

## IMPORTANT NOTES ON ASTRAGALUS SUBGENUS TRAGACANTHA BUNGE IN IRAN

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Based on 3000 herbarium specimens a taxonomic study of *Astragalus* subgenus *Tragacantha* has been done. In this research 10 new taxa including: *A. glaucopsiformis*, *A. jamzadae*, *A. khatamsazae*, *A. membranostipulus*, *A. montosus*, *A. neo-mozaffarianii*, *A. passargadensis*, *A. peymanii*, *A. polystachys*, *A. sumarensis* are described as new from Iran. Moreover due to the intensive collection from all Iranian territory, particularly in western border of the country 6 new records including: *A. karabaghensis* Bunge, *A. vedicus* Takht., *A. yueksekovae* Matthews, *A. gummifer* Labill., *A. turkmenorum* (Boriss.) Boriss. and *A. zoharyi* Eig with the short notes are presented from Iran. Uncertain position of the few taxa are discussed.

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## یادداشت‌های مهم درباره زیر جنس *Tragacantha* از جنس *Astragalus* از ایران

علی اصغر معصومی

بر پایه ۳۰۰۰ نمونه هرباریومی، مطالعات تاکسونومیک زیر جنس *Tragacantha* از جنس *Astragalus* انجام گرفته است. در این تحقیق ۱۰ گونه جدید به نامهای *A. membranostipulus*، *A. khatamsazae*، *A. jamzadae*، *A. glaucopsiformis*، *A. peymanii*، *A. passargadensis*، *A. neo-mozaffarianii*، *A. montosus*، *A. sumarensis* و *A. polystachys* شرح داده می‌شوند. از طرف دیگر بعثت جمع‌آوری‌های فراوان در تمام سطح ایران بویژه در مرزهای غربی کشور ۶ گونه بعنوان گزارش جدید برای ایران به نامهای *A. karabaghensis* Bunge، *A. turkmenorum* (Boriss.)، *A. yueksekovae* Matthews، *A. vedicus* Takht.، *A. zoharyi* Eig، Boriss. و *A. gummifer* Labill. به همراه یادداشت‌های کوتاهی معرفی می‌شوند. در این اثر بعضی از پیچیدگی‌های این زیر جنس همچون موقعیت تعداد کمی از گونه‌ها به همراه جمع‌آوری‌های جدید بحث شده است.

## INTRODUCTION

Based on 3000 herbarium specimens in very good condition along with several field excursions, a full revision of Iranian tragacanthic species of the genus *Astragalus* were prepared. 77 distinct species in 7 different sections were recognized from Iran. 35 (45%) species are known as endemics for the Iranian territory. A great number of the taxa are inaequally distributed in the country. Inventory of the existing species shows that 39 species are broadly distributed in Zagros range. In this paper 10 new species, some new records, and new collections are presented, all materials are preserved in the Central Herbarium of Iran (TARI).

## NEW SPECIES

### *Astragalus glaucopsiformis*

Maassoumi, **sp. nov.** e sect. *Platonychium* Bunge

Differs from *A. verus* Oliv. in subsericeous appressed hairs and being not densely tomentose; from *A. pycnocladus* Boiss. by panduriform standard which is obtuse angulate at the base, (not stenonychium, hastate at the base).

Plantae perennes, suffruticosae, caespitosae

valde spinosae, erinaceae, hemisphaericae, adscendentes, ca. 40 cm altae et ca. 35-50 cm diametro; caules abbreviati vel valde ramosi, intricati. Stipulae lanceolatae vel ovatae, chartaceae vel membranaceae dense pilosae, deinde glabrae, margine ciliatae, in parte libero lanceolato-acuminatae, ca. 6-7 mm longae, basi ca. 4 mm petiolis adnatis, inter se liberae. Folia 2-2.5 cm longa, petiolis abbreviatis, ca. 3-5 mm longis, sicut rachis appresse tomentosa, deinde glaberrima. Foliola 5 juga, linearo-lanceolata, apice mucronulata, valde pungentia, mucronibus ca. 1 mm longis, utriusque appresse tomentosa, ca. 4-6 mm longa et 1-1.5 mm lata, plerumque complicata. Synflorescentia cylindracea vel glomerata. Inflorescentia axillaris 2 flori ad basim rachidem. Bractae 4-5 mm longae et 1 mm latae, lineares vel oblongo-spatulatae, membranaceae, dense tomentosae vel in apicem et in partem medianam pilosae, basi glabrae. Calyx turbinatus, ca. 5 mm longus, dense tomentosus basi glabris, dentibus subulatis, ca. 1 mm longis. Corolla flava vel purpureo-violacea. Vexillum ca. 9-10 mm longum, platonychium, in apicem et basim breviter differentiat, in parte mediana sensim constrictum, antice truncata, basim versus leviter dilatata, brevissime

auriculata. Unguis alae et carina ad basim ca. 3 mm staminis tubum adnata. Alae ca. 9 mm longae, carinam superantes; laminae 4 mm longae et 1.5 mm latae. Carinae ca. 9 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Hamadan: S. slope of Alvand mnt. from Serkan, 2150 m, 14. 7. 1999, Maassoumi & Mozaffarian 79614 (hol. TARI).

*Other specimens seen.* Hamadan: S. slope of Alvand mnt. from Serkan, 2150 m, 14. 7. 1999, Maassoumi & Mozaffarian 79615, 70616; Abbas Abad, Kuh-e Alvand, 2100-2300 m, Termeh & Moussavi 40803 b.

***Astragalus jamzadae*** Maassoumi, **sp. nov.** e sect. *Brachycalyx* Bunge

It is close to *A. albispinus* Sirj. & Rech. f. but it differs by having longer calyx teeth and spatulate or elliptic standard limb (non orbicular).

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, adscendentes, ca. 15 cm altae et ca. 20 cm diametro; caules ad basi ramosi, intricati. Stipulae chartaceae vel membranaceae, dense pilosae, deinde glabrae, margine ciliatae, in parte libero lanceolato-acuminatae, ca. 8 mm. longae, basi ca. 4

mm petiolo adnatae, inter se liberae. Folia 2.5-3.5 cm longa, petiolis 6-8 mm longis, sicut rachis glabra vel sparse pilosa. Foliola 3 juga, anguste-elliptica, apice mucronulata, pungentia, sparse pilosa vel glabrescentia, ca. 6-9 mm longa et 2-3 mm lata, plerumque complicata. Synflorescentia cylindracea, ca. 4 cm longa. Inflorescentia axillaris 2 flori ad basim rachidem. Bractae 5 mm longae et 3. 5-4 mm latae, oblongo-spatulatae, vel cordatae, membranaceae, glabrae, margine ciliatae. Calyx turbinatus, ca. 7 mm longus, dense sericeus, dentibus subulatis ca. 2 mm longis, basi pilosis. Corolla alba. Vexillum ca. 10 mm longum, lamin; spatulata, elliptica, non differentiates, antice obtusa, basim abrupte constricta. Unguis alae et carina ad basim sensim staminis tubum adnata. Alae ca. 9 mm longae, carinam superantes. Carinae ca. 8.5 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Esfahan: 4 km on the road from Delyjan to Golpayegan, ca. 1600 m, 20. 07. 1998, Maassoumi & Mozaffarian 76742 (hol. TARI).

New species is named in the honour of Mrs. Z. Jamzad, the Iranian taxonomist and the specialist of family *Labiatae* in the

Central Herbarium of Iran (TARI).

**Astragalus khatamsazae**

Maassoumi, **sp. nov.** e sect. *Platonychium*  
Bunge

New species is similar to *A. gossypinus* Fischer, but it differs in having the short rachis and double indumentum on the rachis and leaflets

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, hemisphaericae, adscendentes. ca. 25-30 cm altae et ca. 20-50 cm diametro; caules elongati vel valde ramosi, intricati. Stipulae chartaceae vel membranaceae, flavae vel brunnea, sparse brevissime pilosae, margine longe ciliatae, in parte libero lanceolato-acuminatae, ca. 10 mm longae, basi ca. 6 mm petiolo adnatae, inter se liberae. Folia 1-1.5 cm longa, petiolis 4-5 mm longis, sicut rachis dense brevissim tomentosa et sparse longe pilosa. Foliola 5-6 juga, oblongi-elliptica, apice mucronulata, valde pungentia, utriusque dense brevissime appresse tomentosa et sparse longe pilosa, ca. 4-5 mm longa et 1-1.5 mm lata, plerumque complicata. Synflorescentia globosa vel cylindracea. Inflorescentia axillaris, 2 flori ad basim rachidem. Bracteae 6-7 mm longae et 1 mm latae, lineares, membranaceae, dense

tomentosae vel in apicem et parte mediano tomentosae, basi glabrae. Calyx turbinatus, ca. 8 mm longus, dense tomentosus basi glabrus, dentibus subulatis, ca. 4 mm longis. Corolla flava vel violacea. Vexillum ca. 13 mm longum, stenonychium; lamina valde differentiates, in parte mediano constricta, antice obtusa, basim versus manifeste dilatata, auriculata vel angulata vel hastata. Unguis alae et carina ad basim ca. 3-4 mm staminis tubum adnata. Alae ca. 12 mm longae, carinam aequantes. Carinae ca. 12 mm longae. Ovarium appresse pilosum. Legumen ovoideum, 5 mm longum et 2 mm latum, dense appresse pilosum, unilocular. Semina 1, brunnea, atropurpureo punctata, 2 mm longa et 1.5 mm lata.

*Typus.* Kurdistan: Divandarre, Kuhay-e Chehelcheshmeh, Fro-Bast village, 2000-2750 m, 18. 08. 1999, Mozaffarian 79847 (hol. TARI).

New species named in the honour of Mrs. M. Khatamsaz, the Iranian taxonomist and specialist on the family *Rosaceae* in the Central Herbarium of Iran (TARI).

**Astragalus membranostipulus**

Maassoumi, **sp. nov.** e sect. *Platonychium*  
Bunge

Plantae perennes, suffruticosae, caespitosae

vel dense spinosae, erinaceae, hemisphaericae, adscendentes vel procumbentes, ca. 15-25 cm altae et ca. 20-25 cm diametro; caules valde ramosi, intricati. Stipulae lanceolatae vel ovatae, papyraceo-hyalinae, sparse pilosae, deinde glabrae, margine ciliatae, in parte libero lanceolatae, ca. 8-9 mm longae, basi ca. 4-5 mm petiolo adnatae, inter se liberae. Folia 2. 5-3 cm longa, petiolis abbreviatis, ca. 5-7 mm longis, sicut rachis sparse appresse pilosa. Foliola 8-9 juga, lineari-lanceolata, apice mutica, utriusque sparse appresse pilosa deinde glabra, ca. 5-7 mm longa et 1-2 mm lata, plerumque complicata. Synflorescentia globosa vel cylindracea vel glomerata. Inflorescentia axillaris 1-2 flori ad basim rachidem. Bractae 5-6 mm longae et 1-2.5 mm latae, lineares vel oblongo-spatulatae, membranaceae, glabrae, vel sparse pilosae, vel in partim mediano sparse pilosae, margine ciliatae. Calyx turbinatus, ca. 10-11 mm longus, omnis dense sericeus, dentibus subulatis vel setaceis, ca. 3-4 mm longis. Corolla flava vel purpureo-violacea. Vexillum ca. 15 mm longum, platonychium vel in apicem et basim leviter differentiatum, in parte mediano sensim constrictum, antice obtusum, basim versus leviter dilatatum. Unguis alae et carina ad basim

sensim staminis tubum adnata. Alae ca. 13-14 mm longae, carinam superantes; laminae 6 mm longae et 1.5 mm latae. Carinae ca. 13 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Tehran: ca. 16 km from Ghazvin to Alamout, 2000-2300 m, 8. 7. 1984, Assadi & Maassoumi 50935 (hol. TARI).

*Paratypus.* Guilan, Rasht road, Amirabad, 12. 7. 1972, Hariri & Foroughian 15802 (TARI).

***Astragalus montosus*** Maassoumi, **sp. nov.** e sect. *Platonychium* Bunge

Differs from *A. cesarensis* Sirj. by having 4 pairs of shortly appressed hairy leaflets (not 2 pairs of tomentose leaflets).

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, hemisphaericae, plerumque procumbentes. ca. 15 cm altae et ca. 10-20 cm diametro; caules abbreviati vel valde ramosi, intricati. Stipulae lanceolatae vel ovatae, chartaceae vel membranaceae, in parte libero lanceolato-acuminatae, ca. 8 mm longae, basi ca. 4-5 mm petiolo adnatae, inter se liberae. Folia 3-3. 5 cm longa, petiolo 1-1. 5 cm longo, sicut rachis dense brevissime appresse pilosa et sparse longe subpatenter pilosa. Foliola 4 juga, oblongo-elliptica,

raro ovato-oblonga, apice mucronulata, valde pungentia, mucronibus ca. 1.5 mm longis, utriusque dense tomentosa, ca. 8-12 mm longa et 3-5 mm lata, plerumque plana. Synflorescentia globosa vel cylindracea. Inflorescentia axillaris, 2 flori ad basim rachidem. Bracteae 7 mm longae et 1-2 mm latae, lineares vel oblongo-spatulatae, membranaceae, dense tomentosae vel in apicem et in partim mediano pilosae, basi glaber. Calyx turbinatus, ca. 9 mm longus, dense tomentosus, basi glaber, dentibus subulatis, ca. 5 mm longis. Corolla purpureo-violacea. Vexillum ca. 13 mm longum, platonychium; in apicem et basim differentiates, in parte mediano constrictum, antice obtusum, basim versus leviter dilatatum, late auriculatum vel angulatum vel hastatum, unguis alae et carina ad basim ca. 3 mm staminis tubum adnata. Alae ca. 12 mm longae, carinam superantes, laminae 3 mm longae et 1 mm latae. Carinae ca. 12 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Esfahan: 5 km from Khansar to Daran, 2150 m, 21. 7. 1998, Maassoumi & Mozaffarian 76724 (hol. TARI).

**Astragalus neo-mozaffarianii**

Maassoumi, **sp. nov.** e sect. *Platonychium* Bunge

Similar to *A. zoharyi* Eig, but the type of indumentum and numbers of leaflets separate these two closed relatives from each other.

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, hemisphaericae, rupestres, adscendentes vel plerumque procumbentes, ca. 30-40 cm altae et ca. 40-60 cm diametro; caules elongati, valde ramosi, intricati. Stipulae chartacea vel membranaceae dense pilosae, deinde glabrae, basi dense tomentosae, in parte libero lanceolato-acuminatae, ca. 5 mm longae, basi ca. 2-3 mm petiolis adnatae, inter se liberae. Folia 1-1.5 cm longa, petiolo 3-5 mm longis, sicut rachis dense brevissime tomentosa, deinde glaberrima. Foliola 6-8 juga, parva, oblongo-lanceolata, rarim obovata, apice breviter mucronulata, valde pungentia, margine cartilaginea, brunea, utriusque dense brevissime tomentosa, ca. 3-4 mm longa et 1-1.5 mm lata, plerumque complicata. Synflorescentia globosa, parva. Inflorescentia axillaris 2 flori ad basim rachidem. Bracteae 4 mm longae et 1 mm latae, lineares, membranaceae, dense tomentosae vele in apicem usque mediano

pilosae, basi glabrae. Calyx turbinatus, ca. 5 mm longus, dense tomentosus, basi glaber, dentibus subulatis, ca. 1-1.5 mm longus. Corolla flava vel purpurea. Vexillum ca. 6 mm longum, platonychium, lamina purpurea, in apicem et basim valde differentiates, in parte mediano constricta, antice retusa, basim versus manifeste dilatata, auriculata vel angulata vel hastata, unguis alae et carinam ad basim ca. 2 mm staminis tubum adnata. Alae ca. 5 mm longae, carinam aequantes. Carinae ca. 5 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Hamadan: Nahavand, Sarab Guian, Garrin mnt. 2200 m, 13. 07. 1999, Maassoumi & Mozaffarian 79608 (hol. TARI).

*Paratypus.* Hamadan, Nahavand, Sarab Guian, Garrin mnt., 2000 m, 13. 07. 1999, Maassoumi & Mozaffarian 79607.

### ***Astragalus* passargadensis**

Maassoumi, **sp. nov.** e sect. *Platonychium* Bunge

Similar to *A. echidnaeformis* Sirj. but it differs with 4-5 pairs of leaflets (not 9) and much longer flower. The new species has the double indumentum on the rachis, differs from *A. globiflorus* Boiss. in violet

calyx teeth, shorter leaflets and much smaller synflorescences.

Plantae perennes, caespitosae vel suffruticulosae, spinosae, erinaceae, hemisphaericae, adscendentes, ca. 15 cm altae et ca. 20-30 cm diametro. Caules abbreviati vel valde ramosi, intricati. Stipulae lanceolatae vel ovatae, chartaceae, dense appresse pilosae, deinde glabrae, margine ciliatae, in parte libero lanceolato-acuminatae, ca. 3 mm longae, basi ca. 4-5 mm petiolis adnatae, inter se liberae. Folia 2-2. 5 cm longa, petiolis 5-10 mm longis, sicut rachis dense brevissime appresse pilosa, et pilis longis subpatentibus immixtis. Foliola 4-5 juga, oblongi-lanceolata, apice rubra, mucronulata, valde pungentia, utriusque dense tomentosa, ca. 5-7 mm longa et 1-2 mm lata, plerumque complicata. Synflorescentia globosa. Inflorescentia axillaris 2 flori ad basim rachidem. Bractae 7-8 mm longae et 1 mm latae, lineares, membranaceae, dense tomentosa vel in apicem et in partim mediano tomentosae, margine ciliatae. Calyx turbinatus, ca. 12 mm longus, dense tomentosus, basi glaber, dentibus subulatis vel setaceis, ca. 5 mm longis. Corolla flava vel violacea. Vexillum ca. 17 mm longum, platonychium, in



apicem et basim differentiates, in parte mediano constrictum, antice obtusa, basim versus manifeste dilatata, late auriculata vel angulata vel hastata, unguis alae et carina ad basim ca. 5 mm staminis tubum adnata. Alae ca. 15 mm longae, carinam superantes; laminae 5 mm longae et 1.5 mm latae. Carinae ca. 14 mm longae. Ovarium appresse pilosum. Legumen ovoideum, dense pilosum, ca. 7 mm longum et 4 mm latum.

*Typus.* Fars: Saadatshahr, Passargad to Sirbanu, Kuh-e Musakhan, 2250-2700 m, 15. 6. 1992, Mozaffarian 71513 (hol. TARI).

***Astragalus peymanii* Maassoumi, sp. nov.** e sect. *Macrophyllum* Boiss.

The new species by the long stem and many heads is distinguishable. *A. peymanii* in having the small leaflets with short appressed hairs and the shape of standard is separable from *A. oleaefolius* DC. and *A. dipodorus* Bunge.

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, adscendentes vel plerumque procumbentes, ca. 30-35 cm altae et ca. 50 cm diametro; caules elongoti vel valde ramosi, intricati. Stipulae chartaceae, dense appresse pilosae,

marginem ciliatae, deinde glabrae, in parte libero lanceolato-acuminatae, ca. 8-10 mm longae, basi ca. 4-5 mm petiolo adnatae, inter se liberae. Folia 10-11 cm longa, petiolis 1.5-3 cm longis, sicut rachis sparse brevissime appresse pilosa. Foliola 6-7 juga, oblongo-elliptica, apice breviter mucronulata, pungentia, supra glabra, subtus sparse brevissime appresse pilosa vel glabrescentia, ca. 10-20 mm longa et 5-8 mm lata, plerumque plana. Synflorescentia globosa, magna, 2-4 capitulata; capitula 6-8 cm longa et 4-6 cm lata. Inflorescentia axillaris 15-20 flori ad basim rachidem. Bracteae 12 mm longae et 1.5-2 mm latae, lineares vel oblongo-ellipticae, membranaceae, dense tomentosae vel in apicem usque mediano tomentosae, basi glabrae, intus in apicem dense pilosae. Calyx turbinatus, ca. 19-20 mm longus, omnino dense tomentosus, dentibus subulatis, ca. 8 mm longis. Corolla lilacina vel purpurea. Vexillum ca. 28-30 mm longum; lamina ca. 20 mm longa et 11-12 mm lata, distincte differentiates, in parte mediano constricta, antice obtusa, basim manifeste dilatatum, auriculatum vel angulatum vel hastatum, unguis alae et carina ad basim ca. 8-9 mm staminis tubum adnata. Alae ca. 25 mm longae; laminae

ellipticae, ca 9 mm longae et 4 mm latae, carinam superantes. Carinae ca. 23 mm longae. Ovarium dense appresse pilosum. Legumen ovoideum, dense pilosum, ca 7 mm longum et 4 mm latum.

*Typus.* Gilan: Masuleh, Majelan village, 1700 m, 02. 08. 1998, Maassoumi & Mozaffarian 78644 (hol. TARI).

New species is named in the honor of Prof. Dr. B. Peymani, a researcher of the range management in the Research Institute of Forests and Rangelands.

***Astragalus polystachys*** Maassoumi, **sp. nov.** e sect. *Rhacophorus* Bunge

Differs from *A. paralipomenus* Bunge in the form of synflorescence, number of cupitules and densely subappressed pilose leaflets.

Plantae perennes, suffruticosae, caespitosae, spinosae, erinaceae, hemisphaericae, plerumque procumbentes, ca. 10-20 cm altae et ca. 20-30 cm diametro; caules abbreviati vel valde ramosi, intricati. Stipulae lanceolatae vel ovatae, chartaceae vel membranaceae, pilosae vel glabrae, margine ciliatae, in parte libero lanceolato-acuminatae, ca. 9 mm longae, basi ca. 6 mm petiolo adnatae, inter se liberae. Folia 2.5-3 cm longa, petiolis 8-10 cm longis, sicut rachis dense

subpatenter pilosa. Foliola 4 juga, anguste oblonga vel oblongi-elliptica, apice mucronulata, pungentia, mucronibus ca. 1-2 mm longis, utriusque dense appresse tomentosa rarim patenter pilosa, ca. 8-15 mm longa et 1-2 mm lata, plerumque complicata, rarim plana. Synflorescentia globosa, 1-3 capitulata. Inflorescentia axillaris 4-5 flori ad basim rachidem. Bractae 9 mm longae et 1-2 latae, lineares vel oblongo-spatulatae, membranaceae, dense tomentosae vel in apicem et in partim mediano tomentosae, margine ciliatae. Calyx turbinatus, ca. 9-10 mm longus, tota dense sericeus, dentibus subulatis vel setaceis, ca. 5 mm longis. Corolla violacea. Vexillum ca. 18 mm longum, breviter panduriforme, in apicem et basim differentiates, lamina in parte mediano sensim constricta, antice obtusum, basim versus leviter dilatata, auriculata vel angulata vel hastata, unguem alae et carina ad basim ca. 3-4 mm staminis tubum adnata. Alae ca. 16 mm longae, carinam superantes; laminae 4 mm longae et 1 mm latae. Carinae ca. 15 mm longae. Ovarium appresse pilosum. Legumen ignotum.

*Typus.* Azarbayejan: Oshnaviyeh, pass between Agh-Bulagh and Dizaj, Zinat Ashu pass, 2150 m, 28. 7. 1998, Maassoumi &

Mozaffarian 78595 (hol. TARI).

*Paratypus*. Azarbayejan: Oshnaviyeh, pass between Agh-Bulagh and Dizaj, Zinat Ashu pass, 2150 m, 28. 7. 1998, Maassoumi & Mozaffarian 78589. 78591.

***Astragalus sumarensis*** Maassoumi, **sp. nov.** e sect. *Rhacophorus* Bunge

Differs from *A. crassinervius* Boiss. in having the leaflets which are densely tomentose, calyx hairy at the base (not glabrous), calyx teeth subulate (not setaceous); from *A. eriosphaerus* Boiss. leaflets covered with short tomentose hairs (not mixed short and long hairs), old rachis straight or horizontal (not deflexed), calyx much longer.

Plantae perennes, suffruticosae, caespitosae vel fruticulosae, spinosae, erinaceae, adscendentes. ca. 30 cm altae et ca. 30-40 cm diametro; caules elongati vel valde ramosi, intricati. Stipulae lanceolatae vel ovatae, chartaceae, in parte libero lanceolato-acuminatae, ca. 10 mm longae, basi ca. 5 mm petiolis adnatis, inter se liberae, dense brevissime et longe pilosae, margine longe ciliatae. Folia 4-6 cm longa, petiolis 1.5-2.5 cm longis, sicut rachis dense brevissime et longe pilosa. Foliola 3 juga, oblongo-elliptica, apice mucronulata, valde pungentia, mucronibus ca. 1 mm longis, utriusque dense tomentosa vel

velutinoso, ca. 8-14 mm longa et 3-7 mm lata, plana, supra manifeste elevatim nervosa. Synflorescentia globosa. Inflorescentia axillaris 6-10 flori ad basim rachidem. Bracteae 12 mm longae et 1-2 latae, lineares vel oblongo-spatulatae, membranaceae, dense tomentosae vel in apicem et in partim mediano pilosae, margine ciliatae. Calyx turbinatus, ca. 10 mm longus, dense tomentosus, basi glaber, dentibus subulatis, ca. 3-4 mm longis. Corolla flava. Vexillum ca. 18-20 mm longum, stenonychium, in apicem et basim differentiates, in parte mediano constrictum, antice obtusum vel retusum, basim versus manifeste dilatatum, late auriculatum vel angulatum vel hastatum, unguis alae et carina ad basim ca. 7 mm staminis tubum adnata. Alae ca. 17 mm longae, carinam superantes; laminae 6 mm longae et 1-2 mm latae. Carinae ca. 16 mm longae. Ovarium pilosum. Legumen ignotum.

*Typus*. Kermansheh: Ca. 14 km from Gilan-e Gharb to Sumar, 980 m, 10. 6. 1999, Mozaffarian 79519 (hol. TARI).

## NEW RECORDS

During this study several species were known from the first time for the flora of Iran. Majority of these species are

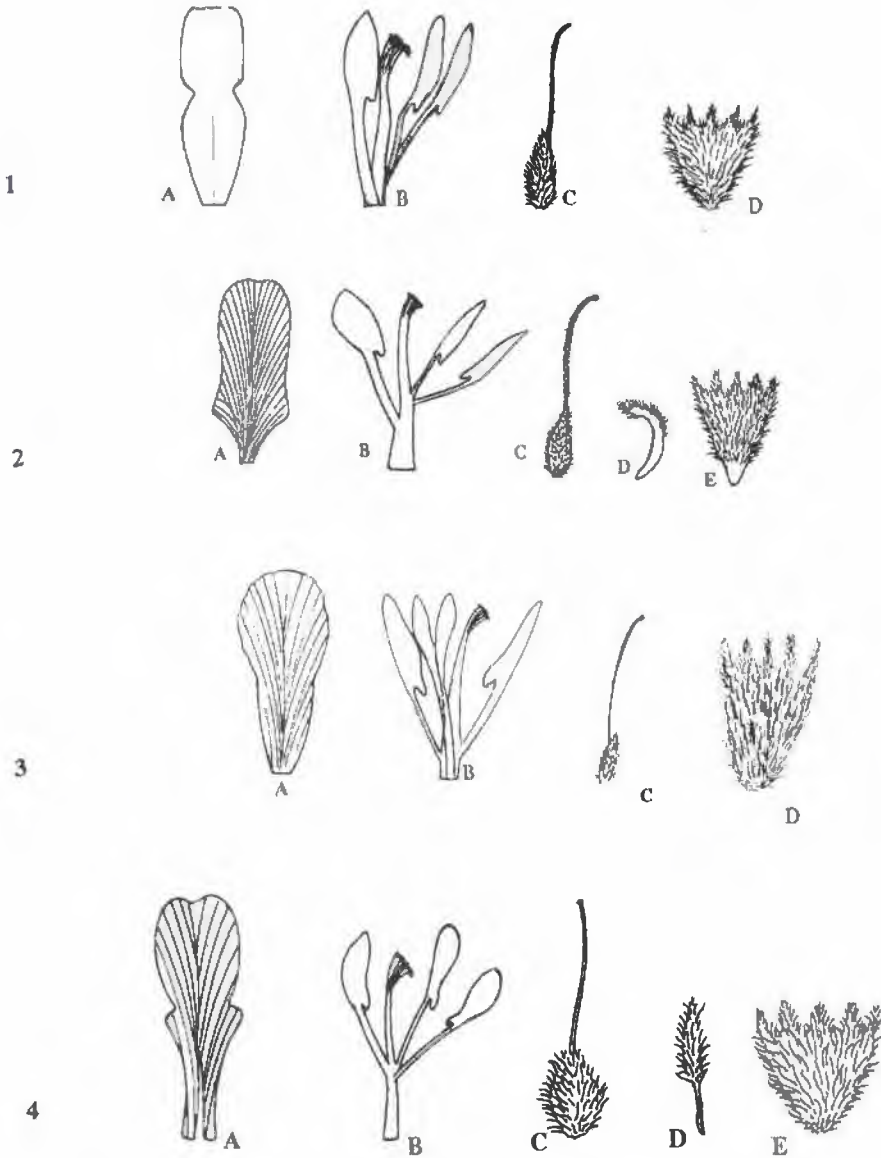


Fig. 1-4. -1. *Astragalus glaucopsiformis*; A. standard; B. wings and keel; C. ovary; D. calyx. -2. *A. khatamsazae*; A. standard; B. wings and keel; C. ovary; D. bract; E. calyx. -3. *A. membranostipulus*; A. standard; B. wings and keel; C. ovary; D. calyx. -4. *A. sumarensis*; A. standard; B. wings and keel; C. ovary; D. bract; E. calyx.

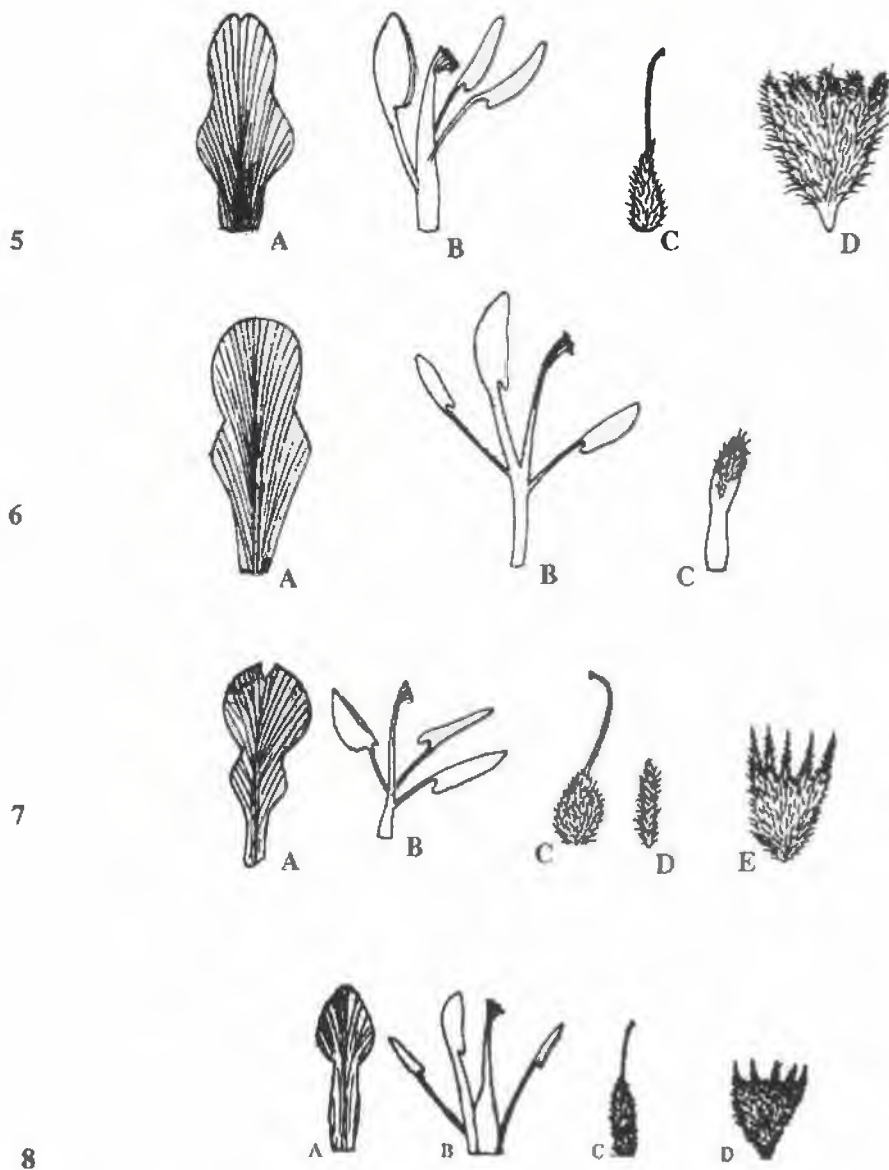


Fig. 5-8. -5 *A. neo-mozaffarianii*; A. standard; B. wings and keel; C. ovary; D. calyx. -6. *A. montosus*; A. standard; B. wings and keel; C. bract. -7. *A. passargadensis*; A. standard; B. wings and keel; C. ovary; D. bracts; E. calyx. -8. *A. jamzadae*; A. standard; B. wings and keel; C. ovary; D. calyx.

recorded from different regions based on intensive collected materials.

***Astragalus gummifer*** Labill., Jour. Phys. 1: 46 (1790).

Azarbayejan, Oroumīyeh, Targevar, Darband, 2000 m, Siami, 3705; Oroumīyeh, Silavana, Targavar, Benar valley, Siami, 5341; Oroumīyeh, Silvana, Bardehsu., Siami, 5344; Oroumīeh, Razhan, Khalil-kuh, 1600-1800 m, Chehregani & Zarre, 17872; Oroumīeh, Silvana, mts. W. of village, 1700-2100 m, Mozaffarian, Maassoumi & Safavi, 75430; Oshnavīyeh, pass between Agh-Bulagh and Dizaj, Zinat Ashu pass., 2150 m, Maassoumi & Mozaffarian, 78594; Ca. 50 km to Oroumīeh on the road from Oshnavīeh, 1750 m, Assadi, 78912. -Ghazvin: Moalem Kellayeh, between Silikan and Garmarand., 1800-2000, Maassoumi, 76792.

The first record goes back to Zarre, (pers. comm. 1999) on few materials from Azarbayejan. This species by several collections from different areas are confirmed from Iran. In western part of the country are only found in few scattered plants. In Azarbayejan prov. around Oroumīyeh (W. Azarbayejan) in the highland in the cushion zone the pure formation sometime mixed with *A.*

*microcephalus* are distinguishable. The field examination shows that this species is one of the best gum producers producing the good quality of white ribbon gum. This species in South Alburz was also collected by the author, a very isolated locality of the species.

***Astragalus karabaghensis*** Bunge, Mem. Acad. Imp. Sci. Saint Petersburg, ser 7. 16/11: 93 (1868), l. c. 15/1: 165(1869). Azarbayejan. Ca. 70 km NW. of Ahar, near the village Gal, 1700 m, Assadi & Shahsavari, 65879; Ca. 70 km NEE of Ahar, basins of Kuh-e Kasabeh, 2000, Assadi & Shahsavari, 65901.

This species in different characters is similar to *A. aureus* Willd., but by the colour of the petals and pairs of leaflets are separable from each other.

Newly systematic revision of the section *Adiaspastus* Bunge has been published (Zarre 1998). In this interesting work few materials have been examined from Armenia and Azarbayejan, but no materials were mentioned from Iran.

***Astragalus turkmenorum*** (Boriss.) Boriss. Fl. USSR. 12: 3 42 (1946).

Khorassan: 23 km on the Raz road from Badranlou, 1700 m, Maassoumi &

Mozaffarian, 79560, 79561; Shirvan, 25-35 km km on the road to Namanlou, after Palkanlou-e Sofla., 1550 m, Maassoumi & Mozaffarian, 79562, 79565.

*A. turkmenorum* was collected for the first time from prov. Khorassan, N. of Bujnurd toward the Raz (S. of Turkenenistan border). This species in both cushion and subshrub forms are largely distributed on gypsum soil in the woodland. Imdumentum of this taxon is very variable, sometimes densely hairy specimens were found with subglabrous specimens.

***Astragalus vedicus*** Takht., Zam. Sist. Geogra. Rast. 9: 2- 3(1940).

Azarbayejan. Sarab to Nir, Saen pass, 2000, Maassoumi & Mozaffarian, 78621; Khalkal to Asalem., 1900 m, Maassoumi & Mozaffarian, 78636. -Zanjan, 20 km on the road from Abhar to Gheidar., 1950 m, Maassoumi & Mozaffarian, 78489; Mahneshan, Anguran, Belgheis mnt., 2800 m, Maassoumi & Mozaffarian, 78524; 15 km from Anguran to Takab., 2500 m, Maassoumi & Mozaffarian, 78529.

This species is variously interpreted in different Floras. Sometime ago this species was reduced as a subspecific rank of *A. karabaghensis* Bunge, recently this species

was compared with *A. polyanthus* Bunge (Zarre 1998), in any cases this species by different morphological characters, including habit form and number of leaflets is distinguishable from above mentioned closest relatives.

***Astragalus yueksekovae*** Matthews, Notes Roy. Bot. Garden Edinb. 29: 295 (1969).

*Selected specimens.* Azarbayejan: Oroumiyeh, Khoshakuh to Jermi, 2500 m, Mozaffarian, 69910; Oroumieh, Razhan, Khalil-kuh, 1600-1800 m, Chehregani & Zarre, 17873; Oroumieh, Silvana, mts. W. of village, 1700-2100 m, Mozaffarian, Maassoumi & Safavi, 75436, 75437; Uroumieh, Mavana, Hakki, mts. W. of the village, Kuh-e Dare-Rash, 2100-2700 m, Mozaffarian, Maassoumi & Safavi, 75438, 75443, 75446;

This is an interesting plant among the cushion forming *Astragalus* species. This taxon in several characters is very close to *A. hystrix* which belongs to an isolated monotypic section (sect. *Hystrix* Bunge) and had not been collected after the type. Recently *A. hystrix* was collected by the author from near the type locality. Morphologically these two taxa in several



characters such as shape of standard and the indumentum are similar to each other, the only distinct character to separate sect. *Hystrix* from neighbouring sections is the indumentum in the inside of the calyx. Surprisingly *A. yueksekovae* very clearly show this character, therefore the author transferred the new record beside *A. hystrix* to the sect. *Hystrix*. Recently sect. *Hystrix* was reduced to a synonymous of sect. *Adiaspastus* (Zarre, 1998). For better analysing it needs much more materials.

***Astragalus zoharyi*** Eig, Syst. Stud. Astrag. Near East, 78 (1955).

Kordestan: Nusud to Marivan, between Nusud and Gardaneh-e Tateh, around Dezaveh, Hanigarmaleh, 2000, Mozaffarian, Maassoumi & Safavi, 74940, 74942.

This species within the Tragacantic species is very distinguishable, because of small size of standard (6-6.5 mm). After the type collection it was not collected again in Iraq (Townsend, 341: 1974). The first gathering was done from prov. Kurdistan near the boundary of Iraq on an altitude about 2000 m. This plant was collected on calcareous rocks, growing just in crevices of rocky mnt., therefore, this species is with no doubt a rupestral species, which

separate it immediately from the other tragacanthic species of the genus *Astragalus*.

## NEW COLLECTIONS

During this study several new collections were made. Following species are the first gathering after the type collection.

***Astragalus hystrix*** Fischer, Bull. Soc. Naturalist Mosco 26: (2) 403 (1853).

Azərbaycan: near Koy, Haji-Aldin mt., 1450-1850 m, 30.6.1978, Assadi & Mozaffarian 30432, Tasso, 1480-1500 m youssefy 1101; Tassuj; between Angoshtajan and Amastajan villages, 1430 m, 19.6.1997, Ghahremani & Talebpur 6572.

This species is the type of sect. *Hystrix* Bunge. Several botanists tried to collect this species from the type locality Atropatanicae. Seidkhodji Khoy, (Sheikh Haji-Aldin)]. This species was recently collected from the type locality.

***Astragalus leucoptilus*** Boiss. & Hausskn., Fl. Or. 2: 32. (1872).

Bakhtaran: Paveh, the hill above Sarab Hauli, 1500-1800m, Hamzeh'ee & Hatami 1197; Pave, mnts. above village Shamshir,



base of Kuh-e Shahow, 1700-1900 m, Assadi 60760: 6 km after paveh to Ravansar, 1600-1700 m, Chehrejani & Zarre 17833; 7 km after Paveh to Ravansar, 1600-1700, Chehregani & Zarre 17839.

This is a very rare plant among the *Tragacanthic* species. Very remote inflorescence, by 2 flowers in each leaf axil place this species close to *A. caspicus* Bieb. (Sect. *Brachcalyx*). Recently in a systematic revision of *Astragalus* (Zarre 1998), this distinct species was wrongly determined as *A. caspicus* Bieb. The similarity of these two taxa is the reason to put this curious species in the right position to Sect. *Brachycalyx* instead of Sect. *Platonychium* Bunge.

***Astragalus rhodochorus*** Boiss. & Hausskn., Fl. Or. 2: 325 (1872).

Kurdestan: Nusud to Marivan, between Nusud and Gardaneh-e Tateh, around Dezaveh, Hangarmaleh, 2000 m, 27.7. 1995, Mozaffarian, Maassoumi & Safavi 74935, 74937.

The type specimens were collected from Kurdestan by Haussknecht (1869). This species in the bract shape is close to *A. geminanus* Boiss. & Hausskn. which shows a broad distribution in Kurdestan. *A.*

*rhodochorus* was collected by the author, in the border of Iraq in the crevices of calcareous rock. Ovate orbicular leaflets and very wide ovate bracts are the distinctive characters of this species. This rupesterial species was collected together with *A. zoharyi* Eig. With no doubt these two taxa are rupesteris species, easily separable from *A. geminanus*.

## REFERENCES

- Boissier, E. 1872: Flora Orientalis, vol. 2. -Genevae & Basiliae.
- 1888: Flora Orientalis, supplement. Genevae & Basiliae.
- Bunge, A. 1868: Generis Astragali species gerontogae, pars prior, clave diagnosticae. -Mem. Acad. Imp. Sci. Saint-Petersbourg 11/16: 76.
- 1869: Generis Astagali species gerotogae, pars altera, specierum enumeratio. -Mem. Acad. Imp. Sci. Saint-Petersbourg, 15/1: 131
- Maassoumi, A. A. 1998: *Astragalus* in the Old world. -Tehran.
- Sirjaev. G. 1939: Conspectus *Tragacantharum* (*Astagalus* L. subgenus *Tragacantha* Bunge). -Fedde Repert. Spec. Nov. Regni. Veg. 47: 194-208; 225-261.

Takhtajan, A. L. (ed.) 1962: *Flora Armenii*,  
vol. 4. -Erevan.

Townsend, C.C. 1974: *Astragalus* in

Townsend, C.C. and Evan Guest (eds.)

*Flora of Iraq*, vol. 3. -Baghdad.

Zarre, Sh. 1998: Systematic Revision of

*Astragalus* sect. *Adiaspastus*, sect.

*Macrophyllum* and sect. *Pterophorus*

(*Fabaceae*) (Ph. D. thesis, unpublished).