

# ***Astragalus orientopersicus*, sp. nov. (Fabaceae), a new taxon from the Khorassan province (Iran)**

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## **ABSTRACT**

*Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov. (family Fabaceae, tribe Galegeae), with 14 to 16 leaflets, dense and many-flowered inflorescence, long peduncle, and tubular-inflated calyx with purplish parallel nerves, is described. It is endemic to Tandureh National Park, Khorassan province, NE Iran. Morphological evidence (spiny habit, basifixed trichome, spiny rachis, paripinnate leaves, pedunculate racemes, cylindrical calyx, inflated calyx in fruit, etc.) supports taxonomic placement in *Astragalus* section *Hymenostegis* Bunge. The species appears to be most closely related to *A. austrokhorasanicus* Podlech.

## **KEY WORDS**

Papilionaceae,  
Leguminosae,  
*Astragalus* sect.  
*Hymenostegis*,  
East Iran,  
new species.

## **RÉSUMÉ**

*Astragalus orientopersicus*, sp. nov. (Fabaceae), taxon nouveau de Fabaceae pour la province du Khorassan (Iran). *Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov. (Fabaceae, tribu des Galegeae) est décrit. Il présente 14 à 16 folioles, une inflorescence compacte à nombreuses fleurs et long pédoncule, ainsi qu'un calice tubulaire-dilaté à nervures pourpres parallèles. Cette espèce est endémique du Parc national de Tandureh, dans la province du Khorassan (NE de l'Iran). L'ensemble de la morphologie (spinescence, trichome basifixe, rachis épineux, feuilles paripennées, grappes pédonculées, calice cylindrique élargi dans le fruit, etc.) appuie son positionnement taxonomique dans *Astragalus* sect. *Hymenostegis* Bunge. L'espèce semble particulièrement affine de *A. austrokhorasanicus* Podlech.

## **MOTS CLÉS**

Papilionaceae,  
Leguminosae,  
*Astragalus* sect.  
*Hymenostegis*,  
Est de l'Iran,  
espèce nouvelle.



FIG. 1. — *Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov. from type specimen.



FIG. 2. — *Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov. in the field. Photo by Dr Farshid Memariani.

## INTRODUCTION

With about 2350 species in the Old World and near 500 species in the Americas *Astragalus* (family Fabaceae, tribe Galegeae) is the largest genus of flowering plants (Podlech & Zarre 2013). It is the biggest genus in the flora of Iran; due to including this genus in family Fabaceae, this family in Iran has attained the first place in terms of species number. *Astragalus* is quite variable in habit and habitats, size of the plants, pattern of indumentum, stipules, leaf rachis, types of inflorescence, relative length of petals, pods etc., thus usually the genus is divided in many sections (Chaudhary *et al.* 2008).

Iran, with probably around 850 species (Ghahremaninejad *et al.* 2012) for the genus *Astragalus* (“*Gevan*” in Persian) has been a vast and suitable area for the *Astragalus* speciation. This country is one of the largest centers of genetic diversity for the genus (Ghahremaninejad 2004), with a concentration in western regions.

In this paper, a new basifixed hair species of the genus *Astragalus* sect. *Hymenostegis* Bunge is newly described from

Khorassan province, East Iran. It is the second species of this section for the province and east Iran. *Astragalus* sect. *Hymenostegis*, one of the sections with basifixed hairs, was originally established by Alexander Bunge (1868). This section belongs to the subgenus *Astragalus*, which is characterized by basifixed or simple trichomes (Podlech 1982).

Since 1992 (Ghahremaninejad 1992a) this section, with 27 species, has been the main object of several taxonomists. Ghahremaninejad (1992b) introduced the first new species of this section after more than 40 years: *A. dianat-nejadii* F.Ghahrem.; the last species was introduced in 1951: *A. naftabensis* Širj. & Rech.f. Then gradually several species are introduced from this section, mostly from Iran (e.g., Zarre & Podlech 1996; Maassoumi & Ghahremaninejad 1999; Ghahremaninejad & Podlech 2005; Bagheri *et al.* 2011, 2013, 2014). The last new introduced species of this section is *Astragalus makuensis* Maassoumi, Bagheri & Rahimin. in Bagheri *et al.* (2014), an endemic species from Iran.

The concise description of the section follows.



FIG. 3. — Distribution of *Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov.

## SYSTEMATIC

### Genus *Astragalus* L. sect. *Hymenostegis* Bunge

*Mémoires de l'Académie impériale des Sciences de Saint Petersburg* 11 (16): 66 (1868). — Type species: *A. hymenostegis* Fisch.

#### DESCRIPTION

Subshrubby, spiny, only covered with white and basifixed hairs. Stems branched, the old parts woody and covered with remains of old leaves. Stipules adnate to the petiole and somewhat connate behind the stem. Leaves paripinnate with spiny rachis. Usually without bracteoles. Racemes pedunculate, many-flowered. Calyx tubular, usually quickly inflated, with constricted mouth. Petals persistent in fruit time. Standard usually with panduriform blade. Wings almost as long as the standard. Keel clearly shorter than the wings. Legumes included in the calyx, typically unilocular with one seed.

#### REMARKS

The main center of genetic diversity of the section is Iran (including our new species: 60 species, of which 46 are endemics) with weakly entrance into Turkey (12 species of which two are endemics), Azerbaijan (three species), Armenia (two species), Iraq (five species) and Turkmenistan (one species).

### *Astragalus orientopersicus*

F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov.  
(Figs 1, 2)

*Similis* *A. austrokhorasanico* Podlech sed differt stipulis 16-23 mm longis (nec 10-12 mm), foliolis 7-8 (nec 5-7)-jugis, pedunculo 12-18 (nec 6-11) cm longo, inflorescentiis 3.5-5 (7) cm longis, atque ovario breve stipitato, nullo modo sessili.

**TYPUS.** — Iran. Khorassan province, NW Darrehgaz, Tandureh National Park, Shekarab, western altitudes of Shekarab station, 2200 m, 37°22'45.8"N & 58°42'07.7"E, 27.VI.2004, *Memariani & Zangooei* 44249 (holo-, FUMH!; iso- FAR!, T!).

**DISTRIBUTION.** — *Astragalus orientopersicus* F.Ghahrem., Joharchi, Fereid. & Hoseini, sp. nov. is endemic to Iran and known only from the type locality, in the Khorassan province, E. Iran (Fig. 3). The species is thriving in mountains of Shekarab, Tandureh National Park, at an altitude *c.* 2200 m, a mountainous area covered with a mixture of gravel and clay, in the Irano-Turanian floristic region (Takhtajan 1986).

The flowering and fruiting material was collected in June.

**ETYMOLOGY.** — The specific epithet is derived from the type locality, East Iran.

#### DESCRIPTION

Plant caespitose, spiny, *c.* 18-32 cm tall, covered with solely white, basifixed hairs. Caudex *c.* 5-8 mm in diameter. Stems 7-15 cm long, the lower parts ligneous, branched, densely covered with blackish remnants of old leaves. Stipules membranaceous, yellowish, ± hyaline towards the tips, 16-23 mm, adnate to the petiole for 11-18 mm, connate behind the stem for 4-6 mm, the free tips acuminate, many-nerved, glabrous or ciliate at the margins with ascending hairs up to 1mm. Leaves 4.5-7.5 cm; petiole 1-2 cm, like the rachis densely covered with appressed to subappressed-ascending hairs *ca.* 0.5 mm, spiny. Leaflets in 7-8 pairs, narrowly elliptic, 10-16 × 1.5-3 mm, acuminate, pungent, with a cusp *c.* 1.5-2 mm, on the both sides densely covered with appressed to subappressed-ascending hairs. Peduncles 12-18 cm, longer than the leaves, recurved, densely covered with ascending to nearly spreading hairs 0.5-0.6 mm and with much fewer hairs 1 mm. Racemes ovoid to shortly cylindrical, 3.5-5 cm long and 2.5-3 cm in diameter, densely many-flowered. Bracts membranaceous, mostly narrowly hyaline at the margins and tip, pale yellowish, 7-10 × 2-3 mm, lanceolate-ovate, aristate, hairy, especially at the middle line, ciliate at the margins. Calyx tubular-inflated, 16-20 mm long, 4-5(7) mm wide, mostly purplish especially in upper part, with purplish parallel nerves, densely covered with ascending-spreading hairs, short hairs 0.2-0.4 mm and rather densely with subappressed to ascending hairs 1-2.5 (3) mm; teeth subulate, 5-6 mm. Petals purplish, fading to yellow-pale orange. Standard 20-24 mm; blade 7-8 mm wide, elliptic, rounded, distinctly constricted in lower part. Wings 20-21 mm; blades elliptic-ovate, obtuse, 6-7 × 2.5-3 mm; auricle *c.* 0.5 mm, claw 12.5-13 mm. Keel 19-20 mm; blades obliquely obovate, obtuse, 5-6 × 2.5-3 mm; auricle short, claw 12-14 mm. Ovary shortly stipitate, *c.* 5 × 0.9 mm, ellipsoid, densely subappressed hairy; style hairy in lower quarter. Legumes immature, 6.5 × 1.5 mm.

#### REMARKS

The new species is close to *A. austrokhorasanico* Podlech. But the new species differs from it in having longer stipules (16-23 not 10-12 mm), more leaflets (7-8 not 5-7 pairs), different peduncles (12-18 not 6-11 cm long; longer than

the leaves not ± as long as leaves), smaller racemes (3.5-5 × 2.5-3 not 7 × 4 cm), narrower bracts (2-3 not 4-8 mm wide), longer standard (20-24 not 20 mm long) and different ovary (shortly stipitate not sessile).

#### DISTRIBUTION

Section *Hymenostegis* species are concentrated in the west of the country. From west to the east the richness of the section strongly decreases and this never spreads beyond Iran towards the eastern areas like Afghanistan and Pakistan countries. It enters to Turkmenistan with *A. chrysostachys*. The most eastern province of Iran, province Khorassan, neighbor of Afghanistan, includes two species based on Podlech & Zarre (2013) for this section: *A. chrysostachys* Boiss. and *A. austrokhorasanicus* Podlech. *A. austrokhorasanicus* is a narrow rare endemic species for the province and is known only from the type specimen from steppic area of a protected region (Dashtabeh). But this locality is out of Khorassan and belongs to the western neighbor province of Khorassan: Semnan province. Thus of this section in Khorassan province only *A. chrysostachys* can be mentioned. It is a widespread species with a distribution area from Turkey, Azerbaijan, Armenia and Turkmenistan. Existence of this species is possible in western part of Afghanistan too, but it will need more field trips.

*Astragalus* sect. *Hymenostegis* includes 62 (based on Podlech & Zarre 2013; Bagheri *et al.* 2013, 2014; Nikitin & Geldikhanov 1988) species. Iran is the center of genetic diversity of this section with 60 species, with a concentration in NW Iran (with 42 species). Gradually towards the east the richness of this section is decreased whereas in E Iran for this section there are just two representatives (including our new species) and this is indeed the ultimate penetration to the east with no entrance to Afghanistan (eastern neighboring of Iran).

#### CONCLUSION

Our new species is the most eastern known for the section. It thrives there with *Astragalus chrysostachys*, whose the distribution area is the biggest for the section *Hymenostegis* from E Turkey to E Iran. But our new species, like the most of the section species is a narrow endemics and so rare.

#### REFERENCES

- BAGHERI A., MAASSOUMI A. A. & GHAHREMANINEJAD F. 2011. — Additions to genus *Astragalus* L. sect. *Hymenostegis* (Fabaceae). *Iranian Journal of Botany* 17 (1): 15-19.
- BAGHERI A., RAHIMINEJAD M. R. & MAASSOUMI A. A. 2013. — *Astragalus hakkianus* a new species of *Astragalus* (Fabaceae) from N.W. Iran. *Feddes Repertorium* 124: 46-49. <http://dx.doi.org/10.1002/fedr.201400003>
- BAGHERI A., RAHIMINEJAD M. R. & MAASSOUMI A. A. 2014. — A new species of the genus *Astragalus* (Leguminosae-Papilionoideae) from Iran. *Phytotaxa* 178 (1): 38-42. <http://dx.doi.org/10.11646/phytotaxa.178.1.4>
- BUNGE A. 1868. — Generis *Astragali* species Gerontogae 1, claves Diagnosticae. *Mémoires de l'Académie impériale des Sciences de Saint Petersburg*, ser. 7, 11 (16): 94.
- CHAUDHARY L. B., RANA T. S. & ANAND K. K. 2008. — Current status of the systematics of *Astragalus* L. (Fabaceae) with special reference to the Himalayan species in India. *Taiwania* 53 (4): 338-355. [http://dx.doi.org/10.6165/tai.2008.53\(4\).338](http://dx.doi.org/10.6165/tai.2008.53(4).338)
- GHAHREMANINEJAD F. 1992a. — A revision on the sect. *Hymenostegis* Bunge of the genus *Astragalus* (Fabaceae) in Iran. MSc Thesis, Tarbiat Moallem University, Tehran, 231 p. (in Persian).
- GHAHREMANINEJAD F. 1992b. — A new species of the genus *Astragalus* L. sect. *Hymenostegis* from NW Iran. *Iranian Journal of Botany* 5 (2): 105-109.
- GHAHREMANINEJAD F. 2004. — The sections of *Astragalus* L. with bifurcating hairs in Iran. *Turkish Journal of Botany* 28: 101-117
- GHAHREMANINEJAD F. & PODLECH D. 2005. — *Astragalus asadabadensis* (Fabaceae), a new species from Iran. *Annales Botanici Fennici* 42 (3): 207-209.
- GHAHREMANINEJAD F., BAGHERI A. & MAASSOUMI A. A. 2012. — Two new species of *Astragalus* L. sect. *Incani* DC. (Fabaceae) from the Zanjan province (Iran). *Adansonia*, sér. 3, 34 (1): 59-65. <http://dx.doi.org/10.5252/a2012n1a6>
- MAASSOUMI A. A. & GHAHREMANINEJAD F. 1999. — Interesting new species of *Astragalus* sect. *Hymenostegis* in Iran. *Iranian Journal of Botany* 8 (1): 35-41.
- NIKITIN V. V. & GELDIKHANOV A. M. 1988. — *Opredelitel rastenii Turkministana [Manual of the Turkmenian Plants]*. Nauk, Leningrad, 680 p. (in Russian & Sirlic).
- PODLECH D. 1982. — Neue aspekte zur evolution und gliederung der gattung *Astragalus* L. *Mitteilungen der Botanischen Staatssammlung München* 18: 359-378.
- PODLECH D. & ZARRE SH. 2013. — *A Taxonomic Revision of the Genus Astragalus L. (Leguminosae) in the Old World*. Naturhistorisches Museum, Wien, 2439 p.
- TAKHTAJAN A. L. 1986. — *Floristic Regions of the World*. University of California Press, Berkeley, Los Angeles, London, 522 p.
- ZARRE S. & PODLECH D. 1996. — Taxonomic Revision of *Astragalus* L. sect. *Hymenostegis* Bunge (Leguminosae). *Sedntnera* 3: 255-312.

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