

**ASTRAGALUS NAMANGANICUS AND ASTRAGALUS BRACHYRACHIS
(FABACEAE): MORPHOLOGICAL, ECOLOGICAL, PHYTOGEOGRAPHIC AND
TAXONOMICALLY COMPARATIVE ANALYSIS**

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Abstract. Comparative analysis of *Astragalus namanganicus* and *Astragalus brachyrachis*.

This comparative study synthesizes morphological, ecological and taxonomic information for *Astragalus namanganicus* and *Astragalus brachyrachis* from available herbarium records and online taxonomic databases. Both species belong to the family Fabaceae and are adapted to arid, rocky habitats in Central Asia. *A. brachyrachis* has more detailed morphological descriptions available (e.g., subcaulescent habit, larger flowers ~20–25 mm), whereas *A. namanganicus* appears to be a more regionally restricted taxon with limited descriptive material. We recommend further field sampling, standardized morphometric analyses, and molecular phylogenetic studies to resolve taxonomic uncertainties and to assess conservation status.

Keywords: *Astragalus*, Fabaceae, Central Asia, morphology, taxonomy, conservation.

Astragalus L. - One of the largest and most complex genera in the family Fabaceae, containing more than 3,000 species worldwide. The territory of Central Asia, in particular Uzbekistan and the adjacent Highlands and mountainous regions, is one of the species-rich centers of the genus *Astragalus*. *Astragalus* L. - One of the largest and most complex genera in the family Fabaceae, containing more than 3,000 species worldwide. The territory of Central Asia, in particular Uzbekistan and the adjacent Highlands and mountainous regions, is one of the species-rich centers of the genus *Astragalus*. Many narrow areallic, endemic, and relict species have formed in the region, and their systematic position, morphological boundaries, and ecological adaptations still remain in scientific discussion.

Astragalus namanganicus and *Astragalus brachyrachis* belong to such a complex taxonomic group that, despite their external similarities, are distinguished by a number of important diagnostic signs. The main purpose of this article is an in — depth analysis of the morphological, ecological and phytogeographic characteristics of the two species in question, on the basis of available literature, collected herbarium data and online Floristic bases, to identify their similar and different aspects.

Object and subject of research The species *Astragalus namanganicus* Popov and *Astragalus brachyrachis* Bunge were selected as the object of the study. The subject of research is the morphology, ecological requirements, areal and taxonomic position of the vegetative and generative organs of these species. Research techniques The following methods were used in the work

Object and subject of research The species *Astragalus namanganicus* Popov and *Astragalus brachyrachis* Bunge were selected as the object of the study. The subject of research is the morphology, ecological requirements, areal and taxonomic position of the vegetative and generative organs of these species.

Research techniques The following methods were used in the work: comparative-morphological method (leaf, petal, stem, flower and fruit markings); Ecological Analysis (substrate, altitude region, phytocenosis); areal and phytogeographic analysis; analysis of literature and electronic databases. **Results and discussion** Taxonomic position Both species belong to the genus *Astragalus* of the family *Fabaceae* and belong to closely related groups at the level of sects by morphological characters. **nanalysis of literature and electronic databases** (POWO, World Flora Online, Plantarium and territorial flora). **Results and discussion** Taxonomic position Both species belong to the genus *Astragalus* of the family *Fabaceae* and belong to closely related groups at the level of sects by morphological characters. *A. brachyrachis* is characterized by relatively clear diagnostic signs in the classical literature, while *a. namanganicus* is noted by some authors as a narrow areallic or locally endemic species. **Morphological features** *A. namanganicus* is a perennial, low-growing, often semi-bushy (subshrub) plant. The STEM is short, with the main biomass concentrated around the root throat. The leaves are patchy, the number and size of the petals are variable depending on environmental conditions. The degree of baldness is moderate, this feature indicates that it is adapted to a dry and open environment. *A. brachyrachis*, on the other hand, has a subcaulescent growth form with a relatively well-developed stem, usually reaching 15-30 cm in height. The petals are relatively densely located, the pubescence is stronger.

The flowers are larger, often yellow, and this sign is important diagnostic in the identification of the specie. **Generative organs.** The structure of generative organs is important in distinguishing species. *A. brachyrachis*, the flowers are about 20-25 mm long, formings. The structure of generative organs is important in distinguishing species. *A. brachyrachis*, the flowers are about 20-25 mm long, forming a ciliated nodule. The fruits (pods) are distinguished by their shape and degree of pubescence. *A. namanganicus*, however, there is less description of generative characters, a condition that requires additional phenological and morphometric studies.

Ecology and phytocenotic connection. Both species are found mainly in dry, rocky, low-fertile soils, in mountainous and low mountain regions. They have xerophytic and psammoxerophytic properties and are adapted to strong insolation and moisture deficiency. **oth** species are found mainly in dry, rocky, low-fertile soils, in mountainous and low mountain regions. They have xerophytic and psammoxerophytic properties and are adapted to strong insolation and moisture deficiency. **A.** The distribution of *namanganicus* is more associated with the Fergana Valley, while *A. brachyrachis* has a relatively wider ecological amplitude.

Areal and endemism

A. namanganicus is highly likely to be a narrowly distributed species, which can be considered an important endemic component of the flora of Uzbekistan **us** is highly likely to be a narrowly distributed species, which can be considered an important endemic component of the flora of Uzbekistan. *A. brachyrachis*, on the other hand, is distributed within Central Asia, with lower levels of endemism.

Conclusion

Although morphologically similar, *Astragalus namanganicus* and *Astragalus brachyrachis* differ in growth form, flower size, degree of pubescence, and areali. *A. namanganicus* is a narrowly distributed and possibly endemic species that requires further field and herbarium research. *A. brachyrachis* is relatively well studied and has clear diagnostic signs.

Molecular-genetic analysis is important in determining phylogenetic relationships between these species. Diagnostic signs and morphometric analysis (deepened). A complex of diagnostic signs plays an important role in the exact differentiation of species. *Astragalus namanganicus* is relatively well studied and has clear diagnostic signs. Molecular-genetic analysis is important in determining phylogenetic relationships between these species. A complex of diagnostic signs plays an important role in the exact differentiation of species. The main morphometric and qualitative characters for *Astragalus namanganicus* and *Astragalus brachyrachis* are summarized as follows.

Description of diagnostic characters

Growth form: *A. namanganicus*-semi-bushy, with a reduced stem; *A. brachyrachis* is a subcaulescent, with a clearly developed stem.

Leaf length: *A. namanganicus* da variable depending on environmental conditions; *A. brachyrachis* da is relatively stable (usually 10-15 cm).

Number and size of petals: *A. rowth form: A. namanganicus*-semi-bushy, with a reduced stem; *A. brachyrachis* is a subcaulescent, with a clearly developed stem. Leaf length: *A. namanganicus* da variable depending on environmental conditions; *a. brachyrachis* da is relatively stable (usually 10-15 cm). Number and size of petals: *A. the number and size of petals (7-15 mm) in brachyrachis* is relatively constant; *a. in namanganicus*, however, variability is high. Hair removal (indumentum): *A. denser at brachyrachis*, *a. at namanganicus* at a moderate level.

Flower length: *A. brachyrachis*-20-25 mm; *a. namanganicus* - less noted in sources, probably smaller.

Fruit (legumes) structure: *A. shape and plumage at brachyrachis* is of diagnostic importance; *A. not sufficiently studied in namanganicus*.

Practical significance:

The results can be applied in the process of inventory of the flora of Uzbekistan and identification of rare species.

A. provides the basis for the development of scientific recommendations for the conservation of namanganicus and the preservation of its natural populations. The results of the study can be used as educational material in the disciplines of Botany, Systematics and geography of plants in higher education institutions.

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