

## Geographical Areal Types of *Astragalus* Species Spread in Nakhchivan Autonomous Republic

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**Abstract:** The article systematically examines 85 species of astragalus gathered among 2 sorts of *Fabaceae* Lindl. family: *Astracantha* Podlech and *Astragalus* L. which are spread in the area of Nakhchivan AR, and their development and formation in the historical-evolutionary process and their areal types are shown in the article. It has been known that most of the existing types of *Astracantha* and *Astragalus* are included into classes and groups as Atropatan, Northern İnan, Asia Minor Front Asia. The investigation of geographical elements, their groups and classes makes it possible to learn out the flora genetically or historically, to be more true, to learn out the ways, the time and the place where the types have come from to this area.

**Key Words:** Nachkcivan, classification, flora, phtosentez, geographical element, ecosystem, class, group.

### Naxçıvan Özerk Cumhuriyeti'nde Yayılmış Geven Türlerinin Coğrafi Areal Tipleri

**Özet:** Makalede Nahçıvan Özerk Cumhuriyeti'nde yayılmış *Fabaceae* Lindl. Familyasından 2 *Astracantha* Podlech ve *Astragalus* L. Cinslerine ait toplam 85 geven türü incelenmiş, gelişim tarihleri ve coğrafi yayılış alanları belirtilmiştir. Nahçıvan'da yayılış gösteren *Astracantha* ve *Astragalus* türleri aynı zamanda Atropatan, Küçük Asya, Orta Asya, Kuzey İnan'da yayılış göstermektedir.

Coğrafi bölgelerin, sınıf ve gruplarının araştırılması, floranın; genetik yapısı, türlerin bu bölgeye nereden, ne zaman ve hangi yollarla geldiğinin belirlenmesine yardımcı olacaktır.

**Anahtar sözcükler:** Nahçıvan, sınıflandırma, flora, fotosentez, coğrafi bölge, ekosistem, sınıf, gurup.

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## Introduction

Nakhchivan Autonomous Republic has natural plant carpet with rich and specific flora. This characteristic feature is closely related to its natural-historical, physico-geographical condition, geological and geomorphological structure, land climate characteristics, complex effect of ecological and antropogenic factors formed in the historical-evolutionary process which has been lasted for millions of years.

The plant kingdom among natural resources is of specific importance for its place in ecosystem and for being the starting point of food stuffs/chains. It is clear that solution of a number of complex duties as rational usage of plants, state control over their protection, determining rare types and their preservation are on the social-economical agenda of each country.

A number of great scientists have investigated the formation process of flora in the area of the region. The thorough investigation of the areal flora was not set as a goal. From this point of view, thorough and complex investigation of flora, vegetable world of Nakhchivan AR should be carried out in the systematic, biomorphological, bioecological, phytocenological, plant resources, biochemical directions.

It is also known as time passes the conclusions of the carried out investigations get older, their study and newly formed characteristics should be taken into consideration periodically. As a result of it, there arises a great necessity to define natural resources of higher plants in the region, carrying out investigations according to the condition having been changed due to natural-historical,

ecological antropogenic influences, their protection, the study of rational and solid usage possibilities and to work out urgent constructive proposals.

Accordingly, the thorough investigation of *Astracantha* Podlech and *Astrogalus* L. astragalus types of *Fabaceae* Lindl. family spread in Nakhchivan Autonomous Republic is one of the actual problems.

## Material and Method

While carrying out this work there was usage from commonly accepted floristic, systematic, ecological, geographical, geobotanical, plant resources methods, the floras of Turkey and İnan, fundamental books as "Flora of the USSR", "Flora of the Caucasus", "Flora of Azerbaijan" and a number of modifiers, methodical instructions, works by A.A. Grossheim (1936), L.I. Pulipko (1939), A.Sh. İbrahimov (2007). The latest taxonomical appendices and amendmends were made according to factual materials in the Herbari fonds of Nakhchivan State University, Bioresources Institute of ANAS, Herbarium of Botany Institute of ANSA, S.K. Cherepanova (1995). Appropriate amendmends were made about incogruity and repetitions noticed in the names of taxons. Investigations on fields were carried out according to scientific missions, local and international expeditions, phenological observations, hospital and semi-hospital methods.

## Experimental part

The modern flora of Nakhchivan AR has an ancient history. A.N.Crishtafovich divides the development of superior plants (Telomophyta) into four eras as Talloshyte (the marine flora), Paleophyte, mesophyte and Kinophyte (Krishtofovich, 1947). The

development of flora and vegetable kingdom of Nakhchivan AR belongs to Mezophyte and Kinophyte eras. Mezophyte era encloses the ages of Perm, Trias, Yura and Chalk during which Neomezophyte and Paleomezophyte floras existed; and Kaynophyte era includes Paleogen, Neogen and fourth ages. The kserophyte type flora of the region has historically developed and formed in close genetical connection with the floras of the Meditterian, Western Asia and Iran.

Recently 2835 species of supreme spored, bareseeded and flowering plants belonging to 874 sorts, 170 families have spread in the area of the region taking into consideration the latest systematic changes. One of the families represented with the most species is *Fabaceae* family. 85 species of the members of the family were divided into two sorts according to the latest taxonomic nomenclature (Talibov, İbrahimov, 2008). 16 of them were given to the *Astracantha* sort whichw as newly created from *Astragalus* sort, and the other 69 species were kept in *Astragalus* sort. According to the conclusions achieved during the investigations and according to literature resources the geographical elements of the species of *Astracantha* and *Astragalus* were defined and thoroughly

examined. The areals of plants spread on the Earth are very different. The geographical conditions of the areals and the groups which the proper species are combined together makes their geographical elements (Aliyev, 1984 ). The main geographical elements of the species (the Mediterranean, Iran, Asia Minor Front Asia, Atropatan and others) belonging to *Fabaceae* family spread in Nakhchivan AR and their division into small elements were defined. The investigation of geographical elements makes it possible to learn out the flora genetically or historically, to be more true, to learn out the ways, the time and the place where the types have come from to this area.

As a result of the studying of investigation materials and literature information it was defined that the *Fabaceae* family is represented with 46 sorts and 258 species in the area of Nakhchivan Autonomous Republic. 16 species of them (6,20%) belongs to *Astracantha* sort, 69 species (26,74%) *Astragalus* sort. It means that sorts of the family forms 33% of common species.

The geographical elements of *Astracantha* and *Astragalus* sorts are given in the table.

Table 1. **Geographical Areal Types of *Astracantha* Podlech and *Astragalus* L. Species Spread in Nakhchivan Autonomous Republic**

№	Names of the species	Geographical Areal Type
1.	<i>Astracantha alexeenkoana</i> (B.Fedtsch. & İvanova) Podlech	-
2.	<i>A.andreji</i> (Rzazade) Czer.	-
3.	<i>A.aurea</i> (Willd.) Podlech	Armenia-Iran
4.	<i>A.barba-carpina</i> (Al.Theod., Fed. & Rzazade) Podlech	-
5.	<i>A.flavirubens</i> (Al.Theod., Fed. & Rzazade) Podlech	-
6.	<i>A.gudrathi</i> (Al.Theod., Fed. & Rzazade) Podlech	-

7.	<i>A.insidiosa</i> (Boriss.) Podlech	Asia Minor
8.	<i>A.jucunda</i> (Al.Theod., Fed. & Rzazade) Czer	-
9.	<i>A.karabaghensis</i> (Bunge) Podlech	Northern Iran
10.	<i>A.karjagini</i> (Boriss.) Podlech	Northern Iran
11.	<i>A.meyeri</i> (Boriss.) Podlech	-
12.	<i>A.microcephala</i> (Willd.) Podlech	Asia Minor
13.	<i>A.oleifolia</i> (DC.) Podlech	Asia Minor
14.	<i>A.stenonychoides</i> (Freyn & Bornm.) Podlech	-
15.	<i>A.vedica</i> (Takht.) Czer.	Atropotan
16.	<i>A.pycnophyllus</i> Stev.	-
17.	<i>Astragalus achundovii</i> Grossh.ex Fed.	Atropotan
18.	<i>A.aduncus</i> Willd.	Front Asia
19.	<i>A.aegobromus</i> Boiss. & Hohen	-
20.	<i>A.alpinus</i> L.	Holarctics
21.	<i>A.ammophilus</i> Kar. & Kir.	İran-Turan
22.	<i>A.angustiflorus</i> C.Koch	Armenia-Iran
23.	<i>A.arguricus</i> Bunge	Atropotan
24.	<i>A.arguroides</i> G.Beck. ex Stapf	Atropotan
25.	<i>A.asterias</i> Stev.ex Ledeb.	-
26.	<i>A.aznabjurticus</i> Grossh.	-
27.	<i>A.badamliensis</i> Chalilov	-
28.	<i>A.calycinus</i> Bieb.	Caucasus
29.	<i>A.camptoceras</i> Bunge	-
30.	<i>A.campylorrhynchus</i> Fisch. & C.A. Mey.	Southern Iran
31.	<i>A.cancellatus</i> Bunge	-
32.	<i>A.candolleanus</i> Boiss.	-
33.	<i>A.chalilovii</i> Grossh. ex Fed.	Atropotan
34.	<i>A.choicus</i> Bunge	Armenia-Iran
35.	<i>A.cicer</i> L.	Europe
36.	<i>A.commixtus</i> Bunge	Southern Iran-Turan
37.	<i>A.compactus</i> Willd.	Armenia
38.	<i>A.conspicuos</i> Boriss.	-
39.	<i>A.cornutus</i> Pall.	Sarmat
40.	<i>A.corrugatus</i> Bertol.	Southern Iran-Turan
41.	<i>A.erivanensis</i> Bornm. & Woronow	Atropotan
42.	<i>A.euoplus</i> Trautv.	-
43.	<i>A.fabaceus</i> Bieb.	Northern İran
44.	<i>A.falcatus</i> Lam.	-
45.	<i>A.finitimus</i> Bunge	İran
46.	<i>A.resupinatus</i> Bieb.	-
47.	<i>A.glycyphylloides</i> DC.	Eastern Mediterranean Sea
48.	<i>A.gezeldarensis</i> Grossh.	Northern İran
49.	<i>A.glycyphyllos</i> L.	Westernpalearctic
50.	<i>A.goktschaicus</i> Grossh.	Northern İran

51.	<i>A. grammocalyx</i> Boiss. & Hohen.	Northern Iran
52.	<i>A. hajastanus</i> Grossh.	Atropotan
53.	<i>A. hamosus</i> L.	-
54.	<i>A. incertus</i> Ledeb.	Asia Minor
55.	<i>A. karakuschensis</i> Gontsch.	Northern Iran
56.	<i>A. kochianus</i> Sosn.	Northern Iran
57.	<i>A. lagurus</i> Willd.	Armenia-Northern Iran
58.	<i>A. longicuspis</i> Bunge	-
59.	<i>A. macrostachys</i> DC.	Front Asia
60.	<i>A. mesites</i> Boiss. & Buhse	-
61.	<i>A. montis-aguilis</i> Grossh.	Atropotan
62.	<i>A. nachitschevanicus</i> Rzazade	-
63.	<i>A. odoratus</i> Lam.	Asia Minor
64.	<i>A. ordubadensis</i> Grossh.	Atropotan
65.	<i>A. paradoxus</i> Bunge	Atropotan
66.	<i>A. pinetorum</i> Boiss.	-
67.	<i>A. polygala</i> Pall.	Asia Minor and Caucasus
68.	<i>A. prilipkoanus</i> Grossh.	Atropotan
69.	<i>A. psiloglottis</i> Stev. ex DC.	-
70.	<i>A. polyphyllus</i> Bunge	Alban
71.	<i>A. persicus</i> Fisch. & C.A.Mey. ex Bunge	Northern Iran
72.	<i>A. regelii</i> Trautv.	-
73.	<i>A. robustus</i> Bunge	Atropotan
74.	<i>A. schelkovnikovii</i> Grossh.	Atropotan
75.	<i>A. strictifolius</i> Boiss.	Northern Iran
76.	<i>A. saganlugensis</i> Trautv.	Armenia-Iran
77.	<i>A. schachbuzensis</i> Rzazade	Garabagh
78.	<i>A. sevangensis</i> Grossh.	Northern-Atropotan
79.	<i>A. striatellus</i> Pall. ex Bieb.	Turan
80.	<i>A. strictilobus</i> Barneby	-
81.	<i>A. szovitsii</i> Fisch. & C.A. Mey.	-
82.	<i>A. takhtadzhanii</i> Grossh.	-
83.	<i>A. tribuloides</i> Delile	The Mediterranean Sea
84.	<i>A. uraniolimneus</i> Boiss.	Northern-Iran
85.	<i>A. viridis</i> Bunge.	Atropotan

From the examining of the table it becomes clear that the geographical areal types of 9 species out of 16 species belonging to *Astracantha* sort spread in the area of Nakhchivan AR – *Astracantha alexeenkoana* (B.Fedtsch. & Ivanova) Podlech, *A. andreji* (Rzazade) Czer., *A. barba-carpina* (Al.Theod., Fed. & Rzazade) Podlech, *A. flavirubens* (Al.Theod., Fed. &

Rzazade) Podlech, *A. gudrathi* (Al.Theod., Fed. & Rzazade) Podlech, *A. jucunda* (Al.Theod., Fed. & Rzazade) Czer., *A. meyeri* (Boriss.) Podlech, *A. stenonychioides* (Freyn & Bornm.) Podlech, *A. pycnophyllus* Stev. are not known. The other 7 species belong to four classes. The geographical areal types of 21 species out of 69 species of *Astragalus* sort –

*Astragalus aegobromus* Boiss. & Hohen, *A. asterias* Stev. ex Ledeb., *A. aznabjurticus* Grossh., *A. badamliensis* Chalilov, *A. camptoceras* Bunge, *A. cancellatus* Bunge, *A. candolleanus* Boiss., *A. conspicuus* Boriss., *A. euoplus* Trautv., *A. falcatus* Lam., *A. resupinatus* Bieb., *A. hamosus* L., *A. longicuspis* Bunge, *A. mesites* Boiss. &

Buhse, *A. nachitschevanicus* Rzazade, *A. pinetorum* Boiss., *A. psiloglottis* Stev. ex DC., *A. regelii* Trautv., *A. strictilobus* Barneby, *A. szovitsii* Fisch. & C.A.Mey., *A. takhtadzhanii* Grossh. are not known, the other 48 species belongs to 27 classes and groups of geographical areal type (table 2).

Table 2. Classes and groups of geographical areal types

№	Classes and groups of geographical areal types	Number of classes and groups	According common number(85) (with per cent)
1	Armenia-Iran	4	4,71
2	Armenia-Northern Iran	1	1,18
3	Armenia	1	1,18
4	Asia Minor	5	5,88
5	Asia Minor and Caucasus	1	1,18
6	Northern Iran	11	12,94
7	Iran	1	1,18
8	Iran-Turan	1	1,18
9	Southern Iran	1	1,18
10	Southern Iran-Turan	1	1,18
11	Atropatan	14	16,47
12	Northern - Atropatan	1	1,18
13	Front Asia	2	2,35
14	Caucasus	1	1,18
15	Europe	1	1,18
16	Sarmat	1	1,18
17	Alban	1	1,18
18	Turan	1	1,18
19	The Mediterranean Sea	1	1,18
20	Eastern Mediterranean Sea	1	1,18
21	Western-palearctic	1	1,18
22	Holarctics	1	1,18
23	Garabagh	1	1,18
<b>Total:</b>		<b>55</b>	<b>100</b>

As understood from the table most of the plant species belonging to Astrakanta and astragalus sorts are included into Atropatan 14 (16,47%), Northern Iran 11 (12,94%) and Asia Minor 5 (5,88%), Front Asia 2 (2,35%) classes and groups of the Caucasus geographical areal types (Grossheim, 1936).

One species is included into each of the classes of Caucasus, Europe, Sarmat, Turan, the Mediterranean, Holarctic.

Available Herbarium materials and literature information don't reflect the systematic structure and objective laws of spreading of *Astracantha* and *Astragalus* sorts of *Fabaceae* family completely. We consider it expedient to study real forms in a complex way in our further investigations.

### **Kaynaklar**

**Aliyev JA, Aliyev RA, Afandiyeva ShM 1984.** Geography of plants on the basis of Botany, Maarif, Baki.

**Talibov TH, İbrahimov ASh 2008.** Taxonomic spectr of the flora of Nakhchivan Autonomous (supreme spored, bareseeded and coveredseeded plants). Ajamy, Nakhchivan, pp. 62-83.

**Grossheim AA 1936.** Kafkasya bitki örtüsü analizi. Botanik Enstitüsü Tutanakları. Cilt I.. Ed. SSCB Bilimler Akademisi Azeri dalı. Bakü, s.37-64

**Ibragimov AŞ 2007.** Nahçıvan Özerk Cumhuriyetinin bitkiliyi, verimlilik ve botanik-coğrafi bölgelere ayırma. Özet. dis .... Doktor. biyol. bilimler. Bakü.

**Krishtofoviç AN 1947.** Üçüncü dönemde SSCB'nin bitkilerin coğrafi dağılımı. / II Coğrafya Kongre, Proc. Raporlar. bölümü. Biyocoğrafya. L., s.68-69

**Prilipko LI 1939.** Nahçıvan Özerk Cumhuriyeti'nde bitkilik ilişkileri. Ed. Az FAN, Bakü, 198 s.

**Cherepanov SK 1981.** SSSR vasküler bitkileri, Yayın.. "Elm", Leningrad, s.300