

Contribuții Botanice – 2013, XLVIII: 7-14
Grădina Botanică “Alexandru Borza”
Cluj-Napoca

LECTOTYPIFICATION OF *DORONICUM CARPATICUM* (GRISEB. & SCHENK) NYMAN (ASTERACEAE), WITH SOME REMARKS ON ITS DISTRIBUTION AND TAXONOMY

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Abstract: *Doronicum carpaticum* (Griseb. & Schenk) Nyman (Asteraceae) is a subalpine to alpine species considered to be endemic to the Eastern and Southern Carpathians in Romania and Ukraine. A specimen collected by Johann Michael Fuss in the Făgăraș Mountains, Romania, and held in the collection of August Heinrich Rudolf Grisebach in Göttingen (GOET) is selected here as a lectotype. Furthermore, its unclear distribution in the Balkan Peninsula, the systematic and morphological relation to *Doronicum columnae* Ten., as well as a neglected paper by Rezső Soó, are discussed. On the basis of the incipient morphological, ecological and chorological distinction of *D. carpaticum* from *D. columnae*, it is suggested to follow Soó and treat *D. carpaticum* as a subspecies of *D. columnae*: *Doronicum columnae* subsp. *carpaticum* (Griseb. & Schenk) Soó.

Keywords: Asteraceae, Carpathians, *Doronicum*, endemic, Fuss, Grisebach, lectotypification, Schenk, Soó

Introduction

Due to the seminal works of Cavillier [11, 12] and Álvarez Fernández [1, 2, 3], the morphology, systematics and phylogeny of the Eurasian genus *Doronicum* (Asteraceae) are well studied, but unresolved questions about nomenclature, distribution or differentiation of some species still remain. One of the lesser known and sometimes queried species is the presumed Carpathian endemic *Doronicum carpaticum* (Griseb. & Schenk) Nyman (Asteraceae). This species was not included in the molecular phylogenetic work of Álvarez Fernández *et al.* (2001) and its lectotypification, including that of *Doronicum* ser. *Carpatica* Gorschk. as well as its formal synonymy, had been missing so far [1]. Therefore, in addition to nomenclatural aspects, the yet insufficiently known and perhaps questionable distribution of *D. carpaticum* in the Balkan Peninsula, as well as forms morphologically transitional to *D. columnae* Ten., are discussed on the basis of a largely neglected paper on this topic by Soó [47].

Material and Methods

In the course of studying alpine species of *Doronicum*, I have searched for type material of *Doronicum carpaticum*. Apart from field observations in Romania and Ukraine in 2009 and 2012, literature and herbaria (BRNU, CL, GOET, LI, LW, LWKS, LWS, P, PR, PRC, W, WU, WU-Hal-E) were critically checked to gain further insights into the nomenclature, systematics, morphology and distribution of this species. Herbarium acronyms follow *Index Herbariorum* [51].

Results and Discussion

Synonymy and lectotypification of *D. carpaticum*

Aronicum scorpioides var. *carpaticum* Griseb. & Schenk, Arch. Naturgesch. 18(1): 342. 1852
 ≡ *Aronicum carpaticum* (Griseb. & Schenk) Fuss, Progr. Gymn. Hermannstadt: 12. 1854 [as „carpathicum“]

N.B.: this combination by Fuss [19] precedes that in Schur (1859) on page 137. Although Schur [44] and Rouy [39] ascribe the same combination to Schur in “Bot. Rundr. 1853 suscept. p. 71”, this work only existed as an unpublished manuscript at that time and was published 153 years later [49].

≡ *Doronicum carpaticum* (Griseb. & Schenk) Nyman, Syll. Fl. Eur., Suppl.: 1. 1865

≡ *Doronicum grandiflorum* subsp. *carpaticum* (Griseb. & Schenk) Rouy, Rev. Bot. Syst. Geogr. Bot. 1: 53. 1903

≡ *Doronicum columnae* subsp. *carpaticum* (Griseb. & Schenk) Soó, Scripta Bot. Mus. Transsilv. 3(3-5): 10. 1944

Lectotypus (hic designatus): Szurul. Fuss.; Herbarium Grisebachianum, GOET 011169, see *Type database of the herbarium Göttingen (GOET)*:

[https://gwdu64.gwdg.de/pls/herbar/typen\\$.startup#](https://gwdu64.gwdg.de/pls/herbar/typen$.startup#)

A high resolution scan of this type specimen can be found at *JSTOR Plant Science*:

<http://plants.jstor.org/>

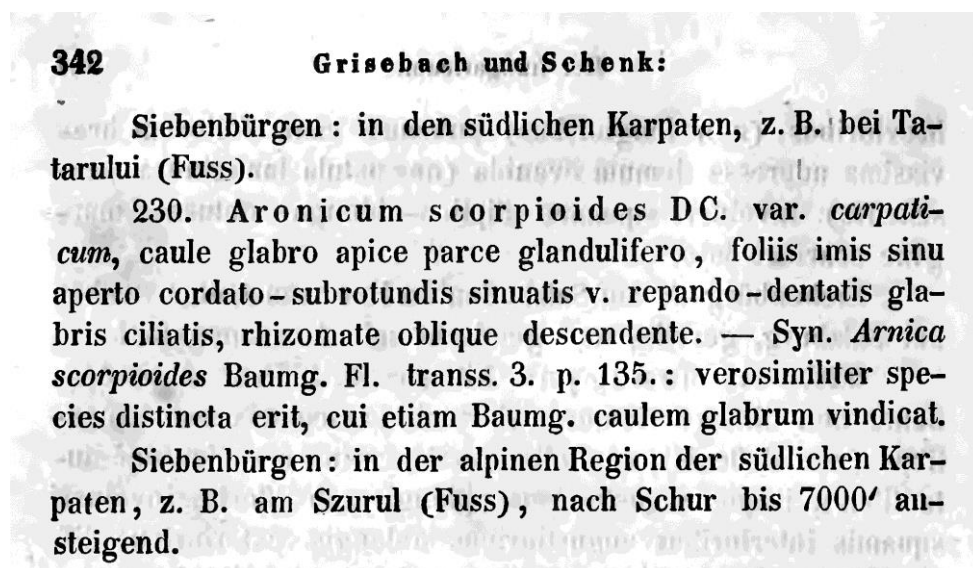


Fig. 1: Original description of *Aronicum scorpioides* var. *carpaticum* taken from Grisebach & Schenk (1852)

Discovery and historical remarks

In 1852, the German botanists August Heinrich Rudolf Grisebach (1814–1879) and Joseph August von Schenk (1815–1891) conducted a botanical expedition to the Principality of Transylvania and also met local botanists, including Johann Michael Fuss (1814–1883) and Ferdinand Schur (1799–1878) in Hermannstadt [Sibiu] [24, 49]. In the summary of their expedition, Grisebach & Schenk (1852) described a new variety, *Aronicum scorpioides* var.

carpaticum (see Fig. 1), today treated as *Doronicum carpaticum* [1, 13, 18, 22, 23, 31, 32, 35, 48, 50, 52]. It should be noted that *Doronicum grandiflorum* Lam. (= *D. scorpioides* Lam., *Aronicum scorpioides* (Lam.) W. D. J. Koch) is absent from the Carpathians although it was erroneously given for this mountain range in 19th century floras, beginning with Baumgarten (1816). Vouchers of *D. grandiflorum* in the collection of Schur (LW!) have been repeatedly cited in the literature, but these likely are mislabeled and were collected in the Alps and not in the Southern Carpathians: Nyárády 1961 in schedae in LW! [cf. 7, 11, 34, 36].

Apart from their own collections, Grisebach and Schenk received specimens from Fuss, Schur and others. Thus, the collection of Grisebach in GOET also contains a sheet of *Doronicum carpaticum* that he obtained from Fuss. The handwritten label reads “Szurul. Fuss.” and includes four different taxon names. Of those, “*Aronicum cordifolium*” and “*Aronicum caucas.*” are crossed out and replaced with “*Aronicum scorpioides* Baumg.”. The fourth name, “*Aronicum scorpioides* var. *carpaticum* m.”, was written by the same hand, but apparently added later, and is – together with the locality and the collector – obviously related to Grisebach & Schenk (1852), see Fig. 1. The note “nach Schur bis 7000' ansteigend” (translation: “after Schur ascending up to 7000”, i.e. 2200 m a.s.l.), refers to species number 31, *Aronicum* (*Arnica*) *scorpioides* in Schur (1850). The lectotype of *Aronicum scorpioides* var. *carpaticum* was collected by Fuss in the Făgăraș Mountains (Munții Făgăraș), Romania, on or below (Mt.) Szurul, today known as Vârful Suru, 2283 m a.s.l., c. 45°35'N, 24°26'E. No collection date is given on the sheet, but it can be supposed that Fuss collected it in 1850 when he visited (Mt.) Szurul, see Schur (1853) on page 16.

Systematics, morphology, ecology and distribution of *D. carpaticum*

When summarizing the paper of Grisebach & Schenk (1852), Fuss [20] only mentioned the closely related *Doronicum columnae* from the same locality (“An den Bächen unter dem Szurul, Fuss”, translation: “along the brooks below Szurul”) instead of *D. carpaticum*. Later, in his *Flora Transsilvaniae excursoria* he listed *Aronicum carpaticum* for “Szuru” [21], thus accepting this new taxon. Remarkably, the most important character that distinguishes *D. carpaticum* from *D. columnae*, homomorphic cypselae, i.e., all florets with pappus in *D. carpaticum* versus heteromorphic cypselae, i.e. ray florets without pappus, in *D. columnae* [1, 13, 35], is lacking in the original description, see Fig. 1. Instead, several quantitative traits, such as leaf hairiness or leaf shape, are mentioned. According to the literature, *Doronicum carpaticum* possesses white-tinted, scattered, multiseriate eglandular trichomes (up to 1.5 mm), uniseriate eglandular trichomes, found mainly on the edge of the blade, and scarce short-stalked glandular trichomes; by contrast, in *D. columnae* multiseriate eglandular trichomes are lacking and only uniseriate eglandular trichomes (up to 0.5 mm) are present. In general, *D. columnae* has more or less glabrous leaves, which are only hairy at the leaf edges, whereas the leaves of *D. carpaticum* are conspicuously hairy [1, 35, 47]. The lectotype possesses these typical longer eglandular trichomes of *D. carpaticum* on the upper leaf surfaces and pappose ray florets. Leaf shape characters given in the protologue (Fig. 1) are not suited to distinguish *D. carpaticum* from *D. columnae* and are considered extremely variable [1; pers. obs.]. After the description of their new variety, Grisebach & Schenk (1852) mentioned *Arnica scorpioides* Baumg. as a probable synonym (Fig. 1), stating that it must be a different species since Baumgarten’s species has totally glabrous stems [5].

In the 19th century, distinction between *Doronicum* (heterocarpic species) and *Aronicum* (homocarpic species) sensu Necker (1790) was widely accepted, but this distinction was later abandoned [11, 12, 18, 35, 53]. Although generally holding to distinguish between species, for some homocarpic species, such as *Doronicum cataractarum* Widder or *D. carpetanum* Willk. (s. lat.), individuals with incompletely developed pappuses on ray florets are reported, supporting the notion that this character lacks phylogenetic signal and is rather artificial [1, 3].

In 1878, both Simonkai and Borbás [8, 9, 45, 46] first mentioned individuals of *Doronicum/Aronicum* from the Romanian Carpathians, being intermediate between, and growing together with, *D. carpaticum* and *D. columnae*. These were later even described as the new species *Doronicum pilosum* Simonk. (= *D. columnae* var. *pilosum* (Simonk.) Rouy, *D. cordatum* var. *asperum* Borb.) and *Aronicum barcense* Simonk. (= *D. barcense* (Simonk.) Cavill., *D. carpaticum* var. *barcense* (Simonk.) Borb.), which should have a pappus that is reduced or missing. The polymorphic traits in *D. columnae*, *D. carpaticum* and intermediate individuals triggered an extensive use of subspecific taxa and the acceptance of hybrids [12, 35, 47, 53]. Such intermediate individuals were repeatedly reported from the Eastern and Southern Carpathians [35, 47], for example for Munții Retezat: BRNU! [cf. 9, 34, 46], Munții Parâng: BRNU!, LW!, Munții Țarcu: W! [cf. 9, 10, 46], Munții Făgăraș: WU! [cf. 17, 46], Masivul Pietra Mare: CL!, Munții Bucegi: CL!, LI! [cf. 7], Masivul Postăvarul: CL!, W!, or Masivul Ceahlău: CL!.

Although *D. carpaticum* and *D. columnae* are generally treated as different species (see above), their similarity is well known and determination in the field and in herbaria frequently causes problems [1, 6, 47; pers. obs.]. With multivariate analysis of morphometric data, Álvarez Fernández & Nieto Feliner (2001) were able to show that these two taxa are morphologically very similar, leading to misclassifications in 17 of 20 cases.

In a comprehensive paper completely ignored by later authors, except Beldie (1967), the Hungarian botanist Rezső Soó (1903–1980) pointed out that a morphological transition series exists between *D. carpaticum* and *D. columnae* [47]: more or less glabrous leaves, scarcely pubescent, glabrous to glabrescent cypsalae and epappose ray florets in *D. columnae*; more or less hairy leaves, scarcely pubescent to glabrous cypsalae and epappose ray florets in *D. (×) pilosum*; more or less hairy leaves, shortly pilose cypsalae and ray florets with a rudimentary pappus in *D. (×) barcense*; and hairy leaves, scarcely pubescent, glabrous to subglabrous cypsalae with a well-developed pappus of ray florets in typical *D. carpaticum* [1, 9, 11, 12, 35, 46, 47, 53]. Therefore, Soó (1944) suggested to treat *D. columnae* and *D. carpaticum* as conspecific, accepting *D. carpaticum* at most as *D. columnae* subsp. *carpaticum* (Griseb. & Schenk) Soó at subspecific level, but to my knowledge this was not followed by any subsequent author.

The subalpine to alpine *D. carpaticum* grows on acidic, intermediate to basic schist, flysch or breccia, or on conglomerate and flowers from June to July. It is restricted to higher mountain chains of the Carpathians from Munții Țarcu and Munții Retezat to Chornohora and Svydovets [1, 15, 17, 30, 35, 47, 53]. *Doronicum carpaticum* grows between (885–) 1600 and 2250 (2400) m a.s.l. within the mostly Carpathian endemic syntaxa *Cardaminetum opizii*, *Cardaminopsis neglectae-Papaveretum*, *Doronicum carpatici-Saxifragetum aizoidis* or *Saxifrago moschatae-Drabetum kotschyi* [7, 14, 16, 17, 28, 40]. Compared to the following species, it requires habitats that are more open, higher in altitude and wetter.

The submontane to (sub-)alpine *D. columnae* mostly grows on limestone but also on schist or breccia, flowers from April to June (July), and is more widely distributed, ranging from the Carpathians, the Southern and Northern Alps, the Apennines and the whole Balkan Peninsula. In Romania, it can be found in the Carpathian foothills, in gorges (e.g. Cheile Turzii), in lower mountain chains such as Munții Maramureșului, Munții Apuseni or Munții Banatului, as well as in higher mountain chains such as Munții Retezat, Munții Făgăraș or Munții Bucegi; apparently it is missing from the Ukrainian Carpathians [1, 15, 17, 30, 32, 35, 47, 53; pers. obs.]. It should be noted however, that the majority of indications for subalpine and alpine populations of *D. columnae* refer to *D. (×) pilosum* or *D. (×) barcense*, thus to individuals having a rudimentary pappus [35, 47]. In the Carpathians, *D. columnae* grows between (400–) 1000 and 1850 m (2400) a.s.l. in *Asplenio septentrionali-Melicetum ciliatae*, *Campanulo kladniana-Calamagrostetum variae*, *Doronico columnae-Piceetum*, *Doronico columnae-Rumicetum scutati*, *Galio schultesii-Fagetum* or *Phyllitidi-Fagetum*, among plant communities which are predominantly endemic to this mountain range [14, 16, 17, 35, 37, 40; pers. obs.].

Traditionally, *D. carpaticum* is considered an endemic of the Southern and Eastern Carpathians in Romania and Ukraine and treated as “Vulnerable” (VU) in the latter country [15, 18, 22, 27, 29, 31, 35, 38]. For distribution maps see Soó (1944), Meusel & Jäger (1992) and Álvarez Fernández (2003).

It has, however, long been known that individuals with pappose ray florets also exist outside the Carpathians. Examples include: in the Balkan Mountains under the Akdere waterfall near Kalofer (Karlovo), Bulgaria, “infra cataractas Akderes fluminis ad pagum Kalofer”, Wagner [1, 12, 47]: W 1893-3993!; WU s.n.! revised by A. v. Hayek as *D. columnae* f. *occidentale* Hayek, on Mt. Botev (Yumrukchal), Balkan Mountains, Bulgaria, “Iumrutschal”, Urumoff [12]: WU-Hal-E s.n.!, near Boyana (Bojana) on the outskirts of Sofia, Bulgaria “In faucibus prope Bojana haud procul ab urbe Sofia”, Pichler [47]: WU s.n.!, WU-Hal-E s.n.! revised by Cavillier as *D. columnae* or on Mt. Ljubiten (Ljuboten, Luboten) in the Šar Mountains, at the border of Kosovo and the Republic of Macedonia, “Ljubiten hegy Lyak Kepisor”, Bierbach [47]. Another indication of *D. carpaticum* from former Yugoslavia, “Mt. Gnila greda supra vallem Dobrido dispersum, prope Trebinje, Aug. 1891, Vandas s.n. (K)” [1], is from the Orjen mountains in the border region of Montenegro/Crna Gora and Bosnia & Herzegovina. Hayek (1917) reported *Doronicum columnae* f. *orientale* Hayek from the same locality and accession of Vandas: PRC s.n.!, WU s.n.!. These unclear indications from the Balkan Peninsula were accepted neither in Hayek’s *Prodromus Florae peninsulae Balcanicae* [26] nor in *Flora Europaea* [18] or recent literature [e.g. 4, 23].

The possible occurrence of forms referable to *D. carpaticum* in the Balkan Peninsula indicates that the distinction between *D. columnae*, which is a frequent species in the Balkans, and *D. carpaticum* may not be justified or that the distribution range of *D. carpaticum* should be extended to mountain systems of the Balkan Peninsula. Therefore, a comprehensive, range-wide morphological and fine-scale morphometric comparison between both taxa, preferably in a phylo-geographical context should be conducted. It should also be tested whether the most important morphological distinction between these two species, the homo- and heteromorphy of cypselae, is stable in natural populations of different habitats, in culture among generations, as well as in other species of the genus *Doronicum*. In this respect, the sibling species *D.*

carpaticum and *D. columnae* could be a well-suited model system for studying ecotypic differentiation, phenotypic plasticity or hybrid zones.

Conclusions

For the time being, I suggest to treat *D. carpaticum* at subspecific rank, as *D. columnae* subsp. *carpaticum*, because it cannot be unambiguously distinguished from *D. columnae* subsp. *columnae*: they exhibit all possible morphological transitions [47; pers. obs.], broad scale morphometric data analysis failed to discriminate between them [2], they are often reported from the same localities and even from the same populations [cf. 17, 20, 24, 35, 46, 47], they have the same ploidy level of $2n = 2x = 60$ [1], and occur sympatrically in the Southern and Eastern Carpathians and presumably in the Balkan Peninsula, although *D. columnae* subsp. *carpaticum* is absent at lower altitudes in the Carpathians and its foothills. The lack of divergence between *D. columnae* subsp. *carpaticum* and *D. columnae* subsp. *columnae* in preliminary ITS data (C. Pachschröll, unpublished) supports the close relationship of these two taxa. Whereas both are phylogenetically closely related to *D. orientale* Hoffm. within the so-called “*D. hungaricum* clade” [3; C. Pachschröll, unpublished], a close relationship to *D. grandiflorum* Lam. can safely be ruled out, cf. Fig. 1, Pax (1898) on page 202 or Rouy (1903).

Acknowledgements: The author wishes to thank the curators of BRNU, CL, GOET, LI, LW, LWKS, LWS, PR, PRC, W and WU who kindly provided access to their collections, pictures or information about herbarium vouchers, especially to J. Heinrichs (MSB, formerly GOET), F. Kolář (PRC), T. Khmil (LW), T. Pochynok (LW) and M. Reiner-Drehwald (GOET). I am also indebted to C. Gilli, A. Hahnekamp, A. Miernik, A. Novikoff, M. Novikoff-Supp, T. Pochynok, M. Puşcaş and D. Turtureanu for accompanying me in the field in the Eastern and Southern Carpathians as well as to A. Laciny, M. Puşcaş and G. M. Schneeweiss for valuable comments on the manuscript.

REFERENCES

1. Álvarez Fernández, I., 2003, Systematics of the Eurasian and North-African genus *Doronicum* (Asteraceae, Senecioneae), *Ann. Missouri Bot. Gard.*, **90**: 319-389.
2. Álvarez Fernández, I., Nieto Feliner, G., 2001, A multivariate approach to assess the taxonomic utility of morphometric characters in *Doronicum* (Asteraceae, Senecioneae), *Folia Geobot.*, **36**: 423-444.
3. Álvarez Fernández, I., Fuertes Aguilar, J., Panero, J., Nieto Feliner, G., 2001, A phylogenetic analysis of *Doronicum* (Asteraceae, Senecioneae) based on morphological, nuclear ribosomal (ITS), and chloroplast (trnL-F) evidence, *Molec. Phylogen. Evol.*, **20**: 41-64.
4. Assyov, B., Petrova, A., (ed.), 2006, *Conspectus of the Bulgarian vascular flora. Distribution maps and floristic elements*, Third revised and enlarged edition, Bulgarian Biodiversity Foundation, Sofia.
5. Baumgarten, J.C.G., 1816, *Enumeratio stirpium in Magno principatu Transsilvaniae praeprimis indigenarum in usum nostratum botanophilorum conscripta inque ordinem sexuali-naturalem concinnata*, Tomus Tertius, Libreria Camesinae, Vindobonae.
6. Bădărău, S.A., 2010, *Doronicum carpaticum* (Griseb. et Schenk.) Nyman. In: FLORA VIRTUALIS ROMANIAE - Flora of Romania on-line. Centuria VIII, <http://www.floraofromania.transilvanica.net/flora%20of%20romania/ac%20IX%20801-900%20dan%20turtureanu/Copy%20%2845%29%20of%20Copy%20of%20species.htm>, (accessed: 28.03.2013)
7. Beldie, A., 1967, *Flora și vegetația Munților Bucegi*, Editura Academiei Republicii Socialiste România, București.
8. Borbás, V., 1878, Correspondenz, *Oesterr. Bot. Z.*, **28** (9): 310-311.
9. Borbás, V., 1896, Nomenklaturái fejtegetések - Nomenklatorische Erklärungen, *Természetráji Füz.*, **19** (2): 209-224, 256-263.
10. Boşcaiu, N., 1971, *Flora și vegetația Munților Țarcu, Godeanu și Cernei*, Editura Academiei Republicii Socialiste România, București.

11. Cavillier, F., 1907, Étude sur les *Doronicum* à fruits homomorphes, *Annuaire Conserv. Jard. Bot. Genève*, **10**: 177-251.
12. Cavillier, F., 1911, Nouvelles études sur le genre *Doronicum*, *Annuaire Conserv. Jard. Bot. Genève*, **13-14**: 195-368.
13. Ciocârlan, V., 2009, *Flora Ilustrată a României - Pteridophyta et Spermatophyta*, 3rd edition, Editura Ceres, București.
14. Coldea, G., Sanda V., Popescu, A., Ștefan, N., 1997, *Les associations végétales de Roumanie, Tome 1, Les associations herbacées naturelles*, Presses Universitaires de Cluj, Cluj.
15. Čopyk, V.I., 1977, *Vyznačnyk roslyn Ukraïns'kykh Karpat (Key for determination of vascular plants in the Ukrainian Carpathians)*, Naukova dumka, Akademiia nauk URSS, Instytut botaniky Imeni N. G. Cholodnogo, Kiev [in Russian].
16. Doniță, N., Popescu, A., Paucă-Comănescu, M., Mihăilescu, S., Biriș, I.A., 2005, *Habitatele din România*, Editura Tehnică Silvică, București.
17. Drăgulescu, C., 2003, *Cormoflora județului Sibiu*, Editura Pelecanus, Brașov.
18. Ferguson, I.K., 1976, *Doronicum* L. In: Tutin, T.G., Heywood, V.H., Burges, N.A., Moore, D. M., Valentine, D.H., Walters, S.M., Webb, D.A., (eds.), *Flora Europaea* Vol. 4, pp. 190-191, Cambridge University Press, Cambridge.
19. Fuss, M., 1854a, *Bericht über den Stand der Kenntniß der Phanerogamen-Flora Siebenbürgens mit dem Schlusse des Jahres 1853/4*. In: Schneider, J., (ed.), *Programm des Gymnasiums A. B. zu Hermannstadt für das Schuljahr 1853*, pp. 3-31, Diözesan Druckerei, Hermannstadt.
20. Fuss, M., 1854b, Zur Flora Siebenbürgens, *Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt*, **5** (1): 3-16.
21. Fuss, M., 1866, *Flora Transsilvaniae excursoria*, Typ. Haeredum Georgii de Closius, Sibinii.
22. Gorshkova, S.R., 1961, *Doronicum* L. In: Shishkin, B.K., Bobrov, E.G., (eds.), *Flora of the U.S.S.R.* 26, pp. 669-682. Akademiya Nauk SSSR, Moscow-Leningrad [in Russian].
23. Greuter, W., 2008, *Med-checklist - A critical inventory of vascular plants of the circum-mediterranean countries. Vol. 2: Dicotyledones (Compositae)*, Organisation for the Phyto-Taxonomic Investigation of the Mediterranean Area (OPTIMA), Genève.
24. Grisebach, A., Schenk, A., 1852, Iter hungaricum a. 1852 susceptum – Beiträge zur Systematik der ungarischen Flora, *Arch. Naturgesch. (Berlin)*, **18**: 291-362.
25. Hayek, A., 1917, Beitrag zur Kenntnis der Flora des albanisch-montenegrinischen Grenzgebietes (Bearbeitung der von I. Dörfler im Jahre 1914 auf einer im Auftrage der Kaiserlichen Akademie der Wissenschaften unternommenen Forschungsreise gesammelten Farn- und Blütenpflanzen), *Denkschr. Kaiserl. Akad. Wiss., Wien. Math.-Naturwiss. Kl.*, **94**: 127-210.
26. Hayek, A., 1924–1933, *Prodromus Florae peninsulae Balcanicae*. 3 Vols., *Repert. Spec. Nov. Regni Veg. Beih.*, **30** (1-3): 1-1193, 1-1152, 1-472
27. Hurdu, B.I., Pușcaș, M., Turtureanu, P.D., Niketić, M., Vonica, G., Coldea, G., 2012, A critical evaluation of the Carpathian endemic plant taxa list from the Romanian Carpathians, *Contrib. Bot.*, **XLVII**: 39-47.
28. Kucowa, I., 1971, *Doronicum* L. In: Pawłowskiego, B., Jasiewiczza, A., (eds.), *Flora Polska* 12, pp. 314-318, Państwowe Wydawnictwo Naukowe, Warszawa.
29. Kricsfalusy, V., Budnikov, B., 2007, Threatened vascular plants in the Ukrainian Carpathians: current status, distribution and conservation, *Thaiszia*, **17**: 11-32.
30. Meusel, H., Jäger, E.J., (eds.) 1992, *Vergleichende Chorologie der zentraleuropäischen Flora*. Vol. 3. - Karten, Literatur, Register, Fischer Verlag, Jena.
31. Minderova, E.V., 1962, *Doronicum* L. In: Visjulina, O.D., (ed.) *Flora URSS*. Vol. 11, pp. 362-369, Vidav-vo Akad. nauk ukrains'kvi RSR, Kiev [in Ukrainian].
32. Mosyakin, S.L., Fedoronchuk, M.M., 1999, *Vascular plants of Ukraine: a nomenclatural checklist*, National Academy of Sciences of Ukraine, M. G. Kholodny Institute of Botany, Kiev.
33. Necker, N.J. de, 1790, *Elementa Botanica*, Tomus Primus, Neowedae ad Rhenum.
34. Nyárády, E.I., 1958, Flora și vegetația munților Retezat, Editura Academiei Republicii Populare Romîne, București.
35. Nyárády, E.I., 1964, *Doronicum* L. In: Săvulescu, T., (ed.), *Flora Republicii Populare Române IX*, pp. 506-520, Editura Academiei Republicii Populare Romîne, București.
36. Pachschwöll, C., Pușcaș, M., Schönswetter, P., 2011, Distribution of *Doronicum clusii* and *D. stiriacum* (Asteraceae) in the Alps and Carpathians, *Biologia (Bratislava), Sect. Bot.*, **66** (6): 977-987.
37. Pawłowski, B., 1939, Notulae floristicae ad Carpatos Austro-Orientales pertinentes, *Bul. Grăd. Bot. Univ. Cluj*, **19**: 1-20.
38. Pax, F., 1898, *Grundzüge der Pflanzenverbreitung in den Karpathen I*. In: Engler A. & Drude O. (eds.), *Die Vegetation der Erde. Sammlung pflanzengeographischer Monographien II*, Verlag von Wilhelm Engelmann, Leipzig.

39. Rouy, M.G., 1903, Le genre *Doronicum* dans la flore européenne et dans la flore atlantique, *Rev. Bot. Syst. Geogr. Bot.*, **1**: 17-22, 33-40, 49-56.
40. Sanda, V., Öllerer, K., Burescu, P., 2008, *Fitocenozele din România – Sintaxonomie, structură, dinamică și evoluție*, Ars Docendi, București.
41. Schur, F., 1850, Ueber eine Centime Pflanzen, welche Herr Albert Bielz auf dem Kühhorn bei Rodna und auf dem Czibles bei Bistriz im August 1848 sammelte, *Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt*, **1** (7): 101-112.
42. Schur, F. 1853, Beiträge zur Kenntniss der Flora von Siebenbürgen. Fünfter Artikel. Erste Reihe. Erläuterungen und Bemerkungen über die im Sertum Florae Transsilvaniae verzeichneten siebenbürgischen Pflanzen, *Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt*, **4** (1): 3-16.
43. Schur, F., 1859, Auszug aus dem von Dr. Ferdinand Schur erstatteten Berichte über eine von Demselben über Auftrag Sr. Durchlaucht Carl Fürsten zu Schwarzenberg, Gouverneur von Siebenbürgen, k.k. Feldzeugmeister, Kommandanten des 12. Armeecorps, Ritter des goldenen Vliesses etc. vom 5. Juli bis 15. August unternommene botanische Rundreise durch Siebenbürgen, *Verh. Mitth. Siebenbürg. Vereins Naturwiss. Hermannstadt*, **10**, 58-86, 96-134, 137-182, 185-212.
44. Schur, F., 1866, *Enumeratio plantarum Transsilvaniae, exhibens: stirpes phanerogamas sponte crescentes atque frequentius cultas, cryptogamas vasculares, Characeas etiam muscos hepaticasque*, G. Braumüller, Vindobonae.
45. Simonkai, L., 1878, Bánsági és hunyadmegyei utazásom 1874-ben, *Mat. Term. Közlem.*, **15**: 479-624.
46. Simonkai, L., 1886, *Enumeratio florum transsilvanicarum vasculosarum critica*, Kiadja a kir. Magyar Természettudományi társulat, Budapest.
47. Soó, R., 1944, Tanulmányok erdélyi növényfajokról, *Scripta Bot. Mus. Transsilv.*, **3** (1-5): 3-14.
48. Speta, E., Rákossy, L., 2010, *Wildpflanzen Siebenbürgens*, Plöchl, Freistadt.
49. Speta, F., 1996, Leben und Werk von Ferdinand Schur, *Stapfia*, **32**: 1-334.
50. Tassenkevich, L., 1998, *Flora of the Carpathians. Checklist of the native vascular plant species*, State Museum of Natural History of the National Academy of Sciences of Ukraine, L'viv.
51. Thiers, B., 2013, *Index Herbariorum: A global directory of public herbaria and associated staff*, New York Botanical Garden's Virtual Herbarium, <http://sweetgum.nybg.org/ih/> (accessed: 28.03.2013)
52. Tzvelev, N.N., (ed.) 1994, *Flora Europeiskoi chastii SSSR (Flora partis Europaeae URSS)*, VII. Izdat. Nauka Leningradskoe Otd., Leningrad, [in Russian].
53. Widder, F.J., 1935, Die Bastarde der *Doronicum*-Arten, *Mitt. Naturwiss. Vereines Steiermark*, **71**: 132-146.

**LECTOTIPIZAREA LUI *DORONICUM CARPATICUM* (GRISEB. & SCHENK) NYMAN
(ASTERACEAE), CU UNELE REMARCI PRIVIND DISTRIBUȚIA ȘI TAXONOMIA ACESTUIA**

(Rezumat)

Doronicum carpaticum (Griseb. & Schenk) Nyman (Asteraceae) este o specie subalpină-alpină, considerată a fi endemică în estul și sudul Carpaților din România și Ucraina. Un specimen colectat de Johann Michael Fuss din Munții Făgăraș, România, și păstrat în colecția lui August Heinrich Rudolf Grisebach în Göttingen (GOET) este selectat ca fiind lectotipul. De asemenea, se mai face referire și la distribuția neclară a speciei în Peninsula Balcanică, la relația sistematică și morfologică cu *Doronicum columnae* Ten., precum și la un articol neglijat al lui Rezső Soó. Pe baza diferențelor morfologice, ecologice și corologice primare dintre *D. carpaticum* și *D. columnae*, se sugerează ideea de a accepta opinia lui Soó, aceea de a considera *D. carpaticum* ca o subspecie a lui *D. columnae*: *Doronicum columnae* subsp. *carpaticum* (Griseb. & Schenk) Soó.