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## ***Astragalus gigantirostratus* (Fabaceae), a remarkable new species from N Iran and supplementary notes on *A. sect. Cytisodes* Bunge**

### **Abstract**

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*Astragalus gigantirostratus*, endemic to the E Elburs Mts, is described as a species new to science and illustrated. It is characterized by long fruits (7.5-11 cm), connate stipules, bifurcate hairs and a retuse wing petal. The new species belongs to *A. sect. Cytisodes* and is related to *A. dolichocarpus*, *A. stenocarpus* and *A. pseudocytisoides*. The hitherto known species of this section are all confined to the Turkestanian floristic province of the Irano-Turanian region. *A. gigantirostratus* thus constitutes an interesting range extension of this section into the Hyrcanian province.

The investigation of an unknown species of *Astragalus* from the eastern part of the Elburs Mts in N Iran revealed to our surprise that the species is undoubtedly a member of *A. sect. Cytisodes* Bunge and, moreover, new to science. This section, originally established by Alexander Bunge (1868: 127) to accommodate a single species, *A. cytisoides* Bunge, comprises 13 species after Gončarov (in Gončarov & al. 1946) but only nine species after recent investigations by Jakovlev & al. (1996). All its species are distributed exclusively in Middle Asia (Kazakhstan, Kirgizistan, Tadžikistan, Turkmenistan and Uzbekistan). The new species now found in N Iran thus constitutes a remarkable range extension of *A. sect. Cytisodes*.

### ***Astragalus* sect. *Cytisodes* Bunge**

The section belongs to *A. subg. Cercidothrix* Bunge, which is characterized by a perennial growth and the presence of bifurcate hairs (Bunge 1868). A concise description of *A. sect. Cytisodes* Bunge follows.

Dwarf subshrubs (5-23 cm) with an indumentum of bifurcate white and black hairs; stemless, or with stems 1-9 cm long; stipules adnate to the petiole at the base, connate, very rarely free; leaves imparipinnate; inflorescence pedunculate, peduncles short to long; bracts usually oblong

and usually black-hairy; bracteoles absent; calyx cylindrical; corolla glabrous; pods bilocular, coriaceous, squarrosely villous, the beak mostly long (1-11 cm), often as long as the fruit body.

*Astragalus gigantirostratus* Maassoumi, Ghahr., Ghahremani & Matin, **sp. nova** – Fig. 1

Holotypus: Iran, Golestan province, Golestan National Park, Almeh, 1550-1650 m, [fl.], 16.5.1992, *Matin & Termeh* (TARI; isotypi: B, IRAN, LE, TARI).

Species *Astragalo pseudocytisoidi* Bunge et *A. stenocarpus* Gontsch. affinis, sed differt plantis longioribus (14-23 nec 5-15 cm), caulibus usque 8(9) cm nec usque 3 cm longis, foliolis 4-6-jugis (nec 1-3-jugis), leguminibus 7.5-11 (nec 2-6) cm longis; ab affini *A. dolichocarpus* Popov inflorescentiis 5-8-floris (nec 10-12-floris) et leguminibus 7.5-11 (nec 2-3) cm longis differt.

*Dwarf subshrub* c. 14-23 cm tall including inflorescence, loosely caespitose from the long divisions of the woody caudex. *Caudex* 10-17 cm, covered with brown bark of 2-2.5 mm diam. Stems very short or up to 8(9) cm, internodes obsolete or up to 2(2.5) cm, white-grey of a dense indumentum of appressed white hairs. *Stipules* 5-10 mm long, acuminate, covered with appressed white hairs, adnate to the petiole up to the middle, connate, yellow and membranous in the lower 1/3-1/4, the free portion lanceolate, green, 1-2.5 mm broad, nerves ± yellow. *Leaves* imparipinnate with 4-6 pairs of leaflets, 2.5-4 cm long, both petiole and rachis densely covered with spreading white hairs; the petiole 1/4 to about as long as the rachis, leaflets sessile to shortly (0.4-0.6(1) mm) petiolulate, oblanceolate to obovate, rarely oblong-elliptical, acute to obtuse, 5-12(15) mm long, 1.5-3(4.5) mm wide, the lower face densely, the upper face somewhat less densely covered with subappressed white hairs; the uppermost 3 leaflets situated at the end of the rachis. *Peduncle* 3-4.5 cm long, somewhat shorter than or up to 1.5 times the length of the leaves, villous of white and black hairs (in lower part pure white). *Inflorescence* spherical to short-ovoid, 5-8(9)-flowered, 2.5-3 cm long, 1.5-2 cm in diameter. *Bract* oblong to oblong-ovate, 4-5 mm long, 1.5-2 mm wide, adaxially greenish, abaxially villous of black hairs. *Bracteoles* wanting. *Pedicel* 1.5-2 mm long, villous of black and white hairs. *Calyx* cylindrical, 11.5-15.5 mm long, not inflated in fruit, finally ruptured or not ruptured by the fruit, villous of white and black hairs; calyx teeth subulate, 2.5-3.5 mm long, 1/5 as long as the tube. *Corolla* drying brown or yellow, glabrous; *standard* 23-25 mm long, the limb obovate-elliptical, 10 mm wide, retuse, non-ligulate; *wing* 20-22 mm long, the limb oblong, asymmetrically retuse, 3/4 as long as the claw, 2.5 mm wide, the ligule 0.6-1 mm long; *keel* 18-19 mm, the limb 6-6.5 mm long, 3 mm wide, the ligule 0.6 mm long, the claw 12-13 mm long. *Stamens* 19-20 mm long, the free portion 4-4.5 mm long, anther 0.8 mm long. *Ovary* 7-9 mm long, 0.6-0.7 mm wide, sessile, glabrous, 30-ovulate; ovules reniform, 0.25 × 0.2 mm; style 8-11 mm long, glabrous. *Pod* sessile, 7.5-11 cm long, 2-3 mm broad in the lower part, bilocular, terminating in a long beak c. 2/3 as long as the fruit body or more, sparsely villous of white hairs.

Additional specimens seen

IRAN: GOLESTAN PROVINCE: Golestan National Park, Dasht-e Calpush, 920-1000 m, [fr.], 21.5.1976, *Matin & Termeh 34860-E* (IRAN, LE, TARI); Golestan National Park, Sulgerd, Eslamabad toward Maraveh-Tappeh, 800-1500 m, [fr.], 25.5.1994, *Maassoumi, Pakravan, & Nasseh 72339* (TARI).

Distribution and ecology

*Astragalus gigantirostratus* is endemic to Iran and known only from the three collections quoted, which are all from the Golestan National Park, situated in the eastern part of the Elburs Mts, at 37°25'N, 56°00'E (Fig. 2). The species was found in an *Artemisia* steppe within the Hyrcanian forest, at an altitude between 800 and 1650 m.

The flowering and fruiting material was all collected in May.

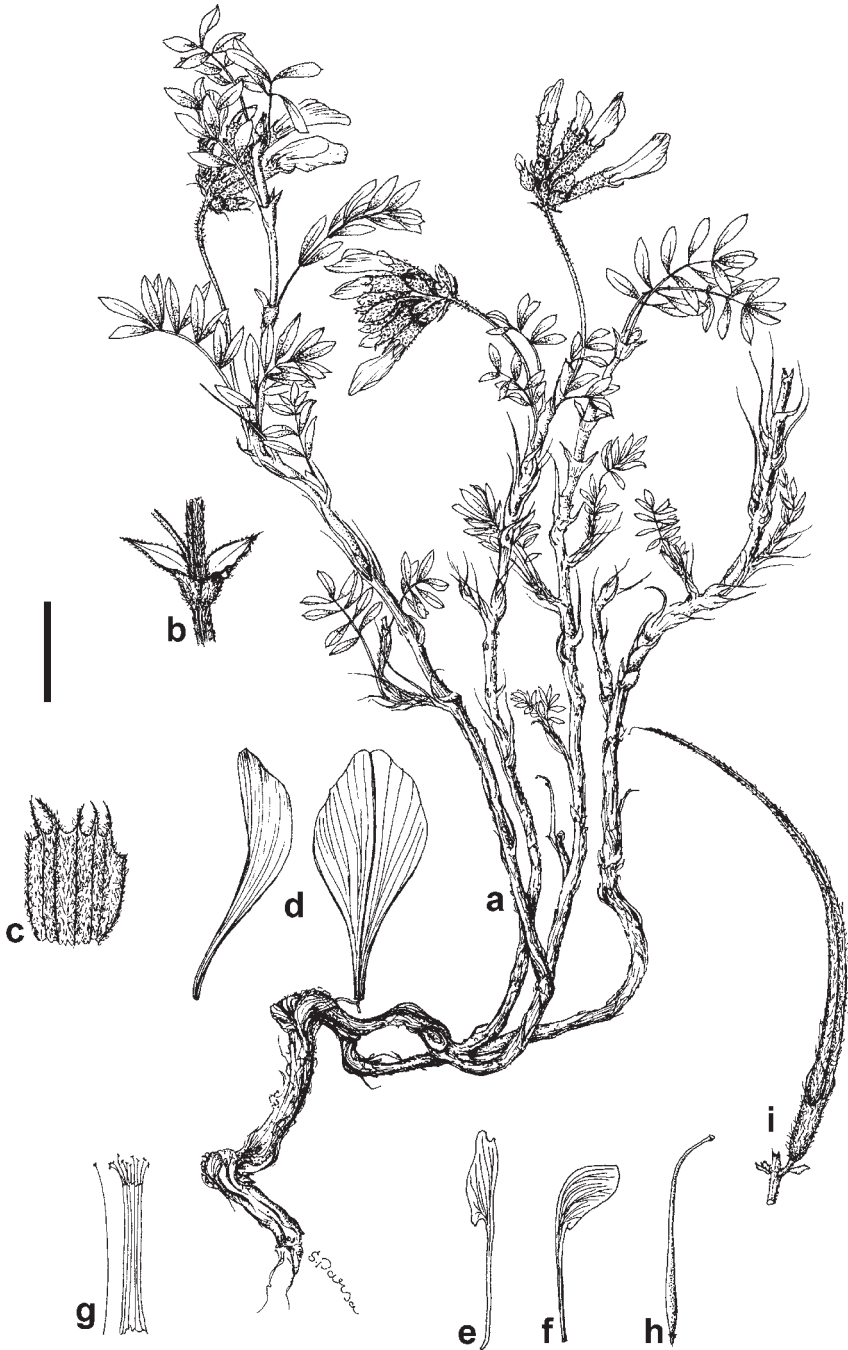


Fig. 1. *Astragalus gigantirostratus* – a: habit; b: stem segment with stipules and petiole; c: calyx; d: standard; e: wing; f: keel; g: stamens; h: pistil; i: fruit. – Scale: a+i = 2 cm, b = 8 mm, c-h = 1 cm; a-h after *Matin & Termeh*, TARI; i after *Matin & Termeh 34860-E*, TARI.

### Relationships

*Astragalus gigantirostratus* is well distinguished from all other species of *A. sect. Cytisodes* by the combination of longer stems and fruits, retuse standard and wing petals, and leaves with 4-6 pairs of leaflets. From *A. pseudocytisoides* Popov (*V. Titov*, type, LE!), distributed in Kazakhstan and Kirgizistan, and *A. stenocarpus* Gontsch. (*Lipsky*, type, LE!), distributed in Tadžikistan, Turkmenistan and Uzbekistan, it differs especially in having longer stems, 4-6 pairs of leaflets (not 1-3) and longer fruits (7.5-10 not 2-6 cm), from *A. dolichocarpus* Popov (*M. Popov*, type, LE!), occurring in all Middle Asian countries except Turkmenistan (Jakovlev & al. 1996), in 5-8-flowered (not 10-12-flowered) inflorescences and longer pods (7.5-11 not 2-3 cm), from *A. cytisoides* Bunge (*Sewerzow*, type, LE!), endemic to Kazakhstan, in a taller growth (14-23 not 7-10 cm) and leaves with 4-6 (not 1-2) pairs of leaflets, and from *A. xipholobus* Popov (*Granitov*, type, LE!) in the lower number of leaflet pairs (not 10-20) and the shorter calyx (11.5-15.5 not 21-25 mm).

The closest relatives of the new species are *A. pseudocytisoides*, *A. stenocarpus* and *A. dolichocarpus*.

### Phytogeography

*Astragalus sect. Cytisodes* has its centre of diversity in the Turkestanian floristic province (Taktadžjan 1986) of the Irano-Turanian region. The species of this section, which are now 10, are distributed in Kazakhstan (eight species, of which four are endemic), Kirgizistan (three species), Uzbekistan (three species), Tadžikistan (two species), Turkmenistan and Iran (one species each). Hitherto thought to be confined to the Turkestanian floristic province, the distributional range of *A. sect. Cytisodes* is shown, with the discovery of *A. gigantirostratus* in the E Elburs Mts in N Iran, also to reach the Hyrcanian province (Fig. 2).

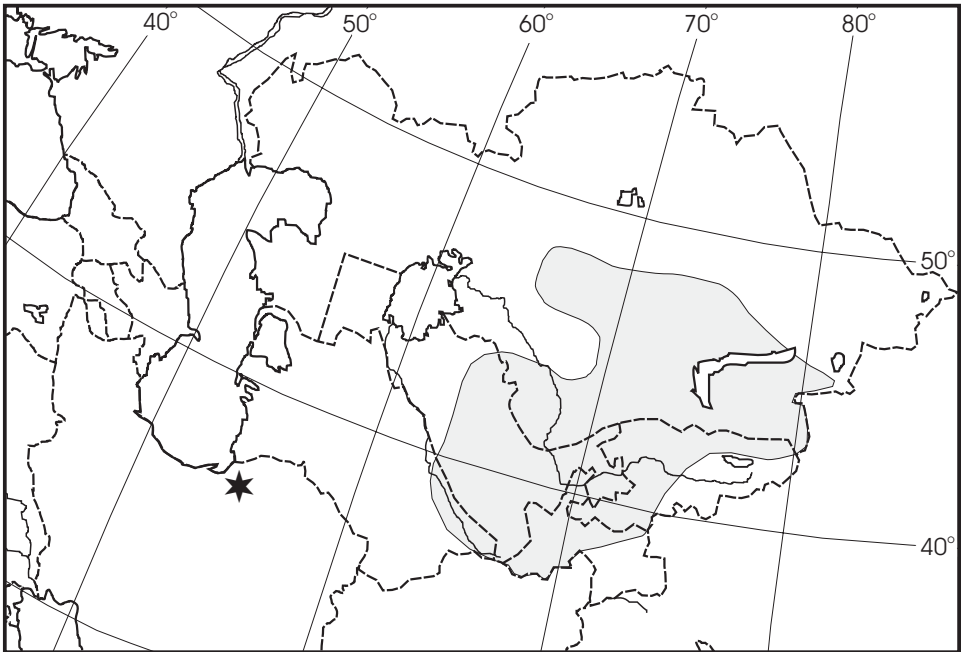


Fig. 2. Distribution of *Astragalus gigantirostratus* (★) and of the other species of *A. sect. Cytisodes* (grey area, based on the distribution data given by Jakovlev & al. 1996).

The presence of a first species of *A. sect. Cytisodes* in Iran is a further example for the close relationships between *Astragalus* in Iran and Middle Asia. Another example is the Middle Asian *A. sect. Macrocystodes* Popov, of which *A. pseudorhacodes* Gontsch. has been recorded recently from Khorassan, Iran, by Maassoumi (1998: 223).

In the case of *A. sect. Cytisodes* further investigations will have to answer the question, whether *A. gigantirostratus* testifies a southwestern migration of *A. sect. Cytisodes* into the Hyrcanian floristic province, or whether, in contrast, the Hyrcanian province is perhaps the ancestral region of this section.

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