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CURRENT STATUS AND TAXONOMICAL COMPOSITION OF THE NATURAL DENDROFLORA OF THE HIRKAN NATIONAL PARK

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СОВРЕМЕННОЕ СОСТОЯНИЕ И ТАКСОНОМИЧЕСКИЙ СОСТАВ ПРИРОДНОЙ ДЕНДРОФЛОРЫ ГИРКАНСКОГО НАЦИОНАЛЬНОГО ПАРКА

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Abstract. The current state of the natural dendroflora of the Hirkan National Park was analyzed, an inventory of natural and cultivated plant species was carried out, the impact of climate change on biodiversity, the taxonomic composition of trees and shrubs, dominant species, and the distribution areas of the studied plants were comprehensively studied. In the forest ecosystem of Hirkan National Park, the area where the plants live change in several directions. In the deep layers of the forest, the sun hits a small amount. The level of illumination depends on the composition, age, density and geometric dimensions of the trees and shrubs that make up the forest. Depending on the amount of light, more or less shade-tolerant species grow in the lower tiers of the forest. Hirkan National Park has undergone anthropogenic impact in recent years. The forest usually consists of 2-3 tiers.

Аннотация. Проанализировано современное состояние природной дендрофлоры Гирканского национального парка, проведена инвентаризация природных и культурных видов растений, всесторонне изучено влияние климатических изменений на биоразнообразие, таксономический состав деревьев и кустарников, доминирующие виды, ареалы распространения изучаемых растений. В лесной экосистеме Гирканского национального парка условия местности, где обитают растения, изменяются в нескольких направлениях. В глубокие слои леса солнце попадает в небольшом количестве. Уровень освещенности зависит от состава, возраста, густоты и геометрических размеров деревьев и кустарников, составляющих лес. В зависимости от количества света в нижних ярусах леса произрастают более или менее теневыносливые виды. Гирканский национальный парк в последние годы подвергается антропогенному воздействию. Лес обычно состоит из 2–3 ярусов.

Keywords: flora, taxonomy, edificators, rare species, relict species, range, plant strata, climate.

Ключевые слова: флора, таксономия, эдификаторы, редкие виды, реликтовый вид, ареал, ярусы растительности, климат.

Introduction

In the flora of Hyrcanus, 1204 species of higher plants are known. There are 174 species of trees and shrubs in the Hirkan National Park, of which 36 species are relict and endemic. Hyrcanian



flora mainly consists of *Quercus castaneifolia* C. A. Mey., *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Parrotia persica* (DC.) C. A. Mey., *Alnus barbata* C. A. Mey., *Zelkova carpinifolia* (Pall.) Dippel, *Diospyros lotus* L., etc. A special place is occupied by tree species, many of which are relicts [9]. The average age of these trees is 120-150 years. In the forests of *Zelkova carpinifolia* (Pall.) Dippel, *Diospyros lotus* L., *Pterocarya pterocarpa* (Michx.) Kunth ex Iljinsk. and so on. *Albizia julibrissin* Durazz., *Quercus castaneifolia* C. A. Mey., *Gleditsia caspia* Desf., various creepers (ivy species) are widespread. Species *Fagus orientalis* Lipsky, *Quercus castaneifolia* C. A. Mey., *Parrotia persica* (DC.) C. A. Mey., *Carpinus betulus* L. are the main edificators in Hyrcanian forests [5]. Evergreen plant species in these areas are *Buxus hyrcana* Pojark., *Ilex hyrcana* Pojark., *Ruscus hyrcanus* Woronow, *Danae racemosa* (L.) Moench. forms an undergrowth. *Ruscus hyrcanus* Woronow usually in the lowland and foothill zone, *Danae racemosa* (L.) Moench. mainly on riverbanks and wet ravines *Ilex hyrcana* Pojark. forms undergrowth in oak and beech forests. At the same time, endemic trees and various plants listed in the Red Book of the Republic of Azerbaijan are widespread in this area.

Material and methods

Vegetation in research Kh. M. Safarov [1], rare and endangered species T. S. Mamedov, E. O. Iskendarov [2, 3], distribution area of V. S. Farzaliev, E. S. Shukurov, G. M. Safarov [4], “Azerbaijani flora” and S. K. Cherepanov [5] were used to identify plants, the layers of V. Ch. Gadzhiev [6], climate P. P. Posokhov and K. S. Asadov [11], systems. APC. III-IV (<https://goo.su/aYhgppj>), endemic, relict species of G. F. Akhundov, I. S. Dzhaferova [7, 8] and literature materials [9] were used.

Analysis and Discussion

The flora of Hyrcanus is geographically rich in flora elements of different types of habitats. Here a special place is occupied by elements of plant groups of boreal and Mediterranean origin.

The territory of the Hirkan National Park has a humid subtropical character due to its natural climate.

The average annual rainfall is 1200–1600 mm. The maximum temperature is +40°C in summer and the minimum is +2–3°C in winter [10]. It is for this reason that this area is rich in elements with endemic and numerous relict vegetation dating back to the Tertiary period. More than 1200 species out of 4500 higher plants grow in the Hyrcanian forests, about 170 species out of 450 trees and shrubs distributed on the territory of the republic, of which 36 are relict and endemic species [7, 8].

The seasons influence the structure of the Hyrcanian flora and species richness, under the canopy of trees and shrubs, ephemeral plants flourish in early spring and bloom until the trees are covered with leaves. After the end of the growing season in summer, the aerial part of the ephemera dries up until the next spring. Usually, such plants are not found around conifers. Ephemerals cannot grow because they lack sunlight in a shaded garden.

Humidity and temperature regime of the Hirkan National Park varies depending on the evaporation of water by plants. Under mesa conditions, most of the water evaporates into the atmosphere through plant leaves. As a result, humid climate conditions are created. Disintegration of the earth's surface at a high speed, the presence of steep slopes, climatic and water factors cause erosion processes here. Washing out of the soil after heavy rains can lead to the formation of heaps of stones and outcrop of rocks.

The main reason for the formation of layering in the Hyrcanian forest is light, heat, and

humidity. Therefore, plants are located in the forest in several tiers. Ecological factors, soil, spelling, genetic factors play a key role in the formation of vegetation. A noticeable difference was observed in height, leaves and fruits of trees in tiers (Figure) [6; 12].



Figure. General view of the Hirkan National Park

On the territory of the Hirkan National Park, partial thinning and changes in area were recorded compared to previous years. The reasons for the reduction in plant areas are determined, the criteria for danger, biological characteristics, and the reasons for changing natural resources are investigated.

Although the territory of the Hirkan National Park is not very high in the vertical zone (up to 1000 m), as you climb the mountains from east to west, you can notice that the forests change in the vertical zone: in the lower part, mainly *Quercus castaneifolia* C. A. Mey., *Fagus orientalis* Lipsky, *Carpinus betulus* L., *Parrotia persica* (DC.) C. A. Mey., *Zelkova carpinifolia* (Pall.) Dippel, *Diospyros lotus* L., *Pterocarya pterocarpa* (Michx.) Kunth ex Iljinsk. and so on. Forests dominated by *Albizia julibrissin*, *Durazz.*, etc. are widespread [11].

With increasing height, mainly *Parrotia persica* (DC.) C. A. Mey., partly *Quercus castaneifolia* C. A. Mey. decreases, they are replaced by *Fagus orientalis* Lipsky forests. In the forests of the National Park *Dryopteris* Adans., *Ruscus hyrcanus* Woronow, *Buxus sempervirens* subsp. *hyrcana* (Pojark.) Takht. Various creepers of the Lesser Caucasus, *Ilex hyrcana* Pojark., are widespread. The names of most of these plants are listed in the Red Book of Azerbaijan [10].

Hyrcanian flora is dominated by *Fagus orientalis* Lipsky, *Quercus castaneifolia* C. A. Mey., *Parrotia persica* (DC.) C. A. Mey., *Carpinus betulus* L.

Buxus hyrcana Pojark., *Ilex hyrcana* Pojark., *Ruscus hyrcanus* Woronow, *Danae racemosa* (L.) Moench, etc. were noted in the study areas. They form undergrowth. *Ruscus hyrcanus* Woronow usually in the lowland and foothill zone, *Danae racemosa* (L.) Moench. More common along riverbanks and in damp ravines, *Ilex hyrcana* Pojark., in oak and beech forests. Sometimes *Ruscus hyrcanus* Woronow, *Carpinus betulus* L., *Quercus castaneifolia* C. A. Mey., *Zelkova carpinifolia* (Pall.) Dippel, *Acer campestre* L. form a small range in river areas [4].

The vegetation cover of the banks of Khanbulanchay is not the same, despite the fact that they are at the same height. In the southern part of the Khanbulan River, the composition of vegetation is changing. *Carpinus betulus* L. *Quercus castaneifolia* C. A. Mey., abundant, *Parrotia persica* (DC.) C. A. Mey. and relatively less the trees are almost completely covered with *Hedera pastuchovii* Woronow. In the Hyrcanian flora, *Ruscus hyrcanus* Woronow dominates among the plants forming

the undergrowth in the lower layer. *Parrotia persica* (DC) C. A. Mey. the forest exists. *Parrotia persica* (DC.) C. A. May in the forest. Young trees with straight trunks of a typical height of 25-28 m make up the majority. Forest edges usually contain *Mespilus* L., *Crataegus* Tourn. ex L., *Prunus* L., and in places blackberry bushes *Ficus hyrcana* Grossh., *Punica* L., *Rosa* L., *Smilax* L. and *Periploca* L. form an insurmountable barrier. Sometimes in eroded areas, around rocks, on very large areas along the edges of the forest, the genera *Quercus* L., *Parrotia* C. A. Mey., *Carpinus* L., *Fagus* L. dominate, evergreen shrubs in the forest: *Ruscus hyrcanus*, *Ilex hyrcana*, *Danae racemosa* evergreen undergrowth forms a tier [2, 3].

The shrub layer forming the undergrowth consists of *Mespilus* L., *Crataegus* Tourn. ex L., *Prunus* L., sometimes *Cydonia oblonga* Mill. consists of *Hedera pastuchovii* Woronow, *Rubus raddeanus* Focke, *Periploca graeca* L., *Smilax excelsa* L., *Vitis sylvestris* C. C. Gmel. were found throughout the territory where our studies were carried out. creepers can be found.

Taxonomic composition of plants APC. It is assigned according to the III-IV system (Table) (<https://goo.su/aYhgppj>).

Table

TAXONOMIC COMPOSITION, LIFE FORM AND ORIGIN OF SOME PLANTS
 OF THE HIRKAN NATIONAL PARK

№	Family	Genus	Species	Life form	Homeland
1	Fagaceae	<i>Quercus</i> L.	<i>Quercus castaneifolia</i> C. A. Mey.	tree	Azerbaijan
2	Asparagaceae	<i>Ruscus</i> L.	<i>Ruscus hyrcanus</i> G. Woronow	shrub	Northern Iran, Europe, Caucasus
		<i>Danae</i> Medik.	<i>Danae racemosa</i> (L.) Moench	shrub	Asia Minor, Caucasus
3	Aquifoliaceae	<i>Ilex</i> L.	<i>Ilex hyrcana</i> Pojark.	shrub	Lesser Caucasus
4	Hamamelidaceae	<i>Parrotia</i> C. A. Mey.	<i>Parrotia persica</i> (DC.) C. A. Mey.	tree	Azerbaijan
5	Fagaceae	<i>Fagus</i> L.	<i>Fagus orientalis</i> Lipsky	tree	Greater and Lesser Caucasus
6		<i>Castanea</i> Mill.	<i>Castanea sativa</i> L.	tree	Southern Europe, Asia Minor,
7	Ulmaceae	<i>Zelkova</i> Spach	<i>Zelkova carpinifolia</i> (Pall.) Dippel	tree	Central, Southern China, Western Asia, Caucasus
8	Juglandaceae	<i>Pterocarya</i> Kunth.	<i>Pterocarya pterocarpa</i> (Michx.) Kunth ex Iljinsk.	tree	Caucasus, Northern Iraq
9		<i>Juglans</i> L.	<i>Juglans regia</i> L.	tree	Iran, Afghanistan, China
10	Betulaceae	<i>Alnus</i> Mill	<i>Alnus barbata</i> C. A. Mey.	tree	Asia Minor, Caucasus
11	Rosaceae	<i>Prunus</i> L.	<i>Prunus divaricata</i> Ledeb.)	tree	Greater Caucasus
12		<i>Cydonia</i> Mill.	<i>Cydonia oblonga</i> Mill.	tree	Asia Minor, Caucasus
13		<i>Crataegus</i> L.	<i>Crataegus</i> Tourn. ex L.	shrub	North America, Europe
14		<i>Mespilus</i> L.	<i>Mespilus germanica</i> L.	tree	Southwest Asia, Southeast Europe
15		<i>Sorbus</i> L.	<i>Sorbus boissieri</i> C. K. Schneid.	shrub	Asia Minor, Caucasus

№	Family	Genus	Species	Life form	Homeland
16		<i>Rubus</i> L.	<i>Rubus raddeanus</i> Focke	shrub	Eastern Caucasus
17	Apocynaceae	<i>Periploca</i> L.	<i>Periploca graeca</i> L.	liana	Mediterranean countries
18	Smilacaceae	<i>Smilax</i> L.	<i>Smilax excelsa</i> L.	shrub	Asia, America
19	Araliaceae	<i>Hedera</i> L.	<i>Hedera pastuchovii</i> Woronow	liana	Greater Caucasus
20	Vitaceae	<i>Vitis</i> L.	<i>Vitis sylvestris</i> C. C. Gmel.	liana	West Europe
21	Ebenaceae	<i>Diospyros</i> L.	<i>Diospyros lotus</i> L.	tree	Caucasus, Asia
22	Betulaceae	<i>Carpinus</i> L.	<i>Carpinus betulus</i> L.	tree	South America
23	Buxaceae	<i>Buxus</i> L.	<i>Buxus sempervirens</i> subsp. <i>hyrcana</i> Takht.	shrub	Azerbaijan
24	Fabaceae	<i>Albizia</i> Durazz.	<i>Albizia julibrissin</i> Durazz.	tree	Iran, Turkey, South-Eastern Azerbaijan
		<i>Gleditsia</i> J. Clayton	<i>Gleditsia caspica</i> Desf.	tree	Azerbaijan, Iran
25	Sapindaceae	<i>Acer</i> L.	<i>Acer campestre</i> L.	tree	Central America, South Asia
26			<i>Acer velutinum</i> Boiss.	tree	Azerbaijan, Iran.
27	Taxaceae	<i>Taxus</i> L.	<i>Taxus baccata</i> L.	tree	Europe, Africa
28	Tiliaceae	<i>Tilia</i> L.	<i>Tilia caucasica</i> Rupr.	tree	Caucasus, Crimea, Asia Minor

Conclusion

An inventory of natural and cultivated plant species has been carried out, the impact of climate change on biodiversity, the taxonomic composition of trees and shrubs, dominant species, and distribution areas of the studied plants have been comprehensively studied.

The ranges of most species in the Hirkan National Park have changed compared to previous years, and some plant species have multiplied, and the gene pool of some of them has been threatened. The forest usually consists of 2-3 layers: the first layer is *Quercus castaneifolia* C. A. Mey., *Carpinus betulus* L., *Populus hyrcana* Grossh. comprises. Second layer — *Parrotia persica* (DC.) C.A. Mey., *Acer velutinum* Boiss., *Ulmus minor* Mill. etc. consists of species. In the third layer, *Pterocarya pterocarpa* (Michx.) Kunth ex Iljinsk., in some places *Alnus barbata* C. A. Mey. prevails.

Species *Fagus orientalis* Lipsky, *Quercus castaneifolia* C. A. Mey., *Parrotia persica* (DC.) C. A. Mey., *Carpinus betulus* L. are the main edificators in Hyrcanian forests. In these areas, the evergreen plant species *Buxus hyrcana*, *Ilex hyrcana*, *Ruscus hyrcanus* and *Danae racemosa* form the undergrowth. *Ruscus hyrcanus* usually forms undergrowth in lowlands and foothills, *Danae racemosa* more often on riverbanks and damp ravines, and *Ilex hyrcana* in oak and beech forests.

As a result of the monitoring, the taxonomic composition of the tree and shrub flora of Hyrcanus was studied, from 54 species of tree and shrub plants belonging to 21 genera, for 28 seasons at different stages of plant development.

References:

1. Safarov, Kh. M. (2009). Kratkoe opisanie raspredeleniya rastitel'nosti Girkanskogo natsional'nogo parka po vysotnym poyasam. Bioraznoobrazie i introduktsiya rastenii. In *Materialy mezhdunarodnoi nauchnoi konferentsii, Baku, I*, 241-245. (in Azerbaijani).
2. Mamedov, T. S. (2014). Redkie derev'ya i kustarniki Azerbaidzhana. Baku. (in Azerbaijani).
3. Iskanderov, E. O. (2010). Okhrana redkikh i ischezayushchikh vidov derev'ev i kustarnikov Azerbaidzhana i analiz ee sostoyaniya (obzor). *Trudy Botanicheskogo obshchestva Azerbaidzhana*, 23-43. (in Azerbaijani).
4. Farzaliyev, V. S., Shukurov, E. S., & Safarov, G. M. (2007). Nekotorye redkie vidy rastenii vokrug Khanbulanskogo vodokhranilishcha v Girkanskom natsional'nom parke. In *Materialy Chetvertoi mezhdunarodnoi nauchnoi konferentsii*, St. Petersburg. 178-179. (in Russian).
5. Cherepanov, S. K. (1995). Sosudistye rasteniya Rossii i sopredel'nykh gosudarstv (v predelakh byvshego SSSR). St. Petersburg. (in Russian).
6. Karta rastitel'nosti Azerbaidzhana (2007). Masshtab 1:600000. Pod redaktsiei V. Ch. Gadzhiev. Gosudarstvennyi komitet po geodezii i kartografii Azerbaidzhanskoi Respubliki. Baku. (in Azerbaijani).
7. Akhundov, G. F. (1973). Endemy flory Azerbaidzhana: Avtoref. dis. ... d-r biol. nauk. Baku. (in Russian).
8. Safarov, I. S. (1962). Vazhneishie drevesnye tretichnye relikty Azerbaidzhana. Baku. (in Russian).
9. Krasnaya kniga Azerbaidzhanskoi SSR (1989). Baku. (in Russian).
10. Posokhov, P. P., & Asadov, K. S. 1968. Tipy lesov razlichnykh vysotno-klimaticheskikh poyasov Malogo Kavkaza. Barda. (in Russian).
11. Yaroshenko P. D. (1961). Geobotanika. Osnovnye ponyatiya, napravleniya i metody. Moscow, Leningrad. (in Russian).

Список литературы:

1. Səfərov X. M. Girkanski Milli Parkının bitki örtüyünün hündürlük zonalarında yayılmasının qısa təsviri. Biomüxtəliflik və bitki introduktsiyası // Beynəlxalq elmi konfransın materialları. Bakı: CBS, İstehsalat, 2009. T. I. S. 241-245.
2. Məmmədov T. S. Azərbaycanın nadir ağac və kol bitkiləri. Bakı: Qarağac, 2014. 380 s.
3. İskəndərov E. O. Azərbaycanın nadir və nəslə kəsilməkdə olan ağac və kol növlərinin mühafizəsi və onun vəziyyətinin təhlili (icmal) // Azərbaycan Botanika Cəmiyyətinin materialları. 2010. S. 23-43.
4. Фарзалиев В. С., Шукуров Э. С., Сафаров Г. М. Некоторые редкие виды растений вокруг Ханбуланского водохранилища в Гирканском национальном парке // Материалы Четвертой международной научной конференции. СПб, 2007. С. 178-179.
5. Черепанов С. К. Сосудистые растения России и сопредельных государств (в пределах бывшего СССР). СПб: Мир и семья. 1995.
6. Azərbaycanın bitki örtüyünün xəritəsi. Ölçüsü 1:600000 / Redaktə edən V. Ç. Hacıyev. Azərbaycan Respublikasının Dövlət Geodeziya və Xəritəçəkmə Komitəsi. Bakı, 2007.
7. Ахундов Г. Ф. Эндемы флоры Азербайджана: Автореф. дис. ... д-р биол. наук. Баку: ЭЛМ, 1973. 44 с.
8. Сафаров И. С. Важнейшие древесные третичные реликты Азербайджана. Баку: Вяз, 1962. 312 с.
9. Красная книга Азербайджанской ССР. Баку, 1989.

10. Посохов П. П., Асадов К. С. Типы лесов различных высотно-климатических поясов Малого Кавказа. Барда, 1968. 56 с.

11. Ярошенко П. Д. Геоботаника. Основные понятия, направления и методы. М.-Л.: Изд-во АН СССР, 1961. 474 с.

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