International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 12-10-2021, Accepted: 27-10-2021, Published: 13-11-2021
Volume 6, Issue 6, 2021, Page No. 294-297

Phytosenological features of Daridagh and Ilandagh Sparse Juniper Forest

Gunay Fakhraddin Gizi Quliyeva
Nakhchivan Teachers' Institute, Azerbaijan

Abstract
In the Nakhchivan Autonomous Republic, Daridagh and Ilandagh are among the most important territories where Gymnosperm plants inhabit. During the research conducted on the territory of the Daridagh, Juniperus polycarpos C.Koch, J. foetidissima Willd. and J. communis L. species belongin to the Juniperus L. genus of the Cupressaceae S.F. Gray family of the Gymnospermae class, and Ephedra procera Fisch & C.A. Mey. species belongin to the Ephedra L. genus of the Ephedraceae Dumort family of the Gymnospermae class were detected. Ilandagh, considered a natural monument, is surrounded by steep slopes and impassable rocks, its flora is peculiar as well, it is surrounded only by. J. foetidissima Willd. and Juniperus polycarpos shrubs. Both sparse juniper forests have enough potential to regenerate itself. Since Daridagh and Ilandagh territories are included in Ordubad State Nature Reserve, the juniper species here are fully protected. But the future fate of the plants in both mountains will be possible with the precipitation of snow and rains in accordance with the norm and the elimination of severe drought.

Keywords: copressaceae, daridag, ilandag, juniper, juniperus, bitterness, ephedra

Introduction

The Nakhchivan Autonomous Republic is a typical mountainous region within the Republic of Azerbaijan and is located in the south-west of the Lesser Caucasus. The total area of the Nakhchivan AR is 5502.75 km^2, the most remote point from the north is Komurludagh located on the shoulder of Saraybulag mountain range, which is included in the territory of Sharur region. The southernmost point of the Zangezur chain is the Zerani railway stop, which gradually descended from the Cold Mountain and reached 600 m on the Left Bank of the Araz. The length of the borderline with the neighboring states of the Nakhchivan AR is 398 km. Of these, for 163 km it borders with Iran on the south and West along the Araz River, for 11 km on the northwest borders with Turkey along the Araz River and for 224 km on the North and North-East with Armenia. The border with Armenia stretches along the watershed of the Daralayaz and Zangezur ranges. The Zangezur range has many north-west trending ranges, one of which is the Daridagh and Garayokhush range. These ridges merge into the Zangezur ridge with the Daridagh (1927 m), located in the Abragunus depression, and the Ilandagh (2415 m), rising in the form of a dome. The mineral spring Daridagh is located in the Julfa region northeast of the city Julfa, in the gorge of the Shorlu River, at an altitude of 800-900 meters above sea level, near the arcenic deposit Daridagh. Rich in carbon dioxide, highly mineralized water contains arcenic. The name of this spring comes from the name of the mountain of the same name, located on the territory. On the territory of the Julfa region, 8 km northeast of the Julfa city, at the foot of the Daridagh, at an altitude of 900 m above sea level, there is a thermal spring Daridagh. The mineral thermal waters coming out of the ground under high pressure contain carbon dioxide, arsenic, highly mineralized chloride -bicarbonate-sodium.

Mineral springs, known in Germany under the names "Durkheim", in Poland as "Kudova", in France as "Lois-Nightingale", in Russia as "Sinegorsk" (Sakhalin), also have similarities with this water. But Daridagh mineral water differs from the thermal springs mentioned above by its high salt content [1]. It is used to treat nervous, skin and other diseases.

During the investigation, the plants of the *Gymnospermae* family, especially Juniper sparse forests were investigated and evaluated in these ranges.

Material and Methodology

As a research material, *Gymnospermae* plants were taken from Daridagh and Ilandagh area. While the implementation of the study, the generally accepted floristic, systematic, ecological, geographical, geobotanical, plant resources methods are used in the study of flora and vegetation. "Метод фенологических наблюдений при ботанических исследованиях" [9], "Методика полевых геоботанический исследований" [8], "Флора Кавказа" of A.A. Grossheym [7], "Флора Азербайджана" [10] were used as a methodological means, and Protection Status of rare species was determined on base of Red Books and Red Data Book categories of IUCN and works of T.H. Talibov [3, 4]. The specification of systematic taxons was clarified by the information taken from International Botanical Nomenclature code and Angiosperm Phylogeny Group-APG IV və Germplasm Resources Information Network *(GRIN)* [11, 12, 13, 14].

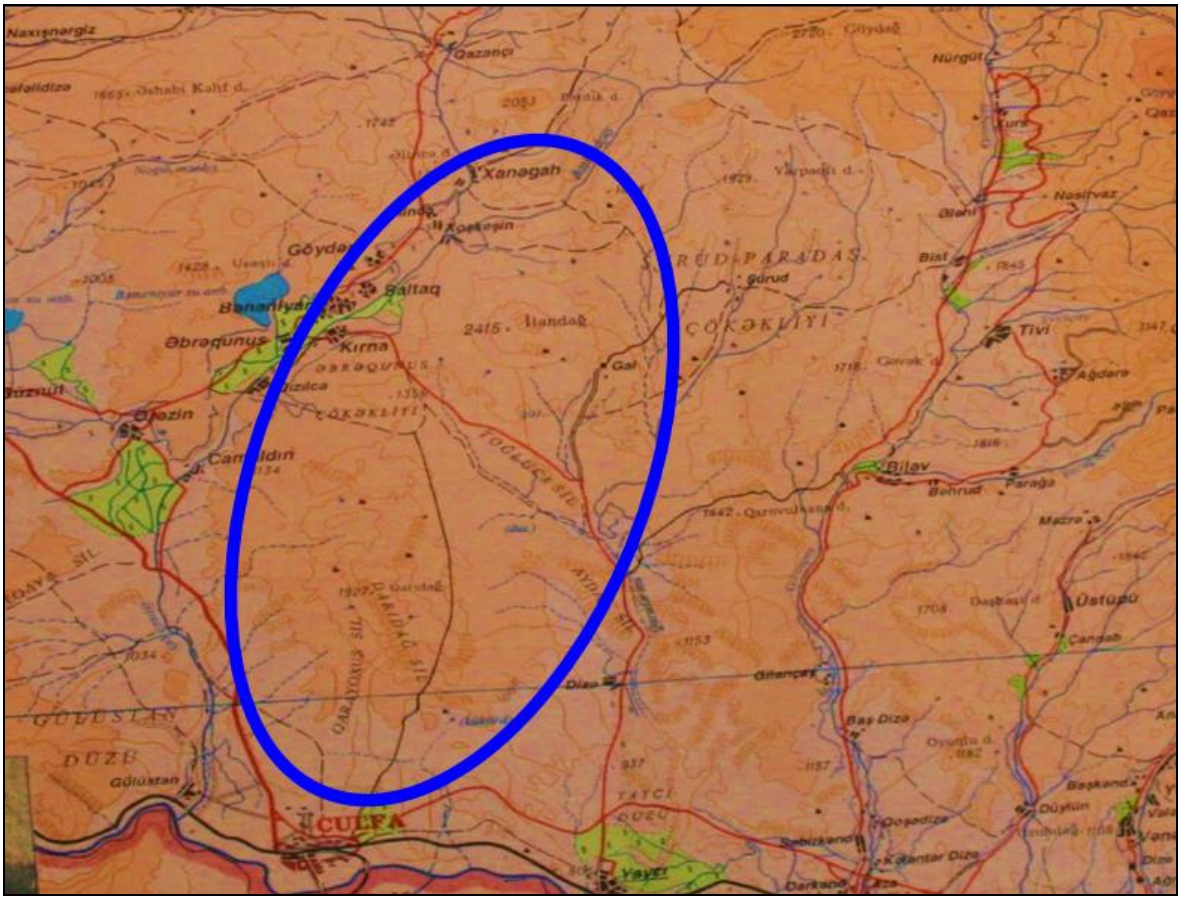

Fig 1: Physical map of the Daridagh territory

The measurement of the experimental zones was carried out using the TOMSHKO TM 1000A-"Laser distance meter Telescope", the MAVIC mini-drone, which gave the opportunity to indicate *Gymnospermae* plants on steep cliffs and impassable rocks, by the help of GPS apparatus coordinates were determined and the images were taken using Nikon cameras.

Discussion of the Study

According to the studies and literature, currently classification division of *Gymnospermae* plants in the territory, including the species found while the excavation (--*) and cultural flora (*--) on the territory of the Nakhchivan Autonomous Republic [2, 5, 6] is as follows:

Phylum: *Gnetophyta* Bessey, 1907

Classis: *Ephedropsida*

Ordo: *Ephedrales* Dumort., 1829 nom. cons.
1. Fam: *Ephedraceae* Dumort., 1829, nom. cons.
1. Genus: *Ephedra* L.
1(1) *Ephedra procera* Fisch & C.A. Mey.
2(2) *E. aurantiaca* Takht. & Pachom. (*E. equisetina* Bunge, 1852; *E. distachya* L.)

Phylum: *Pinophyta*
Classis: *Pinopsida*
Ordo: *Pinales*
1. Familia: *Araucariaceae* Henkel et W. Hochstetter
1. Genus: *Araucaria* Juss.
1(1) *Araucaria angusta* (Palib.) Takht. (*Protodammara*)*
2. Genus: *Agathis* Salisb.
2(1) *Agathis borealis* (Heer) Krysht. et Baik*
3. Genus: *Brachyphyllym* Brongniart
3(1) *Brachyphyllym araxenum* Palib.*
4(2) *B. obesiforme* Sap.*

2. Familia: *Pinaceae* Spreng. ex Rudolphi
1. Genus: *Abies* Mill.
5(1) *Abies* sp.*
2. Genus: *Pinus* L.
6(1) *Pinus kochiana* Klotzsch
7(2)**P. sylvestris* L.
8(3)**P. brutia* var. *eldarica* (Medw.) Silba, 1985
9(4) *Pinus* sp.*
3. Genus*: Cedrus* Trew
10(1)**Cedris libanica* A.Rich.

3. **Familia:** *Taxodiaceae* W. Neger.
1. Genus: *Glyptostrobus* Endl.
11(1) *Glyptostrobus europaeus* (A.Br.) Heer*
2. Genus: *Sequoia* Endl.
12(1) *Sequoia reichenbachii* (Geinitz) Heer*

Ordo: Cupressales
4. Familia: *Cupressaceae* S.F.Gray
1. Genus: *Widdringtonites* Endl.
13(1) *Widdringtonites reichii* (Ettingsh.) Heer *
2. Genus: *Cupressus* (Tourn.) L.
14(1)**Cupressus arizonica* Greene
Subfam: *Juniperoideae* C.Koch

3. Genus: *Juniperus* L.
Section: *Juniperus = Oxycedrus*

15(1) *Juniperus communis* L.= *J. communis* L. var. *saxatilis* Pall.
16(2) *Juniperus depressa Stev.*[=*J. communis* L. subsp. *Hemisphaerica* (J. & Presl)

Nym; *J. pygmaea* auct. non (C.Koch) Imch.; *J. hemisphaerica* C. Presl]
17(3) *Juniperus oblonga* Bieb. [*J. communis* L. subsp. *oblonga* (Bieb.) Galushko]

Section: *Sabina* (Mill.) Spach
18(4) *J. excelsa* Bieb. = *J. excelsa* Bieb. subsp. *polycarpos* (C.Koch) Takht.
19(5) *J. polycarpos* C.Koch
20(6) *J. foetidissima* Willd.
21(7) *J. sabina* L..
22(8)**J. virginiana* L..= *J. v.* f. *glauca* Knight

Subfam.: *Thujoideae* Pilg.

4. Genus: *Platycladus* Spach [*Biota* (D. Don) Endl.]
23(1)**Platycladus orientalis*(L.) Franko [*Thuja orientalis* L.; *Biota orientalis* (L.) Endl.]

5. Genus: *Thuja* (L.) Tourn.
24(1)**Thuja occidentalis* L.

During the study conducted on the territory of the Daridagh, *Juniperus polycarpos* C.Koch, *J. foetidissima* Willd. and *J. communis* L. species belongin to the *Juniperus* L. genus of the *Cupressaceae* S.F. Gray family of the *Gymnospermae* class, and *Ephedra procera* Fisch & C.A. Mey. species belongin to the *Ephedra* L. genus of the *Ephedraceae* Dumort family of the *Gymnospermae* class were detected. In the areas stretching to the north-eastern part of the ridge, we can say that not a single juniper plant has been found, and contrary, on the southern slope of the mountain there are about 7-8 junipers per hectare of area, and sometimes more than 100 junipers on an area of 160 m^2 which form pure juniper formations [Fig 2]. These trees were about 5-30 years old. The juniper plant, which in the past was used as fuel and for agricultural purposes, is no longer fully used by the population. Therefore, the sparse juniper forest will have the opportunity to condense in the future, but the fact that there has been a sharp drought in the last 5 years due to the durable lack of precipitation will certainly create new problems. Beginning from the altitude of about 1200 m above sea level in the downward direction, juniper plants is very rare or does not occur at all [Fig 3].

Fig 2: Pure juniper area-Juniperetum formation

On the northern slope of the ridge, junipers are found in impassable rock and in avalanches, albeit singly. The species we found here are *Juniperus foetidissima* Willd., *J. communis* L. və *Ephedra procera* Fisch & C.A. Mey. The age of junipers is determined visually. We came to the conclusion that the oldest tree is no more than 50 years old. *Ephedra* L. spacies are most often formed on calcareous soils [Fig 4].
A small shrub-forest has formed on a not quite sunny part of the valley. Inside the shrub-forest took place *Pyrus salicifolia* Pall., *Acer campestre* L., *Crataegus pentagyna* Walds. & Kit, *Cerasus araxina* Pojark., *Lonicera iberica* Bieb., *Prunus amygdalus* Batsch(*Amygdalus fenzliana*), *Tamarix hohenackeri* Bunge, *Rhamnus cathartica* L., *Berberis integerrima* Bunge, *Rosa canina* L., and in its vicinity *Juniperus polycarpos* C.Koch, *Juniperus foetidissima* Willd., *Atraphaxis spinosa* L., *Onobrychis transcaucasica* Grossh., *Ephedra aurantiaca* Takht. & Pachom., *Capparis spinosa* L., *Acantholimon araxanum* Bunge, *Atriplex cana* C.A. Mey., *Alhagi pseudalhagi* Fisch species exist [Fig 5].
In forest-shrubby areas, the litter under large umbrella trees mainly consists of the remains of herbaceous plants, dried branches of broad-leaved trees and junipers with fluffy leaves. Therefore, it is thin and soft. In open areas, the litter is not fixed, semi-shrubs, spikes, grass cover and moss-lichen background forms the soil cover in the lower tier. The basis of the grass cover is dry steppe vegetation and a variety of cereals.

Fig 3: The Valley on the east side of Daridagh

Fig 4: Northern Territory of Daridagh

Fig 5: Sunless North of Daridagh and və *Ephedra aurantiaca* Takht. & Pachom

Ilandagh, considered a natural monument, is surrounded by steep slopes and impassable rocks, its flora is peculiar as well, it is surrounded only by. *J. foetidissima* Willd. and Juniperus polycarpos shrubs [Fig.6, 7].

Fig 6: General view of Ilandagh

Fig 7: Juniper groves in Ilandagh

In addition, here *Ephedra procera* Fisch & C.A. Mey., *Zygophyllum atriplicoides* Fisch & C.A. Mey., *Caragana grandiflora* DC., *Sempervivum caucasicum* Rupr. ex Boiss., *Thymus collinus* Bieb. and some grains were prescribed. In general, the number of juniper in juniper groves in Ilandagh is about 80. The age of the oldest juniper tree is about 100 years.

Since Daridagh and Ilandagh territories are included in Ordubad State Nature Reserve, the juniper species here are fully protected. But the future fate of the plants in both mountains will be possible with the precipitation of snow and rains in accordance with the norm and the elimination of severe drought.

Conclusion

In Nakhchivan Autonomous Republic, Daridagh and Ilandagh territories are among the most important habitats of *Gymnospermae* plants. During the study conducted on the territory of the Daridagh, *Juniperus polycarpos* C.Koch, *J. foetidissima* Willd. and *J. communis* L. species belongin to the *Juniperus* L. genus of the *Cupressaceae* S.F. Gray family of the *Gymnospermae* class, and *Ephedra procera* Fisch & C.A. Mey. species belongin to the *Ephedra* L. genus of the *Ephedraceae* Dumort family of the *Gymnospermae* class were detected. Ilandagh, considered a natural monument, is surrounded by steep slopes and impassable rocks, its flora is peculiar as well, it is surrounded only by. *J. foetidissima* Willd. and Juniperus polycarpos shrubs. Both sparse juniper forests have enough potential to regenerate itself. Since Daridagh and Ilandagh territories are included in Ordubad State Nature Reserve, the juniper species here are fully protected. But the future fate of the plants in both mountains will be possible with the precipitation of snow and rains in accordance with the norm and the elimination of severe drought.

Reference

1. Geography of Nakhchivan Autonomous Republic. Physical geography. Nakhchivan, “Ajami” Publishing and polygraphy Union, 2016, 456.
2. Rzayeva AA. Floristic analysis of the genus Juniperus L., introduction of some species in Absheron. Abstract of the dissertation for the degree of Doctor of philosophy, Baku, 2021, 27.
3. Talıbov TH, Ibragimov AM, Guliyeva GF. The role of the species included in the forest ecosystem of the Nakhchivan Autonomous Republic, the Juniper genus (Juniperus L.) Ganja State University. Actual problems of modern natural sciences. International scientific conference (may 04-05, 2017), Ganja,2017:2:9-12
4. Talıbov TH, Ibragimov ASh, Ibragimov AM. Taxonomic spectrum of the flora of Nakhchivan Autonomous Republic. Baku: shirvanneshr PPU, 2021, 426
5. Allahkuliyeva KhM. Juniper woodlands of the northern slope of the Lesser Caucasus within the Republic of Azerbaijan: Dissertation for the degree. cand. biol. sciences. Baku, 1995, 136.
6. Rzayeva AA. Geobotanical analysis of juniper species common in the Shahbuz district of the Nakhichevan Autonomous Republic // Natural and Technical Sciences, 2020, 3.
7. Grossheim AA. Flora of the Caucasus. Baku: Publishing House of Azerbaijani Branch of the USSR Academy of Sciences,1939:1:265.
8. Methods of field geobotanical research. M.-L. of the USSR Academy of Sciences, 1938, 214.
9. The method of phenological observations in botanical research. USSR Academy of Sciences, M.-L. Nauka, 1966, 102.
10. Flora of Azerbaijan. Baku, Publishing House of the Azerbaijan SSR Academy of Sciences,1950:1:370.
11. Adams RP, Schwarzbach AE. Phylogeny of *Juniperus* using nrDNA and four cpDNA regions. Phytologia,2013:95(2):179-187, PDF. Reference page.
12. Armin Jagel, Veit Dörken. Morphology and morphogenesis of the seed cones of the *Cupressaceae* - part III. *Callitroideae*. In: Bulletin of the Cupressus Conservation Project,2013:4(3):91-103.
13. The *Angiosperm Phylogeny Group*. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG IV: // Botanical Journal of the Linnean Society,2016:1:181. P.1-20, DOI: 10.1111/ boj.12385
14. Vegetation of Europe: hierarchical floristic classification system of vascular plant, bryophyte, lichen and algal communities /L. Mucina et al. // Applied Vegetation Science,2016:19(1):24-190