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Senecio ×*riloensis* (Asteraceae), a new natural hybrid between *S. hercynicus* and *S. transylvanicus* from Bulgaria

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Abstract

The newly described *Senecio* ×*riloensis* combines the morphological features of *S. hercynicus* and *S. transylvanicus*, and grows in subalpine habitats in the Rila Mountains, Bulgaria. It is illustrated with photos of living plants in the locus classicus.

Keywords: Balkan Peninsula, genome size, hybridization, Rila Mts., *Senecio*, taxonomy

Introduction

Interspecific hybridization in the genus *Senecio* Linnaeus (1753: 866) is quite frequent, especially in the *S. nemorensis* aggregate (Oberprieler 1994; Hodálová 2002; Oberprieler *et al.* 2010). One of the main factors facilitating hybridization is environmental changes leading to the breaking down of habitat and geographical barriers. During the floristic research in the Rila Mountains in Bulgaria, we found plants clearly showing characters intermediate between *S. hercynicus* Herborg (1997: 160) belonging to the *S. nemorensis* aggregate and *S. transylvanicus* Boissier (1856: 34). As no hybrid between these species was hitherto known, we decided to describe these plants as a new nothospecies.

Material and methods

Living plants collected in the field and cultivated in the experimental garden of the Institute of Biodiversity and Ecosystem Research in Sofia were checked for ploidy level following the method described in Szeląg & Vladimirov (2019). The herbarium specimens are deposited in SOM, KRAM and in herbarium of Z. Szeląg.

Taxonomy

Senecio* ×*riloensis Szeląg & Vladimirov, ***nothospec. nov.*** (Figs. 1–3)

Type:—BULGARIA. Rila Mountains, along tourist road from Yastrebetz hut to Musala hut, eroded slope on granite, 2380 m a.s.l., 3 August 2018, *V. Vladimirov & Z. Szeląg* (holotype SOM; isotypes SOM, KRAM & Herb. Z. Szeląg).

Paratype:—BULGARIA. Rila Mountains, along tourist path from Ribni ezera hut to Mt. Mermer, rocky places on granite with *Senecio transylvanicus*, 2420 m a.s.l., 13 August 2019, *Z. Szeląg* (Herb. Z. Szeląg).

Description:—Aphyllopodous. Rhizomatous herbaceous perennial. Stem (40–)50–70(–80) cm high, robust, brown or purple-brown, in the lower part glabrous or almost so, in the middle part with sparse glandular hairs 0.1–0.2 mm

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long mixed with or without few simple hairs up to 0.2 mm long, within synflorescence with numerous glandular hairs and with or without scattered simple hairs. Basal leaves withered at anthesis. Cauline leaves 15–22 (the lower and the middle ones usually withered at anthesis), somewhat coriaceous and fleshy, oblong-lanceolate to broadly lanceolate, acute at apex, finely denticulate, 8–13 cm long and 1.5–3.0 cm wide, tapered to a winged petiole which is relatively long (2–7 cm) in the lower and middle cauline leaves and short (0.3–2.0 cm) in the upper leaves; middle cauline leaves glabrous on both surfaces, the margins and along the midrib with sparse glandular hairs up to 0.3 mm long and with or without very few simple hairs up to 0.4 mm long; uppermost cauline leaves with sparse glandular hairs on both surfaces occasionally mixed with simple hairs. Synflorescence with (1–)2–5(–7) erect capitula. Peduncles up to 3 cm long, thin, with numerous glandular hairs and with or without very few simple hairs. Bracteoles 3–4, linear-lanceolate, 8–13 mm long, with numerous to scattered glandular hairs and with or without sparse simple hairs. Involucres cylindrical, 8–9(–10) mm long and 5–7 mm broad. Involucral bracts ca. 13–15, broadly-lanceolate, 1.0–1.4 mm wide, green with wide membranous margins, blackish at the apex and with dense tufts of white trichomes, covered by scattered glandular hairs and with or without a few simple hairs. Ligules 10–12, yellow, glabrous, 14–17 mm long and 3–4 mm wide. Pollen grains in anthers absent. Achenes greyish-brown, ca. 4.5 mm long. Pappus white. Flowering: August.

FIGURE 1. *Senecio ×riloensis* in the locus classicus (plant from which the holotype specimen was collected), on August 3, 2018.

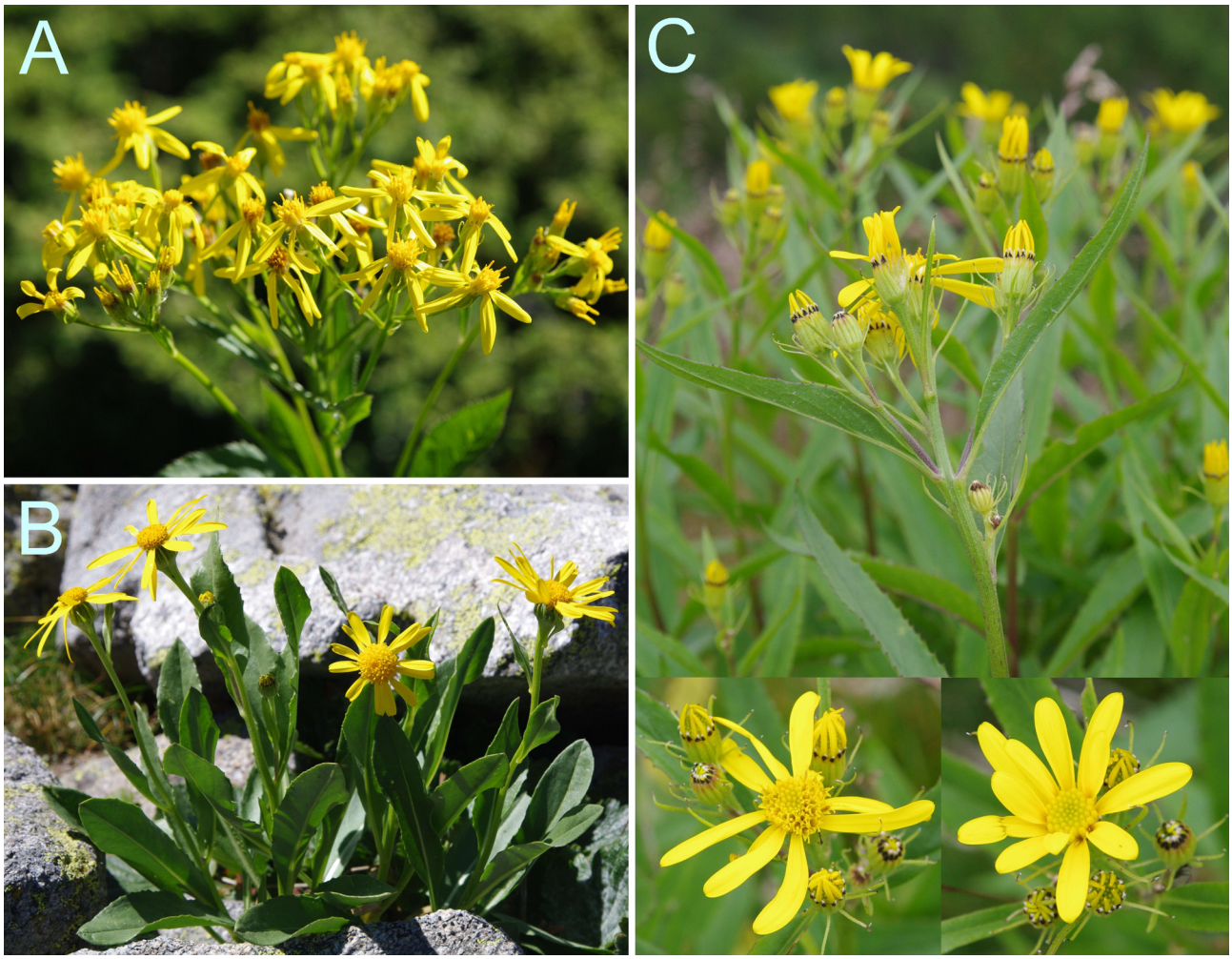

FIGURE 2. Synflorescence of *Senecio hercynicus* (**A**), *S. transylvanicus* (**B**), and *S. ×riloensis* (**C**).

Chromosome number and mode of reproduction:—2n ~ 40, probably sterile as no viable seeds were found.

The somatic chromosome number of *S. hercynicus* is 2*n* = 40 (Herborg 1987) but no count has yet been published for *S. transylvanicus*. Until a count is available, we infer from the genome sizes that we have measured (*S. hercynicus* 1C=4,78 pg; *S.* x *riloensis* 1C=4.67 pg; *S. transylvanicus* 1C=4,15 pg) that all three taxa are likely to have the same chromosome number.

Distribution:—Endemic to the Rila Mountains in Bulgaria, known from the type and paratype localities; the discovery of further sites is to be expected.

Affinity:—*Senecio ×riloensis* resembles *S. hercynicus* in overall size and habit but differs in *(1)* the petiolate and somewhat fleshy leaves, *(2)* the synflorescence with fewer capitula, *(3)* the broader involucres, *(4)* having more involucral bracts and *(5)* having more ligules in the capitula. Occasionally, we have also observed plants morphologically somewhat closer to *S. transylvanicus* (Fig. 3).

Discussion

Senecio transylvanicus is a Balkan-Carpathian endemic which occurs in the highest mountain ridges in Albania, Bulgaria, Greece, North Macedonia and Romania (Dimopoulos *et al.* 2016; Hayek 1931; Nyárády 1964; Vangjeli *et al.* 2000; Vladimirov 2012). The geographical range of *S. hercynicus* is wider and comprises the mountainous areas of Central and South-eastern Europe (Hodálová 1999; Herborg 1987; Rola 2014; Vladimirov 2012).

The Rila Mountains are one of the few places in Europe where these species occur sympatrically, although their vertical ranges are mutually exclusive (Vladimirov 2012). *Senecio hercynicus* grows in coniferous forests and in grassy habitats in the lower part of the subalpine belt, whereas *S. transylvanicus* is characteristic of the alpine zone.

The Rila Mountains, the highest mountain range on the Balkan Peninsula, are characterized by an exceptionally large vertical extension of the subalpine belt and the huge areas of *Pinus mugo* scrub which form the natural barrier to contact between *S. hercynicus* and *S. transylvanicus.* An equally important barrier is the phenological difference; the forest populations of *S. hercynicus* in the Rila Mountains flower at least two weeks earlier than *S. transylvanicus* in alpine zone.

FIGURE 3. *Senecio ×riloensis* above the Ribni ezera lake, on August 13, 2019.

In our opinion, the construction of the ski slopes through the *Pinus mugo* belt has allowed the migration of *S. hercynicus* to higher altitudes where both *Senecio* species flower at the same time and has allowed hybridization between them. It is possible that the migration of *S. hercynicus* to higher altitudes may also be related to climate change, although this hypothesis needs to be verified.

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References

Boissier, E. (1856) *Diagnoses plantarum novarum praesertim orientalium nonnullis Europaeis boreali-africanisque additis* ser. 2, vol. 3. B. Hermann, Lipsia, 177 pp.

Dimopoulos, P., Raus, T., Bergmeier, E., Constantinidis, T., Iatrou, G., Kokkini, S., Strid, A. & Tzanoudakis, D. (2016) Vascular plants of Greece – an annotated checklist. Supplement. *Willdenowia* 46: 301–347. https://doi.org/10.3372/wi.46.46303

Hayek, A. (1931) Prodromus florae peninsulae Balcanicae. 2. Band: Dicotyledoneae Sympetalae. *Repertorium specierum novarum regni vegetabilis. Beihefte* 30 (2): 1–1152.

Herborg, J. (1987) Die Variabilität und Sippenabgrenzung in der *Senecio nemorensis*-Gruppe (Compositae) im europäischen Teilareal. *Dissertationes Botanicae* 107: 1–262.

Hodálová, I. (1999) Taxonomy of the *Senecio nemorensis* group (Compositae) in the Carpathians. *Biologia* 54: 395–404.

Hodálová, I. (2002) A new hybrid *Senecio ×slovacus* from the *S. nemorensis* group (Compositae) in the West Carpathians. *Biologia* 57: 75–82.

Linnaeus, C. (1753) *Species plantarum*. L. Salvius, Holmia, 1200 pp.

Nyárády, E.I. (1964) *Senecio* L. *In*: Nyárády, E.I. (ed.) *Flora Republicii Populare Romîne*, vol. 9. Editura Academiei Republicii Populare Romine, Bucureşti, pp. 520–587.

Oberprieler, C. (1994) Die *Senecio nemorensis*-Gruppe (Compositae, Senecioneae) in Bayern. *Berichte der Bayerischen Botanischen Gesellschaft* 64: 7–54. https://doi.org/10.2478/pbj-2014-0004

Oberprieler, C., Barth, A., Schwarz, S. & Heilmann, J. (2010) Morphological and phytochemical variation, genetic structure and phenology in an introgressive hybrid swarm of *Senecio hercynicus* and *S. ovatus* (Compositae, Senecioneae). *Plant Systematics and Evolution* 286: 153–166. https://doi.org/10.1007/s00606-010-0295-0

Rola, K. (2014) Morphometry and distribution of *Senecio nemorensis* agg. species (Asteraceae) in Poland. *Polish Botanical Journal* 59: 37–54. https://doi.org/10.2478/pbj-2014-0004

Szeląg, Z. & Vladimirov, V. (2019) The species intermediate between *Hieracium petrovae* and *H. olympicum* (Asteraceae): a treatment of *H. kritschimanum* and description of a new species from Greece. *Phytotaxa* 402: 107–113. https://doi.org/10.11646/phytotaxa.402.2.4

Vangjeli, J., Ruci, B., Mullaj, A., Paparisto, K. & Qosja, X. (2000) *Flora e Shqipërisë,* vol. 4. Akademia e Shkencave e Republikes se Shqiperise, Tiranë, 502 pp.

Vladimirov, V. (2012) *Senecio* L. *In*: Kožuharov, S.I. & Ančev, M.E. (eds.) *Flora Republicae Bulgaricae*, vol. 11. Editio Academica "Profesor Marin Drinov", Sofia, pp. 432–449.