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Distribution Areas of Plant Species Spread in The Lesser Caucasus Area and Determination of Their Type Composition

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ABSTRACT
The Republic of Azerbaijan is the country with the richest natural resources in the Caucasus region. Up to 4,500 species of higher plants have been recorded on the territory of the republic, which makes up 66% of the species composition of the Caucasus. It is for this reason that the study of the flora of both the Greater Caucasus and the Lesser Caucasus has always been in the center of attention and is considered one of the priority issues of the modern era. During the research, perennial grasses were 142 species (52.59%), annuals 41 (15.19%), biennials 12 (4.44%), one- or two-years 9 (3.33%) of useful plants according to life forms in the territory of the Lesser Caucasus. , shrubs were represented by 30 species (11.11%), and trees by 28 species (10.38%). Accordingly, 157 types of hemicryptophytes, 58 types of phenorophytes, 50 types of therophytes, and 5 types of cryptophytes were determined. As a whole, 13 families, 24 genera, 30 species of Azerbaijan and 170 species of the Caucasus are endemic in the study area. 22 families, 37 genera, 48 species are included in subendemes.
Keywords: *Lesser Caucasus, flora, fauna, endemic, phytocenosis*

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INTRODUCTION

A plant-phytocenosis suitable for food, medicine, paint, essential oil, vaccine, decoration, which is rich in complex biochemical compounds and can be successfully used in various fields of the national economy, formed as a result of the fertility of the soil of Azerbaijan, having different ecological conditions, as well as the long-term historical geological evolution. The plant world is a source of healthy life and powerful food for people. Strengthening the economic power of our republic is organically connected with plant raw materials [2].

However, in the last century, the rapid development of all sectors of the economy and the negative impact of human activity on the environment have resulted in overexploitation of natural resources. As in most countries, great attention is paid to solving the problems of environmental protection and efficient use of natural resources in the Republic of Azerbaijan.

In this regard, in order to achieve results in the field of environmental health, which is the basis of environmental policy, a number of important laws adapted to the requirements of European legislation have been adopted in our republic, appropriate measures have been taken within the framework of relevant state programs [11]. Thus, after the implementation of the first National Strategy and Action Plan on biological diversity, the area of protected areas in Azerbaijan increased from 5 percent to 11.3 percent, and the area of forest cover increased from 11.4 percent to 12.1 percent. Eight national parks have already been established in Azerbaijan, and two national parks are currently being created [12].

It should also be noted that the created national parks are an irreplaceable basis for the study of the flora and fauna of Azerbaijan.

MATERIAL AND METHODS

The object of the research is the study of plant species distributed in the Lesser Caucasus. Floristic, floristic-systematic, areological, botanical-geographical, phytocenological, statistical methods used in botany were taken into account by using route and stationary methods in conducting research.

RESULTS AND DISCUSSION

The Republic of Azerbaijan is the country with the richest natural resources in the Caucasus region. Up to 4,500 species of higher plants have been registered in the territory of the republic in 9 climate zones, which makes up 66% of the species composition of the Caucasus. In addition to plant species widely distributed in the Caucasus and other regions, the flora of Azerbaijan includes a sufficient number of about 240 endemic plant species that are characteristic only for Azerbaijan and its relatively small regions. Thus, out of 600 species of endemic plants found in the republic, as we mentioned, 240 species belong to Azerbaijan and 360 species belong to Caucasian flora. The spread of vegetation is determined by the physical and geographical formation of the region, modern soil and climate conditions, vertical zonation and a number of other factors. Thus, in the lowland part of the republic, desert and semi-desert plant types and wetland plants have developed up to 200 meters [10]. It is for this reason that the study of the flora of both the Greater Caucasus and the Lesser Caucasus has always been in the center of attention and is considered one of the priority issues of the modern era.

It is known that in mountainous regions, the morphostructural features of the territory are taken into account for each large regional separation (in the territory of special physical-geographical mountainous countries). That is why, in Azerbaijan, physical-geographical regions with the same names - Greater Caucasus, Lesser Caucasus, Central Aran (Kur-Araz plain), Middle-Araz and Lankaran physical-geographical regions have been separated for the mountainous countries of the Caucasus and Front Asia in Azerbaijan. The Lesser Caucasus province, which is our research object, is located in the west of Azerbaijan. It mainly covers the Lesser Caucasus mountains. The main mountain ranges of the province are Shahdag, Eastern Goycha, Murovdag (Gamishdag 3724 m) and Karabakh [5].

Small Caucasus province includes 4 districts.

1. Ganja mountains physical-geographic region,
2. Nagorno-Karabakh physical-geographic region,
3. Karabakh volcanic plateau physical-geographic region,
4. Hekari physical-geographical region

The role of specially protected natural areas (SPAs) in researching and preserving the biological diversity of the mentioned regions is irreplaceable. In particular, in the current conditions, the unsystematic use of land and forest resources by people and the radical change of natural conditions have created a problem for the sustainable development of biological diversity [3;4].

Specially protected natural areas in the Lesser Caucasus region include Goygol National Park, Eldar Pine, Garayazi, Korchay State Nature Reserves, and its complex geological history is related to human economic activity. The physical-geographical conditions of these areas differ from each other according to their geomorphological structure and area, as well as their vegetation. The need to investigate this difference and clarify the taxonomic composition of the Lesser Caucasus territory for the protection of biological diversity, to determine the areas of the main useful plant species and their species composition is considered one of the urgent problems.

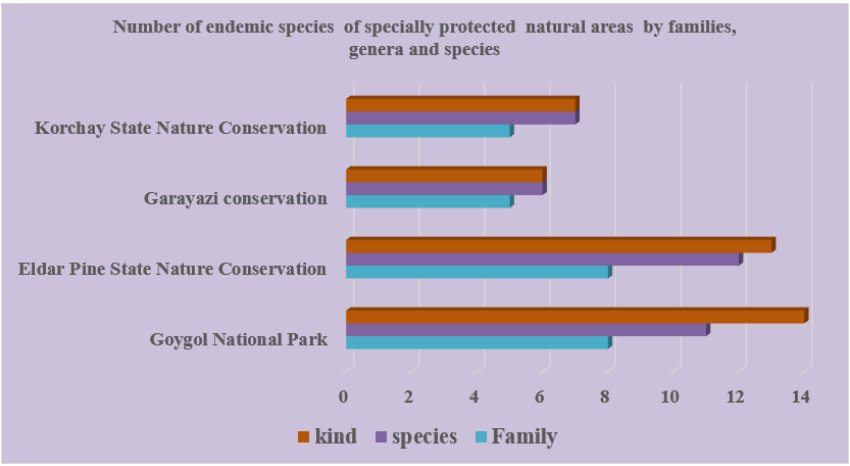
Literature data [3; 4; 6; 7], as a result of the conducted research, especially A.A. Bayramova [1], 107 families, 467 genera and 1200 species were determined for the specially protected natural areas of the Lesser Caucasus (Goygol National Park, Eldar pine, Garayazi, Korchay State Nature Reserve). In the systematic structure of the flora, 820 species belong to 26 leading families. This is 67.5% of the flora. Asteraceae (126), Fabaceae (101), Poaceae (80), Rosaceae (68), Scrophulariaceae (59), Caryophyllaceae (58), Lamiaceae (56) represent 45% of the flora, represented by more than 50 species. The remaining 82 families include a total of 394 species (32.2%). Out of 467 genera, 202 genera (43.3%) belong to 13 families. 56 families are unisexual, 18 are disexual, *Polypodiaceae, Liliaceae, Alliaceae, Onagraceae, Malvaceae, Anacardiaceae are represented by three genera, Crassulaceae, Gentianaceae, Orobanchaceae, Rubiaceae* by four genera, Hyacinthaceae, Saxifragaceae by five genera.

652 species belonging to 285 genera belonging to 79 families were found for the flora of Goygol National Park. Analysis at the phylum level showed an average of 8.2 species per phylum, and analysis at the genus level showed an average of 2.3 species per genus. Selaginellaceae, Alismataceae, Melanthiaceae, Ceratophyllaceae, Capparaceae, Peganaceae, Balsaminaceae, Malvaceae, Cornaceae, etc. genera were monotypic, represented by only one species.

538 species belonging to 76 families and 182 genera were discovered for the flora of Eldar pine State Nature Reserve. The analysis at the phylum level shows that each family has an average of 7.7 species, and the analysis at the genus level shows that each genus includes an average of 2.9 species. Selaginellaceae, Convallariaceae, Betulaceae, Corylaceae, Berberidaceae, Capparaceae, Saxifragaceae, Peganaceae, Rutaceae, Punicaceae, Ericaceae, Asclepiadaceae, Cuscutaceae, etc. genera were monotypic, represented by only one species.

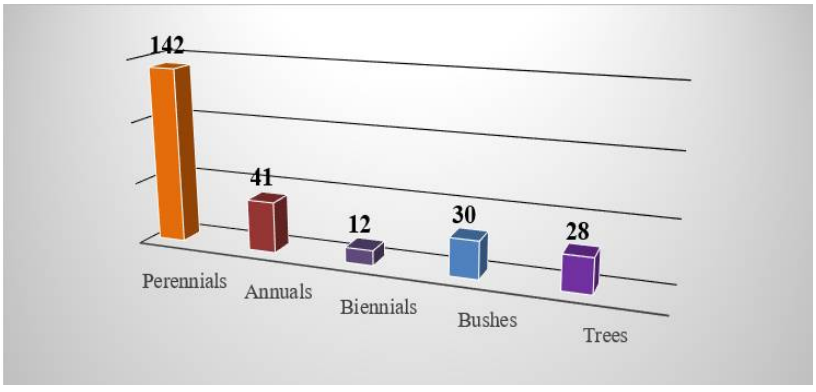
For the flora of Garayazi reserve, 379 species belonging to 229 genera were found in 73 families, and it was determined that each family included 5.2 species, and each genus included 1.6 species. Araceae, Asphodelaceae, Smilacaceae, Dioscoreaceae, Iridaceae, Juglandaceae, Betulaceae, Corylaceae, Cannabaceae, Santalaceae, Ceratophyllaceae, Tamaricaceae, Rutaceae, Anacardiaceae, etc. genera were monotypic, represented by only one species.
For the flora of Korchay State Nature Reserve, 363 species belonging to 221 genera in 71 families were found. The analysis at the phylum level shows that each family includes an average of 5.1 species, and the analysis at the genus level shows that each genus includes an average of 1.5 species. Rutaceae, Anacardiaceae, Celastraceae, Rhamnaceae, Vitaceae, Tiliaceae, Cistaceae, Datiscaceae, Elaeagnaceae, Primulaceae, Asclepiadaceae, Cuscutaceae, etc. genera were monotypic, represented by only one species.

Picture 1.



The analysis of the endemic flora of the specially protected natural areas shows that they are unevenly distributed in the protected areas and have different life forms. In total, 13 families, 24 genera, 30 species of Azerbaijan (Fig. 1.), 170 species of the Caucasus are endemic in the study area.
22 families, 37 genera, 48 species are included in subendemes. *Allium szovitsii, Rosa prilipkoana, R.komarovii, R.nizami, Vaviloviaformosa, Viola caucasica, Acantholimontenuiflorum, Salvia verbascifolia, Ziziphoraserpyllacea, Thymus fedtschenkoi, Veronica minuta, Euphrasia kurdica, E.nisami, Galiumkiapazi*are located in Goygöl National Park [1 ; 9].
During the study, among the useful plants, 142 species of perennial grasses (52.59%), 41 species of annuals (15.19%), 12 species of biennials (4.44%), 9 species of one or two-year species (3.33%), and 30 species of shrubs (11.11%), and trees are represented by 28 species (10.38%).

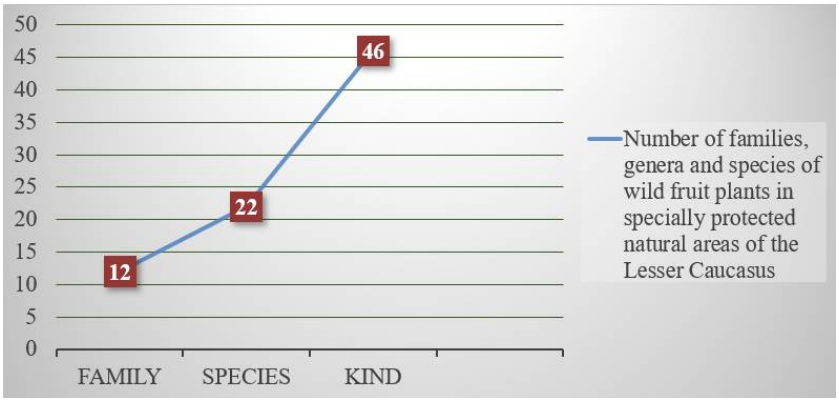
Picture 2.



Accordingly, 157 types of hemicryptophytes, 58 types of phenorophytes, 50 types of therophytes, and 5types of cryptophytes were determined. When we say useful plants, especially economically important plants, we mean flowering plants, decorative plants, medicinal plants, nectar plants, food, fruit and berry plants, fodder plants and spice plants, which are reflected in the mentioned grouping [13].

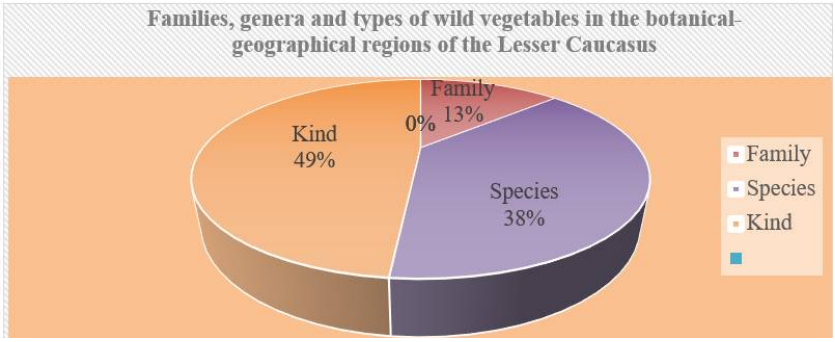
Although 46 species of wild fruit plants belonging to 22 genera in 12 seasons are distributed in the specially protected natural areas of the Lesser Caucasus, they are not used efficiently enough (Figure 3). Thus, the real stock of wild fruits and berries in the economic regions of Azerbaijan, as well as in individual regions, has not been accurately studied and determined until now. The main stage of effective use of wild fruits and berries should start here. If the natural reserve for this or that fruit and berry is determined, the rest of the issues will be planned and implemented accordingly [3]. The most abundant wild fruits of the republic are wild apples, wild pears, hawthorns, hawthorns, blackberries, gooseberries, cherries,blueberries, cranberries, hips, mulberries, gooseberries, wild strawberries, wild pomegranates, hazelnuts, walnuts, chestnuts, peanuts and others.. These are valuable raw materials for local industrial enterprises, and it is considered appropriate to organize their use for various purposes on an industrial scale.

Picture 3.



152 species of 120 genera of wild vegetable plants belonging to 42 seasons were determined as a result of the research conducted in the flora of the botanical-geographical regions of the Lesser Caucasus within the Republic of Azerbaijan (Figure 4). Their taxonomic spectrum has been clarified and systematized. An ecobiomorphological analysis of wild vegetables was carried out and their distribution areas were specified [8].

Picture 4.



It should also be noted that 55 species belonging to 50 genera in 30 chapters were included in the 2nd edition of the "Red Book" of Azerbaijan of Goygol National Park, Eldar Pine, Garayazi, Korchay State Nature Reserve of the specially protected natural areas of the Lesser Caucasus [1; 6].

During the ecological analysis, it was found that mesoxerophytes from the plants used in the area make up 35.56% of the total flora with 96 species. Xeromesophytes occupy the third place with 9.26% with 25 species, mesophytes with 87 species with 32.22%, and xerophytes with 54 species with 20.00%.

The conducted phytogeographical analysis shows that among the areal types of species used by the population, boreal 112 (41.48%), xerophyllous 85 (31.49%), and Caucasian 24 (8.89%) elements prevail (221 species, 81, 86%). It was found that the migration of useful plants in the flora of the region mainly originated from species originating from the Paleoarctic (54), Europe (39), Front Asia (47), Mediterranean (35), Caucasus (24) and Holarctic (19). The range of some species is uncertain.

As a result of the research, it was determined that the distribution areas and species composition of the main useful plant species that spread wildly in the territory of the Lesser Caucasus were formed as a

result of zonation, endemism, eco-biological and geographical conditions. Their morpho-anatomical, morphophysiological, taxonomic characteristics are dominated by constant signs characteristic of the species.

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