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# Biodiversity conservation of the Gizilagaj National Park of the south Caspian coast

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**Abstract**
Determination of plant species being protected in our country, specification of list, as well as study of reasons of belonging to plant categories for rare and endangered or destroyed of these plants is one of the actual problems of modern period. For this purpose, along with the activities of IUCN (International Union for Conservation of Natural Resources), TPC (Threatened Plant Committee) Secretariat, WWF (World Wildlife Fund), OPTİMA (Organization for the Phytotaxonomic İnvestigation of the Mediterranean), each country is taking measures to protect its flora. From this point of view, state reserves and national parks have been created in the Republic to protect flora with protection status, as well as in the territory of the Caspian coast for protection of Biological Diversity. In the territory of Azerbaijan, the northern, middle and southern parts of the Caspian coast are bordered by the Republic of Dagestan of the Russian Federation in the north, the Caspian Sea in the East and the Islamic Republic of Iran in the South. Gizilaghaj National Park, located south of the Caspian coast between Masalli and Lankaran regions, east of Greenwich 38 p. a. 51 p. m. and 39 p. m. 20 p. m. north, as well as 48 December 50' and 49 December 15' are East-length.Masalli-721,0 for administrative regions within the border kv.km, Lankaran-1548,9 kv.km, and Astara-616,4 kv.km it consists of plots. A natural area has been created on the North, middle and south Caspian coast to preserve biodiversity, as well as to preserve its flora and vegetation.In this regard, some information on the history of the creation of these natural areas and their geographical location is disclosed below.
Gizilagaj State Nature Reserve was established in 1929 in the south-west of the Caspian Sea, gizilagaj National Park (in September 2018), which covers an area of 88400 hectares.
On the territory of the national Park of gizilagach, the Coastal Forest, shrubby, psammophytic-desert, semi-desert vegetation is zonal, and shrub-meadow and wetland vegetation is introsonal.

**Keywords:** biocenosis, ecosystem, phytocenosis, type, formation, association, dominant, subdominant, halophyte, psammophyte, endemic

## Introduction

In March 2000, the Republic of Azerbaijan acceded to the United Nations Convention on Biological Diversity in order to expand international cooperation in the field of biodiversity conservation, which is an important component of natural resources [First National Report on the Convention on Biological Diversity, 2004] [6]. Biological Diversity Since the middle of the twentieth century, biodiversity has been degraded as a result of human activities that threaten biodiversity and ecosystems, and many plant species have become extinct or their numbers have begun to decline sharply. Such loss of biodiversity requires serious measures for its conservation, scientific study and sustainable use [Gurbanov, Jabbarov, 2017,] [10]. Therefore, Presidential Decree No. 1368 of 24 March 2006 provides for scientific research to study of natural reproduction of endangered wild plants and animals in the Decree No. 1368 of March 24, 2006 of Azerbaijani President “On Approval of the National Strategy and Action Plan for the Sustainable Use and Conservation of Biological Diversity in the Republic of Azerbaijan”. In connection with this problem, the biological diversity of the South Caspian coast within the territory of Azerbaijan, as well as the desert vegetation of the Gizilaghaj National Park (GNP) have been studied. In modern times, the creation of national parks, reserves, sanctuaries and etc. natural areas for the protection of natural resources, as well as biodiversity of flora and fauna (biocenoses) is of great ecological importance [Khalilov, 2006; Mammadov, 2003] [17, 21].
Therefore, in order to protect the flora and fauna of the republic, the Gizilagaj National Park (GNP) was established in 1929 on the basis of the state reserve [Vinogradov, Litvinova, *et al*.1990] [31]. The main purpose of the establishment of large and small Gizilagaj on the South Caspian coast of GNP, as well as on the island of Kur dili is to improve the ecological conditions for the protection of ducks, geese, swans, partridges, sultan's chickens and etc. migratory wetland andwild birds included in the “Red Book” [Red Book of Azerbaijan Republic, 2013] [27]. The entire territory of the reserve is an important place for wintering and resting of migratory birds in the Khazar region. According to the botanical-geographical zoning of Azerbaijan, Gizilagaj state nature reserve is included in the territory of Lankaran and Masalli regions: the eastern and northern part to the Kur-Araz lowland, and the western and southern parts to the Lankaran-Mugan region.

GNP is located in the boundaries of administrative regions of Lankaran and Masalli, as well as is surrounded with Neftchala region and Caspian Sea.
Research shows that every tenth of 4500 species of the flora of Azerbaijan is currently in danger of extinction, of these, 547 species are rare or in danger of extinction, of which 17 are highly spore-bearing plants, 5 are bare-seeded plants and 394 are flowering plants [Hajiyev, Musayev, et.al. 2004] [14].
A.M Asgarov [Asgarov, 2016] [3] notes that in the flora of Azerbaijan there are, 146 endemic species of 191 genera in 28 families and 402 subendemic plant species of 191 genera in 58 families. About 400 species of rare plants are found in the flora of the Kyzylagach reserve [Mammadov, 2003] [14]. In this reserve, 360 species of plants of 215 genera in 64 families; phytocenosis typical of semidesert, shrubs, wetlands and coastal-swamps types are widespread in the vegetation. [Hajiyev, Yusifov, 2003] [15]
Endemic species of the Caucasian area: *Plantago filiformis* (*Coronopus*) J. Koch., *Taraxacum grossheimii* Schischk. and *Raphanus rastratus* Dc. (endemic to Azerbaijan) (description) is found in the flora of the reserve.
As noted in the monograph "Vegetation of the reserve and its biodiversity" [Hajiyev, Yusifov, 2003] [15], saline and sandy desert vegetation is recorded here. However, the assignment classification of the relevant phytocenoses as semi-desert type cannot be considered correct. We think that that this plant belongs to the desert type [Movsumova, 2004; Gurbanov, Huseynova, et.al. 2013; Gurbanov, 2004] [23, 9, 13].

**Material and Methdos**

For the first time, geobotanical or phytosenological surveys were conducted in April-May 2016-2017 (field phase) to monitor biodiversity, including the current state of species and structural diversity, and to study vegetation in GNP. In this regard, the following is to be investigated:

- registration of the composition and structure of species diversity of saline and sandy desert-type vegetation;
- providing modern phytocenological classification and compiling a large-scale (1: 200,000) geobotanical map based on it;
- identification of dominant (edificatory), subdominant, endemic, rare, endangered species and their names in the Red Book on plant groups;
- development of recommendations on biodiversity conservation measures.
- Object and methodology of research.

The vegetation studied in the South Caspian coast belongs to the saline and coastal psammophyte desert type. Desert vegetation distributed here in saline, saline meadow-gray soils and sands [Mammadov, Azizova, 2017] [22] were selected as the "objects" or places of research. In this sense, we have conducted geobotanical research in the areas from Gizilagaj Bay to Garagush Island and winter pastures of Neftchala region [Yaroshenko].
The flora and vegetation of the reserve can be noted in the research conducted by A.G.Rubsova [1940], A.A.Grossheym [1948], L.İ.Prilipko [1970] [24], H.A.Aliyev [1988] [2], V.G.Vinogradov [1990] [31], V.J. Hajıyev [2003] [15], E. M. Gurbanov [2017] [10] and others for various purposes.
It should be noted that information on the study of species diversity of desert vegetation in Azerbaijan is given in the works of R.K. Malikov [2004] [18], I.M. Aghaguluyev [2000], F.G. Movsumov [2004] [23] and other studies.
The idea of the existence of desert vegetation in the Republic of Azerbaijan was first put forward by academician E.M. Gurbanov [Gurbanov, 2004] [9] on methodological and geobotanical grounds. According to his scientific considerations, desert-type vegetation is found in saline and saline gray soils, which are resistant to drought and salinity. Among the bushes spread in the sands are *Calligonum* L., and grasses are *Argusia sogdiana* L. and etc., *Convolvulus persicus* L., and etc; there are *Halocnemum strobilaceum* (Pall.) Bieb., Sualda confusa iljin., *Salicornia europaea* L. and etc. from halopyhtes.
Based on the relevant idea of Academician EM Gurbanov, ecological features of flora and vegetation of Samur-Shabran lowland on the Caspian coast [Gurbanov, Huseynova, 2013] [11], as well as geobotanical researches on plant diversity of Absheron, Shirvan National Parks and GNP were conducted by us [Serebryakov, 1964; Flora of Azerbaijan, 1950-1961; Shennikov, 1964] [28]. Herbariums collected from the vegetation of the reserve studied during field research were determined according to the new systematic taxa, the "Flora of Azerbaijan", the "Vegetal life of Azerbaijan, the species were named after S.K. Cherepanova, V.J. Hajiyev and T.E. Gasimova.

**Experimental Parts and Discussion**

The territory of the reserve is included in the "desert and semi-desert zone of the Eastern Transcaucasian province", as well as the first reserve in the republic in terms of territory and the third in terms of history. Its area is 884 thousand km or 83,360 hectares.
The territory of the GNP is located at an altitude of 24.5 to 200 meters above sea level. The height of the water area or water level in the Gizilaghaj Bay varies from 24.5 meters to 29.0 meters [Mammadov, Azizova, 2017] [22]. The reserve borders the winter pastures of Neftchala region in the north, by the lands of Caspian Sea, Masalli and Lankaran regions in the east.
Taking its source from the north-western slopes of the Talish (Lankaran) mountain range, Vilashchay and Bodalichay flow into Gizilagaj Bay [Mammadov, Yusifov, 2012] [20].
The relief is flat and slightly sloping towards the shores of the Caspian Sea. The northern part of the reserve is an accumulative plain consisting of winter pastures of Neftchala region, Kur dili, Garagush island and Sara peninsula with sea alluvial, alluvial-lake and alluvial sediments [Aliyev, Hasanov, 1988; Yusifov, 2003] [2, 15].

The relief of the Caspian coast has led to the formation of a climate. In particular, the area belongs to the type of temperate - hot, semi-desert and steppe (steppe) climate with dry summers [Hajiyev, Rahimov, 1977] [12].
Climate types are characterized by very low and low humidity, mild winters, dry and hot summers. The average annual air temperature varies between 13.2-14.5$^0$C, the annual amount of precipitation reaches 200-600 mm [Vinogradov, Litvinova, 1990] [31].
A desert vegetation (Deserta) of the GNP, is formed in saline and psammophyte groups. According to the "Flora of Azerbaijan", as well as the "Abstract of the flora of the North and South Caspian coasts", it should be noted that the flora of the area includes 16 families, 35 genera and 43 species of Caucasian natural habitat, as well as endemic plants of 16 families, 26 genera and 28 species of Azerbaijan natural habitat.
In the recorded desert-type vegetation, the species typical of the *Chenopodiaceae* Vent. family have a number of advantages in the species composition of *Salicornietum-Petrosimoniosum, Puccinilieta-Limonietum-Artemisiosum, Suaedaetum-Argusiosum* formations.
Species composition of phytocenoses include *Halocnemum strobilaceum, Sualda dendroides, Salsola dendroides, Suaeda confusa, Petrosimonia brachiata, Salicornia europala* and etc. halophytic plants, which indicate soil salinization and indicator [Huseynova, 2011]. In particular, endemic species of the Iris musulmanica and *Plantago caropinus* of Caucasian natural habitat were recorded in the vegetation of the reserve.
The study shows that in the flora of the Caspian coast, 38 rare and endangered species belonging to 32 genera of 38 families, which the names are included in the Red Book (2013), have been identified.
*Dianthus cyri* Fisch. et Willd. and *Galium articulata* (L.) Ehrend. of new natural habitat in the saline and sandy desert phytocenosis of the reserve, are sparsely distributed.
Geobotanical studies of biodiversity on the South Caspian coast have identified the distribution of 25 species in the species composition of *Petrosimonietum brachiata-Salicorniosum europeae* association of the *Salicornietum-Petrosimoniosum* formation belonging to the annual saline desert formation class.
According to the analysis of plant species by biomorphological or life forms 1 species (4.0%) shrubs, 1 species (4.0%) semi-shrubs, 5 species (20.0%) perennial grasses, 2 species (8.0%) biennials herbs and 16 species (64.0%) of annual grasses are found. According to the ecological analysis of the same number of species, 17 species (68.0%) of halophytes, 4 species (16.0%) of xerophytes, 1 species (4.0%) of mesophytes, 1 species (4.0%) of mesoxerophytes and 2 species (8.0%) psammophytes are represented in the composition.
The dominance of the formation and association, (*Petrosimonietum brachiata-Salicorniosum europeae*) the abundance of *Petrosimonia brachiata* (Pall.) Bunge. is considered to be 3-4 points, and the subdominant *Salicornia europaea* L is considered to be 2-3 points. This phytocenosis consists of a three-storeyed or tiered structure. The average height of grass cover is 20-40 cm. The total project coverage varies between 60-80%.

**Table 1:** Species composition and structure of *Solicornietum-Petrosimoniosum* formation. On saline soils between the North of the great Kyzylagach Bay and winter pastures of the Neftchala district

| № | Biomorph species | Ecological groups | Abundance (in points) | Surface flooring and height (in cm) | Phenological phases |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Shrubs | | | | | |
| | Suaeda dendroides (C.A.Mey.) Moq. | halophyte | 1-2 | II (80) | To veg. |
| | Halothamnus glaucus (Bieb.) Botsch. | halophyte | 1 | II (60) | To veg. |
| Perennial grasses | | | | | |
| | Limonium caspicum (Willd.) Gams. | halophyte | 1-2 | II (40) | To flow. |
| | Artemisia lerchiana Web. | xerophyte | 1-2 | III (30) | To veg. |
| | Frankenia hirsuta L. | halophyte | 1-2 | III (20) | To flow. |
| | Cirsium arvense (L.) Scop. | mesophyte | 1 | I (100) | To flow. |
| | Alluropus littoralis (Gouan.) Parl. | halophyte | 1 | III (10) | To flow. |
| Biennial grasses | | | | | |
| | Tragopogon macropogon C.A.Mey. | psammophyte | 1-2 | III (25) | To flow. |
| | Tripolium vulgare Ness. | halophyte | 1 | II (35) | To flow. |
| Annual grasses | | | | | |
| | Petrosimonia brachiat (Pall.) Bunge. | halophyte | 3-4 | III (30) | To veg. |
| | Salicornia europala L. | halophyte | 2-3 | II (25) | To veg. |
| | Lolium rigidum Gaudin | xerophyte | 1-2 | II (45) | To flow. |
| | Hordeum geniculatum All. | psammofit | 1-2 | III (40) | To flow. |
| | Sphenopus divaricatus (Gouan.) Reichenb. | halophyte | 1-2 | III (35) | To flow. |
| | Lepidium perfoliatum L. | meso-xerophyte | 1-2 | III (30) | To flow. |
| | Spergularia diandra (Guss.) Heldr. et Sart. | halophyte | 1-2 | III (25) | To flow. |
| | Plantago coronopus L. | halophyte | 1-2 | III (20) | To flow. |

| | | | | | |
|---|---|---|---|---|---|
| | Suaeda confusa İljin. | halophyte | 1 | II (50) | To veg. |
| | Atriplex tatarica L. | halophyte | 1 | II (45) | To veg. |
| | İris musulmanica Fomin. | xerophyte | 1 | III (30) | To flow. |
| | Anagallis arvensis L. | xerophyte | 1 | III (20) | To flow. |
| | Climacoptera crassa (Bieb.) Botsch. | halophyte | 1 | III (15) | To veg. |
| | Gamanthus pilosa (Pall.) Bunge. | halophyte | 1 | III (10) | To veg. |
| | Parapholis İnsurva (L.) C.E.Hubb. | halophyte | 1 | III (5) | To flow. |
| | Chamomilla aurea (L.) Gay. | halophyte | 1 | III (3) | To flow. |

In the species composition of the formation Caucasian areal *Plantago coronopus* L., *Iris musulmanica* Fomin. and Azerbaijan areal *Tragopogon macropogon* C.A.Mey. endemic plants are found.
*Puccinileta-Limonietum-Artemisiosum* formation of perennial saline-Wormwood formation class of desert vegetation is concentrated in the associations of *Puccinileta gigantea-Limonietum meyeri-Artemisiosum lerchiana, Limonietum meyeri-Artemisiosum lerchiana* and *Limonietum caspica-Artemisiosum lerchiana.*

**Table 2:** In the species composition and structure of the *Puccinelieta-Limonietum-Artemisiosum formation.* On the "shore" of the Kyzylagach Bay and on the saline gray-meadow soil between Kura Island and the Caspian Sea.

| № | Biomorph species | Ecological groups | Abundance (in points) | Surface flooring and height (in cm) | Phenological phases |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Shrubs | | | | | |
| | Lycium ruthenicum Murr. | xerophyte | 1-2 | I (110) | To veg. |
| | Tamarix meyeri Boiss. | meso-xerophyte | 1 | I (200) | To flow. |
| Semi-Shrubs | | | | | |
| | Kochia prostrata (L.) Shrad. | psammo-xerophyte | 1-2 | II (60) | To flow. |
| | Artemisia szowitsianum (Bess.) A.Grossh. | xerophyte | 1 | II (80) | To veg. |
| Perennial Grasses | | | | | |
| | Artemisia lerchiana Web. | xerophyte | 3-4 | II (30) | To veg. |
| | Limonium meyeri (Boiss.) Kuntze | halophyte | 2-3 | II (50) | To flow. |
| | Puccinellia gigantea Grossh. | halophyte | 2 | II (70) | To flow. |
| | Cichorium intybus L. | meso-xerophyte | 1-2 | II (65) | To flow. |
| | Plantago lanceolata L. | meso-xerophyte | 1-2 | III (30) | To flow. |
| | Tarixacum gresshemii Schischk. | mesophyte | 1-2 | III (25) | To flow. |
| | Tragopogon graminifolius DS. | xerophyte | 1 | III (20) | To flow. |
| | Galium articulata (L.) Ehrend. | mesophyte | 1 | III (15) | To flow. |
| | Poa Guebosa L. | xerophyte | 1 | III (10) | To flow. |
| Biennial Grasses | | | | | |
| | Melilotus officinalis (L.) Pall. | mezofit | 1-2 | I (120) | To flow. |
| | Sisymbrium loeseli L. | xerophyte | 1-2 | II (80) | To flow. |
| | Garduus hystrix C.A.Mey. | xerophyte | 1 | II (70) | To flow. |
| | Geranium pusilum L. | mezo-kserofit | 1 | II (50) | To flow. |
| Annual Grasses | | | | | |
| | Petrosimonia brachiata (Pall.) Bunge. | halophyte | 1-2 | III (30) | To veg. |
| | Frankenia pulveruenta L. | halophyte | 1-2 | III (25) | To flow. |
| | Salicornia eurepala L. | halophyte | 1-2 | III (20) | To veg. |
| | Avena clauda Duricu. | xerophyte | 1 | II (40) | To flow. |
| | Barkhausia rholadifolia Bieb. | psammo xerophyte | 1 | II (40) | To flow. |
| | Papaver arenarium Bieb. | psamo-xerophyte | 1 | II (35) | To flow. |
| | Lolium rigidum Gaudin. | psammophyte | 1 | III (30) | To flow. |
| | Lepidium perfoliatum L. | psammophyte | 1 | III (25) | To flow. |
| | Psyllostachys spicata (Willd.) Nevski. | psammo-halophyte | 1 | III (20) | To veg. |
| | Caucalis platycarpus L. | xerophyte | 1 | III (15) | To flow. |
| | Filago pyramidata L. | xerophyte | 1 | III (10) | To flow. |
| | Gamanthus pilosus (Pall.) Bunge. | halophyte | 1 | III (5) | To veg. |

29 species were recorded in the species composition of the formation; of which 2 species (6.9%) shrubs, 1 species (3.4%) semi-shrubs, 1 species (3.4%) shrubs, 9 species (31.1%) perennial grasses, 4 species (13.8 %) biennial grasses and 12 species (14.4%) are annual grasses. According to the ecological analysis of the same number of species are represented by 9 species (31.1%) xerophytes, 6 species (20.7%) halophytes, 5 species (17.2%) mesoxerophytes, 3 species (10.3%) mesophytes, 3 species (10), 3%) psammo-xerophytes and 1 type (3.5%) psammohalophytes. *Artemisia lerchiana* Web. abundance is 3-4 points, subdominant *Limonium meyeri* (Boiss.) Kuntze. abundance is 2-3 points and *Puccinelli gigantea* (Grossh.) Grossh. abundance is 2 points. The structure of the vegetation is reflected in three floors; On the first floor there are *Lycium ruthenicum* Murr., *Tamarix meyeri* Boiss. shrubs and biennial grass *Melilotus officinalis* (L.) Pall. In the second and third tier, annual grasses are found.

*Artemisia szowitsiana* (Bess.) A.Grossh, an endemic plant of the Caucasian natural habitat, spread very rare (1-2 points).

As shown in geobotanical description No. 3, in the reserve area Sualdaetum confusa-*Arguziosum sogdiana* association belonging to the *Suaedaetum-Argusiosum* formation group in the psalmophyte lithoral (coastal) formation class of the psammophyte desert type was formed from the *Suaedaetum confusa-Arguziosum sogdiana* association.

The following can be noted on the biomorphological and ecological analysis of 23 species of higher flowering plants in the species composition of this formation [20, 28, 30]. In particular, according to life forms, 3 species (13.0%) shrubs, 1 species (4.4%) hemlock, 6 species (26.1%) perennial grasses, 2 species (8.7%) biennial grasses and 11 species (47.8%) annual grasses are found in phytosis. According to the ecological analysis of the same number of species, are represented by 12 species (52.1%) psammophytes 8 species (34.8%) halophytes, 2 species (8.7%) b mesoxerophytes and 1 species (4.4%) by xerophytes.

The dominant member of the phytocenosis is *Argusia sogdiana* (Bunge.) Czer., which its abundance is 3-4 points, and the subdominant *Suaedaetum confusa* Iljin. abundance is 2-3 points. Vegetation consists of three floors. The average height of grass cover varies between 15-30 cm and the total project cover varies between 50-70%.

**Table 3:** Species composition and structure of *Suaedaetum-Argusiosum* formation.
The southern part of Gizilaghaj Bay - the island of Kur dili and the shores of the Caspian Sea, in the saline sandy soil.

| № | Biomorph species | Ecological groups | Abundance (in point) | Surface flooring and height (in cm) | Phenological phases |
|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 |
| | | Shrubs | | | |
| | Tamarix ramosissima Lebed. | mesoxephrophyte | 1-2 | I (250) | To flow. |
| | Halocnemum Strobilaceum (Pall.) Bieb. | halophyte | 1-2 | III (30) | To veg. |
| | Sualda dendroides (C.A.Mey.) Mog. | halophyte | 1 | II (60) | To veg. |
| | | Semishrubs | | | |
| | Salsola dendroides Pall. | halophyte | 1 | II (80) | To veg. |
| | | Perennial grasses | | | |
| | Argusia sogdiana (Bunge.) Czer. | psammophyte | 3-4 | III (30) | To flow. |
| | Convolvulus persicus | psammophyte | 1-2 | III (25) | To flow. |
| | Tragopogon graminigolius DC | xerophyte | 1-2 | III (20) | To flow. |
| | Aeluropus littoralis (Gouan.) Parl | halophyte | 1-2 | III (10) | to flow. |
| | Limonium meyeri (Boiss.) Kuntze | halophyte | 1 | II (70) | to flow. |
| | Artemisia scoparia Waldst. et Kit. | psammophyte | 1 | II (65) | To veg |
| | | Biennial grasses | | | |
| | Foeniculum vulgare Mill. | psammophyte | 1 | I (95) | to flow. |
| | Spergularia salina J. et C. Presl. | halophyte | 1 | II (40) | to flow. |
| | | Annual grasses | | | |
| | Sualda confusa İljin. | psammophyte | 2-3 | II (50) | To veg. |
| | Frankenia pulverulenta L. | halophyte | 1-2 | III (20) | to flow. |
| | Vulpia myuros (L.) C.C.Gmel | psammophyte | 1-2 | III (15) | to flow. |
| | Plantago arenaria Woldst. et Kit. | psammophyte | 1-2 | III (10) | to flow. |
| | Lolium rigidum Gaudin. | psammophyte | 1-2 | III (5) | to flow. |
| | Atriplex tatarica L. | halophyte | 1 | II (40) | to flow. |
| | Dianthus cyri Fisch. et Willd. | psammophyte | 1 | III (30) | To veg. |
| | Chenopadium rubrum L. | mesoxephrophyte | 1 | III (25) | To veg. |
| | Amaranthus graecizans L. | psammophyte | 1 | III (20) | to flow. |
| | Sagina apetala Ard. | psammophyte | 1 | III (15) | to flow. |
| | Hordeum geniculatum All. | psammophyte | 1 | III (10) | to flow. |

From our geobotanical studies and research, we conclude that the biodiversity of the reserve, including natural vegetation, has been degraded and desertified by anthropogenic factors and man-made influences [Hajiyev, Musayev, et.al. 2004; Mammadov, 2003] [14]. Therefore, in order to prevent such negative effects, based on the ecological and phytocenological indicators of desert vegetation, it is recommended to implement the following measures for the protection and monitoring of biodiversity on the South Caspian coast: Therefore, in order to prevent such negative effects, based on the ecological and phytocenological indicators of desert vegetation, it is recommended to implement the following measures for the protection and monitoring of biodiversity on the South Caspian coast:

- Establishment of a forest strip with the use of multi-branched willow, southern willow, Russian willow and other psammophyte plants during the consolidation of coastal sands;
- creation of a buffer zone in the reserve in order to prevent grazing of livestock and protection of bird shelters;
- carrying out phytomelioration in salinity and psammophyte desert vegetation.

Implementation of the above recommendations will create a basis for the protection of biodiversity and flora in the Gizilaghaj National Park.

**Conclusion**

25 species of higher flowering plants were recorded in the species composition of the studied *Salicornietum-Petrosimoniosum* formation: 1 species of shrub, 1 species of semi-shrub, 5 species of perennial grass, 2 species of biennial and 16 species of monocotyledonous grasses. According to the ecological analysis of the same number of species, the species composition is represented by 17 species (68.0%) of halophytes, 4 species (16.0%) of xerophytes, 1 species (4.0%) mesophytes, 1 species (4.0%) mesoxerophytes and 2 species (8.0%) psammophytes.

29 species are recorded in the species composition of *Puccinilieta-Limonietum-Artemisiosum* formation: of these, 2 species (6.9%) shrubs, 1 species (3.4%) semi-shrubs, 1 species (3.4%) shrubs, 9 species (31, 1%) perennial grasses, 4 species (13.8%) biennials and 12 species (14.4%) annual grasses. According to the ecological analysis of the same number of species, 9 species (31.1) xerophytes, 6 species (20.7%) halophytes, 5 species (17.2%) mesoxerophytes, 3 species (10.3%) mesophytes, 3 species (10.3%) psammoxerophytes and 1 type (3.5%) psammophytes are involved.

23 species were recorded in the species composition of *Sualdaetum-Argusiosum* formation: 3 species (13.0%) of shrubs, 1 species (4.4%) of semi-shrubs, 6 species (26.1%) of perennial grasses, 2 species (8, 1%) biennial and 11 species (47.8%) annual grasses are recorded. The same number of species (according to environmental analysis) is represented 12 species (52.1%) psammophytes, 8 species (34.8%) halophytes, 2 species (8.7%) mesoxerophytes and 1 species (4.4%) xerophytes. Endemic plants of the Caucasian natural habitat are found in the vegetation: Iris musulmanica, Plantago coronopus, Dianthus cyri, Galium articulata and Tragopogon macropogon of the Azerbaijan natural habitat.

**References**

1. Aghaguluyev İM. Methodical instructions on geobotanical research of natural forage areas of Azerbaijan. Baku, “Science”, 2001, 72.
2. Aliyev HA, Hasanov HH. Guarded by nature. Baku, “Maarif”, 1988, 311.
3. Asgarov AM. Flora of Azerbaijan (Higher Plants - Embryophyta): Baku, TEAS-PRESS Publishing House, 2016, 444.
4. Cherepanov SK. Vascular Plants of Russia and Agrosent States the former USSR. North American Branch Cambridge University. Publishing house, 1995, 992.
5. Dictionary of Azerbaijani flora // Acad. V.C.Hajiyev and c.b.s by T.E Gasimova’s authorship. Baku, “Science”, 2008, 272.
6. First National Report on the Convention on Biological Diversity, Country Research on Biodiversity of the Republic of Azerbaijan. Baku, ANAS, “Alraful” publishing house, 2004, 160.
7. Flora of Azerbaijan. Baku, publishing house of ANAS Azerbaijan. SSR, 1950-1961, 1-8.
8. Grossheim AA. Vegetation cover of the Caucasus. MOIP. 1948, 267.
9. Gurbanov EM. Desert and semi-desert vegetation of the Atrapaten province // Proceedings of the Institute of Botany of ANAS. T. XXV. Baku, "The Science", 2004, 50-55.
10. Gurbanov EM, Jabbarov MT. Geobotany. Baku, “Baku State University” publishing house, 2017, 320.
11. Gurbanov EM, Huseynova HZ, Aliyeva AB. Coastal sandy desert vegetation of Samur-Shabran lowland // Scientific works of the Institute of Microbiology of ANAS. Volume 11 №1. Baku, “Science”, 2013, 254-259.
12. Hajiyev GA, Rahimov VA. Climatic characteristics of the administrative regions of the Azerbaijan SSR. Baku, “Elm” publishing house, 1977, 259.
13. Hajıyev VJ. Vegetation map (Scale 1: 500 000) // Ecological Atlas of the Republic of Azerbaijan. Baku, Baku Cartography Factory, 2009, 111.
14. Hajiyev VC, Musayev SH, Akparov ZI, Ibadullayev SC. On the biodiversity of higher plants of the flora of Azerbaijan // Scientific Works of the Institute of Botany of ANAS. XXV cild. Baku, “Science”, 2004, 88-93.

15. Hajiyev VD, Yusifov EF. Flora and vegetation of the Gizilaghaj nature reserve and their biodiversity. Baku, ANAS Institute of Botany, 2003, 182.
16. Huseynova HZ. Geobotanical researches and importance of saline desert vegetation in Samur-Shabran lowland // Materials of the Scientific Conference of Doctoral Students of ANAS. Baku, “Science”, 2011, 105-107.
17. Khalilov VC. Protected natural areas of Azerbaijan // Scientific works of the Institute of Botany of ANAS. Baku, “Science”,2006:26:182-187.
18. Malikov RK, Huseynova AD. Typology of Kur-Araz lowlands. // Scientific works of the Institute of Botany of ANAS. Baku, “Science”,2004:25:273-282.
19. Mammadov Q, Sh, Khalilov MY. Ecology and environmental protection. Baku, “Science”, 2005, 880.
20. Mammadov G, Yusifov E, Khalilov M, Karimov V. Azerbaijan Ecotourism potential. Part I. Baku, “East-West” publishing house, 2012, 360.
21. Mammadov TS. Ecology. Baku, “Science”, 2003, 300.
22. Mammadov MA, Azizova NA, Nagiyeva XX. Modern condition of lands formed in Lankaran lowland and their anthropogenic transformation // Materials of the Scientific Conference on "Human and Environmental Relations" ANAS acad. Institute of Geography named after H.A. Aliyev. Baku, “Europe” publishing house,2017:20:34-40.
23. Movsumova FQ. Biodiversity of saline desert plants of Azerbaijan and protection of its ecosystem // Scientific Works of the Institute of Botany of ANAS. Baku, “Science”, 2004:25:302-305.
24. Prilipko LI. Vegetation cover of Azerbaijan. Baku, "The Science" publishing house, 1970, 170.
25. Prilipko LI. Kura-Araksin (East Caucasian) lowlands // Vegetation of the European part of the USSR. The science. 1980, 295-298.
26. Rubtsova AG. Vegetation cover of the Gizilaghac reserve named after S.M. Kirov.
27. Red Book of Azerbaijan Republic. Types of the rare and endangered plants and mushrooms. / 2nd edition /. Baku, “East-West” publishing-house, 2013, 676.
28. Serebryakov KG. Life forms of higher plants and research // Field geobotany. M.: The Science, 1964, 146-202.
29. Shennikov AP. Introduction to geobotany. L, 1964, 447.
30. Voronov AG. Geobotany. M.: "High school", 1973, 384.
31. Vinogradov VG, Litvinova NA. others. Gizilaghaj reserve // Nature reserves of the Caucasus. M.: "Mysl", 1990, 287-310.
32. Yaroshenko PD. Geobotany (Basic concepts, directions and methods). M.: L.: publishing house of ANAS USSR, 1961, 474.