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REVIEW ARTICLE

DIVERSITY OF FERNS IN AJARA FLORISTIC REGION

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ABSTRACT

The article deals with the specific diversity of the wild flora ferns in the Ajara floristic region as well as gives the systematic-geographical and ecological-coenotic analysis. In the Ajara floristic region ferns are represented by 51 species of 27 genera and 11 families. According to the number of species the following are the leading families: *Dryopteridaceae* (21), *Aspleniaceae* (9), *Pteridaceae* (7). The leading genera are: *Dryopteris* (9), *Asplenium* (7), *Polystichum* (5). According to the geographical structure the majority of the ferns belong to the holarctic, Mediterranean, Caucasian, subtropical, South American, palaearctic and Asian geo-elements. In accordance with the relation to humidity, there are 38 mesophytes, 5 – mesohygrophytes and 8 xerophyte species of ferns. According to the relation to the light, there are 6 heliophytes, 22 sciophytes and 23 facultative heliophytes.

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INTRODUCTION

Ferns are one of the oldest and, from systematic viewpoint, the complex groupს of vascular higher plants. Their origin is connected to the Devonian period of Paleozoic Era. Their study is interesting for the understanding of flora, formation of vegetation and its further development. Longtime research and literary sources allowed confirming that at present there are 51species of ferns registered in the Ajara floristic region. They comprise 2,9% of the entire floristic composition.

Ajara belongs to the climatic region of Western Georgia. Humid subtropical climate is better reflected along the Ajara Black Sea littoral. Mountain ranges surrounding Ajara from three sides and the sea from the fourth determine the dominance of sea winds, abundance of precipitation and high humidity for which coastal Ajar belongs to the ever-humid region of marine subtropical climate.

MATERIALS AND METHODS

The aim of the research was to update the specification of the fern species and systematic and geographic structure as well as make their ecological and coenotic analysis. The object of study was the Ajara floristic region. The authors have gathered herbariums of the wild flora in Ajara at different stages of development. The plants have been identified and the systematic nomenclature has been verified in relation to the Ajara Plant Directory (Dmitriyeva, 1959: 1990), Georgian Flora (Ketskhoveli, 1964: Makashvili, 1971) and Synopsis of Caucasian Flora (Takhtajyan, 2003). The authors have also worked on the data of the herbarium funds of the Batumi Botanical Garden and Tbilisi Institute of Botany of Ilya State University. For the specification of geographical structure Caucasian Flora was used (Grossgeim, 1928; 1939).

RESULTS AND DISCUSSION

The research has stated that for today there are 51 species of ferns in the Ajara floristic region that comprise 14 families and 25 genera.

According to the number of species, the leading families are: *Dryopteridaceae* – 15, *Aspleniaceae* – 9, *Pteridaceae* – 8, *Thelypteridaceae* – 3, *Ophioglossaceae* – 3, *Polypodiaceae* – 2, *Adiantaceae* – 2, *Onocleaceae* – 2, *Athyriaceae* – 2, *Cystopteridaceae* – 2.

These are the families represented by single species: *Osmundaceae, Hymenophyllaceae, Woodsiaceae, Blechnaceae, Dennstaedtiaceae.*

According to the number of species, the leading genera are: *Dryopteris* –9, *Asplenium-8, Polystichum* – 5, *Pteris* – 3; two

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species are represented by: *Adiantum, Thelypteris, Athyrium, Polypodium, Ophioglossum.*

The genera represented by singles species are: *Osmunda, Anogramma, Cryptogramma, Notholaena, Pteridium, Hymenophyllum, Phegopteris, Oreopteris, Ceterach, Phyllitis, Cystopteris, Cyrtomium, Gymnocarpium, Matteuccia, Onoclea, Woodsia, Blechnum, Botrychium.*

Geographical Structure

Geographical structure (origin) of the ferns spread in the Ajara floristic region is quite diverse. From this point of view, they are distributed in the following way:

Holarctic: *Asplenium viride*, *A.trichomanes*, *A. septentrionale*, *A.ruta muraria*, *Athyrium alpestre, Athyrium filix - femina*, *Blechnum spicant*, *Botrychium lunaria. Dryopteris filix-mas*, *Dryopteris Auastriaca, Dryopteris carthusiana, Gymnocarpium dryopteris, Matteuccia struthiopteris*, *Polystichum lonchitis, Polystichum setiferum*, *P. braunii*, *Polypodium vulgare, Phegopteris connectilis, Thelypteris confluens*, *Woodsia alpina.*

Eoropean: *Asplenium adiantum-nigrum*, *Asplenium scolopendrium, Cystopteris fragilis, Hymenophyllum tunbrigense, Notholaena marantae, Polystichum aculeatum, Pteridium tauricum, Thelypteris limbosperma*.

Mediterranean: *Adiantum capillus veneris, Anogramma leptophylla, Ceterach officinarum, Dryopteris pseudomas*, *Pteris cretica*, *Pteridium tauricum*, *Polypodium australe, Pteris vittata, Pteris serrulata, Ophioglossum lusitanicum.*

Caucasian: *Asplenium cuneifolium, A. pseudolanceolatum, Dryopteris alexeencoana, Dryopteris liliana*, *Dryopteris oreades, Polystichum woronowii.*

Subtropical: *Osmunda regalis.*

South American: *Adiantum cunneatum.*

Palaearctic: *Cryptogramma crispa, Ophioglossum vulgatum.*

Asian: *Cyrtomium falcatum, Dryopteris atrata, Onoclea sensibilis.*

Correlation of different geo-elements is shown on the diagram.

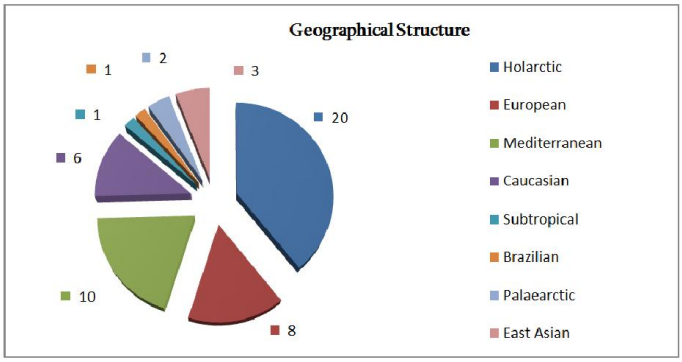

Diagram 1. Correlation of Fern Species according to Geographical Origin

According to life forms, out of the ferns registered in the Ajara floristic region, only *Anogramma leptophylla* – is annual, the rest are perennial herbaceous plants.

According to the habitat, the ferns registered in the Ajara floristic region are distributed in 5 ecotopes:

Forest ecotopes comprise 22 species of ferns: *Athyrium filix - femina* (L.) Roth, *Asplenium scolopendrium*, *Blechnum spicant*, *Dryopteris atrata*, *Dryopteris pseudomas, Dryopteris alexeencoana*, *Dryopteris carthusiana, Dryopteris filix-mas, Dryopteris kemulariae, Dryopteris liliana, Matteuccia struthiopteris, Polystichum aculeatum, Polystichum braunii, Polystichum woronowii, Phegopteris conectilis, Polypodium australe*, *Pteridium tauricum*, *Thelypteris limbosperma*, *Cyrtomium falcatum*, *Gymnocarpium dryopteris, Ophioglossum vulgatum, Onoclea sensibilis*.

Forest-rock ecotote is mostly characteristic to inland mountainous Ajara with high xerophytization. There are 8 species of ferns here: *Athyrium alpestre*, *Asplenium trichomanes*, *Asplenium septentrionale*, *Asplenium pseudolanceolatum, Dryopteris auastriaca*, *Polypodium vulgare*, *Asplenium adiantum-nigrum, Pteris cretica*.

Dry rocky-gravel ecotope comprises 15 species: *Asplenium ruta muraria, Asplenium viride, Asplenium cuneifolium, Cystopteris fragilis, Cryptogramma crispa, Polystichum lonchitis, Polystichum setiferum, Woodsia alpine*, *Dryopteris oreades*, *Ophioglossum lusitanicum*, *Anogramma leptophylla, Ceterach officinarum*, *Notholaena marantae*, *Pteris vittata*, *Botrychium lunaria***.**

Humid rock ecotope counts 4 species:*Adianthum cappilis veneris*, *Adianthum cuneatum*, *Hymenophyllum tunbrigense, Pteris serrulata*.

Marshy ecotope includes 2 species:*Osmunda regalis*, *Thelipteris palustris***.**

According to the relation with humidity, the ferns registered in the Ajara floristic region are distributed in 3 groups:

Mesophytes – it is the largest group represented by 38 species (74.5% of the total number) that mainly comprises forest species.

Mesohygrophytes – it is the smallest group represented by 5 species (9.8% of the total number) that grow in high humidity soils.

Xerophytes – the group is represented by dry-habitat-loving species, 8 in total (15.7% of the total number).

According to the relation with humidity, the ferns registered in the Ajara floristic region are divided into 3 groups:

Light-requiring or heliophytes that comprise open, always light-location species, 6 in total (11.7% of the total number); Shade-requiring or sciophytes that comprise species growing in lower circles of shaded humid forests, 22 in total (43.3% of the total number);

Shade-resistant or facultative heliophytes – species that resist more-or-less shading and at the same time feel well in good light conditions, total 23 species (45% of the total number).

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