

## *Astragalus hamzae* (Fabaceae), a new species from Central Anatolia, Turkey

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*Astragalus hamzae* E. Hamzaoğlu from Central Anatolia (Kırıkkale-Turkey) is described as a species new to science and illustrated. It belongs in the section *Caprini* DC. and is related to *A. pinetorum* Boiss., from which it mainly differs in its very big legumes.

Key words: *Astragalus*, Fabaceae, taxonomy

In terms of species numbers, *Astragalus* L. (Fabaceae) is the richest genus of vascular plants on Earth, represented by a total of ca. 2500 species (Maassoumi 1998). It is also the largest genus in Turkey, where ca. 442 species in 62 sections occur in the Irano-Turanian region (Chamberlain & Matthews 1970, Özhatay *et al.* 1994 & 1999, Podlech 1999a, Aytaç 2000, Akan & Civelek 2001, Ekici & Aytaç 2001, Hamzaoğlu & Kurt 2002). In Turkey, the number of endemic taxa of *Astragalus* is 207 and the rate of endemism is thus 46.8%. The reported chromosome numbers are  $2n = 16, 32, 48$  and  $64$  (Davis *et al.* 1988).

The author collected some interesting *Astragalus* specimens with flowers in a botanical trip to Çerikli (Delice-Kırıkkale) in spring 2002. The area was revisited and fruiting specimens were collected in the summer. The specimens were compared with those in ANK, GAZI, HUB and ADO, and also with the descriptions of species of *Astragalus* in Schischkin (1965), Chamberlain and Matthews (1970), Townsend and Guest (1974), Zohary

(1987), Davis *et al.* (1988), Podlech (1999b) and Aytaç (2000).

***Astragalus hamzae* E. Hamzaoğlu, *sp. nova* (Fig. 1)**

*Affinis* *A. pinetori* sed *pedicellis* 5–12 mm longis (*non* 2–6 mm), *vexillo* 24–27 mm longo (*non* 15–22 mm), *et legumine* 28–60 mm longo *et stipitato* (*non* 15–20 mm *et sessile*) differt.

TYPE: Turkey. B4/5 Kırıkkale: Delice, Çerikli, Tatlıcak-Melemkar köyleri arası, 660 m, gypseous steppes, 28.IV.2002 E. Hamzaoğlu 2741 (holotype ADO; isotypes GAZI, ANK).

Scapose to shortly caulescent perennial herb with woody branched caudex with white, simple hairs. Stems 0.5–2.5 cm, simple, sparsely villous. Leaves 8–26 cm, oblong-lanceolate in outline, imparipinnate, with villous rachis; petioles 2.5–8 cm, villous; leaflets 8–21 × 4–10 mm, 8–16-paired, lanceolate to elliptic, obtuse or acute, villous below, glabrous above; stipules 13–20

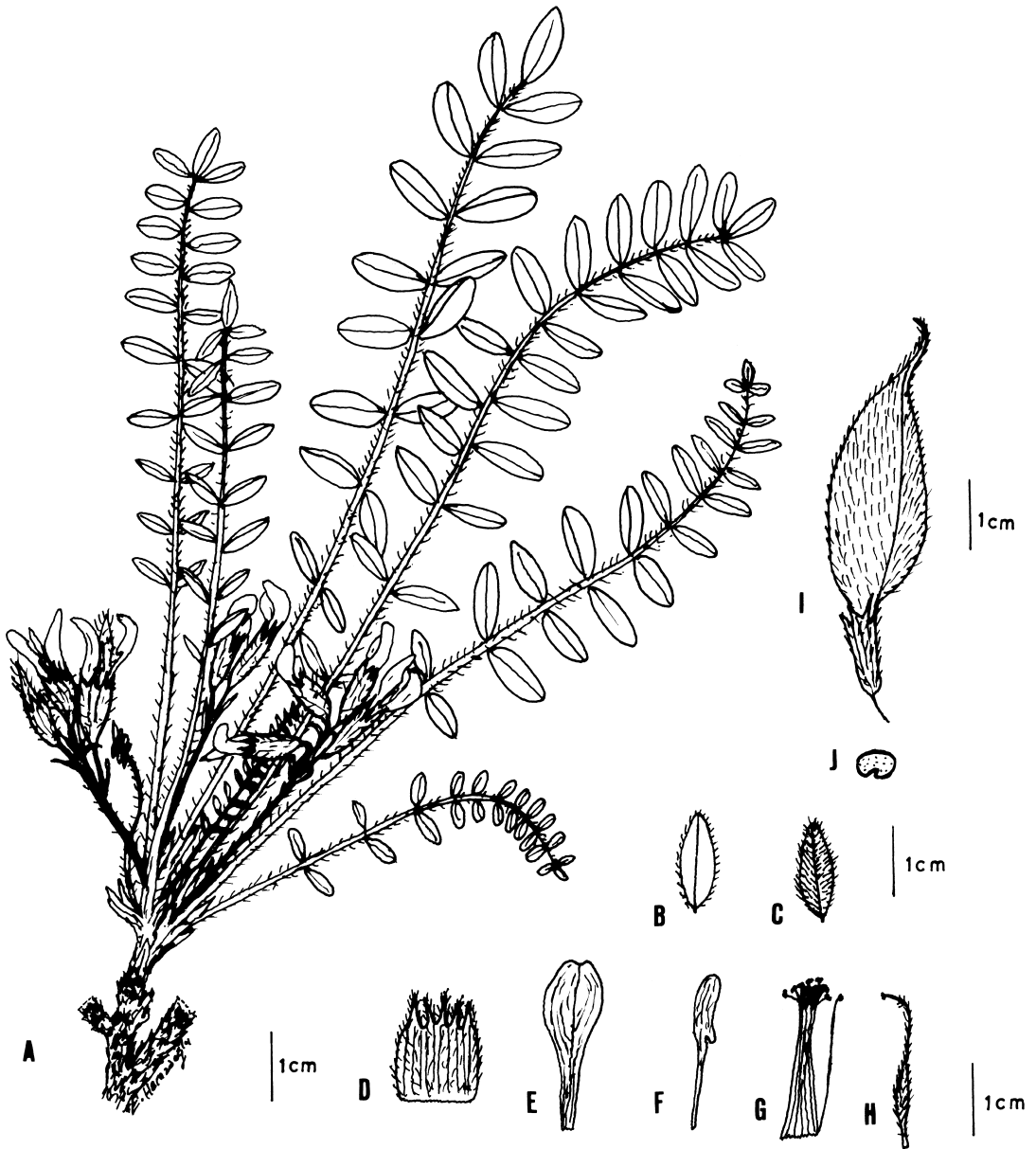


Fig. 1. *Astragalus hamzae* (from holotype). — A: Habit. — B: Leaflets, upper surface. — C: Leaflets, lower surface. — D: Calyx. — E: Standard. — F: Wings. — G: Stamens (diadelphous). — H: Pistil. — I: Fruit. — J: Seed.

$\times 1.5\text{--}4$  mm, linear-lanceolate to oblong, villous,  $\pm$  membranous, acute. Peduncles 1–3.5 cm, villous. Pedicels 5–12 mm, villous. Flowers in 2–7-flowered racemes. Bracts 7–11 mm, linear, villous,  $\pm$  membranous. Calyx 13–15 mm, tubular, sparsely villous; teeth 3.5–5 mm, linear-triangular, villous. Corolla yellow when fresh and dark brownish when dry; standard 24–27 mm,

lamina suborbicular to obovate, bilobed at apex; wings 21–24 mm, oblong; keels 20–22 mm, ovate. Ovary bilocular, spreadingly villous, 6–10 ovulate; style ca. 12 mm, evenly hairy below the stigma. Legume 28–60  $\times$  10–22 mm, ellipsoid or oblong-lanceolate, sparsely villous, stipitate (stipe 8–17 mm); beak 4–8 mm, straight, villous. Seeds 4–6  $\times$  3–4.5 mm, compressed, reniform.

**HABITAT AND LIFE FORM.** Gypseous steppes, 660–700 m altitude, flowers and fruits April–June, hemicryptophyte.

**CONSERVATIONAL STATUS.** Endemic, Irano-Turanian element. It should be graded as critically endangered (CR) (IUCN 2001).

*Astragalus hamzae* is closely allied to *A. pinetorum*. The two species are compared in Table 1. *Astragalus pinetorum* is distributed in Anatolia, Lebanon, Syria, Iraq, Persia, Caucasus and Transcaucasia. *Astragalus pinetorum* subsp. *pinetorum* grows in Central and East Anatolia and *A. pinetorum* subsp. *declinatus* generally in East Anatolia. The distributions of *A. hamzae* and *A. pinetorum* overlap widely (see examined specimens). Therefore, a distribution map is not given. However, *A. pinetorum* grows in mountain steppes, stony slopes, pine woods and alpine meadows. *Astragalus hamzae* on the other hand thrives in gypseous steppes with plants such as *Gypsophila parva*, *G. eriocalycis*, *Astragalus aucheri*, *A. karamasicus*, *A. polemioniacus*, *Onobrychis armena*, *Thymus sipyleus* subsp. *rosulans*, *Festuca valesiaca* and *Bromus tomentellus*.

**ADDITIONAL SPECIMENS EXAMINED** (paratypes): **Turkey.** B4/5 Kırıkkale: Delice, Çerikli, Tatlıcak-Melemkar köyleri arası, 700 m, 12.V.2002 *E. Hamzaoğlu 2810* (ADO); B4/5 Kırıkkale: Delice, Çerikli, Tatlıcak-Melemkar köyleri arası, 700 m, 24.V.2002 *E. Hamzaoğlu 2835* (ADO) (fruiting specimens).

**SELECTED EXAMINED SPECIMENS OF *Astragalus pinetorum*.** — Subsp. *pinetorum*: **Turkey.** A3 Ankara: Beypazarı, Hırkatepe köyü, 750–800 m, 1991 *Z. Aytaç 6119* & *M. Ekici* (GAZI, 1 sheet); A5 Çorum: Dodurga-İskilip arası, ca. 720 m, 1989 *Z. Aytaç 2734* (GAZI, 5 sheets); A8 Bayburt: Çoruh vadisi, Adabaşı köyü doğusu, 1460 m, 1991 *A. Güner 9684* (HUB & GAZI, 2 sheets); B5 Aksaray: Hasan Dağı, Ahmetkarı-Tahta yaylası arası, ca. 2400 m, 1975 *A. Düzenli 448* (ANK, 1 sheet); B5 Nevşehir: Ortahisar, Gemil Dağı, 1450–1500 m, 1989 *M. Vural 5191* (GAZI, 1 sheet); B5

Nevşehir: Göreme, Arılıburun dere, 1100–1250 m, 1989 *M. Vural 4718* (GAZI, 1 sheet); B5 Kayseri: Erciyes Dağı, ca. 2150 m, 1934 *Balls 1410* & *Gourbay* (ANK, 1 sheet); B5 Kayseri: Erciyes Dağı, Derindere Mevki, ca. 2570 m, 1974 *R. Çetik 4092* (ANK, 1 sheet); B6 Kayseri: Pınarbaşı, Kaynar üstü, Hınzır Dağı, 2150 m, 1980 *N. Çelik 1379* (HUB & ANK, 2 sheets); B6 Kahramanmaraş: Berit Dağı, Arpaçukuru-Karagöl Yatağı arası, 2600–2900 m, 1992 *Z. Aytaç 5541* (GAZI, 1 sheet); B6 Sivas: Şarkışla, Beyyurdu köyü, Şahinkaya mevki, ca. 1900 m, 1979 *T. Ekim 3888* & *A. Düzenli* (ANK, 1 sheet); B7 Tunceli: Munzur Dağı, Ovacık, ca. 2800 m, 1957 *Davis 31226* & *Hedge* (ANK, 1 sheet); B8 Bitlis: Bitlis–Van arası, Pelli'nin 10 km güneydoğusu, ca. 2591 m, 1954 *Davis 22596* & *O. Polunin* (ANK, 1 sheet); B8 Bingöl: Bingöl Dağı, Beritan yayları, ca. 3000 m, 1983 *N. Adıgüzel 7887* (GAZI & ANK, 2 sheets); B9 Van: Kurutaş geçidi, 2250 m, 1993 *Y. Altan 4902* (GAZI, 1 sheet); C3 Antalya: Elmalı, Çıglıkara, 1976 *Y. Akman 6082* (ANK, 1 sheet); C3 Isparta: Gölcük Gölü, Pürenova mevki, 1550–1600 m, 1995 *H. Özçelik 7063* (GAZI, 1 sheet); C4 Antalya: Gazipaşa, Maden köyü yaylası, Sırainler mevki, 1800–2000 m, 1981 *H. Sümbül 1211* (HUB & ANK, 2 sheets); C4 İçel: Anamur, Akine köyü, Elbalak obası yaylası, 1900–2200 m, 1983 *H. Sümbül 2128* (HUB & ANK, 2 sheets); C4 Konya: Ermenek, Damlaçal mevki, ca. 1600 m, 1979 *M. Vural 1782* (ANK, 1 sheet); C6 Malatya: Erkenek, Akdağ, 1750–1800 m, 1989 *E. Aktoklu 1512b* (GAZI, 1 sheet); C6 Kahramanmaraş: Engizek Dağı, Fatmadüzü-Karatepe arası, 2150 m, 1988 *H. Duman 4221* (GAZI, 1 sheet); C6 Kahramanmaraş: Engizek Dağı, Kasımkuyusu tepesi, 2300–2400 m, 1986 *H. Duman 2199* (GAZI, 1 sheet); C9 Hakkari: Cilo Dağı, Cilo Tepe, ca. 3353 m, 1954 *Davis 24157* & *O. Polunin* (ANK, 1 sheet); C9 Hakkari: Hakkari-Uludere arası, Süvari Halil Geçidi girişi, ca. 2500–2600 m, 1983 *N. Adıgüzel 8108* (GAZI & ANK, 2 sheets). Total number of examined specimens is 58. — Subsp. *declinatus*: **Turkey.** A4 Ankara: Ayaş, Ayaş Beli, Orta Bereket mevki, ca. 1000 m, 1983 *Y. Akman 13287* (ANK, 1 sheet); A8 Gümüşhane: Maden Dağı, ca. 2900 m, 1933 *Balls 543* & *Gourbay* (ANK, 1 sheet); A8 Erzurum: Erzurum-İspir arası, Aynalıkale köyünün kuzeybatısı, 2250 m, 1976 *A. Tath 5276* (HUB, 1 sheet); A8/9 Erzurum: Pasinler-Horasan arası, ca. 1650 m, 1987 *Davis 29438* & *Hedge* (ANK, 1 sheet); A9 Kars: Selim, ca. 1900 m, 1957 *Davis 29547* (ANK, 1 sheet); B4 Ankara: Çubuk-II Barajı, ca. 1200 m, 1986 *F. Demircioğlu 1130* (GAZI, 1 sheet); B7 Tunceli: Ovacık, Munzur Dağları, Kepir tepesi, 3000 m, 1979 *Ş. Yıldırım*

**Table 1.** Differences between *Astragalus hamzae* and *A. pinetorum*.

Diagnostic characters	<i>A. hamzae</i>	<i>A. pinetorum</i>
Stipules	13–20 mm long	5–13(–17) mm long
Petiole	2.5–8 cm long	1.5–3 cm long
Leaves	8–26 cm long	3–10(–15) cm long
Inflorescence	2–7 flowered	2–3 flowered
Pedicele	5–12 mm long	2–6 mm long
Standard	24–27 mm long	(12–)15–22 mm long
Legume	28–60 mm long, stipitate, beak 4–8 mm long	15–20 mm long, sessile, beak 2–4 mm long

2306 (HUB, 1 sheet); B7 Tunceli: Ovacık, Munzur Dağları, Karagöl vadisi, 2150 m, 1983 Ş. *Yıldırım* 5446 (HUB, 1 sheet); B9 Van: Van Kalei çevresi, 1730 m, 1988, *H. Duman* 2328 (GAZI, 1 sheet); B9 Van: Erek Dağı, Sarmaç köyü üstü, 2200–2400 m, 1978, *A. Güner* 1715 (HUB, 1 sheet). Total number of examined specimens is 16.

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