

Lectotypification of *Onosma viridis* and synonymization of *O. tornensis* with *O. viridis* (Boraginaceae)

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Recent molecular and taxonomic studies in the genus *Onosma* supported the notion that *O. viridis* (Borbás) Jáv. described from the present-day Romania is distinct from *O. heterophylla* Griseb., and also showed that *O. tornensis* Jáv., an alleged narrow endemic at the Slovak–Hungarian border, is conspecific with *O. viridis*. In this paper we formally lectotypify the name *O. viridis*, and reduce *O. tornensis* into the synonymy of *O. viridis*. The nomenclatural and taxonomic history of *O. viridis* is discussed.

Introduction

Onosma heterophylla s. lato (Boraginaceae) is a complex whose representatives are common in the southern and eastern Balkan Peninsula, having been reported also from Asia Minor (Ball 1972, Riedl 1978, Teppner 1991a, 1991b, 1996, 2008). The northernmost populations in the Carpathian Basin probably represent remnants of a former northward colonization of the group from refugia in the southern Balkan Peninsula, during favourable climatic conditions (Kolarčík *et al.* 2010). The complex is karyologically and morphologically very heterogeneous. It comprises diploids ($2n = 14$), tetraploids ($2n = 26$), and higher polyploids with chromosome numbers ranging between 26 and 38, and a triploid cytotype has also been reported (Teppner 1991b, Mártonfi *et al.* 2008). The great morphological variability has resulted in describing several taxa within the group. Teppner (1991a, 1991b, 1996, 2008) treated *O. heterophylla* s. lato as a

single species (*O. heterophylla* Griseb.), originally described from northern Greece (Makri), and included in this taxon also the populations of the Carpathian Basin. Those populations have traditionally been recognized as two distinct species, *O. viridis* (Borbás) Jáv., described from the Banat region and Transylvania in present-day Romania (Jávorka 1906, Grintescu & Nyárády 1960), and putatively reported from Turkey (Riedl 1978), and *O. tornensis* Jáv., described from the vicinity of Turňa nad Bodvou (Torna) village in present-day Slovakia (Jávorka 1906). However, *O. viridis* was not recognized by Ball (1972), Teppner (1996), or Ciocârlan (2000), nor did it appear as a separate species in the most recent checklist of Romania (Oprea 2005). Instead, it was subsumed under *O. heterophylla* Griseb., which is a Balkanian taxon. On the other hand, *O. tornensis* has always been recognized as a distinct species, with a small distribution range restricted to the vicinity of the state border between Slovakia and Hungary (e.g. Tatár 1938,

Jakucs 1952, Ball 1972, Németh 1989, Holub & Kmet'ová 1993, Háberová & Karasová 1994, Karasová 1994, Holub 1999, Less 1999, Molnár 2003, Mered'a et al. 2005, Kolarčik & Mártonfi 2006, Molnár 2006, Mered'a & Hodálová 2011).

Recent research applying molecular AFLP markers revealed that *O. heterophylla s. lato* consists of two taxonomic entities, *O. heterophylla s. stricto* and *O. viridis s. lato* (Kolarčik et al. 2010). The latter taxon was comprehensively sampled in the study, including both *O. viridis* and *O. tornensis*, but *O. heterophylla s. stricto* was represented by only a few populations, thus this species requires further taxonomic research.

The data of Kolarčik et al. (2010) based on neutral molecular marker suggested that the similarity between *O. tornensis* and some populations of *O. viridis* from the Banat region (SW Romania) is higher than the similarity among populations in three Romanian regions (eastern Banat, western Banat, Transylvania) of *O. viridis* itself. Therefore, *O. tornensis* appeared to be conspecific with *O. viridis*, and thus the recognition of *O. viridis s. lato* as a single species was justified.

To translate the evolutionary conclusions of Kolarčik et al. (2010) to a formal taxonomic system, typification of the name *O. viridis* and synonymization of *O. tornensis* under *O. viridis* (or vice versa) is required. Since *O. tornensis* has been assessed as critically endangered in Europe (IUCN 2001), and was included in the Bern Convention on the Conservation of European Wildlife and Natural Habitats (BERN1) as well as the Annex II of Council Directive 92/43/EEC (the "Habitats Directive") (Feráková et al. 2001, Bilz et al. 2011), the formal nomenclatural change is urgent. Fixing the correct name of this taxon may have an influence on further conservation management as well.

Regarding the correct name to be established, both legitimate names *O. tornensis* Jáv. and *O. viridis* (Borbás) Jáv. are of equal priority in the species rank (McNeill et al. 2012, Art. 11.5.), because they were published in the same publication. According to Art. 11.5, the first effectively published selection establishes the priority of the chosen name. Here we choose *O. viridis* (Borbás) Jáv. as the correct name for *O. viridis s. lato*, and thus reduce the name *O. tornensis* into the synonymy of *O. viridis*. We prefer

the geographically neutral species epithet *viridis* because the species under study is primarily distributed in the regions of Banat and Transylvania in Romania, whereas the epithet *tornensis* refers to the Torna village, which constitutes only a minor part of the species' distribution range.

The nomenclatural and taxonomic history of *Onosma viridis*

For a long time during the 19th century the name *O. stellulata* Waldst. & Kit., originally described from Croatia (Waldstein & Kitaibel 1805), was applied to almost all plants belonging to the genus *Onosma*, informal group *Asterotricha*. Such populations, under that name, were also known mainly from the Banat region and Transylvania in historical Hungary (e.g. Fuss 1846, Heuffel 1858, Hazslinszky 1864, Schur 1866). However, the Hungarian botanist Vince Borbás and his correspondent, the Austrian Anton Kerner reached the conclusion that the "*O. stellulata*" plants from historical Hungary, primarily distinguished by their longer corolla, were taxonomically different from Kitaibel's *O. stellulata* (Borbás 1877). Borbás and Kerner, however, did not agree on the taxonomic status; in his letter (Borbás 1877: 407) to Kerner, Borbás proposed a new varietal name *O. stellulata* var. *longiflora*, but Kerner treated it as the oriental species *O. taurica* Pall. (Borbás 1877: 407, see also Simonkai 1887). Borbás did not fully accept Kerner's concept, and described a new variety *O. taurica* var. *viridis* for the Hungarian plant and cited *O. stellulata* var. *longiflora* in the synonymy (Borbás 1877: 409). Interestingly, in the introductory chapter of the same paper, Borbás (1877: 374) yet mentioned *O. stellulata* var. *longiflora* among the taxonomic novelties to be discussed. Nonetheless, that taxon was validly described by him as *O. taurica* var. *viridis* (page 409), and some pages later, Borbás (1877: 420) even suggested the possibility of the species rank distinction of his newly described variety ("*an species distincta?*").

In the protologue Borbás (1877: 408) specified the localities of *O. taurica* var. *viridis*, establishing its distribution area covering the Lower Danube and Banat regions as well as Transylvania. However, Borbás directly cited only one

gathering, from the collections of the Hungarian botanist János Csató: “*Sabesi Csató exsicc.!*”. That locality refers to the Latin name *Sabesium* of the historical Szászsebes town in Transylvania (Sebeş in present-day Romania), named Mühlbach or Mühlenbach in German.

Jávorka (1906) raised Borbás’ variety to the rank of species, at the same time distinguishing some of its infraspecific taxa: *O. viridis* var. *baumgartenii* and var. *citrina* were described from Transylvania, and *O. viridis* subsp. *banatica* and *O. viridis* subsp. *banatica* var. *subcanescens* from the Banat region. Although those infraspecific taxa described by Jávorka were accepted much later by Grințescu & Nyárády (1960), recent studies based on molecular and phenetic data (Kolarčík *et al.* 2010) do not support their separation.

Typification of *Onosma viridis*

The original material of the name *O. viridis* is rather scarce, especially regarding the Transylvanian material, which we preferred in typification, because the original material from the Banat region is mostly referable to *O. viridis* subsp. *banatica*, subsequently described by Jávorka (1906: 436). Although we found some remarkable pre-1877 Transylvanian collections labelled as “*O. stellulatum* W. et K.”, e.g. those collected by Heuffel at Deva (= Déva) (BP 228077), or by Fuss at “Tallmats” (= Talmács, Talmesch, today: Tâlmăciu) (BP 621005, BP 621008, BP 621013), they were not clearly cited by Borbás (1877: 409), hence their consideration as original material of *O. viridis*, and particularly as potential types, is not justified. The best candidates for lectotypification are the specimens collected by Csató at “*Sabesium*”, unequivocally cited by Borbás (1877: 408), as discussed above. This gathering has probably been distributed to multiple herbaria, because Csató kept on intensive herbarium exchange with many European botanists and herbarium exchange associations, such as the famous “*Botanischer Tauschverein in Wien*” (Moesz 1912). Unfortunately, no specimen of this gathering was found in BP, where the bulk of Csató’s herbarium is stored (Moesz 1912). However, one of the presum-

able duplicates (WU 071764), its label being accompanied by the stamp of the above-mentioned botanical association (Skofitz 1881), and reading “*Onosma stellulatum* W. K. 1871, 18 Juni. Mühlenbach Siebenbürgen. Sandige Hügel. Johann v. Csató”, was found by us. That specimen is accompanied by the revision labels of Kerner (with the identification “*Onosma tauricum* Pall.”) and Jávorka (with the identification “*O. viride* (Borb.)”). All facts considered, we regard this specimen as the most suitable one for the lectotypification of the name *O. viridis*.

In the whole text we consider the generic name *Onosma* as feminine (Stearn 1993), in full conformity with Arts. 23.5., 32.2. and 62.2(b) (McNeill *et al.* 2012). In the following enumeration the symbol “!” refers to herbarium specimen(s) and the symbol “!!” to a larger number of herbarium specimens from the given locality seen by the respective authors (Borbás or Jávorka).

Onosma viridis (Borbás) Jáv.

Ann. Hist.-Nat. Mus. Natl. Hung. 4: 431. 1906. — *Onosma taurica* var. *viridis* Borbás, Math. Természettud. Közlem. 14: 409. 1877 [“*O. Tauricum* var. *viride*”]. Ind. loc.: “vallis Danubiis inferioris (in apricis montis Allion ad Orsova, montis Eliae ad Baziás) Valachicum (ad Portam ferream infra pagum Verciorova) et Transsilvanicum (Sabesi Csató exsicc.!)”. LECTOTYPE (here designated): “Mühlenbach. Siebenbürgen. Sandige Hügel. 1871, 18 Juni, leg. Johann v. Csató”; WU 071764! (Fig. 1). — *Onosma tubiflora* subsp. *viridis* (Borbás) Hayek, Repert. Spec. Nov. Regni Veg. Beih. 30: 87. 1928.

Onosma viridis subsp. *banatica* Sándor ex Jáv., Ann. Hist.-Nat. Mus. Natl. Hung. 4: 436, 1906. Ind. loc.: “Magyarország: Grebenác!!; Baziás!!; Tiszovicza!!; Szvinicza! (Herb. Mus. Nat. Hung.), Allion hegy Orsova felett (leg. Degen, herb. Degen, Mus. Berol.), Plavisevicza!!; Orsova!!; Románia: Verciorova!!; Szerbia!!”. LECTOTYPE (here designated): “Lecta in Banatu, Transylvania, Turcia” [original label in Sándor’s handwriting]; BP 16730! (the left-hand specimen numbered 1 by Jávorka). — *Onosma tubiflora* subsp. *banatica* (Jáv.) Hayek, Repert. Spec. Nov. Regni Veg. Beih. 30: 87. 1928.

Onosma viridis subsp. *banatica* var. *subcanescens* Jáv., Ann. Hist.-Nat. Mus. Natl. Hung. 4: 437, 1906. Ind. loc.: “Baziás!!; Grebenác!!”. TYPE: unknown.

Onosma viridis var. *baumgartenii* Heuff. ex Jáv., Ann. Hist.-Nat. Mus. Natl. Hung. 4: 436. 1906. Ind. loc.: “Déva várhegyének környékén! (leg. Heuffel, Herb. Mus. Nat. Hung.); Sz.-Erzsébet! (leg. Schur, Herb. Mus. Palat. Vindob.)”. LECTOTYPE (indicated by Kováts 1975 as holotype, correctable to lectotype under Art. 9.9): “juxta Déva (:in

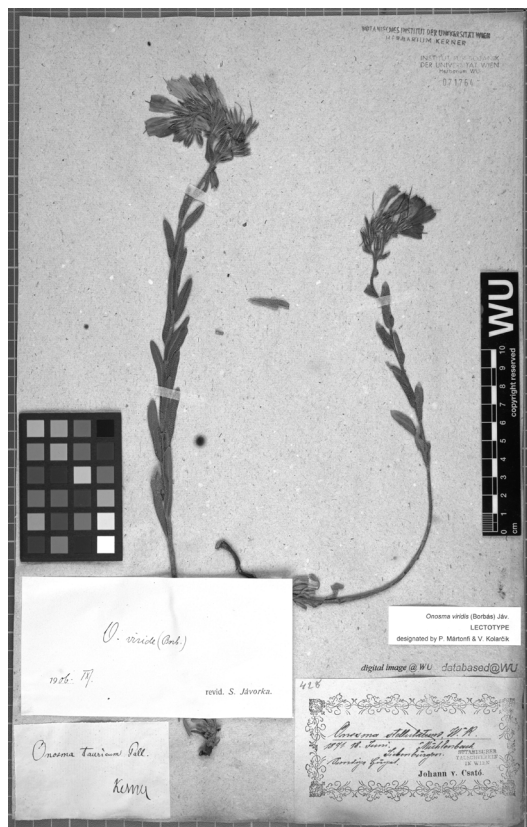


Fig. 1. Lectotype of *Onosma viridis* (Borbás) Jáv.

Transylvaniae Cottu Hunyadiensi:”, leg. Heuffel, VI. 1882, BP 139439! (the right-hand specimen).

Onosma viridis var. *citrina* Jáv., Ann. Hist.-Nat. Mus. Natl. Hung. 4: 436. 1906. Ind. loc.: “Déva várhegyén bőven!”. TYPE: unknown.

Onosma tornensis Jáv., Ann. Hist.-Nat. Mus. Natl. Hung. 4: 431. 1906 [“*O. Tornense*”]. Ind. loc.: “Abauj-Torna megyében a tornai várhegy szikláin és onnan észak-nyugat felé a Szádelli kő felé vezető gerincz meredek lejtőin 150–300 m. magasságban elég bőven.” LECTOTYPE (indicated by Kováts 1975 as holotype, correctable to lectotype under Art. 9.9): “Torna a várrom hegyein”, leg. Hazslinszky, BP 139434!

Onosma stellulata var. *longiflora* Borbás, Math. Természettud. Közlem. 14: 409. 1877, *pro syn.* (Art. 36.1(c)).

Onosma echioides auct. (*p. p.*) non L. 1762: Baumg., Enum. Stirp. Transilv. 127, 1816; Borbás Math. Természettud. Közlem. 11: 85. 1875.

Onosma simplicissima auct. non L. 1762: Lerchenfeld ex Schur, Österr. Bot. Zeitschr. 10: 227. 1860.

Onosma stellulata auct. (*p. p.*) non Waldst. & Kit. 1805: Rochel, Bot. Reise Banat.: 66. 1838; Fuss, Baumg. Enum. Stirp. Transilv. Mantissa: 10. 1846; Heuffel, Enum. Pl. Banat.: 162. 1858; Hazslinszky, Éjsz. Magyarh. Vir.: 189. 1864; Schur, Enum. Pl. Transilv.: 468. 1866.

Onosma taurica auct. (*p. p.*) non Pall. 1792: Simonk., Enum. Fl. Transilv.: 404. 1887.

Onosma viridis var. *pallida* auct. (*p. p.*) non Boiss. 1849: Grințescu & Nyárády, Fl. Rep. Pop. Rom.: 226. 1960.

SELECTED ILLUSTRATIONS of *Onosma viridis*: Jávorka, Ann. Hist.-Nat. Mus. Natl. Hung. 4: tab. 11. fig. 3, tab. 12., figs. 1–5. 1906 [as *O. tornensis*]. — Jávorka & Csapody, Iconogr. Fl. Hung.: 416, fig. 2833 + colour tab. 30, fig. 2835. 1934, also in succeeding editions (1975, 1979, 1991) [as *O. tornensis* and *O. viridis*, respectively]. — Dostál, Květena ČSR: 1178, fig. 2. 1950 [as *O. tornensis*]. — Jakucs, Ann. Biol. Univ. Hung. 2: without page number, tab. 4. fig. 2. 1954 [as *O. tornensis*]. — Dostál, Klíč ke květeně ČSR: 509, fig. 167/1715. 1958 [as *O. tornensis*]. — Grințescu & Nyárády, in Săvulescu Fl. Republ. Pop. Rom. 7: 219, tab. 32. fig. 1, fig. 2. 1960 [as *O. viridis* and *O. viridis* subsp. *banatica*, respectively]. — Németh & Seregélyes, Ne bántsd a virágot: 109. 1981 [as *O. tornensis*]. — Csapody: Védett növényeink: without page number, fig. 21. 1982 [as *O. tornensis*]. — Rakonczay, Vörös Könyv: 291, fig. 187. 1989 [as *O. tornensis*]. — Dostál, Nová květena ČSSR 2: 827, tab. 199. fig. 4. 1989 [as *O. tornensis*]. — Dostál & Červenka, Velký klíč na určovanie rastlín II: 874, tab. 226. fig. 1977. 1992 [as *O. tornensis*]. — Simon, A magyarországi edényes flóra határozója: 339, fig. 739. 1992, also in second edition (2000) [as *O. tornensis*]. — Holub & Kmet'ová, in Bertová & Goliašová Fl. Slov. 5/1: 40, tab. 3. fig. 1. 1993 [as *O. tornensis*]. — Molnár, in Farkas Magyarország védett növényei: 192. 1999 [as *O. tornensis*]. — Holub, in Čerňovský, Feráková, Holub, Maglocký & Procházka, Červená kniha ohrozených a vzácných druhov rastlín a živočíchov SR a ČR, vol. 5 (Vyššie rastliny): 257. 1999 [as *O. tornensis*]. — Molnár, Rejtzkódó kincseink: 76. 2003, also in German edition (2003) [as *O. tornensis*]. — Boldoghné, Tornai vértő (*Onosma tornense*): front cover. 2004. — Molnár, Két-szikúék III.: 23. 2006 [as *O. tornensis*]. — Molnár, in Ujhelyi & Molnár A Kárpát-medence gombái és növényei: 438. 2006 [as *O. tornense*]. — Király, Virók & Molnár, Új magyar fűvészkönyv, Magyarország hajtásos növényei, Ábrák: 356, fig. 1417. 2011 [as *O. tornensis*] — Mereďa & Hodálová, Atlas druhov európskeho významu pre územia NATURA 2000 na Slovensku: 94. 2011 [as *O. tornensis*].

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