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Monotypical families of the flora of the Nakhchivan autonomous republic

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Abstract
Significant changes in plant taxonomy in recent years, especially in *Angiosperm Phylogeny Group* (APG I, II, III, IV) and *Pteridophyte Phylogeny Group* - PPG I, have made it possible to study the phylogenetic relationships of plants at the molecular level. As a result of the research, it was determined that many families have been transferred to other families in the status of semi- families, and new taxa discovered in the area in recent years have entered the new floristic spectrum of the region. After analyzing the taxonomic spectrum of higher spore, bare-seeded and cover-seeded plants of the Nakhchivan Autonomous Republic, it was determined that 26 of the 160 families present in the flora of the area are monotypic, represented by only one genus and one species. The species belonging to 11 families introduced in the Autonomous Republic are used for landscaping and decorative purposes, and the species belonging to 7 families are included in the Red Books of Nakhchivan AR or the Republic of Azerbaijan and will be included in future editions with certain statuses.

Keywords: plant taxonomy, apg, ppg, monotype, family, taxonomic spectrum, rare species, introduction

Introduction

The flora of the Nakhchivan Autonomous Republic has historically developed in close genetic contact with the flora of the Mediterranean, Central Asia and Iran, and as a result, a rich biodiversity of xerophyte-type flora has been formed in the area. This richness has been of great interest to naturalists, botanists, pharmacists, phytochemists and paleobotanists since ancient times. They made periodic trips and observations, and later began to study the biodiversity of flora with expeditions. Research conducted by florists at different times on different species, genera and families has been limited to the introduction of new taxa into the flora of the area and the study of the beneficial properties of a number of species. Since plant diversity has always played an important role in solving the socio-economic problems of each country in terms of being the beginning of the food chain, the study, efficient use and protection of their species composition has been closely monitored. In particular, the protection, restoration, reproduction and reintroduction of endemic, relict, rare and endangered plant species is one of the most pressing issues of modern times, because the loss of a species created by nature over millions of years due to human error is unacceptable.

The problem of determining the taxonomic composition of the area flora by studying it fully, its effective use and protection of rare species was set by the state as a goal after the establishment of the Institute of Bioresources of Nakhchivan Branch of ANAS in 2003 and the researches continued as planned. The flora of the Nakhchivan Autonomous Republic is richer than other botanical-geographical regions of the Republic of Azerbaijan, spreading in 3 botanical-geographical zones existing in the area [1; 2; 3; 6].

During the research, many new taxa were discovered for the flora of the territory, as well as for the flora of Azerbaijan and the Caucasus, and these innovations are reflected in the taxonomic spectrum. Significant changes have taken place in the systematic divisions presented in the first edition of the book "Taxonomic spectrum of flora of the Nakhchivan Autonomous Republic (Higher spore, bare-seeded and covered-seeded plants)".

Significant changes in plant taxonomy in recent years, particular inclusion of many families in the status of already half- families, transfer of some species to other families as a result of study of phylogenetic kinship relationships of plants at the molecular level by *Angiosperm Phylogeny Group* (APG I, II, III, IV) and *Pteridophyte Phylogeny Group* - PPG I, as well as, the inclusion of new taxa discovered in the area over the last 12 years in the flora spectrum covered the compilation of the second edition of the book "Taxonomic spectrum of flora of the Nakhchivan Autonomous Republic (Higher spore, bare-seeded and covered-seeded plants)".

Thus, the families where systematic changes are made are as follows [7, 8, 9, 10, 11, 12].

1. *Pteridaceae* E.D.M. Kirchn. (*Adiantaceae* Nevm.) – Brake family;
2. *Woodsiaceae* Herter (*Athyrioides*, *Athyriaceae*, *Cystopteridaceae*) - Woodsia family;
3. *Dryopteridaceae* R.-C.Ching (*Aspidaceae* Mett. ex. Frank.) – Woodfern family;
4. *Aristolochiaceae* Juss. (*Asaraceae* Vent., *Hydnoraceae* C. Agardh, nom. cons., *Lactoridaceae* Engl.) - Birthwort family;
5. *Araceae* Juss. (*Lemnaceae* S.F. Gray) – Arum family;
6. Potamogetonaceae Bercht. & J.Presl (*Zannichelliaceae* Dumort.) – Pondweed family;
7. *Papaveraceae* Juss. (*Fumariaceae* DC., *Hypecoaceae* Willd. et Lange) - Poppy-flowered family;
8. *Berberidaceae* Juss., nom. cons. (*Podophyllaceae* DC.) - Barberry family
9. *Santalaceae* R.Br., nom. cons. (not monophyletic if *Balanophoraceae* are embedded; including *Amphorogynaceae* Nickrent & Der, *Thesiaceae* Vest, *Cervantesiaceae* Nickrent & Der, *Omandraceae*

Nickrent & Der, *Nanodeaceae* Nickrent & Der, *Viscaceae* Batsch) - Sandalwood family
10. *Tamaricaceae* Link., nom. cons. (*Reaumuriaceae* Ehrenb ex Lindl) - Tamarisk family
11. *Betulaceae* S.F. Gray (*Corylaceae* Mirb.) – Birch family;
12. *Amaranthaceae* Juss.(*Chenopodiaceae* Vent.*)* - Amaranth family
13. *Lythraceae* J.St. - Hil., nom. cons. (*Punicaceae* Horan.) - Loosestrife family
14. *Boraginaceae* Juss. (*Codonaceae* Weigend & Hilger) - Borage family;
15. *Olacaceae* R. Br. (*Aptandraceae* Miers, *Coulaceae* Tiegh., *Erythropalaceae* Planch. ex Miq.,*Octoknemaceae* Soler., *Strombosiaceae* Tiegh.,*Ximeniaceae* Horan.) –Olive family;
16. *Plantaginaceae* Juss. (*Globulariaceae* DC., *Callitrichaceae* Link, *Veronicaceae* Cassel, *Hippuridaceae* Vest) - Plantain family;
17. *Caprifoliaceae* Juss. (*Dipsacaceae* Juss., *Valerianaceae* Batsch.) - Honeysuckle family;
18. *Aceraceae* Juss. (*Sapindaceae* Juss.) - Maple family

Such changes in the systematics will undoubtedly continue in the future, and research at the molecular level will inevitably lead to the formation of new changes. Information on the study of flora and vegetation of the Caucasus, including the Republic of Azerbaijan, is already found in the works of scientific groups and research scientists. Some families of the flora of Nakhchivan AR have been included in scientific researches and systematically review, rare species, possibilities of use are reflected in fully published books. At the same time, the occurence and formation of flora, the history of the study and the results of recent taxonomic changes are presented here [4; 5]

Thus, on the basis of the collected rich collection of plants and literature as a result of long-term research, the current state of the species composition of the flora of Nakhchivan AR has been fully determined. 3018 species of higher spore, bare-seeded and covered-seeded plants are found in this region, which is not very large in area, of which monocotyledonous class of flowering plants is represented by 24 families, 159 genera and 577 species, and dicotyledonous class by 87 families, 646 genera and 2269 species. The taxonomic spectrum is shown in the table below (Table).

Table 1: Flora spectrum of higher spore, bare-seeded and covered-seeded plants of Nakhchivan AR

Division		Family	Genus	Species
Bryophyta		37	79	127
Pteridophyta Polypodiophyta		6	11	15
Equisetophyta		1	1	7
Gnetophyta		1	1	2
Pinophyta (Gimnospermae)		4	13	21
Magnoliophyta (Angiospermae)	Classes: *Monocotyledoneae*	24	159	578
	Classes: *Dicotyledoneae*	87	646	2270
Total:		160	910	3020

After analyzing the taxonomic spectrum of higher spore, bare-seeded and covered-seeded plants of Nakhchivan AR, it was determined that 26 out of 160 families present in the territorial flora are represented by only one genus and one species. These families are as follows:

Classes: Psilotopsida
Order: Ophioglossales
1. Family: Ophioglossaceae R.Br.
Genus: Botrychium Sw.
Botrychium lunaria (L.) Swartz in Schrad., Jorun
Classes: Angiospermae
Subclasses: *Liliidae*
Monocotyledon
2. Family: Butomaceae Mirb., nom. cons.
Genus: Butomus L.
Butomus umbellatus L.
3. Family: Juncaginaceae Rich., nom. cons.
Genus: Triglochin L.
Sect.1. Triqlochin
Triglochin palustre L.
4. Family: Ruppiaceae Horan. 1834, nom. cons.
Genus: Ruppia L. - Widgeonweed
Ruppia maritima L. - Widgeongrass
Order: Dioscoreales Mart.
5. Family: Dioscoreaceae R.Br., nom. cons. - Yam family
Genus: Dioscorea L.
Dioscorea caucasica Lipsky – Caucasian yam
6. Family: Ixioliriaceae Nakai
Genus: Ixiolirion Herb.
Ixiolirion tataricum (Pall.) Herb. (I. montanum (Labill.) Herb.
Order: Zingiberales Griseb.
7. Family: Zingiberaceae Martinov, nom. cons.
- Ginger family
Genus: Curcuma L. - Hidden-lily
*Curcuma longa L.- Common turmeric
8. Family: Cannaceae Juss. nom. cons.
.Genus: Canna L. - Canna
*Canna indica L. - Indian shot
Dicotyledon
Order: Ceratophyllales Link
9. Family: Ceratophyllaceae S.F. Gray, nom. cons. – Hornwort family
Genus: Ceratophyllum L. - Hornwort
Ceratophyllum demersum L.
Order: Proteales Juss. ex Bercht. & J.Presl
10. Family: Platanaceae T. Lestib., nom. cons. – Plane family
Genus: Platanus L. - Plane
*Platanus orientalis L. – Oriental plane
Order: Saxifragales Bercht. & J.Presl
11. Family: Paeoniaceae Raf. non. cons. – Peony family
Genus: Paeonia L.- Peony
Sect.1. Paeonia
Subsect.1. Paeonia
Paeonia tenuifolia L. - Slender-leaved peony
12. Family: Haloragaceae R.Br., nom. cons. - Foxtail family
Genus: Myriophyllum L. - Foxtail
*Myriophyllum spicatum L. – Grain foxtail
Subclass: Magnoliidae
Order: Aristolochiales
Suborder: Aristolochiineae
13. Family: Aristolochiaceae Juss., nom. cons.* (including *Asaraceae* Vent., *Hydnoraceae* C. Agardh, nom. cons.,

Lactoridaceae Engl., nom. cons.) - Subfam.1. Aristolochioideae Burnett
Genus: Aristolochia L. - Dutchman's pipe
Aristolochia bottae Jaub. & Spach - Botta dutchman's pipe
14. Family: Datiscaceae Dumort., nom. cons. - Datisca family
Genus: Datisca L. – Datisca
Datisca cannabina L.
15. Family: Passifloraceae Juss. ex Roussel, nom. cons. - Passion flowered family
Genus: Passiflor L. - Passionflower
*Passiflora incarnata L. - Purple passionflower
Order: Oxalidales Bercht. & J.Presl
16. Family: Oxalidaceae R.Br., nom. cons. - Oxalis family
Genus: Xanthoxalis Small
Xanthoxalis corniculata (L.) Small - Horn oxalis
17. Family: Myrtaceae Juss., nom. cons. - Myrtle family
Genus: Myrtus L. - Myrtle
*Myrtus communis L. – Common myrtle
Order: Sapindales Juss. ex Bercht. & J.Presl
18. Family: Biebersteiniaceae Schnizl. – Biebershteinia family
Genus: Biebersteinia Steph. - Biebershteinia
Biebersteinia multifida DC. - Multiseparate biebershteinia
19. Family: Simaroubaceae DC., nom. cons. - Ailanthus family Genus: Ailanthus Desf. - Ailanthus, Ailanthus altissima (Mill.) Swingle
20. Family: Meliaceae Juss., nom. cons. Genus: Melia L. – Melia *Melia azedarach L. – Persian melia
21. Family: Capparaceae Juss., nom. cons. – Capers family Subfam.1. Capparoideae Burnett Trib.1.Cappareae DC.
Genus: Capparis L. – Caper Capparis spinosa auct. non L. (C. herbacea Willd.) – Spiny caper
Asterids
Order: Cornales Link
22. Family: Hydrangeaceae Dumort., nom. cons. – Hydrangeas family
Genus: Philadelphus L. - Mockorange
*Philadelphus caucasicus Kochne. – Caucasian mockorange
Order: Ericales Bercht. & J.Presl
23. Family: Balsaminaceae A.Rich., nom. cons. – Balsam family
Genus: Impatiens L. - Balsam
*Impatiens balsamina L. - Balsam
Order: Garryales Mart.
24. Family: Eucommiaceae Engl., nom. cons.
Genus: Eucommia Oliv.
*Eucommia ulmoides Oliv.
25. Family: Menyanthaceae Dumort., nom. cons.
Genus: Menyanthes L.
Menyanthes trifoliata L.
Order: Apiales Nakai
26. Family: Araliaceae Juss., nom. cons.
Genus: Hedera L.
*Hedera helix L.

The species of the presented 11 marked families are introduced in the Autonomous Republic and used for landscaping and decorative purposes, and the species highlighted in italics will be included in the Red Books of Nakhchivan AR or the Republic of Azerbaijan or will be included in future editions with certain statuses.

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