

## *Astragalus nezaketæ* (Fabaceae), a new species from Turkey

Ahmet Duran<sup>1</sup> & Zeki Aytaç<sup>2</sup>

<sup>1)</sup> Selçuk Üniversitesi, Eğitim Fakültesi, Biyoloji Bölümü, Meram, 42090 Konya, Turkey (e-mail: ahmetduran22@yahoo.com)

<sup>2)</sup> Gazi Üniversitesi, Fen-Edebiyat Fakültesi, Biyoloji Bölümü, Teknikokullar, 06500 Ankara, Turkey

Received 17 Feb. 2004, revised version received 29 Nov. 2004, accepted 2 Dec. 2004

Duran, A. & Aytaç, Z. 2005: *Astragalus nezaketæ* (Fabaceae), a new species from Turkey. — Ann. Bot. Fennici 42: 381–385.

*Astragalus nezaketæ* A. Duran & Aytaç *sp. nova* with bifurcating hairs (sect. *Incani*), is described from East Anatolia in Turkey. It is an endemic and closely similar to *A. ancistrocarpus*. Diagnostic morphological characters from closely similar taxa are discussed.

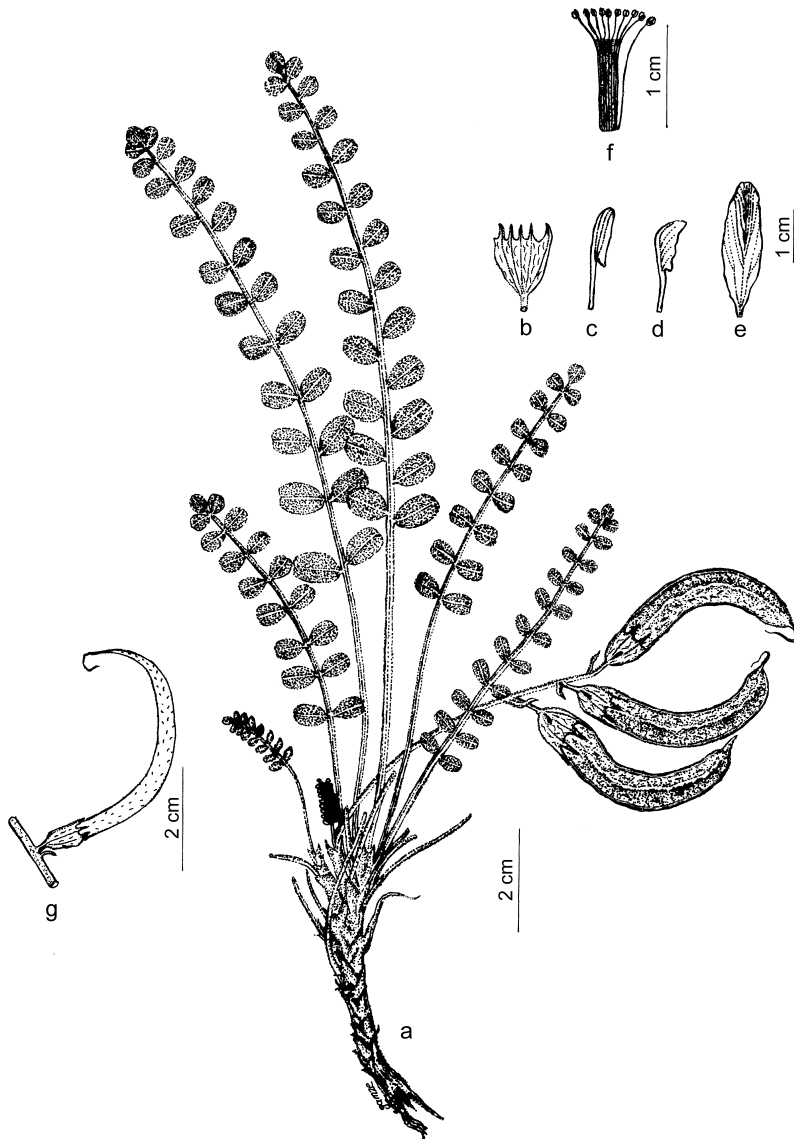
Key words: *Astragalus*, Fabaceae, new species, taxonomy

*Astragalus* (Fabaceae), which is the richest genus of vascular plants on earth, is represented by a total of nearly 2500 species (Maassoumi 1998). It is also the largest genus in Turkey, where it is represented by ca. 455 species in 61 sections (Chamberlain & Matthews 1970, Davis *et al.* 1988). Generally, the genus *Astragalus* is best represented in the steppe areas in the Irano-Turanian phytogeographic region of Turkey. The plants are adapted especially to steppe environment of high mountains (Chamberlain & Matthews 1970, Podlech 1999).

The genus *Astragalus* was previously revised by Chamberlain and Matthews (1970) for the *Flora of Turkey*. Forty-one species have since been described; two species and two subspecies were newly reported from Turkey (Davis *et al.* 1988, Aytaç 2000). Since then, 33 new species have been identified by Podlech (1999, 2001) and Podlech and Sytin (2002), and nine new species have been described by

different authors (Akan & Civelek 2001, Aytaç *et al.* 2001, Ekici & Aytaç 2001, Aytaç & Ekici 2002, Hamzaoğlu & Kurt 2002, Akan & Duman 2003, Göktürk *et al.* 2003, Hamzaoğlu 2003, Ketenoğlu & Menemen 2003, Akan & Aytaç 2004). In this paper we describe a further new species in the section *Incani*, which now has 27 species in Turkey (Chamberlain & Matthews 1970, Davis *et al.* 1988, Hamzaoğlu & Kurt 2002).

The authors collected flowering and fruiting specimens of *Astragalus* in 1990 and 1999 in Erzurum and Erzincan provinces. The specimens were not referable to any known species. Studying the descriptions of *Astragalus* in Chamberlain and Matthews (1970), Davis *et al.* (1988), Townsend and Guest (1974), Aytaç (2000), Boissier (1872), Shishkin (1946), Post (1932), as well as a comparison with specimens in GAZI, HUB, E, K, G and KNYA, showed that the specimens represent a species new to science.



**Fig. 1.** *Astragalus nezaketiae* (a–f, from holotype), *A. ancistrocarpus* (g, from isotype) — a: Habit and legume. — b: Calyx. — c: Wing. — d: Keel. — e: Standard. — f: Stamens. — g: Legume.

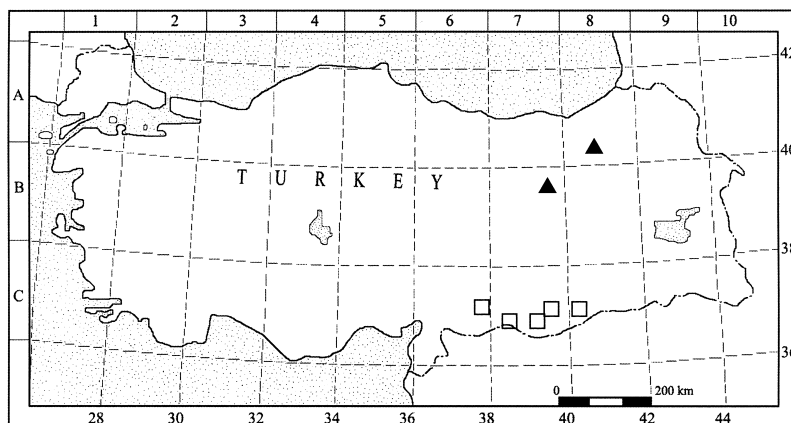
***Astragalus nezaketiae* A. Duran & Aytaç.**  
*sp. nova* (Figs. 1 and 2)

*Affinis A. ancistrocarpo, sed foliis sparse pilis infra, glabratis vel glabris supra (non omnino densis pilis), pedicellis ca. 3 mm longis (non subsessilibus), vexillis 24–27 mm longis (non 20–24 mm), leguminibus lateraliter compressis, 6–10 mm latis (non cylindricis, 4 mm) differt.*

TYPE: Turkey. **A8** Erzurum, Erzurum–İspir yolu 50. km, Eğerti köyü, Kelkaya mevkii, step, 2000–2200 m, 19.VII.1990, H. Duman & Z. Aytaç 3195 (holotype GAZI; isotype KNYA).

Perennial dwarf herb, scapose, with a woody base. Leaves 5–12 cm (excl. petiole), linear-oblong; petiole 2.55 cm long. Leaflets 6–12 pairs, 5–13 × 4–7 mm, broadly orbicular to oblong-elliptic, rounded or submarginate at apex, cuneate at base, sparsely adpressed bifurcate-sericeous below, glabrescent or glabrous above. Stipules whitish-hyaline, 8–12 mm long, ovate to lanceolate, subulate to acuminate at apex, adnate to petiole for 1–2 mm, covered with adpressed white hairs outside, later glabrescent. Peduncle 4–7.5 cm long, bearing black and white bifurcate hairs. Inflorescence a short raceme, ±

**Fig. 2.** Distribution map of *Astragalus nezaketae* (▲) and *A. ancistrocarpus* (□) in Turkey.



lax, 4–9-flowered. Bracts thin membranous, 3–5 mm long, ovate to lanceolate, with adpressed sparse hairs. Bracteoles 2, minute scale-like, at the base of calyx. Flowers shortly pedicellate, pedicel ca. 3 mm long. Calyx 11–14 mm long, tubular, predominantly with adpressed black and sometimes few white hairs, gibbous at base; teeth subulate, 3–4 mm long. Petals mauve-pink. Standard 24–27 mm long, elliptic,  $\pm$  obtuse at apex, tapering gradually at base. Wings ca. 20 mm long; blades oblong, obtuse at apex; auricle 1 mm long, claw 10 mm long. Keel ca. 17 mm long; blades 8–10 mm long, falcate-triangular, obtuse at apex; auricle ca. 1 mm long; claw 8–9 mm long. Stamens 11–13 mm long. Ovary 8–10 mm long,  $\pm$  linear, attenuate-substipitate, densely adpressed white sericeous; style ca. 10 mm long, glabrous. Legume curved,  $\pm$  spreading, (35–) 40–55  $\times$  6–10 mm, clearly laterally compressed, sutures very distinct, reticulate-veined, with sparse adpressed white hairs, mostly with brown blotches, bilocular with 15–20 seeds; beak 2–6 mm long, straight to slightly curved. Seeds subquadrate or comma-shaped, chestnut-brown, 2–3  $\times$  2 mm, scrobiculate. Flowering in June, fruiting in July.

**ETYMOLOGY:** This species is named in honour of the Turkish botanist, Associate Professor Nezaket Adıgüzel (Biology Department, Gazi University).

**DISTRIBUTION:** Endemic to Turkey (Erzincan and Erzurum provinces), of Irano-Turanian element.

**HABITAT ECOLOGY:** It grows in calcareous stony slopes and steppe with *Aubrieta canescens*

subsp. *macrostyla*, *Hesperis bicuspidata*, *Arabis caucasica*, *Anchonium elichrysifolium*, *Gypsophila briquetiana*, *Centaurea pyrrhoblephara*, *Origanum acutidens*, *Stipa holosericea*, *Dactylis glomerata*, between 2000–2600 m. Hemicryptophyte.

*Astragalus nezaketae* is included in the section *Incani*, in which all taxa have ovate to narrowly cylindrical legumes. The legumes of *A. nezaketae* are conspicuously laterally compressed, which separates it easily from the other species of the section.

*Astragalus nezaketae* resembles *A. ancistrocarpus*, which is known from South East Anatolia, Syria, Iraq, Iran and Jordan. Morphological differences between the two species are provided in Table 1.

Another fairly similar species is *A. siakheshmehensis* from Iran. The main differences in *A. nezaketae* are: stipules 8–12 mm long, covered with adpressed white hairs outside, later glabrescent (vs. 3–4 mm long, sparsely hairy at tip and margins in *A. siakheshmehensis*); leaves 6–12 cm long (vs. 1.5–6 cm long); petiole 2.5–5 cm long (vs. 0.5–3 cm long); leaflets in 6–12 pairs, rounded or subemarginate at apex (vs. 2–6 pairs, mostly distinctly emarginate at the tip); peduncles 4–7.5 cm long (vs. 0.7–4 cm long); bracts 3–5 mm long (vs. 2–2.5 mm long); calyx with adpressed black and sometimes few white hairs (vs. sparsely covered with very short black hairs); petals mauve-pink (vs. dark violet); limb  $\pm$  obtuse at apex (vs. slightly emarginate); legumes 40–55  $\times$  6–10 mm,  $\pm$  spreading, the beak 2–6 mm long (vs. ca. 20 mm long, 3.5 mm high, erect, the beak 1–2 mm long); and valves mostly

**Table 1.** Morphological comparison between *Astragalus nezaketiae* and *A. ancistrocarpus*.

Character	<i>Astragalus nezaketiae</i>	<i>Astragalus ancistrocarpus</i>
Leaflets	sparsely adpressed sericeous below, subglabrous or glabrous above	generally on both surfaces densely adpressed sericeous, sometimes more densely below
Stipules	8–12 mm long	5–8 mm long
Inflorescence	4–9 flowered, pedicel ca. 3 mm long	5–20 flowered, flowers shortly pedicellate or subsessile
Bracts	3–5 mm long	2–3 mm long
Standard	24–27 mm long	20–24 mm long
Legume	(35–)40–55 × 6–10 mm, laterally compressed, sutures very distinct	20–40 × 4 mm, cylindrical, sutures not so distinct

with brown blotches (valves purplish-mottled) (Podlech & Maassoumi 2003).

ADDITIONAL SPECIMENS EXAMINED (paratypes). — **Turkey.** B7 Erzincan, Üzümlü, Keşiş Dağı, 13. km, Devrant vicinity, 2550 m, 39°45.995'N, 39°43.370'E, 3.VII.1999 A. Duran 4833 (KNYA, GAZI, HUB, ANK).

REPRESENTATIVE SPECIMENS EXAMINED OF *Astragalus ancistrocarpus*. — **Turkey.** C6 Şanlıurfa: Birecik, Djebel Taken, 1888 *Sint.* 200 (E, photo KNYA!); C7 Şanlıurfa: Ceylanpınar, Şeyhane köyü çevresi, step, taşlı yerler, 520 m, 1995 N. Adıgüzel 2124 & Z. Aytaç (GAZI); same locality, 1995 N. Adıgüzel 2366 & Z. Aytaç (GAZI); Şanlıurfa: Akçakale-Harran, Telliçime (Bellitaş) köyü, Karac mezarası, Tektek Dağı, 450–550 m, 1980 A. Güner 2244 (HUB). — **Syria.** (Syrian Desert) in deserto Mesopotamia ad radices montis Gebel Abdul Aziz, 1867 *Hausknecht* (isotype K, photo KNYA! GAZI!); Gebel Rat Juah (Qaryatein), 3300–5000', 1949, *Davis 5615* (E, photo KNYA!); in monte Gebel Abaid deserti Syriae inter Hama et Palmyran, 1859 *Blanche 3092* (syntype G, photo KNYA! GAZI!)

## Acknowledgements

The authors thank GAZI, ANK and HUB that allowed us to study their *Astragalus* specimens. The first author also thanks K, G and E for sending digital photographs and pictures of some specimens. The type specimen of the new species was collected during “The Revision of the Genus *Hesperis* L. of Turkey” project, which is funded by TÜBİTAK (Project No. TBAG-1748).

## References

- Akan, H. & Aytaç, Z. 2004: A new species of *Astragalus* (Fabaceae) from Turkey. — *Ann. Bot. Fennici* 41: 209–212.  
 Akan, H. & Civelek, Ş. 2001: *Astragalus aytatchii* (Fabaceae), a new species from Anatolia, Turkey. — *Ann. Bot. Fen-*

*nici* 38: 167–170.

- Akan, H. & Duman, H. 2003: New species of *Astragalus* L. (sect. *Alopecuroidei*: Leguminosae) from Turkey. — *Bot. J. Linn. Soc.* 143: 201–205.  
 Aytaç, Z. 2000: *Astragalus* L. — In: Güner, A., Özhatay, N., Ekim, T. & Başer, K. H. C. (eds.), *Flora of Turkey and the East Aegean Islands* (suppl.) 11: 79–88. Edinburgh Univ. Press, Edinburgh.  
 Aytaç, Z. & Ekici, M. 2002: A new species of *Astragalus* L. (Sect. *Proselius*) (Leguminosae) from Central Anatolia Turkey. — *Nordic J. Bot.* 22: 59–63.  
 Aytaç, Z., Ekici, M. & Açıık, L. 2001: A new species of *Astragalus* L. (Leguminosae) from South Anatolia. — *Bot. J. Linn. Soc.* 136: 131–135.  
 Boissier, E. 1872: *Astragalus* L. — In: *Flora Orientalis* 2: 205–498. H. Georg, Geneva.  
 Chamberlain, D. F. & Matthews, V. A. 1970: *Astragalus* L. — In: Davis, P. H. (ed.), *Flora of Turkey and the East Aegean Islands* 3: 49–254. Edinburgh Univ. Press, Edinburgh.  
 Davis, P. H., Mill, R. R. & Tan, K. 1988: *Astragalus* L. — In: Davis, P. H., Mill, R. R. & Tan, K. (eds.), *Flora of Turkey and the East Aegean Islands* (suppl.) 10: 114–124. Edinburgh Univ. Press, Edinburgh.  
 Ekici, M. & Aytaç, Z. 2001: *Astragalus dumanii* (Fabaceae) a new species from Anatolia, Turkey. — *Ann. Bot. Fennici* 38: 171–174.  
 Göktürk, S. R., Düşen, O. D. & Stimbül, H. 2003: A new species of *Astragalus* L. (Fabaceae/Leguminosae) from Southwest Anatolia. — *Israel J. Plant Sci.* 51: 67–70.  
 Hamzaoglu, E. 2003: *Astragalus hamzae* (Fabaceae), a new species from Central Anatolia, Turkey. — *Ann. Bot. Fennici* 40: 291–294.  
 Hamzaoglu, E. & Kurt, L. 2002: *Astragalus duranii* (Fabaceae), a new species from Central Anatolia, Turkey. — *Ann. Bot. Fennici* 39: 89–91.  
 Ketenoglu, O. & Menemen, Y. 2003: *Astragalus hamzaoglu* (Fabaceae), a new species from the east Black Sea region, Turkey. — *Ann. Bot. Fennici* 40: 59–62.  
 Maassoumi, A. A. 1998: *Astragalus* L. in the Old World, check-list. — Islamic Rep. Iran Min. Jahas-e Sazandgi Res. Inst. Forest & Rangelands, Tehran.  
 Podlech, D. 1999: New *Astragali* and *Oxytropis* from North Africa and Asia, including some new combinations and

- remarks on some species. — *Sendtnera* 6: 135–171.
- Podlech, D. 2001: Contributions to the knowledge of the genus *Astragalus* L. (Leguminosae) VII–X. — *Sendtnera* 7: 163–201.
- Podlech, D. & Maassoumi, A. A. 2003: New species of *Astragalus* L. (Fabaceae) from Iran, mainly of sects. *Incani* and *Malacothrix*. — *Feddes Repertorium* 114: 320–349.
- Podlech, D. & Sytin, A. 2002: New species of *Astragalus* L. (Leguminosae) sect. *Hololeuce*, *Onobrychoidei*, *Ornithopodium* & *Synochreati* and a new section *Baldaccia*. — *Sendtnera* 8: 155–166.
- Post, G. E. 1932: *Astragalus* L. — In: Post, G. E. (ed.), *Flora of Syria*, vol. 2: 373–408. Am. Univ. Beirut.
- Shishkin, B. K. 1946: *Astragalus* L. — In: Komarov, V. L. (ed.), *Flora of the U.S.S.R.* 12: 1–681. — Israel P. Sci. Trans., Jerusalem. [Translated from Russian].
- Townsend, C.C. 1974: *Astragalus* L. — In: Townsend, C. C. & Guest, E. (eds.), *Flora of Iraq*, vol. 3: 231–442. Glasgow Univ. Press, Glasgow.