

Nomenclatural notes on  
*Solenanthus minimus* Brand  
(Boraginaceae)

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# Nomenclatural notes on *Solenanthus minimus* Brand (Boraginaceae)

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## KEY WORDS

Boraginaceae,  
Iran,  
neotypification,  
new synonym.

## ABSTRACT

A Boraginaceae species, *Solenanthus minimus* Brand, described from the territory of Iran is neotypified due to lack of any available original material. In the present paper, it is assigned to the genus *Rindera* based on newly collected material and original description. Thus, *Cynoglossum minimum* (Brand) Greuter & Stier is treated here as a synonym for *R. bungei* (Boiss.) Gürke.

## RÉSUMÉ

*Notes nomenclaturales sur Solenanthus minimus Brand (Boraginaceae).*

Une espèce de Boraginaceae, *Solenanthus minimus* Brand, décrite sur le territoire de l'Iran est néotypifiée en raison de l'indisponibilité du matériel original. Dans le présent article, elle est assignée au genre *Rindera* sur la base du matériel nouvellement collecté et de la description originale. Ainsi, *Cynoglossum minimum* (Brand) Greuter & Stier est traité ici comme un synonyme de *R. bungei* (Boiss.) Gürke.

## MOTS CLÉS

Boraginaceae,  
Iran,  
néotypification,  
synonyme nouveau.

## INTRODUCTION

*Solenanthus minimus* Brand (1915: 547) was described from the northeast of Iran “Nördliches Persien: Scharud” based on material collected by Christoph and housed in the “Herb. Ascherson” (Brand 1915). The type specimen cited under *S. minimus* were lost at B during World War II, and its relatively short protologue referred to only a few morphological characters. We realized that the *S. minimus* differs from *Solenanthus* Ledeb. (Ledebour 1829: 193) and in fact belongs to the genus *Rindera* Pallas (1771: 486). There are no significant differences between *Rindera bungei* (Boiss.) Gürke (1893: 196) and *S. minimus*. Brand (1915) doubtfully placed this latter between *Solenanthus* and *Rindera*, whereas he could not provide any morphological argument for its removal from *Rindera* species. Due to the double wings surrounding the nutlet, he transferred later *R. bungei* in his genus *Bilegnum* separately (Brand 1915: 549) [*Bilegnum bungei* (Boiss.) Brand (1915: 550)]. Also, Greuter & Stier placed *S. minimus* in the genus *Cynoglossum* L. (Linnaeus 1753: 134) [*Cynoglossum minimum* (Brand) Greuter & Stier in Hilger *et al.* (2015: 19)]. According to essentially published sources (Riedl 1967), the position of the genus *Rindera* together with its derivatives, *Bilegnum* Brand and *Mattia* Schult. (Schultes 1809: 32), in the heterogeneous subtribe *Cynoglossinae* Dumortier (1827: 39) has not yet been satisfactorily resolved (Weigend *et al.* 2013; Chacón *et al.* 2016; Sherafati *et al.* 2021).

## RESULTS

Despite our extensive search in all available databases, we did not find specimens associated with the *Solenanthus minimus* collected by Christoph or with any information that could be related to this name. Therefore, we hereby designate a neotype to determine the application of this name following Art. 9.8 (ICN, Turland *et al.* 2018) (Fig. 3). The chosen specimen completely matches the protologue description, it was collected from the type location and displays well preserved leaves, flowers and, in addition, fruits. This name is no longer in use, so it is now a synonym of the current scientific name, *Rindera bungei*.

*Rindera bungei* (Boiss.) Gürke

*Die Natürlichen Pflanzenfamilien*, Engler & Prantl 4 (3a): 106 (Gürke 1893) (Fig. 2). — *Bilegnum bungei* (Boiss.) Brand, *Repertorium Specierum Novarum Regni Vegetabilis* 13: 550 (Brand 1915). — Basionym: *Mattia bungei* Boiss., *Flora Orientalis* 4 (1): 274 (Boissier 1875). — Typus: Iran. Prov. Semnan, Shahroud, Deh Molla, 1720 m, [Persiae bor.-orientalis prope Schahrud, Deh Mallah], 27.V.1858, *Bunge s.n.* (holo-, G-BOIS[G00773940]; iso-, G-BOIS[G00773941], K[K000895812], LE[LE0107898], P[P04083563, P04083564]).

*Solenanthus minimus* Brand, *Repertorium Specierum Novarum Regni Vegetabilis* 13: 547 (Brand 1915), **syn. nov.** (Figs 1; 2). — *Cynoglossum minimum* (Brand) Greuter & Stier, *Biodiversity Data Journal* 3

(e4831): 19 (Hilger *et al.* 2015), **syn. nov.** — Typus: Iran. Prov. Semnan, Shahroud, [Persia borealis, Shahrud], Christoph in the herb. Ascherson (B†), (neo-, Semnan, Shahroud, Abshar Park, 1.VI.2018, *Ranjbar & Khalvati* 41148, BASU, here designated) (Fig. 3).

**HABITAT.** — Dry mountain pastures, rocky slopes, on limestone, 1400-2700 m.

**DISTRIBUTION.** — North Iran: Semnan, Shahroud (Brand 1915) (Fig. 4).

**OTHER SPECIMENS EXAMINED.** — Iran. Prov. North Khorasan, Esfaryen, Shah Jahan Mtn., 1400-2500 m, *Mozaffarian* 48625 (TARI); Prov. Khorasan-e Razavi, Mashhad, Akhlamad village, 1820 m, *Shad & Vafayi* 1080 (FUMH); Prov. Semnan, 35 km north of Damghan, Toyeh, 2000 m, *Asadi & Wendelbo* 29487 (TARI) (Fig. 4).

## DESCRIPTION

Perennial herb with a blackish woody stock producing few to several flowering and non-flowering shoots. Rosette leaves numerous, 30-60 mm long, 3-5 mm wide, with long attenuated leaf bases, linear-lanceolate, acute to subacute, appressed grey to silvery tomentose on both sides. Flowering stem 5-10 cm long, erect, sometimes flexuous, simple, sulcate, tomentose. Cauline leaves mostly reduced, usually twisted, 0.5-1.5 × 0.2-0.3 mm; lower cauline leaves similar to rosette leaves, highly reduced; upper cauline leaves linear-lanceolate to linear, sessile. Inflorescence dense, 10-20 flowered, subumbellate, consisting of 3-7 scorpioid, ebracteate cymes each with 6-12 flowers. Peduncles and pedicels straightening and elongating considerably in fruit, tomentose; pedicels to 0.5 cm long at anthesis, to 1-1.5 cm long at fruiting; peduncles to 2 cm long at anthesis, to 4 cm long at fruiting. Calyx silvery to grey densely tomentose, divided to base into narrowly lanceolate, acute lobes 3-5 × 0.5-1 mm long in flower, unequal in width, slightly accrescent, and often deflexed in fruit. Corolla 5-6 mm long, regular, light pinkish-purple with darker striation; tube with distinct vaginations at the middle of the corolla, *c.* 1.5 mm long below the base of the lobes; faucal appendages broadly subquadrate or triangular-trapezoidal, inserted in the lower third of tube; lobes erect, ovate-elliptic, 0.5-1 × 0.5-1 mm, rounded at apex. Stamens inserted in the lower third of tube; filaments 8-10 mm long, anthers 0.3-0.5 mm, distinctly exerted. Style distinctly exerted from corolla, nearly equal to the stamens, *c.* 8-9 mm long, persistent; stigma minute, capitate. Nutlets suborbicular, 8-12 mm long in diam., smooth, with a broad margin, including the double wing, without glochids; wing obviously muciculate-dentate in outline and curved.

## DISCUSSION

The type of *Solenanthus minimus* was not explicitly cited by Riedl (1967) in *Flora Iranica* and the original material could not be seen by him. Khatamsaz confirmed that the specimen was not seen in the “*Flora of Iran*” and considered *S. minimus* as a doubtful species (Khatamsaz 2002). Most of Christoph’s original material housed in Berlin (B) was lost during the Second World War (<https://www.bgbm.org>, Kuo *et al.* 2018),

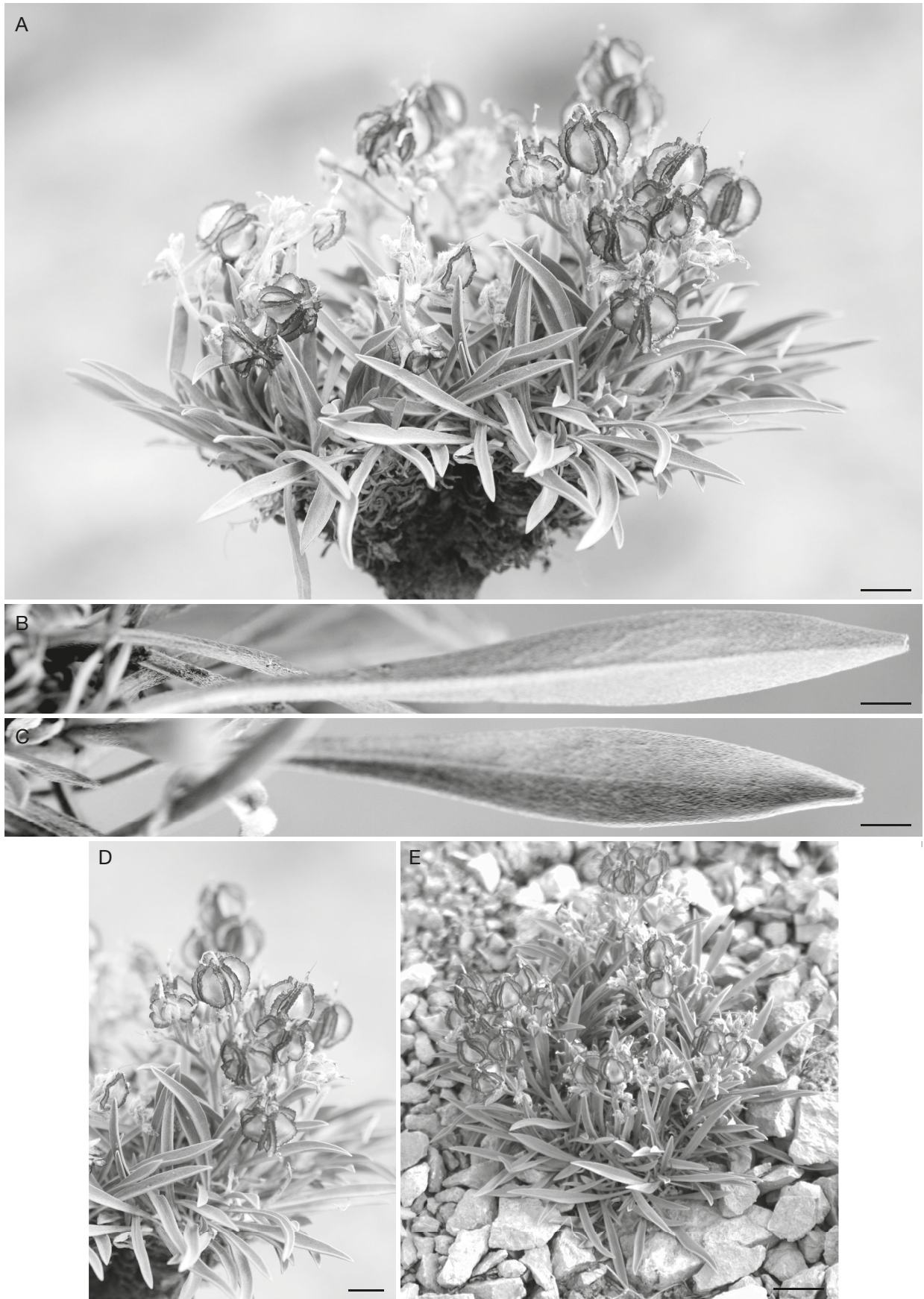


FIG. 1. — *Rindera bungei* (Boiss.) Gürke (Ranjbar & Khalvati 41148): **A**, whole plant; **B**, leaf abaxial surface; **C**, leaf adaxial surface; **D**, infructescence; **E**, habit. Scale bars: A, 1 cm; B, C, 3 mm; D, 5 mm; E, 2 cm. Photos: M. Ranjbar.



FIG. 2. — *Rindera bungei* (Boiss.) Gürke: **A**, whole plant; **B**, nutlets; **C**, calyx; **D**, open corolla. Scale bar: A, 1 cm; B, 3 mm; C, D, 2 mm. Drawings: S. Khalvati.



FIG. 3. — Neotype of *Solenanthus minimus* Brand (Ranjbar & Khalvati 41148, BASU).



FIG. 4. — Distribution map of *Rindera bungei* (Boiss.) Gürke in Iran. The star in the circle indicates the type locality of *Rindera bungei* and *Solenanthus minimus* Brand (new synonym of *Rindera bungei*).

although some sheets survived in other European herbaria. However, we could not find Christoph's collection neither at B nor in herbaria with important collections used by Paul Ascherson (pers. comm. Dr R. Vogt, Curator of Botanischer Garten und Botanisches Museum B). To satisfactorily clarify this situation, the establishment of a neotype for *S. minimus* is required according to the rules indicated in the ICN (Turland *et al.* 2018). During our expedition, the type locality in Iran corresponding to *Solenanthus* was found, which included the localities of herbarium specimens given below under *S. minimus*. Then, we selected one of our collections as a neotype for the *S. minimus*, because it matches well with the characters and comes from the type locality with a type label provided at BASU (Fig. 1). Similarity of *S. minimus* Brand with *Rindera* species was expressed by Brand (1915) in a somewhat confusing way: "Im Habitus zeigt die Pflanze eine täuschende Ähnlichkeit mit *Rindera graeca*". In terms of habit, the species seems so to be very deceptive to *Rindera graeca* (A.DC.) Boiss. & Heldr. (Boissier 1846), which is moreover considered as an endemic Balkan species and does not occur in Iran. According to the original description of *R. bungei* and *R. graeca*, they have linear-lanceolate leaves, corolla with ovate lobes and the filaments are twice the length of the corolla (Fig. 3). Also, these features are available in the Brand's description. It seems that Brand made this misdiagnosis because not having the most relevant diagnostic features of *Rindera/Bilegnum* such as the nutlets: "Nuculae ignotae" or he only considered the size of the stamens (corolla longe excedentia) as the base of generic identification. No further comment should be made due to the lack of type or original material. Therefore, *S. minimus* should be treated as a synonym of *R. bungei*.

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## REFERENCES

- BOISSIER P. E. 1846. — *Diagnoses plantarum orientalium novarum*. Lipsiae Hermann, ser. 1, 7: 30.
- BOISSIER P. E. 1875. — *Flora Orientalis, sive Enumeratio plantarum in Oriente a Graecia et Aegypto and Indiae fines hucusque observatarum*. H. Georg, Geneva, Basel, 4: 274. <https://www.biodiversitylibrary.org/page/18114946>
- BGBM. 2020. — Herbarium Berolinense Virtual. Available from: <http://ww2.bgbm.org/herbarium/> (accessed 2 October 2021).
- BRAND A. 1915. — Neue Gattungen und Arten der *Cynoglosseae*. *Repertorium specierum novarum regni vegetabilis* 13: 545-550. <https://doi.org/10.1002/fedr.19150133602>
- BRAND A. 1921. — Boraginaceae-Borraginoideae, Cynoglosseae, in ENGLER A. (ed.), *Das Pflanzenreich*. Vol. 78. W. Engelmann, Leipzig: 1-183. <https://www.biodiversitylibrary.org/item/143034>
- CHACÓN J., LUEBERT F., HILGER H. H., OVCHINNIKOVA S., SELVI F., CECCHI L., GUILLIAMS M. C., HASENSTAB-LEHMAN K., SUTORY K., SIMPSON M. G. & WEIGEND M. 2016. — The borage family (Boraginaceae s.str.): A revised infrafamilial classification based on new phylogenetic evidence, with emphasis on the placement of some enigmatic genera. *Taxon* 65 (3): 523-546. <https://doi.org/10.12705/653.6>
- DUMORTIER B. C. J. 1827. — *Florula Belgica, operis majoris prodromus. Stamina. Typis*. J. Casterman, Tornaci Nerviorum, Brussels, 172 p.
- GÜRKE M. 1893. — Boraginaceae (Asperifoliaceae), in ENGLER A. & PRANTL K. (eds), *Die natürlichen Pflanzenfamilien* 4. W. Engelmann, Leipzig: 71-131. <https://doi.org/10.5962/bhl.title.4635>

- HILGER H. H., GREUTER W. & STIER V. 2015. — Taxa and names in *Cynoglossum* sensu lato (Boraginaceae, Cynoglosseae): an annotated, synonymic inventory, with links to the protologues and mention of original material. *Biodiversity Data Journal* (3): e4831: 1-24. <https://doi.org/10.3897/bdj.3.e4831>
- KHATAMSAZ M. 2002. — *Solenanthus* Ledeb., in ASSADI M., MAASSOUMI A. A. & KHATAMSAZ M. (eds), *Flora of Iran*. Volume 39. Research Institute of Forests and Rangelands, Tehran: 364-374.
- KUO J., CAMBRIDGE M. L., MCKENZIE L. J. & COLES R. G. 2018. — Taxonomy of Australian Seagrasses, in LARKUM A., KENDRICK G. & RALPH P. (eds), *Seagrasses of Australia*. Springer, Cham, 759-782. [https://doi.org/10.1007/978-3-319-71354-0\\_23](https://doi.org/10.1007/978-3-319-71354-0_23)
- LEDEBOUR C. F. 1829. — *Icones Plantarum Novarum vel Imperfecte Cognitarum Floram Rossicam, imprimis Altaicam illustrantes*. Vol. 1. I. Deubner, Rigae; Treuttel & Würtz, Londini, Argentorati; Libraria Parisiensi, Bruxellae, 440 p, 100 tab. <https://www.biodiversitylibrary.org/page/6038374>
- LINNAEUS C. 1753. — *Species plantarum* L. Salvius, Holmiae, Stockholm, 1200 p. <https://www.biodiversitylibrary.org/page/358153>
- PALLAS P. S. 1771. — *Rindera*, in *Reise durch verschiedene Provinzen des Russischen Reichs in den Jahren*. Vol. 1. Kayserliche Academie der Wissenschaften, St. Petersburg, 486 p.
- POPOV M. G. 1953. — *Solenanthus* Ldb., in SHISKIN B. K. (ed.), *Flora of the USSR*. Vol. 19. Botanicheskii institut, Akademii nauk SSSR, Moscow, Leningrad: 638-657 [in Russian]. <http://biodiversitylibrary.org/page/30047495>
- RIEDL H. 1967. — Boraginaceae, in RECHINGER K. H. (ed.), *Flora Iranica*. Vol. 48. Akademische Druck- und Verlagsanstalt, Graz: 1-281.
- SCHULTES J. A. 1809. — *Observations botanicae in Linnaei species Plantarium*. C. L. Willdenow Denipouti, 220 p.
- SHERAFATI M., KAZEMPOUR-OSALOO S., KHOSHOKHAN-MOZAFFAR M., ESMAILBEGI KERMANI S., STAEDLER Y. M. & MANAFZADEH S. 2021. — Diversification of Cynoglossinae genera (Cynoglosseae-Boraginaceae) in the western Irano-Turanian bioregion. *Botany* 99 (9): 541-553: <https://doi.org/10.1139/cjb-2020-0224>
- TURLAND N. J., WIERSEMA J. H., BARRIE F. R., GREUTER W., HAWKSWORTH D. L., HERENDEEN P. S., KNAPP S., KUSBER W. H., LI D.-Z., MARHOLD K., MAY T. W., MCNEILL J., MONRO A. M., PRADO J., PRICE M. J. & SMITH G. F. (eds) 2018. — International Code of Nomenclature for Algae, Fungi, and Plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress, Shenzhen, China, July 2017. *Regnum Vegetabile* 159. Koeltz Botanical Books, Glashütten, xxxviii + 254 p. <https://doi.org/10.12705/Code.2018>
- WEIGEND M., LUEBERT F., SELVI F., BROKAMP G. & HILGER H. H. 2013. — Multiple origins for Hound's tongues (*Cynoglossum* L.) and Navel seeds (*Omphalodes* Mill.) – The phylogeny of the borage family (Boraginaceae s.str.). *Molecular Phylogenetics and Evolution* 68: 604-618. <https://doi.org/10.1016/j.ympev.2013.04.009>

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