

## NEW RECORDS AND NEW SYNONYM OF ASTRAGALUS SECTIONS AMMODENDRON AND CAPRINI (FABACEAE) FROM IRAN

Y. Nasseh & M. R. Joharchi

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Three species, i.e. *Astragalus zurmatensis* Podlech & Zarre, *A. similissimus* Podlech & Zarre and *A. urgunensis* Podlech (sect. *Ammodendron*) and also *A. kopetdaghi* Boriss. var. *kopetdaghi* (sect. *Caprini*) are reported for the first time for the flora of Iran and compared with their closest relatives. The later variety is characterized by lacking of hairs on the vegetative organs. Moreover, type specimens of *A. semiglabricarpus* Maassoumi and *A. hekmat-safaviae* F. Ghahremani. were revised and compared. Since there are no differences between them, *A. semiglabricarpus* is considered as a synonym of the latter. A new locality for the rare species *A. ahmed-adlii* Bornm. & Gauba is also reported from Yazd province. Illustrations and distribution map for the taxa are presented.

Yasamin Nasseh (correspondence, <[y\\_nasseh@yahoo.com](mailto:y_nasseh@yahoo.com)> & Mohammad Reza Joharchi, Ferdowsi University of Mashhad, Herbarium (FUMH), Mashhad, Iran.

**Key words.** *Astragalus*, sect. *Ammodendron*, sect. *Caprini*, Fabaceae, new records, Khorassan.

### گزارش‌ها و مترادف جدید از جنس گون، بخش‌های *Ammodendron* و *Caprini* از ایران

یاسمین ناصح و محمدرضا جوهرچی، پژوهشگران پژوهشکده علوم گیاهی، دانشگاه فردوسی مشهد.

سه گونه *Astragalus zurmatensis* Podlech & Zarre، *A. similissimus* Podlech & Zarre و *A. urgunensis* Podlech از بخش *Ammodendron* و *A. kopetdaghi* Boriss. var. *kopetdaghi* از بخش *Caprini* برای نخستین بار برای فلور ایران گزارش و با نزدیکترین خویشاوندان خود مقایسه می‌شوند. اندام‌های رویشی وارسته اخیر بدون کرک است. همچنین نمونه تپ دو گونه *A. semiglabricarpus* و *A. hekmat-safaviae* بررسی و با یکدیگر مقایسه شدند و به دلیل عدم تفاوت بین آنها، *A. semiglabricarpus* به عنوان مترادف منظور شد. رویشگاه جدیدی نیز از شهرستان طبس در استان یزد برای گونه *A. ahmed-adlii* گزارش می‌شود. نقشه پراکنندگی جغرافیایی آنها به همراه تصاویر مربوطه ارائه شده است.

## INTRODUCTION

The Middle Asia in Irano-Turanian region is the main center of diversity of *Astragalus* sect. *Ammodendron* and the species of this section are mainly distributed in Asia, Caucasus and North Africa (Komarov 1965, Maassoumi 1998). This section comprises 37 species in Flora Iranica area and 22 species in Iran, 14 of which are Iranian endemics (Podlech et al. 2010). Sect. *Caprini* is one of the largest sections of *Astragalus* with 280 species. This section has 171 and 115 species in Flora Iranica area and in Iran, respectively (Podlech 1999). 37 species of this section are known from Khorassan provinces (Nasseh & Joharchi 2009). In the framework of preparing a taxonomic revision on *Astragalus* sect. *Ammodendron* in Khorassan provinces, specimens in Herbarium of Ferdowsi University of Mashhad (FUMH) were revised and three species including *Astragalus zurmatensis* Podlech &

Zarre, *A. similissimus* Podlech & Zarre and *A. urgunensis* Podlech were identified as new records for the flora of Iran from Razavi-Khorassan province. A specimen of *A. kopetdaghi* var. *kopetdaghi* was found among the herbarium material under sect. *Caprini* in FUMH. The aim of this paper is to report new records to Iran and to introduce a new synonym.

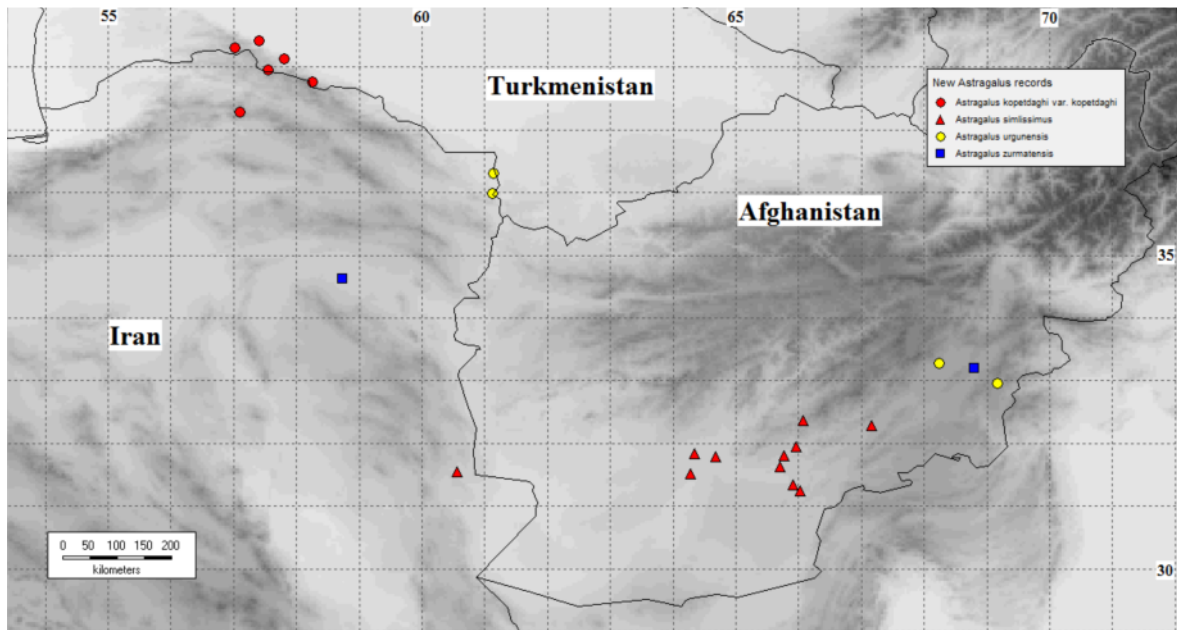
## RESULTS

### 1. Sect. *Ammodendron*

#### New records to Iran

*Astragalus urgunensis* Podlech, Mitt Bot. Staatssaml. München, 11: 263 (1973). - Figs. 1 & 2.

Razavi Khorassan: Sarakhs, Pole Khatoon, 406 m, Joharchi 43021 (FUMH); Sarakhs, between Dowlatabad and Nowroozabad, 300 m, Joharchi 43017 (FUMH).

Fig. 1. Distribution map of the new records of *Astragalus* for Iranian flora.Table 1. Diagnostic characters of *Astragalus urgunensis* and *A. akhundzadahensis*.

Characters Species	Leaflet shape and size (mm)	Peduncle length (cm)	Calyx length (mm)	Legume shape and length (mm)
<i>A. urgunensis</i>	linear, 1 pair; 5-18 × 1-2	up to 18	3.5-4	ovoid; ±5
<i>A. akhundzadahensis</i>	narrowly elliptic, 1-2 pair(s); 5-10(-13) × 1.5-3	5-10	±6	long elliptic; 7

Table 2. Diagnostic characters of *Astragalus zumatensis* and *A. urgunensis*.

Characters Species	Leaflet size (mm)	Peduncle length (cm)	Bracts length (mm)	Calyx length (mm)	Standard length (mm)	Legume length and indumentum (mm)
<i>A. zumatensis</i>	15-30 × 2-3	7-15	1-1.5	5	12	8-9 only with long hairs
<i>A. urgunensis</i>	5-18 × 1-2	up to 7	0.5	3.5-4	6-7	5 with long and short hairs

Table 3. Diagnostic characters *Astragalus similissimus* and *A. squarrosus*.

Characters Species	Stipule length (mm)	Raceme	Petiole length (mm)	Calyx indumentum	Legume indumentum
<i>A. similissimus</i>	4-6	more or less liberate	1-1.5	only covered with sub-appressed hairs	long hairs without tubercle on the base
<i>A. squarrosus</i>	1.5-3	firstly dense, then lax	0.5	covered with ascending and sub-appressed hairs	long hairs with tubercle on the base

*A. urgunensis*, described from E Afghanistan, is newly reported for the flora of Iran. This species is similar to *A. akhundzadahensis* Podlech & Zarre but there is some differences between them (table 1).

***Astragalus zurmatensis*** Podlech & Zarre, Willdenowia 33: 348 (2003). - Figs. 1 & 3.

Razavi Khorassan: Between Gonabad and Torbate Heydariyeh, Lout-e Emrani, 867 m, Memariani & Zangooei 37467 (FUMH), *ibid.* 37468 (FUMH).

This species was described from E Afghanistan, Paktia province, is similar to *A. urgunensis* but differs from it in some morphological characters presented in table 2. Here, we report this species as a new record for the flora of Iran.

***Astragalus similissimus*** Podlech & Zarre, Willdenowia 33: 346 (2003). - Figs. 1 & 4.

South Khorassan: Between Nehbandan and Tabasein, Panbe-Nasouz (Asbestos) mine, 900 m, Faghihnia & Zangooei 19815 (FUMH).

This species, hitherto known from south-central parts of Afghanistan, is close to *A. squarrosus* Bunge but differs in some morphological characters shown in table 3. The above-cited specimen is the first record of this species for the Iranian flora.

#### New synonym

***Astragalus hekmatsafaviae*** F. Ghahremani., Ann. Bot. Fennici 42: 313 (2005). Fig. 5.

Syn: *A. semiglabricarpus* Maassoumi, The Genus of *Astragalus* vol. 5: 338-390, appendix (2005), **syn. nov.**

*A. hekmatsafaviae* is another species of sect. *Ammოდendron* described from NE Iran in mountains between Mashhad and Torbate Heydariyeh (Ghahremani-nejad 2005) but has been neglected in Flora Iranica (Podlech et al. 2010). Its type specimen was carefully examined and compared with the type specimen of *A. semiglabricarpus* and also more specimens from locus classicus (Maassoumi 2005) and surrounding areas. Since there is no reasonable difference between these taxa, *A. semiglabricarpus* is considered as a synonym of *A. hekmatsafaviae* based on priority rule.

**Specimens seen:** Razavi Khorassan: 64 km on the road of Mashhad towards Torbate Heydariyeh, Baz-e Hour, 1650 m, Hojjat & Zangooei 28706 (Typus, FUMH); Torbate Heydariyeh, Bezgh village, N slope of Bezgh Mt. opposite to Bezgh village, 2000-2500 m, Amirabadi & Paryab 4800 (TARI) [type of *A. semiglabricarpus*]; N Kashmar, 50 km on the road towards Neyshabour, 1600 m, Faghihnia & Zangooei 18456 (FUMH); N Kashmar, Chalpo, 1870-1900m, Memariani & Zangooei 38940 (FUMH); *ibid.*, 38941 (FUMH).

#### New record to Yazd province

*Astragalus ahmed-adlii* Bornm. & Gauba, known only from some locations around Karaj in Alborz province, is reported for the first time from Tabas, Yazd province. This species is endemic to Iran and has only limited distribution in C. Iran.

**Specimens seen:** Yazd province: Tabas, between Robat-e Khan and Robat-e Kalmard, 1000 m, 16.4.1996, Raafei & Zangooei 26378 (FUMH).

#### 2. Sect. *Caprini*

***Astragalus kopetdaghi*** Boriss var. *kopetdaghi*. Figs. 1 & 6.

North Khorassan: SW Bojnord, Salook Protected Area, 2500-2580 m, Memariani & Arjmandi 43947 (FUMH).

*A. kopetdaghi* is an endemic species to Kopetdagh Mountains with two recorded varieties in Flora Iranica: *A. kopetdaghi* var. *orientikopetdaghensis* V.V. Nikitin from Iran and Turkmenistan, and var. *kopetdaghi* only from Turkmenistan, near the Iranian borders. This is the first record of the type variety of the species, with glabrous vegetative organs, for the Iranian flora.

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Fig. 2. *Astragalus argunensis*. –Joharchi 43021 (FUMH).





Fig. 3. *Astragalus zurmatensis*. –Memariani & Zangooei 37467 (FUMH).



Fig. 4. *Astragalus similissimus*. –Faghihnia & Zangooei 19819 (FUMH).





Fig. 5. *Astragalus hekmat-safaviae*. –Memariani & Zangoeei 38940 (FUMH).





Fig. 6. *Astragalus kopetdaghi* var. *kopetdaghi*. – Memariani & Arjmandi 43947 (FUMH).