

The florogenetical analysis of the vegetation of the specially protected natural territories of the small caucasus

VS Novruzov¹, AA Bayramov^{2*}, Tagiyev ZI³
Ganja State University, Azerbaijan

Abstract

For the first time, the modern classification of vegetation is as follows: It is justified that the Goygol National Park tall grass, forests, meadows, rock, steppe; Eldar Pine State Nature Preserve III period elements, xerophytes sparse forests; The Karayazi State Nature Reserve the tugai forests, the dry steppe; the Korchay state nature reserve consists of desert and semi-desert complexes. Although desert, semi-desert and steppe species occur in specially protected areas, these species have specific features within each reserve. In addition to the zonal vegetation, intrazonal, azonal, and extra zonal species are spread in specially protected natural areas.

Systematic structure of flora has been analyzed for its bioecological features, endemism and relict, as well as geographical elements. Systematical, florogenetical, areoloji, bioecological analysis of the flora has been given in the article.

Keywords: florogenetic, systematic, areological, bioecologic, family, genus, species

Introduction

Analysis of the modern spreading situation of flora allows distribution for their protection measures. International experience shows that, the most effective form of the protection to protect plant areas in the specially protected natural territories. The preservation the balance of the vegetation in the specially protected areas is directly connected of the area's natural resources studies. Complex geological history of specially protected natural territories of Small Caucasus related to shift activity of the people. The physical and geographical conditions, according the geomorphological structure of The Small Caucasus Specially Protected Natural Territories differ from each other of the area and also differ from each other of the vegetation. Professor Brodsky [2002] at the University of Central Asia has shown that, the main function of the reserves are not only nature reserve for environmental studies but also guarantee of environmental sustainability.

The role of Specially Natural Protected Territories is indispensable to the protection of biodiversity in Azerbaijan (1). The purpose of the expanding the network of specially protected natural territories, biodiversity conservation, sustainable use of natural resources in the recent years, the Specially Protected Natural Territories of the Small Caucasus - Goy-Gol National Park, Eldar Shamligi, Korchay and Garayazi State have been given reserve status with the orders of the President of the Republic of Azerbaijan. After changing the status at the state level was done inveterisation of the flora for the first time. Literature data [1, 2, 3, 4, 5, 6, 7, 10, 11, 12] and as the result of development of the field research the Specially Protected Natural Territories

of Western region of Azerbaijan (Goy-Gol National Park, Eldar Shamligi, Garayazi, Korchay State Nature Reserve), 107 families, 467 genera and 1200 species have been identified. 820 species from 26 families are leading to a systematic structure of flora. This is 67.5% of the flora. Representing more than 50 species of Asteraceae (126), Fabaceae (101), Poaceae (80), Rosaceae (68), Scrophulariaceae (59), Caryophyllaceae (58), Lamiaceae (56) families are 45% of the flora. The remaining 82 families, a total 394 species (32.2%) included. (Figure 1).

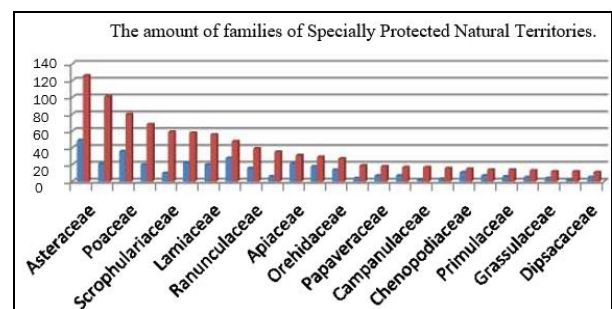


Fig 1: The amount of families of Specially Protected Natural Territories.

202 genera of 467 species (43,3%) accounted for 13 families. 56 homogeneous families, 18 two genders families, Polypodiaceae, Liliaceae, Alliaceae, Onagraceae, Malvaceae, Anacardiaceae three genders, Crassulaceae, Gentianaceae, Orobanchaceae, Rubiaceae four genders, Hyacinthaceae, Saxifragaceae five genders were represented.

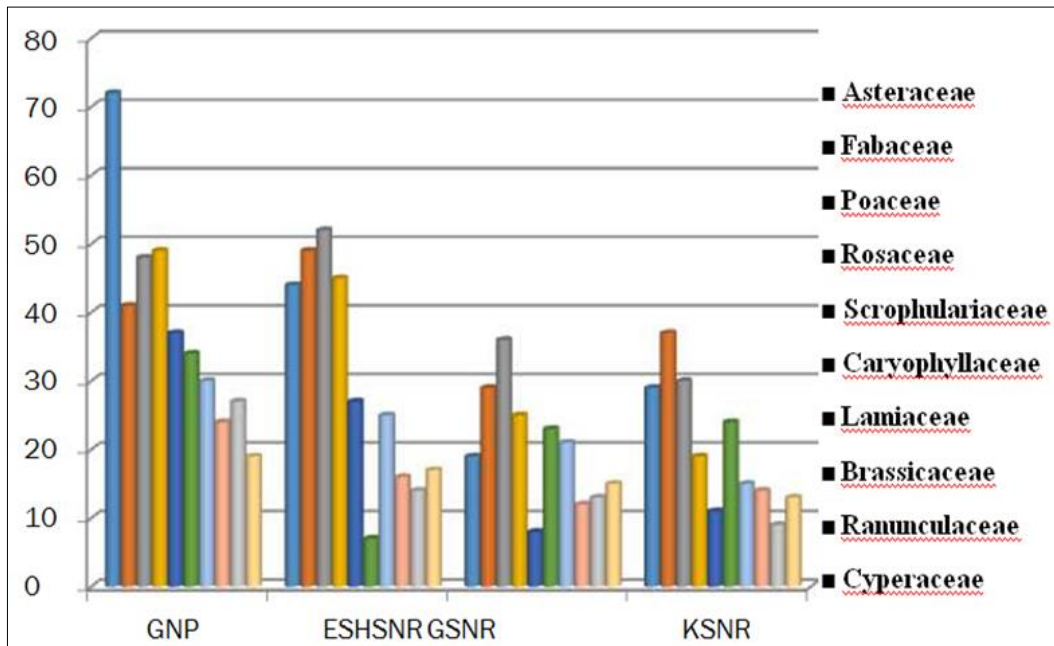


Fig 2: The leading families of the Specially Protected Natural Territories.

In general, the amount of species in the leading families in the research areas, the middle amount of the genders in the leading families, the average number of species in the leading genders are equal. Species richness of genders in flora (the total number of species compared to the amount of the genders) 2, 5 species richness of families (the ratio of the number of species to the families) is equal to 11.3. Comparative analysis shows that, richness of species of the families in the Specially Protected Natural Territories - Goy-Gol National

Park (8,2), Eldar Shamligi State Nature Reserve (7,7), Garayazi State Nature Reserve, (5,2), Korchay State Nature Reserve (5,1) Richness of the genders Goy-Gol National Park (2,3), Eldar Shamligi State Nature Reserve (2,9), Garayazi State Nature Reserve(1,6), Korchay State Nature Reserve (1,5)

The analysis by Biomorf

Biomorphologic groups of flora of the Specially Protected Areas are listed in the chart

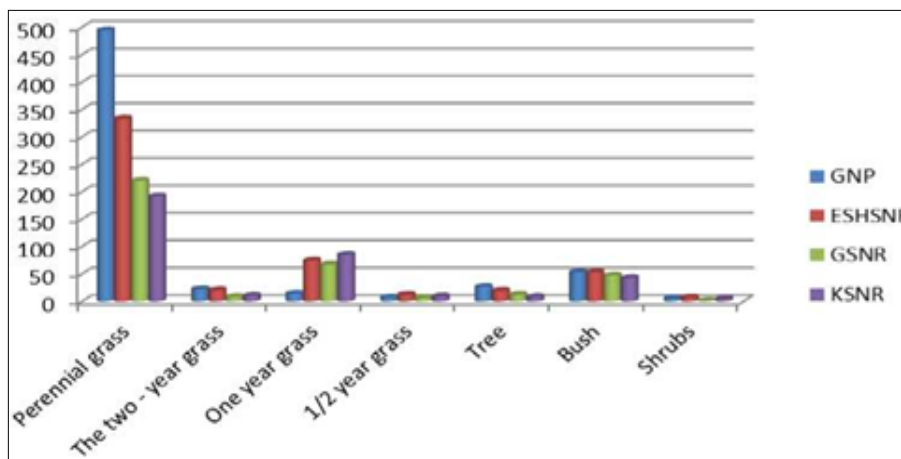


Fig 3

According to Biomorf analysis shows that, perennial grass is dominated in the most protected areas. The desert and steppe landscapes characterized by Eldar Shamligi State Nature Reserve, Garayazi State Nature Reserve and Korchay State Nature Reserve is high percent coming across annual grass. Eldar Shamligi State Nature Reserve and Goy-Gol National Park is dominated by shrubs. One of the characteristic features of specially protected natural territories have got specific biomorf for each territory. It also meets the requirements of Protected Natural Territories of the International Biological Program, which allows you to use as a biological landfills. Biomorfs were chosen as the

test facilities. It is possible to identify and predict agroecosystems the sukseksia with test facilities. The analysis shows that, spatial and temporal characteristic of the Specially Protected Natural Areas play an important role in the protection of biodiversity. The areal types of flora of research area was analyzed to identify these characteristics.

The analysis by geographic elements

In order to determine the geographical structure of natural floristic complexes in the specially protected natural areas the geographical elements which including natural habitat

types have been analyzed. There is no single approach to the issue of classification of geographic elements. A group of Researchers geographical elements, researchers in the area of similar groups based on the concept fitoxoreon [13]. The researchers who conducted the study of geoelements of the Caucasus and adjacent areas is based rpoocre ŪM [8]. As a basis for the classification of the area of the Specially Protected Natural Areas was taken rpoocre ŪM [8], Tanymko [9], fflxarancoeB [13]. Some of the natural habitat complexes based on the concept of the fitoxorion. The following geographical elements system has been adopted.

Mediterranean elements

This element combines of the Mediterranean floristic province species [7, 8, 13]. Mediterranean combines across two or more the province species. In the research area this element is separated to interim areal complexes, the Eastern Mediterranean, Eastern of the Ancient Mediterranean, the Ancient Mediterranean, and West of the Ancient Mediterranean, the Ancient Mediterranean, the Caucasus Mediterranean, and the Euro-Mediterranean. In the research area the specially protected mode does not allow for the separation in the isolated form integrated complex of habitat complexes. Any complexes or other complexes in the area of the 179 species are found. Therefore, the species of all complexes have been considered appropriate to include Mediterranean element. *Ceterach officinarum* Willd., *Equisetum telmateia* Ehrh., *Taxus baccata* L., *Juniperus hemisphaerica* J. et C. Pres., *J. oxycedrus* L., *Piptatherum virescens* (Trin.) Boiss., *Eremopyrum orientale* (L.) Jaub. et Spach., *Melica taurica* C. Koch., *Aeluropus littoralis* (Gouan) Parl., *Anisantha sterilis* (L.) Nevski., *Lolium rigidum* Gaudin, and so on. Are the typical Mediterranean species.

Caucasian elements

It covered Great and Small Caucasus, Transcaucasia and the front Asia. 426 species include to this item. As a result of spreading the modern area of species of Caucasian origin has been identified that, the Specially Protected Natural Areas can be considered rezervator for protection of gene pool. In the research area this element separated to Caucasian, the South Caucasus, North Caucasian natural habitat complexes. The complex of Caucasian has the main role of the according to the riches of composition of species. They are very different both environmentally features but also due to the spread. There are more than 50 % of Caucasuan species in this complex. *Atropis sevagensis* (Grossh.) V. Krecz., *Scutellaria sedelmeyerae* Juz., *Nepeta grandiflora* Bieb., *Thymus nummularius* Bieb., *Linaria zangezura* Grossh., *Scrophularia chrysantha* Janb. et Spach., *S. ilwensis* C. Koch., *Veronica minuta* C. A. Mey., *Melampyrum chlorostachyum* Beauverd., *Euphrasia nisami* Kem.-Nath., *Rhododendron caucasicum* Pall., *Primula woronowii* Losinsk., *Vavilovia formosa* Fed., *Astragalus microcephalus* Willd. etc. species. The species which spread in Azerbaijan and Georgia are included to the South Caucasus. *Astragalus mollis* Bieb. A. *Microcephalus* Willd., *A. caucasicus* Pall. *Gypsophila tenuifolia*, *Gagea germaniae* these species are included to the North Caucasus complex. Caucasian element analysis show that, mesophyll forest species are dominated in this flora.

Boreal element

Boreal species are widespread of holarctic coniferous forests and other plant climatic zones, plains and mountain areas. The species in which more penetrating towards holarctic areas are included in the notoboreal complex. The notoboreal species are spread as panboreal in the holarctic areas. Boreal species of flora are 29.2%. 185 boreal species are spread in the research area. The following natural habitat complexes are separated.

Polearctic complex

The species in which spread boreal area belong to the polearctic complex. This complex is covered with holarctic temperate and subtropical regions which incompatible any specific community of the world. The research area covers several types. *Cystopteris fragilis*, *Lamium purpureum*, *L. tomentosum*, *Thalictrum minus*, *T. foetidum* etc. are the species. The center of the European Mediterranean, West polearctic area, South polearctic area species include to this complex. 112 polearctic species are spread in the research area.

European complex

The species which covers Europe are related to the Europe complex. *Festuca supina*, *Fumaria schleicheri*, *Poa iberica*, *P. araratica*, *P. polychroa*, *P. bulbosa*, *P. meyeri*, *Taxus baccata*, *Berberis vulgares*, *Convolvulus cantabrica* (10 species) are belong to this complex.

Holarctic complex

The species in which spread all holarctic provinces are related to holarctic complex. This group includes 73 species. *Catabrosa aquatica*, *Poa palustris*, *P. araratica*, *Festuca rubra*, *Lycopodium selago*, *L. clavatum*, *Eleocharis palustris*, *Polygonatum verticillatum* etc.

Steppe element

The Eurasian steppe provinces cover. It includes 68 species. It also comes across in the composition of other elements. *Crepis pannonica*, *Taraxacum praticolum*, *Scorzonera biebersteinii*, *Tragopogon buphtalmoides*, *Carduus cinereus*, *Echinops pungens*, *Ornithogalum ponticum*, *O. navaschirii* and so on. are typical steppe. Representing 68 species have been included to this kserophit complexes.

Pontic element

The species belonging to the Pontic element are spread in the desert ecosystems of the holarctic and Asia. It comes across Korchay and Eldar shamligi state nature reserves in the research area. *Aeluropus littoralis*, *Allium rubellium*, *Cerastium tauricum*, *Roemeria refracta*, *Ferula szowitsiana*, *Artemisia fragrans*, *A. absinthium*, *A. caucasica* etc., are the species. Pontic element includes 49 species.

An element of the Iran-Turan

The species which spread in Iran state are belong to this element. 72 species elements of Iran - Turan are found in the research area. This element covers a half of the ancient Mediterranean world and all the provinces of Iran and Turan provinces. *Festuca chalcophaea*, *Bromopsis variegata*, *B. tomentella*, *Lolium persicum*, *Elymus elongatiformis*, *Hordeum violaceum*, *Gagea quasitenuifolia* and so on. The species belong to Iran Turan elements.

Plyuregional element

The holarctic and two or more species in the world include to Plyuregional element. Some species are edipicator in the wetland plants. 26 species and *Cystopteris fragilis*, *Asplenium trichomanes*, *A. adiantum-nigrum*, *Polypodium vulgare*, *Cynodon dactylon*, *Lemna trisulea*, *L. Minor* ets.,

belong to this element. The aftoxton species and allaxton species are preserved in the Specially Protected Natural Areas. It should be noted, the role of the different areoloji complexes are not the same of the formation of the specially protected area. The results of phitogeographical analysis are given in 4 diagrams.

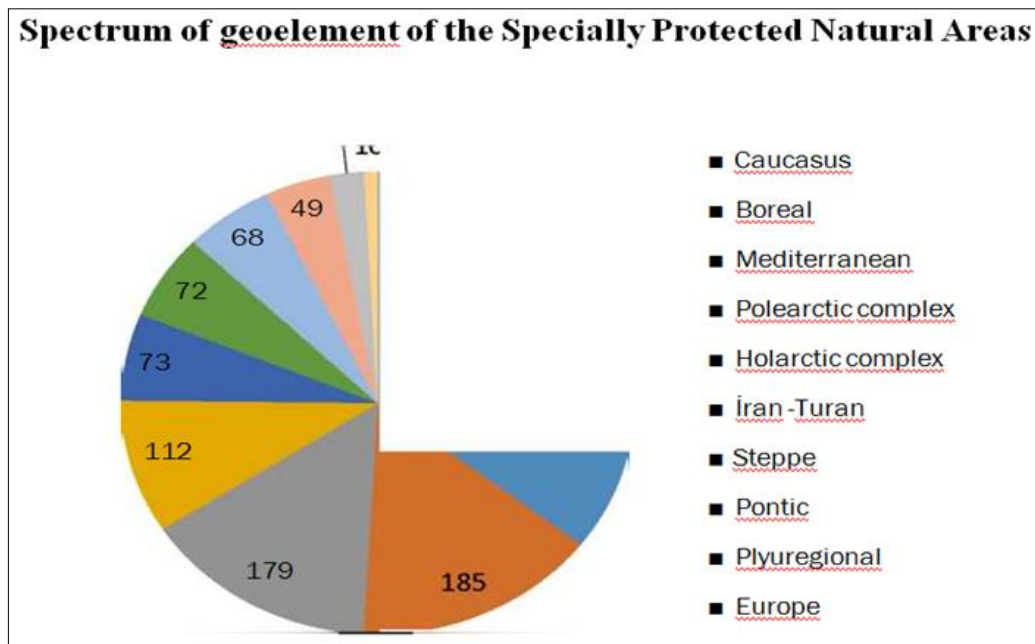


Fig 4

It is clear of No. 4 diagram that, 7 elements and 3 complexes belong to the flora of the Specially Protected Territories. Floristic spectrum Caucasus (426 species), Boreal (185 species), Mediterranean (179 species), Polearctic complex (112), Holarctic complex (73), Iran and Turan (72), Steppe (68 species), Pontic (49), Plyuregional (26), Europe (10) are dominated by the types of complexes and natural habitat. The high place of Steppe areal type in flora, location of the Eldar shamligi and Garayazi state reserves in the steppe plateau, high place of boreal species of flora, localization and protection of boreal species in Goygol National Park of is the result. In the geographic spectrum location of the kserophit species as a result of anthropogenic factors the natural floristic complexes to be replaced by a second origin kserophit mountain vegetation, location in the spectrum of areal type of desert species (49 species) as a result of inefficient use for a long time of the natural phitosenos happened salinization again and again. The amount of the desert species may be linked to the Korchay State Nature Reserve. As a result of geographical analysis, it was determined that, the preservation of the ancient species of flora of the Specially Protected Natural Areas (32 species), formed as a result of migration and species formation.

References

1. Ali-zadeh VM. The biological diversity, study, preservation and enrichment of Azerbaijan. National Academy of Sciences of Azerbaijan, Scientific works of the Institute of Botany XXXI, Baku, 2011, 3-16.
2. Askerov AM. Conspekts of the flora of Azerbaijan. Baku, Science, 2011, 202.
3. Askerov AM. The plant world of Azerbaijan. Baku, 2016, 444.
4. Bayramova AA. The flora of the special protected areas of the Western region of Azerbaijan. // News National Academy of Sciences of Azerbaijan, Biological Sciences, N° -2 s., Baku, 2012, 105-110.
5. Hajiev VC, Musaev SH, Akperov ZI, Ibadullaeva SC. About the biodiversity of higher plants of the flora of Azerbaijan. National Academy of Sciences of Azerbaijan, Scientific works of the Institute of Botany: XXV, Baku, Science, 2004, 88-93.
6. Hajiev VD. The materials of vegetation cover of surrounding the Maraljol lake in the Small Caucasus. Baku, 1971, 76.
7. Hajiev VD. Florogenetical analysis of the Small Caucasus Mountains. Baku, 1971, 169.
8. Grossgeim AA. Flora analysis of Caucasus. Baku, 1963, 269.
9. Galushko AI. Analysis and perspective using of flora of the western part of the Central Caucasus. Author. diss. Dr. Biol. Sciences. L, 1969, 42.
10. Novruzov VS, Ismailova ZM, Bayramova AA. The specially protected areas of the Western region of Azerbaijan (Goy-gol, Eldar shamligi, Garayazi) flora biodiversity and gene pool protection. Scientific works of Botanists Association of Azerbaijan. Baku, Science. 2010; 1:89-94.
11. İkl̄smaillova ZM. The biodiversity of flora of Goy-Gol reserve ecosystem of the lakes. National Academy of Sciences of Azerbaijan, Scientific works of the Institute of Botany XXIX, Baku, 2009, 329-333.
12. Efendieva S. The vegetation cover of Goygol in The Small Caucasus. Author. Cand. Diss., Baku, 1955, 20.
13. Shhagapsoev SH. Petrofit analysis of the prosperity of the Western part of the Central Caucasus. Nalchik, 2003, 217.