

Astragalus cephalotes Banks & Sol. - a new species for the Republic of Azerbaijan

Dashgin Sh. Ganbarov

Nakhchivan State University, University campus, AZ7012, Nakhchivan, Azerbaijan

Yegana A. Aslanova

Ganja State University, Heydar Aliyev Avenue 429, Ganja, Azerbaijan

Alex V. Matsyura

Altai State University, Lenin St. 61, Barnaul, 656049, Russian Federation; Western Caspian University, Istiglaliyyat St. 31, AZ1001, Baku, Azerbaijan

New species *Astragalus cephalotes* Banks & Sol. is reported to the flora of the Republic of Azerbaijan. We sampled it in Safdara, Kechili village (Shahbuz district, Nakhchivan Autonomous Republic) in mountain xerophytic community in 2016. Considering species current status and distribution we suggested include it in the future edition of the Red Data Book of the Republic of Azerbaijan and Nakhchivan with status VU, A2c+3c and with IUCN status 2016-LC.

doi: 10.5281/zenodo.11216116

Corresponding author: Dashgin Sh. Ganbarov (dasqinqenberov@ndu.edu.az)

Academic editor: R. Yakovlev | Received 27 March 2024 | Accepted 18 April 2024 | Published 21 May 2024

<http://zoobank.org/B2BB221C-CFF2-4743-9180-3E4432D6AE6D>

Citation: Ganbarov DSh, Aslanova YeA, Matsyura AV (2024) *Astragalus cephalotes* Banks & Sol. - a new species for the Republic of Azerbaijan. Acta Biologica Sibirica 10: 465-470.

<https://doi.org/10.5281/zenodo.11216116>

Keywords

Astragalus cephalotes, Azerbaijan, Nakhchivan, new species

Introduction

The plant genus *Astragalus* L. (Fabaceae) comprises approximately 3000 species worldwide. This genus thrives in cold, semiarid, and arid regions across the globe, with around 2400 species in the Old World, about 450 species in western North America, and roughly 100 species along the Andean Mountains in South America (Maassoumi 1998; Zarre, Podlech 2013). *Astragalus* section *Hymenostegis* was initially identified by Bunge (1868-1869) in his work "Generis *Astragali* species *Gerontogaeae*" within the subgenus *Calyphysa*. This section underwent further revisions by Rechinger et al. (1958) and was subsequently documented in the Flora of Turkey (Chamberlain and Matthews 1970), Flora of USSR (Gontscharov, 1946), and Flora of Iraq (Townsend 1974). Zarre and Podlech (1996) conducted the most recent revision of this section. *Astragalus* section *Macrophyllum* Boiss. was first described by Boissier in 1872.

The flora of the Nakhchivan Autonomous Republic (AR) includes 2 subgenera and 33 sections of 84

species belonging to the genus *Astragalus*. Of these species, 54 belong to *Astragalus*, and 30 belong to the subgenus *Cercidothrix* (Ganbarov 2021).

Materials and methods

Starting in 2016, a comprehensive revision of the *Astragalus* genus involved extensive field surveys in Nakhcivan AR, resulting in the collection of a significant number of specimens. These specimens underwent thorough verification against the *Astragalus* descriptions provided in key literature sources, including Flora Uzbekistana (Borissova, 1955), Flora Tadzikistana (Borissova, 1937), Flora USSR (Borissova, 1946), and Flora Kavkaza (Grossheim, 1950). Herbarium material has been compared to plants kept in the Herbarium of the Iran (*A. cephalotes* Banks & Sol. (appressed hairy) East Azerbaijan: Oshnavieh to Orumieh, after Movana, 1669 m, 26.6.2009, Ranjbar & Assadi, BASU 17677, MAC77; *A. cephalotes* Banks & Sol. (spreading hairy) East Azerbaijan: Oshnavieh to Orumieh, after Movana, 1669 m, 26.6.2009, Ranjbar and Assadi; BASU 17678, MAC78).

As far as possible, descriptions of the species are based on herbarium specimens collected in the territory of Kechili Village (Shahbuz Region) and on personal data. Living plants and/or herbarium specimens were photographed. Newly gathered plant specimens were utilized to produce Herbarium sheets following the protocols outlined by Bridson and Forman (2010). Following the guidelines set by the IUCN criteria (IUCN 2017), we provide an evaluation and justification for the species conservation status. For the nomenclature of a recently discovered species, we have adhered to the regulations of the International Code of Nomenclature for algae, fungi, and plants (Turland et al. 2018).

Floristic and geobotanical studies were conducted in Kechili village of Shahbuz district of Nakhchivan AR (39°21'58"N, 45°42'47"E, 1742 m above sea level) in 2016-2023 resulting in new species discovering. This species is *Astragalus cephalotes* Banks & Sol. that was found in the Safdara area of Kechili village, Shahbuz district of Nakhchivan AR, in the middle mountain belt, on dry grassy slopes (Fig. 1).



Figure 1. *Astragalus cephalotes* Banks & Sol., a herbarium specimen.

Results

Species was first published in A.Russell, Nat. Hist. Aleppo, ed. 2, 2: 260 (1794). The native range of this species is E & SE Türkiye to Lebanon and NW Iran. It is a subshrub and grows primarily in the temperate biome. Initially categorized in section Pterophorus by Boissier (1872) due to the presence of bracteoles, *A. cephalotes* was later reclassified by Zarre (2000) into section Macrophyllum based on its large and glabrous leaves. However, the Flora of Turkey assigns *A. cephalotes* to section Rhacophorus (Chamberlain, Matthews 1970).

Taxonomic Treatment

Superdivision: **Spermatophyta**

Division: **Angiospermae**

Class: **Dicotyledoneae**

Family: **Fabaceae**

Genus: ***Astragalus***

Astragalus cephalotes Banks & Sol., Russell, Nat. Hist. Aleppo, ed. 2: 260. 1794. Distribution: Turkey, Georgia, Syria, Lebanon, Iran. Irano-Turanian element.

Description: *Astragalus cephalotes* is a thorny, cushion-forming perennial plant with stems that become more or less woody; it forms a loose mat of growth 20– 50cm tall. In optimal growing conditions (high humidity) the plant develops larger leaves. The flowers are sessile with 2–5 pieces inside each leaf.

Phenology: Flowering and seeding occur in May–July, and sometimes seed ripening occurs in the first ten days of August. Life form (Raunkiaer): chamaephyte, Spinescence: leaves, It is non-succulent, perennating, chamaephyte. flowers hermaphrodite only, homogeneous seeds-fruits, Leaf arrangement: alternate (one leaf per node), Leaf Type: pinnate, stipule: present. Habitat: Tragacanth shrub vegetation (Oro-Mediterranean), glycophyte, Synanthrop: obligate natural. Chorotype: Med-Irano-Turanian.

Habitat and Associated Species: This species is found in the middle mountain belt, on dry grassy slopes at elevation ranging from 1600 to 1750 m. It grows alongside associated species such as *Astragalus karjagini* Boriss., *A. microcephalus* Willd. (*A. pycnophyllus* Stev.; *A. andreji* Rzazade; *A. gurdathii* Al. Theod., Fed.et Rzazade), *A. lagopoides* Lam (*A. lagurus* Willd.), *A. cancellatus* Bunge, *A. conspicuus* Boriss., *A. mesites* Boiss., *Stachys inflata* Benth., *Phlomoides tuberosa* (L.) Moench, *Phlomis orientalis* Mill., *Rumex acetosa* L., *Cotoneaster integerrimus* Medik., *Helichrysum arenarium* (L.) Moench.

Distribution: East Mediterranean and west Irano-Turanian distribution.

Conservation Status: Based on the available information, this plant has been tentatively classified as Least Concern in accordance with the IUCN Red List Categories and Criteria (IUCN, 2017). The existing data for Azerbaijan, and the Nakhchivan Autonomous Republic is insufficient to evaluate the risk factor associated with this species. Here, the plant is known solely from its type locality. To comprehensively assess its distribution, population numbers, subpopulation numbers, further investigations are required in similar habitats adjacent to the known areas. We recommend to include this species in the new edition of the "Red Data Book" of Azerbaijan, and the Nakhchivan Autonomous Republic as a vulnerable species that is spreading in a limited range or area and is subject to negative effects –IUCN 2016-LC.

A copy of that species is kept in the herbarium fund of Nakhchivan State University. Materials of herbarium are given below:

1. Nakhchivan Autonomous Republic, Kechili Village of Shahbuz District, Safdara. Coordinates: 39°21'58"N, 45°42'47"E, 1742 m asl, middle mountain belt, dry grassy slopes, mountain-xerophytic community; D. Ganbarov, 23.07.2016.

References

Boissier E (1872) *Astragalus* L. In: Boissier E (Ed.) Flora Orientalis. Vol. 2. H. Georg, Geneva and Basel, 205 pp.

Borissova A (1937) *Tragacantha* (Tourn.) Mill. In: Flora of Tajikistan. Vol. 5. The Academy of Sciences of the USSR, Moscow, 709 pp.

Borissova A (1946) *Astragalus* sect. Acanthophace, *Astragalus* subg. *Tragacantha*. In: Komarov VL (Ed.) Flora of USSR. Vol. 12. The Academy of Sciences of the USSR, Moscow, 318–382.

Borissova A (1955) *Tragacantha*. In: Korovin EP (Ed.) Flora of Uzbekistan. Vol. 3. The Academy of Sciences of the UzSSR, Tashkent, 672–686.

Bridson D, Forman L (2010) The herbarium handbook. Royal Botanic Gardens, Kew, 346 pp.

Brummitt RK, Powell CE (1992) Authors of Plant Names. Royal Botanic Gardens, Kew, 732 pp.

Bunge A (1868) Generis *Astragali* species *Gerontogaeae*. Pars prior, claves diagnosticae. Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg, Septième série 11: 1-140.

Bunge A (1869) Generis *Astragali* species *Gerontogaeae*. Pars altera, specierum enumeration. Mémoires de l'Académie Impériale des Sciences de Saint Pétersbourg, Septième série 15: 1-245.

Chamberlain DF, Matthews VA (1970) *Astragalus*. In: Davis PH (Ed.) Flora of Turkey and the East Aegean Islands. Edinburgh University Press, Edinburgh, UK 3: 49-254.

Ganbarov DSh (2021) Chandes in the floristic analysis of the *Astragalus* genus spreading in the flora of the Nakhchivan Autonomous Republic. InterConf 56.

<https://ojs.ukrlogos.in.ua/index.php/interconf/article/view/12506>

Ganbarov DSh (2013) Floristic analysis of the species of *Astracantha* and *Astragalus* spreading the area of the Nakhchivan Autonomous Republic. European Academic Research 1(9): 2586-2593.

Ganbarov DSh (2014) Systematic analysis of *Astracantha* species spread in the flora of Nakhchivan Autonomous Republic. International Journal of Scientific and Research Publications 4(6): 50-55.

Govaerts R, Koopman J, Simpson DA, Goetghebeur P, Wilson K, Egorova T, Bruhl JJ (2018) World Checklist of Selected plant families. Facilitated by the Royal Botanic Gardens, Kew.

Grossheim AA (1950) Flora of the Caucasus. Vol. 4. Moscow, Leningrad, 312 + 178 + XXIpp. [In Russian]

IUCN (2014) IUCN Standards and Petitions Subcommittee. Guidelines for Using the IUCN Red List Categories and Criteria. Version 11. Prepared by the Standards and Petitions Subcommittee. Gland, Switzerland. Available from: <http://www.iucnredlist.org/>

IUCN (2017) Guidelines for using the IUCN Red List Categories and Criteria. Version II, prepared by the Standards and Petitions Subcommittee. Cambridge, UK. Available from: http://jr.iucnredlist.org/documents/Redlist_guidelines.pdf/

Maassoumi AA (1998) *Astragalus* in the Old World, Check List. Research Institute of Forests and Rangeland, Tehran, Iran, 617 pp.

Mamedov TS (2016) Dendroflora of Azerbaijan. Vol. 1, part 3. Vyaz, Baku, 181 pp. [In Azerbaijani]

Mamedov TS, Iskendarov EO, Talybov TKh (2016) Rare trees and shrubs of Azerbaijan. Vyaz, Baku, 380 pp. [In Azerbaijani]

Mammadov T, Gadirova N, Aliyeva Sh (2022) Study of rare and endangered species of the *Astragalus* L. genus in the natural flora of Azerbaijan. Bulletin of Science and Practice 8(5): 59-66. <https://doi.org/10.33619/2414-2948/78/06>

Podlech D, Zarre S (2013) A taxonomic revision of the genus *Astragalus* L. (Leguminosae) in the Old World. In 3 Volumes. Naturhistorisches Museum, Vienna, Austria.

POWO (2020) Plants of the world online. Royal Botanic Gardens, Kew Science. Available from: <http://www.plantsoftheworldonline.org/>

Ranjbar M, Assadi, A, Karamian R (2011) Notes on *Astragalus* sect. *Macrophyllum* with a cytogenetic report on its two tetraploid species. Quarterly Journal of Science Kharazmi University

11(2): 211-226. Available from: <https://ndea10.khu.ac.ir/jsci/article-1-1461-en.pdf/>

Rechinger KH (1958) Leguminosae. In: Koeie & Rechinger (Eds) *Symbolae Afghanicae* (Enumerations and descriptions of the plants collected by L. Edelberg and M. K oe on "The 3rd Danish Expedition to Central Asia" and by W. Koelz, H.F. Neubauer, O.H. Volk, and others in Afghanistan. 9(3): 1-208.

Rzazade R (1954) *Astragalus*. In: Karjagin II (Ed.) *Flora of Azerbaijan*. Vol. 5. The Academy of Sciences of the AzSSR, Baku, 529 pp.

Thiers B (2020) [continuously updated]. *Index Herbariorum: A global directory of public herbaria and associated staff*. New York Botanical Garden's Virtual Herbarium. Available from: <http://sweetgum.nybg.org/ih/>

Townsend CC, Guest E (1974) *Flora of Iraq*. Vol. 3. Ministry of Agriculture & Agrarian Reform, Baghdad, Iraq, 662 pp.

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kusber W-H, Li D-Z, Marhold K, May TW, McNeill J, Monro AM, Prado J, Price MJ, Smith GF (Eds) (2018) *International Code of Nomenclature for algae, fungi, and plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017*. *Regnum Vegetabile* 159. Koeltz Botanical Books, Glash tten. <https://doi.org/10.12705/Code.2018>

Zarre S, Podlech D (1996) Taxonomic revision of *Astragalus* L. sect. *Hymenostegis* Bunge (Leguminosae). *Sendtnera* 3: 255-312.

Zarre S (2000). Systematic revision of *Astragalus* sect. *Adiaspastus*, sect. *Macrophyllum* and sect. *Pterophorus* (Fabaceae). *Englera* 18: 1-219.