

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

Hasan Akan<sup>1</sup> & Şemsettin Civelek<sup>2</sup>

<sup>1)</sup> Harran University, Faculty of Science & Art, Department of Biology, Şanlıurfa, Turkey

<sup>2)</sup> Firat University, Faculty of Science & Art, Department of Biology, Elazığ, Turkey

Received 2 October 2000, accepted 31 May 2001

Akan, H. & Civelek, Ş. 2001: *Astragalus aytatchii* (Fabaceae), a new species from Anatolia, Turkey. — *Ann. Bot. Fennici* 38: 167–170.

*Astragalus aytatchii* Akan & Civelek *sp. nova* (Fabaceae) from middle Anatolia, Turkey, is described and illustrated in line drawings. It is compared with the closely related *A. elatus* Boiss & Bal. Both species belong to *Astragalus* sect. *Alopecuroidei* DC. (= *Alopecias* Bunge).

Key words: *Astragalus*, Fabaceae, taxonomy

## Introduction

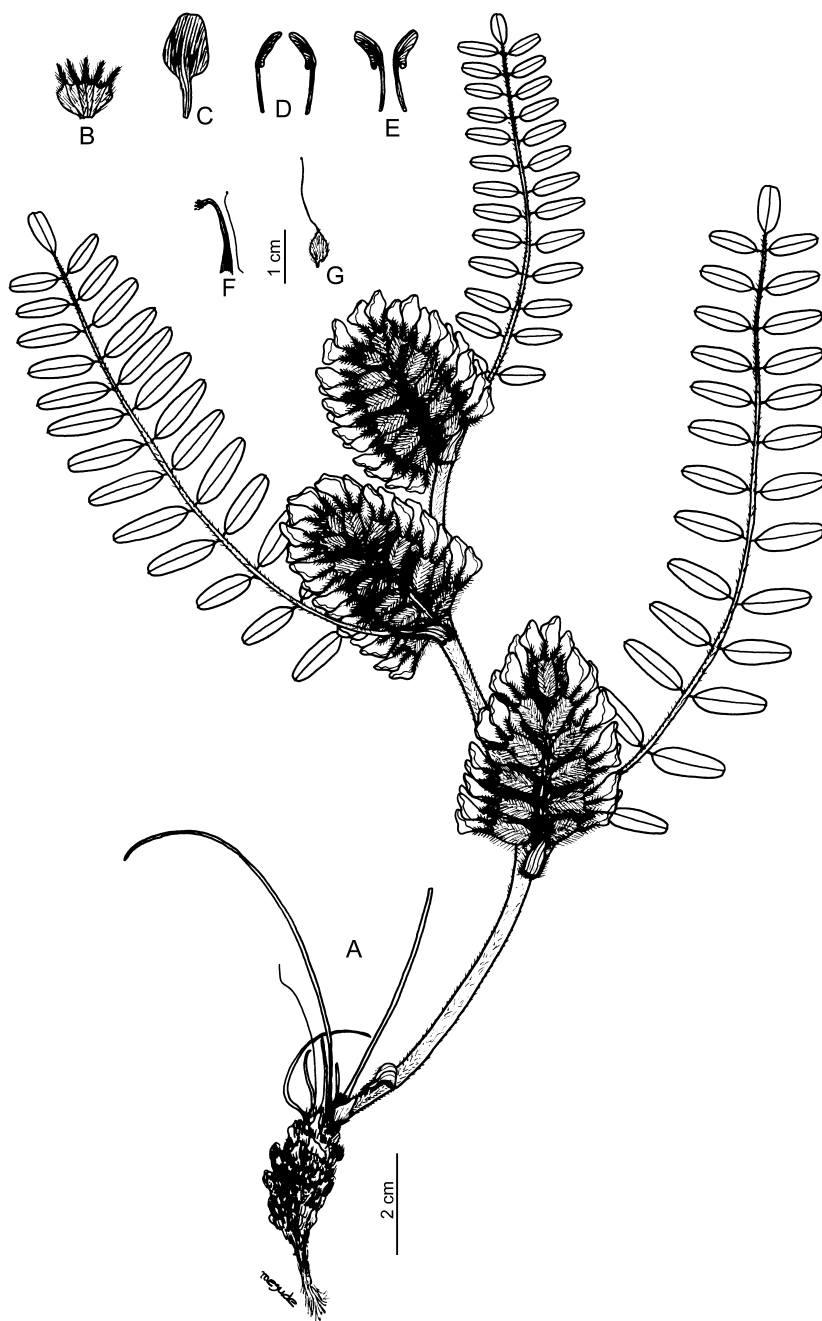
In terms of species number, *Astragalus* L. (Fabaceae) is the richest genus of vascular plants on Earth, represented by a total of ca. 2500 species (Maassoumi 1998). It is also the largest genus in Turkey, where ca. 439 species in 62 sections occur in the Irano-Turanian region (Chamberlain & Matthews 1970, Özhatay *et al.* 1994, 1999, Podlech 1999). In Turkey, the number of endemic taxa of *Astragalus* is 204 and the rate of endemism is 46.5%. Generally, *Astragalus* is represented by the highest number of species in the steppe regions of Turkey. The plants are adapted especially to steppe environments of high mountains.

The taxonomical problems in the section

*Alopecuroidei* DC. (= *Alopecias* Bunge) were mentioned by Chamberlain and Matthews (1970). They suggested that the section should be revised. The Turkish species of the section were revised as a doctoral thesis by the author (H. Akan unpubl.). Chamberlain and Matthews (1970) recognized 22 species in the section, whereas Akan recognized 21.

Dr. Civelek, a Turkish botanist, collected a specimen of *Astragalus* fifteen years ago during preparation of his masters' thesis. However, the specific identity of the specimen has remained unknown. A similar specimen was collected in 1998 by the present authors and it was examined again during the revision of section *Alopecuroidei* in Turkey.

The sections closest to *Alopecuroidei* are

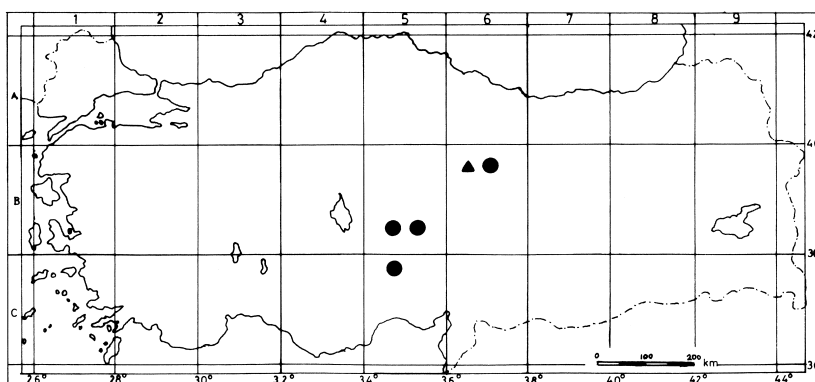


**Fig. 1.** *Astragalus aytatchii* (from the holotype). — **A:** Habit. — **B:** Calyx. — **C:** Standard. — **D:** Wings. — **E:** Keel. — **F:** Stamens. — **G:** Ovary.

*Argeus* Boiss. and *Grammocalyx* Bunge. The members of *Alopecuroidei* are caulescent, the stipules are free from one another and from the petioles, and the calyx is not inflated. In sect. *Grammocalyx* the stipules are joined at the base and the calyx becomes inflated. The present specimens are erect-caulescent and have completely free stipules, which features belie a

placement in sect. *Argeus*, which contains small scapose plants with stipules adnating to petiole. After comparisons with some fairly similar taxa, namely *Astragalus elatus* Boiss. & Bal., *A. dipsaceus* Bunge and *A. maximus* Willd. of sect. *Alopecuroidei*, it was concluded that the present specimens represent a hitherto undescribed species.

**Fig. 2.** Distribution of *Astragalus aytatchii* (▲) and *A. elatus* (●) in Turkey.



The specimens were collected in Taşlıdere, around the village of Hocaköy (Sivas, Turkey) in 1985 and 1998, and they are deposited at FUH and GAZI. They were compared with allied taxa deposited at ANK, BM (photo), BRNM (photo), G (photo), GAZI, HUB, OXF (photo) and W.

***Astragalus aytatchii* Akan & Civelek, sp. nova** (Figs. 1 and 2)

*Affinis A. elatus* Boiss. & Bal. *sed plantae* 10–35 cm (non 50–90 mm), *folia* 6–18 cm (non 19–36 mm), *foliola* 9–14-juga (non 20–24-juga) *et calyx* 8–10 mm (non 12–18 mm) *differt*.

**HOLOTYPE:** Turkey. [B6] Sivas: Taşlıdere, Domuzluk district, Hocabey Village, Al Hill, deep soil, gypsum fields and slopes, 39°37'N, 37°00'E, 1500–1600 m 14.VI.1998, *Akan 1428 & Civelek* (GAZI). **Paratype:** Same locality, 1550–1600 m, 18.VI.1985 *Civelek 1753* (FUH).

Plants 10–35 cm tall, caulescent perennial. Leaves 6–18 cm long, petioles 2–4 cm long, leaflets oblong, obtuse to acute at apex, 10–18 × 3–7 mm, glabrous above, adpressed-simple-pilose below, especially under midrib, 9–14 paired. Stipules linear to narrowly lanceolate, acuminate at apex, 8–15 mm long, ciliate. Pedicule 1–5 mm long. Inflorescence globose to oblong, with sessile flowers. Bracts linear, 9–10 mm long, ciliate. Bracteole absent. Calyx tubular to campanulate, densely long-villose, tube inflated in fruit, purple-striped, 8–10 mm long; teeth linear, 3–5 mm long, ciliate. Petals yellow. Standard stenonychioid, 18–19 × 6–7 mm, glabrous. Wing 18–19 × 2–3 mm. Keel 16–18 × 2–4 mm. Ovary ovoid, 8–9 × 3–4 mm, densely

white-villose, style 14–15 mm, hairy at the base, stigma globose. Legume included within the calyx, ovoid, compressed, 10–11 × 5–6 mm, with white hairs, bilocular, with a slightly curved beak, ca. 2–3 mm long. Seeds reniform, light brown and smooth. Fl. & Fr. VI–VII.

**ETYMOLOGY:** We dedicate this new species to the supervisor of the doctoral thesis of the first author, Dr. Zeki Aytac, of the Gazi University, Ankara, Turkey. He has made a revision of *Astragalus* sect. *Dasyphyllium* Bunge in Turkey (Aytac 1997) and also contributed so much to our knowledge of Turkish endemic plants.

**DISTRIBUTION AND SUGGESTED CONSERVATIONAL STATUS:** Endemic to Middle Anatolia, of Irano-Turanian element. The species is known only from the type locality and from an area of ca. 1–1.5 acres. The population is not in good condition and approximately 100–150 specimens grow in the small area. It is also threatened by grazing. Therefore, it should be regarded as belonging to *EN* category (IUCN 1994).

**ECOLOGY:** *Astragalus aytatchii* grows on deep soil, gypsum fields and slopes with some characteristic plants, such as *Aethionema spicatum*, *Matthiola anchoniifolia*, *Sterigmostemum incanum*, *Erysimum hamosum*, *Minuartia anatolica* var. *tetrasticha*, *Gypsophila festucifolia*, *G. heteropoda* subsp. *minutiflora*, *Genista albida*, *Astragalus aucheri*, *Sedum album*, *Asperula stricta* subsp. *latibracteata*, *Campanula fastigata*, *Onosma sintenisii*, *Thesium stellerioides*, *Scrophularia lepidota*, *Allium nevseherinse*, and *Hyacinthella acutiloba*. Other associated plants include *Ephedra major*, *Ranunculus argyreus*, *Leontice leontopetalum* subsp. *leontopetalum*, *Conringia perfoliata*, *Aethionema cordatum*, *Alyssum lepidostellatum*, *Erysimum thyrsoideum* subsp. *thyrsoideum*, *Beta lomatogona*, *Onobrychis argyrea* subsp. *argyrea*, *Helycrisum noeanum*, *Achillea spikorensis*, *Achillea lycaonica*, *Centaurea drabifolia* subsp. *detonsa*, *Chardinia orientalis* and *Phlomis tuberosa*.

**Table 1.** Differences between *Astragalus elatus* and *A. aytatchii*.

<i>A. elatus</i>	<i>A. aytatchii</i>
Plants 50–90 cm tall	Plants 10–35 cm tall
Leaves 19–36 cm long	Leaves 6–18 cm long
Leaflets 9–30 mm long	Leaflets 10–18 mm long
Leaflets narrowly elliptic	Leaflets oblong
Leaflets in 20–24 pairs	Leaflets in 9–14 pairs
Stipule 10–18 mm long	Stipule 8–15 mm long
Stipule lanceolate	Stipule linear to narrowly lanceolate
Stipule covered with white hairs	Stipule glabrose, ciliate but not hairy
Calyx 12–18 mm long	Calyx 8–10 mm long

## Discussion

*Astragalus aytatchii* resembles *A. elatus*, an endemic of Turkey. Both belong in sect. *Alopecuroidei*. After collecting *A. elatus* from the type locality (B5, Kayseri) and examining its type specimen (W), the species were compared with each other. After thoroughly studying pertinent specimens and literature (Becht 1978, Maassoumi 1998), we realised that *A. elatus* differs from the present specimens. The differences between *A. aytatchii* and *A. elatus* are given in Table 1.

Other species to be considered in connection with *Astragalus aytatchii* are *A. dipsaceus* and *A. maximus*. The three species can be distinguished by the following key.

1. Leaflets in 8–20 pairs ..... 2
1. Leaflets in 21–26 pairs ..... *A. dipsaceus*
2. Calyx 8–10 mm long, peduncles 1–5 mm long .....  
..... *A. aytatchii*
2. Calyx 12–18 mm long, peduncles absent .....  
..... *A. maximus*

## Acknowledgements

We thank Dr. Zeki Aytaç for help with identification and description, Prof. Dr. Tuna Ekim, Prof. Dr. Mecit Vural and Dr. Hayri Duman for useful discussions, Dr. Murat

Ekici for providing important publications, Dr. Ernst Vitek (W) for sending some type specimens on loan, the herbaria of E, OXF, BM and G for sending photographs of type specimens, Mesude Ceylan for the illustrations, and TUBITAK for financial support.

## References

- Aytaç, Z. 1997: The Revision of the section *Dasyphyllum* Bunge of the genus *Astragalus* L. of Turkey. — *Turkish J. Bot.* 21: 31–57.
- Becht, R. 1978: Revision der Sektion *Alopecuroidei* DC. der Gattung *Astragalus* L. — *Phanerogamarum Monogr.* 10: 1–227.
- Chamberlain, D. F. & Matthews V.V. 1970: *Astragalus* L. — In: Davis, P. H. (ed.), *Flora of Turkey and The East Aegean Islands* 3: 49–254. Univ. Press, Edinburgh.
- IUCN Species Survival Commission 1994: *IUCN Red List Categories*. — Gland, Switzerland, pp. 9–18.
- Maassoumi, A. A. 1998: *Astragalus* L. in the world, check-list. — Islamic Rep. Iran Ministry Jihad-e Sazandgi Res. Inst. Forest & Rangelands, pp. 1–617.
- Özhatay, N., Kültür, Ş. & Aksoy, N. 1994: Check list of additional taxa to the supplement Flora of Turkey. — *Turkish J. Bot.* 18: 502.
- Özhatay, N., Kültür, Ş. & Aksoy, N. 1999: Check list of additional taxa to the supplement Flora of Turkey. — *Turkish J. Bot.* 23: 155–156.
- 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.