



A new species of the genus *Astragalus* (Leguminosae-Papilionoideae) from Iran

ALI BAGHERI¹, MOHAMMAD REZA RAHIMINEJAD^{1*} & ALI ASGHAR MAASSOUMI²

¹Department of Biology, Faculty of Sciences, University of Isfahan, P.O. Box 73441-81746, Isfahan, Iran; e-mail: mrr@sci.ui.ac.ir

²Department of Botany, Research Institute of Forests and Rangelands, P.O. Box 13185-116, Tehran, Iran

*author for correspondence

Abstract

As a result of a recent expedition to the north-west of Iran, we describe here a newly discovered species, *Astragalus makueensis*, belonging to sect. *Hymenostegis*. The new species is described and illustrated with a line drawing, and compared with its most closely related species *A. hymenocystis* and *A. pereshkhoranicus*. The new species is endemic to the western Azarbaijan province of Iran.

Key words: Fabaceae, sect. *Hymenostegis*, new taxon

Introduction

Astragalus Linnaeus (1753: 755) with c. 2850 species is the world's largest genus of flowering plants (Podlech & Zarre 2013). A very high proportion of the species of *Astragalus* occurring in Iran, around 527 of an estimated total of 850 species, are endemics (Maassoumi 1998; Maassoumi 2005), implying that the genus has undergone a process of adaptive radiation on the plateau of Iran.

Section *Hymenostegis* Bunge (1869: 108) is one of the many groups within *Astragalus* that have been subject to different taxonomic treatments (Maassoumi 1998; Zarre & Podlech 1996). This section was typified with *A. hymenostegis* Fisch. & C. A. Mey. (Fischer 1853: 448) by Podlech (1990) and is characterized by the inflated calyx, basifixed hairs (not medifixed), absence of black hairs (all hairs are white), and broad and conspicuous bracts. Bunge (1868, 1869) restricted this section to 23 species, but this number was increased to 57 by later authors (Bagheri *et al.* 2011). According to the circumscription of Mahmoodi *et al.* (2009), sect. *Hymenostegis* is one of the largest sections of *Astragalus*. Including around 75% of Iranian endemics (Table 1) (Bagheri *et al.* 2011), the section is considered as a subendemic taxon to this country (Mahmoodi *et al.* 2012). Taking into account the number of species, proportion of endemics, and pattern of distribution it can be concluded that sect. *Hymenostegis* is likely to have originated and diversified in Iran, particularly in the north-western area. The morphological homogeneity at the species level within this section suggests that rapid speciation by adaptive radiation has occurred. This hypothesis requires further assessment.

TABLE 1. A summary of the worldwide distribution of *Astragalus* sect. *Hymenostegis*, including endemism per country as a percentage of total number of species worldwide.

Country	Total spp. (59 spp. worldwide)	Endemic spp.	Percentage of endemism
Iran	57	44	75%
Turkey	13	2	3.38%
Iraq	5	-	-
Armenia	2	-	-
Azerbaijan	2	-	-

TABLE 2. Diagnostic morphological characters of *Astragalus makuensis* compared to *A. hymenocystis* and *A. pereshkhoranicus*.

Character	<i>A. hymenocystis</i>	<i>A. pereshkhoranicus</i>	<i>A. makuensis</i>
Stipules	8–13 mm	10–13 mm	13–20 mm
Leaves	1.5–3 cm	2–3.5 cm	2–8 cm
Leaflets	3–5 pairs	5–6 pairs	4–7 pairs
Peduncle	2.5–6 cm	1.5–7 cm	3–12 cm
Racemes	globose to ovoid, 2.5–3.5 cm long	globose to ovoid, 2.5–4.5 cm long	ovoid to cylindrical, 3.5–6.5 cm long
Bracts	6–11 mm, glabrous	9–15 mm, glabrous	11–15 mm, in the central part sparsely hairy
Calyx	9–18 mm long, whitish, apex purple	15–20 mm long, pale yellow, apex purple	13–18 mm long, whitish-yellow
Calyx hairs	erect to spreading hairs 2.5–4 mm, and short hairs up to 0.5 mm	erect to spreading hairs 1.5–3 mm, and short hairs up to 0.5 mm	erect to spreading hairs up to 4.5 mm
Teeth	(4-) 6–7 mm, hairy on inner surface	7–12 mm, glabrous on inner surface	5–8 mm, glabrous on inner surface
Petals	pink to violet	violet, becoming yellow to brownish	pale yellowish
Standard	16–25 mm	18–25 mm	16–20 mm

References

- Bagheri, A., Maassoumi, A. A. & Ghahremaninejad, F. (2011) Additions to *Astragalus* sect. *Hymenostegis* (Fabaceae) in Iran. *The Iranian Journal of Botany* 17: 15–19.
- Bunge, A. (1868) Generis *Astragali* species Gerontogaeae. Pars prior, claves diagnosticae. *Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg, Septième série* 11: 1–140.
- Bunge, A. (1869) Generis *Astragali* species Gerontogaeae. Pars altera, Specierum enumeration. *Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg, Septième série* 15: 1–245.
- Fischer, F.B. (1853) Synopsis *Astragalarum* Tragacantharum. *Bulletin de la Société Imperiale des Naturalistes de Moscou*. Moscow 26: 314–486.
- Linnaeus, C. von (1753) *Species Plantarum*, Vol. 2. Laurentius Salvius, Stockholm. 755 p.
- Maassoumi, A.A. & Ghahremaninejad, F. (1999) Interesting new species of *Astragalus* sect. *Hymenostegis* in Iran. *The Iranian Journal of Botany* 8: 35–41.
- Maassoumi, A.A. (2005) *The genus Astragalus in Iran, perennials*, vol. 5. Research Institute of Forests and Rangelands, Tehran, 785 pp.
- Maassoumi, A.A. (1998) *Astragalus in the Old World, Check List*. Research Institute of Forests and Rangeland. Tehran, 617 pp.
- Mahmoodi, M., Maassoumi, A.A. & Hamzeh'ee, B. (2009) Geographic distribution of *Astragalus* (Fabaceae) in Iran. *Rostaniha* 10: 112–132. [in Persian, with English summary].
- Mahmoodi, M., Maassoumi, A. A. & Jalili, A. (2012) Distribution patterns of *Astragalus* in the Old World based on some selected sections. *Rostaniha* 13: 39–56. [in Persian, with English summary].
- Podlech, D. (1990) Die Typifizierung der altweltlichen sektionen der gattung *Astragalus* L. (Leguminosae). *Mitteilungen der Botanischen Staatssammlung*, München 29: 478.
- Podlech, D. & Maassoumi, A.A. (2001) *Astragalus* sect. *Hymenostegis* In: Rechinger, K.H. (Ed.) *Flora Iranica*. No. 175. Akademische Druck- und Verlagsanstalt, Graz, pp. 127–183.
- Podlech, D. & Zarre, Sh. (2013) *A taxonomic revision of the genus Astragalus L. (Leguminosae) in the Old World*. vols. 1–3. Naturhistorisches Museum, Wien, 2439 pp.
- Zarre, Sh. & Podlech, D. (1996) Taxonomic Revision of *Astragalus* L. sect. *Hymenostegis* Bunge (Leguminosae). *Sendtnera* 3: 255–312.