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DENDROFLORA OF ZAAMINSKY STATE RESERVE

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ANNOTATION

Zaamin State Reserve, located on the western spurs of the Turkestan ridge in the upper reaches of the Sangzar River, is the richest region in Uzbekistan in terms of floristic and phytocenotic relations. This reserve, created in 1926, is unique in the number of rare endangered plant species growing in this small area. Juniper forests, in their fullness and richness in species of trees and shrubs, have no analogues in our republic. At least 20 plant species have been described from this territory, which is comparable to the famous flora of Chimgan. The list of vascular plants compiled and published by M.G. Popov, N.V. Androsov in 1937, for a long time was almost the only floristic information throughout the western Pamir-Alai. In the second half of the 20th century, large-scale floristic research was carried out not only in this region, but also throughout the territory of Uzbekistan. In particular, lists of floras of the Chatkal, Nurata and Surkhan reserves were published. Thus, the studied dendroflora, which is richer in the number of plant species, will be a good help for creating an electronic database of the modern flora of Uzbekistan.

Key words: spurs, vegetation, reserve, long-term observations, florogenetic classification, cryophyton, described in detail, Juniperus polycarpos var.sarawschanica, Aceraceae Juss, Zaamin reserve, Central Asian, Astragalus L., dendroflora.

INTRODUCTION

Zaamin State Reserve is located on the northern slope of the western part of the Turkestan Range (Western Pamir-Alai). The boundaries of the reserve run along the ridge of the Turkestan ridge (southern), along the watershed of one of its spurs (eastern) and along the valley of the river. Baikungursai. The northern border has no natural landmarks and is marked by sold out houses along the slopes of the Malguzar ridge. The history of the creation of the Zaamin Reserve is associated with the name of the remarkable Russian naturalist B.A. Fedchenko [3], who together with his wife, botanist and artist O. Fedchenko, at the end of the 60s of the XIX century. explored the western part of the Turkestan ridge[2]. The first description of the vegetation of this area was made in 1916 by the employee of the Resettlement Department of the Ministry of Agriculture of Russia O.E. Knorring [5]. At the beginning of the XX century. As a result of the first forest management works on the territory of modern Sangzarsky, Bakhmal and Zaamin forestry enterprises, the Zaamin forest dacha was organized [6]. Detailed forest management in 1925-1926 served as the basis for the creation of the first in Uzbekistan Guralash reserve with an area of about 8500 hectares. It existed from 1926 to 1926 and from 1934 to 1951. In the 1920s and 1930s, comprehensive studies (geological, hydrological, botanical and zoological) were carried out in the western part of the Turkestan ridge. Since 1978, the territory of the reserve is included in the protected area of the People's Park of Uzbekistan, and its area is more than 26840 hectares.

MATERIAL AND METHODS

The climate of the Zaamin State Reserve can be characterized by the data of long-term observations of the Kulsai hydrometeorological station, located at an altitude of 2100 m. This territory is characterized by relatively cool and humid summers and moderately cold winters. Botanical research of the river basin. The Sangzar and its upper reaches were started by B.A. Fedchenko in 1866, where the great Russian traveler collected an extensive herbarium collection and described the vegetation cover of the western Pamir-Alai B.A. Fedchenko [3]. Perhaps the only work on the flora and vegetation of the Guralash reserve was done by M.G. Popov in 1930, N.V. Androsov [7]. Here, not only tree-shrub plant groups are described in detail, but also wheatgrass, feather grass, fescue and forb communities. Of particular interest are descriptions of alpine meadows, cryophyton, and upland xerophyte formations. The dendroflora of the reserve is described in great detail, where the authors indicate 13 dominant species. Another geobotanical map was published by M.V. Agafonov and G.S. Sivoraksha [1] on the natural renewal of juniper in the Zaamin forest dacha. Notes on the dendroflora of Guralash and Kulsai were published by A.L. Fedorov [4]. Then E.M. Demurina published an essay on the vegetation of the western part of the Turkestan ridge and its spurs. Later, her data E.M. Demurin, [8] were included in the essay on the Turanian dry steppe in the multivolume monograph “Vegetation cover of Uzbekistan and ways of its rational use”. Vegetation mapping of the river basin Sangzar (excluding the reserve) was carried out using unpublished data from Sh.K. Kamalov and M. Tirkasheva.

Now let us consider in more detail the main florocenotypes of the study area, distinguished on the basis of the florogenetic classification of plants developed by R.V. Kamelin [10]:

A). Macrothermal juniper forests (edificator - Juniperus polycarpos var.sarawschanica - kara archa).

The juniper stands of the reserve are forests with a projective cover of up to 0.8 in the altitude range of 1600 - 2500 m. at. m.The shrub layer is represented, as a rule, by several types of roses (Rosa canina, R. ecae, R. maracandica, R. transturkestanica), honeysuckle (Lonicera altmanii, L. microphylla), irgai (Cotoneaster nummularia) and ephedra (Ephedra equisetina, E. intermedia).

B). Microthermal juniper forests (edificator - Juniperus pseudosabina - caur juniper).

The saurarch forests of the reserve are light forests with a projective cover of up to 0.5 in the altitude range of 2500 - 3200 m. at. The main subdominant at lower altitudes is Juniperus semiglobosa, and the poor shrub layer is composed of Berberis oblonga, Cotoneaster nummularia, Rosa ecae, Ribes meyeri, Lonicera persica, L. microphylla, L. Altmanni [1]. Thus, the vegetation of the Zaamin Reserve is represented mainly by 5 florocenopes, we have identified 2 (A, B) florocenopes. It is especially worth noting the fact that macrothermal juniper forests not only in the reserve, but also on the territory of the national park have no analogues in Uzbekistan. 3. The collection of herbarium material to identify the composition of the flora of the Zaamin Reserve was carried out from 2019 to 2020 by the route-reconnaissance method. During the research period, more than 750 leaves of the herbarium were collected and identified, which are currently stored in the TASH collection, as well as in the Zaamin reserve. The flora summary is made in alphabetical order, and the priority species names are given according to S.K. Cherepanov [10] and U.P. Pratov, M.M. Nabiev with some IPNI adjustments. The names of the taxa authors correspond to the latest R.K. Brummit & C.E. Powell "Authors of plants name".

When identifying plant species, the multivolume editions "Flora of Uzbekistan", "Flora of Tajikistan", "Flora of Kyrgyzstan", "Keys to Plants of Central Asia" were used. The species were counted on the basis of our own field studies, literature data and viewing, herbarium specimens in the TASH herbarium.

K. Sh. Assisted in identifying taxonomic groups and compiling a list of flora. Tojibaev (different groups), F.O. Khasanov (species Astragalus), N.F. Rusanov (Rosa).

The analysis of the types of areas was made according to the principles proposed by G. Walter, V. Alekhin, Humboldt, A.I. Tolmachev and R.V. Kamelin. We, as well as the above authors, adopted a simple one-stage scheme, since a 2-stage scheme is most acceptable for large floristic units, as well as in the case when the study area is borderline with 2 or more regions at once. In total, 42 types of areas were identified:

1. Guralash (2 species) endemics of the Guralashsay basin (Eremurus chloranthus, A. guralashense ined.)

2.Kulsai (3 species) range within the Kulsai basin (Astragalus belolipovii, A. russanovii).

3.Malguzar (1 species) range within the endemic range of the Malguzar (Allium levichevii) ridge.

4. Turkestan (7 species) range within the Turkestan ridge. Among them are Cousinia horridula, C. malgusarica, Acantholimon aff. alatavicum, Elymus lachnophyllus.

5. Nuratau-Turkestan (1 species) range within the Nuratau and Turkestan ridges. This is Dracocephalum nuratavicum.

6.Western Pamir-Alai (58 species) range within the western spurs of the Turkestan, Zaravshan and Gissar ranges. Among them are Astragalus leptophysus, A. lipskyi, A. patentivillosus, Cousinia verticillaris.

7.Kukhistan (24 species) area within the Kuhistan district in the sense of R.V. Kamelin. Among them are Primula iljinskyi, Caragana alaica, Cicer pungens, Oxytropis capusii.

8. Fergana-West Pamir-Alai (2 species) range within the Circumfergan block and the western spurs of the Turkestan, Zaravshchansky and Gissar ranges. Oedibasis tamerlanii, Astragalus dictamnoides.

9.Pamir-Alai (57 species) range within the Pamir-Alai mountain system. Among them are Dianthus baldschuanicus, D. subscabridus, Matthiola integrifolia, Cynoglossum glochidiatum.

10. Turan-Pamir-Alai (5 species) range within the Turan desert and Pamir-Alai mountain systems. Among them are Alhagi kirghosorum, Ferula schtschurowskiana.

11.Western Tien Shan-Western Pamir-Alai (47 species) range within the Western Tien Shan and Western Pamir-Alai. Among them are Leiospora subscapigera, Leontice eversmannii, Tragopogon malicus, Pseudolinosyris grimmii.

12.Western Tien Shan-Pamir-Alai (31 species) range within the Western Tien Shan and Pamir-Alai mountain system. Among them are Echinops maracandicus, Artemisia glanduligera, Eremurus aitchinsonii, Mediasia macrophylla.

13. Mountainous Central Asian (116 species) area within the Mountainous Central Asian province in the sense of R.V. Kamelina [9]. Among them are Lomatocarpa albomarginatum, Elaeosticta hirtula, Helichrysum maracandicum., Tragopogon vvedenskyi.

14. Turan-Mountain Central Asian (1 species) area within the Turan desert and Mountain Central Asian province in the sense of R. Kamelin [9]. This is Allium filidens.

15. Tarbagatai-Mountain Central Asian (69 species) area within the Mountain Central Asian province in the sense of R.V. Kamelin [9] and Tarbagatai ridge. Among them are Lappula occultata, Macrotomia euchroma, Lonicera altmannii., L. microphylla.

16. Kopetdag-Mountain Central Asian (6 species) area within the Mountain Central Asian province in the sense of R. Kamelin [9] and the Kopetdag ridge. Among them are Pseudoclausia turkestanica, Bunium chaerophylloides, Elaeosticta allioides, Kozlovia paleacea.

17. Khorasan-Mountain Central Asian (45 species) area within the area within the Mountain Central Asian province in the sense of R.V. Kamelin [9] and Khorasan province. Among them are Eremogone griffithii, Achyroseris tragopogonoides, Borkonstia popovii, Cirsium turkestanicum.

18. Central Asian (35 species) area within Central Asia, adopted in the Keys to Plants of Central Asia. Among them are Arum korolkowii, Artemisia serotina, Microcephala lamellata., Scorzonera circumflexa.

19. Altai-Central Asian (6 species) area within Central Asia, adopted in the Keys to Plants of Central Asia and Siberian Altai. Among them are Stellaria fontana, Rochelia leiocarpa, Solenanthus circinnatus.

20.Iran-Central Asian (76 species) range within the entire Iran and the Mountainous Central Asian province. Among them are Eremodaucus lehmannii, Eryngium caucasicum, Heteracia epapposa, Inula macrophylla.

21. Primalay (32 species) range within the Gorno-Central Asian province, Paropamiz and Hindu Kush. Among them are Erigeron petroiketes, Lepidolopsis turkestanica, Veronica cardiocarpa, Solanum asiae-mediae.

22. Iranian-Himalayan (109 species) range within the entire Iran, Pamir-Alai, Paropamiz and Hindu Kush. Among them are Artemisia persica, A. rutifolia, Lactuca dissecta, Pyrethrum pyrethroides, Taraxacum monochlamydeum.

23. Altai-Himalayan (2 species) area within Siberian Altai, Gorno-Central Asian province in the sense of R.V. Camelina [9], Paropamiz and Hindu Kush. Among them are Paeonia hybrida, Poa litwinowiana.

24. Kashgar-Central Asian- (1 species) area within Kashgar and Central Asia, adopted in the Keys to Plants of Central Asia. These are Pseudohandelia umbellifera, Nepeta micrantha, Eremopoa songarica

25. Kashgar-Siberia-Central Asian (6 species) area within Siberia, Kashgar and Central Asia, adopted in the Keys to Plants of Central Asia. Among them are Gentiana leucomelaena, Gentiana turkestanorum, Antonina debilis.

26.Siberian-Mountain Central Asian (7 species) range within Siberia and Mountain Central Asian province in the sense of R.V. Kamelina [9]. Among them are Erigeron sarawschanicus, Juncus schischkinii, Gagea dshungarica, Gagea filiformis.

27.Siberian-Central Asian (26 species) range within Siberia and Central Asia, adopted in the Keys to Plants of Central Asia. Among them are Cirsium alatum, Chondrilla aspera, Senecio subdentatus.

28. Caucasus-Iran-Central Asian (13 species) area within the Caucasus, all of Iran and the Gorno-Central Asian province in the sense of R.V. Kamelina [9]. Among them are Elymus transhyrcanus, Astragalus stalinskyi, Onobrychis chorassanica.

29. Euro-Caucasus-Central Asian (8 species) area within Europe, the Caucasus and the Mountainous Central Asian province in the sense of R.V. Kamelina [8]. Among them are Sideritis montana, Daucus carota, Camelina sylvestris.

30. Euro-Siberian-Central Asian (17 species) range within Europe, Siberia and the Gorno-Central Asian province in the sense of R.V. Kamelina [8]. Among them are Cnicus benedictus, Filago pyramidata, Pyrethrum parthenifolium.

31. Eastern Mediterranean (69 species) range within Anatolia, Iran and Central Asia to Kashgar and Xinjiang. Among them are Asparagus neglectus, Artemisia tournefortiana, Barkhausia kotschyana, Lactuca glaucifolia.

32. Pontic-Eastern-Ancient Mediterranean (17 species) range within the Crimea, Anatolia, Iran and Central Asia to Kashgar and Xinjiang. Among them are Fumaria vaillantii, Linum corymbulosum, Echinaria capitata.

33. Pontic-Ancient Mediterranean (12 species) area within

Crimea and the Ancient Mediterranean Region in the sense of M.G. Popov. Among them are Trachomitum scabrum, Lactuca tatarica, Salvia virgata.

34. Caucasus-Siberia-Eastern-Ancient Mediterranean (7 species) area within the Caucasus, Siberia and Anatolia, Iran and Central Asia to Kashgar and Xinjiang. Among them are Orobanche amoena, Papaver croceum, Parnassia laxmannii.

35. Ancient Mediterranean (56 species) range within the Area of the Ancient Mediterranean in the sense of M.G. Popov. Among them are Artemisia scoparia, Carduus nutans, Cirsium vulgare, C. arvense.

36. Pontic-South-Siberian-Ancient Mediterranean (14 species) area within the Caucasus, Siberia and the Ancient Mediterranean Region in the sense of M.G. Popov. Among them are Carduus albidus, Centaurea depressa, C. iberica, C. squarrosa.

37. Euro-Eastern-Ancient Mediterranean (12 species) range within Atlantic Europe and the eastern part of the Ancient Mediterranean Region in the sense of M.G. Popov. Among them are Cistanche salsa, Orobanche cernua, Orobanche elatior.

38. Euro-ancient Mediterranean (63 species) range within Atlantic Europe and the Ancient Mediterranean Region in the sense of M.G. Popov. Among them are Centaurea ruthenica, Filago arvensis, Lactuca serriola, Asperugo procumbens.

39. Moderate-Palaearctic (40 species) range within the boreal and desert part of the Palaearctic. Among them are Ceterach officinarum., Cirsium brevipapposum, Centaurium pulchellum, Geranium collinum.

40. Palaearctic (54 species) range within the entire Palaearctic. Among them are Alisma plantago-aquatica, Crepis multicaulis, Gnaphalium luteo-album, Hieracium virosum.

41. Holarctic (73 species) range within Holarctis. Among them are Conium maculatum, Asplenium ruta-muraria, Artemisia absinthium, A. annua.

42.Pluregional (44 species) range within 3 or more plant kingdoms. Among them are Asplenium trichomanes, Conyza canadensis, Xanthium strumarium.

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RESULTS

A detailed floristic analysis of the territory of the Zaamin State Reserve with a total area of 266 km2, as well as a generalization of all the literature data available on the topic of research and the study of stock materials of the Central Herbarium of the Scientific and Research Center “Botanica” of the Academy of Sciences of the Republic of Uzbekistan made it possible to identify 94 species of trees and shrubs belonging to 50 genera and 26 families (Table 1).

List of dendroflora of the Zaamin State Reserve

Table 1

№	Family	Genus	species	A type range	Life form
1.	*Aceraceae Juss.*	*Acer L.*	*Acer pubescens Franch.*	9	tree
2.			*Acer semenovii Regel et Herder*	13	tree
3.			*Acer turkestanicum Pax*	9	tree
4.	*Anacardiaceae*	*Pistacia L.*	*Pistacia vera L.*	20	tree

	Lindl.				
5.	*Berberidaceae Juss.*	*Berberis L.*	*Berberis nummularia Bunge*	20	bush
6.			*Berberis oblonga (Regel) Schneid.*	18	bush
7.	*Betulaceae S. F. Gray*	*Betula L.*	*Betula tianschanica Rupr.*	15	tree
8.	*Caprifoliaceae Juss.*	*Lonicera L.*	*Lonicera altmannii Regel et Schmalh.*	15	tree
9.			*Lonicera microphylla Willd. ex Schult.*	15	tree
10.			*Lonicera nummulariifolia Jaub. et Spach*	31	tree
11.			*Lonicera simulatrix Pojark.*	20	tree
12.	*Celtidaceae Link*	*Celtis L.*	*Celtis caucasica Willd.*	31	tree
13.	*Chenopodiaceae Vent.*	*Kochia Roth*	*Kochia prostrata (L.) Schrad.*	40	bush
14.			*Kochia scoparia (L.) Schrad.*	40	bush
15.		*Krascheninnikovia Gueldenst.*	*Krascheninnikovia ceratoides Gueldenst. (L.) Gueldenst.*	40	bush
16.	*Cistaceae Juss.*	*Helianthemum Adans.*	*Helianthemum songaricum Schrenk*	35	bush
17.	*Cupressaceae Rich. ex Bartl.*	*Juniperus L.*	*Juniperus polycarpos Koch var.sarawschanica (Kom.) Kitamura*	21	tree
18.			*Juniperus pseudosabina Fisch. et C.A. Mey.*	15	tree
19.			*Juniperus semiglobosa Regel*	21	tree
20.	*Elaeagnaceae Juss.*	*Elaeagnus L.*	*Elaeagnus angustifolia L.*	35	tree
21.		*Hippophayo L.*	*Hippophaë rhamnoides L.*	22	bush
22.	*Ephedraceae Dumort.*	*Ephedra L.*	*Ephedra equisetina Bunge*	15	bush
23.			*Ephedra intermedia Schrenk et C. A. Mey.*	31	bush
24.			*Ephedra kokanica Regel*	15	bush
25.			*Ephedra regeliana Florin*	15	bush
26.	*Fabaceae Lindl.*	*Astragalus L.*	*Astragalus bactrianus Fisch.*	11	bush
27.			*Astragalus dendroides Kar. et Kir.*	15	bush

28.			*Astragalus lasiosemius Boiss.*	13	bush
29.			*Astragalus lasiostylus Fisch.*	6	bush
30.			*Astragalus macranthus (Boriss.) F.O. Khass. ined.*	11	bush
31.			*Astragalus pterocephalus Bunge*	11	bush
32.			*Astragalus russanovii F. O. Khass., Sarybaeva et Esankulov*	2	bush
33.			*Astragalus variegatus Franch.*	13	bush
34.		*Caragana Fabr.*	*Caragana alaica Pojark.*	7	bush
35.			*Caragana turkestanica Kom.*	13	bush
36.		*Colutea L.*	*Colutea paulsenii Freyn et Sint.*	9	bush
37.		*Onobrychis Mill.*	*Onobrychis echidna Lipsky*	12	bush
38.	*Grossulariaceae DC.*	*Ribes L.*	*Ribes meyerii Maxim.*	25	bush
39.	*Juglandaceae A. Rich. ex Kunth*	*Juglans L.*	*Juglans regia L.*	34	tree
40.	*Limoniaceae Sér.*	*Acantholimon Boiss.*	*Acantholimon aff. alatavicum Bunge*	4	bush
41.			*Acantholimon erythraeum Bunge*	9	bush
42.			*Acantholimon tataricum Boiss.*	9	bush
43.	*Moraceae Link*	*Morus L.*	*Morus alba L.*	39	tree
44.	*Oleaceae Hoffmanns. et Link*	*Fraxinus L.*	*Fraxinus sogdiana Bunge*	18	bush
45.	*Polygonaceae Juss.*	*Atraphaxis L.*	*Atraphaxis pyrifolia Bunge*	15	bush
46.			*Atraphaxis sarawschanica Pavlov*	17	bush
47.		*Polygonum L.*	*Polygonum thymifolium Jaub. et Spach*	22	bush
48.			*Polygonum vvedenskyi Sumnev.*	11	bush
49.	*Rhamnaceae Juss.*	*Rhamnus L.*	*Rhamnus cathartica L.*	40	tree
50.			*Rhamnus coriacea (Regel) Kom.*	11	bush
51.		*Sageretia Brongn.*	*Sageretia thea (Osbeck) M. C. Johnst.*	21	bush
52.	*Rosaceae Juss.*	*Amygdalus L.*	*Amygdalus bucharica Korsh.*	6	tree
53.			*Amygdalus spinosissima Bunge*	11	bush

54.		*Cerasus L.*	*Cerasus amygdaliflora Nevski*	11	bush
55.			*Cerasus erythrocarpa Nevski*	20	bush
56.			*Cerasus mahaleb (L.) Mill.*	39	tree
57.		*Cotoneaster Medik.*	*Cotoneaster goloskokovii Pojark.*	15	bush
58.			*Cotoneaster nummularioides Pojark.*	31	bush
59.			*Cotoneaster nummularius Fisch. et C. A. Mey.*	22	bush
60.			*Cotoneaster songaricus (Regel et Herder) Popov*	15	bush
61.			*Cotoneaster suavis Pojark.*	15	bush
62.		*Crataegus L.*	*Crataegus songarica Koch*	15	bush
63.			*Crataegus turkestanica Pojark.*	17	tree
64.		*Hulthemia Dumort.*	*Hulthemia persica (Michx. ex Juss.) Bornm.*	20	bush
65.		*Malus Mill.*	*Malus sieversii (Ledeb.) M. Roem.*	27	tree
66.		*Pentaphylloides Duhamel*	*Pentaphylloides parvifolia (Fisch. ex Lehm.) Soják*	21	bush
67.		*Prunus L.*	*Prunus divaricata Ledeb.*	13	tree
68.		*Pyrus L.*	*Pyrus regelii Rehd.*	11	tree
69.		*Ribes L.*	*Ribes meyeri Maxim.*	23	bush
70.		*Rosa L.*	*Rosa beggeriana Schrenk*	22	bush
71.			*Rosa canina L.*	41	bush
72.			*Rosa ecae Aitch.*	13	bush
73.			*Rosa fedtschenkoana Regel*	13	bush
74.			*Rosa kokanica (Regel) Regel*	13	bush
75.			*Rosa maracandica Bunge*	13	bush
76.			*Rosa nanothamnus Boulenger*	13	bush
77.			*Rosa transturkestanica N. F. Russanov*	13	bush
78.		*Rubus L.*	*Rubus caesius L.*	41	bush
79.		*Sibbaldia L.*	*Sibbaldia tetrandra Bunge*	41	bush
80.		*Sorbus L.*	*Sorbus tianschanica Rupr.*	13	bush
81.		*Spiraea L.*	*Spiraea hypericifolia L.*	31	bush
82.	*Salicaceae Mirb.*	*Populus L.*	*Populus afghanica (Aitch. et Hemsl.) Schneid.*	18	tree
83.			*Populus talassica Kom.*	13	tree

84.		*Salix L.*	*Salix linearifolia E. Wolf*	18	bush
85.			*Salix olgae Regel*	11	bush
86.			*Salix pycnostachya Andersson*	21	bush
87.	*Saxifragaceae Juss.*	*Saxifraga L.*	*Saxifraga hirculus L.*	41	bush
88.	*Solanaceae Juss.*	*Lycium L.*	*Lycium ruthenicum Murray*	38	bush
89.		*Solanum L.*	*Solanum asiae-mediae Pojark.*	21	bush
90.	*Tamaricaceae Link*	*Myricaria Desv.*	*Myricaria bracteata Royle*	39	bush
91.		*Tamarix L.*	*Tamarix arceuthoides Bunge*	18	bush
92.			*Tamarix ramosissima Ledeb.*	39	bush
93.	*Thymelaeaceae Juss.*	*Restella Pobed.*	*Restella abertii (Regel) Pobed.*	13	bush
94.	*Ulmaceae Mirb.*	*Ulmus L.*	*Ulmus campestre L.*	35	tree

According to the composition of the leading families, which are sharply distinguished by the level of species richness, the dendroflora of the Zaamin State Reserve, one can indicate families such as Ephedraceae, Fabaceae, Rosaceae, Salicaceae, genera such as Lonicera L., Juniperus L., Ephedra L., Astragalus L., Cotoneaster Medik., Rosa L. et al. (Table 2)

Leading genera of dendroflora of the Zaamin reserve

table 2

Astragalus L.	*8*	*Juniperus L.*	*3*
Rosa L.	*8*	*Acantholimon Boiss.*	*3*
Cotoneaster Medik.	*5*	*Cerasus L.*	*3*
Lonicera L.	*4*	*Salix L.*	*3*
Ephedra L.	*4*	*Berberis L.*	*2*
Acer L.	*3*	*Populus L.*	*2*

DISCUSSION

Narrow-local and disjunctive types of areas are of the greatest interest in chorological analysis. Areal types 1 and 2 are endemic for the Zaamin reserve (5 species or 0.42% of the flora). The next group of areas (3, 4, 5), in fact, representing subendemics, contains 9 species or 0.75%. Recently described from Nuratau Dracocephalum nuratavicum was found by us in Bakhmal. A group of habitats (6-9) within the Pamir-Alai with 133 species or 11.16% of the entire flora of the reserve stands apart. It is safe to speak about the Kuhistan or, more precisely, the Pamir-Alai genesis of the studied flora. If we consider a higher level, namely the level of the provinces, then the mountainous Central Asian genesis of the studied flora is quite obvious - ranges 1-13 (338 species or

28.35%). The close proximity of the study area to the Turan desert province (areas 10 and 14) all affected the presence of several (6) purely desert (Kyzyl-Kum) species. Closer connections can be traced with other mountainous regions of Central Asia, especially with Tarbagatay (69 species or 3.46%) and Khorasan (51 species or 4.27%). Even closer ties can be traced with the Iranian floras (including Khorasan) - 236 species or 19.79%. Similar connections exist with the Afghan-Pakistani (Himalayan) floras - 143 species or 11.99%. The influence of Altai (6 species or 0.50%), Siberian (50 species or 4.19%), Caucasian (21 species or 1.76%) and Kashgar (1 species or 0.08%) is insignificant. The same can be said about the southern European ties (25 types or 2.09%). The thesis about the ancient Mediterranean genesis of the mountainous Central Asian floras confirms the prevailing ratio of the types of areas included in the Ancient Mediterranean Region, identified by M.G. Popov. There are 832 such species or 69.79%. Quite a large number of Palaearctic (91 species or 4.6%) and Holarctic (72 species or 6.04%) species is explained by the presence of a complete alpine belt. (Himalayan) flora - 143 species or 11.99%. The influence of the Altai (6 species or 0.50%), Siberian (50 species or 4.19%), Caucasian (21 species or 1.76%) and Kashgar (1 species or 0.08%) is insignificant. Species with a pluralistic (44 species or 3.69%) type of habitat indicate a strong anthropogenic disturbance of the flora of this mountainous territory [72], which for a long time was a livestock grazing area.

For the analysis of life forms, we used the classification of I.G. Serebryakov [74]. The spectrum of life forms is shown in Table 3.

Trees and shrubs of the Zaamin State Reserve

table 3

Life form	Designation in the abstract	amount species	% from the flora of the reserve
Trees	Trees	*26*	*2, 18*
Bushes	Bush	*68*	*5, 70*
Total:	*2*	*94*	*7,89*

The number of trees in the reserve is quite large, and together with shrubs this group is 94 species or 7.89%.

The dendroflora of the reserve has much in common with the neighboring dendroflora of the Aktau-Nurata system of low mountains, as well as with the Kuhistan and even Alai floras. Despite this, the studied dendroflora lacks a number of taxa that are quite characteristic of the aforementioned dendrofloras. Being an integral part of the Kuhistan district, the studied dendroflora is quite different from the Zeravshan dendroflora, not to mention from the Central Turkestan. The remarkable endemic Kuhistan genus Komarovia Korovin does not come here either, not to mention the North Fergana genus Mogoltavia Korovin [11].

CONCLUSION

The special richness of the flora of the reserve with species of the genus Astragalus L. was reflected in the endemism of the flora. The first astragalus - A. belolipovii - was scheduled for description by R.V. Kamelin back in the 20th century and was officially described only in 2010 by F.O. Khasanov, N.O. Suleimanov, 2010.

Plants were collected by I.V. Belolipov in the vicinity of the Kulsai forest dacha and planted in the Botanical Garden in 1975. In 2010, we also collected vegetative plants there, undoubtedly belonging to this species. This species belongs to the small Khorasan-Pamir-Alai section Halicacabus Bunge with 3 species (Kopetdag - A. raddei Basil and western Gissar (A. willisii Popov and A. pseudanthylloides Gontsch.). If these 3 species are petrophytic formations, then the Zaamin plant is a clear derivative of the Karaarchans, bordering on the steppe groupings, thus the recently described endemic Zaamin is the northernmost young sharply limited race of this section. Together with A. belolipovii, we collected specimens of plants related to A. iskanderi Lipsky from the Paraxiphidium Kamelin section. This natural group of astragalus is characterized by a perianth characteristic of the section Xiphidium Bunge, but with an original wide and short fruit, quite different from the narrow and long fruit characteristic of the section Xiphidium. A slightly swollen calyx is another systematic feature of the Paraxiphidium Kamelin section.

The new shrub species we described, A. russanovii, which we described differs from A. iskanderi in the pink (not dark blue) and naked (not hairy) flag, as well as the shape and pubescence of the calyx (Khassanov et al., 2010). The proximity of these species shows the commonality of the Kuhistan floras with ours. Another undescribed taxon A. kuljsaicus ined. is a subendemic of our flora, as it also grows in the Zaamin River basin (northern macroslope). This species is close to the widespread Pamir-Alai species A. marguzaricus Lipsky, from which it differs in the shape of the flag, as well as in black and appressed-pubescent fruits and calyces. In general, evaluating the endemic astragals of the study area, it can be stated that speciation processes in most groups of this genus are very intensively observed in the mid-mountainous parts of the Tien Shan and Pamir-Alai [11]. The factor of isolation here is often sharply limited by high mountain ridges, catchment basins of rivers and sais.

6. As a result of the research carried out, the list of dendroflora of the Zaamin Reserve was compiled, consisting of 94 taxa of dendroflora belonging to 50 genera and 26 families.

As a result of the chronological analysis, 42 types of areas were identified. The flora is based on ancient Mediterranean species (832 or 69.79% of the flora). A clear predominance of the Central Asian mountainous (338 species or 28.35%) and Kuhistan elements (133 species or 11.16%) was revealed. The endemism of this flora is moderately rich (4 species and 2 subendemics) and can be defined as young and progressive, based on the mountainous Central Asian superpolymorphic groups. Analysis of life forms revealed the predominance of dendroflora (94 species or 7.89%). The closest floras are those of the Aksu river basin and the Nurata nature reserve, and the least similarity is observed with the floras of the Chatkal and Surkhan nature reserves. The compiled summary of plant dendroflora of the Zaamin State Reserve, including 94 species, 50 genera and 26 families, was handed over to the scientific department of the reserve for use in scientific reports and environmental measures.

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