

## *Heliotropium samoliflorum* subsp. *erzurumicum* (Boraginaceae), a new subspecies from Turkey

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*Heliotropium samoliflorum* was formerly regarded as an endemic species of Iran until the collection of the species from Erzurum (Turkey). Due to the presence of clavate intercalary lobes of corolla and hairy indumentum of the nutlets, the Turkish material is described as *H. samoliflorum* subsp. *erzurumicum* Dönmez *subsp. nova* and illustrated. Description of *H. samoliflorum* is given with observed new characters. Identification key to the species of *Heliotropium* in Turkey is reorganised by inserting two species, based on *H. samoliflorum* as well as on other species recorded by previous authors.

Key words: Boraginaceae, *Heliotropium*, Iran, IUCN, Turkey.

The genus *Heliotropium* is represented by 14 species (Riedl 1978) in the flora of Turkey. In addition to that treatment, Duman and Şağban (2000) recorded the widely distributed Old-World species *H. ovalifolium* for the Turkish flora. The specimen reported here was collected in Erzurum by the present author and it was identified by H. Akhane, the co-author of the recent revision of the genus in the *Flora Iranica* area (Akhane & Förther 1994). The specimen was identified as *H. samoliflorum* by Akhane and it is the second new record for the Turkish flora for the genus.

A comparison of the specimen with the description and illustration given by various authors (Riedl 1967, Akhane & Förther 1994) showed that the material clearly fits into the species concept, except for two characters. Shape of the intercalary lobes and indumentum of the seeds are clearly different. Therefore, the Turkish material is described as a new subspecies in

consideration of the morphological differences among the Turkish and Iranian materials and biogeography of the species. A small correction on the typification of *H. samoliflorum* is also done and discussed below.

*Heliotropium ovalifolium* and *H. samoliflorum*, both recently added to the flora of Turkey, are inserted in the identification key of the genus.

### ***Heliotropium samoliflorum* Bunge subsp. *samoliflorum***

Bull. Soc. Imp. Naturalistes Moscou 42: 314. 1869. — LECTOTYPE: Iran. “*in apricis limoso-salsis prope Schurab*”, [17. 5. 1859], Bunge *s.n.* (P, with diagnosis; islectotypes G-BOIS, K, M, P, designated by Akhane and Förther 1994). SYNTYPES: Iran. “*inter urbes Kaschan & Kum, Persiae mediae occidentalis*”, [10. 1868], Bunge & Bienert (G-BOIS, L, P). — NOTE 1: Because of the description of the new subspecies, *Heliotropium samoliflorum* subsp. *samoliflorum* is an automati-

cally created combination according to Art. 6.8 (McNeill *et al.* 2006). — NOTE 2: In the revision by Akhani and Förther (1994) the authors mentioned the types of the species as follows (p. 263); “Syntypes: in apricis limoso-salsis prope Schurab, [17. 5. 1859], *Bunge s.n.*; inter urbes Kaschan & Kum, Persiae mediae occidentalis, [10. 1868], *Bunge & Bienert* (G-BOIS, L, P). LECTOTYPE (here designated): in apricis limoso-salsis prope Schurab, [17. 5. 1859], *Bunge s.n.* (P, with diagnose; Isotypes: (G-BOIS, K, M, P)”. The typification of the species requires minor changes by repetition of the same gatherings and mention of the other gatherings. The selected lectotype has priority to syntype(s) and it is therefore given first. Then, the duplicates of the holotype, cited as isotypes, are given as isolectotypes and the other collections are cited as syntypes. According to the McNeill *et al.* (2006), isotype is an element(s), which is a duplicate of the holotype. Hence, without a holotype there can be no isotypes.

Annual, 10–50 cm high, branched from base and stem, villous, hairs 0.5–0.7 mm long, from middle of stem downwards subadpressed, above patent or adpressed. Leaves 5–40 mm long, 2–28 mm broad, ovate, ovate-orbicular, elliptic-ovate to suborbicular, obtuse to subacute, petiole 0.5–1.2 cm long, margin thickened,  $\pm$  sinuate, indistinctly revolute; upper side subadpressed villous, nerves slightly impressed, lower side patent villous, nerves slightly prominent. Inflorescence simple or branched; unilateral and uniseriate cymes of 5–25 cm long, with 10–50 sessile flowers, lax in the lower part. Calyx  $\pm$  persistent after dropping of nutlets; lobes 2–3 mm long, 0.3–1 mm broad, linear-oblong, acute, nearly free to base. Corolla 3–7 mm long, tubular, glabrous inside, villous outside from middle to downwards, subglabrous upwards; lobes 0.6–2.5 mm long, 0.3–1.5 mm broad, oblong, acute or obtuse, alternately arranged with intercalary lobes; intercalary lobes linear-filiform, acute or clavate at apex as long as or longer than main lobes. Anthers 1–2 mm long, recurved apiculate, inserted 0.7–2 mm above corolla base. Stigma 0.9–1.7 mm long, distinctly bilobed, pilose. Style 0.2–0.8 mm long, sometimes hidden by stigma sparsely pilose to subglabrous. Nutlets 0.9–1.5  $\times$  0.7–1 mm, ovoid, black, glabrous or adpressed hairy, obscurely granulate.

***Heliotropium samoliflorum* Bunge subsp. *erzurumicum* Dönmez, subsp. *nova* (Fig. 1)**

*Affinis* subsp. *samolifloro*, sed *dentibus inter corollae lobos clavatis et nuculis pilosis differt.*

HOLOTYPE: Turkey. Erzurum, from Olur to Yusufeli, 15. km, around Buzluca village, metamorphic rocks, 40°46'009"N, 42°03'854"E, 930 m, 2.VII.2002 A. A. Dönmez 11067 (HUB).

ETYMOLOGY. The subspecific epithet of the new taxon is derived from the name of the city, Erzurum, where the specimen was collected.

### Key to the subspecies

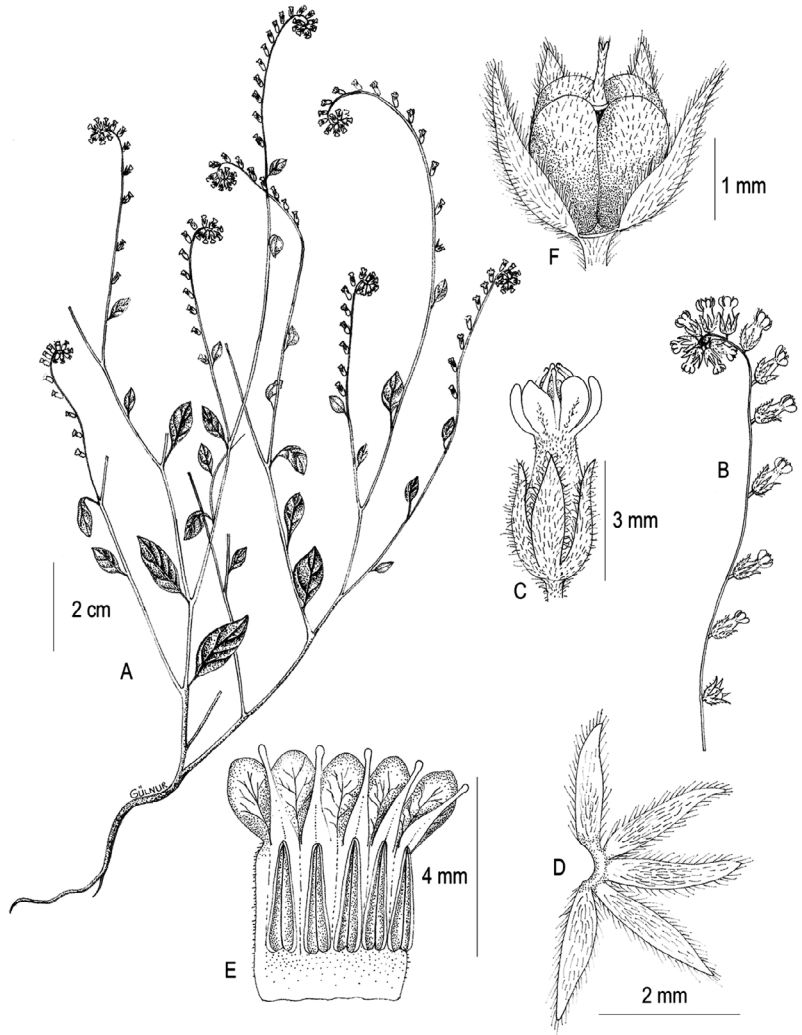
1. Intercalary lobes acute, nutlets glabrous ..... subsp. *samoliflorum*
1. Intercalary lobes clavate, nutlets hairy ..... subsp. *erzurumicum*

Because of a recent collection from Turkey, the circumscription of the species, *Heliotropium samoliflorum*, is enlarged. Two subspecies are recognized; one occurs in the eastern part of Turkey, while the other grows in the central part of Iran (Fig. 2). While the endemic status of the Iranian *H. samoliflorum* is rejected, the number of *Heliotropium* species is raised to 16 in Turkey.

*Heliotropium samoliflorum* subsp. *erzurumicum* is known from only the type material from Turkey. Type location was an area of floristic research, and material of this subspecies was not collected during the study. It will be inferred from this situation that the subspecies is not common in the area.

Identification key to the species of *Heliotropium* given by Riedl (1978) does not include *H. samoliflorum*, and the key in the Turkish flora should be amended as below. It is based on Riedl (1978) and Akhani and Förther (1994).

1. Perennial, subglabrous ..... *H. curassavicum*
1. Annual, hairy ..... 2
2. Calyx concealing 1-seeded fruit and falling with it ..... *H. supinum*
2. Calyx persistent, not enclosing nutlets; nutlets 4 ..... 3
3. Bracts present ..... *H. myosotoides*
3. Bracts absent ..... 4
4. Small teeth or intercalary lobes present between primary corolla lobes ..... 5
4. Teeth or intercalary lobes lacking between primary corolla lobes ..... 7
5. Corolla 3–7 mm; intercalary lobes as long as or longer than limbs ..... *H. samoliflorum*
5. Corolla 6–12 mm; intercalary lobes shorter than limbs .. ..... 6
6. Anthers inserted near base of corolla tube, tips hooked ..... *H. circinatum*
6. Anthers inserted just below middle of corolla tube, tips



**Fig. 1.** *Heliotropium samoliflorum* subsp. *erzurumicum* (from the holotype). — **A:** Habit. — **B:** Branch of inflorescence. — **C:** Flower. — **D:** Dissected calyx. — **E:** Dissected corolla. — **F:** Nutlets.

- not hooked ..... *H. ferrugineogriseum*
- 7. Corolla lobes involute in bud, not overlapping ..... 8
- 7. Corolla lobes imbricate in bud, overlapping ..... 10
- 8. Corolla 8–13 mm; leaves green ..... *H. greuteri*
- 8. Corolla 3–6 mm; leaves greyish-tomentose ..... 9
- 9. Nutlets indistinctly warty to rugulose, with short retrorse hairs; corolla 5–6 mm ..... *H. haussknechtii*
- 9. Nutlets tuberculate, glabrous; corolla 3–3.5 mm ..... *H. bovei*
- 10. Nutlets densely hairy ..... 11
- 10. Nutlets glabrous ..... 12
- 11. Leaves 7–15 mm; calyx 1.5–2 mm ..... *H. ovalifolium*
- 11. Leaves 15–40 mm; calyx 2.5–3 mm ..... *H. lasiocarpum*
- 12. Stigma depressed-pulvinate; stem densely covered with predominantly spreading hairs; corolla tube plicate, folds sometimes ending in a hairy scale-like protuberance in



**Fig. 2.** Distribution of *Heliotropium samoliflorum* subsp. *samoliflorum* (■) (after Akhani & Förther 1994), and *H. samoliflorum* subsp. *erzurumicum* (\*).

- throat ..... *H. hirsutissimum*
12. Stigma shortly to elongate-conical; hairs on stem predominantly adpressed; corolla tube plicate or not, folds never ending in scale-like protuberances ..... 13
13. Stigma depressed-conical; corolla limb 5(–6) mm diam., throat longitudinally plicate ..... *H. suaveolens*
13. Stigma elongate-conical; corolla limb 3–4 mm diam., throat not plicate ..... 14
14. Apex of stigma subfiliform, deeply bifid; stigma usually glabrous ..... *H. europaeum*
14. Apex of stigma broadly conical, obtuse; stigma shortly hairy ..... 15
15. Calyx lobes patent in fruit; nutlets with shallow reticulate grooves, sometimes finely tuberculate 2 mm or more ..... *H. ellipticum*
15. Calyx lobes incurved in fruit; nutlets grossly rugulose, less than 2 mm ..... *H. dolosum*

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## References

- Akhani, H. & Förther, H. 1994: The genus *Heliotropium* L. (Boraginaceae) in Flora Iranica Area. — *Sentnera* 2: 187–276.
- Duman, H. & Şağban, H. 2000: A new record (*Heliotropium ovalifolium* Forssk.) from Southern Turkey. — *Turkish J. Bot.* 24: 207–209.
- McNeill, J., Barrie, F. R., Burdet, H. M., Demoulin, V., Hawksworth, D. L., Marhold, K., Nicolson, D. H., Prado, J., Silva, P. C., Skog, J. E., Wiersema, J. H. & Turland, N. J. (eds.) 2006: International Code of Botanical Nomenclature (Vienna Code). — *Regnum Vegetabile* 146.
- Riedl, H. 1967: *Heliotropium* L. — In: Rechinger, K. H. (ed.), *Flora Iranica*, Lieferung 48: 9–53. Akademische Druck und Verlagsanstalt, Graz.
- Riedl, H. 1978: *Heliotropium* L. — In: Davis, P. H. (ed.), *Flora of Turkey and the East Aegean Islands*. 6: 248–255. Edinburgh Univ. Press, Edinburgh.