species/11954760

= *Silene nutans* [unanked] β *transsilvanica* Grec., Consp. Fl. Rom.: 109 (1898)

= *Silene transsilvanica* Schur, Oesterr. Bot. Z. 8: 22 (1858) [nom. nudum] et Oesterr. Bot. Z. 10: 181 (1860); GBIF: https://www.gbif.org/species/5587908; IPNI: https://www.ipni.org/n/158548-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000440073; POWO: https://powo.science.kew.org/taxon/158548-1; BHL: https://www.biodiversitylibrary.org/page/28724891#page/30; JACQ: https://www.jacq.org/detail.php?ID=369397; JACQ: https://www.jacq.org/detail.php?ID=369398; JACQ: https://www.jacq.org/detail.php?ID=369401; JACQ: https://www.jacq.org/detail.php?ID=369407; JACQ: https://www.jacq.org/detail.php?ID=369408; JACQ: https://www.jacq.org/detail.php?ID=369417; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204020; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204018a; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204022; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204019; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204018b; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00204017

= *Silene transsilvanica* var. *angustifolia* Hormuz., Oesterr. Bot. Z. 61: 147 (1911); BHL: https://www.biodiversitylibrary.org/item/37201#page/159

= *Silene saxatilis* [unranked] a racemosa Schur, Enum. Pl. Transsilv.: 101 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/121

= *Silene saxatilis* [unranked] a robustior Schur, Enum. Pl. Transsilv.: 101 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/121; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203992

– *Silene saxatilis* Schur, Enum. Pl. Transsilv.: 101 (1866), non Sims nec M.Bieb.; BHL: https://www.biodiversitylibrary.org/item/7364#page/121

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Following Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/d201548b-883c-4f46-8151-aed4fac379ee, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Silene-nutans, accessed on 07.06.2023), *S. nutans* L. includes three subspecies – subsp. *nutans* (most widely distributed, with Eurasian range), subsp. *insubrica* (Gaudin) Soldano (distributed mainly in the Alps, but also occurs in Greece, Hungary, Romania and some other countries) and subsp. *dubia* (occurs exclusively in the south-eastern

Carpathians). Additionally, *S. nutans* subsp. *smithiana* (Moss) Jeanm. & Bocquet distributed in France, Belgium, Great Britain and the Netherlands was described by Jeanmonod and Bocquet (1983). *Silene nutans* subsp. *smithiana* in mentioned databases is synonymised with *S. nutans* susbp. *nutans*. However, recent studies showed that this subspecies is a separate taxon represented by two haplotypes (Martin et al. 2016). Besides this, POWO (https://powo.science.kew.org/taxon/157927-1, accessed on 05.06.2023) and WFO (https://list.worldfloraonline.org/wfo-0000440799, accessed on 05.06.2023) recognise *S. nutans* subsp. *livida* (Willd.) Gremli. However, *S. nutans* subsp. *livida* is a direct synonym of *S. nutans* subsp. *insubrica* (Jeanmonod and Bocquet 1983, Soldano 1991, Soldano 2001).

Two of the four mentioned subspecies occur in the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015) – *S. nutans* susbp. *nutans* (occupies light forested and adjacent habitats in the montane belt) and *S. nutans* subsp. *dubia* (occupies rocky and stony slopes in the montane and subalpine belts).

Silene zawadzkii Herbich, Enum. Pl. Galic. Bucow.: 191 (1835)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/9YK58
- GBIF https://www.gbif.org/species/5587094
- IPNI urn:lsid:ipni.org:names:158695-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000439914
- POWO https://powo.science.kew.org/taxon/158695-1
- Wikispecies https://species.wikimedia.org/wiki/Silene_zawadzkii
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/807e3ed7-4af8-4f62-ae46-a23e4f845c28
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Silene-zawadzkii

Nomenclature:

≡ *Melandrium zawadskii* (Herbich) A.Braun, Flora 26: 387 (1843) [nom. nudum]; GBIF: https://www.gbif.org/species/3814125; WFO: http://www.worldfloraonline.org/taxon/wfo-0001292100; BHL: https://www.biodiversitylibrary.org/item/940#page/388

≡ *Elisanthe zawadzkii* (Herbich) Fuss, Fl. Transsilv.: 106 (1866); GBIF: https://www.gbif.org/species/10950560; IPNI: https://www.ipni.org/n/154224-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000666384; POWO: https://powo.science.kew.org/taxon/154224-1

≡ *Elisanthe zawadskii* (Herbich) Klokov, Fl. UkrSSR 4: 574 (1952) [nom. illeg.]; GBIF: https://www.gbif.org/species/3815102; IPNI: https://www.ipni.org/n/154225-1

≡ *Silenanthe zawadzkii* (Herbich) Griseb. & Schenk, Arch. Naturgesch. (Berlin) 18(1): 300 (1852); GBIF: https://www.gbif.org/species/3811613; IPNI: https://www.ipni.org/n/156730-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000438300; POWO: https://powo.science.kew.org/taxon/156730-1; BHL: https://www.biodiversitylibrary.org/page/13707709#page/308

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: A rare species that occurs in the Ukrainian Carpathians only in the Chyvchyny Mts. (Chorney 2009a, Chopyk and Fedoronchuk 2015, MEPNR of Ukraine 2021). This species was considered to belong to the genera *Melandrium* Röhl., *Elisanthe* Rchb. or *Silenanthe* Griseb. & Schenk. It was also considered a synonym of *Silene vulgaris* (Moench) Garcke subsp. *vulgaris*, but recent molecular studies showed that this narrow endemic is an independent and well-separated species nested within *Silene* sect. Physolichnis s.l. (Martyniuk et al. 2018, Petri and Oxelman 2019, Jafari et al. 2020).

GBIF (https://www.gbif.org/species/3814125, accessed on 18.06.2023), WFO (http://www.worldfloraonline.org/taxon/wfo-0001292100, accessed on 18.06.2023) and Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/807e3ed7-4af8-4f62-ae46-a23e4f845c28, accessed on 18.06.2023) provide the name *Melandrium zawadskii* (Herbich) A.Braun with reference to Braun (1843). This name is quite popular and often used in the Ukrainian herbaria and regional floras. However, in the original publication, Braun (1843) did not apply such a combination. Instead, he used the name *Silene zawadskii* and only indicated that this species belongs to the group Melandrien (Elisanthen). Therefore, it is not clear who was the actual author of the combination *M. zawadskii* and whether it was validly published at all.

Family Plumbaginaceae

Armeria pocutica Pawł., Fragm. Florist. Geobot. 8: 399 (1962)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5W4RS
- GBIF https://www.gbif.org/species/5668250
- IPNI urn:lsid:ipni.org:names:686381-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000549162
- POWO https://powo.science.kew.org/taxon/686381-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/fd28cfaf-32e3-44bc-85d6-fa1e03aabe18
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Armeria-pocutica

Nomenclature:

– *Armeria elongata* auct., non (Hoffm.) Koch

– *Armeria maritima* subsp. *elongata* auct., non (Hoffm.) Bonnier

– *Armeria vulgaris* auct., non Willd.

Conservation status: In Ukraine – RE (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: This species is extinct in the Ukrainian Carpathians (Kagalo and Sytschak 2009b, MEPNR of Ukraine 2021).

Order Dipsacales

Family Caprifoliaceae

Scabiosa lucida subsp. *barbata* Nyár., Enum. Pl. Vasc. Cheia Turzii: 280 (1939)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/B89FK
- IPNI urn:lsid:ipni.org:names:77252742-1
- POWO https://powo.science.kew.org/taxon/77252742-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/8580928c-4139-4518-914f-d08b075d3436
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Scabiosa-lucida

Nomenclature:

≡ *Scabiosa barbata* Nyár. ex Chopyk & Fedoronchuk, Fl. Ukr. Carpath.: 436 (2015) [des. et nom. invalid.] *

≡ *Scabiosa pseudobanatica* subsp. *barbata* (Nyár.) Chrtek, Preslia 57: 201 (1985); POWO: https://powo.science.kew.org/taxon/3007691-4

= *Asterocephalus lucidus* [unranked] a. alpicolus Schur, Enum. Pl. Transssilv.: 300 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/320

= *Asterocephalus lucidus* [unranked] b. *subalpinus* Schur, Enum. Pl. Transssilv.: 300 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/320

= *Scabiosa columbaria* subsp. *subalpina* Brügger, Flora Curiensis. Naturgeschichtliche Beiträge zur Kenntniss der Umgebungen von Chur: 65 (1874) [nom. nudum]

= *Scabiosa columbaria* subsp. *subalpina* (Brügger) Killias, Jahresber. Naturf. Ges. Graubündens 31: 82 (1887–1888); BHL: https://www.biodiversitylibrary.org/item/43011#page/278

= *Scabiosa columbaria* subsp. *lucida* var. *subalpina* (Brügger) Braun-Blanq., Jahresber. Naturf. Ges. Graubünd. 58: 94 (1918); GBIF: https://www.gbif.org/species/12141628

= *Scabiosa lucida* subsp. *barbata* f. *alpicola* (Schur) Prodan, Fl. Rep. Pop. Rom. 8: 685 (1961); POWO: https://powo.science.kew.org/taxon/3007684-4

= *Scabiosa lucida* subsp. *barbata* f. *hirticaulis* (Nyár.) Prodan, Fl. Rep. Pop. Rom. 8: 685 (1961)

= *Scabiosa lucida* subsp. *barbata* f. *perramosa* (Nyár.) Prodan, Fl. Rep. Pop. Rom. 8: 685 (1961)

= *Scabiosa lucida* subsp. *barbata* f. *subalpina* (Schur) Prodan, Fl. Rep. Pop. Rom. 8: 685 (1961); POWO: https://powo.science.kew.org/taxon/3007687-4

= *Scabiosa lucida* f. *elata* Nyár., Enum. Pl. Vasc. Cheia Turzii: 280 (1939); POWO: https://powo.science.kew.org/taxon/3007682-4

= *Scabiosa lucida* f. *hirticaulis* Nyár., Enum. Pl. Vasc. Cheia Turzii: 280 (1939); POWO: https://powo.science.kew.org/taxon/3007681-4

= *Scabiosa lucida* f. *perramosa* Nyár., Enum. Pl. Vasc. Cheia Turzii: 280 (1939); POWO: https://powo.science.kew.org/taxon/3007683-4

= *Scabiosa lucida* f. *scaposa* Nyár., Enum. Pl. Vasc. Cheia Turzii: 280 (1939); POWO: https://powo.science.kew.org/taxon/3007680-4

= *Scabiosa lucida* var. *subalpina* (Brügger) Hayek & Hegi, Ill. Fl. Mitt.-Eur. 6(1): 308 (1908)

= *Scabiosa opaca* Klokov, Novosti Sist. Vyssh. Nizsh. Rast.: 112 (1974) *; CoL: https://www.catalogueoflife.org/data/taxon/6Y55F; GBIF: https://www.gbif.org/species/4103554; IPNI: https://www.ipni.org/n/1004941-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001046436; POWO: https://powo.science.kew.org/taxon/1004941-1

= *Scabiosa subalpina* Brügger, Jahresber. Nat. Gesell. Graubünd. 29: 137 (1886); GBIF: https://www.gbif.org/species/4104181; IPNI: https://www.ipni.org/n/320160-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000500648; POWO: https://powo.science.kew.org/taxon/320160-1; BHL: https://www.biodiversitylibrary.org/page/11661731#page/167

– *Scabiosa lucida* Vill., Prosp. Hist. Pl. Dauphiné: 18 (1779) [p. p., tantum quod plantas ucrain. carpat.], non W.T.Aiton *; GBIF: https://www.gbif.org/species/7475424; IPNI: https://www.ipni.org/n/319978-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000500124; POWO: https://powo.science.kew.org/taxon/319978-1

– *Scabiosa lucida* subsp. *lucida* Vill., Prosp. Hist. Pl. Dauphiné: 18 (1779) sensu Tasenkevych [non sensu orig.]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: There are four (https://powo.science.kew.org/taxon/319978-1, accessed on 05.06.2023) to five (https://europlusmed.org/cdm_dataportal/taxon/e6eec090-a11f-40b2-a8d1-a9f47863d58f, accessed on 05.06.2023) accepted subspecies of *S. lucida* Vill. – subsp. *lucida* (non-endemic taxon distributed in European mountains, starting from ca. 1000 m elevation – Štěpánek and Holub (1997)), subsp. *calcicola* Błoński (endemic of W Carpathians – Štěpánek and Holub (1997), Danihelka et al. (2012)), subsp. *pseudobanatica* (Schur) Holub (problematic taxon with Carpathian-Pannonian distribution range that prefers lower elevations and occurs in Ukraine, Slovakia and Romania, but often overlooked or confused – Chrtek (1985), Chrtek and

Goliašová (1985), Tasenkevich (2006)), subsp. *stricta* (Waldst. & Kit.) Jasiewicz (distributed in southern Europe) and subsp. *barbata* Nyár. (south-eastern Carpathian endemic – Kliment et al. (2016)).

In the Flora of UkrSSR (Kotov 1961: p. 378), *S. lucida* is indicated as having var. *subalpina* (Brügger) Hegi with *S. subalpina* Brügger, Zur. Fl. Tirol (1860) amongst its synonyms. However, POWO (https://powo.science.kew.org/taxon/77227194-1, accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000500277, accessed on 05.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Scabiosa-columbaria, accessed on 07.06.2023) indicate *S. subalpina* to be a synonym for *S. columbaria* L., a quite distinct species. After checking, it was found that Brügger did not describe *S. subalpina* in his mentioned work "Zur Flora Tirols" (Brügger 1860). IPNI (https://www.ipni.org/n/320160-1, accessed on 05.06.2023) says that Brügger described this species much later, in 1887–1888 (i.e. *S. subalpina* Brügger, Jahresber. Naturf. Ges. Graubündens 31, Beil. 82 (1887-88). However, this is also wrong because IPNI references the work of Killias (1887), who only repeated an epithet *subalpina* for *S. columbaria* subsp. *subalpina* (the rank of subspecies is indicated by the author in the taxon's description) following Brügger (1874), who, in turn, published this subspecies without the protologue. Considering the mistake in IPNI, it is worth noting that complete and correct nomenclatural citations for this subspecies should be *S. columbaria* subsp. *subalpina* Brügger, Fl. Cur.: 65 (1874) [nom. nudum] and *S. columbaria* subsp. *subalpina* (Brügger) Killias, Jahresber. Naturf. Ges. Graubündens 31: 82 (1887–1888). Nevertheless, this does not answer the question about where the initial Brügger's species name has been applied. In fact, Brügger first applied the epithet *subalpina* in 1874 (without any protologue provided) and later, in 1886, with a subsequent self-reprint of the last paper in the same 1886 that, however, has changed pagination (Brügger 1874, Brügger 1886a, Brügger 1886b). Therefore the correct nomenclatural citation for this species should be *S. subalpina* Brügger, Fl. Cur.: 65 (1874) [nom. nudum] et Jahresber. Nat. Gesell. Graubünd.: 137 (1886). Brügger (1886a) and Brügger (1886b) described *S. subalpina* as an intermediate species between *S. columbaria* and *S. lucida.* It was Hayek and Hegi (1908), who, on page 308, determined *S. subalpina* belonging to *S. lucida* and applied the combination *S. lucida* var. *subalpina* (Brügger) Hayek & Hegi, Ill. Fl. Mitt.-Eur. 6(1): 308 (1908). Schur (1866) also believed that *subalpina* plants belong to the *lucida* group and applied the new name *Asterocephalus lucidus* [unranked] b. *subalpinus* Schur, Enum. Pl. Transsilv.: 300 (1866). Later, Pawłowski (Planta Poloniae Exsiccata deposited at KW) synonymised *S. lucida* var. *subalpina* with *S. lucida var. lucida* Considering this, I believe that the mentioned databases mistakenly synonymise *S. subalpina* (and derivatives) with *S. columbaria*. Instead, *S. subalpina* should be considered as a synonym of *S. lucida.* Moreover, after herbarium inspection, I found that at least part of the specimens identified as *S. lucida* var. *subalpina* belong to *S. lucida* subsp. *barbata*.

It is important to note that Brügger mentioned many taxa (e.g. *Hepatica rhaetica, Malus hortensis, Batrachium micranthum, Nasturtium montanum* etc.) for the first in Flora

Curiensis (Brügger 1874); however, this book is entirely ignored by IPNI and, consequently, many other databases, for some reason.

Order Ericales

Family Ericaceae

Pyrola carpatica Holub et Křísa, Folia Geobot. Phytotax. 6(1): 82 (1971)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6WQBQ
- GBIF https://www.gbif.org/species/4171403
- IPNI urn:lsid:ipni.org:names:706939-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000396313
- POWO https://powo.science.kew.org/taxon/706939-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/ab1d2989-c95f-4369-9f82-7c9ceb6aca26
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Pyrola-carpatica
- JACQ https://prc.jacq.org/PRC454358
- JACQ https://prc.jacq.org/PRC454359
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc454359
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc454358

Nomenclature:

≡ *Pyrola rotundifolia* subsp. *carpatica* (Holub & Křísa) Váczy & Beldie, Fl. Rep. Soc. Rom. 13: 46 (1976)

– *Pyrola intermedia* auct., non Schleich. ex Arcang.

– *Pyrola intermedia* Schleich. sensu Szafer in Kulczyński & Pawłowski, Rośliny Polskie: 459 (1924) [nom. illeg.], non Schleich. ex Arcang., Comp. Fl. Ital.: 460 (1882)

– *Pyrola rotundifolia* [unranked] *arenaria* Scheele sensu Jáv., Magyar Fl.: 797 (1924)

– *Pyrola rotundifolia* subsp. *intermedia* (Alef.) Wohlfahrt in W.D.J.Koch, Syn. Deut. Schweiz. Fl., Bd. 2: 1946 (1902) [p. p., tantum quod plantas carpat.]; GBIF: https://www.gbif.org/species/12116320

– *Pyrola rotundifolia* subsp. *intermedia* (Schleich.) Dostál, Květena ČSR: 1115 (1949) [p. p., tantum quod plantas carpat., excl. var. *arenaria* Koch; nom. illeg.]; GBIF: https://www.gbif.org/species/11041003

Conservation status: In Ukraine – CR (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: High-mountain species occurring in the Ukrainian Carpathians only in a few subalpine and alpine habitats on Chornohora and Svydovets (Holub and Křísa 1971, Parnikoza and Gilchuk 2002, Chopyk and Fedoronchuk 2015).

Family Primulaceae

Soldanella hungarica Simonk., Enum Fl. Transsilv.: 461 (1886) et Oesterr. Bot. Z. 39: 219 (1889)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4Y57T
- GBIF https://www.gbif.org/species/4005274
- IPNI urn:lsid:ipni.org:names:702873-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000504539
- POWO https://powo.science.kew.org/taxon/702873-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/2946e82e-d01f-4883-aba9-46020cc08b2e
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Soldanella-hungarica
- BHL https://www.biodiversitylibrary.org/page/10524596#page/525

Nomenclature:

A. *Soldanella hungarica* Simonk., Enum Fl. Transsilv.: 461 (1886) et Oester. Bot. Z. 39: 219 (1889) [s. str.] *

≡ *Soldanella hungarica* subsp. *hungarica* Simonk., Enum Fl. Transsilv.: 461 (1886) et Oesterr. Bot. Z. 39: 219 (1889) [s. str.]; CoL: https://www.catalogueoflife.org/data/taxon/5L7SN; GBIF: https://www.gbif.org/species/7683860; IPNI: https://ipni.org/n/702873-1; WFO: https://list.worldfloraonline.org/wfo-0000504539; POWO: https://powo.science.kew.org/taxon/702873-1; Euro+Med: https://europlusmed.org/cdm_dataportal/taxon/08c3b726-14a8-483b-8f42-ee2b144702fb; BHL: https://www.biodiversitylibrary.org/page/10524596#page/525

≡ *Soldanella montana* subsp. *hungarica* (Simonk.) Lüdi in Hegi, Illustr. Fl. Mittel-Europa 5(3): 1827 (1927); GBIF: https://www.gbif.org/species/7912534; WFO: http://www.worldfloraonline.org/taxon/wfo-0001105527

≡ *Soldanella montana* var. *hungarica* (Simonk.) Grinț., Gen. Soldan. Haretii: 10 (1908)

≡ *Soldanella alpina* var. *hungarica* (Simonk.) Stojanoff & Stefanoff, Ann. Arch. Min. Agri. Dom. Roy. Bulg. 5: 865 (1925) [p. p.]

= *Soldanella major* f. *parviflora* Morariu in Morariu, Nyár. & Guşul., Fl. Rep. Pop. Rom. 7: 642 (1960) [nom. inval.]

= *Soldanella major* f. *purpureifolia* R.Rös., Comun. Bot. 7: 58 (1963) [nom. inval.]

= *Soldanella pseudomontana* F.K.Meyer, Haussknechtia 2: 15 (1985); GBIF: https://www.gbif.org/species/4005090; IPNI: https://ipni.org/n/929081-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000504554; POWO: https://powo.science.kew.org/taxon/929081-1

– *Soldanella alpina* [unranked] *minor* Clus., Rar. Plant. Hist.: 309 (1601) [p.p.]

– *Soldanella alpina* [unranked] β *minor* (Clus.) Neilr. [p.p.], Nachtraege Fl. Wien: 219 (1851) et Fl. Wien, Bd. 2: 219 (1868), non Seringe *; GBIF: https://www.gbif.org/species/9326958; POWO: https://powo.science.kew.org/taxon/3221241-4

– *Soldanella alpina* [unranked] a minor Schur [p.p., nom. illeg.], Enum. Pl. Transsilv.: 556 (1866), non Seringe; POWO: https://powo.science.kew.org/taxon/3221253-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/576

– *Soldanella hungarica* var. *minor* (Schur) Vierh. in Hannig & Winkler, Pflanzenareale 1(1): Karte 7–8 (1926) [p. p.]; POWO: https://powo.science.kew.org/taxon/3221255-4

– *Soldanella major* f. *hungarica* (Simonk.) Jáv., Fl. Hung.: 811 (1925) [p. p.]

– *Soldanella major* f. *macrocarpa* Morariu in Morariu, Nyár. & Guşul., Fl. Rep. Pop. Rom. 7: 642 (1960) [p. p., nom. inval.]

– *Soldanella montana* subsp. *hungarica* var. *minor* (Schur) Vierch. [nom. inval., ex herb. LWS] *

– *Soldanella montana* var. *hungarica* f. *minor* (Schur) G.Kozij [nom. inval., ex herb. LWS] *

– *Soldanella montana* var. *minor* (Schur) Borbás, Beih. Bot. Centralb. 10: 282 (1901) [p. p.]; POWO: https://powo.science.kew.org/taxon/3221254-4

B. *Soldanella major* (Neilr.) Vierh. in Urban & Graebn., Festschr. Asch.: 502 (1904), **emend. Zhang & Kadereit**, Nordic J. Bot. 22(2): 153 (2002) *; GBIF: https://www.gbif.org/species/8202303; IPNI: https://www.ipni.org/n/77205570-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747205; POWO: https://powo.science.kew.org/taxon/77205570-1; Euro+Med: https://europlusmed.org/cdm_dataportal/taxon/f3a6a754-dd75-45ff-9787-5944c19710b0; Worldplants: https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Soldanella-major; BHL: https://www.biodiversitylibrary.org/item/42427#page/574; JACQ: https://je.jacq.org/JE00006613

≡ *Soldanella alpina* [unranked] α *major* Neilr., Nachtraege Fl. Wien: 219 (1851) et Fl. Wien, Bd. 2: 219 (1868) *; GBIF: https://www.gbif.org/species/8334456; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747204; POWO: https://powo.science.kew.org/taxon/2900745-4

≡ *Soldanella montana* subsp. *hungarica* var. *major* (Neilr.) Lüdi in Hegi, Illustr. Fl. Mittel-Europa 5(3): 1827 (1930)

= *Soldanella stiriaca* F.K.Meyer, Haussknechtia 2: 20 (1985) [nom. inval., superfl.]; GBIF: https://www.gbif.org/species/4005020; POWO: https://powo.science.kew.org/taxon/3221343-4; JACQ: https://gzu.jacq.org/GZU000274107; JACQ: https://wu.jacq.org/WU0025155; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0002803; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.g00440606; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.g00440605; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00006613; JSTOR Global Plants: https

://plants.jstor.org/stable/10.5555/al.ap.specimen.g00440607; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.c10017495

– *Soldanella hungarica* subsp. *major* (Neilr.) Pawłowska, Fragm. Florist. Geobot. 9: 11 (1963) [p. p.] *; CoL: https://www.catalogueoflife.org/data/taxon/5L7SP; GBIF: https://www.gbif.org/species/7505299; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747203; POWO: https://powo.science.kew.org/taxon/2900744-4

– *Soldanella alpina* var. *vulgaris* Seringe, Mus. Helv. Hist. Nat., Ser. Bot. 1: 83 (1823) [p. p., nom. inval.]; GBIF: https://www.gbif.org/species/9560877; POWO: https://powo.science.kew.org/taxon/3255240-4

– *Soldanella major* subsp. *margittaniana* Fodor [nom. nudum, ex herb. UU] *

C. *Soldanella marmarossiensis* Klášt., Preslia 9: 19 (1930), **emend. Zhang & Kadereit**, Nordic J. Bot. 22(2): 148 (2002) *; GBIF: https://www.gbif.org/species/10930409; IPNI: https://www.ipni.org/n/702877-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001105526; POWO: https://powo.science.kew.org/taxon/702877-1; Worldplants: https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Soldanella-haretii; JACQ: https://je.jacq.org/JE00024665; JACQ: https://je.jacq.org/JE00024666

≡ *Soldanella richteri* subsp. *marmarossiensis* (Klášt.) Niederle, Skalnickáruv rok 75: 27 (2017); GBIF: https://www.gbif.org/species/11089257; GBIF: https://www.gbif.org/species/9291156; IPNI: https://ipni.org/n/60473714-2; WFO: http://www.worldfloraonline.org/taxon/wfo-0001368119; POWO: https://powo.science.kew.org/taxon/60473714-2

= *Soldanella haretii* Grinț., Gen. Soldan. Soldan. Haretii: 7 (1908); GBIF: https://www.gbif.org/species/10744534; IPNI: https://ipni.org/n/77205518-1; POWO: https://powo.science.kew.org/taxon/77205518-1

= *Soldanella major* f. *haretii* (Grinț.) Guşul. in Morariu, Nyár. & Guşul., Fl. Rep. Pop. Rom. 7: 67 (1960); POWO: https://powo.science.kew.org/taxon/3221191-4

= *Soldanella montana* var. *repanda* Grinț., Gen. Soldan. Soldan. Haretii: 12 (1908)

– *Soldanella montana* subsp. *faceta* A.Kress, Primulaceen-Studien 11: 22 (1993) [p. p.]; GBIF: https://www.gbif.org/species/4005175; POWO: https://powo.science.kew.org/taxon/3221190-4

– *Soldanella montana* subsp. *hungarica* var. *marmarossiensis* (Klášt.) Fodor, Fl. Zakarpattia: 57 (1974) [p. p.]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: *Soldanella hungarica* is a critical taxon considered here in a broad sense due to its unclear chorology and taxonomy in the Ukrainian Carpathians, with provisional aggregation of *S. hungarica* Simonk. [s. str.], *S. major* (Neilr.) Vierh. in Urban &

Graebn. and *S. marmarossiensis* Klášt. that are recognised separately by Zhang and Kadereit (2004).

Order Fabales

Family Fabaceae

Genista tinctoria subsp. *oligosperma* (Andrae) Soó, Feddes Repert. 83(3): 169 (1972)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/9DRQQ
- GBIF https://www.gbif.org/species/8231729
- GBIF https://www.gbif.org/species/7840990
- IPNI urn:lsid:ipni.org:names:885285-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000208982
- POWO https://powo.science.kew.org/taxon/885285-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/120f2415-eff0-4cbd-bc7c-04d4e826ac24
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Genista-tinctoria

Nomenclature:

≡ *Genista oligosperma* (Andrae) Simonk., Enum. Fl. Transsilv.: 169 (1886) *; GBIF: https://www.gbif.org/species/5347633; WFO: http://www.worldfloraonline.org/taxon/wfo-0000214674; POWO: https://powo.science.kew.org/taxon/2819438-4; BHL: https://www.biodiversitylibrary.org/item/40105#page/233

≡ *Genista tinctoria* subsp. *oligosperma* (Andrae) Malinovsky, Ukr. Bot. J. 19(3): 75 (1962) [comb. invalid.]

≡ *Genista tinctoria* var. *oligosperma* Andrae, Bot. Zeitung 11: 440 (1853); GBIF: https://www.gbif.org/species/5347624; WFO: http://www.worldfloraonline.org/taxon/wfo-0000208981; POWO: https://powo.science.kew.org/taxon/2819649-4; BHL: https://www.biodiversitylibrary.org/item/105829#page/232

= *Genista alpicola* Schur, Enum. Pl. Transsilv.: 145 (1866); GBIF: https://www.gbif.org/species/5627746; IPNI: https://ipni.org/n/495869-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000696334; POWO: https://powo.science.kew.org/taxon/495869-1; BHL: https://www.biodiversitylibrary.org/page/10544196#page/167; JACQ: https://www.jacq.org/detail.php?ID=373262; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00205812

= *Genista oligosperma* f. *alpicola* (Schur) Morariu, Fl. Rep. Pop. Rom. 5: 62 (1957)

= *Genista oligosperma* f. *ghisae* Pawł., Bul. Grăd. Bot. Cluj 19: 6 (1939)

= *Genista rupestris* Schur, Enum. Pl. Transsilv.: 145 (1866) *; GBIF: https://www.gbif.org/species/5347637; IPNI: https://ipni.org/n/496316-1; WFO: http://

www.worldfloraonline.org/taxon/wfo-0000208980; POWO: https://powo.science.kew.org/taxon/496316-1; BHL: https://www.biodiversitylibrary.org/page/10544196#page/167; JACQ: https://www.jacq.org/detail.php?ID=446081; JACQ: https://www.jacq.org/detail.php?ID=446082; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00205824; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00205825; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0219545

= *Genista sigeriana* Fuss, Fl. Transsilv.: 149 (1866); GBIF: https://www.gbif.org/species/5626815; IPNI: https://ipni.org/n/496357-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000696633; POWO: https://powo.science.kew.org/taxon/496357-1

= *Genista tinctoria* var. *prostrata* auct., non Bab.

– *Genista procumbens* Baumg. ex Fuss, Fl. Transsilv.: 150 (1866) [nom. inval.], non alior

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: There are two (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Genista-tinctoria, accessed on 07.06.2023) to five (https://powo.science.kew.org/taxon/496408-1, accessed on 05.06.2023) subspecies within *G. tinctoria* L. – subsp. *tinctoria* (has a wide Eurasian distribution with a secondary presence on other continents), subsp. *ovata* (Waldst. & Kit.) Arcang. (has a western–south-eastern European distribution), subsp. *insubrica* (Brügger) Pignatti (endemic to Italy, sometimes, for example, by Worldplants, considered as a synonym of subsp. *tinctoria*), subsp. *littoralis* (Corb.) Rothm. (occurs in France and Italy, sometimes considered a synonym of subsp. *tinctoria*) and subsp. *oligosperma* (occurs in Ukrainian and Romanian Carpathians).

Genista tinctoria subsp. *oligosperma* has been considered extinct for the Ukrainian Carpathians and previously has been reported only from the Maramures Mts. (Kagalo 2009). However, Kobiv et al. (2017) recently rediscovered a small population on Mt. Berlebashka (Latundur) in the Maramures Mts. Chopyk and Fedoronchuk (2015) also mentioned this subspecies for Pip Ivan Chornohirskiy Mt. (Chornohora Mts.). However, the presence of *G. tinctoria* subsp. *oligosperma* in Chornohora Mts. requires validation because I found no respective herbarium material, except a doubtful (hard to identify unambiguously) specimen of Fodor collected from 'Polonyna Kvasy' in 1966 (unnumbered specimen deposited at UU).

GBIF (https://www.gbif.org/species/5347632, https://www.gbif.org/species/11406566, accessed on 05.06.2023), POWO (https://powo.science.kew.org/taxon/885285-1, accessed on 05.06.2023) and WFO (https://list.worldfloraonline.org/wfo-0000208982, accessed on 05.06.2023) mistakenly indicate that *G. tenuifolia* Loisel. and *G. tinctoria subsp. tenuifolia* (Loisel.) Pignatti are synonyms of *G. tinctoria* subsp. *oligosperma*.

Genista tenuifolia has been described from Cavaglià in Piedmont, Italy (Loiseleur-Deslongchamps 1810) and has nothing in common with *G. tinctoria* subsp. *oligosperma*.

Lathyrus transsilvanicus (Spreng.) Rchb.f., Icon. Fl. Germ. Helv. 22: t. 220, fig. 4, nr. 8-12 (1886)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/9D78Y
- GBIF https://www.gbif.org/species/5356553
- IPNI urn:lsid:ipni.org:names:502057-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000209548
- POWO https://powo.science.kew.org/taxon/502057-1
- Wikispecies https://species.wikimedia.org/wiki/Lathyrus_transsylvanicus
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/399ea63e-d18b-499b-9eed-0b615c34b13c
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Lathyrus-transsylvanicus

Nomenclature:

≡ *Lathyrus transsilvanicus* (Spreng.) R.M.Fritsch, Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 104: 517 (1895) [nom. inval.]; GBIF: https://www.gbif.org/species/8329194; IPNI: https://ipni.org/n/502057-1; BHL: https://www.biodiversitylibrary.org/item/120550#page/599

≡ *Lathyrus laevigatus* subsp. *transsylvanicus* (Spreng.) Breistr., Bull. Soc. Bot. France 87: 53 (1940); GBIF: https://www.gbif.org/species/5356554; WFO: http://www.worldfloraonline.org/taxon/wfo-0000209549; POWO: https://powo.science.kew.org/taxon/3013336-4

≡ *Lathyrus linnaei* f. *transsilvanicus* (Spreng.) Rouy in Rouy & Foucad, Fl. France 5: 269 (1899)

≡ *Lathyrus luteus* subsp. *transsylvanicus* (Spreng.) Dostal, Květena ČSR: 821 (1949); GBIF: https://www.gbif.org/species/5356555; WFO: http://www.worldfloraonline.org/taxon/wfo-0000209552; POWO: https://powo.science.kew.org/taxon/3013337-4

≡ *Lathyrus luteus* [unranked] a transsilvanicus (Spreng.) Ascherson & Graebn., Syn. Mitteleur. Fl. 6(2): 1044 (1906–1910)

≡ *Lathyrus luteus* [unranked] c *transsylvanicus* (Spreng.) Beck in Rchb., Icon. Fl. Germ. Helv. 22: 155 (1903); GBIF: https://www.gbif.org/species/11385726; WFO: http://www.worldfloraonline.org/taxon/wfo-0001446301; POWO: https://powo.science.kew.org/taxon/3013335-4; BHL: https://www.biodiversitylibrary.org/item/29430#page/165

≡ *Orobus luteus* subsp. *transsylvanicus* (Spreng.) Nyman, Consp. Fl. Eur. 1: 204 (1878) [nom. et des. inval.]; GBIF: https://www.gbif.org/species/11408855; WFO: http://www.worldfloraonline.org/taxon/wfo-0001448072; POWO: https://

powo.science.kew.org/taxon/3013334-4; BHL: https://www.biodiversitylibrary.org/page/11015817#page/213

≡ *Orobus transsylvanicus* Spreng., Syst. Veg., ed. 16, 3: 260 (1826); GBIF: https://www.gbif.org/species/2962476; IPNI: https://www.ipni.org/n/urn:lsid:ipni.org:names:511062-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000209547; POWO: https://powo.science.kew.org/taxon/511062-1; BHL: https://www.biodiversitylibrary.org/page/792612#page/261

= *Lathyrus transsilvanicus* f. *trichocarpus* Borbás in Nyár., Herb. Kv. fl.: 335 (1941-1944)

– *Orobus laevigatus* Baumg., Enum. Stirp. Transsilv. 2: 329 (1816), non Waldst. & Kit.

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Obsolescent species, which is narrowly distributed only in the volcanic part of the Ukrainian Carpathians. It is listed by the Red Book of Ukraine (Prots and Kish 2009 , MEPNR of Ukraine 2021).

GBIF (https://www.gbif.org/species/8318457) provides the name *L. laevigatus* subsp. *transsylvanicus* (Spreng.) Soó without indicating the publication details, which seems to be some technical mistake since I could not locate a publication where Soó applied such a name.

Trifolium sarosiense Hazsl., Éjsz. Magyarh. Vir.: 76 (1864) et Hazsl. ex Neilr., Diagn. Gefaesspfl.: 35 (1864)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/58Q5X
- GBIF https://www.gbif.org/species/5358815
- GBIF https://www.gbif.org/species/8013811
- IPNI urn:lsid:ipni.org:names:523672-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000163734
- POWO https://powo.science.kew.org/taxon/523672-1
- Wikispecies https://species.wikimedia.org/wiki/Trifolium_medium_var._sarosiense
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/61648c41-a0e4-4b5d-adb9-cda45bced2c5
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Trifolium-medium

Nomenclature:

≡ *Trifolium flexuosum* subsp. *sarosiense* (Hazsl.) Gibelli & Belli, Mem. Reale Accad. Sci. Torino ser. 2, 39 (1): 333 (1889); GBIF: https://www.gbif.org/species/11394034; WFO: http://www.worldfloraonline.org/taxon/wfo-0001449053; POWO: https://powo.science.kew.org/taxon/3223699-4; BHL: https://www.biodiversitylibrary.org/item/138459#page/381

≡ *Trifolium medium* subsp. *sarosiense* (Hazsl.) Simonk., Enum. Fl. Transsilv.: 180 (1887) *; GBIF: https://www.gbif.org/species/5358814; WFO: http://www.worldfloraonline.org/taxon/wfo-0000214196; POWO: https://powo.science.kew.org/taxon/2873267-4; BHL: https://www.biodiversitylibrary.org/item/40105#page/244

≡ *Trifolium medium* var. *sarosiense* (Hazsl.) A.Nyár. in Săvul., Fl. Rep. Pop. Rom. 5: 208 (1952); GBIF: https://www.gbif.org/species/7456349; WFO: http://www.worldfloraonline.org/taxon/wfo-0001449124; POWO: https://powo.science.kew.org/taxon/3223843-4

= *Trifolium banaticum* (Heuff.) Májovský, Acta Fac. Rerum Nat. Univ. Comen., Bot. 35: 6 (1988); GBIF: https://www.gbif.org/species/5633914; IPNI: https://ipni.org/n/946118-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000412696; POWO: https://powo.science.kew.org/taxon/946118-1

= *Trifolium medium* subsp. *banaticum* (Heuff.) Hendrych, Preslia 28: 405 (1956); GBIF: https://www.gbif.org/species/5358817; WFO: http://www.worldfloraonline.org/taxon/wfo-0000214194; POWO: https://powo.science.kew.org/taxon/2873266-4

= *Trifolium medium* var. *banaticum* Heuff., Verh. K.K. Zool.-Bot. Ges. Wien 8(Abh.): 89 (1858); GBIF: https://www.gbif.org/species/8309775; WFO: http://www.worldfloraonline.org/taxon/wfo-0000185251; POWO: https://powo.science.kew.org/taxon/2873265-4

= *Trifolium medium* var. *sarosiense* f. *bracteolatum* A.Nyár. in Săvul., Fl. Rep. Pop. Rom. 5: 208, 540 (1952)

= *Trifolium medium* var. *sarosiense* f. *eciliatum* A.Nyár. in Săvul., Fl. Rep. Pop. Rom. 5: 208, 540 (1952)

= *Trifolium sarosiense* subsp. *banaticum* (Heuff.) Holub, Folia Geobot. Phytotax. 18(2): 205 (1983); GBIF: https://www.gbif.org/species/5632674; IPNI: https://ipni.org/n/922821-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001365469; POWO: https://powo.science.kew.org/taxon/922821-1

= *Trifolium medium* [unranked] e *humile* Schur, Enum. Pl. Transsilv.: 155 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/175; JACQ: https://www.jacq.org/detail.php?ID=374793; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00205914

Conservation status: In Ukraine – NE (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: For *T. medium* var. *sarosiense*, GBIF (https://www.gbif.org/species/7456349, accessed on 05.06.2023) mistakenly indicated the authorship (Hazsl.) Săvul. & Rayss. Instead of this, it should be (Hazsl.) A.Nyár. in Săvul. (Săvulescu 1952).

Order Gentianales

Family Gentianaceae

Gentiana laciniata Kit. ex Kanitz, Verh. Zool.-Bot. Ges. Wien 12: 572 (1862)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/3FMBY
- GBIF https://www.gbif.org/species/7483254
- GBIF https://www.gbif.org/species/7654718
- GBIF https://www.gbif.org/species/9234218
- IPNI urn:lsid:ipni.org:names:77205254-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000698412
- POWO https://powo.science.kew.org/taxon/77205254-1
- Wikispecies https://species.wikimedia.org/wiki/Gentiana_pyrenaica
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/eea7efa0-65c0-4870-963d-199a771d42d8
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Gentiana-pyrenaica
- BHL https://www.biodiversitylibrary.org/item/95692#page/112

Nomenclature:

≡ *Ciminalis dshimilensis* subsp. *laciniata* (Kit. ex Kanitz) Zuev, Turczaninowia 22(3): 147 (2019); GBIF: https://www.gbif.org/species/11090477; IPNI: https://ipni.org/n/77205255-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200008725; POWO: https://powo.science.kew.org/taxon/77205255-1

≡ *Gentiana pyrenaica* var. *laciniata* (Kit. ex Kanitz) Jáv., Shed. Fl. Hung. Exs. 8: Nr 786 (1927) *; POWO: https://powo.science.kew.org/taxon/2933142-4

= *Gentiana vagneriana* Janka, Oesterr. Bot. Z. 35: 109 (1885); POWO: https://powo.science.kew.org/taxon/2933141-4; BHL: https://www.biodiversitylibrary.org/item/91439#page/117

= *Gentiana wagneri* Janka, Oesterr. Bot. Z. 35: 109 (1885) [nom. inval.; ortho. var.]; GBIF: https://www.gbif.org/species/7631972; WFO: http://www.worldfloraonline.org/taxon/wfo-0000698952; BHL: https://www.biodiversitylibrary.org/item/91439#page/117

– *Gentiana pyrenaica* auct. fl. ucrain. carpat., non L. *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: The Red Book of Ukraine lists this species as rare (Zyman and Shiyan 2009, MEPNR of Ukraine 2021).

This species is of unclear taxonomy and chorology. In Ukraine, it is often equated with *G. pyrenaica* L. (Mosyakin and Fedoronchuk 2015). Tutin (1972) also considered *G. laciniata* a synonym of *G. pyrenaica*. In GBIF (https://www.gbif.org/species/7270399,

accessed on 05.06.2023), WFO (https://list.worldfloraonline.org/wfo-0000698412, accessed on 05.06.2023) and Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/eea7efa0-65c0-4870-963d-199a771d42d8, accessed on 05.06.2023), *G. laciniata* is also regarded as a synonym of *G. pyrenaica*. However, Tzvelev (1978) argued its independent position due to differences in calyx morphology (3–5 mm long laciniate vs. 2–3 mm long ovate-laciniate segments) and distribution (Carpathian vs. Pyrenean). Kliment et al. (2016), based on the studies of Rybczyński et al. (2014), who showed its isolated position from *G. pyrenaica*, also concluded that *G. laciniata* is an independent species, an eastern Carpathian endemic narrowly distributed in the Ukrainian Carpathians. Nevertheless, Zuev (2019) later reconsidered it as a subspecies within the genus *Ciminalis*, i.e. *C. dshimilensis* subsp. *laciniata* (Kit. ex Kanitz) Zuev and indicated a much wider, Caucasian-Balkanian-Carpathian, distribution. Zuev (2019) also proposed a new combination for *G. pyrenaica* – *Ciminalis pyrenaica* (L.) Zuev and placed it together with *C. dshimilensis* subsp. *laciniata* in the same section Pyrenaicae (Grossh.) Zuev. However, he did not indicate either distribution or morphological differences between *C. pyrenaica* and *C. dshimilensis subsp. L.ciniata*. Later, Favre et al. (2020) made several taxonomic recombinations, based on molecular data. In particular, Favre et al. (2020) placed *G. pyrenaica* into the section Chondrophyllae Bunge (≡ *Ciminalis* sect. Chondrophyllae (Bunge) Zuev), but the position and identity of *G. laciniata* remained unclear. Hence, due to controversial opinions, the taxonomic status and chorology of *G. laciniata* require further discussion.

Swertia punctata Baumg., Enum. Stirp. Transsilv. 1: 190 (1816)

- GBIF https://www.gbif.org/species/5595494
- IPNI urn:lsid:ipni.org:names:371052-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000498017
- POWO https://powo.science.kew.org/taxon/371052-1
- Wikispecies https://species.wikimedia.org/wiki/Swertia_perennis_subsp._perennis
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/8849d45a-513e-4769-be0e-172d4a9dc41f
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Swertia-perennis

Nomenclature:

≡ *Swertia perennis* subsp. *punctata* (Baumg.) Ciocârlan, Fl. Ilustr. Rom. Vol. 2: 104 (1990), non *S. dichotoma* var. *punctata* T.N.Ho & J.X.Yang; POWO: https://powo.science.kew.org/taxon/3007716-4

= *Swertia perennis* M.Bieb. ex Boiss., Fl. Orient. [Boissier] 4(1): 78 (1879), non L.; GBIF: https://www.gbif.org/species/8516331; GBIF: https://www.gbif.org/species/7945478; IPNI: https://ipni.org/n/371025-1; BHL: https://www.biodiversitylibrary.org/page/18114750#page/86

= *Swertia stigmantha* K.Koch, Linnaea 23: 586 (1850); GBIF: https://www.gbif.org/species/5595375; IPNI: https://ipni.org/n/371096-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000497939; POWO: https://

powo.science.kew.org/taxon/371096-1; BHL: https://www.biodiversitylibrary.org/item/109824#page/594

– *Swertia perennis* L., Sp. Pl. 1: 226 (1753) [p. p. *minor*]; CoL: https://www.catalogueoflife.org/data/taxon/9KSFD; GBIF: https://www.gbif.org/species/7270211; IPNI: https://ipni.org/n/371026-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000498075; POWO: https://powo.science.kew.org/taxon/371026-1; BHL: https://www.biodiversitylibrary.org/page/358245#page/238

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: GBIF (https://www.gbif.org/species/5595494, accessed on 06.06.2023), POWO (https://powo.science.kew.org/taxon/371096-1, accessed on 06.06.2023) and WFO (https://list.worldfloraonline.org/wfo-0000498017, accessed on 06.06.2023) provide *S. stigmantha* K.Koch amongst the synonyms of *S. punctata*. However, *S. stigmantha* has been described from Kazbek Mt. in the Caucasus and in its protologue, it was indicated that this species is just similar to *S. perennis* L. and *S. punctata* (Koch 1850: pp. 586–587). Perhaps, due to the occasional synonymisation of *S. stigmantha* and *S. punctata* within the framework of *S. perennis*, these two species were considered as direct synonyms. However, they are not – *S. punctata* occurs in the Carpathians and has only a few confirmed localities outside these mountains – in Bulgaria and Kosovo (Tan and Vladimirov 2001, Anchev et al. 2009, Kliment et al. 2016).

Boissier (1879), on page 78, mentioned *S. punctata* for Hungarian Mts. and Transylvania and provided *S . perennis* in the sense of M.Bieb., non L. amongst its synonyms. However, for some reason, he also included the Caucasian plants *S. iberica* Fisch. ex C.A.Mey. and *S. obtusa* var. *albiflora* Ledeb. in *S. punctata*.

Family Rubiaceae

Galium album subsp. *suberectum* (Klokov) Michálk., Karpatskaja Fl.: 78 (1988) et Biología, Bot. (Czechoslovakia) 48(1): 48 (1993)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7JSZR
- GBIF https://www.gbif.org/species/2915138
- IPNI urn:lsid:ipni.org:names:975731-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000968241
- WFO http://www.worldfloraonline.org/taxon/wfo-0001257913
- POWO https://powo.science.kew.org/taxon/975731-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/e9e55f52-c0a6-4ff1-bfc2-850fc687fe7c
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Galium-album

Nomenclature:

≡ *Galium erectum* subsp. *suberectum* (Klokov) Kobiv et al., Visnyk Lviv Univ., Ser. Biol. 49: 68 (2009) [nom. illeg.]

≡ *Galium suberectum* Klokov, Fl. UkrSSR 10: 463 (1961) *; GBIF: https://www.gbif.org/species/2915139; IPNI: https://ipni.org/n/750685-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000970278; POWO: https://powo.science.kew.org/taxon/750685-1

= *Galium mollugo* subsp. *erectum* f. *longifolium* Kucowa in Pawł., Fl. Polska 11: 311, 324 (1967)

– *Galium erectum* auct. fl. ucrain. carpat., non Huds.

– *Galium mollugo* subsp. *erectum* (Huds.) Syme sensu Kucowa in Pawł., Fl. Polska 11: 311, 324 (1967) [p. p.]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Galium transcarpaticum Stojko et Tasenk., Ukr. Bot. J. 36(6): 594 (1979)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/3F6MG
- GBIF https://www.gbif.org/species/2914196
- IPNI urn:lsid:ipni.org:names:750754-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000970423
- POWO https://powo.science.kew.org/taxon/750754-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d23eb453-2c4e-44b0-88b7-a1017ad5b096
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Galium-transcarpaticum
- JACQ https://www.jacq.org/detail.php?ID=406667
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.lws0017273

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Controversial species (probably a local morphotype of *Galium album* subsp. *suberectum*) with an unclear systematic position (Stojko and Tasenkevich 1979). It was excluded from the new edition of the Flora of the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015) due to its ambiguous delimiting morphological features and almost total absence of specimens identified as *G. transcarpaticum* by other researchers besides Tasenkevich. However, it was accepted by Mosyakin and Fedoronchuk (1999) and still listed as an endangered species by Onyshchenko et al. (2022) due to the absence of any further investigations on this species. Only for this reason, despite solid doubts, I retained this species as valid in the current list.

Order Lamiales

Family Lamiaceae

Thymus alternans Klokov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 16: 293 (1954)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/56QNV
- GBIF https://www.gbif.org/species/5607756
- IPNI urn:lsid:ipni.org:names:460875-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000323669
- POWO https://powo.science.kew.org/taxon/460875-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d4cedbae-5fc0-4f8a-b5cc-deeb11ca2ad4
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Thymus-alternans

Nomenclature:

– *Thymus marschallianus* auct., non Willd. *

– *Thymus glabrescens* auct., non Willd.

– *Thymus serpyllum* f. *margittaianus* auct., non Lyka in Jav.

– *Thymus roegneri* K.Koch, Linnaea 21(6): 666 (1849) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/5605565; IPNI: https://ipni.org/n/461608-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000324688; POWO: https://powo.science.kew.org/taxon/461608-1; BHL: https://www.biodiversitylibrary.org/page/110603#page/669

– *Thymus serpyllum* var. *roegneri* (K.Koch) Nyman, Consp. Fl. Eur. Suppl. 2: 257 (1890) [p. p., tantum quod plantas ucrain. carpat.]; IPNI: https://ipni.org/n/77293372-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000803343; POWO: https://powo.science.kew.org/taxon/77293372-1; BHL: https://www.biodiversitylibrary.org/page/11015401#page/268

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/d4cedbae-5fc0-4f8a-b5cc-deeb11ca2ad4, accessed on 06.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Thymus-roegneri, accessed on 06.06.2023) consider *T. alternans* a synonym of *T. roegneri* K.Koch, which is widely distributed. However, Kliment et al. (2016) suggest it to be a valid subendemic species. Mártonfi (1996), Nachychko (2014) and Nachychko and Honcharenko (2017) also support the independence of *T. alternans*. Nevertheless, *T. alternans* plants from the Ukrainian Carpathians were sometimes misidentified as *T. roegneri*.

Thymus pulcherrimus subsp. *pulcherrimus* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 140 (1859) et Enum. Pl. Transsilv.: 526 (1866)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/56RBT
- GBIF https://www.gbif.org/species/7306766
- IPNI urn:lsid:ipni.org:names:461561-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000324604
- POWO https://powo.science.kew.org/taxon/461561-1
- Wikispecies https://species.wikimedia.org/wiki/Thymus_pulcherrimus
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/633a82db-648d-4296-8a92-d38b5b1d68af
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Thymus-pulcherrimus
- BHL https://www.biodiversitylibrary.org/page/11528081#page/384

Nomenclature:

≡ *Thymus chamaedrys* subsp. *pulcherrimus* (Schur) Simonk., Enum. Fl. Transsilv.: 442 (1886); GBIF: https://www.gbif.org/species/9273406; IPNI: https://ipni.org/n/77257228-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200012678; POWO: https://powo.science.kew.org/taxon/77257228-1; BHL: https://www.biodiversitylibrary.org/page/10524577#page/506

≡ *Thymus pulcherrimus* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 140 (1859) [s. str.] *; CoL: https://www.catalogueoflife.org/data/taxon/56RBT; GBIF: https://www.gbif.org/species/7306766; IPNI: https://ipni.org/n/461561-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000324604; POWO: https://powo.science.kew.org/taxon/461561-1; BHL: https://www.biodiversitylibrary.org/page/11528081#page/384

≡ *Thymus serpyllum* subsp. *pulcherrimus* (Schur) Lyka in Ják., Magyar Fl.: 902 (1925); GBIF: https://www.gbif.org/species/7921817; IPNI: https://ipni.org/n/77257325-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000813146; POWO: https://powo.science.kew.org/taxon/77257325-1

≡ *Thymus serpyllum* var. *pulcherrimus* (Schur) Nyman, Consp. Fl. Eur., Suppl. 2: 257 (1890); GBIF: https://www.gbif.org/species/8243035; IPNI: https://ipni.org/n/77293914-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000803341; POWO: https://powo.science.kew.org/taxon/77293914-1; BHL: https://www.biodiversitylibrary.org/page/11015401#page/268

= *Thymus rotundifolius* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 1: 108 (1850), non alior; GBIF: https://www.gbif.org/species/8345586; IPNI: https://ipni.org/n/461614-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000324696; POWO: https://powo.science.kew.org/taxon/461614-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/118

= *Thymus serpyllum* f. *oreades* Lyka ex Jáv., Magyar Fl.: 902 (1925); GBIF: https://www.gbif.org/species/8043403; WFO: http://www.worldfloraonline.org/taxon/wfo-0000813147; POWO: https://powo.science.kew.org/taxon/351274-4

= *Thymus pulcherrimus* var. *oreades* (Lyka) Borza, Consp. Fl. Rom.: 233 (1947)

= *Thymus pulcherrimus* f. *oreades* (Lyka) Guşul. in Săvul., Fl. Rep. Pop. Rom. 8: 330 (1961)

= *Thymus pulcherrimus* f. *beldiei* Guşul. in Săvul., Fl. Rep. Pop. Rom. 8: 689 (1961) [nom. invalid.]

= *Thymus circumcinctus* Klokov, Bot. Mater. Gerb. Bot. Inst. Komarova Akad. Nauk SSSR 16: 294 (1954) *; GBIF: https://www.gbif.org/species/5607459; IPNI: https://ipni.org/n/461039-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000323880; POWO: https://powo.science.kew.org/taxon/461039-1

– *Thymus carpathicus* auct fl. ucrain. carpat., non Čelak. *

– *Thymus montanus* auct., non Waldst. & Kit.

– *Thymus sudeticus* Opiz ex Rchb., Fl. Germ. Excurs.: 312 (1830–1832) et Opiz ex Borbás, Math. Term. Közlem. 24(2): 103 (1890) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/5605220; GBIF: https://www.gbif.org/species/8040934; GBIF: https://www.gbif.org/species/8594373; IPNI: https://ipni.org/n/461700-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000324862; POWO: https://powo.science.kew.org/taxon/461701-1; BHL: https://www.biodiversitylibrary.org/page/6026374#page/385

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: Mártonfi (1997) delimited *T. pulcherimus* subsp. *carpaticus* (= subsp. *sudeticus* (Lyka) P.A.Schmidt) distributed in the western Carpathians and Sudetes from the eastern Carpathian subspecies *T. pulcherimus* subsp. *pulcherimus* (Mártonfi and Marhold 1998, Štěpánek and Tomšovic 2000). Amongst synonyms of *T. pulcherimus* subsp. *carpaticus*, Mártonfi (1997) surprisingly indicated *T. circumcinctus* Klokov, which has been described from the eastern Carpathians (Klokov 1960: pp. 301–302). However, in the following paper (Mártonfi and Marhold 1998), this confusing synonym and some other synonyms have been excluded.

Family Oleaceae

Syringa josikaea J.Jacq. ex Rchb.f., Iconogr. Bot. Pl. Crit. 8: 32 (1830) et J.Jacq., Flora 14(1): 67, 399 (1831)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/8X5YV
- GBIF https://www.gbif.org/species/7636833
- GBIF https://www.gbif.org/species/5549698

- IPNI urn:lsid:ipni.org:names:60466522-2
- IPNI urn:lsid:ipni.org:names:611121-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000818449
- POWO https://powo.science.kew.org/taxon/60466522-2?_gl=1
- Wikispecies https://species.wikimedia.org/wiki/Syringa_josikaea
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/b96456c9-76ec-444e-a8ff-6e36428ecf45
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Syringa-josikaea
- BHL https://www.biodiversitylibrary.org/page/27340#page/72

Nomenclature:

= *Syringa henryi* var. *eximia* Rehder, Mitt. Deutsch. Dendrol. Ges. 24: 227 (1915); GBIF: https://www.gbif.org/species/7903992; WFO: http://www.worldfloraonline.org/taxon/wfo-0000821332; POWO: https://powo.science.kew.org/taxon/359007-4; BHL: https://www.biodiversitylibrary.org/item/49730#page/257

= *Syringa josikaea* var. *eximia* Froebel ex Olbrich, Möller's Deutsche Gärtn.-Zeitung 16: 561 (1901); GBIF: https://www.gbif.org/species/12061256; IPNI: https://www.ipni.org/n/77293238-1; WFO: http://www.worldfloraonline.org/taxon/wfo-1200020780; POWO: https://powo.science.kew.org/taxon/77293238-1

= *Syringa josikaea* [unranked] *eximia* hort. ex Beissner, Schelle & Zabel, Handb. Laubholzben.: 415 (1903); GBIF: https://www.gbif.org/species/11982022; POWO: https://powo.science.kew.org/taxon/495110-4

= *Syringa josikaea* f. *monstrosa* Jägger ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* f. *pallida* Jägger ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* [unranked] *pallida* hort. ex Beissner, Schelle & Zabel, Handb. Laubholzben.: 415 (1903)

= *Syringa josikaea* f. *rosea* Miemetz ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* f. *rubra* hort. ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* [unranked] *rubra* hort. ex Beissner, Schelle & Zabel, Handb. Laubholzben.: 415 (1903)

= *Syringa josikaea* f. *simia* Froebel ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* f. *zabelii* Froebel ex Morariu, Fl. Rep. Pop. Rom. 8: 513 (1961)

= *Syringa josikaea* [unranked] *zabeli* hort. ex Beissner, Schelle & Zabel, Handb. Laubholzben.: 415 (1903); GBIF: https://www.gbif.org/species/7596635; IPNI: https://www.ipni.org/n/77293646-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000821333; POWO: https://powo.science.kew.org/taxon/77293646-1

= *Syringa prunifolia* Kit. ex Lingelsh., Pflanzenr. [Engler] 72: 78 (1920); GBIF: https://www.gbif.org/species/5549631; IPNI: https://www.ipni.org/n/611152-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001354634; BHL: https://www.biodiversitylibrary.org/item/61953#page/84

= *Syringa vincetoxifolia* Baumg. ex Steud., Nomencl. Bot., ed. 2 2: 656 (1841); GBIF: https://www.gbif.org/species/8462335; GBIF: https://www.gbif.org/species/5549581; IPNI: https://www.ipni.org/n/611183-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000818702; POWO: https://powo.science.kew.org/taxon/611183-1; BHL: https://www.biodiversitylibrary.org/page/392733#page/1512

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022). Global – EN (Höhn and Lendvay 2018).

Distribution: SE Carpathian endemic.

Notes: This vulnerable species is listed by the Red Book of Ukraine (Mygal et al. 2009, MEPNR of Ukraine 2021) and by IUCN Red List (Höhn and Lendvay 2018).

Vasiliev (1952) and Macalik et al. (2013) mentioned *S. prunifolia* as a synonym of *S. josikaea*, but provided incorrect taxonomic authorship Kit. in Sched. ex Borbás, while the proper authorship is Kit. ex Lingelsh. (https://www.ipni.org/n/611152-1, accessed on 07.07.2023).

Family Orobanchaceae

Euphrasia tatrae Wettst., Oesterr. Bot. Z. 44: 248 (1894)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/3CS5Z
- GBIF https://www.gbif.org/species/3736062
- IPNI urn:lsid:ipni.org:names:802898-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000682687
- POWO https://powo.science.kew.org/taxon/802898-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/3f527fb0-810c-433f-a045-dbc651817be3
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Euphrasia-tatrae
- BHL https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p28757191|p8735912
- JACQ https://kfta.jacq.org/KFTA0001455
- JACQ https://wu.jacq.org/WU0037599
- JACQ https://wu.jacq.org/WU0037600
- JACQ https://wu.jacq.org/WU0037601
- JACQ https://wu.jacq.org/WU0037602
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.mpu020694
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.g00356782
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.mpu020693
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.kfta0001455

Nomenclature:

≡ *Euphrasia minima* subsp. *tatrae* (Wettst.) Hayek in Hegi, Ill. Fl. Mitteleur. 6(1): 91 (1913) *; GBIF: https://www.gbif.org/species/7531784; WFO: http://www.worldfloraonline.org/taxon/wfo-0001138644; POWO: https://

powo.science.kew.org/taxon/2900710-4; JACQ: https://je.jacq.org/JE00017586; JACQ: https://je.jacq.org/JE00017587; JACQ: https://je.jacq.org/JE00017588; JACQ: https://je.jacq.org/JE00017589; JACQ: https://je.jacq.org/JE00017590; JACQ: https://je.jacq.org/JE00017591; JACQ: https://je.jacq.org/JE00017592; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017590; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017592; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017589; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017588; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017591; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017586; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017587

≡ *Euphrasia minima* var. *tatrae* (Wettst.) Pawł., Fl. Polska 11: 17 (1967)

= *Euphrasia minima* var. *carpathica* Freyn in Sagorski & Schneider, Fl. Centralkarpat. 2: 421 (1891) non *Euphrasia carpatica* Zapał.; POWO: https://powo.science.kew.org/taxon/2936289-4; JACQ: https://wu.jacq.org/WU0037573

= *Euphrasia minima* var. *tatrae* f. *glandulifera* (Wettst.) Răvăruț, Fl. Rep. Pop. Rom. 7: 586 (1960)

= *Euphrasia officinalis* [unranked] δ *alpestris* Freyn, Verh. K.K. Zool.-Bot. Ges. Wien 22: 350 (1872), non Günther, Grab. & Wimm.; BHL: https://www.biodiversitylibrary.org/item/136833#page/494

= *Euphrasia tatrae* subsp. *glandulifera* (Wettst.) Staszk., Fragm. Florist. Geobot. 22(2): 292 (2015); GBIF: https://www.gbif.org/species/8923251; IPNI: https://www.ipni.org/n/77154667-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001368423; POWO: https://powo.science.kew.org/taxon/77154667-1

= *Euphrasia tatrae* f. *glandulifera* Wettst., Monogr. Gatt. *Euphrasia*: 165 (1896)

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Wettstein, who described *E. tatrae* in 1894, later distinguished *E. tatrae* f. *glandulifera* Wettst. by the presence of glandular trichomes (Wettstein 1894, Wettstein 1896). However, he noted that plants with glandular and eglandular trichomes co-occur and can probably hybridise. Staszkiewicz (2015) raised this form to rank of subspecies and delimited subsp. *tatrae* and subsp. *glandulifera* (Wettst.) Staszk. Staszkiewicz (2015) also noted that *E. tatrae* subsp. *glandulifera* is a hybrid of *E. rostkoviana* Hayne and *E. nemorosa* (Pers.) Wallr. *Euphrasia tatrae* subsp. *glandulifera* is not mentioned for the flora of the Ukrainian Carpathians, but both mentioned parental species occur there and, therefore, the presence of their hybrid is highly possible. It is also worth noting that Mirek et al. (2020) consider *E. tatrae* as a synonym of *E. minima* Jacq. ex DC. At the same time, Tzvelev (1981) and Peregrym (2010) believed that *E. minima* and *E. tatrae* are two different species. He pointed out that *E. minima* occurs in more western areas of Europe and does not occur in the USSR (i.e. in the Ukrainian

Carpathians), where it is displaced by *E. tatrae*. Hence, due to the absence of special morphological studies of *E. tatrae* in the Ukrainian Carpathians and its questionable taxonomy, here I am not delimiting the subspecies or forms within this species and consider *E. tatrae* subsp./ f. *glandulifera* a synonym of *E. tatrae*.

Family Plantaginaceae

Plantago atrata subsp. *carpatica* (Pilg.) Soó, Acta Geobot. Hung. 3: 61 (1940)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5KH8H
- GBIF https://www.gbif.org/species/7624228
- IPNI urn:lsid:ipni.org:names:77252604-1
- WFO http://www.worldfloraonline.org/taxon/wfo-1200011825
- POWO https://powo.science.kew.org/taxon/77252604-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/8cf71b0a-d70e-47e4-a6fc-328e266ce518
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Plantago-atrata

Nomenclature:

≡ *Plantago atrata* subsp. *atrata* var. *carpathica* (Pilg.) Pilg., Pflanzenr. (Engler) 102: 296 (1937); GBIF: https://www.gbif.org/species/8397828; BHL: https://www.biodiversitylibrary.org/item/71651#page/304

≡ *Plantago montana* subsp. *atrata* var. *carpathica* Pilg., Repert. Spec. Nov. Regni Veg. 23: 256 (1926–1927); GBIF: https://www.gbif.org/species/7564352; POWO: https://powo.science.kew.org/taxon/3007639-4

≡ *Plantago montana* subsp. *carpatica* (Pilg.) Soó ex Balázs, Acta Geobot. Hung. 2: 40 (1938–1939); POWO: https://powo.science.kew.org/taxon/3007638-4

= *Plantago atrata* subsp. *atrata* var. *carpathica* subvar. rigidior (Pilg.) Pilg., Pflanzenr. (Engler): 296 (1937); BHL: https://www.biodiversitylibrary.org/item/71651#page/304

= *Plantago atrata* subsp. *atrata* var. *carpathica* subvar. vestita (Pilg.) Pilg., Pflanzenr. (Engler): 296 (1937); BHL: https://www.biodiversitylibrary.org/item/71651#page/304

= *Plantago atrata* var. *carpathica* f. *vestita* (Pilg.) Borza, Consp. Fl. Rom.: 255 (1949)

= *Plantago atrata* subsp. *carpathica* f. *vestita* (Pilg.) Soó, Acta Geobot. Hung. 3: 61 (1940)

= *Plantago lanceolata* [unranked] β *alpestris* Wahlenb., Fl. Carpat. Princip.: 44 (1814)

= *Plantago montana* [unranked] *alpestre* Wahlenb., Fl. Carpat. Princip.: 44 (1814)

= *Plantago montana* subsp. *atrata* var. *carpathica* subvar. rigidior Pilg., Repert. Spec. Nov. Regni Veg. 23: 257 (1926–1927)

= *Plantago montana* subsp. *atrata* var. *carpathica* subvar. vestita Pilg., Repert. Spec. Nov. Regni Veg. 23: 257 (1926–1927)

= *Plantago montana* subsp. *carpatica* subvar. rigidior (Pilg.) Balázs, Acta Geobot. Hung. 2: 40 (1938–1939)

= *Plantago montana* subsp. *carpatica* subvar. vestita (Pilg.) Balázs, Acta Geobot. Hung. 2: 40 (1938–1939)

– *Plantago alpina* Vill. sensu Rochel, Pl. Banat. Rar.: 32; Nr. 4, Tab. 1, fig. 4 (1828)

– *Plantago alpina* Vill. sensu Schur, Enum. Pl. Transsilv.: 564 (1866), non alior; BHL: https://www.biodiversitylibrary.org/item/7364#page/584

– *Plantago atrata* Hoppe, Bot. Taschenb. 1799: 85 (1799) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/8083357; IPNI: https://www.ipni.org/n/684903-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000487646; POWO: powo.science.kew.org/taxon/684903-1; BHL: https://www.biodiversitylibrary.org/item/22931#page/95

– *Plantago montana* Lam. sensu Schur, Enum. Pl. Transsilv.: 564 (1866), non alior *; BHL: https://www.biodiversitylibrary.org/item/7364#page/584

– *Plantago saxatilis* M.Bieb., Fl. Taur.-Caucasus 1: 109 (1808) [p. p.]; GBIF: https://www.gbif.org/species/4156187; IPNI: https://www.ipni.org/n/685623-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000487134; POWO: https://powo.science.kew.org/taxon/685623-1; BHL: https://www.biodiversitylibrary.org/page/11268189#page/117

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: There are nine subspecies of *P. atrata* Hoppe, from which only *P. atrata* subsp. *carpatica* is usually reported for the Ukrainian Carpathians. However, Chrtek (2000) also delimited *P. atrata* subsp. *ucrainica* Chrtek that, as he indicated, mainly occurs in the Svydovets Mts. Besides this, he mentioned the presence of this subspecies in Romania (Slănic Moldova and Retezat). *Plantago atrata* subsp. *ucrainica* differs by erect ascending (vs. decumbent to prostrate in *P. atrata* subsp. *carpatica*), longer (up to 17 cm long vs. 14 cm in *P. atrata* subsp. *carpatica*) and more narrow (up to 8 mm wide vs. 16 mm *P. atrata* subsp. *carpatica*) leaves. Distribution and phylogenetic position of *P. atrata* subsp. *ucrainica* still requires clarifications since, after Chrtek (2000), there were no further corresponding investigations on this subspecies.

The combination *P. montana* subsp. *carpatica* Soó, Acta Geobot. Hung. 2: 40 (1938–1939) and consequent recombination *P. atrata* subsp. *carpatica* (Soó) Soó, Acta Geobot. Hung. 3: 61 (1940), commonly circulated in the checklists, seem to be incorrect because it was Pilger who first applied the epithet *carpathica* in the name *P. montana* subsp. *atrata* var. *carpathica* Pilg. in 1926 (Pilger 1926). Later, in 1937, Pilger introduced a new combination *P. atrata* subsp. *atrata* var. *carpathica* (Pilg.) Pilg. (Pilger

1937). It looks like Soó made further taxonomic recombinations, based on these two Pilger's names, but, unfortunately, I could not locate the original works of Soó regarding *P. atrata* to check.

GBIF (https://www.gbif.org/species/11030083, accessed on 06.06.2023) incorrectly provides the name *P. atrata* subsp. *carpathica* (Pilg.) Pilg. It should be either *P. atrata* var. *carpathica* (Pilg.) Pilg. (incorrect taxonomic rank is indicated) or *P. atrata* subsp. *carpatica* (Pilg.) Soó (the incorrect authorship is provided). In both cases, the entry is duplicating other existing records.

Family Scrophulariaceae

Melampyrum saxosum Baumg., Enum. Stirp. Transsilv. 2: 199 (1816)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/6R9T5
- GBIF https://www.gbif.org/species/3725032
- IPNI urn:lsid:ipni.org:names:805724-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001138715
- POWO https://powo.science.kew.org/taxon/805724-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/6a35a594-7f27-40ef-8379-37fa68e734fe
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Melampyrum-saxosum

Nomenclature:

≡ *Melampyrum sylvaticum* [unranked] *M. saxosum* (Baumg.) Nyman, Consp. Fl. Eur.: 556 (1881); BHL: https://www.biodiversitylibrary.org/item/41446#page/567

≡ *Melampyrum sylvaticum* subsp. *saxosum* (Baumg.) G.Beauvis., Bull. Soc. Bot. Geneve 4: 418 (1912) et Mem. Soc. Phys. Hist. Nat. Geneve 38(6): 581 (1916) *; BHL: https://www.biodiversitylibrary.org/item/27563#page/810; BHL: https://www.biodiversitylibrary.org/item/50058#page/665

= *Melampyrum herbichii* Woł., Spraw Kom. Fizyi. Krajow. 21: 133 (1888) *; CoL: https://www.catalogueoflife.org/data/taxon/3Z5BY; GBIF: https://www.gbif.org/species/7331709; IPNI: https://www.ipni.org/n/805671-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001138706; POWO: https://powo.science.kew.org/2507126-4

= *Melampyrum herbichii* subsp. *csatoi* (Soó) Soó, Feddes Repert. 83(3): 181 (1972); GBIF: https://www.gbif.org/species/3725616; IPNI: https://www.ipni.org/n/891377-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001364943; POWO: https://powo.science.kew.org/taxon/891377-1

= *Melampyrum herbichii* subsp. *woloszczakii* Jasiewicz, Fragm. Florist. Geobot. 4: 112 (1958); GBIF: https://www.gbif.org/species/7867330

= *Melampyrum saxosum* subsp. *baumgartenii* (Soó) Soó, Feddes Repert. 24: 176 (1927); GBIF: https://www.gbif.org/species/8046716; WFO: http://

www.worldfloraonline.org/taxon/wfo-0000747163; POWO: https://powo.science.kew.org/taxon/2900697-4

= *Melampyrum saxosum* [unranked] *baumgartenii* Soó ex Jáv., Magyar Fl.: 1011 (1925); GBIF: https://www.gbif.org/species/8117461; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747164; POWO: https://powo.science.kew.org/taxon/2900698-4

= *Melampyrum saxosum* var. *baumgartenii* (Soó) Nyár., Flora Rep. Pop. Rom. 7: 637, 646 (1960)

= *Melampyrum saxosum* subsp. *javorkae* (Soó) Soó, Feddes Repert. 24: 176 (1927); GBIF: https://www.gbif.org/species/7459548; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747162; POWO: https://powo.science.kew.org/taxon/2900696-4

= *Melampyrum saxosum* [unranked] *javorkae* Soó ex Jáv., Magyar Fl.: 1011 (1925); GBIF: https://www.gbif.org/species/7653737; WFO: http://www.worldfloraonline.org/taxon/wfo-0000747165; POWO: https://powo.science.kew.org/taxon/2900699-4

= *Melampyrum saxosum* var. *javorkae* (Soó) Nyár., Flora Rep. Pop. Rom. 7: 637, 646 (1960)

= *Melampyrum saxosum* var. *typicum* Nyár., Flora Rep. Pop. Rom. 7: 637, 646 (1960)

= *Melampyrum sylvaticum* f. *csatoi* Soó, Feddes Repert. 24: 174 (1927); GBIF: https://www.gbif.org/species/8389454; POWO: https://powo.science.kew.org/taxon/2900694-4

= *Melampyrum sylvaticum* subsp. *moeszianum* Soó, Feddes Repert. 24: 190 (1927); GBIF: https://www.gbif.org/species/7632053; POWO: https://powo.science.kew.org/taxon/2900695-4

= *Melampyrum sylvaticum* [unranked] α *pictum* Herbich, Select. Pl. Rar. Galic. Bucov.: Nr 39 (1836) et Fl. Bucov.: 275 (1859)

= *Melampyrum sylvaticum* var. β *saxosum* Willkomm, Führer Pfl. Deutsch., Österr. und Schweiz: 535 (1881)

= *Melampyrum sylvaticum* subsp. *saxosum* var. *herbichii* (Woł.) G.Beauvis., Mem. Soc. Phys. Hist. Nat. Geneve 38: 582 (1916)

= *Melampyrum sylvaticum* subsp. *saxosum* var. β *pictum* (Herbich) G.Beauvis., Mem. Soc. Phys. Hist. Nat. Geneve 38: 581 (1916); BHL: https://www.biodiversitylibrary.org/item/50058#page/665

= *Melampyrum sylvaticum* subsp. *saxosum* var. *pictum* subvar. eu-pictum G.Beauvis., Mem. Soc. Phys. Hist. Nat. Geneve 38: 582 (1916); BHL: https://www.biodiversitylibrary.org/item/50058#page/666

= *Melampyrum sylvaticum* subsp. *saxosum* var. *pictum* subvar. eu-saxosum G.Beauvis., Mem. Soc. Phys. Hist. Nat. Geneve 38: 582 (1916); BHL: https://www.biodiversitylibrary.org/item/50058#page/666

– *Melampyrum pictum* Herbich [nom inval., ex herb LWS] *

– *Melampyrum sylvaticum* Simonk., Enum. Fl. Transsilv.: 429 (1886) [p. p.], non L.; BHL: https://www.biodiversitylibrary.org/item/40105#page/493

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Capathian endemic.

Notes: GBIF (https://www.gbif.org/species/7331709, accessed on 06.06.2023), CoL (https://www.catalogueoflife.org/data/taxon/3Z5BY, accessed on 06.06.2023), WFO (https://list.worldfloraonline.org/wfo-0001138706, accessed on 06.06.2023) and Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/dd655aaa-26d0-4250-8474-fdb870a3cea8) consider *M. herbichii* Woł. an independent species. However, Štech and Drábková (2005) and Těšitel and Štech (2007) concluded that *M. herbichii* is morphologically identical to *M. saxosum* and differs only by perianth colouration. Later, Těšitel et al. (2009), based on comprehensive morphological and molecular analyses, confirmed that these two species are to be united.

Order Malpighiales

Family Linaceae

Linum extraaxillare Kit. ex Rochel, Pl. Banat. Rar.: 26 (1828) [nom. nudum] et Kit., Linnaea 32(4-5): 573 (1864)

- GBIF https://www.gbif.org/species/4049149
- IPNI urn:lsid:ipni.org:names:544466-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000363481
- POWO https://powo.science.kew.org/taxon/544466-1
- Wikispecies https://species.wikimedia.org/wiki/Linum_extraaxillare
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/2e6f70ed-2b39-4165-b65a-3fc35efc0590
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Linum-perenne
- BHL https://www.biodiversitylibrary.org/page/118664#page/576

Nomenclature:

≡ *Linum perenne* subsp. *extraaxillare* (Kit. ex Rochel) Nyman, Consp. Fl. Eur., Suppl. 2: 71 (1889); CoL: https://www.catalogueoflife.org/data/taxon/7K9NB; GBIF: https://www.gbif.org/species/6711238; WFO: https://list.worldfloraonline.org/wfo-0000737557; POWO: https://powo.science.kew.org/taxon/2873434-4

– *Linum montanum* auct. fl. transsilv., non Schleich.

– *Linum alpinum* auct. fl. transsilv., non L.

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Family Salicaceae

Salix kitaibeliana Willd., Sp. Pl., ed. 4 [Willdenow] 4(2): 683-684 (1806)

- GBIF https://www.gbif.org/species/5583534
- IPNI urn:lsid:ipni.org:names:777938-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000928719
- POWO https://powo.science.kew.org/taxon/777938-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/fbc32a8d-dcc0-4db9-8ae3-d3cad32cc004
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Salix-retusa
- BHL https://www.biodiversitylibrary.org/page/566410#page/52

Nomenclature:

≡ *Salix retusa* subsp. *kitaibeliana* (Willd.) Jáv., Magyar Fl.: 235 (1924) *; POWO: https://powo.science.kew.org/taxon/3007645-4

≡ *Salix retusa* f. *kitaibeliana* (Willd.) Rouy, Fl. France [Rouy & Foucaud] 12: 219 (1910) *; POWO: https://powo.science.kew.org/taxon/3253081-4

≡ *Salix retusa* [unranked] γ *kitaibeliana* (Willd.) Rchb., Reichenbachianae Fl. German.: 15 (1833) et Icon. Fl. Germ. Helv. 11: 16, fig. 1187 (1849); GBIF: https://www.gbif.org/species/9285964; BHL: https://www.biodiversitylibrary.org/page/5763497#page/22

= *Salix retusa* [unranked] b *serrulata* Roch., Pl. Banat.: 78, tab. 38, fig. 80 (1828)

= *Salix retusa* var. *serrulata* Roch. ex Rchb., Fl. Germ. Excurs.: 166 (1831); POWO: https://powo.science.kew.org/taxon/3235618-4; BHL: https://www.biodiversitylibrary.org/item/7359#page/239

= *Salix retusa* var. *major* Rchb., Fl. Germ. Excurs.: 166 (1830–1832); POWO: https://powo.science.kew.org/taxon/3235617-4; BHL: https://www.biodiversitylibrary.org/item/7359#page/239

= *Salix retusa* [unranked] β *major* W.D.J. Koch, Syn. Fl. Germ. Helv.: 660 (1837) [nom. superfl.]; GBIF: https://www.gbif.org/species/11966312; BHL: https://www.biodiversitylibrary.org/item/29532#page/724

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: A rare species listed by the Red Book of Ukraine (Danylyk 2009, MEPNR of Ukraine 2021) with an unclear taxonomic position.

In all databases that were accessed on 06.06.2023, including CoL (https://www.catalogueoflife.org/data/taxon/6XDTN), GBIF (https://www.gbif.org/species/

8119241), POWO (https://powo.science.kew.org/taxon/778676-1), Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/fbc32a8d-dcc0-4db9-8ae3-d3cad32cc004) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Salix-retusa), *S. kitaibeliana* is provided as a synonym for *S. retusa* L., a Paneuropean mountainous species. Similarly, it is synonymised with *S. retusa* by many Ukrainian authors (e.g. Mosyakin and Fedoronchuk (1999), Danylyk (2009), Chorney (2011), Ishchuk (2017)). It is also synonymised by Kucowa (1954) and Mirek et al. (2020). However, Kliment et al. (2016), like some other authors (e.g. Piscová et al. (2021)), consider *S. kitaibeliana* as an independent species. Chopyk and Fedoronchuk (2015) noted that these two species are very close, but also still delimited them, based on the differences in the leaf morphology (leaves are up to 2 cm long obovate, with a retuse tip in *S. retusa* and up to 4 cm long, oblong-obovate, with a pointed tip in *S. kitaibeliana*). The same differences in the leaf morphology applied to delimit *S. kitaibeliana* and *S. retusa* in the Flora of Romania (Beldie 1952), where they are, however, provided in the rank of varieties. *Salix retusa* s. str. is considered in the Flora of Romania as *S. retusa* var. *genuina* Rchb. and *S. kitaibeliana* – as *S. retusa* var. *kitaibeliana* (Willd.) Rchb. Additionally, Beldie (1952) mentioned differences in their habitus (short creeping stems and branches in *S. retusa* and firm and sometimes ascending stems in *S. kitaibeliana*). The difference in the leaf morphology of these two species was statistically confirmed by Kosiński and Adreas Hilpold (2017). However, later phylogenetic studies (Kosiński et al. 2019) regarding ploidy did not allow delimiting *S. kitaibeliana*.

It is worth noting that Pawłowski (1946) also recognised *S. retusa* and *S. kitaibeliana* separately. He pointed out that, despite these two species often co-occurring, *S. retusa* prefers lime substrates while *S. kitaibeliana* mainly grows on granite outcrops and rocks. Myklestad and Birks (1993) partially confirmed such ecological differentiation of these two species in their ecogeographical studies – on the provided graphs, *S. kitaibeliana* is well separated from *S. retusa*.

Family Violaceae

Viola declinata Waldst. et Kit., Descr. Icon. Pl. Rar. Hung. 3: 248 (1807)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5BGMT
- GBIF https://www.gbif.org/species/5664655
- IPNI urn:lsid:ipni.org:names:868009-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000424016
- POWO https://powo.science.kew.org/taxon/868009-1
- Wikispecies https://species.wikimedia.org/wiki/Viola_declinata
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/02a632cf-6c07-4887-adef-70bd54e7d0ec
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Viola-declinata
- JACQ https://w.jacq.org/W0020444
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.m0112758

Nomenclature:

= *Viola declinata* var. *knechtelii* Grec., Consp. Fl. Rom.: 88 (1898)

= *Viola declinata* var. *major* (Roch.) Grec., Consp. Fl. Rom.: 88 (1898)

= *Viola declinata* [unranked] b *montana* Schur, Enum. Pl. Transsilv.: 86 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/106

= *Viola gracilis* Rchb., Fl. Germ. Excurs. 709 (1832), non alior; GBIF: https://www.gbif.org/species/7951755; IPNI: https://www.ipni.org/n/868244-1; BHL: https://www.biodiversitylibrary.org/page/6164133#page/276

= *Viola mutabilis* [unranked] b *intermedia* Roch., Enum. Pl. Banat.: 6 (1828) [nom. nudum]

= *Viola mutabilis* [unranked] e *major* Roch., Enum. Pl. Banat.: 6 (1828) [nom. nudum]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Capathian endemic.

Notes: *Viola declinata* is often considered a Carpatho-Balkanic species (Kricsfalusy and Budnikov 2002, Oprea 2005, Ciocârlan 2009). However, Velev and Apostolova (2009) reported that it does not occur in Serbia and Bulgaria, as suggested before. Considering the questionable presence of *V. declinata* in the Balkans (perhaps it is introduced), Chorney (2011) and Kliment et al. (2016) considered it a Carpathian endemic.

POWO (https://powo.science.kew.org/taxon/868009-1, accessed on 06.06.2023) erroneously indicates *V. latisepala* Wettst. amongst synonyms of *V. declinata. Viola latisepala* (= *V. elegantula subsp. latisepala* (Wettst.) W.Becker) is a problematic taxon, which is often considered a synonym for *V. elegantula*, a Balkan endemic (Valentine et al. 1968, Tomović et al. 2016). Currently *V. latisepala* is considered as a synonym for *V. tricolor* L. (Marcussen et al. 2022). Moreover, there are some other species (e.g. *V. aetolica* Boiss. & Heldr. and *V. dacica* Borbás) that are occasionally misidentified as *V. L.tisepala*. (Tomović et al. 2014).

Order Ranunculales

Family Ranunculaceae

Aconitum bucovinense Zapał., Rozpr. Wydz. Mat.-Przyr. Akad. Umiej., Dział B. Nauki Biol. 48: 8990 (1908)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/8S2V7
- GBIF https://www.gbif.org/species/3926782
- IPNI urn:lsid:ipni.org:names:707221-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517006

- POWO https://powo.science.kew.org/taxon/707221-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/3e3c3e87-e094-4e54-ae24-fef1882829ed
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list/?name=Aconitum-bucovinense

Nomenclature:

≡ *Aconitum callibotryon* subsp. *bucovinense* (Zapał.) Grinț., Fl. Rep. Pop. Rom. 2: 481 (1953); GBIF: https://www.gbif.org/species/8002043; WFO: https://list.worldfloraonline.org/wfo-0000517021; POWO: https://powo.science.kew.org/taxon/2618479-4

≡ *Aconitum firmum* subsp. *bucovinense* (Zapał.) Aschers. & Graebn., Syn. Mitteleurop. Fl. 5/2: 781 (1929); GBIF: https://www.gbif.org/species/8007137; WFO: https://list.worldfloraonline.org/wfo-0000517250; POWO: https://powo.science.kew.org/taxon/2618700-4

= *Aconitum bucovinense* f. *orthotricha* Gáyer, Magyar Bot. Lap. 8: 168 (1909); GBIF: https://www.gbif.org/species/12044665; POWO: https://powo.science.kew.org/taxon/3284484-4; BHL: https://www.biodiversitylibrary.org/item/201903#page/194

= *Aconitum callibotryon* subsp. *bucovinense* f. *altum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 685 (1953)

= *Aconitum callibotryon* subsp. *bucovinense* f. *densum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 685 (1953)

= *Aconitum callibotryon* subsp. *bucovinense* f. *glaberrimum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 684 (1953)

= *Aconitum callibotryon* subsp. *bucovinense* f. *laxum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 685 (1953)

= *Aconitum callibotryon* subsp. *bucovinense* f. *pilosum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 684 (1953)

= *Aconitum callibotryon* subsp. *bucovinense* f. *pyramidatum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 685 (1953)

= *Aconitum callibotryon* subsp. *rigidum* (Rchb.) Grinț., Fl. Rep. Pop. Rom. 2: 482 (1953)

= *Aconitum callibotryon* subsp. *rigidum* f. *glabrum* Grinț., Fl. Rep. Pop. Rom. 2: 482, 683 (1953)

= *Aconitum callibotryon* subsp. *rigidum* f. *pubescens* Grinț., Fl. Rep. Pop. Rom. 2: 482, 684 (1953); JACQ: https://ere.jacq.org/ERE0005605

= *Aconitum commutatum* Rchb., Uebers. *Aconitum*: 36 (1819); GBIF: https://www.gbif.org/species/3926625; IPNI: https://www.ipni.org/n/707272-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517107; POWO: https://powo.science.kew.org/taxon/707272-1

= *Aconitum firmum* f. *rigidum* (Rchb.) Gáyer, Magyar Bot. Lapok 8: 165 (1909); BHL: https://www.biodiversitylibrary.org/item/201903#page/191

= *Aconitum laetum* [unranked] β *rigidum* Rchb., Icon. Fl. Germ. Helv. 4: 25, tab. 97, fig. 4708b (1840); BHL: https://www.biodiversitylibrary.org/item/28665#page/127/

= *Aconitum napellus* f. *commutatum* (Rchb.) Gáyer in G. Hegi, Ill. Fl. Mitt.-Eur. 3: 499 (1912); GBIF: https://www.gbif.org/species/12132273; POWO: https://powo.science.kew.org/taxon/2619134-4

– *Aconitum bernhardianum* Rchb., Uebers. *Aconitum*: 34 (1819) et Illustrat. Spec. *Aconitum*: tab. 68 (1823–1827), non Wallr.; GBIF: https://www.gbif.org/species/3926951; IPNI: https://www.ipni.org/n/707197-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000516975; POWO: https://powo.science.kew.org/taxon/707197-1

Conservation status: In Ukraine – EN (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: The nomenclature and synonymy of the genus *Aconitum* L. follow Mitka (2003), Mitka (2008) and Mitka et al. (2021) with my *minor* additions and some notes.

Aconitum firmum subsp. *firmum* Rchb., Uebers. Aconitum: 20 (1819)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FDHQ
- GBIF https://www.gbif.org/species/7277350
- IPNI urn:lsid:ipni.org:names:707355-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517247
- POWO https://powo.science.kew.org/taxon/51035059-1
- Wikispecies https://species.wikimedia.org/wiki/Aconitum_firmum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/7f24502b-f9bb-438a-93e5-be837558865e
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-firmum
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613691
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613690
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613679

Nomenclature:

≡ *Aconitum koelleanum* var. *firmum* (Rchb.) Rchb., Mon. *Aconitum*: 85, Tab. 14, fig. 1 (1821); GBIF: https://www.gbif.org/species/12133197; GBIF: https://www.gbif.org/species/8102235; WFO: https://list.worldfloraonline.org/wfo-0000517479; POWO: https://powo.science.kew.org/taxon/2618919-4

≡ *Aconitum napellus* subsp. *firmum* (Rchb.) Gáyer in G.Hegi, Ill. Fl. Mitt.-Eur. 3: 498 (1912); GBIF: https://www.gbif.org/species/8325653; WFO: https://list.worldfloraonline.org/wfo-0000517706; POWO: https://powo.science.kew.org/taxon/2619142-4

≡ *Aconitum napellus* var. *firmum* (Rchb.) Pawł., Fl. Tatr. 1: 274 (1956) *; GBIF: https://www.gbif.org/species/11952496; WFO: https://list.worldfloraonline.org/wfo-0000517707; POWO: https://powo.science.kew.org/taxon/2619143-4

= *Aconitum napellus* [unranked] e *babiogorense* Zapał., Consp. Fl. Gal. Crit. 2: 226 (1908); GBIF: https://www.gbif.org/species/12106242; GBIF: https://www.gbif.org/species/7637895; WFO: https://list.worldfloraonline.org/wfo-0000517696; POWO: https://powo.science.kew.org/taxon/2619122-4

= *Aconitum napellus* [unranked] e *babiogorense f. babiogorense* Zapał., Consp. Fl. Gal. Crit. 2: 226 (1908); GBIF: https://www.gbif.org/species/8383207; WFO: https://list.worldfloraonline.org/wfo-0000517697

= *Aconitum napellus* [unranked] e *babiogorense f. subfissum* Zapał., Consp. Fl. Gal. Crit. 2: 227 (1908); GBIF: https://www.gbif.org/species/8104841; GBIF: https://www.gbif.org/species/12048859; WFO: https://list.worldfloraonline.org/wfo-0000517734; POWO: https://powo.science.kew.org/taxon/2619197-4

= *Aconitum napellus* [unranked] d *carpaticum f. carpaticum* Zapał., Consp. Fl. Gal. Crit. 2: 226 (1908); GBIF: https://www.gbif.org/species/12091834; GBIF: https://www.gbif.org/species/12091834; WFO: https://list.worldfloraonline.org/wfo-0000517699

= *Aconitum napellus* [unranked] b *subtatrense* Zapał., Consp. Fl. Gal. Crit. 2: 225 (1908); GBIF: https://www.gbif.org/species/8026543; GBIF: https://www.gbif.org/species/12162386; WFO: https://list.worldfloraonline.org/wfo-0000517736; POWO: https://powo.science.kew.org/taxon/2619199-4

= *Aconitum napellus* [unranked] b *subtatrense f. abnorme* Zapał., Consp. Fl. Gal. Crit. 2: 225 (1908); GBIF: https://www.gbif.org/species/7907677; WFO: https://list.worldfloraonline.org/wfo-0000517691; POWO: https://powo.science.kew.org/taxon/2619113-4

= *Aconitum napellus* [unranked] b *subtatrense f. latisectum* Zapał., Consp. Fl. Gal. Crit. 2: 225 (1908); GBIF: https://www.gbif.org/species/7593018; GBIF: https://www.gbif.org/species/12063034; WFO: https://list.worldfloraonline.org/wfo-0000517717; POWO: https://powo.science.kew.org/taxon/2619162-4

= *Aconitum napellus* [unranked] b *subtatrense f. subtatrense* Zapał., Consp. Fl. Gal. Crit. 2: 225 (1908); GBIF: https://www.gbif.org/species/7982741; WFO: https://list.worldfloraonline.org/wfo-0000517735; POWO: https://powo.science.kew.org/taxon/2619198-4

= *Aconitum napellus* [unranked] g *tatrense* Zapał., Consp. Fl. Gal. Crit. 2: 227 (1908); GBIF: https://www.gbif.org/species/7478935; GBIF: https://www.gbif.org/species/11994294; WFO: https://list.worldfloraonline.org/wfo-0000517740; POWO: https://powo.science.kew.org/taxon/2619201-4

– *Aconitum palmatifidum* Rchb., Uebers. Gat. *Aconitum*: 48 (1819) [p. p.]; GBIF: https://www.gbif.org/species/3922207; IPNI: https://www.ipni.org/n/707672-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517830; POWO: https://powo.science.kew.org/taxon/707672-1

– *Aconitum skerisorae* auct [e.g., Seitz, Soó], non Gáyer *

– *Aconitum tatrae* Borbás in Pallas, Nagy Lexikona 15: 15 (1897) [p. p.]; GBIF: https://www.gbif.org/species/7278294; WFO: https://list.worldfloraonline.org/wfo-0000518167; POWO: https://powo.science.kew.org/taxon/2619606-4

– *Aconitum tauricum* auct. fl. carpat., non Wulfen

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: GBIF (https://www.gbif.org/species/7569378, accessed on 06.06.2023) incorrectly provides *A. callibotryon* subsp. *scarisorense* Grinț. as a synonym for *A. firmum* subsp. *firmum*. At the same time, GBIF correctly indicates that *A. napellus* subsp. *scarisorense* (Grinț.) Jalas (https://www.gbif.org/species/3922734, accessed on 06.06.2023), a homotypic synonym of *A. callibotryon* subsp. *scarisorense*, belongs to *A. firmum* subsp. *skerisorae* (Gáyer) Starm. (https://www.gbif.org/species/10985587, accessed on 06.06.2023).

Aconitum firmum subsp. *fissurae* Nyár., Enum. Pl. Cheia Turzii: 132 (1939)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/8S9QC
- GBIF https://www.gbif.org/species/7501250
- IPNI urn:lsid:ipni.org:names:77122905-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517252
- POWO https://powo.science.kew.org/taxon/77122905-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/e6d4ad09-6515-4fc2-a11c-22936e7e1aa9
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-firmum

Nomenclature:

≡ *Aconitum napellus* subsp. *fissurae* (Nyár.) W.Seitz, Feddes Repert. 80: 42 (1969); GBIF: https://www.gbif.org/species/7688050; WFO: https://list.worldfloraonline.org/wfo-0000517708; POWO: https://powo.science.kew.org/taxon/2619144-4

= *Aconitum flerovii* Steinb. in Komarov, Fl. USSR 7: 221, 730 (1937); GBIF: https://www.gbif.org/species/3925362; IPNI: https://www.ipni.org/n/707360-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517265; POWO: https://powo.science.kew.org/taxon/707360-1

= *Aconitum hunyadense* Degen, Magyar Bot. Lapok 5: 196 (1906); GBIF: https://www.gbif.org/species/3924541; IPNI: https://www.ipni.org/n/707449-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517401; POWO: https://powo.science.kew.org/taxon/707449-1; BHL: https://www.biodiversitylibrary.org/item/202161#page/600

= *Aconitum romanicum* Woł., Fl. Polon. Exsicc. no. 905. *; GBIF: https://www.gbif.org/species/8006246; IPNI: https://www.ipni.org/n/707774-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517999; POWO: https://powo.science.kew.org/taxon/2619449-4; JACQ: https://www.jacq.org/detail.php?ID=389701; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613645; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00126605

= *Aconitum tatrae* subsp. *hunyadense* (Degen) Soó, Feddes Repert. 83: 135 (1972); GBIF: https://www.gbif.org/species/3931258; IPNI: https://www.ipni.org/n/888821-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000518168; POWO: https://powo.science.kew.org/taxon/888821-1

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: GBIF (https://www.gbif.org/species/10985587, accessed on 06.06.2023) incorrectly provides *A. napellus* subsp. *fissurae* amongst synonyms to *A. firmum* subsp. *skerisorae* (Gáyer) Starm. *Aconitum firmum* subsp. *skerisorae* is an independent subspecies endemic to Transylvania (Starmühller 2000).

Aconitum degenii subsp. *degenii* Gáyer, Magyar Bot. Lapok 5: 123 (1906)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FDH6
- GBIF https://www.gbif.org/species/7276900
- IPNI urn:lsid:ipni.org:names:707304-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517153
- POWO https://powo.science.kew.org/taxon/77122903-1
- Wikispecies https://species.wikimedia.org/wiki/Aconitum_degenii
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/4bf508f8-0fb6-42b5-8ea2-8cbe48db894a
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-degenii

Nomenclature:

= *Aconitum degenii* f. *craciunelense* Gáyer, Magyar Bot. Lap. 5: 126 (1906); GBIF: https://www.gbif.org/species/12141980; POWO: https://powo.science.kew.org/taxon/3284590-4; BHL: https://www.biodiversitylibrary.org/item/202161#page/528

= *Aconitum molle* Rchb., Uebers. Gat. *Aconitum*: 47 (1819); GBIF: https://www.gbif.org/species/3926208; IPNI: https://www.ipni.org/n/707593-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517656; POWO: https://powo.science.kew.org/taxon/707593-1

= *Aconitum paniculatum* [unranked] b *czeremossicum* Zapał., Consp. Fl. Gal. Crit. 2: 220 (1908); GBIF: https://www.gbif.org/species/8037520; WFO: https://

list.worldfloraonline.org/wfo-0000517836; POWO: https://powo.science.kew.org/taxon/2619293-4

= *Aconitum paniculatum* [unranked] d *intermedium* Zapał., Consp. Fl. Gal. Crit. 2: 221 (1908); POWO: https://powo.science.kew.org/taxon/2619296-4

= *Aconitum paniculatum* f. *latiusculum* Zapał., Consp. Fl. Gal. Crit. 2: 220 (1908); GBIF: https://www.gbif.org/species/12126565; POWO: https://powo.science.kew.org/taxon/2619299-4

= *Aconitum paniculatum* [unranked] a percalabense Zapał., Consp. Fl. Gal. Crit. 2: 220 (1908); GBIF: https://www.gbif.org/species/7721719; POWO: https://powo.science.kew.org/taxon/2619303-4

= *Aconitum paniculatum* [unranked] c *prutense* Zapał., Consp. Fl. Gal. Crit. 2: 221 (1908); GBIF: https://www.gbif.org/species/7793959; POWO: https://powo.science.kew.org/taxon/2619306-4; POWO: https://powo.science.kew.org/taxon/2619307-4

= *Aconitum paniculatum* [unranked] c *prutense f. lobatum* Zapał., Consp. Fl. Gal. Crit. 2: 221 (1908)

= *Aconitum paniculatum* [unranked] c *prutense f. subintermedium* Zapał., Consp. Fl. Gal. Crit. 2: 221 (1908)

= *Aconitum paniculatum* f. *tenuifissum* Zapał., Consp. Fl. Gal. Crit. 2: 220 (1908); GBIF: https://www.gbif.org/species/8294225; POWO: https://powo.science.kew.org/taxon/2619301-4

= *Aconitum prutense* (Zapał.) Tzvelev, Bot. Zhurn. (Moscow & Leningrad) 81(12): 115 (1997) *; GBIF: https://www.gbif.org/species/3921802; IPNI: https://www.ipni.org/n/996847-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517917; POWO: https://powo.science.kew.org/taxon/996847-1

– *Aconitum hebegynum* auct. fl. carpat., non DC. [p. p.] *

– *Aconitum paniculatum* Lam., Fl. Fr. 3: 646 (1778) [p. p., nom. inval.] *; GBIF: https://www.gbif.org/species/7276809; IPNI: https://www.ipni.org/n/707675-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517834; POWO: https://powo.science.kew.org/taxon/707675-1; BHL: https://www.biodiversitylibrary.org/page/10168296#page/648

– *Cammarum paniculatum* (Arcang.) Fourr., Ann. Soc. Linn. Lyon sér. 2 16: 327 (1868) [p. p.]; GBIF: https://www.gbif.org/species/5616149; IPNI: https://www.ipni.org/n/709367-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000582912; POWO: https://powo.science.kew.org/taxon/709367-1; BHL: https://www.biodiversitylibrary.org/item/237401#page/399

– *Delphinium paniculatum* (Arcang.) E.H.L.Krause, Deutschl. Fl. (Sturm), ed. 2. 5: 234 (1901) [p. p.], non Host; GBIF: https://www.gbif.org/species/3929050; IPNI: https://www.ipni.org/n/710879-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000640512

; POWO: https://powo.science.kew.org/taxon/710879-1; BHL: https://www.biodiversitylibrary.org/page/55366385#page/236

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022). Global – LC (Mitka 2019).

Distribution: Pancarpathian endemic.

Aconitum lasiocarpum subsp. *kotulae* (Pawł.) Starm. & Mitka, Acta Soc. Bot. Polon. 69(2): 150 (2000)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/7J77P
- GBIF https://www.gbif.org/species/3923695
- IPNI urn:lsid:ipni.org:names:1017003-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517522
- POWO https://powo.science.kew.org/taxon/1017003-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/4c78b8c9-e199-41f4-8248-3c3be1940167
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-lasiocarpum

Nomenclature:

≡ *Aconitum variegatum* subsp. *kotulae* Pawł., Fl. Tatr 1: 275 (1956); GBIF: https://www.gbif.org/species/12058061; GBIF: https://www.gbif.org/species/7777045; WFO: https://list.worldfloraonline.org/wfo-0000518265; POWO: https://powo.science.kew.org/taxon/2619702-4

≡ *Aconitum variegatum* f. *kotulae* (Pawł.) Skalický, Preslia 54(2): 119 (1982); GBIF: https://www.gbif.org/species/3930764; IPNI: https://www.ipni.org/n/920448-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000518266; POWO: https://powo.science.kew.org/taxon/920448-1

= *Aconitum beskidense* (Zapał.) Gáyer, Magyar Bot. Lapok 10: 201 (1911); GBIF: https://www.gbif.org/species/7861353; WFO: https://list.worldfloraonline.org/wfo-0000516976; POWO: https://powo.science.kew.org/taxon/2618437-4; BHL: https://www.biodiversitylibrary.org/item/201840#page/233

= *Aconitum cammarum* [unranked] a beskidense Zapał., Consp. Fl. Gal. Crit. 2: 215 (1908); GBIF: https://www.gbif.org/species/12167522; WFO: https://list.worldfloraonline.org/wfo-0000517030; POWO: https://powo.science.kew.org/taxon/2618487-4

= *Aconitum cammarum* [unranked] c *koscieliskanum* Zapał., Consp. Fl. Gallic. Crit., 2: 215 (1908); GBIF: https://www.gbif.org/species/7787241; WFO: https://list.worldfloraonline.org/wfo-0000517035; POWO: https://powo.science.kew.org/taxon/2618491-4

= *Aconitum gracile* subsp. *grosserratum* f. *beskidense* (Zapał.) Grinț., Fl. Rep. Pop. Rom. 2: 485 (1953); GBIF: https://www.gbif.org/species/11985202; GBIF: https://

www.gbif.org/species/8257779; WFO: https://list.worldfloraonline.org/wfo-0000517322; POWO: https://powo.science.kew.org/taxon/2618771-4

= *Aconitum paniculatum* [unanked] e *podolicum* Zapał., Consp. Fl. Gal. Crit. 2: 221 (1908); GBIF: https://www.gbif.org/species/8236504; GBIF: https://www.gbif.org/species/8149503; WFO: https://list.worldfloraonline.org/wfo-0000517847; POWO: https://powo.science.kew.org/taxon/2619305-4

= *Aconitum paniculatum* [unanked] e *podolicum f. latilobum* Zapał., Consp. Fl. Gal. Crit. 2: 222 (1908); GBIF: https://www.gbif.org/species/12053893; GBIF: https://www.gbif.org/species/7668283; WFO: https://list.worldfloraonline.org/wfo-0000517840; POWO: https://powo.science.kew.org/taxon/2619298-4

= *Aconitum podolicum* (Zapał.) Voroshylov, Bjul. Glav. Bot. Sada 158: 39 (1990) *; GBIF: https://www.gbif.org/species/3921913; IPNI: https://www.ipni.org/n/962363-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517900; POWO: https://powo.science.kew.org/taxon/962363-1

– *Aconitum lasiocarpum* Rchb., Uebers. Gat. *Aconitum*.: 55 (1819) [p. p.]; GBIF: https://www.gbif.org/species/7277094; IPNI: https://www.ipni.org/n/707516-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517521; POWO: https://powo.science.kew.org/taxon/707516-1

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022). Global – NT (Novikov and Mitka 2019).

Distribution: Pancarpathian subendemic.

Notes: *Aconitum lasiocarpum* (Rchb.) Gáyer is listed in the Red Book of Ukraine as vulnerable species without delimitation of subspecies (Melnyk and Batochenko 2009, MEPNR of Ukraine 2021).

Aconitum lasiocarpum subsp. *lasiocarpum* (Rchb.) Gáyer, Magyar Bot. Lapok 11: 199 (1911)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5FDJF
- GBIF https://www.gbif.org/species/7277095
- IPNI urn:lsid:ipni.org:names:707516-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517521
- POWO https://powo.science.kew.org/taxon/77227837-1
- Wikispecies https://species.wikimedia.org/wiki/Aconitum_lasiocarpum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/ac18631e-47c1-4016-9e69-aaed03e08cbf
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-lasiocarpum

Nomenclature:

≡ *Aconitum nasutum* var. *lasiocarpum* Rchb., Illustr. Spec. *Aconitum*: Nr. 47, Tab. 9 (1823–1827); GBIF: https://www.gbif.org/species/7616758; WFO: https://

list.worldfloraonline.org/wfo-0000517757; POWO: https://powo.science.kew.org/taxon/2619219-4

≡ *Aconitum paniculatum* subsp. *lasiocarpum* (Rchb.) Soó, Acta Bot. Hung. 5: 213 (1943); GBIF: https://www.gbif.org/species/8127169; WFO: https://list.worldfloraonline.org/wfo-0000517839; POWO: https://powo.science.kew.org/taxon/2619297-4

≡ *Aconitum toxicum* subsp. *lasiocarpum* (Rchb.) Grinț., Fl. Rep. Pop. Rom. 2: 491 (1953); GBIF: https://www.gbif.org/species/8405975; WFO: https://list.worldfloraonline.org/wfo-0000518204; POWO: https://powo.science.kew.org/taxon/2619645-4

= *Aconitum dasycarpum* (Schur) Schur ex Gáyer, Magyar Bot. Lapok 10: 199 (1911); GBIF: https://www.gbif.org/species/8459344; GBIF: https://www.gbif.org/species/3926069; IPNI: https://www.ipni.org/n/707298-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517143; POWO: https://powo.science.kew.org/taxon/707298-1; BHL: https://www.biodiversitylibrary.org/item/201840#page/231

= *Aconitum toxicum* [unranked] a dasycarpum Schur, Enum. Pl. Transsilv.: 33 (1886); GBIF: https://www.gbif.org/species/7883173; WFO: https://list.worldfloraonline.org/wfo-0000518203; POWO: https://powo.science.kew.org/taxon/2619644-4; BHL: https://www.biodiversitylibrary.org/item/7364#page/53

= *Aconitum vagneri* Kern. ex Gáyer, Magyar Bot. Lapok 10: 199 (1911); GBIF: https://www.gbif.org/species/8665182; GBIF: https://www.gbif.org/species/3930829; IPNI: https://www.ipni.org/n/707928-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000518249; POWO: https://powo.science.kew.org/taxon/707928-1; BHL: https://www.biodiversitylibrary.org/item/201840#page/231

– *Aconitum lasiocarpum* Rchb., Uebers. Gat. *Aconitum*.: 55 (1819) [p. p.]; GBIF: https://www.gbif.org/species/7277094; IPNI: https://www.ipni.org/n/707516-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517521; POWO: https://powo.science.kew.org/taxon/707516-1

Conservation status: In Ukraine – VU (Onyshchenko et al. 2022). Global – NT (Novikov and Mitka 2019).

Distribution: SE Carpathian endemic.

Notes: This vulnerable species is listed in the Red Book of Ukraine without clarification of the subspecies (Melnyk and Batochenko 2009, MEPNR of Ukraine 2021).

Aconitum moldavicum subsp. *hosteanum* (Schur) Graebn. et P.Graebn., Syn. Mitteleur. Fl. 5(2): 725 (1929)

- GBIF https://www.gbif.org/species/8062401
- IPNI urn:lsid:ipni.org:names:77249320-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517652
- POWO https://powo.science.kew.org/taxon/77249320-1

- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/a8dc028d-0922-4f47-ba8f-1894176c0424
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-lycoctonum
- BHL https://www.biodiversitylibrary.org/page/25296776#page/735

Nomenclature:

≡ *Aconitum hosteanum* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 2: 177 (1851) [nom. nudum] et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 3: 84 (1852) [nom. nudum] et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 49 (1853) *; GBIF: https://www.gbif.org/species/3924597; IPNI: https://www.ipni.org/n/707441-1; IPNI: https://www.ipni.org/n/707442-1; WFO: https://list.worldfloraonline.org/wfo-0000517392; POWO: https://powo.science.kew.org/taxon/707442-1; BHL: https://www.biodiversitylibrary.org/item/42660#page/87; BHL: https://www.biodiversitylibrary.org/item/42660#page/534; BHL: https://www.biodiversitylibrary.org/item/42660#page/701; JACQ: https://www.jacq.org/detail.php?ID=351628; JACQ: https://www.jacq.org/detail.php?ID=351319; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00201808; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00150056

≡ *Aconitum moldavicum* [unranked] e *hosteanum* (Schur) Zapał., Consp. Fl. Gal. Crit. 2: 213 (1908)

= *Aconitum hosteanum* f. *borbasii* Gáyer, Magyar Bot. Lapok 8: 316 (1909); BHL: https://www.biodiversitylibrary.org/item/201903#page/342

= *Aconitum hosteanum* var. *geraniifolium* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 499, 678 (1953)

= *Aconitum moldavicum* var. *australe* f. *dissectifolium* (Zapał.) Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 497 (1953)

= *Aconitum moldavicum* var. *australe* f. *fragile* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 496, 676 (1953)

= *Aconitum moldavicum* var. *australe* f. *grandiflorum* (Schur) Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 497 (1953)

= *Aconitum moldavicum* var. *australe* f. *leopoliensis* (Zapał.) Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 497 (1953)

= *Aconitum moldavicum* var. *australe* f. *obtusidentatum* Simonk. ex Gáyer, Magyar Bot. Lap. 8: 315 (1909); BHL: https://www.biodiversitylibrary.org/item/201903#page/341; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017686; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017691; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017689; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017685; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017687; JSTOR Global Plants: htt

ps://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017688; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017690

= *Aconitum moldavicum* var. *australe* f. *thyraicum* (Błocki) Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 497 (1953)

= *Aconitum moldavicum* [unranked] a dissectifolium Zapał., Consp. Fl. Gal. Crit. 2: 212 (1908)

= *Aconitum moldavicum* [unranked] b *grandicassum* Zapał., Consp. Fl. Gal. Crit. 2: 212 (1908)

= *Aconitum moldavicum* [unranked] c *grandiflorum* Schur, Enum. Pl. Transsilv.: 32 (1866)

= *Aconitum moldavicum* [unranked] d *leopoliense* Zapał., Consp. Fl. Gal. Crit. 2: 213 (1908)

= *Aconitum thyraicum* Błocki, Allg. Bot. Z. Syst. 1: 59 (1895) *; GBIF: https://www.gbif.org/species/7986865; IPNI: https://www.ipni.org/n/707888-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000518189; POWO: https://powo.science.kew.org/taxon/2619630-4; BHL: https://www.biodiversitylibrary.org/item/38475#page/71; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.l0821162; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613637; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00018562; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.hbg508762; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00018563

= *Aconitum moldavicum* [unranked] e *hosteanum f. czywczynense* Zapał., Consp. Fl. Gal. Crit. 2: 213 (1908)

= *Aconitum moldavicum* [unranked] e *hosteanum f. rodnense* Zapał., Consp. Fl. Gal. Crit. 2: 213 (1908)

– *Aconitum moldavicum* Hacq., Reis. Dac. Sarm. Karpathen 1: 169 (1790) et Hacq. ex Rchb., In: Übers. Gen. Acon.: 67 (1819) [p. p.]; GBIF: https://www.gbif.org/species/8058146; GBIF: https://www.gbif.org/species/7276954; IPNI: https://www.ipni.org/n/77319987-1; WFO: https://list.worldfloraonline.org/wfo-0000517651; POWO: https://powo.science.kew.org/taxon/77319987-1

– *Aconitum moldavicum* var. *australe* (Rchb.) Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 496 (1953) [p. p.]

– *Delphinium moldavicum* (Hacq.) Bránadza, Prodr. Fl. Rom.: 11 (1879) [p. p., nom. inval.]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: Following the Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-lycoctonum, accessed on 06.06.2023), CoL (ht

tps://www.catalogueoflife.org/data/taxon/5FDJJ, accessed on 06.06.2023) and GBIF (https://www.gbif.org/species/3923267, accessed on 06.06.2023), they provide outdated taxonomy for *A. moldavicum* Hacq. and consider it belonging to *A. lycoctonum* subsp. *moldavicum* (Hacq.) Jalas. Such consideration is based, perhaps, on the research of Utelli et al. (2000), who showed the phylogenetic affinity of *A. moldavicum* and *A. lycoctonum* L. in Europe and proposed to delimit its morphs as subspecies. Mitka et al. (2013), Mitka et al. (2016) have further discussed and stressed this question in the context of the biogeography of the genus *Aconitum* L. in the Carpathians. Anatomical studies (Novikoff 2010) also showed that, besides the common features (well-developed differentiated two-layered lignified parenchymal ring and occurrence of peripheral vascular bundles in the stem), *A. lycoctonum* and *A. moldavicum* differ by the position of sclerenchymatous strands supporting the vascular bundles in their stems. In *A. moldavicum*, the parenchyma layer is present between the vascular bundles and sclerenchymatous strands, while, in *A. lycoctonum*, it is absent. Morphological variation allowing to delimit subspecies within *A. moldavicum* was not taken into account by Utelli et al. (2000), but was studied in detail by Mitka (2008). Hence, *A. moldavicum* is currently considered an independent species with a developed infraspecific structure (Mitka and Kozioł 2009, Novikov and Mitka 2020 and Novikov and Mitka 2020).

GBIF (https://www.gbif.org/species/11040564, accessed on 06.06.2023) has a technical mistake and provides the name *A. moldavicum* subsp. *nothoconfusum* (Grin.) A.Novikov – it should be *A. moldavicum* nothosubsp. *confusum* (Grinţ.) A.Novikov.

Aconitum moldavicum subsp. *moldavicum* Hacq. ex Rchb., Uebers. Gat. Aconitum: 67 (1819)

- GBIF https://www.gbif.org/species/8058146
- GBIF https://www.gbif.org/species/7276954
- IPNI urn:lsid:ipni.org:names:77319987-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000517651
- POWO https://powo.science.kew.org/taxon/77227195-1
- Wikispecies https://species.wikimedia.org/wiki/Aconitum_moldavicum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/ea0a74d3-376c-4931-82c2-63fd1f84fedb
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Aconitum-lycoctonum

Nomenclature:

≡ *Aconitum lycoctonum* subsp. *moldavicum* (Hacq.) Jalas, Ann. Bot. Fenn. 22(3): 219 (1985); CoL: https://www.catalogueoflife.org/data/taxon/5FDJJ; GBIF: https://www.gbif.org/species/3923267; IPNI: https://www.ipni.org/n/924000-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517604; POWO: https://powo.science.kew.org/taxon/924000-1; JACQ: https://je.jacq.org/JE00017685; JACQ: https://je.jacq.org/JE00017686; JACQ: https://je.jacq.org/JE00017687; JACQ: https://je.jacq.org/JE00017688; JACQ: https://je.jacq.org/JE00017689; JACQ: https://

je.jacq.org/JE00017690; JACQ: https://je.jacq.org/JE00017691; JACQ: https://je.jacq.org/JE00017823; JACQ: https://je.jacq.org/JE00017824; JACQ: https://je.jacq.org/JE00017825; JACQ: https://je.jacq.org/JE00017826; JACQ: https://je.jacq.org/JE00017827; JACQ: https://je.jacq.org/JE00017828; JACQ: https://je.jacq.org/JE00017829; JACQ: https://je.jacq.org/JE00017830; JACQ: https://je.jacq.org/JE00018561; JACQ: https://je.jacq.org/JE00018562; JACQ: https://je.jacq.org/JE00018563

= *Aconitum lycoctonum* [unranked] β *caeruleum* Wahlenb., Fl. Carp. Princip.: 163 (1814); GBIF: https://www.gbif.org/species/8350826; WFO: https://list.worldfloraonline.org/wfo-0000517594; POWO: https://powo.science.kew.org/taxon/2619024-4

= *Aconitum moldavicum* subsp. *hacquetianum* Grinț., Cat. Sem. Grăd. Bot. Bucovin.: 6 (1945) [nom. nudum]

= *Aconitum moldavicum* var. *hacquetianum* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 496 (1953); JACQ: https://ere.jacq.org/ERE0005606

= *Aconitum moldavicum* var. *hacquetianum* f. *flexuosum* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 498, 677 (1953)

= *Aconitum moldavicum* var. *hacquetianum* f. *macrocassis* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 498, 677 (1953)

= *Aconitum moldavicum* var. *hacquetianum* f. *piliferum* Grinț. in Săvul., Fl. Rep. Pop. Rom. 2: 498, 677 (1953); JACQ: https://ere.jacq.org/ERE0005607

= *Aconitum moldavicum* var. *rubicundum* Borbás, Kárp. Egyl. Évk. 5: 247 (1886) et Oesterr. Bot. Z. 36: 318 (1886); BHL: https://www.biodiversitylibrary.org/item/91253#page/326

= *Aconitum moldavicum* f. *stenanthum* Gáyer, Magyar Bot. Lapok 6: 297 (1907); BHL: https://www.biodiversitylibrary.org/item/201813#page/321

= *Aconitum septentrionale* Baumg., Enum. Stirp. Transsilv. 2: 98 (1816), non Koelle *

= *Aconitum transilvanicum* Lerchenf. ex Schur., Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 165 (1859); GBIF: https://www.gbif.org/species/3931066; GBIF: https://www.gbif.org/species/8527174; IPNI: https://www.ipni.org/n/707900-1; WFO: https://list.worldfloraonline.org/wfo-0000518206; POWO: https://powo.science.kew.org/taxon/707900-1; BHL: https://www.biodiversitylibrary.org/item/42663#page/409

– *Aconitum carpathicum* (DC.) Sagorski & Schneider, Fl. Centralkarpat.: 45 (1891) [p. p.]; GBIF: https://www.gbif.org/species/7741610; POWO: https://powo.science.kew.org/taxon/2618509-4

– *Aconitum fallacinum* Błocki, Allg. Bot. Z. Syst. 1: 117 (1895) [p. p.]; IPNI: https://www.ipni.org/n/707347-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000517234; POWO: https://powo.science.kew.org/taxon/2618686-4; BHL: https://www.biodiversitylibrary.org/item/38475#page/129; JACQ: https://hal.jacq.org/

HAL0117457; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017829; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017826; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017825; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017823; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017827; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00018561; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.hal0117457; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.bm000613638; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017830; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017828; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00017824

– *Aconitum jacquinianum* Host, Fl. Austr. 2: 68 (1831) [quoad pl. carpat.]; GBIF: https://www.gbif.org/species/3924390; IPNI: https://www.ipni.org/n/707468-1; WFO: https://list.worldfloraonline.org/wfo-0000517422; POWO: https://powo.science.kew.org/taxon/707468-1

– *Aconitum lycoctonum* subsp. *carpaticum* (DC.) Dostal, Květ. ČSR 2: 150 (1950) [p. p.]; GBIF: https://www.gbif.org/species/7448841; WFO: https://list.worldfloraonline.org/wfo-0000517596; POWO: https://powo.science.kew.org/taxon/2619026-4

– *Aconitum lycoctonum* var. *carpaticum* (DC.) Ser., Mus. helv. d'hist. nat. 1: 136 (1822) [p. p.]; GBIF: https://www.gbif.org/species/8273319; WFO: https://list.worldfloraonline.org/wfo-0000517595; POWO: https://powo.science.kew.org/taxon/2619025-4

– *Aconitum moldavicum* Hacq., Reis. Dac. Sarm. Karpathen 1: 169 (1790) et Hacq. ex Rchb., Übers. Gen. Acon.: 67 (1819) [p. p. *major*]; GBIF: https://www.gbif.org/species/8058146; GBIF: https://www.gbif.org/species/7276954; IPNI: https://www.ipni.org/n/77319987-1; WFO: https://list.worldfloraonline.org/wfo-0000517651; POWO: https://powo.science.kew.org/taxon/77319987-1

– *Aconitum moldavicum* [unranked] c *parvicassum* Zapał., Consp. Fl. Gal. Crit. 2: 212 (1908) [p. p.]

– *Aconitum moldavicum* f. *puberulum* Zapał., Consp. Fl. Gal. Crit. 2: 212 (1908) [p. p.]

– *Aconitum septentrionale* [unranked] β *carpaticum* DC., Syst. Nat. 1: 370 (1818) [p. p.]; GBIF: https://www.gbif.org/species/7520649; WFO: https://list.worldfloraonline.org/wfo-0000518062; POWO: https://powo.science.kew.org/taxon/2619506-4; BHL: https://www.biodiversitylibrary.org/item/127665#page/380

– *Delphinium moldavicum* (Hacq.) Bránadza, Prodr. Fl. Rom.: 11 (1879) [p. p. *major*, nom. inval.]

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Ranunculus carpaticus Herbich, Sel. Pl. Rar. Gallic.: 15 (1836), non Wahlenb. ex Nyman

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4RFXM
- GBIF https://www.gbif.org/species/3921904
- IPNI urn:lsid:ipni.org:names:712424-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000460647
- POWO https://powo.science.kew.org/taxon/712424-1
- Wikispecies https://species.wikimedia.org/wiki/Ranunculus_carpaticus
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/d8e20ade-0c13-4253-a130-e2f9c2f68b34
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Ranunculus-carpaticus
- JACQ https://je.jacq.org/JE00021608
- JACQ https://www.jacq.org/detail.php?ID=442598
- JACQ https://www.jacq.org/detail.php?ID=442599
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200025
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.je00021608
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.cher0200024

Nomenclature:

= *Ranunculus aduncus* Schur, Enum. Pl. Transsilv. 16 (1866), non Gren. & Godr.; BHL: https://www.biodiversitylibrary.org/item/7364#page/36

= *Ranunculus carpaticus* f. *anomalus* A.Nyár., Fl. Rep. Pop. Rom. 2: 620, 687 (1953)

= *Ranunculus carpaticus* f. *flabellatus* A.Nyár., Fl. Rep. Pop. Rom. 2: 620, 687 (1953)

= *Ranunculus carpaticus* f. *plenus* Zapał., Consp. Fl. Galic. Crit. 2: 274 (1908)

= *Ranunculus carpaticus* f. *pygmaeus* Porcius, Phaner. Năsăud: 152 (1881)

= *Ranunculus carpaticus* var. *rupicolus* Zapał., Consp. Fl. Galic. Crit. 2: 274 (1908)

= *Ranunculus dentatus* (Baumg.) Freyn in A.Kern., Sched. Fl. Austro-Hung. 5: 47 (1888) *; GBIF: https://www.gbif.org/species/3930794; IPNI: https://www.ipni.org/n/712586-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000460732; POWO: https://powo.science.kew.org/taxon/712586-1

= *Ranunculus gouani* Baumg., Enum. Stirp. Transsilv. 2: 125 (1816), non alior

= *Ranunculus lerchenfeldianus* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 3: 84 (1852) [nom. nudum] et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 14 (1853); GBIF: https://www.gbif.org/species/3924099; IPNI: https://www.ipni.org/n/713087-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000460869; POWO: https://powo.science.kew.org/taxon/713087-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/534; BHL: https://www.biodiversitylibrary.org/page/11525300#page/666; JACQ: https://www.jacq.org/detail.php?ID=362042; JACQ: https://www.jacq.org/detail.php?ID=362813; JACQ: https://www.jacq.org/detail.php?ID=362826; JACQ: https://www.jacq.org/detail.php?

ID=362839; JACQ: https://www.jacq.org/detail.php?ID=362842; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.mel2427577; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203232a; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203232b; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203233; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203234; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00203184

= *Ranunculus montanus* Willd. [unranked] α *dentatus* Baumg., Enum. Stirp. Transsilv. 2: 124 (1816); GBIF: https://www.gbif.org/species/6710384; POWO: https://powo.science.kew.org/taxon/3298250-4

= *Ranunculus pormbachiensis* Lerchenf. ex Schur, Enum. Pl. Transsilv.: 16 (1866); BHL: https://www.biodiversitylibrary.org/item/7364#page/36

= *Ranunculus schurii* Fuss ex Schur, Enum. Pl. Transsilv.: 16 (1866); GBIF: https://www.gbif.org/species/8666188; GBIF: https://www.gbif.org/species/3925490; IPNI: https://www.ipni.org/n/713787-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000462193; POWO: https://powo.science.kew.org/taxon/713787-1; BHL: https://www.biodiversitylibrary.org/page/10544067#page/38

= *Ranunculus tuberosus* Schur, Oesterr. Bot. Z. 11: 82 (1861) et Enum. Pl. Transsilv.: 16 (1866), non alior.; GBIF: https://www.gbif.org/species/7688016; IPNI: https://www.ipni.org/n/714032-1; POWO: https://powo.science.kew.org/taxon/714032-1; BHL: https://www.biodiversitylibrary.org/openurlmultiple.aspx?id=p28748883|p9224548; BHL: https://www.biodiversitylibrary.org/page/10544067#page/38

– *Ranunculus szurulensis* Lerchenf. ex Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4: 14 (1853) [p. p.]; GBIF: https://www.gbif.org/species/8534706; GBIF: https://www.gbif.org/species/3923469; IPNI: https://www.ipni.org/n/713932-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000462274; POWO: https://powo.science.kew.org/taxon/713932-1; BHL: https://www.biodiversitylibrary.org/page/11525300#page/666

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Almost all databases accessed on 06.06.2023, including CoL (https://www.catalogueoflife.org/data/taxon/4RH2B), GBIF (https://www.gbif.org/species/7276759), POWO (https://powo.science.kew.org/taxon/713262-1), WFO (https://list.worldfloraonline.org/wfo-0000462989) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Ranunculus-montanus) indicate *R. szurulensis* Lerchenf. ex Schur as a synonym for *R. montanus* Willd. However, Domin and Krajina (on some herbarium labels) indicated that *R. szurulensis* is a synonym for *R. carpaticus*. This requires further exploration, but at least in the sense of Domin and Krajina, *R. szurulensis* should be considered a partial synonym of *R. carpaticus*.

Ranunculus malinovskii Elenevsky et Derv.-Sok., Novosti Sist. Vyssh. Rast. 23: 59 (1986)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/4RGWJ
- GBIF https://www.gbif.org/species/3922948
- IPNI urn:lsid:ipni.org:names:931315-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000462988
- POWO https://powo.science.kew.org/taxon/931315-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/c8c99844-6aae-47fe-9652-31b79a864157
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Ranunculus-malinovskii
- JACQ https://www.jacq.org/detail.php?ID=388543
- JACQ https://www.jacq.org/detail.php?ID=422905
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00122218
- JSTOR Global Plants https://plants.jstor.org/stable/10.5555/al.ap.specimen.lw00122216

Nomenclature:

= *Ranunculus kladnii* auct. fl. ucrain. carpat., non Schur *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Carpathian endemic.

Notes: Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/c8c99844-6aae-47fe-9652-31b79a864157, accessed on 06.06.2023) considers *R. malinovskii* as a synonym for *R. acris* L. Indeed, *R. malinovskii* and *R. acris* are morphologically similar, but *R. malinovskii* differs by smaller habitus, developed rhizome, weak pubescence of the leaves and stem and longer beak of the fruits (Visjulina 1953, Jelenevsky and Derviz-Sokolova 1986, Chopyk and Fedoronchuk 2015).

Some plants from the higher altitudes in the Ukrainian Carpathians were identified as *R. kladnii* Shur. CoL (https://www.catalogueoflife.org/data/taxon/4RHQG, accessed on 06.06.2023), POWO (https://powo.science.kew.org/taxon/713807-1), WFO (https://list.worldfloraonline.org/wfo-0000462207, accessed on 06.06.2023), Euro+Med (https://europlusmed.org/cdm_dataportal/taxon/61b4424b-1bc9-4ee8-8cda-c5b9d6f5f7d8, accessed on 06.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Ranunculus-serbicus, accessed on 07.06.2023) synonymise *R. kladnii* with *R. serbicus* Vis. GBIF (https://www.gbif.org/species/7277719, accessed on 06.06.2023), instead, considers *R. kladnii* to be a synonym for *Ranunculus acris* subsp. *acris*. However, Jelenevsky and Derviz-Sokolova (1986) pointed out that the mentioned plants from higher altitudes differ from those described by Schur as *R. kladnii*. Jelenevsky and Derviz-Sokolova (1986) also found these plants to be different from *R. acris* and *R. serbicus* and, as a result, proposed a new name – *R. malinovskii*. Hence, all specimens from the Ukrainian Carpathians,

identified as *R. kladnii*, appeared to be *R. malinovskii* (Tzvelev 2001, Chopyk and Fedoronchuk 2015).

Order Saxifragales

Family Crassulaceae

Sempervivum carpathicum subsp. *carpathicum* Wettst. ex Prodan, Fl. Rep. Pop. Rom. 1: 530 (1923)

- GBIF https://www.gbif.org/species/8594037
- GBIF https://www.gbif.org/species/7334507
- IPNI urn:lsid:ipni.org:names:20007689-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000437104
- POWO https://powo.science.kew.org/taxon/77225188-1
- Wikispecies https://species.wikimedia.org/wiki/Sempervivum_carpathicum_subsp._carpathicum
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/dc0af6e4-2449-4717-a20f-c69eba919385
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Sempervivum-montanum
- JACQ https://wu.jacq.org/WU0034206

Nomenclature:

≡ *Sempervivum carpathicum* Wettst. in A.Kern., Sched. Fl. Exs. Austro-Hung. 10: 25. 1913, [nom. nudum] et Wettst. ex Prodan, Fl. Rom. 1: 530 (1923); GBIF: https://www.gbif.org/species/8594037; GBIF: https://www.gbif.org/species/7334507; IPNI: https://www.ipni.org/n/20007689-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000437104; POWO: https://powo.science.kew.org/taxon/20007689-1

≡ *Sempervivum montanum* subsp. *carpathicum* (Wettst. ex Prodan) A.Berger in Engler & Prantl, Nat. Pflanzenfam., ed. 2 18a: 422 (1930); GBIF: https://www.gbif.org/species/7940262; IPNI: https://www.ipni.org/n/77143230-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000735970; POWO: https://powo.science.kew.org/taxon/77143230-1

≡ *Sempervivum montanum* subsp. *carpaticum* Wettst. in Sched., Flora Exs. Austro-Hung. (1913) [nom. nudum]

≡ *Sempervivum montanum* subsp. *carpaticum* Wettst. ex Hayek in Hegi, Ill. Fl. Mitt.-Eur. 4(2): 554 (1923) [nom. nudum]; CoL: https://www.catalogueoflife.org/data/taxon/5L5BR; GBIF: https://www.gbif.org/species/8493204

≡ *Sempervivum montanum* var. *carpathicum* (Wettst. ex Prodan) Praeger, An account of the *Sempervivum* group: 46 (1932) [comb. inval.]

≡ *Sempervivum montanum* subsp. *eumontanum* var. *carpathicum* (Wettst. ex Prodan) Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933); GBIF: https://

www.gbif.org/species/7373462; WFO: https://list.worldfloraonline.org/wfo-0000735971; POWO: https://powo.science.kew.org/taxon/2871574-4

= *Sempervivum montanum* f. *brachypetalum* Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933); GBIF: https://www.gbif.org/species/7561540; WFO: https://list.worldfloraonline.org/wfo-0000735972; POWO: https://powo.science.kew.org/taxon/2871575-4

= *Sempervivum montanum* f. *congestum* Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933); GBIF: https://www.gbif.org/species/7627077; WFO: https://list.worldfloraonline.org/wfo-0000735975; POWO: https://powo.science.kew.org/taxon/2871578-4

= *Sempervivum montanum* var. *pallidum* Wettst. ex Hayek in Hegi, Ill. Fl. Mitt.-Eur. 4(2): 554 (1923) [nom. inval.]

= *Sempervivum montanum* f. *pallidum* (Wettst. ex Hayek) Fiori, Nuov. Fl. Italia 1: 716 (1923)

= *Sempervivum montanum* f. *pallidum* (Wettst. ex Hayek) Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933) [comb. illeg.]; GBIF: https://www.gbif.org/species/7872574; IPNI: https://www.ipni.org/n/77087400-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000735974; POWO: https://powo.science.kew.org/taxon/77087400-1

= *Sempervivum montanum* f. *pallidum* (Wettst. ex Hayek) Hadrava & Miklánek, Kaktusy (Brno) 43 (Special 1): 11 (2007) [nom. illeg.]; IPNI: https://www.ipni.org/n/77087401-1; POWO: https://powo.science.kew.org/taxon/77087401-1

= *Sempervivum montanum* f. *neopallidum* Hadrava & Miklánek, Kaktusy (Brno) 43 (Special 1): 11 (2007) [nom. illeg.]; GBIF: https://www.gbif.org/species/4199474; IPNI: https://www.ipni.org/n/77087402-1; WFO: https://list.worldfloraonline.org/wfo-0001325704; POWO: https://powo.science.kew.org/taxon/77087402-1

= *Sempervivum montanum* f. *speciosum* Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933); GBIF: https://www.gbif.org/species/8138052; WFO: https://list.worldfloraonline.org/wfo-0000735973; POWO: https://powo.science.kew.org/taxon/2871576-4

= *Sempervivum montanum* f. *stenophyllum* Domin, Rozpr. Ceské Akad. Ved, Tr. 2, Vedy Mat. Prír. 42(29): 28 (1933); GBIF: https://www.gbif.org/species/8394796; WFO: https://list.worldfloraonline.org/wfo-0000735976; POWO: https://powo.science.kew.org/taxon/2871579-4

= *Sempervivum montanum* var. *pallidum* Wettst. ex Schinz & R. Keller, Fl. Schweiz (Schinz), ed. 2. 2: 96 (1905); IPNI: https://www.ipni.org/n/77087399-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0001400047; POWO: https://powo.science.kew.org/taxon/77087399-1

= *Sempervivum wettsteinii* subsp. *wettsteinii* Letz, Vybrané Problémy Taxonomickej Diferenciácie rodov *Sempervivum* a *Jovibarba* v Európe, Thèse Bratislava: 184 (1998) [nom. invalid.] *

– *Sempervivum arachnoideum* auct. [e.g., G.Reuss], non L.

– *Sempervivum heterophyllum* Jáv., Magyar Fl.: 456 (1925), non Haszl.

– *Sempervivum montanum* L., Sp. Pl. 1: 465 (1753) [p. p., tantum quod plantas ucrain. carpat.], non alior *; GBIF: https://www.gbif.org/species/8164781; IPNI: https://www.ipni.org/n/276551-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000441784; POWO: https://powo.science.kew.org/taxon/276551-1; BHL: https://www.biodiversitylibrary.org/page/358484#page/477

– *Sempervivum montanum* subsp. *debile* auct., non (Schott.) Dostál

– *Sempervivum montanum* subsp. *heterophyllum* auct., non (Haszl.) Jáv. ex Soó

– *Sempervivum montanum* subsp. *montanum* auct. [e.g., Pawłowski, Dostál, Lippert], non L.

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian endemic.

Notes: The Red Book of Ukraine lists this species as *S. montanum* s.l. (Kobiv 2009, MEPNR of Ukraine 2021).

There are two subspecies within *S. carpathicum* Wettst. ex Prodan – subsp. *carpathicum* and subsp. *heterophyllum* (Hazsl.) Letz (occurs in Slovakia – Letz 2002). However, *S. carpathicum* is sometimes (e.g. in CoL – https://www.catalogueoflife.org/data/taxon/5L5BR, accessed on 06.06.2023) considered as a subspecies of *S. montanum* L. *Sempervivum montanum*, in general, has a wider distribution range and three (https://powo.science.kew.org/taxon/276551-1, accessed on 06.06.2023) to five (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Sempervivum-montanum, accessed on 07.06.2023) delimited subspecies (i.e. subsp. *montanum, subsp. burnatii* Wettst. ex Hayek, subsp. subsp. *carpaticum* Wettst. ex Hayek, subsp. *rex* Niederle and subsp. *stiriacum* (Wettst. ex Hayek) Hayek). Nevertheless, even in such a case, only *S. montanum* subsp. *carpaticum* occurs in the Ukrainian Carpathians (Chopyk and Fedoronchuk 2015). Worldplants also mentions the presence of *S. montanum* subsp. *montanum* for Ukraine, but no recent reports confirm this. Previous reports of *S. montanum* subsp. *montanum* from Ukraine probably result from some mistaken taxonomic interpretation (Letz and Marhold 1998) of lowland plants of *S. monatnum* that also occur in the flora of Poland and Slovakia (Pawłowski 1956, Zahradníková 1985, Dostál 1989, Jalas 1999). Moreover, GBIF (ttps://www.gbif.org/species/7771274, https://www.gbif.org/species/8674343, accessed on 06.06.2023) synonymises *S. heterophyllum* Haszl. (≡ *S. carpathicum* subsp. *heterophyllum* (Hazsl.) Letz) with *S. carpathicum* subsp. *carpathicum*, which is not entirely correct. Only a part of *S. carpathicum* subsp. *heterophyllum* (i.e. in the sense of Jávorka) can be treated as a synonym for *S. carpathicum* subsp. *carpathicum* (Letz 2002).

Sempervivum globiferum subsp. *preissianum* (Domin) M.Werner, Avonia 28(4): 191 (2011)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5L5BC
- GBIF https://www.gbif.org/species/7943221
- IPNI urn:lsid:ipni.org:names:77110762-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0001361905
- POWO https://powo.science.kew.org/taxon/77110762-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/13361222-617f-42b0-b280-edd556d997eb
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Sempervivum-globiferum

Nomenclature:

≡ *Jovibarba preissiana* (Domin) Omelczuk & Chopik, Bot. Zhurn. 60(8): 1184 (1975) *; GBIF: https://www.gbif.org/species/9627483; IPNI: https://www.ipni.org/n/274240-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000355803; POWO: https://powo.science.kew.org/taxon/274240-1

≡ *Jovibarba globifera* subsp. *preissiana* (Domin) Holub, Preslia 70(2): 106 (1998); GBIF: https://www.gbif.org/species/6441825; IPNI: https://www.ipni.org/n/1002586-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000355779; POWO: https://powo.science.kew.org/taxon/1002586-1

≡ *Jovibarba globifera* var. *preissiana* (Domin) Hadrava & Miklánek, Kaktusy (Brno) 43 (Special 1): 28 (2007); GBIF: https://www.gbif.org/species/4201475; IPNI: https://www.ipni.org/n/77087405-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000509637; POWO: https://powo.science.kew.org/taxon/77087405-1

≡ *Jovibarba hirta* subsp. *preissiana* (Domin) Soó, Acta Bot. Hung. 23: 380 (1977); GBIF: https://www.gbif.org/species/8264808

≡ *Sempervivum hirtum* subsp. *preissianum* (Domin) Dostál, Květena ČSR: 537 (1948); GBIF: https://www.gbif.org/species/7440878

≡ *Sempervivum preissianum* Domin, Bull. Internat. Acad. Sc., Prague, 33: 126 (1932) *; GBIF: https://www.gbif.org/species/4199066; IPNI: https://www.ipni.org/n/276602-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000441817; POWO: https://powo.science.kew.org/taxon/276602-1; JACQ: https://prc.jacq.org/PRC454424; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc454422; JSTOR Global Plants: https://plants.jstor.org/stable/10.5555/al.ap.specimen.prc454424

≡ *Sempervivum soboliferum* subsp. *preissianum* (Domin) Pawłowska, Fl. Polska 7: 48, 294 (1955); GBIF: https://www.gbif.org/species/8342394; WFO: https://list.worldfloraonline.org/wfo-0001299919

= *Jovibarba globifera* var. *tatrensis* (Domin) Konop & Bendak, Skalnicky, 1981(1): 33 (1981) [nom. illeg.]; GBIF: https://www.gbif.org/species/7776508; JACQ: https://prc.jacq.org/PRC454422

= *Jovibarba hirta* subsp. *tatrensis* (Domin) Á.Löve & D.Löve, Bot. Not. 114: 53 (1961); GBIF: https://www.gbif.org/species/7520442; WFO: https://list.worldfloraonline.org/wfo-0001300750; POWO: https://powo.science.kew.org/taxon/2878711-4

= *Jovibarba hirta* var. *tatrense* (Domin) Soó, Feddes Repert. 83(3): 174 (1972); GBIF: https://www.gbif.org/species/4201267; IPNI: https://www.ipni.org/n/878851-1; WFO: https://list.worldfloraonline.org/wfo-0000355810; POWO: https://powo.science.kew.org/taxon/878851-1

= *Jovibarba hirta* var. *tatrensis* (Dom.) Konop & Bendak, Skalnicky 1981(1): 33 (1981) [nom. illeg.]; GBIF: https://www.gbif.org/species/4201255; IPNI: https://www.ipni.org/n/920004-1

= *Sempervivum hirtum* f. *glabrescens* Sabr., Oesterr. Bot. Z. 32: 378 (1882); GBIF: https://www.gbif.org/species/4200162; IPNI: https://www.ipni.org/n/51013624-1; WFO: https://list.worldfloraonline.org/wfo-0001299917; POWO: https://powo.science.kew.org/taxon/3242423-4; BHL: https://www.biodiversitylibrary.org/page/9607775#page/394

= *Sempervivum hirtum* subsp. *glabrescens* (Sabr.) Jáv., Magyar Fl. 2: 458 (1924); GBIF: https://www.gbif.org/species/11028494; GBIF: https://www.gbif.org/species/8816122; WFO: https://list.worldfloraonline.org/wfo-0001299957

= *Sempervivum hirtum* subsp. *tatrense* (Domin) Dostál, Květena ČSR: 537 (1948); GBIF: https://www.gbif.org/species/7844009

= *Sempervivum soboliferum* subsp. *preissianum* f. *minus* Domin ex Pawłowska, Fl. Polska 7: 48 (1955)

= *Sempervivum soboliferum* subsp. *preissianum* var. *tatrense* (Domin) Pawłowska, Fl. Polska 7: 48, 294 (1955); GBIF: https://www.gbif.org/species/7850718

= *Sempervivum tatrense* Domin, Rozpr. České Akad. Věd, Tř. 2, Vědy Mat. Přír. 42/29: 20–21 (1933); GBIF: https://www.gbif.org/species/4198415; IPNI: https://www.ipni.org/n/276680-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000441748; POWO: https://powo.science.kew.org/taxon/276680-1

– *Jovibarba globifera* subsp. *hirta* (L.) J. Parn., Bot. J. Lin. Soc. 103(3): 219 (1990) [p. p., tantum quod plantas ucrain. carpat.]; GBIF: https://www.gbif.org/species/4201494; IPNI: https://www.ipni.org/n/956373-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000355771; POWO: https://powo.science.kew.org/taxon/956373-1

– *Jovibarba sobolifera* (Sims) Opiz, Seznam: 54 (1852) [p. p., tantum quod plantas ucrain. carpat.] *; GBIF: https://www.gbif.org/species/8990928; IPNI: https://www.ipni.org/n/274241-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000355792; POWO: https://powo.science.kew.org/taxon/274241-1

– *Sempervivum soboliferum* Sims, Bot. Mag. 35: t. 1457 (1812) [p. p., tantum quod plantas ucrain. carpat.], non Fleisch. & Lindem. *; GBIF: https://www.gbif.org/species/4198581; IPNI: https://www.ipni.org/n/276661-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000441418; POWO: https://powo.science.kew.org/taxon/276661-1; BHL: https://www.biodiversitylibrary.org/item/14321#page/114

Conservation status: In Ukraine – NT (Onyshchenko et al. 2022).

Distribution: Pancarpathian subendemic.

Notes: *Jovibarba* Opiz. is often synonymised with *Sempervivum* L., but is sometimes considered an independent genus (Chopyk and Fedoronchuk 2015, Kliment et al. 2016 , Mirek et al. 2020). In Ukraine, this genus is traditionally recognised as *Jovibarba.* Here, two geographically well-separated *Jovibarba* species occur – lowland *J. sobolifera* Opiz and high-mountainous *J. preissiana* (Domin) Omelczuk et Chopik. Both species are rare and listed in the Red Book of Ukraine (Andriyenko et al. 2009, Chorney 2009b, MEPNR of Ukraine 2021). In addition, *J. heuffelii* (Schott) Á.Löve & D.Löve is sometimes mistakenly mentioned for the Ukrainian Carpathians – this species occurs in Romania, but was never discovered in the Ukrainian Carpathians (Bialt 2001, Chopyk and Fedoronchuk 2015).

CoL (https://www.catalogueoflife.org/data/taxon/5L5BC, accessed on 07.06.2023), GBIF (https://www.gbif.org/species/7943221, accessed on 06.06.2023) and Worldplants (https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Sempervivum-globiferum, accessed on 07.06.2023), amongst synonyms of *S. globiferum* subsp. *preissianum*, mentioned *J. hirta* subsp. *preissiana* (Domin) Holub, which is, perhaps, a technical mistake. Holub (1998) did not apply such a combination, but instead used a combination *J. globifera* subsp. *preissiana* (Domin) Holub. It is also interesting that Omelczuk-Mjakushko and Chopik are often mentioned as the authors of *J. preissiana*. This is not a principal mistake, but a result of a complicated publication case. Omelczuk-Mjakushko and Chopik (1975) are, indeed, the authors of the paper where the species is published. However, in the species protologue, near the new name on page 1184, they provided the maiden name of the first author (i.e. Omelczuk). Therefore, the proper authority of this species should be provided as Omelczuk & Chopik.

Family Saxifragaceae

Chrysosplenium alpinum Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 3(6): 86 (1852) et Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 10: 133 (1859)

- Catalogue of Life https://www.catalogueoflife.org/data/taxon/5YTN5
- GBIF https://www.gbif.org/species/5567560
- IPNI urn:lsid:ipni.org:names:790542-1
- WFO http://www.worldfloraonline.org/taxon/wfo-0000603880
- POWO https://powo.science.kew.org/taxon/790542-1
- Euro+Med https://europlusmed.org/cdm_dataportal/taxon/4cb54abb-d957-4541-8621-b7cc55069df5
- Worldplants https://www.worldplants.de/world-plants-complete-list/complete-plant-list?name=Chrysosplenium-alpinum
- BHL https://www.biodiversitylibrary.org/item/42660#page/536

- BHL https://www.biodiversitylibrary.org/item/42663#page/377
- JACQ https://w.jacq.org/W0046043
- JACQ https://w.jacq.org/W0046044
- JACQ https://w.jacq.org/W0046045
- JACQ https://w.jacq.org/W0046046
- JACQ https://w.jacq.org/W18890086003

Nomenclature:

≡ *Chrysosplenium oppositifolium* var. *alpinum* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt, 4(8): 28 (1853) et Enum. Pl. Transsilv.: 241 (1866) *; GBIF: https://www.gbif.org/species/7964184; WFO: https://list.worldfloraonline.org/wfo-0000604048; POWO: https://powo.science.kew.org/taxon/2720224-4; BHL: https://www.biodiversitylibrary.org/item/42660#page/914; BHL: https://www.biodiversitylibrary.org/item/7364#page/261

= *Chrysosplenium glaciale* Fuss, Fl. Transs.: 247 (1866) *; GBIF: https://www.gbif.org/species/5567435; IPNI: https://www.ipni.org/n/790594-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000603976; POWO: https://powo.science.kew.org/taxon/790594-1

= *Chrysosplenium oppositifolium* var. *rosulare* (Schot) Schott ex Engl., Nat. Pflanzenfam. ed. 2, 18a: 165 (1930); GBIF: https://www.gbif.org/species/8660071; GBIF: https://www.gbif.org/species/8009567; WFO: http://www.worldfloraonline.org/taxon/wfo-0000604049; POWO: https://powo.science.kew.org/taxon/2720225-4

= *Chrysosplenium rosulare* Schott ex Maxim., Gartenflora 6: 115 (1857) [nom. nudum] et Bull. Acad. Imp. Sci. Saint-Pétersbourg 23: 345 (1877); GBIF: https://www.gbif.org/species/8560914; GBIF: https://www.gbif.org/species/5567837; IPNI: https://www.ipni.org/n/790655-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000604087; POWO: https://powo.science.kew.org/taxon/790655-1; BHL: https://www.biodiversitylibrary.org/page/40083306#page/153; BHL: https://www.biodiversitylibrary.org/page/5354877#page/189

= *Chrysosplenium transsilvanicum* Schur, Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt 4(8): 28 (1853) et Enum. Pl. Transsilv.: 241 (1866); GBIF: https://www.gbif.org/species/5567792; IPNI: https://www.ipni.org/n/790679-1; WFO: http://www.worldfloraonline.org/taxon/wfo-0000604115; POWO: https://powo.science.kew.org/taxon/790679-1; BHL: https://www.biodiversitylibrary.org/item/42660#page/914; BHL: https://www.biodiversitylibrary.org/item/7364#page/261

– *Chrysosplenium oppositifolium* auct. fl. roman. et ucrain. [e.g., Baumg., Enum. Stirp. Transsilv. 1: 338, Nr. 699 (1816)], non L. *

Conservation status: In Ukraine – LC (Onyshchenko et al. 2022).

Distribution: SE Capathian endemic.

Notes: *Chrysosplenium alpinum* and *C. oppositifolium* L. are two closely-related species that are sometimes synonymised (e.g. Maximowicz (1877), Răvăruț (1956)).

Chrysosplenium alpinum plants are glabrous with entire or almost entire leaves (occur in Romanian and Ukrainian Carpathians), while *C. oppositifolium* plants are pubescent at least in their base and have distinctly dentate leaves (occurring in western and central Europe, but not in Romania or Ukraine – Hrouda and Šourková (1992)). The affinity of these two species resulted in their misinterpretation and inevitable confusion. For example, GBIF provides *C. glaciale* Fuss (https://www.gbif.org/species/5567435, accessed on 06.06.2023) amongst the synonyms of *C. oppositifolium* (https://www.gbif.org/species/7526486, accessed on 06.06.2023). Perhaps, this synonymy resulted from Maximowicz's (1877) observations. Similarly, GBIF provides *C. rosulare* Schott ex Maxim. (https://www.gbif.org/species/8560914, https://www.gbif.org/species/5567837, accessed on 06.06.2023) amongst synonyms to *C. oppositifolium.* This is because Maximowicz (1877), on page 345, indicated that *C. rosulare, C. alpinum* and *C. glaciale*, are synonyms for *C. oppositifolium.* Maximowicz (1877) noted that Transylvanian plants slightly differ, but concluded that this difference is taxonomically unimportant. In the original protologue of *C. glaciale*, Fuss (1866), on page 247, indeed provided *C. oppositifolium* as a synonym for *C. glaciale*, but he considered *C. oppositifolium* in the sense of Baumgarten, not in the original sense of Linnaeus. In turn, Baumgarten (1816a) on page 338, mentioned glabrous plants with slightly dentate leaves from Romania (i.e. *C. alpinum*, not *C. oppositifolium*). Hence, after analysis of the original protologues, it looks like both species, *C. glaciale* and *C. rosulare*, should be interpreted as synonyms of *C. alpinum*.

Analysis

Experience in working with taxonomy-related databases

The work on the current checklist has been a part of the inventory of endemics distributed in the flora of the Ukrainian Carpathians (Novikoff and Hurdu 2015, Novikov and Sup-Novikova 2022a). During the inventory, creating a working list of taxa and their most frequently applied synonyms was necessary because herbarium specimens could be stored under different names. Later, the initial list was updated following the recent taxonomy and extended with other synonyms, including rare ones from old publications. It was found that different taxonomic databases (e.g. Worldplants, Euro+Med and POWO) have different visions of the structure and status of certain taxa, sometimes providing controversial data. Hence, the need to appeal to original protologues and monographic studies arose.

Considering that the data were prepared specially to be deposited in GBIF, the GBIF backbone taxonomy (Grosjean 2019) was the main focus. Moreover, each taxonomic record in GBIF has hyperlinks to principal taxonomic databases, including IPNI, Tropicos, POWO, WFO and CoL. The only exception are the databases Wikispecies and Worldplants – they are not directly crosslinked with GBIF; however, Worldplants is applied as a source of taxonomic data by CoL. Hence, GBIF seems to be the most comprehensive aggregator for gathering all taxonomic information. Moreover, GBIF uses for its backbone taxonomy checklist datasets published directly in GBIF through ChecklistBank. As a result,

surprisingly, many rare taxonomic citations were present in GBIF and absent in other specialised taxonomic databases. Therefore, the GBIF backbone taxonomy has been chosen as a starting point for the exploration.

All databases were artificially subdivided on several types during the work regarding their primary focus listed below. It is worth noting that most databases combine the signs of different types.

1) **Nomenclatural** – the databases providing valuable nomenclatural information, including the taxonomic name, author(s) and details about the place of the protologue's publication without clarification of relationships between listed taxa (i.e. IPNI)

2) **Taxonomic** – the databases providing more or less detailed information about taxa nomenclature, their synonymy and systematics (e.g. CoL, POWO, WFO, Wikispecies, Euro+Med, Worldplants). Such databases often offer extra data on the taxa distribution, type material, treatment etc.

3) **Biogeographic** – the databases primarily provide data on the taxa distribution, but also gather other information, including synonymy and systematics (i.e. GBIF).

4) **Virtual herbaria** – the databases hosting images of the herbarium material, including the type material and related data (e.g. JACQ and JSTOR Global Plants).

5) **Publication repositories** – the databases containing scanned publications with protologues and taxonomic treatments (e.g. Biodiversity Heritage Library (BHL), Biodiversity Literature Repository (BLR), Plazi, GBIF). With virtual herbaria, such databases are beneficial during the nomenclatural work because they provide access to principal taxonomic data.

The taxonomic databases were used to construct an initial working checklist and clarify the systematics of investigated taxa. Later, nomenclatural and biogeographic databases, as well as virtual herbaria and publication repositories, were used to test and develop the constructed checklist.

Despite numerous taxonomic-related databases, none of them is exceptional and exhaustive. Below are provided some pros and cons of the databases that were mostly used during the work on the current checklist.

1) CoL

Pros: CoL focuses on constructing a standardised and comprehensive checklist of the entire biota and is useful for global exploration. It provides persistent IDs for the valid names, information about authors and publication of the taxa. CoL predominantly uses Worldplants as a source for taxa validation and systematics. There is also *minor* information on the distribution of the listed taxa and their vernacular names. CoL is curated by a large number of specilaists in the taxonomy of the particular organism group.

Cons: CoL does not provide persistent IDs for synonyms and has no separate databases containing details about the authors and standard publications. It provides only simplified synonymy without clarification on whether it is a homotypic or heterotypic synonym. It has no maps visualising the distribution of taxa. It has no direct links to other databases. Additionally, the time lag of introducing new taxa or nomenclatural changes to CoL can be too long, sometimes a year or more.

2) GBIF

Pros: GBIF primarily aims to gather data on the distribution of living organisms and uses its own taxonomic backbone for systematics purposes. As a result, provided data are mostly related to reported occurrences. It allows us to build precise distribution maps and provides some other metrics facilities. GBIF gathers the data from different sources, which results in the presence of some unique poorly-known synonyms. It also contains other taxonomy-related data, including information about type materials, vernacular names, treatments etc. GBIF provides its own unique IDs for all taxa, including synonyms. Besides this, it provides a comprehensive list of cross-linked IDs applied by other databases.

Cons: Due to using different sources to construct the taxonomic backbone, there are some duplicated records (e.g. with some *minor* orthographic differences). GBIF has no separate databases about authors and publications where taxa were published, except from the taxonomic treatments extracted and provided by Plazi.

3) IPNI

Pros: IPNI is a fundamental nomenclatural database used as a starting point for validating taxon names, authors' and publications' abbreviations and searching for protologues. IPNI provides stable persistent identifiers (LSIDs) for all taxa, publications and authors.

Cons: IPNI provides links to POWO, WFO and BHL databases for certain taxa. However, it does not offer any interpretation of relationships between taxa. Therefore, detecting whether a taxon name is valid or a synonym is impossible. It also does not provide details on the principal chorology of taxa, which is sometimes useful for nomenclatural and taxonomic explorations. Besides this, IPNI has some 'dead' LSIDs listed in other databases, but suspended for some reason by IPNI. There are some duplicated records.

4) WFO

Pros: WFO is focused on constructing a taxonomic checklist and classification of the world flora, largely based on POWO. It provides its own unique IDs for all listed taxa, including synonyms. It is interlinked with IPNI and some other databases, including BOLD and GBIF.

Cons: It has a visually unfriendly interface with an overuse of bold fonts. Some IDs are integrated into plain text, making them tricky to find. Each taxon has two different pages (within the list and stand-alone taxonomic page – for example, https://wfoplantlist.org/plant-list/taxon/wfo-0000788843-2023-06 and http://www.worldfloraonline.org/taxon/

wfo-0000788843), which is confusing. There is not even basic information about the distribution of the listed taxa. There are some duplicated records.

5) POWO

Pros: POWO is one of the most used databases during the construction of the current checklist. It has a user-friendly interface and provides the most important information about listed taxa, including extended synonymy with the indication of homotypic and heterotypic synonyms, distribution details on the level of countries with the indication of native and introduced ranges, plant photos, links to digitised herbarium materials, list of related publications and other sources and links to some other databases (e.g. IPNI). POWO also applies LSIDs like IPNI.

Cons: The only disadvantage of POWO is the absence of independent databases dealing with authors and publications, which IPNI substitutes. There are some duplicated records.

6) Wikispecies

Pros: Some rare and unique names are represented that are not listed in other databases, which makes Wikispecies necessary to check. Classification of certain groups is often provided by narrow specialists. There are usually photos of listed plants. There are often provided vernacular names.

Cons: Wikispecies has numerous limitations due to its construction. In particular, the absence of persistent IDs, providing data as plain text, application of unusual abbreviations etc. Wikispecies is constructed mostly by enthusiasts, so many taxa are absent in this database.

7) Euro+Med

Pros: Some exclusive synonymy and systematics resulted from elaborating certain taxa by narrow specialists. Good maps with detailed information about data sources. Clustered synonymy with differentiation of homotypic and heterotypic synonyms. For some taxa, Euro+Med provides vernacular names in languages from the distribution range.

Cons: Some data, especially regarding the systematics of problematic taxa, are outdated. The database covers a limited geographical range, while some represented taxa have distribution extended out of this range. Unfriendly pop-up taxa list. Application of long URNs instead of short unique persistent IDs and absence of such IDs for synonyms.

8) Worldplants

Pros: Stand-alone database providing an alternative vision on plant systematics, which often differs from those proposed by POWO, Euro+Med and GBIF. This database offers detailed and precise nomenclature and systematics operatively updated following the newly-published data. It contains numerous rare synonyms from regional floras that are mostly absent in other databases. It also provides quite detailed information about taxa distribution in different countries.

Cons: The absence of persistent IDs and stable links makes it hard to cite certain taxon. The synonyms are listed as plain text without clarification of their type. Applied abbreviations for the authors and publications often differ from those used by IPNI and other databases. The old-fashion interface does not attract.

9) BHL

Pros: The principal repository of old printed materials related to biodiversity, providing a unique opportunity to work directly with protologues. BHL provides DOIs for some of the publications. It also offers persistent IDs for all content, allowing links to a certain page from the publication. It automatically searches and displays the taxa mentioned on the selected page. Allows us to download the content freely.

Cons: Slightly complicated interface with a somewhat unfriendly searching procedure.

10) JACQ

Pros: One of the virtual herbaria; extremely useful for studies related to the Carpathian Region. Provides free access to scanned herbarium vouchers (including the type material) with high resolution and to the data parsed from the herbarium labels. For some entries, JACQ provides persistent IDs.

Cons: Not all entries are supported by scans.

11) JSTOR Global Plants

Pros: Another virtual herbarium, which focuses mostly on gathering the images of type material and providing both scans and data parsed from the labels. It offers stable links similar to DOIs.

Cons: Paid access.

12) PLAZI TreatmentBank

Pros: Provides direct access to parsed taxonomic treatments and mentions of taxa in the publications and grants UUIDs for these records.

Cons: Undeveloped interface. Complicated search procedure. Absence of the treatments for most of the analysed taxa.

Issues revealed during the work with databases

Besides the inconsistency in nomenclatural and taxonomic visions, when different taxa are considered to be independent or merged as synonyms (e.g. *Aconitum moldavicum* Hacq. and *A. lycoctonum* L.) or considered at different taxonomic ranks (e.g. *Koeleria transsilvanica* Schur versus *Koeleria macrantha* subsp. *transsilvanica* (Schur) A.Nyár.) by different data providers, several other issues were detected and resolved viz.:

1) Some taxa have two or more **duplicated checklist records**. For example, in GBIF, there are duplicated checklist records for *Campanula microphylla* Kit. ex Schult. (https://www.gbif.org/species/5411213 and https://www.gbif.org/species/7654241, accessed on 06.06.2023), *Thesium serratum* Kit. ex Schult. (https://www.gbif.org/species/7614045 and https://www.gbif.org/species/7390879, accessed on 06.06.2023), *Alsine pauciflora* Kit. ex Nyman (https://www.gbif.org/species/8455786 and https://www.gbif.org/species/3807842, accessed on 06.06.2023) and many other species. Such issues, in most cases, including other databases, result from data aggregation from different sources that can provide data of different quality. Providing the same data, but containing even *minor* differences (mistakes or technical errors) or incomplete data can result in their automatic interpretation as independent records. Therefore, it is necessary to revise and catch such duplicated records manually.

2) Some of the records in IPNI (e.g. *Centaurea mollis* f. *maramarosiensis* Jáv. – https://www.ipni.org/n/50909566-1, accessed on 23.07.2023) are **suppressed for unclear reasons**, while the assigned LSIDs are still in use in other databases (e.g. https://powo.science.kew.org/taxon/50909566-1, accessed on 23.07.2023) and provided nomenclatural information is correct.

3) Some taxonomic records provide **incomplete and/or incorrect authorship** for taxa. For example, all databases provide for *Jovibarba preissiana* authorship (Domin) Omel'chuk-Myakushko & Chopik (https://www.gbif.org/species/9627483, accessed on 06.06.2023), but it should be (Domin) Omelczuk & Chopik (this is clearly indicated in the original protologue of the species and also recognised in the IPNI authors database (https://www.ipni.org/n/274240-1, accessed on 06.06.2023), which bases its abbreviations on the respective TDWG). For *Koeleria tenuipes* and its homonyms, all databases display Domin as an author of the basionym. However, Ujhelyi (1965) 191) pointed out that it is Schur and provided the correct name – *Koeleria tenuipes* (Schur) Ujhelyi. Another example, GBIF provides the record for *Lathyrus transsilvanicus* Fritsch (https://www.gbif.org/species/8329194, accessed on 06.06.2023), while it should be *Lathyrus transsilvanicus* (Spreng.) Fritsch. Some similar authorship issues were also revealed and fixed while elaborating on the current checklist.

4) Some taxonomic records provide **missing, incomplete and/or incorrect protologue data.** For example, in GBIF, pages are not indicated for protologues of *Campanula napuligera* f. *longisepala* (Nyár.) Morariu (https://www.gbif.org/species/8397712, accessed on 06.06.2023), *Campanula rotundifolia* var. *grandiflora* J.A.Knapp (https://www.gbif.org/species/7764236, accessed on 06.06.2023) and many other taxa. Protologue data are missing for *Minuartia oxypetala* (Woł.) Kulczyński (https://www.gbif.org/species/7504529, accessed on 06.06.2023), *Minuartia verna* subsp. *oxypetala* (Woł.) G.Halliday (https://www.gbif.org/species/8333640, accessed on 06.06.2023), *Genista oligosperma* (Andrae) Simonk. (https://www.gbif.org/species/5347633, accessed on 06.06.2023) and many other taxa. For some taxa, GBIF provides empty taxonomic records with missing protologue data, for example, for *Campanula napuligera* var. *alpiniformis* Nyár. ex Morariu (https://www.gbif.org/species/8554545, accessed on 06.06.2023).

5) Occasionally taxonomic records provide **not the first published protologue**. For example, the name *Dianthus microchelus* B.S.Williams (https://www.gbif.org/species/3810687, https://powo.science.kew.org/taxon/153597-1, accessed on 06.06.2023) has been first published in 1890 (not in 1891, as indicated in World Plants, GBIF and POWO). Similarly, the name *Trifolium sarosiense* Hazsl. (https://www.gbif.org/species/5358815, https://powo.science.kew.org/taxon/523672-1, accessed on 06.06.2023) has been first published in 1864 (not in 1867). Such dating mistakes occur mostly due to the inaccessibility of many old publications, especially periodicals that were published locally. In some cases, such mistakes had resulted from publication tardiness – before many journals published their volumes in the consequent year (e.g. the last volume from 1912 could be published in 1913). Sporadically, such dating mistakes result due to the use of re-prints instead of original publications. Fortunately, currently, BHL and other virtual libraries provide access to more and more rarities allowing the detection of such dating issues and discovering the first publications with the original protologues of many taxa.

6) For many taxa, all elaborated databases provide an **incomplete list of synonyms**. Some taxa, especially those published in old local periodicals and monographs, are missing from the databases. In particular, there are often missing taxa published by Zapałowicz (1906b) in the "Conspectus florae Galiciae criticus" – for example, many infraspecific taxa of *Alsine zarencznyi* Zapał. Additionally, there are some missing taxa published in "Flora Reipublicae Populare România" (Săvulescu 1952) – for example, infraspecific taxa of *Aconitum callibotryon* Rchb. GBIF has no taxonomic record about the name *Melandrium zawadzkii* (Herbich) A. Braun, which is often applied as an alternative name for *Silene zawadzkii* Herbich (https://www.gbif.org/species/5587094, accessed on 06.06.2023) in the Ukrainian herbaria. World Plants, CoL and GBIF completely miss the data on *Scabiosa lucida* subsp. *barbata* Nyár., its homonyms and infraspecific derivates.

7) In some cases, the **taxonomic rank is indicated incorrectly**. For example, GBIF provides a taxonomic record for *Campanula polymorpha* f. *reflectans* Hruby (https://www.gbif.org/species/5410039, accessed on 06.06.2023). However, this taxon has been described as a subform and, hence, the correct citation should be *Campanula polymorpha* subf. reflectans Hruby (initially described as *Campanula polymorpha* var. *typica* f. *lepida* subf. reflectans – Hruby (1930)). Similarly, GBIF mistakenly indicates the rank of subspecies for *Aconitum koelleanum* var. *firmum* (Rchb.) Rchb. (https://www.gbif.org/species/12133197, accessed on 06.06.2023), *Aconitum paniculatum* f. *latilobum* Zapał. (https://www.gbif.org/species/12053893, accessed on 06.06.2023) and many other *Aconitum* L. taxa.

8) The **lack of synonymic interlinkage** for existing taxonomic records has been observed in some cases. For example, in GBIF, there is a taxonomic record for *Campanula stenophylla* (Schur) Witasek (https://www.gbif.org/species/7633288, accessed on 06.06.2023), but it is not linked to the record of the valid taxon *C. tatrae* subsp. *tatrae* (https://www.gbif.org/species/7222073, accessed on 06.06.2023). Similarly, the taxonomic record of *Trifolium sarosiense* Hazsl. ex Neilr. (https://www.gbif.org/species/8013811, accessed on 06.06.2023) is not linked to the parental record of *Trifolium sarosiense* Hazsl. (https://www.gbif.org/species/5358815, accessed on 06.06.2023).

9) Many databases **omit orthographical variants** that often appear in taxonomy. For example, GBIF provides the only variant *Minuartia zarecznyi* (Zapał.) Klokov (https://www.gbif.org/species/7267413, accessed on 06.06.2023), while it is often written as *Minuartia zarencznii*. In this checklist, such orthographical variants are considered.

10) The **uneven approach in building the nomenclatural backbone**. Amongst all databases, only IPNI has an ultimative structure comprising three main nomenclatural elements (i.e. the name of the taxon, the author(s) of the taxon and the publishing source) as independent datasets and providing unique urns to each of these elements. For example, *Campanula carpatica* has a LSID names:140068-1 (https://www.ipni.org/urn:lsid:ipni.org:names:140068-1, accessed on 06.06.2023), its author, Nicolaus Jacquin, has its own LSID – authors:12576-1 (https://www.ipni.org/urn:lsid:ipni.org:authors:12576-1, accessed on 06.06.2023) and the publication with the protologue, Hortus Botanicus Vindobonensis, has its own LSID – publications:3465-2 (https://www.ipni.org/urn:lsid:ipni.org:publications:3465-2, accessed on 06.06.2023). This is extremely useful because, sometimes, it is not clear where the taxon was published. By browsing other taxa of the same author, it is possible to locate the protologue. Such an operation is impossible without independent datasets with taxa names, authors and publications. Moreover, besides the urns, IPNI proposes standard abbreviations for the authors and publications, which makes it more accessible to routine work with nomenclatural data. Unfortunately, all other databases provide unique ids (if any) only for the taxa and do not allow navigating amongst the authors and their publications, which limits their application for nomenclatural work.

11) The **lack or excessive length of unique IDs for listed taxa**. Most of the elaborated databases provide unique IDs for the hosted taxa. In particular, POWO applies IPNI's LSIDs (https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:77221836-1, accessed on 06.06.2023). While CoL, GBIF and WFO have their own short persistent IDs (e.g. https://www.catalogueoflife.org/data/taxon/3KXBD or https://list.worldfloraonline.org/wfo-0000745368, accessed on 06.06.2023), Euro+Med also applies persistent IDs in the form of UUIDs (e.g. https://europlusmed.org/cdm_dataportal/taxon/616ef7e8-6c89-4d43-8f5b-b52b0bb164b0, accessed on 06.06.2023). The Wikispecies simply applies URLs (e.g. https://species.wikimedia.org/wiki/Heracleum_carpaticum, accessed on 06.06.2023). Regardless of the ID type, most databases provide IDs both to valid taxa and their synonyms and build independent pages for them, allowing cross-linkage and precise citation of each of the taxa (valid or synonymic). Unfortunately, Euro+Med, Worldplants and Wikispecies have limitations in operation with synonyms. In Euro+Med, synonyms also have unique ids, but they have no independent pages and, therefore, it is not possible to dirrectly navigate to them – they are only highlighted in the list of synonyms and generated links are extremely long (e.g. https://europlusmed.org/cdm_dataportal/taxon/43877abc-2ef9-4cbf-afaf-d18e92f3cf63/synonymy?highlite=676063a0-c78d-433b-9c76-efdfb15a2d15&acceptedFor=676063a0-c78d-433b-9c76-efdfb15a2d15#676063a0-c78d-433b-9c76-efdfb15a2d15, accessed on 06.06.2023). In Worldplants and Wikispecies, only valid taxa have their own URLs and synonyms are simply listed as a plain text (e.g. https://species.wikimedia.org/wiki/

Scilla_kladnii, accessed on 06.06.2023). Moreover, in Worldplants, even valid species are bulked together within the same page of the genus, while the ids are temporarily generated, which makes it impossible to provide a permanent link to certain species.

General recommendations to taxonomy-related databases

Considering my experience in working with and combining data from different taxonomic-related databases, I can outline a few following recommendations for these databases, which, in general, correspond to FAIR principles (Wilkinson et al. 2016, GO FAIR 2023). These recommendations aim to increase the speed and quality of automatic or semi-automatic data processing and data reusability by individual researchers.

1) Use **persistent and resolvable persistent IDs for all taxon names**, including synonymic ones. Applying unique persistent IDs assures the ability to easily recombine and interlink the names following new taxonomic visions and particular nomenclatural purposes.

2) Assign **unique persistent IDs to all elements of the taxon name**, including name, authority and publication source. This allows us to navigate between different elements of the taxon name quickly, find the original publications and interlink them, providing surplus analysis on the value of certain publication sources.

3) Use of the **standard abbreviations for the taxon authors and at least principal publications sources**. Since the taxon authors and nomenclatural citations are frequently abbreviated in different ways, sometimes it is extremely hard to findi the original publication for further nomenclatural exploration. This is especially evident in work with rare old publications and journal series that have changed their name several times. Together with providing unique ids, the application of standardised abbreviations allows us to correctly navigate amongst the authors and publications.

4) Providing at least **basic data on the distribution** of specified taxon helps a lot in preliminary decisions during the initial explorations. The databases with maps of the distribution or with the list of countries where the taxon occurs are very helpful in building the initial lists for further nomenclatural and taxonomic investigations because they allow us to exclude the taxa that are out of the area of interest and, at the same time, locate some obviously problematic taxa requiring special attention.

5) Providing the **links to the original publications with protologues** is crucial because it speeds the taxonomic revision process and assures correct and unambiguous elaboration of the original material by different investigators. Providing links to other related databases could be also helpful. However, different databases develop with different intensities and support, so extensive cross-linkage can result in the appearance of dead links that should be additionally maintained.

6) Providing the **history or the log of the changes** occurring with taxa names would help to understand which issue was detected and for which reason the name has been

suspended or modified. At the moment, such an option is partly realised only in the WFO database.

7) Providing the **bibliographic reference to the works containing taxa descriptions** (with an option to download it in RIS/ BibTex format or at least displayed as plain text following one of the citation styles like APA) would be helpful in two ways – (a) *practical*, since the researchers will not waste their time on searching and formatting proper citations in case of need to provide in-text references with analysis of the original publications; (b) *respective*, since providing the full citations for taxa names (all or at least recently published) will increase the citation rate of nomenclatural and taxonomic works that are generally significantly unacknowledged (Valdecasas et al. 2000, Haszprunar 2011, Pyke 2014). Unfortunately, at the moment such an option is not realised in any of the used databases.

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References

- Akademie věd České republiky (2023) Digitální knihovna AV ČR. https://www.lib.cas.cz/digitalni-knihovna/. Accessed on: 2023-2-02.
- Al-Shehbaz IA (2014) A synopsis of the genus *Noccaea* (Coluteocarpeae, Brassicaceae). Harvard Papers in Botany 19 (1): 25-51. https://doi.org/10.3100/hpib.v19iss1.2014.n3
- Anchev ME, Apostolova I, Assyov B, Bancheva ST, Denchev CM, Dimitrov D, Dimitrova DI, Evstatieva L, Genova E, Georgiev V, Goranova V, Gussev C, Ignatova P, Ivanova D, Meshinev T, Peev D, Petrova A, Petrova AS, Sopotlieva D, Stanev S, Stoeva MP, Stoyanov S, Tashev AN, Tosheva A, Tsoneva S, Tzonev R, Vitkova A, Vladimirov V (2009) Red List of Bulgarian vascular plants. Phytologia Balcanica 15 (1): 63-94.
- Andrae CJ (1855) Beiträge zur Kenntniss der Flora des südlichen Banates, der banater Militärgrenze und Siebenbürgens. Botanische Zeitung 13: 305-320. URL: https://www.biodiversitylibrary.org/item/104887
- Andriyenko TL, Konischuk VV, Panchenko SM (2009) Boridnyk parostkoviy. *Jovibarba sobolifera* (Sims.) Opiz. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 414 pp. [In Ukrainian].

- Ascherson P (1867) Bemerkungen über einige Pflanzen des Kitaibel'schen Herbariums. Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 12: 565-590. URL: https://www.biodiversitylibrary.org/item/239512
- Ascherson PF, Graebner P (1896) Synopsis der mitteleuropäischen Flora (1896-1910). Bds. 1-6. Verlag von Wilhelm Engelmann https://doi.org/10.5962/bhl.title.35810
- Ascherson PF, Graebner P (1898) Synopsis der mitteleuropäischen Flora. Bd. 2, Abt. 1. Verlag von Wilhelm Engelmann https://doi.org/10.5962/bhl.title.10838
- Băcilă I, Şuteu D, Coste A, Filipaş L, Ursu T, Stoica IA, Hurdu B-, Puşcaş M, Coldea G (2010) The *Poa granitica* group in the Carpathian Mountains: some molecular insights. Contributii Botanice 45: 7-12.
- Bánki O, Roskov Y, Döring M, Ower G, Vandepitte L, Hobern D, Remsen D, Schalk P, DeWalt RE, Keping M, Miller J, Orrell T, Aalbu R, Abbott J, Adlard R, Adriaenssens EM, Aedo C, Aescht E, Akkari N (2023) Catalogue of Life Checklist. Version 2023-05-15. https://doi.org/10.48580/dfs6. Accessed on: 2023-5-31.
- Barberá P, Romero-Zarco C, Aedo C (2018) Taxonomic Revision of Trisetum sect. Trisetum (Poaceae: Pooideae: Aveninae) from Eurasia and North Africa. Annals of the Missouri Botanical Garden 103 (3): 350-392. https://doi.org/10.3417/2018067
- Baumann H, Lorenz R (2011) (2037) Proposal to conserve the name *Gymnadenia rubra* (Nigritella rubra) against *Orchis miniata* (Orchidaceae). Taxon 60 (6): 1775-1776. https://doi.org/10.1002/tax.606027
- Baumgarten JC (1816a) Enumeratio stirpium magno Transsilvaniae principatui præprimis indigenarum. 1. Vindebonae URL: https://books.google.com/books?id=e5OBfzBFkHgC&dq
- Baumgarten JC (1816b) Enumeratio stirpium magno Transsilvaniae principatui præprimis indigenarum (1816-1846). 1-4. Vindebonae
- Bednarska I (2007) Genus *Festuca* L. (Poaceae) in the flora of the western regions of Ukraine. Doctoral dissertation. Institute of the Ecology of the Carpathians, Lviv. [In Ukrainian].
- Bednarska I, Kagalo O (2009) Kostrytsia Porciusa. *Festuca porcii* Hack. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 228 pp. [In Ukrainian].
- Beldie A (1952) Fam. 14. Salicaceae Lindl. In: Săvulescu T (Ed.) Flora Republicii Populare Române. 1. Editura Academiei Republicii Populare Române, 267-322 pp.
- Bernátová D, Májovský J, Kliment J, Topercer J (2006) Taxonomy and distribution of *Poa carpatica* in the Western Carpathians. Biologia 61 (4): 387-392. https://doi.org/10.2478/s11756-006-0069-x
- BHL (2022) The Biodiversity Heritage Library. https://www.biodiversitylibrary.org/. Accessed on: 2022-12-14.
- Bialt VV (2001) Sem. 86. Crassulaceae J. St.-Hill. – Tolstiankoviye. In: Tzvelev NN (Ed.) Flora of Eastern Europe. 10. Mir i Semiya, Moscow, 250-285 pp. [In Russian].
- Bilz M (2011a) *Campanula serrata* (errata version published in 2020). The IUCN Red List of Threatened Species 2011: e.T161866A176601594. https://doi.org/10.2305/IUCN.UK.2011-1.RLTS.T161866A176601594.en
- Bilz M (2011b) Poa granitica ssp. disparilis (Europe assessment). The IUCN Red List of Threatened Species 2011: e.T162408A5587454. URL: https://www.iucnredlist.org/species/162408/5587454

- Błocki B (1883a) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 427-428. URL: https://www.biodiversitylibrary.org/item/35444
- Błocki B (1883b) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 397-400. https://doi.org/10.1007/BF01662880
- Błocki B (1883c) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 361-364. https://doi.org/10.1007/BF01638400
- Błocki B (1883d) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 257-259. https://doi.org/10.1007/BF01638737
- Błocki B (1883e) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 220-223. https://doi.org/10.1007/BF01638359
- Błocki B (1883f) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 175-176. https://doi.org/10.1007/BF01673789
- Błocki B (1883g) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 144-147. https://doi.org/10.1007/BF01701574
- Błocki B (1883h) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 116-119. https://doi.org/10.1007/BF01665440
- Błocki B (1883i) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 33: 37-40. https://doi.org/10.1007/BF01641992
- Błocki B (1884a) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 427-428. https://doi.org/10.1007/BF01643170
- Błocki B (1884b) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 359-360, 427. https://doi.org/10.1007/BF01643354
- Błocki B (1884c) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 249-251. https://doi.org/10.1007/BF01641853
- Błocki B (1884d) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 212-216. https://doi.org/10.1007/BF01638379
- Błocki B (1884e) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 120-122. https://doi.org/10.1007/BF01665933
- Błocki B (1884f) Ein Beitrag zur Flora Galiziens und der Bukowina. Österreichische Botanische Zeitschrift 34: 51-55. https://doi.org/10.1007/BF01665613
- Boissier E (1879) Flora orientalis: sive enumeratio plantarum in oriente a graecia et aegypto ad indiae fines hucusque observatarum. 4. Appud H. Georg, Bibliopolam, Ludguni. URL: https://www.biodiversitylibrary.org/item/60323
- Boissier PE (1837) Voyage botanique dans le midi de l'Espagne pendant l'année. 2. Gide et Cie, Paris. URL: https://books.google.com/books?id=Ps-S1bh4_FgC&dq
- Boissier PE (1843) Diagnoses plantarum orientalium novarum. Vol. 1, Sisteus fasciculos 1–7. 1. Appud B. Herrmann, Lipsiae. URL: https://archive.org/details/e.-boissier-diagnoses-plantarum-orientalium-novarum-series-1-vol.-1-no.-1-7-1843-1846
- BOLD (2023) Barcode of Life Data System. v4. https://boldsystems.org/index.php. Accessed on: 2023-6-21.
- Borbás V (1889) A Lembergi egyetem herbáriumában lév Schur-féle erdélyi szegfüvekrl. Természetrajzi Füzetek kiadja a Magyar nemzeti Muzeum 12: 40-53. URL: https://www.biodiversitylibrary.org/item/97426
- Borbás V (1902) A Tátra flórájáról. Természettudományi Közlöny 34 (394): 369-390.
- Bordzilovskiy YI (1938) Flora of UkrSSR (1938-1940). 1 & 2. Academy of Sciences of UkrSSR, Kyiv. [In Ukrainian].

- Braun A (1843) Beitrag zur Feststellung natürlicher Gattungen unter den Sileneen. Flora oder Allgemeine Botanische Zeitung 26: 350-263. URL: https://www.biodiversitylibrary.org/item/940#page/366/
- Brügger CG (1860) Zur flora tirols. Wagner'schen Buchdr URL: https://books.google.com/books?id=C2uH8PVZlqMC&hl
- Brügger CG (1874) Flora Curiensis: Systematische übersicht der in der Umgebung von Chur Wildwachsenden und Häufig Cultivirten Gefässplanzen. In: Naturforschende Gesellschaft Graubünden (Ed.) Naturgeschichtliche Beiträge zur Kenntniss der Umgebungen von Chur. Druck von Gebrüder Casanova, 47-104 pp. URL: https://books.google.com.ua/books?id=ItpWzQB_WjQC&hl
- Brügger CG (1886a) Mittheilungen über neue und kritische formen der bündner- und nachbar-floren. Selbstverlag des Verfassers https://doi.org/10.5962/bhl.title.9765
- Brügger CG (1886b) Mittheilungen über neue und kritische formen der bündner- und nachbar-floren. Jahresbericht Der Naturforschenden Gesellschaft Graubündens 29: 46-178. URL: https://www.e-periodica.ch/cntmng?pid=ngg-002%3A1884%3A29%3A%3A244
- Chopyk V, Fedoronchuk M (2015) Flora of the Ukrainian Carpathians. Terno-graph, Ternopil. [In Ukrainian].
- Chopyk VI (1976) High-mountain flora of the Ukrainian Carpathians. Naukova dumka, Kyiv. [In Ukrainian].
- Chorney II (2006) Toward the question of endemism of the flora of Ukrainian Carpathians. Protection Affairs in Ukraine 12 (2): 7-16. [In Ukrainian].
- Chorney II (2009a) Smilkokvitka Zavadskoho (Smilka Zavadskoho). *Silenanthe zawadskii* (Herbich) Griseb. et Schenk (*Elisanthe zawadskii* (Herbich) Klokov; *Silene zawadskii* Herbich. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 400 pp. [In Ukrainian].
- Chorney II (2009b) Boridnyk sherstystovolosystiy. *Jovibarba hirta* (L.) Opiz (*J. preissiana* (Domin) Omelczuk et Czopik, J. hirta (L.) Opiz subsp. preissiana (Domin) Soó, *Sempervivum hirtum* L.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 413 pp. [In Ukrainian].
- Chorney II (2009c) Chornianka karpatska (nigritelia karpatska). *Nigritella carpatica* (Zapał.) Teppner, Klein et Zagulski (*Gymnadenia carpatica* (Zapał.) Teppner et E. Klein, Nigritella angustifolia Rich. var. carpatica Zapał., *N. nigra* auct. non (L.) Rchb. f.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 198 pp. [In Ukrainian].
- Chorney II, Danylyk IM (2009) Sossureya Porciusa. *Saussurea porcii* Degen. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 335 pp. [In Ukrainian].
- Chorney II, Fedoronchuk MM (2009) Minuartsia ridkokvitkova. *Minuartia pauciflora* (Kit. ex Kanitz) Dvořaková (*M. gerardii* auct. non (Willd.) Hayek; *M. verna* auct. non (L.) Hierr; *M. zarecznyi* (Zapał.) Klokov). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 397 pp. [In Ukrainian].
- Chorney II, Korotchenko IA, Shevera MV (2009) Tonkonig Remana. *Poa rehmannii* (Asch. et Graebn.) Woł. (P. nemoralis L. subsp. rehmannii Asch. et Graebn.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 233 pp. [In Ukrainian].

- Chorney II (2011) Critical revision of the taxa, mentioned as endemic for flora of Ukrainian Carpathians. Scientific Proceedings of Bukovina Society of Naturalists 1 (1-2): 23-59. [In Ukrainian].
- Chrtek J, Jirásek V (1964) *Poa deylii sp. nova*, eine neue Rispengrasart in den Karpaten. Feddes Repertorium Specierum Novarum Regni Vegetabilis 69: 176-180.
- Chrtek J (1985) Poznámky k druhu *Scabiosa lucida* s. l. v Karpatech. Preslia 57: 199-203.
- Chrtek J, Goliašová K (1985) *Scabiosa* L. Hlaváč. In: Bertová L (Ed.) Flóra Slovenska. IV/2. Veda, Bratislava, 178-190 pp.
- Chrtek J, Pouzar Z (1985) Further comments on the problem of *Antennaria carpatica*. Preslia 57: 193-198.
- Chrtek J (2000) Observations on Carpathian populations of *Plantago atrata*. Journal of the National Museum (Prague), Natural History Series - Časopis Národního muzea 169 (1-4): 47-52.
- Ciocârlan V (2009) Flora ilustrată a României. Pteridophyta et Spermatophyta. Editura Ceres, București.
- Comănescu P, Ștefănuț S (2010) Preliminary data about the chorology of the species *Sesleria bielzii* in Romania. Acta Horti Botanici Bucurestiensis 37: 51-62. URL: https://ahbb.unibuc.ro/wp-content/uploads/2019/04/AHBB-37-53-65.pdf
- Compositae Working Group (2023) Global Compositae Database. https://www.compositae.org/gcd/. Accessed on: 2023-6-01.
- Czerepanov SK (1994) Rod 110. Vasiliek – *Centaurea* L. In: Tzvelev NN (Ed.) Flora of the European part of USSR. 7. Nauka, 260-288 pp. [In Russian].
- Czerepanov SK (1995) Vascular plants of Russia and adjacent states (the former USSR). Cambridge University Press, Cambridge.
- Danciu VM, Golban D (2009) The herbarium of Simonkai L. in the collection of the Cris County Museum (Part II). Nymphaea. Folia Naturae Bihariae 36: 37-166.
- Danihelka J, Chrtek J, Kaplan Z (2012) Checklist of vascular plants of the Czech Republic. Preslia 84: 647-811.
- Danylyk IM (2009) Verba tupolysta. *Salix retusa* L. (*S. kitaibeliana* Willd.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 587 pp. [In Ukrainian].
- Deyl M (1934) Tři transsilvanské subspecie trav na Podkarpatské Rusi. Věda Přirodní 15: 224-245.
- Deyl M (1940) Plants, soil and climate of Pop Ivan. Synecological study from Carpathian Ukraine. Opera Botanica Čechica (2)1-290.
- Deyl M (1980) *Sesleria* Scop. In: Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM (Eds) Flora Europaea. 5. Cambridge University Press, Cambridge, 173-177 pp.
- Didukh YP (Ed.) (2009) Red book of Ukraine. The plant world. Globalconsulting, Kyiv. [In Ukrainian].
- Domin K (1935) Plantarum Cechoslovakiae enumeratio: species vasculares indigenas et introductas exhibens. Vytiskla Státní Tiskárna v Praze, Prague.
- Dostál J (1989) Nová Kvétena ČSSR. 1-2. Academia Press, Praha.
- Dremliuga N, Zyman S (2012) Biomorphological analysis of species of the genus *Campanula* L. in the flora of Ukraine. Bilogical Systems 5 (1): 31-38. [In Ukrainian].

- EMBL-EBI (2023) European Nucleotide Archive (ENA). https://www.ebi.ac.uk/ena/browser/home. Accessed on: 2023-6-21.
- Essl F, Staudinger M, Stöhr O, Schratt-Ehrendorfer L, Rabitsch W, Niklfeld H (2009) Distribution patterns, range size and niche breadth of Austrian endemic plants. Biological Conservation 142 (11): 2547-2558. https://doi.org/10.1016/j.biocon.2009.05.027
- ETH Library (2023) E-Periodica. https://www.e-periodica.ch/. Accessed on: 2023-1-18.
- Euro+Med (2023) Euro+Med PlantBase. https://europlusmed.org/. Accessed on: 2023-5-31.
- Fassou G, Korotkova N, Nersesyan A, Koch M, Dimopoulos P, Borsch T (2022) Taxonomy of Dianthus (Caryophyllaceae) – overall phylogenetic relationships and assessment of species diversity based on a first comprehensive checklist of the genus. PhytoKeys 196: 91-214. https://doi.org/10.3897/phytokeys.196.77940
- Favre A, Pringle J, Heckenhauer J, Kozuharova E, Gao Q, Lemmon EM, Lemmon A, Sun H, Tkach N, Gebauer S, Sun S, Fu P (2020) Phylogenetic relationships and sectional delineation withinGentiana(Gentianaceae). TAXON 69 (6): 1221-1238. https://doi.org/10.1002/tax.12405
- Fedoronchuk MM, Chorney II (2005) Genus Dianthus L. (Caryophyllaceae Juss.) of the flora of Ukraine: taxonomical and sozological analysis. Protection Affairs in Ukraine 11 (2): 9-18. [In Ukrainian].
- Fedoronchuk MM, Chorney II (2009) Minuartia gostropelustkova. *Minuartia oxypetala* (Woł.) Kulcz. (*Alsine oxypetala* Woł., Minuartia verna (L.) Hier subsp. oxypetala (Woł.) Halliday). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 398 pp. [In Ukrainian].
- Fedoronchuk MM, Mosyakin SL (2016) The genus *Minuartia* s. l. (Caryophyllaceae) in the flora of Eastern Europe: an overview of nomenclatural changes in the light of new molecular phylogenetic data. Ukrainian Botanical Journal 73 (2): 134-143. [In Ukrainian]. https://doi.org/10.15407/ukrbotj73.02.134
- Fedorov A (1974) Flora of the European part of USSR (1974-1987). 1-6. Nauka [In Russian].
- Feráková V (Ed.) (1993) Flóra Slovenska. V/1–VI/4. Veda, Bratislava.
- Filipaş L, Puşcaş M, Ursu T, Stoica IA, Coldea G (2009) On the occurrence of the *Poa granitica* group in the Romanian Carpathians. Contributii Botanice 44: 13-19.
- Fuss M (1866) Flora transsilvaniae excursoria. Typis haeredum Georgii de Closius URL: https://books.google.com/books?id=zDQ-AAAAcAAJ&hl
- Futák J (Ed.) (1966) Flóra Slovenska (1966-1982). I-III. Veda, Bratislava.
- GBIF (2023) The Global Biodiversity Information Facility. https://www.gbif.org/. Accessed on: 2023-6-01.
- Gergely I, Beldie A (1972) Genul 177. *Sesleria* Scop. In: Săvulescu T (Ed.) Flora Republicii Socialiste România. XII. Editura Academiei Republicii Socialiste România
- Geslot A (1971) Contribution a l'etude cytotaxinomique de *Campanula recta* Dul., *C. scheuchzeri* Vill. et *C. ficarioides* Tim.-Lagr. en Pyrenees Centrales et Orientales. Bulletin de la Société Botanique de France 118 (suppl. 2): 271-298. https://doi.org/10.1080/00378941.1971.10839000
- Ghişa E, Beldie A (1972) Genul 739. *Poa* L. In: Săvulescu T (Ed.) Flora Republicii Socialiste România. XII. Editura Academiei Republicii Socialiste România

- GO FAIR (2023) FAIR Principles. https://www.go-fair.org/fair-principles/. Accessed on: 2023-7-23.
- Google (2023) Google books. https://books.google.com/. Accessed on: 2023-2-12.
- Greene EL (1898) Studies in the compositae - VII. Pittonia 3 (18): 264-298. URL: https://www.biodiversitylibrary.org/page/15254108#page/295
- Greuter W (2006) Compositae (pro parte majore). In: Greuter W, Raab-Straube E (Eds) Compositae. Euro+Med Plantbase - the information resource for Euro-Mediterranean plant diversity. URL: https://europlusmed.org/cdm_dataportal/taxon/599e0bdb-a2e8-49b9-9907-5398259c4f00
- Grosjean M (2019) Six questions answered about the GBIF Backbone Taxonomy. https://data-blog.gbif.org/post/gbif-backbone-taxonomy/. Accessed on: 2023-6-05.
- Hand R, Thieme M, Mitarbeiter (2023) Florenliste von Deutschland (Gefäßpflanzen), begründet von Karl Peter Buttler, Version 13. https://www.kp-buttler.de/. Accessed on: 2023-5-31.
- Harpke D, Meng S, Rutten T, Kerndorff H, Blattner F (2013) Phylogeny of *Crocus* (Iridaceae) based on one chloroplast and two nuclear loci: Ancient hybridization and chromosome number evolution. Molecular Phylogenetics and Evolution 66 (3): 617-627. https://doi.org/10.1016/j.ympev.2012.10.007
- Hassler M (2023) World Plants. Synonymic Checklist and Distribution of the World Flora. Version 15.4. https://www.worldplants.de/. Accessed on: 2023-6-01.
- Haszprunar G (2011) Species delimitations – not ‘only descriptive’. Organisms Diversity & Evolution 11 (3): 249-252. https://doi.org/10.1007/s13127-011-0047-1
- Hayek A, Hegi G (1908) Illustrierte Flora von Mittel-Europa: Mit besonderer Berücksichtigung von Deutschland, Oesterreich und der Schweiz. Zum Gebrauche in den Schulen und zum Selbstunterricht. Bd. VI, H. 1. Lehmanns Verlag URL: https://bibdigital.rjb.csic.es/idurl/1/16573
- Hayek A (1921) Diagnosen neuer von J. Dörfler und H. Zerny in den Jahren 1916 und 1918 in Albanien gesammelter Pflanzenformen. Öesterreichische Botanische Zeitschrift 70: 12-22. https://doi.org/10.1007/bf01635690
- Heimerl A (1884) Die Arten, Unterarten, Varietäten und Hybriden: Monographia sectionis "*Ptarmica*" Achilleae Generis. Section Ptarmica des Genus *Achillea*. Denkschriften der Kaiserlichen Akademie der Wissenschaften / Mathematisch-Naturwissenschaftliche Classe 48: 113-192. URL: https://www.biodiversitylibrary.org/item/31429
- Herbich F (1859) Flora der Bucovina. F. Volckmar, Leipzig. URL: https://books.google.com/books?id=n0U-AAAAcAAJ&dq
- Hodálová I (1999) Multivariate analysis of the *Senecio nemorensis* group (Compositae) in the Carpathians with a new species from the East Carpathians. Folia Geobotanica 34: 321-335. https://doi.org/10.1007/BF02912818
- Höhn M, Lendvay B (2018) *Syringa josikaea*. *The IUCN Red List of Threatened Species* 2018: e.T162267A99428926. https://doi.org/10.2305/IUCN.UK.2018-1.RLTS.T162267A99428926.en
- Holub J, Křísa B (1971) Pyrola carpatica Holub etKřísa, a new species among European Wintergreens; with remarks on the name “Pyrola intermedia”. Folia Geobotanica et Phytotaxonomica 6 (1): 81-92. https://doi.org/10.1007/bf02851839
- Holub J (1998) Reclassifications and new names in vascular plants 1. Preslia 70: 97-122.

- Hooker W (1840) *Crocus speciosus*. Curtis's botanical magazine. Series II 67 (14): t. 3861. URL: https://www.biodiversitylibrary.org/item/14345
- Hrouda L, Šourková M (1992) *Chrysosplenium* L. – mokrýš. In: Hejný S, Slavík B, Kirschner J, Křísa B (Eds) Květena České republiky. 3. Academia, Praha, 420-422 pp.
- Hruby J (1930) Campanulastudien innerhalb der Vulgares und ihrer Verwandten. Magyar Botanikai Lapok 29: 152-269. URL: http://real-j.mtak.hu/9913/
- Hungarian Electronic Library (2023) Elektronikus Periodika Archívum. http://epa.oszk.hu/html/. Accessed on: 2023-2-01.
- Hurdu BI, Puşcaş M, Turtureanu PD, Niketić M, Vonica G, Coldea G (2012) A critical evaluation of the Carpathian endemic plant taxa list from the Romanian Carpathians. Contributii Botanice 47: 39-47.
- Indreica A (2007) *Festuca amethystina* in the sessile oak forests from upper basin of Olt river. Revista Contributii Botanice 42: 11-18.
- Internet Archive (2022) https://archive.org/. Accessed on: 2022-8-03.
- IPNI (2023) International Plant Names Index. https://www.ipni.org/. Accessed on: 2023-5-31.
- Ishchuk L (2017) Analysis of willow (*Salix* L.) flora in Ukrainian Carpathians. Revista Botanică 9 (1): 50-55.
- IUCN (2022) *The IUCN Red List of Threatened Species. Version 2022-2*. https://www.iucnredlist.org. Accessed on: 2022-12-14.
- JACQ consortium (2023) JACQ virtual herbaria. https://www.jacq.org/. Accessed on: 2023-6-20.
- Jafari F, Zarre S, Gholipour A, Eggens F, Rabeler R, Oxelman B (2020) A new taxonomic backbone for the infrageneric classification of the species-rich genus *Silene* (Caryophyllaceae). TAXON 69 (2): 337-368. https://doi.org/10.1002/tax.12230
- Jakubowska-Gabara J (1994) Distribution of Festuca amethyslina L. subsp. ritschilli (Hackel) Lemke ex Markgr.-Dannenb. in Poland. Acta Societatis Botanicorum Poloniae 63 (1): 87-95. https://doi.org/10.5586/asbp.1994.014
- Jalas J (1999) Atlas florae europaeae: distribution of vascular plants in Europe. Vol. 12. Resedaceae to Platanaceae. Committee for Mapping the Flora of Europe, Societas Biologica Fennica Vanamo
- Janka V (1858) Zur Flora von Siebenbürgen. Oesterreichische Botanische Zeitschrift 8 (6): 196-201. https://doi.org/10.1007/bf02106081
- Janka V (1882) Correspondenz. Oesterreichische Botanische Zeitschrift 32 (9): 309-310. https://doi.org/10.1007/bf01653621
- Janka V (1884) Plantae novae. Természetrajzi Füzetek kiadja a Magyar nemzeti Muzeum 8: 28-29. URL: https://www.biodiversitylibrary.org/item/96699
- Jasiewicz A (Ed.) (1980) Flora Polska – Rośliny naczyniowe Polski i ziem ościennych. 14. PWN, Warszawa–Krakow.
- Jasiewicz A (Ed.) (1985) Flora Polski – Rosliny Naczyniowe (1985-1992). 3-5. PWN, Warszawa–Krakow.
- Jávorka S (1924) Magyar flóra (1924-1925). 1-3. Studium, Budapest.
- Jeanmonod D, Bocquet G (1983) Propositions pour un traitement taxonomique du *Silene nutans* L. (Caryophyllaceae). Candollea 38: 267-295.
- Jelenevsky A, Derviz-Sokolova T (1986) De speciebus duabus europaeis generis *Ranunculus* L. (Ranunculaceae) notae. Novosti Sistematiki Vysshykh Rasteniy - Novitates Systematicae Plantarum Vascularium 23: 55-60. [In Russian].

- JSTOR (2023) Global plants. https://plants.jstor.org/. Accessed on: 2023-6-20.
- Kagalo OO (2009) Drik malonasinniy. *Genista oligosperma* (Andrae) Simonk. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 462 pp. [In Ukrainian].
- Kagalo OO, Sytschak NM (2009a) Dzvonyky karpatski. *Campanula carpatica* Jacq. (*C. reniformis* Schur). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 381 pp. [In Ukrainian].
- Kagalo OO, Sytschak NM (2009b) Armeria pokutska. *Armeria pocutica* Pawł. (*A. elongata* auct. non (Hoffm.) W.D.J. Koch., A. maritima (Mill.) Willd. subsp. elongata auct. non (Hoffm.) Bonnier, *A. vulgaris* auct. non Willd.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 517 pp. [In Ukrainian].
- Kiedrzyński M, Zielińska KM, Kiedrzyńska E, Jakubowska-Gabara J (2015) Regional climate and geology affecting habitat availability for a relict plant in a plain landscape: the case of *Festuca amethystina* L. in Poland. Plant Ecology & Diversity 8 (3): 331-341. https://doi.org/10.1080/17550874.2014.904951
- Killias E (1887) Die Flora des Unterengadins, mit besonderer Berücksichtigung der speciellen Standorte und der allgemeinen Vegetationsverhältnisse. Ein Beitrag zur Kenntniss des Unterengadins. Jahresbericht Der Naturforschenden Gesellschaft Graubündens 31: 1-266. https://doi.org/10.5962/bhl.title.9630
- Kliment J (1999) Komentovaný prehľad vyšších rastlín flóry Slovenska, uvádzaných v literatúre ako endemické taxóny. Bulletin Slovenskej Botanickej Spoločnosti 21 (Suppl. 4): 1-434.
- Kliment J, Turis P, Janišová M (2016) Taxa of vascular plants endemic to the Carpathian Mts. Preslia 88 (1): 19-76.
- Klokov MV (1960) Rodyna Gubotsviti – Labiatae Juss. In: Kotov MI (Ed.) Flora of UkrSSR. IX. Academy of Sciences of UkrSSR, Kyiv, 5-364 pp. [In Ukrainian].
- Knotek A, Konečná V, Wos G, Požárová D, Šrámková G, Bohutínská M, Zeisek V, Marhold K, Kolář F (2020) Parallel alpine differentiation in *Arabidopsis arenosa*. Frontiers in Plant Science 11: Article 561526. https://doi.org/10.3389/fpls.2020.561526
- Kobiv V (2007) Distribution and individual and group parameters of *Symphytum cordatum* Waldst. et Kit. ex Willd. In lowland conditions in the Western Ukraine. Proceedings of the State Natural History Museum 23: 137-144. [In Ukrainian].
- Kobiv Y (2009) Molodylo girske. *Sempervivum montanum* L. (incl. S. montanum L. subsp. carpaticum Wettst. ex Hayek, *S. carpathicum* Wettst. ex Prodan non G. Reuss). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 418 pp. [In Ukrainian].
- Kobiv Y, Prokopiv A, Nachychko V, Borsukevych L, Helesh M (2017) Distribution and population status of rare plant species in the Marmarosh Mountains (Ukrainian Carpathians. Ukrainian Botanical Journal 74 (2): 163-176. [In Ukainian]. https://doi.org/10.15407/ukrbotj74.02.163
- Koch K (1850) Beiträge zu einer Flora des Orientes. Linnaea 23 (7): 577-713. URL: https://www.biodiversitylibrary.org/item/109824
- Kolář F, Lučanová M, Záveská E, Fuxová G, Mandáková T, Španiel S, Senko D, Svitok M, Kolník M, Gudžinskas Z, Marhold K (2016) Ecological segregation does not drive the intricate parapatric distribution of diploid and tetraploid cytotypes of the *Arabidopsis arenosa* group (Brassicaceae). Biological Journal of the Linnean Society 119 (3): 673-688. https://doi.org/10.1111/bij.12479

- Kolesnyk AV (2001) The essence of the taxon and intraspecific systematics of *Scilla bifolia* agg. in the Ukrainian Carpathians. Scientific Proceedings of Uzhgorod State University. Series Biology 9: 236-243. [In Ukrainian].
- Kolesnyk AV (2003) Genus *Scilla* L. within the flora of the Ukrainian Carpathians (systematics, ecological-geographic, biological and population peculiarities). Doctoral dissertation. M.M. Gryshko National Botanical Garden, National Academy of Sciences of Ukraine, Kyiv. [In Ukrainian].
- Komarov VL (1934) Flora of USSR (1934-1960). 1-29. Academy of Sciences of USSR, Moscow-Leningrad. [In Russian].
- Kondracki J (1989) Karpaty. Wydawnictwo Szkolne i Pedagogiczne, Warszawa.
- Kosiński P, Adreas Hilpold AB (2017) Taxonomic differentiation of *Salix retusa* agg. (Salicaceae) based on leaf characteristics. Dendrobiology 78: 40-50. https://doi.org/10.12657/denbio.078.005
- Kosiński P, Sliwinska E, Hilpold A, Boratyński A (2019) DNA ploidy in *Salix retusa* agg. only partly in line with its morphology and taxonomy. Nordic Journal of Botany 37 (7): Article e02197. https://doi.org/10.1111/njb.02197
- Kotov MI (1961) Rodyna Chersakovi – Dipsacaceae Lindl. In: Kotov MI (Ed.) Flora of UkrSSR. X. Publishing house of the Academy of Sciences of UkrSSR, Kyiv, 339-379 pp. [In Ukrainian].
- Koutecký P, Štěpánek J, Bad'urova T (2012) Differentiation between diploid and tetraploid *Centaurea phrygia*: mating barriers, morphology and geographic distribution. Preslia 84 (1): 1-32.
- Kovanda M (1975) *Campanula tatrae*, the correct name for *Campanula polymorpha*. Preslia 47: 26-30.
- Krajina V (1930) Monografická studie druhů *Festuca varia* (Haenke) a *Festuca versicolor* (Tausch) Krajina. Spisy Vydávané Přírodovědeckou Fakultou Karlovy University 106: 1-46.
- Krajina V (1933) Bemerkungen zur Verbreitung und Systematik einiger Arten der Gattung *Festuca* in den rumänischen Karpathen. Veröffentlichungen des Geobotanischen Institutes der Eidgenössische Technische Hochschule, Stiftung Rübel, in Zürich 10: 26-53. URL: https://www.e-periodica.ch/digbib/view?pid=gbi-001%3A1933%3A10#5
- Kricsfalusy V, Vajnagi A (1994) Biologie und Oekologie von *Scilla kladnii* Schur in Ostkarpaten. Linzer Biologische Beiträge 26 (1): 1081-1111.
- Kricsfalusy V, Budnikov G (2002) Endemic vascular plants in the Ukrainian Carpathians. In: Hamor FD (Ed.) Proceedings of the International Scientific Conference "People and mountains". Proceedings of the International Scientific Conference "People and mountains", Rakhiv, 2002, October 14–18. 356-360 pp. [In Ukrainian].
- Kricsfalusy V, Budnikov G (2007) Threatened vascular plants in the Ukrainian Carpathians: current status, distribution and conservation. Thaiszia 17: 11-32.
- Kucowa I (1954) Krytyczny przegląd gatunków wierzb (*Salix* L.) z osadów glacjalnych Polski. Acta Societatis Botanicorum Poloniae 23 (4): 807-836. https://doi.org/10.5586/asbp.1954.043
- Kuzmanović N, Barina Z, Šída O, Lakušić D (2015) Typification of names in the group *Coerulans* of the genus *Sesleria* (Poaceae). Phytotaxa 202: 103-120. https://doi.org/10.11646/phytotaxa.202.2.3

- Kuzmanović N, Lakušić D, Frajman B, Alegro A, Schönswetter P (2017) Phylogenetic relationships in *Seslerieae* (Poaceae) including resurrection of *Psilathera* and *Sesleriella*, two monotypic genera endemic to the Alps. Taxon 66 (6): 1349-1370. https://doi.org/10.12705/666.5
- Lazarević M, Kuzmanović N, Lakušić D, Alegro AL, Schönswetter P, Frajman B (2015) Patterns of cytotype distribution and genome size variation in the genus *Sesleria* Scop. (Poaceae). Botanical Journal of the Linnean Society 179 (1): 126-143. https://doi.org/10.1111/boj.12306
- Łazarski G (2016) *Festuca amethystina* (Poaceae) - a species new for the Płaskowyż Jędrzejowski plateau. Fragmenta Floristica et Geobotanica Polonica 23 (2): 370-374. URL: http://bomax.botany.pl/pubs-new/#article-4182
- Letz R, Marhold K (1998) Multivariate morphometric study of the *Sempervivum montanum* group (Crassulaceae) in the West Carpathians. Phyton 38: 323-336.
- Letz R (2002) The nomenclature of the *Sempervivum montanum* group (Crassulaceae) in the Carpathians. Phyton 42 (1): 109-115.
- Lindley J (1839) *Crocus speciosus*. Showy autumn crocus. Edwards's Botanical Register 25: t. 40.
- Loiseleur-Deslongchamps JL (1810) Notice sur les plantes à ajouter à la flore de France (Flora Gallica): avec quelques corrections et observations. Imprimerie de J.B. Sajou, Paris. https://doi.org/10.5962/bhl.title.6361
- Lucian Blaga Central University Library (2022) Biblioteca Digitala BCU Cluj. https://dspace.bcucluj.ro/. Accessed on: 2022-12-24.
- Lut CW, Veldkamp JF (2023) Guide to the plant species descriptions published in seed lists from Botanic Gardens for the period 1800-1900. https://seedlists.naturalis.nl/content/seedlists. Accessed on: 2023-6-11.
- Macalik K, Tamás R, Kolcsár LP, Keresztes L (2013) Present status of the *Syringa josikaea* Jacq. ex Rchb., an endemic species which contributes to the diversity of the Flora of the Carpathians. Studia Universitatis Babeş-Bolyai. Series Biologia 58 (2): 31-40.
- Malynovskiy K, Tsaryk Y, Kyyak V, Nesteruk Y (2002) Rare, endemic, relict and marginally-ranged plant species of the Ukrainian Carpathians. Liga-Press, Lviv. [In Ukrainian].
- Marcussen T, Ballard H, Danihelka J, Flores A, Nicola M, Watson J (2022) A revised phylogenetic classification for *Viola* (Violaceae). Plants 11 (17). https://doi.org/10.3390/plants11172224
- Marhold K (2022) Caryophyllaceae. Euro+Med Plantbase – the information resource for Euro-Mediterranean plant diversity. https://europlusmed.org/cdm_dataportal/taxon/49f3f935-a218-49f0-9acd-5bbd9c2b8739
- Martin H, Touzet P, Van Rossum F, Delalande D, Arnaud J- (2016) Phylogeographic pattern of range expansion provides evidence for cryptic species lineages in *Silene nutans* in Western Europe. Heredity 116: 286-294. https://doi.org/10.1038/hdy.2015.100
- Mártonfi P (1996) *Thymus alternans* Klokov - a new species of Slovak flora. Biologia, Bratislava 51 (1): 27-29.
- Mártonfi P (1997) Nomenclatural survey of the genus Thymus sect. Serpyllum from Carpathians and Pannonia. Thaiszia 7: 111-181.
- Mártonfi P, Marhold K (1998) To the legitimity of the name Thymus pulcherrimus subsp. sudeticus (Lyka) P.A. Schmidt. Thaiszia 8: 17-18.

- Martyniuk VO, Karpenko NI, Kostikov IY (2018) Molecular phylogenetic analysis of rare sileneae species of the Ukrainian flora. Scientific Reports of NULES of Ukraine 3 (73): Article 2. [In Ukrainian]. https://doi.org/10.31548/dopovidi2018.03.002
- Maximowicz CJ (1877) Diagnoses plantarum novarum Asiaticarum. Bulletin de l'Académie Impériale des Sciences de St.-Pétersbourg 23: 305-391. https://doi.org/10.5962/bhl.title.46308
- Melnyk VI, Batochenko VM (2009) Akonit opushenoplodiy. *Aconitum lasiocarpum* (Rchb.) Gáyer (*A. degenii* auct. non Gáyer). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 550 pp. [In Ukrainian].
- MEPNR of Ukraine (2021) Decree Nr 111. On approval of lists of plant and fungi species included in the Red Book of Ukraine (plant world) and plant and fungi species excluded from the Red Book of Ukraine (plant world). Ministry of Environmental Protection and Natural Resources of Ukraine. URL: https://zakon.rada.gov.ua/laws/show/z0370-21?lang=en#Text
- Meyer FK (1973) Conspectus der *Thlaspi*-Arten Europas, Afrikas und Vorderasiens. Feddes Repertorium 84: 449-469. https://doi.org/10.1002/fedr.19730840503
- Michalko J (Ed.) (1984) Flóra Slovenska (1984-1988). IV/1–IV/4. Veda, Bratislava.
- Mihály AV, Komendar VI (1993) State of population of *Crocus banaticus* J. Gay in the Transcarpathian region of the Tisza valley. Tiscia 27: 61-63.
- Mirek Z, Piękoś-Mirkowa H, Zając A, Zając M (2020) Vascular plants of Poland: an annotated checklist. W. Szafer Institute of Botany, Polish Academy of Sciences, Cracow.
- Mitka J (2003) The genus *Aconitum* in Poland and adjacent countries - a phenetic-geographic study. Institute of Botany, Jagiellonian University, Cracow.
- Mitka J (2008) *Aconitum moldavicum* Hacq. (Ranunculaceae) and its hybrids in the Carpathians and adjacent regions. Roczniki Bieszczadzkie 16: 233-252.
- Mitka J, Kozioł M (2009) *Aconitum moldavicum* (Ranunculaceae) na Wyżynie Małopolskiej. Fragmenta Floristica et Geobotanica Polonica 16 (1): 7-25.
- Mitka J, Boroń P, Sutkowska A (2013) Holocene history of *Aconitum* in the Polish Western Carpathians and adjacent regions: long-distance migrations or cryptic refugia? Modern Phytomorphology 3: 9-18. https://doi.org/10.5281/zenodo.161587
- Mitka J, Bąba W, Szczepanek K (2014) Putative forest glacial refugia in the Western and Eastern Carpathians. Modern Phytomorphology 5: 85-92. https://doi.org/10.5281/zenodo.161009
- Mitka J, Boroń P, Novikoff A, Wróblewska A, Binkiewicz B (2016) Two major groups of chloroplast DNA haplotypes in diploid and tetraploid *Aconitum* subgen: *Aconitum* (Ranunculaceae) in the Carpathians. Modern Phytomorphology 9 (Suppl.): 5-15. https://doi.org/10.5281/zenodo.159700
- Mitka J (2019) *Aconitum degenii*. The IUCN Red List of Threatened Species 2019: e.T129114432A129114435. https://doi.org/10.2305/IUCN.UK.2019-1.RLTS.T129114432A129114435.en
- Mitka J, Novikov A, Rottensteiner W (2021) The taxonomic circumscription of Aconitum subgenus Aconitum (Ranunculaceae) in Europe. Webbia 76 (1): 11-45. https://doi.org/10.36253/jopt-10006
- Mosyakin SL, Fedoronchuk MM (1999) Vascular plants of Ukraine: A nomenclatural checklist. M.G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Kyiv.

- Mosyakin SL, Fedoronchuk MM (2015) New combinations for East European species of *Sabulina* (Caryophyllaceae). Phytotaxa 231 (1): 95-98. https://doi.org/10.11646/phytotaxa.231.1.10
- Mráz P, Barabas D, Lengyelová L, Turis P, Schmotzer A, Janišová M, Ronikier M (2016) Vascular plant endemism in the Western Carpathians: spatial patterns, environmental correlates and taxon traits. Biological Journal of the Linnean Society 119 (3): 630-648. https://doi.org/10.1111/bij.12792
- Mygal AV (2009) Shafran banatskiy. *Crocus banaticus* J. Gay (*C. iridiflorus* Heuff. ex Rchb.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 118 pp. [In Ukrainian].
- Mygal AV, Kagalo OO, Felbaba-Klushyna LM (2009) Buzok uhorskiy. *Syringa josikaea* J. Jacq. ex Rchb. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 527 pp. [In Ukrainian].
- Myklestad A, Birks HJ (1993) A numerical analysis of the distribution patterns of *Salix* L. species in Europe. Journal of Biogeography 20 (1): 1-32. https://doi.org/10.2307/2845736
- Nachychko V (2014) The genus *Thymus* L. (Labiatae Juss.) in the Ukrainian Carpathians' flora: systematics and taxonomic problems. Visnyk of Lviv University. Biological Series 64: 159-169. [In Ukrainian].
- Nachychko VO, Honcharenko VI (2017) Botanical-geographical characterization of *Thymus* L.(Lamiaceae) species in the flora of western regions of Ukraine. Visnyk of Lviv University. Biological Series 75: 35-47. https://doi.org/10.30970/vlubs.2017.75.04
- Negrean G, Karácsonyi K, Szatmari PM (2015) Kárpáti, erdélyi, dácikus és pannon endemikus fajok a Szilágyság flórájában. Kitaibelia 20 (2): 259-267. https://doi.org/10.17542/kit.20.259
- Neilreich A (1861) Nachträge zu Maly's Enumeratio plantarum phanerogamicarum imperii austriaci universi. Zoologisch-Botanische Gesellschaft in Wien, Wien. URL: https://books.google.com/books?id=Zk0-AAAAcAAJ&hl
- Novikoff AV (2010) Some features of anatomical structure of the stem of *Aconitum moldavicum* Hacq. and *Aconitum lycoctonum* L. em. Koelle (Ranunculaceae). Studia Biologica 4 (1): 109-114. https://doi.org/10.30970/sbi.0401.068
- Novikoff AV, Hurdu BI (2015) A critical list of endemic vascular plants in the Ukrainian Carpathians. Contributii Botanice 50: 43-91.
- Novikov A, Mitka J (2019) *Aconitum lasiocarpum*. The IUCN Red List of Threatened Species 2019: e.T129089723A129089823. https://doi.org/10.2305/IUCN.UK.2019-1.RLTS.T129089723A129089823.en
- Novikov A, Mitka J (2020) Spatial analysis and distribution modeling of *Aconitum moldavicum* in Ukrainian Carpathians and adjacent territories with special reference to the algorithm used. Plant Introduction 85-86: 50-64. https://doi.org/10.46341/PI2020001
- Novikov A (2021) Developing the GIS-based maps of the geomorphological and phytogeographical division of the Ukrainian Carpathians for routine use in biogeography. Biogeographia - The Journal of Integrative Biogeography 36: Article a009. https://doi.org/10.21426/B636052326
- Novikov A, Sup-Novikova M (2022a) Endemic vascular plants in the Ukrainian Carpathians. Biodiversity Data Journal 10: Article e95910. https://doi.org/10.3897/BDJ.10.e95910

- Novikov A, Sup-Novikova M (2022b) Endemic vascular plants of the Ukrainian Carpathians. 1.4. State Museum of Natural History of the National Academy of Sciences of Ukraine. Release date: 2022-10-02. URL: https://doi.org/10.15468/5hrh87
- Novikov A (2023) Working synonymic checklist of endemic vascular plants occurring in the Ukrainian Carpathians. 64. Zenodo. Release date: 2023-3-16. URL: https://doi.org/10.5281/zenodo.7742316
- Nunvářová Kabátová K, Kolář F, Jarolímová V, Krak K, Chrtek J (2019) Does geography, evolutionary history or ecology drive ploidy and genome size variation in the *Minuartia verna* group (Caryophyllaceae) across Europe? Plant Systematics and Evolution 305: 1019-1040. https://doi.org/10.1007/s00606-019-01621-2
- Nyman C (1878) Conspectus florae europaeae: seu enumeratio methodica plantarum phanerogamarum Europae indigenarum, indicatio distributionis geographicae singularum etc. Örebro Sueciae, typis officinae Bohlinianae https://doi.org/10.5962/bhl.title.10533
- Omelczuk-Mjakushko TJ, Chopik VV (1975) Genus *Jovibarba* Opiz (Crassulaceae) in the flora of Ukraine. Botanicheski Zhurnal 60 (8): 1183-1187. [In Russian].
- Onyshchenko VA, Mosyakin SL, Korotchenko IA, Danylyk IM, Burlaka MD, Olshanskyi IH, Shiyan NM, Zhygalova SL, Tymchenko IA, Kolomiychuk VP, Novikov AV, Chorney II, Kish RY, Shevera MV, Fedoronchuk MM, Protopopova VV (2022) IUCN Red List categories of vascular plant species of Ukrainian flora. M.G. Kholodny Institute of Botany of the NAS of Ukraine, Kyiv.
- Opiz FM (1852) Seznam rostlin květeny české. Nákladem Českého museum URL: https://books.google.com.ua/books?id=F1M-AAAAcAAJ&hl
- Oprea A (2005) Lista critică a plantelor vasculare din România. Editura Universităţii Alexandru Ioan Cuza, Iaşi.
- Országgyűlési Könyvtár (2023) Hungaricana. https://www.hungaricana.hu/. Accessed on: 2023-3-15.
- Pachschwöll C, Pachschwöll T (2019) A new find of *Arabidopsis neglecta* (Brassicaceae) in the Svydovets Massif (Ukrainian Carpathians). Ukrainian Botanical Journal 76 (1): 60-66. https://doi.org/10.15407/ukrbotj76.01.060
- Parnikoza IY, Gilchuk PV (2002) Itinerary study of coenopopulations of rare and endangered plants in Rakhiv district of Zakarpattia region. Protection Affairs in Ukraine 8 (1): 35-39. [In Ukrainian].
- Pawłowski B (1946) O niektórych naszych wierzbach. Materiały do Fizjografii Kraju. T. 1. Nakładem Polskiej Akademii Umiejętności
- Pawłowski B (1956) Flora Tatr. Rośliny naczyniowe. PWN, Polska Akademia Nauk
- Pawłowski B (1961) Observationes ad genus *Symphytum* L. pertinentes. Fragmenta Floristica et Geobotanica Polonica 4 (1-2): 133-152.
- Pawłowski B (Ed.) (1963) Flora Polska. Rośliny naczyniowe Polski i ziem ościennych. 10-11. PWN, Warszawa-Krakow.
- Pawłowski B, Jasiewicz A (Eds) (1971) Flora Polska. Rośliny naczyniowe Polski i ziem ościennych. 12-13. PWN, Warszawa-Krakow.
- Peregrym OM (2010) A taxonomic overview of the genus *Euphrasia* L. in Ukraine. Ukrainian Botanical Journal 67: 248-260. [In Ukrainian].
- Petri A, Oxelman B (2019) Phylogenetic relationships within *Silene* (Caryophyllaceae) section Physolychnis. TAXON 60 (4): 953-968. https://doi.org/10.1002/tax.604002

- Piękoś-Mirkowa H, Mirek Z (2011) Endemic taxa of vascular plants in the Polish Carpathians. Acta Societatis Botanicorum Poloniae 72 (3): 235-242. https://doi.org/10.5586/asbp.2003.031
- Pilger R (1926) Beiträge zur Kenntnis der Gattung *Plantago*. VII. Sektion *Oreades* Decne. Repertorium Specierum Novarum Regni Vegetabilis 23: 241-270. URL: https://bibdigital.rjb.csic.es/records/item/14708-redirection
- Pilger R (1937) Plantaginaceae. In: Diels L (Ed.) Das Pflanzenreich. Regni vegetabilis conspectus (Engler). H. 102. Verlag von Wilhelm Engelmann, Leipzig, 1-466 pp. URL: https://www.biodiversitylibrary.org/item/71753
- Piscová V, Ševčík M, Hreško J, Petrovič F (2021) Effects of a short-term trampling experiment on alpine vegetation in the Tatras, Slovakia. Sustainability 13 (5). https://doi.org/10.3390/su13052750
- Plazi (2023) TreatmentBank. https://plazi.org/treatmentbank/. Accessed on: 2023-7-08.
- Podlech D (1965) Revision der europäischen und nordafrikanischan Vertreter der Subsect. Heterophylla (Witas.) Fed. der Gattung *Campanula*. Feddes Repertorium 71 (1-3): 50-187. https://doi.org/10.1002/fedr.19650710103
- Porcius F (1878) Enumeratio plantarum phanerogamicarum districtus quondam naszódiensis. Papp, Claudiopoli. URL: https://books.google.com/books?id=bWtuuQAACAAJ&hl
- POWO (2023) Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. https://powo.science.kew.org/. Accessed on: 2023-5-31.
- Prodan I, Nyárády EI (1964) Genul 582 *Centaurea* L. In: Nyárády EI (Ed.) Flora republicii populare Romîne. 9. Editio Academiae reipublicae popularis Romanicae, 785-951 pp.
- Prots BG, Kish RY (2009) Chyna transylvanska. *Lathyrus transsilvanicus* (Spreng.) Rchb. (*Orobus transsilvanicus* Spreng.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 472 pp. [In Ukrainian].
- Pyke G (2014) Evaluating the Quality of Taxonomic Publications: A Simple Alternative to Citations and Effort. BioScience 64 (11): 961-962. https://doi.org/10.1093/biosci/biu154
- Ratnasingham S, Hebert PD (2007) BOLD: The Barcode of Life Data System (www.barcodinglife.org). Molecular Ecology Notes 7 (3): 355-364. https://doi.org/10.1111/j.1471-8286.2007.01678.x
- Răvăruț M (1956) Fam. 46. Saxifragaceae DC. In: Săvulescu T (Ed.) Flora Reipublicae Populare România. 4. Editio Academiae Reipublicae Popularis Romanicae, 87-148 pp.
- REAL-J (2023) repository of the Library and Information Centre of the Hungarian Academy of Sciences. http://real-j.mtak.hu/. Accessed on: 2023-2-10.
- Rewicz A, Tomczyk PP, Kiedrzyński M, Zielińska KM, Jędrzejczyk I, Rewers M, Kiedrzyńska E, Rewicz T (2018) Morphometric traits in the fine-leaved fescues depend on ploidy level: the case of *Festuca amethystina* L. PeerJ 6: Article e5576. https://doi.org/10.7717/peerj.5576
- Richter K (1889) Plantae Europeae. Enumeratio systematica et synonymica plantarum phaenerogamicarum in Europa sponte crescentium vel mere inquilinarum. I. W. Engelmann Verlag, Leipzig. URL: https://doi.org/10.5962/bhl.title.10116
- RJB-CSIC (2023) Biblioteca del Real Jardín Botánico. https://bibdigital.rjb.csic.es/. Accessed on: 2023-2-10.
- Rochel A (1828) Plantae banatus rariores iconibus et descriptionibus illustratae. Landerer de Füskút URL: https://books.google.com/books?id=Iw9JAAAAcAAJ&hl

- Roleček J, Dřevojan P, Šmarda P (2019) First record of *Festuca amethystina* L. from the Transylvanian Basin (Romania). Contribuții Botanice 54: 91-97. https://doi.org/10.24193/contrib.bot.54.6
- Rybczyński J, Davey MR, Mikuła A (2014) The Gentianaceae. Volume 1: Characterization and Ecology. Springer, Berlin–Heidelberg. https://doi.org/10.1007/978-3-642-54010-3
- Sagorski E, Schneider G (1891) Flora der Centralkarpathen, mit specieller Berücksichtigung der in der Hohen Tatra vorkommenden Phanerogamen und Gefäss-Cryptogamen, nach eigenen und fremden Beobachtungen. II. E. Kummer, Leipzig.
- Săvulescu T (Ed.) (1952) Flora Reipublicae Populare România / Flora Reipublicae Socialistica România (1952-1976). 1-13. Editio Academiae Reipublicae Popularis România (Editio Academiae Reipublicae Socialistica România)
- Schmickl R, Paule J, Klein J, Marhold K, Koch M (2012) The evolutionary history of the *Arabidopsis arenosa* complex: Diverse tetraploids mask the Western Carpathian center of species and genetic diversity. PLoS ONE 7 (8): Article e42691. https://doi.org/10.1371/journal.pone.0042691
- Schultz Bipontius CH (1856) Sendschreiben an Herrn Victor Janka. Oesterreichisches botanisches Wochenblatt 6: 299-301. https://doi.org/10.1007/BF02059367
- Schur F (1853) Sertum florae Transsilvaniae, sive enumeratio systematica omnium plantarum, quae in Transsilvania sponte crescunt et in usum hominum copiosius coluntur. Verhandlungen und Mitteilungen des Siebenbürgischen Vereins für Naturwissenschaften zu Hermannstadt 4: 1-94.
- Schur F (1859a) Beobachtungen in der Flora von Siebenbürgen, nebst Beschreibung neuer Pflanzenarten und Varietäten. Österreichische botanische Zeitschrift 9: 9-16. https://doi.org/10.1007/BF01962324
- Schur F (1859b) Botanische Rundreise durch Siebenbürgen. Verhandlungen und mitteilungen des Siebenbürgischen vereins für naturwissen schaften zu Hermannstadt 10 (7-8): 137-182. URL: https://www.biodiversitylibrary.org/item/42663
- Schur F (1866) Enumeratio plantarum Transsilvaniae. Vindobonae URL: https://doi.org/10.5962/bhl.title.312
- Sheliag-Sosonko YR, Didukh YP, Kukovytsa HS (1980) Distribution of *Viola jooi* Janka in Ukraine. Ukrainian Botanical Journal 37 (3): 221-224. [In Ukrainian].
- Simonkai L (1886) Enumeratio florae transsilvanicae vesculosae critica. Magyar Természettudományi Társulat, Budapest. https://doi.org/10.5962/bhl.title.9882
- Šmarda P, Šmerda J, Knoll A, Bureš P, Danihelka J (2007) Revision of Central European taxa of Festuca ser. Psammophilae Pawlus: morphometrical, karyological and AFLP analysis. Plant Systematics and Evolution 266 (3): 197-232. https://doi.org/10.1007/s00606-007-0532-3
- Šmarda P (2008) DNA ploidy level variability of some fescues (Festuca subg. Festuca, Poaceae) from Central and Southern Europe measured in fresh plants and herbarium specimens. Biologia 63 (3): 349-367. https://doi.org/10.2478/s11756-008-0052-9
- Soldano A (1991) Le sottospecie di Cesati: altre novitá e precisazioni nomenclaturali e tassonomiche su fanerogame d'Italia e dell'area Mediterranea. Atti della Società Italiana di Scienze Naturali e del Museo Civico di Storia Naturale in Milano 131: 245-256.
- Soldano A (2001) Silene nutans subsp. insubrica (Gaudin) Soldano, *comb. nova*. Candollea 56 (1): 137. https://doi.org/10.5169/seals-879363

- Soó R (1972) Systematisch-nomenklatorische Bemerkungen zur Flora Mitteleuropas mit Beziehungen zur südosteuropäischen Flora. Feddes Repertorium 83 (3): 129-212. https://doi.org/10.1002/fedr.19720830302
- Starmühller W (2000) Fortschritte in der Systematik der Gattung *Aconitum* in Siebenbürgen. Siebenbürgisches Archiv 36: 9-24.
- Staszkiewicz J (2015) Zmienność i systematyka taksonów z rodzaju *Euphrasia* (Scrophulariaceae; Orobanchaceae) w Polsce: 2. Analiza biometryczna taksonów i populacji z podsekcji *Ciliatae*. Fragmenta Floristica et Geobotanica Polonica 22 (2): 141-302. URL: http://bomax.botany.pl/pubs-new/#article-3980
- Štech M, Drábková L (2005) Morphometric and RAPD study of the *Melampyrum sylvaticum* group in the Sudeten, the Alps and Carpathians. Folia Geobotanica 40: 177-193. https://doi.org/10.1007/BF02803233
- Štěpánek J, Holub J (1997) *Scabiosa* L. – hlaváč. In: Slavík B, Chrtek J, Tomšovic P (Eds) Květena České republiky. 5. Academia, Praha, 536-542 pp.
- Štěpánek J, Tomšovic P (2000) *Thymus* L. – mateřídouška. In: Slavík B, Chrtek J, Tomšovic P (Eds) Květena České republiky. 6. Academia, Praha, 656-669 pp.
- Steudel EG (1855) Synopsis plantarum glumacearum. Pars 1. J.B. Metzler, Stuttgartaiae. https://doi.org/10.5962/bhl.title.83535
- Stojko SM, Tasenkevich L (1979) *Galium transcarpaticum* Stojko et Tasenkevitsch - new species from the Ugolsky massif of the Capathian State Reservation. Ukrainian Botanical Journal 36 (6): 594-597. [In Ukrainian].
- Stojko SM, Tasenkevich L (1993) Some aspects of endemism in the Ukrainian Carpathians. Fragmenta Floristica et Geobotanica Polonica 2 (1): 343-353.
- Surányi G, Máthé C, Mosolygó Á, Borbély G, Vasas G (2010) Analysis of genetic diversity in crocuses with Carpathian Basin origin using AFLP-markers. Acta Biologica Hungarica 61: 149-155. https://doi.org/10.1556/abiol.61.2010.suppl.15
- Szafer W, Raciborski M (Eds) (1919) Flora Polska. Rośliny naczyniowe Polski i ziem ościennych. 1. PAU, Kraków.
- Szafer W (Ed.) (1921) Flora Polska. Rośliny naczyniowe Polski i ziem ościennych (1921-1947). 2-6. PAU, Kraków.
- Szafer W, Pawłowski B (Eds) (1955) Flora Polska. Rośliny naczyniowe Polski i ziem ościennych (1955-1960). 7-9. PWN, Warszawa–Kraków.
- Tan K, Vladimirov V (2001) *Swertia punctata* (Gentianaceae) in Bulgaria. Bocconea 13: 461-466.
- Tasenkevich L (1998) Flora of the Carpathians: Checklist of the native vascular plant species. State Museum of Natural History of the NAS of Ukraine, Lviv. [In Ukrainian].
- Tasenkevich L (2003) Diversity of the flora of vascular plants In Ukrainian Carpathians. Proceedings of Shevchenko Scientific Society 12: 145-157. [In Ukrainian].
- Tasenkevich L (2004) Regional phytogeographical division of Carpathians. Scientific Proceedings of the State Natural History Museum of the NAS of Ukraine 19: 29-39. [In Ukrainian].
- Tasenkevich L (2006) Native flora of vascular plants of the Carpathians, its pecularities and genesis. Doctoral dissertation. State Museum of Natural History of the NAS of Ukraine, Lviv. [In Ukrainian].
- Těšitel J, Štech M (2007) Morphological variation in the *Melampyrum sylvaticum* group within the transitional zone between *M. sylvaticum* s. str. and *M. herbichii*. Preslia 79: 83-99.

- Těšitel J, Malinová T, Štech M, Herbstová M (2009) Variation in the *Melampyrum sylvaticum* group in the Carpathian and Hercynian region: two lineages with different evolutionary histories. Preslia 81: 1-22.
- Thiers B (2022) The world's herbaria 2021: a summary report based on data from Index Herbariorum. Issue 6.0. http://sweetgum.nybg.org/science/wp-content/uploads/2022/02/The_Worlds_Herbaria_Jan_2022.pdf
- Tomović G, Vukojičić S, Mirjačić K, Radović A, Niketić M (2014) Genus *Viola* L. (Violaceae) in Serbia collections of the Natural History Museum in Belgrade and the Institute of Botany and Botanical Garden 'Jevremovac', Faculty of Biology, University of Belgrade. Bulletin of the Natural History Museum 7: 31-91. https://doi.org/10.5937/bnhmb1407031t
- Tomović G, Niketić M, Lazarević M, Melovski L (2016) Taxonomic reassessment of *Viola aetolica* and *Viola elegantula* (V. sect. Melanium, Violaceae), with descriptions of two new species from the Balkan Peninsula. Phytotaxa 253 (4): 237-265. https://doi.org/10.11646/phytotaxa.253.4.1
- Tutin TG (1972) *Gentiana* L. In: Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM, Webb DA (Eds) Flora Europaea. Vol. 3. Diapensiceae to Myoporaceae. Cambridge University Press, Cambridge, 59-63 pp.
- Tzvelev NN (1971) The genus *Alopecurus* L. in USSR. Novosti Sistematiki Vysshykh Rasteniy 8: 12-22. [In Russian].
- Tzvelev NN (1974) Fam. 180. Poaceae Barnh (Gramineae Juss. nom. altern.) – Zlaki. In: Fedorov AA (Ed.) Flora of European part of USSR. 1. Nauka, Moscow, 117-368 pp. [In Russian].
- Tzvelev NN (1976) Cereals of USSR. Nauka, Moscow. [In Russian].
- Tzvelev NN (1978) Fam. 133. Gentianaceae. – Horechavkoviye. In: Fedorov AA (Ed.) Flora of USSR. 3. Nauka, Moscow, 57-85 pp. [In Russian].
- Tzvelev NN (1981) Rod 20. Ochanka – *Euphrasia* L. In: Fedorov A (Ed.) Flora of the European part of USSR. 5. Nauka, Moscow, 268-281 pp. [In Russian].
- Tzvelev NN (Ed.) (1989) Flora of the European part of USSR / Flora of the Eastern Europe (1989-2004). 7-11. Various Publishers – Nauka, Mir i Semia, KMK [In Russian].
- Tzvelev NN (1995) Plantae vasculares Rossicae et civitatum collimitanearum (in limicis URSS olim). Mir i Semia, Saint-Petersburg. [In Russian].
- Tzvelev NN (2001) Rod 20. Lutik – *Ranunculus* L. In: Tzvelev NN (Ed.) Flora of the European part of USSR. 10. Mir i Semia, Saint-Petersburg, 100-158 pp. [In Russian].
- Ujhelyi J (1965) Data to the sectio *Bulbosae* and section Caespitosae of the genus *Koeleria*. V. Annales Historico-Natürales Musei Nationalis Hungarici. Pars Botanica 57: 179-202.
- Utelli AB, Roy BA, Baltisberger M (2000) Molecular and morphological analyses of European *Aconitum* species (Ranunculaceae). Plant Systematics and Evolution 224: 195-212. https://doi.org/10.1007/BF00986343
- Valdecasas A, Castroviejo S, Marcus L (2000) Reliance on the citation index undermines the study of biodiversity. Nature 403 (6771): 698-698. https://doi.org/10.1038/35001751
- Valentine DH, Merxmüller H, Schmidt A (1968) *Viola* L. In: Tutin TG, Heywood VH, Burges NA, Moore DM, Valentine DH, Walters SM, Webb DA (Eds) Flora Europaea. 2. Cambridge University Press, Cambridge.

- Vasiliev VN (1952) Fam. CXXIX. Oleaceae Lindl. In: Shyshkin BK, Bobrov EG (Eds) Flora of USSR. 18. Academy of Sciences of USSR, Moscow–Leningrad, 488-525 pp. [In Russian].
- Velev NI, Apostolova II (2009) A review of *Potentillo ternatae-Nardion strictae* alliance. Hacquetia 8: 49-66.
- Visjulina OD (1953) Rodyna Zhovtytsevi – Ranunculaceae Juss. In: Klokov MV, Visjulina OD (Eds) Flora of UkrSSR. 5. Publishing house of the Academy of Sciences of UkrSSR, Kyiv, 14-152 pp. [In Ukrainian].
- WBC (2023) Wielkopolska Biblioteka Cyfrowa. https://wbc.poznan.pl/dlibra
- Wettstein R (1891) Litteratur-Uebersicht. Österreichische Botanische Zeitschrift 41 (4): 147-178.
- Wettstein R (1894) Untersuchungen über Pflanzen der österreichischungarischen Monarchie. Österreichische Botanische Zeitschrift 44 (7): 244-249. https://doi.org/10.1007/bf01795066
- Wettstein R (1896) Monographie der Gattung *Euphrasia*. Engelmann URL: https://bibdigital.rjb.csic.es/idurl/1/14706
- WFO (2023) World Flora Online. http://www.worldfloraonline.org/. Accessed on: 2023-6-01.
- Wikimedia (2023) Wikispecies, free species directory. https://species.wikimedia.org/wiki/Main_Page. Accessed on: 2023-5-31.
- Wilkinson M, Dumontier M, Aalbersberg IJ, Appleton G, Axton M, Baak A, Blomberg N, Boiten J, da Silva Santos LB, Bourne P, Bouwman J, Brookes A, Clark T, Crosas M, Dillo I, Dumon O, Edmunds S, Evelo C, Finkers R, Gonzalez-Beltran A, Gray AG, Groth P, Goble C, Grethe J, Heringa J, 't Hoen PC, Hooft R, Kuhn T, Kok R, Kok J, Lusher S, Martone M, Mons A, Packer A, Persson B, Rocca-Serra P, Roos M, van Schaik R, Sansone S, Schultes E, Sengstag T, Slater T, Strawn G, Swertz M, Thompson M, van der Lei J, van Mulligen E, Velterop J, Waagmeester A, Wittenburg P, Wolstencroft K, Zhao J, Mons B (2016) The FAIR Guiding Principles for scientific data management and stewardship. Scientific Data 3 (1): Article 160018. https://doi.org/10.1038/sdata.2016.18
- Williams FN (1890) The pinks of Central Europe. West Newman URL: https://books.google.com/books?id=MDgIAQAAMAAJ&hl
- Williams FN (1893) A monograph of the genus *Dianthus*, Linn. Journal of the Linnean Society of London, Botany 29 (203): 346-478. https://doi.org/10.1111/j.1095-8339.1893.tb02037.x
- Witasek J (1902) Ein Beitrag zur Kenntnis der Gattung Campanula. Abhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien 1: 1-106.
- Zahradníková K (1985) *Sempervivum* L. In: Bertová L (Ed.) Flóra Slovenska. IV/2. Veda, Bratislava, 193-201 pp.
- Zapałowicz H (1906a) Niektóre nowe, krytyczne i rzadkie gatunki (odmiany) flory Pokucko-Marmaroskiej. Sprawozdanie Komisyi Fizyograficznej 29: 32-38.
- Zapałowicz H (1906b) Conspectus florae Galiciae criticus (1906-1911). 1-3. Nakładem Akademii Umiejętności w Krakowie, Kraków.
- Zawadski A (1835) Enumeratio plantarum Galiciae & Bucowinae, oder die in Galizien und der Bukowina wildwachsenden Pflanzen mit genauer Angabe ihrer Standorte. W.G. Korn URL: https://books.google.com/books?id=WHA-AAAAcAAJ&hl
- Zerov DK (1950) Flora of UkrSSR (1950-1965). 3-12. Academy of Sciences of UkrSSR, Kyiv. [In Ukrainian].

- Zhang L, Kadereit J (2004) Nomenclature of *Soldanella* L. (Primulaceae). TAXON 53 (3): 741-752. https://doi.org/10.2307/4135448
- Zuev VV (2019) System of the Russian species of the genus *Ciminalis* Adans. (Gentianaceae Juss.). Turczaninowia 22 (3): 144-149. https://doi.org/10.14258/turczaninowia.22.3.10
- Zyman SM, Bulakh OV (2009) Kotiachi lapki. *Antennaria carpatica* (Wahlenb.) Bluff et Fingerh. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 290 pp. [In Ukrainian].
- Zyman SM, Chorney II (2009) Chykhavka tonkolysta (dereviy Shura). *Ptarmica tenuifolia* (Schur) Schur (Achillea oxyloba (DC.) Sch. Bip. subsp. schurii (Sch. Bip.) Heimerl, *A. schurii* Sch. Bip.). In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 332 pp. [In Ukrainian].
- Zyman SM, Shiyan NM (2009) Tyrlych rozdilniy. *Gentiana laciniata* Kit. ex Kanitz. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 488 pp. [In Ukrainian].
- Zyman SM, Gamor AF, Dremliuga NG, Tukh YY (2009) Dzvonyky Kladny. *Campanula kladniana* (Schur) Witasek. In: Didukh YP (Ed.) Red book of Ukraine. The plant world. Globalconsulting, Kyiv, 382 pp. [In Ukrainian].

Supplementary materials

Suppl. material 1: An alphabetic index of endemic species and infraspecific taxa of vascular plants distributed in the Ukrainian Carpathians doi

Authors: Andriy Novikov
Data type: Checklist
Brief description: This is an alphabetically ordered checklist of endemic vascular plants distributed in the Ukrainian Carpathians.
Download file (76.44 kb)

Suppl. material 2: Clustered synonymic checklist of endemic species and infraspecific of vascular plants taxa distributed in the Ukrainian Carpathians doi

Authors: Andriy Novikov
Data type: Checklist
Brief description: This is a hierarchically ordered (with clustered homotypic synonyms) checklist of endemic vascular plants distributed in the Ukrainian Carpathians.
Download file (67.94 kb)

Suppl. material 3: Revealed accessions to molecular data on the investigated species doi

Authors: Andriy Novikov
Data type: molecular data
Brief description: This table contains all accessions to molecular data regarding investigated species and revealed using the ENA and BOLD facilities.
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