Original Article

Floristic Analysis Of The Dendroflora Of The Zamin State Reserve

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Annotation. The Zamin State Reserve, located on the western spurs of the Turkestan Range in the upper reaches of the Sangzar River, is the richest region of Uzbekistan in floristic and phytocenotic terms. This reserve, established in 1926, is unique in the number of rare endangered plant species growing in this small area. Juniper forests, in their completeness and richness of tree and shrub species, have no analogues in our republic. At least 20 plant species have been described from this territory, which is comparable to the most famous flora of Chimgan. 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 Pamirs. In the second half of the 20th century, large-scale floristic studies were 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 dendroflora studied by us, 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

The Zamin State Reserve is located on the northern slope of the western part of the Turkestan Range (Western Pamiroalai). The boundaries of the reserve pass along the crest of the Turkestan Range (southern), along the watershed of one of its spurs (eastern) and along the valley of the river Baikungursay. The northern border has no natural landmarks and is marked by full houses along the slopes of the Malguzar ridge. The history of the creation of the Zamin Reserve is associated with the name of the remarkable Russian naturalist B.A. Fedchenko [3], who together with his wife, botanist and artist O.A. Fedchenko, in the late 60s of the XIX century explored the western part of the Turkestan Range [2].

The first description of the vegetation of this area was made in 1916 year. Employee of the Resettlement Department of the Ministry of Agriculture of Russia O.E. Knorring [5]. At the beginning of the 20th century As a result of the first forest inventory work on the territory of modern Sangzar, Bakhmal and Zaamin forestries, the Zaamin forest dacha was organized [6]. Detailed forest management in 1925-1926 served as the basis for the creation of the first Guralash reserve in Uzbekistan with an area of about 8500 hectares. It existed from 1926 to 1926 and from 1934 to 1951. In the 20-30s, complex studies (geological, hydrological, botanical and zoological) were carried out in the western part of the Turkestan Range. Since 1978, the territory of the reserve has been included in the protected area of the People's Park of Uzbekistan, and its area is more than 26,840 hectares.

The climate of the Zamin State Reserve can be characterized by long-term observations of the Kulsay hydrometeorological station, located at an altitude of 2100 m. This territory is characterized by relatively cool and humid summers and moderately cold winters.

Botanical researches of the Sangzar river basin 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]. It describes in detail not only tree and shrub plant groups, but also couch grass, feather grass, fescue and herb communities. Of particular interest are descriptions of high-mountain alpine meadows, cryophyton, and formations of upland xerophytes. 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 regeneration of juniper in the Zamin forest dacha. Notes on the dendroflora of Guralash and Kulsay were published by A.L. Fedorov [4]. Then E.M. Demurina published an essay on the vegetation of the western part of the Turkestan Range and its spurs. Later, her data E.M. Demurin, [8] were included in the essay on the Turan forb dry steppe in the multi-volume monograph Vegetation cover of Uzbekistan and ways of its rational use. Vegetation mapping of the river basin Sangzar (excluding the reserve) was carried out according to unpublished data of Sh.K. Kamalov and M. Tirkasheva.

Now we see in more detail the main flora cenotypes of the study area, identified on the basis of the florogenetic classification of plants developed by R.V. Kamelin [10]:

A). Macrothermal junipers (edificator - *Juniperus polycarpos var. sarawschanica* - juniper carp). The juniper forests of the reserve are forests with a projective cover of up to 0.8 in the altitude range of 1600 - 2500 meters above sea level. 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*), irgay (*Cotoneaster nummularia*) and ephedra (*Ephedra equisetina, E. intermedia*).
B). Microthermal junipers (edificator - *Juniperus pseudosabina* - saur archa). *Juniperus pseudosabina* forests of the reserve are light forests with a projective cover of up to 0.5 in the altitude range of 2500 - 3200 meters above sea level. The main subdominant at lower altitudes is *Juniperus semiglobosa*, and a poor shrub layer consists of *Berberis oblonga, Cotoneaster nummularia, Rosa ecae, Ribes meyeri, Lonicera persica, L. microphylla,* and *L. Altmanni* [1].
Thus, the vegetation of the Zamin Reserve is represented mainly by 5 flora cenotypes, we reported 2 (A, B) flora cenotypes. Of particular note is the fact that macrothermal junipers not only in the reserve, but also on the territory of the national park have no analogues in Uzbekistan.
3. Collections of herbarium material to identify the composition of the flora of the Zamin Reserve were carried out from 2019 to 2020 using the route-reconnaissance method. During the research period, more than 750 herbarium sheets were collected and identified, which are currently stored in the TASH collection, as well as in the Zamin Reserve.
The abstract of the flora is made in alphabetical order, and the priority names of the species are given according to S.K. Cherepanov [10] and U.P. Pratov, M.M. Nabiev with some adjustment for the IPNI index. The names of taxon authors correspond to the latest R.K. Brummit & C.E. Powell "Authors of plants name". When determining plant species, multi-volume publications "Flora of Uzbekistan", "Flora of Tajikistan", "Flora of Kyrgyzstan", "Key to Plants of Central Asia" were used.
The registration of species was carried out on the basis of our own field research, literature data and review, herbarium samples in the TASH herbarium.
K.Sh. Tozhibaev (different groups), F.O. Khasanov (Astragalus species), N.F. Rusanov (Rosa) assisted in identifying taxonomic groups and compiling a list of flora.

The analysis by types of habitats (ranges) 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 the 2-stage scheme is most suitable for large floristic units, and also in the case when the study area is bordering with 2 or more regions at once. In total, 23 types of habitats (ranges) were identified:
1. Kulsay (1 species) range within the Kulsay basin (*Astragalus russanovii F. O. Khass., Sarybaeva et Esankulov*).
2. Turkestan (1 species) range within the Turkestan Range. Among them there is a *Acantholimon aff. alatavicum Bunge*.
3. Western Pamir-Alai (2 species) range within the western spurs of the Turkestan Range. Among them there are *Astragalus lasiostylus Fisch., Amygdalus bucharica Korsh*.
4. Kukhistan (1 species) range within the Kukhistan district in the sense of R.V. Kamelin. Among them there is a *Caragana alaica Pojark*.
5. Pamir-Alai (5 species) range within the Pamir-Alai mountain system. Among them there are *Acer pubescens Franch, Acer turkestanicum Pax., Colutea paulsenii Freyn et Sint., Acantholimon erythraeum Bunge, Acantholimon tataricum Boiss.*
6. Western Tien Shan-Western Pamir-Alai (9 species) range within the Western Tien-Shan and Western Pamir-Alai. Among them are *Astragalus bactrianus Fisch., Astragalus macranthus (Boriss.) F.O. Khass. ined., Astragalus pterocephalus Bunge., Polygonum vvedenskyi Sumnev., Rhamnus coriacea (Regel) Kom., Amygdalus spinosissima Bunge, Cerasus amygdaliflora Nevsk, Pyrus regelii Rehd., Salix olgae Regel.*
7. Mountain Central Asian (14 species) range within the Mountain Central Asian province in the sense of R.V. Camelina [9]. Among them are *Acer semenovii Regel et Herder, Astragalus lasiosemius Boiss., Astragalus variegatus Franch, Prunus divaricata Ledeb., Rosa ecae Aitch., Rosa fedtschenkoana Regel, Rosa kokanica (Regel) Regel, Rosa maracandica Bunge, Rosa nanothamnus Boulenger, Rosa transturkestanica N. F. Russanov , Caragana turkestanica Kom. Sorbus tianschanica Rupr., Populus talassica Kom., Restella abertii (Regel) Pobed.*
8. Tarbagatai-Mountain Central Asian (13 species) range within the limits of the Mountain Central Asian province in the sense of R.V. Kamelin [9] and Tarbagatai Ridge. Among them are *Betula tianschanica Rupr., Lonicera altmannii Regel et Schmalh., Lonicera microphylla Willd. ex Schult., Juniperus pseudosabina Fisch. et C.A. May. Ephedra equisetina Bunge, Ephedra kokanica Regel, Ephedra regeliana Florin, Astragalus dendroides Kar. et Kir., Atraphaxis pyrifolia Bunge, Cotoneaster goloskokovii Pojark., Cotoneaster songaricus (Regel et Herder) Popov, Cotoneaster suavis Pojark., Crataegus songarica Koch.*
9. Khorasan-Mountain Central Asian (2 species) range within the range within the Mountain Central Asian province in the sense of R.V. Kamelin [9] and Khorasan province. Among them are *Atraphaxis sarawschanica Pavlov, Crataegus turkestanica Pojark.*
10. Central Asian (5 species) range within Central Asia, adopted in the Key to Plants of Central Asia. Among them are *Hulthemia persica (Michx. ex Juss.) Bornm., Fraxinus sogdiana Bunge, Populus afghanica (Aitch. et Hemsl.) Schneid., Salix linearifolia E. Wolf, Tamarix arceuthoides Bunge*.
11. Iran-Central Asian (5 species) range within the whole of Iran and the Mountain Central Asian province. Among them are *Pistacia vera L., Berberis nummularia Bunge, Lonicera simulatrix Pojark., Cerasus erythrocarpa Nevski, Hulthemia persica (Michx. ex Juss.) Bornm.*

12. Himalayan (6 species) range within the Mountain Central Asian province, Paropamiz and Hindu Kush. Among them are *Juniperus polycarpos Koch var.sarawschanica (Kom.) Kitamura, Juniperus semiglobosa Regel, Sageretia thea (Osbeck) M. C. Johnst., Pentaphylloides parvifolia (Fisch. ex Lehm.) Soják, Salix pycnostachya Andersson, Solanum asiae-mediae Pojark.*
13. Iran-Himalayan (4 species) range within the whole of Iran, Pamir-alai, Paropamiz and Hindu Kush. Among them *are Hippophae rhamnoides L., Polygonum thymifolium Jaub. et Spach, Cotoneaster nummularius Fisch. et C. A. Mey., Rosa beggeriana Schrenk.*
14. Altai-Himalayan (1 species) range within the Siberian Altai, Mountain Central Asian province in the sense of R.V. Kamelina [9], Paropamiza and Hindu Kush. Among them is *Ribes meyeri Maxim.*
15. Kashgar-Siberia-Central Asian (1 species) range within Siberia, Kashgar and Central Asia, adopted in the Guide to Plants of Central Asia. Among them is *Ribes meyerii Maxim.*
16. Siberian-Central Asian (1 species) range within Siberia and Central Asia, adopted in the Key to Plants of Central Asia. Among them is *Malus sieversii (Ledeb.) M. Roem.*
17. East-ancient Mediterranean (5 species) range within Anatolia, Iran and Central Asia to Kashgar and Xinjiang. Among them are *Lonicera nummulariifolia Jaub. et Spach, Celtis caucasica Willd, Ephedra intermedia Schrenk et C. A. Mey., Cotoneaster nummularioides Pojark., Spiraea hypericifolia L.*
18. Caucasus-Siberia-Eastern-Mediterranean (1 species) range within the Caucasus, Siberia and Anatolia, Iran and Central Asia to Kashgar and Xinjiang. Among them there is a *Juglans regia L.*
19. Ancient Mediterranean (3 species) range within the Ancient Mediterranean Region in the sense of M.G. Popov. Among them there are *Helianthemum songaricum Schrenk. Elaeagnus angustifolia L., Ulmus campestre L.*
20. Europe-East-Old Mediterranean (1 species) range within Atlantic Europe and the eastern part of the Ancient Mediterranean Region in the sense of M.G. Popov. Among them, there is a *Lycium ruthenicum Murray,.*
21. Moderate Palearctic (4 species) range within the boreal and desert parts of the Palearctic. Among them are *Morus alba L., Cerasus mahaleb (L.) Mill., Myricaria bracteata Royle, Tamarix ramosissima Ledeb..*
22. Palearctic (4 species) range within the entire Palearctic. Among them are *Kochia prostrata (L.) Schrad., Kochia scoparia (L.) Schrad., Kraschenninnikovia ceratoides Gueldenst. (L.) Gueldenst., Rhamnus cathartica L.,*
23. Holarctic (4 species) range within Holarctic. Among them are *Rosa canina L., Rubus caesius L., Sibbaldia tetrandra Bunge, Saxifraga hirculus L.*

A detailed floristic analysis of the territory of the Zamin State Reserve with a total area of 266 km^2, as well as a synthesis of all herbarium materials available on the topic of research, literary data and the study of stock materials of the institute "Botany" 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).

Table 1 List of dendroflora of the Zamin State Reserve

№	Family	Genus	Species	Type of range	Life form
1.	*Aceraceae Juss.*	*Acer L.*	*Acer pubescens Franch.*	5	tree
2.			*Acer semenovii Regel et Herder*	7	tree
3.			*Acer turkestanicum Pax*	5	tree
4.	*Anacardiaceae Lindl.*	*Pistacia L.*	*Pistacia vera L.*	11	tree
5.	*Berberidaceae Juss.*	*Berberis L.*	*Berberis nummularia Bunge*	11	bush
6.			*Berberis oblonga (Regel) Schneid.*	10	bush
7.	*Betulaceae S. F. Gray*	*Betula L.*	*Betula tianschanica Rupr.*	8	tree
8.	*Caprifoliaceae Juss.*	*Lonicera L.*	*Lonicera altmannii Regel et Schmalh.*	8	tree
9.			*Lonicera microphylla Willd. ex Schult.*	8	tree
10.			*Lonicera nummulariifolia Jaub. et Spach*	17	tree
11.			*Lonicera simulatrix Pojark.*	11	tree
12.	*Celtidaceae Link*	*Celtis L.*	*Celtis caucasica Willd.*	17	tree
13.	*Chenopodiaceae Vent.*	*Kochia Roth*	*Kochia prostrata (L.) Schrad.*	22	bush
14.			*Kochia scoparia (L.) Schrad.*	22	bush
15.		*Kraschenninnikovia Gueldenst.*	*Kraschenninnikovia ceratoides Gueldenst. (L.) Gueldenst.*	22	bush
16.	*Cistaceae Juss.*	*Helianthemum Adans.*	*Helianthemum songaricum Schrenk*	19	bush
17.	*Cupressaceae*	*Juniperus L.*	*Juniperus polycarpos Koch*	12	tree

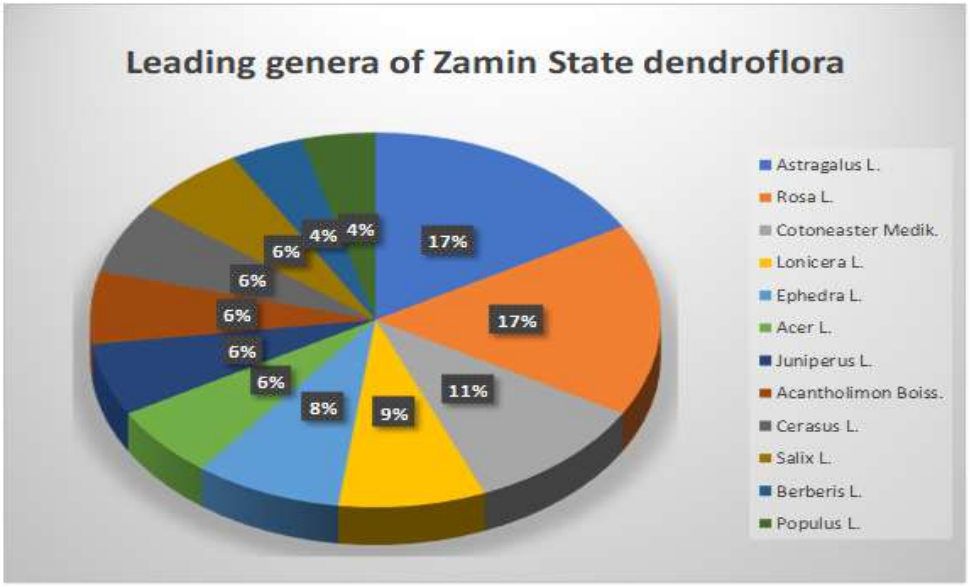
	Rich. ex Bartl.		*var.sarawschanica (Kom.) Kitamura*		
18.			*Juniperus pseudosabina Fisch. et C.A. Mey.*	8	tree
19.			*Juniperus semiglobosa Regel*	12	tree
20.	*Elaeagnaceae Juss.*	*Elaeagnus L.*	*Elaeagnus angustifolia L.*	19	tree
21.		*Hippophayo L.*	*Hippophaë rhamnoides L.*	13	bush
22.	*Ephedraceae Dumort.*	*Ephedra L.*	*Ephedra equisetina Bunge*	8	bush
23.			*Ephedra intermedia Schrenk et C. A. Mey.*	17	bush
24.			*Ephedra kokanica Regel*	8	bush
25.			*Ephedra regeliana Florin*	8	bush
26.	*Fabaceae Lindl.*	*Astragalus L.*	*Astragalus bactrianus Fisch.*	6	bush
27.			*Astragalus dendroides Kar. et Kir.*	8	bush
28.			*Astragalus lasiosemius Boiss.*	7	bush
29.			*Astragalus lasiostylus Fisch.*	3	bush
30.			*Astragalus macranthus (Boriss.) F.O. Khass. ined.*	6	bush
31.			*Astragalus pterocephalus Bunge*	6	bush
32.			*Astragalus russanovii F. O. Khass., Sarybaeva et Esankulov*	1	bush
33.			*Astragalus variegatus Franch.*	7	bush
34.		*Caragana Fabr.*	*Caragana alaica Pojark.*	4	bush
35.			*Caragana turkestanica Kom.*	7	bush
36.		*Colutea L.*	*Colutea paulsenii Freyn et Sint.*	5	bush
37.		*Onobrychis Mill.*	*Onobrychis echidna Lipsky*	12	bush
38.	*Grossulariaceae DC.*	*Ribes L.*	*Ribes meyerii Maxim.*	15	bush
39.	*Juglandaceae A. Rich. ex Kunth*	*Juglans L.*	*Juglans regia L.*	18	tree
40.	*Limoniaceae Sér.*	*Acantholimon Boiss.*	*Acantholimon aff. alatavicum Bunge*	2	bush
41.			*Acantholimon erythraeum Bunge*	5	bush
42.			*Acantholimon tataricum Boiss.*	5	bush
43.	*Moraceae Link*	*Morus L.*	*Morus alba L.*	21	tree
44.	*Oleaceae Hoffmanns. et Link*	*Fraxinus L.*	*Fraxinus sogdiana Bunge*	10	bush
45.	*Polygonaceae Juss.*	*Atraphaxis L.*	*Atraphaxis pyrifolia Bunge*	8	bush
46.			*Atraphaxis sarawschanica Pavlov*	17	bush
47.		*Polygonum L.*	*Polygonum thymifolium Jaub. et Spach*	13	bush
48.			*Polygonum vvedenskyi Sumnev.*	6	bush
49.	*Rhamnaceae Juss.*	*Rhamnus L.*	*Rhamnus cathartica L.*	22	tree
50.			*Rhamnus coriacea (Regel) Kom.*	6	bush
51.		*Sageretia Brongn.*	*Sageretia thea (Osbeck) M. C. Johnst.*	12	bush
52.	*Rosaceae Juss.*	*Amygdalus L.*	*Amygdalus bucharica Korsh.*	3	tree
53.			*Amygdalus spinosissima Bunge*	6	bush
54.		*Cerasus L.*	*Cerasus amygdaliflora Nevski*	6	bush
55.			*Cerasus erythrocarpa Nevski*	11	bush
56.			*Cerasus mahaleb (L.) Mill.*	21	tree
57.		*Cotoneaster Medik.*	*Cotoneaster goloskokovii Pojark.*	8	bush
58.			*Cotoneaster nummularioides Pojark.*	17	bush
59.			*Cotoneaster nummularius Fisch. et C. A. Mey.*	13	bush
60.			*Cotoneaster songaricus (Regel et Herder) Popov*	8	bush
61.			*Cotoneaster suavis Pojark.*	8	bush
62.		*Crataegus L.*	*Crataegus songarica Koch*	8	bush

63.			*Crataegus turkestanica Pojark.*	17	tree
64.		*Hulthemia Dumort.*	*Hulthemia persica (Michx. ex Juss.) Bornm.*	11	bush
65.		*Malus Mill.*	*Malus sieversii (Ledeb.) M. Roem.*	16	tree
66.		*Pentaphylloides Duhamel*	*Pentaphylloides parvifolia (Fisch. ex Lehm.) Soják*	12	bush
67.		*Prunus L.*	*Prunus divaricata Ledeb.*	7	tree
68.		*Pyrus L.*	*Pyrus regelii Rehd.*	6	tree
69.		*Ribes L.*	*Ribes meyeri Maxim.*	14	bush
70.		*Rosa L.*	*Rosa beggeriana Schrenk*	13	bush
71.			*Rosa canina L.*	23	bush
72.			*Rosa ecae Aitch.*	7	bush
73.			*Rosa fedtschenkoana Regel*	7	bush
74.			*Rosa kokanica (Regel) Regel*	7	bush
75.			*Rosa maracandica Bunge*	7	bush
76.			*Rosa nanothamnus Boulenger*	7	bush
77.			*Rosa transturkestanica N. F. Russanov*	7	bush
78.		*Rubus L.*	*Rubus caesius L.*	23	bush
79.		*Sibbaldia L.*	*Sibbaldia tetrandra Bunge*	23	bush
80.		*Sorbus L.*	*Sorbus tianschanica Rupr.*	7	bush
81.		*Spiraea L.*	*Spiraea hypericifolia L.*	17	bush
82.	*Salicaceae Mirb.*	*Populus L.*	*Populus afghanica (Aitch. et Hemsl.) Schneid.*	10	tree
83.			*Populus talassica Kom.*	7	tree
84.		*Salix L.*	*Salix linearifolia E. Wolf*	10	bush
85.			*Salix olgae Regel*	6	bush
86.			*Salix pycnostachya Andersson*	12	bush
87.	*Saxifragaceae Juss.*	*Saxifraga L.*	*Saxifraga hirculus L.*	23	bush
88.	*Solanaceae Juss.*	*Lycium L.*	*Lycium ruthenicum Murray*	20	bush
89.		*Solanum L.*	*Solanum asiae-mediae Pojark.*	12	bush
90.	*Tamaricaceae Link*	*Myricaria Desv.*	*Myricaria bracteata Royle*	21	bush
91.		*Tamarix L.*	*Tamarix arceuthoides Bunge*	10	bush
92.			*Tamarix ramosissima Ledeb.*	21	bush
93.	*Thymelaeaceae Juss.*	*Restella Pobed.*	*Restella abertii (Regel) Pobed.*	7	bush
94.	*Ulmaceae Mirb.*	*Ulmus L.*	*Ulmus campestre L.*	19	tree

According to the composition of the leading families, which stand out sharply in terms of species richness, the dendroflora of the Zamin 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).

Table 2 Leading genera of the dendroflora of the Zamin Reserve

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*



Of greatest interest in the chorological analysis are the narrow local and disjunctive types of areas. Endemic for the Zamin Reserve are range types 1 and 2 (2 species or 0.42% of the flora). The next group of ranges (3, 4, 5) essentially representing sub endemic species contains 8 species or 0.75%. *Dracocephalum nuratavicum* recently described from Nuratau was also found by us in Bakhmal. A group of habitats (6-9) stands apart within the Pamir-Alai with 133 species or 11.16% of the entire flora of the reserve. It is safe to speak about the Kukhistan or, more precisely, the Pamir-Alai genesis of the studied flora. If we consider a higher level, namely the level of provinces, then the Central Asian mountain 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 (ranges 10 and 14) all affected the presence of several (6) purely desert (Kyzylkum) species. Closer links are traced with other mountainous regions of Central Asia, especially with Tarbagatai (69 species or 3.46%) and Khorasan (51 species or 4.27%). Even closer links are traced with the Iranian floras (including Khorasan) - 236 species or 19.79%. Similar relationships 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 South European connections (25 types or 2.09%). The thesis about the ancient Mediterranean genesis of the mountainous Central Asian floras confirms the dominant 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%. A rather large number of Palearctic (91 species or 4.6%) and Holarctic (72 species or 6.04%) species is explained by the presence of a complete high mountain belt. Species with a pluregional (44 species or 3.69%) type of ranges indicate a strong anthropogenic disturbance of the flora of this mountainous territory [72], which for a long time was a cattle grazing zone.

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

Table 3 Trees and shrubs of the Zamin State Reserve.

Life forms	Designation in the abstract.	Number of species	% of the flora of the reserve
Trees	*Дер.*	*26*	*2, 18*
Bushes	*Кустм.*	*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 Kukhistan and even Alai floras. Despite this, the studied dendroflora lacks a number of taxa quite characteristic of the aforementioned dendrofloras. Being an integral part of the Kukhistan district, the studied dendroflora is quite different from the Zeravshan dendrofloras, not to mention the Central Turkestan ones. The remarkable endemic Kukhistan genus *Komarovia* Korovin does not enter here either, not to mention the North Ferghana genus Mogoltavia Korovin [11].

Trees and bushes of Zamin State Reserve	
Trees	26
Bushes	68

The special richness of the flora of the reserve with species of the genus *Astragalus* L. was also 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 Kulsay Forest Dacha and planted in the Botanical Garden in 1975. In 2010, we also collected vegetative plants that undoubtedly belong to this species. This species belongs to the small Khorasan-Pamir-Alai section of *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 Zamin plant is a clear derivative of the black firs, bordering on the steppe groups. Thus, the recently described endemic of Zamin is the northernmost young sharply limited race of this section. Together with *A. belolipovii*, we collected specimens of plants of the kinship *A. iskanderi Lipsky* from the section *Paraxiphidium* Kamelin. This natural group of astragalus is characterized by a perianth characteristic of the *Xiphidium* Bunge section, but original broad and short fruits, quite different from the narrow and long fruits characteristic of the *Xiphidium* section. A slightly swollen calyx is another systematic feature of the section *Paraxiphidium* Kamelin.

The new shrub species described by us, *A. russanovii*, differs from *A. iskanderi* in pink (rather than dark blue) and bare (rather than hairy) flag, as well as in the shape and pubescence of the calyx (Khassanov et al., 2010). The proximity of these species shows the commonality of the Kukhistan floras with our flora. Another undescribed taxon is *A. kuljsaicus* ined. is a sub endemic of our flora, as it also grows in the Zamin 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 black and appressed-pubescent fruits and calyxes. In general, evaluating the endemic astragalus of the study area, it can be stated that the processes of speciation in most groups of this genus are very intensively observed in the mid-mountain parts of the Tien Shan and Pamir-Alai [11]. The isolation factor here is often the watersheds of rivers and sais, which are sharply limited by high-mountain ridges.

6. As a result of the research, a list of the dendroflora of the Zamin 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 basis of the flora is the ancient Mediterranean species by genesis (832 or 69.79% of the flora). A clear dominance of mountainous Central Asian (338 species or 28.35%) and Kukhistan elements (133 species or 11.16%) was revealed. The endemism of this flora is moderately rich (4 species and 2 sub endemics) and can be defined as young and progressive, based on the mountainous Central Asian super polymorphic groups.

An analysis of life forms revealed the predominance of dendroflora (94 species or 7.89%).

The closest floras are the floras of the Aksu river basin and the Nurata reserve, and the least similarity is observed with the floras of the Chatkal and Surkhan reserves.

The compiled summary of the plant dendroflora of the Zamin 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 activities.

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