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## FLORA OF THE BATABAT PLATEAU

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## ФЛОРА ПЛАТО БАТАБАТ

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*Abstract.* In modern times, the study of biodiversity in the context of global climate change is becoming more and more important. The study area is the Batabat Plateau, located in the north of the Nakhchivan Autonomous Republic, on the southern slope of the Zangezur Range. The area surrounded by the Zangezur and Daralayaz ranges has such geographical conditions that the air humidity is below normal for most of the year. Only in the summer months does the humidity increase relatively. Due to the flow of moist air entering the area through the Bichanak pass, which is a low area of the Zangezur range, the humidity of the air is relatively high, which is very important in the formation of vegetation. As a result of our research, it was found that 968 species of plants belonging to 58 families and 344 genera can be found in the flora of the Batabat plateau, and the flora spectrum of the area was prepared by us. The species of plants distributed in the Batabat plateau were analyzed according to their life forms and useful properties, and it was found that the plant groups formed by these species contain a quantity of technical medicines, fruits and berries, and other useful products that will provide a number of industries (food, medicine, perfumery, etc.). Plant groups have abundant natural resources, which are used effectively.

*Аннотация.* В современное время изучение биоразнообразия в условиях глобального изменения климата становится все более важным. Район исследования — плато Батабат, расположенное на севере Нахичеванской Автономной Республики, на южном склоне Зангезурского хребта. Территория, окруженная хребтами Зангезур и Дарелаяз, имеет такие географические условия, что большую часть года влажность воздуха ниже нормы. Лишь в летние месяцы влажность относительно увеличивается. За счет притока влажного воздуха, поступающего на территорию через перевал Биченак, представляющий собой низменную

часть Зангезурского хребта, влажность воздуха относительно увеличивается, что очень важно в формировании растительности. В результате наших исследований установлено, что во флоре Батабатского плато встречается 968 видов растений, относящихся к 58 семействам и 344 родам, нами подготовлен спектр флоры местности. Проанализированы виды растений, распространенных на плато Батабат, по их жизненным формам и полезным свойствам, и установлено, что группы растений, образованные этими видами, содержат некоторое количество технических лекарственных средств, фруктов и ягод и других полезных веществ, которые будут обеспечивать ряд отраслей промышленности (пищевую, медицинскую, парфюмерную и т. д.).

*Keywords:* Zangezur, Batabat plateau, flora, useful plants, Fabaceae, Apiaceae.

*Ключевые слова:* Зангезур, плато Батабат, флора, полезные растения, бобовые, зонтичные.

In modern times, the study of biodiversity in the context of global climate change is becoming more and more important. The study area is the Batabat Plateau, located on the southern slope of the Zangezur Mountain Range, in the north of the Nakhchivan Autonomous Republic, which is an integral part of the Republic of Azerbaijan. The district is bounded by Bichenak Pass (2346 m above sea level), which is the lowest section of the Zangezur mountain range, located between “Eyrigar” mountain (2450 m) and Salvarty mountain (2346 m above sea level), from the east by Salvarty mountain (3100 m), from the west by low hilly sections of the Zangezur mountain range, and from the south surrounded by Big and Small Treasure hills. The district is located at an altitude of 2100-2346 meters above sea level.

The slopes of Mount “Eyrigar” facing Batabat are intensely broken, rocky, and steep slopes. Due to poor vegetation development in these areas, the soil cover has been largely or completely washed away in many places. The Batabat Depression, located in the south of Mount “Eyrigar,” is a low hilly area and represents a very rich floristic area. To the south of the area is the Batabat forest.

Numerous and abundant water springs and Batabat lakes are carrying great importance in regulating the water balance of the Batabat plateau. Although Batabat lakes were originally natural lakes, they were later expanded and turned into large water bodies. The total volume of water of these lakes is 3 million cubic meters.

The amount of annual precipitation in the area varies from 600 to 800 mm. The annual precipitation sometimes reaches 700-800 (900) mm in the high places of the Zangezur and Darelaez ridges. In the spring months of the year, especially in April-May, and in some years even up to mid-June, the amount of precipitation in the area can reach a maximum limit of about 1000 mm.

Snow falls in the area mainly in November, and in some cases from mid-October onwards. Snow lies until April-May. The thickness of snow in the area of Batabat often reaches 1-1.5 meters.

The area surrounded by the Zangezur and Darelaez ranges has geographical conditions such that for most of the year the humidity is below normal. It is only during the summer months that humidity increases relatively. Due to the inflow of humid air coming into the territory from the Caspian Basin through the Bichenak Pass, which is a low-lying section of the Zangezur Range, the air humidity increases relatively, which is very important in the formation of vegetation.

The average annual air temperature in the Batabat area varies between +9 and +20 degrees Celsius depending on altitude.

Grassy mountain-meadow, mountain-meadow steppe, and mountain-meadow forest lands are widespread in the area.

### Material and methodology of the study

In the course of the research, generally accepted floristic, geobotanical, bioecological, and other methods were used, and phenological observations were used. A. Askerov's "Azerbaijan Flora" [2], H. Gasimov, S. Ibadullayeva, M. Seyidov, G. Shiraliyeva "Wild Vegetable Plants in the Flora of Nakhchivan Autonomous Republic" [29], H. Gasimov, S. Ibadullayeva, M. Seyidov, Z. Salayeva. It is given based on the works "Flora and vegetation of Shahbuz state nature reserve" [11] and Flora Azerbaijan [12].

### Discussion and conclusions of the study

Based on the conducted research, 1002 species of higher plants, including 74 families and 374 genera, were found in the flora of the Batabat plateau. In conducting a comprehensive analysis of the local flora, M. M. the works of Seyidov and H. Z. Gasimov were cited. As can be seen from Table 1, 95.41% of the flora of the area is made up of covered plants.

Table 1

DISTRIBUTION OF THE BATABAT FLORA IN THE HIGHER PLANT DIVISIONS.

№	Higher plant divisions	Families		Genus		Species	
		quantity	%	quantity	%	quantity	%
1	<i>Bryophyta</i>	15	20,27	30	8,02	34	3,39
2	<i>Pteridophyta</i>	3	4,06	5	1,34	8	0,80
3	<i>Equisetophyta</i>	1	1,35	1	0,27	2	0,20
4	<i>Pinophyta</i>	1	1,35	1	0,27	2	0,20
5	<i>Magnoliophyta</i>	54	72,97	337	90,10	956	95,41
Total:		74	100	374	100	1002	100

Other plants are few in number and constitute 4.59% of the total flora, including 'Bryophyta' with 34 (3.39%) species belonging to 30 genera belonging to 15 families and 'Equisetophyta' with 2 (2) species belonging to 1 genus. Higher spore plants constitute 4.39% (44 species) of the whole flora, including 36 (9.63%) genera and 19 (25.67%) families.

Holo-seeds are represented by 2 species grouped in 1 (0.27%) genus belonging to 1 (1.35%) family, representing 0.20% of the flora. From Table 1, it can be seen that the coverts constitute 95.41% (956 species) of the local flora. Regarding the analysis of chapters "Asteraceae Dumort" (176 species), "Fabaceae Lindl." (96 species), and "Lamiaceae Lindl." 74 species, "Brassicaceae Burnett" 73 species, "Poaceae Barnhart." 61 species, "Caryophyllaceae Juss." 47 species, "Rosaceae Juss." 47 species, "Scrophulariaceae Juss." 41 species, "Apiaceae Lindl." 40 species, "Ranunculaceae Juss." 36 species and "Boraginaceae Juss." were represented by 29 species [3-7, 9, 10, 13-19, 25].

The number of species included in these families is 720 species (176 to 29), representing 74.46% of the whole flora. The number of species ranges from 20-6 to 10 families and 122 species, representing 12.62% of the total flora, and 41 families with a number of species ranging from 5-1 to 125 species, representing 12.92% of the total flora (Table 2, 3).

*Asteraceae* Bercht. & J. Presl. (46), *Brassicaceae* Burnett (34), *Apiaceae* Lindl. (34), *Poaceae* Barnhart (33), *Lamiaceae* Lindl. (19), *Fabaceae* Lindl. (18), *Caryophyllaceae* Juss. (16), *Boraginaceae* Juss. (16), *Scrophulariaceae* Juss. (13), *Rosaceae* Juss. (11), *Ranunculaceae* Juss. (10), *Polygonaceae* Juss. (6) families dominate by the number of genera (Table 4). Some genera on the Batabat Plateau play an important role in the formation of phytocenoses as subdominant and dominant species because of the large number of species [1, 8, 22-24, 26-28].

Table 2

FLORA SPECTRUM OF THE BATABAT PLATEAU

№	Families	Genus	Species	№	Families	Genus	Species
1	<i>Alismataceae</i> Vent.	1	2	30	<i>Juncaginaceae</i> Rich.	1	1
2	<i>Amaryllidaceae</i> J.St.-Hil.	1	16	31	<i>Lamiaceae</i> Martinov.	19	74
3	<i>Araceae</i> Juss.	1	2	32	<i>Liliaceae</i> Juss.	3	13
4	<i>Amaranthaceae</i> Juss.	2	2	33	<i>Linaceae</i> DC.ex Perleb.	1	2
5	<i>Apiaceae</i> Lindl.	34	40	34	<i>Lythraceae</i> J.St.- Hil.	1	1
6	<i>Apocynaceae</i> Juss	1	1	35	<i>Malvaceae</i> Juss.	2	4
7	<i>Asphodelaceae</i> Juss.	1	1	36	<i>Menyanthaceae</i> Dumort.	1	1
8	<i>Aspleniaceae</i> Newm.	2	4	37	<i>Onagraceae</i> Juss.	2	6
9	<i>Asteraceae</i> Bercht. & J.Presl.	46	176	38	<i>Orchidaceae</i> Juss.	4	7
10	<i>Boraginaceae</i> Juss.	16	29	39	<i>Papaveraceae</i> Juss.	3	6
11	<i>Brassicaceae</i> Burnett	34	73	40	<i>Plantaginaceae</i> Juss.	2	5
12	<i>Butomaceae</i> Mirb.	1	1	41	<i>Plumbaginaceae</i> Juss.	1	2
13	<i>Campanulaceae</i> Juss.	3	14	42	<i>Poaceae</i> Barnhart.	33	61
14	<i>Caprifoliaceae</i> Juss.	5	16	43	<i>Polygalaceae</i> Hoffman.	1	1
15	<i>Caryophyllaceae</i> Juss.	16	47	44	<i>Polygonaceae</i> Juss.	6	20
16	<i>Convolvulaceae</i> Jus.	2	3	45	<i>Potamogetonaceae</i> Berc.	1	3
17	<i>Crassulaceae</i> J.St.-Hil.	3	5	46	<i>Primulaceae</i> Batsch	2	4
18	<i>Cupressaceae</i> S.F.Gray	1	2	47	<i>Pteridaceae</i> Kirchn.	1	1
19	<i>Cyperaceae</i> Juss.	2	16	48	<i>Ranunculaceae</i> Juss.	10	36
20	<i>Colchicaceae</i> DC	2	5	49	<i>Rosaceae</i> Juss.	11	47
21	<i>Dryopteridaceae</i> Ching	2	3	50	<i>Rubiaceae</i> Juss.	3	8
22	<i>Euphorbiaceae</i> Juss.	2	5	51	<i>Rutaceae</i> Juss.	1	1
23	<i>Equisetaceae</i> Michx. ex DC.	1	2	52	<i>Salicaceae</i> Mirb.	1	2
24	<i>Fabaceae</i> Lindl.	18	96	53	<i>Saxifragaceae</i> Juss.	1	3
25	<i>Gentianaceae</i> Juss.	5	7	54	<i>Scrophulariaceae</i> Juss.	13	41
26	<i>Geraniaceae</i> Juss.	2	6	55	<i>Sparganiaceae</i> Rudolphi	1	3
	<i>Hyacinthaceae</i> Batsch	5	12	56	<i>Typhaceae</i> Juss.	1	2
27	<i>Hypericaceae</i> Juss.	1	6	57	<i>Urticaceae</i> Juss.	2	2
28	<i>Iridaceae</i> Juss.	3	10	58	<i>Violaceae</i> Batsch	1	5
29	<i>Juncaceae</i> Juss	2	4	-	-	-	-
<i>Total</i>						344	968

Table 3

PLANT FAMILIES WITH THE MOST GENERA AND SPECIES IN THE BATABAT PLATEAU

№	Plant families	Genus	%	Species	%
1	<i>Asteraceae</i> Bercht. & J.Presl.	46	13,37	176	18,18
2	<i>Fabaceae</i> Lindl.	18	5,23	96	9,92
3	<i>Lamiaceae</i> Lindl.	19	5,52	74	7,64
4.	<i>Brassicaceae</i> Burnett	34	9,88	73	7,54
5	<i>Poaceae</i> Barnhart.	33	9,59	61	6,30
6	<i>Caryophyllaceae</i> Juss.	16	4,65	47	4,86
7	<i>Rosaceae</i> Juss.	11	3,18	47	4,86
8	<i>Scrophulariaceae</i> Juss.	13	3,76	41	4,23
9	<i>Apiaceae</i> Lindl.	34	9,83	40	4,13

№	Plant families	Genus	%	Species	%
10	Ranunculaceae Juss.	10	2,90	36	3,72
11	Boraginaceae Juss.	16	4,65	29	3,00
12	Polygonaceae Juss.	6	1,74	20	2,07
<i>Total:</i>		256	73,30	740	76,45

Table 4

BATABAT PLATEAU GENERA WITH THE HIGHEST NUMBER OF SPECIES

№	Genus	Number of species	Total number as %
1	Allum	16	1,65
2	Astragalus	14	1,45
3	Rosa	14	1,45
4	Cirsium	13	1,34
5	Silene	11	1,14
6	Centaurea	10	1,03
7	Potentilla	8	0,83
8	Salvia	6	0,62
9	Alchemilla	9	0,93
10	Carex	8	0,83
11	Pyrethrum	6	0,62
12	Veronica	6	0,62
13	Ranunculus	7	0,72
14	Vicia	7	0,72
15	Gagea	5	0,51
<i>Total</i>		140	14,46

As can be seen from the table, there are 140 species in 15 genera with the number of species from 5 to 16, which is 14.46% of the total number of species. The genera *Allum* (16), *Astragalus* (14), *Rosa* (14), *Cirsium* (13), *Silene* (11), *Centaurea* (10) dominate in number of species. Of the remaining 329 genera, 828 species were collected, representing 85.54% of the total flora.

### Results

As a result of our research, it was found out that 968 species of plants belonging to 58 families and 344 genera are encountered in the flora of the Batabat Plateau, and for the first time the flora spectrum of the area was developed by us.

When analyzing the plant species distributed in the territory by life forms and useful properties, it was found that in the groups of plants formed by these species, there is a sufficient number of technical and medicinal plants, fruit and berry plants, and other useful plants to provide a number of plants; industries (food, medical, perfumery, etc.) have rich natural resources, and these plants are used effectively.

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