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Phytocenotic Characteristics *Acanthophyllum cyrtostegium* Vved. (Caryophyllaceae) Distributed in Bukhara Region (Uzbekistan)

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Abstract

The article provides a phytocenotic description *of Acanthophyllum cyrtostegium*, distributed in the sandy and gypsum soils of Bukhara region (Uzbekistan). During the study, 6 plant communities were studied with the participation of the field work. There were 70 pcs vascular plants in these communities. The area of this plant, which is rare in the region, is 10 - 12 hectares, and the total number of 750 - 850 pcs. The results obtained from the evaluation of populations are used in carrying out monitoring studies for long years on rare plants. At the same time.he used it as a material for local "Red books".

Keywords

Acanthophyllum Cyrtostegium, Phytocenotic, Plant Community, Rare, Endangered, Uzbekistan

1. Introduction

Today, the state of plants in the world is undergoing significant changes as a result of climate change. This condition also affects their seasonal development [1] [2] [3]. Much work is being done worldwide to study rare and endangered species. As a result, a number of innovations for science emerged [4] [5] [6]. A lot of research has been done in Uzbekistan in this regard. In particular, Abduraimov *et al.* [6] [7] [8], Shomurodov *et al.* [9], Rakhimova *et al.* [10].

2. Material and Methods

Our field researches were conducted in 2015-2021 on the arid zones of Uzbekis-

tan. These studies were carried out using geobotanical and population methods. The objects of research were: *Acanthophyllum cyrtostegium* listed in the Red book of the Republic of Uzbekistan [11]. Geobotanical descriptions were made in all communities where the population structure of species was studied, according to the generally accepted method [12]. When identifying the plant species, was used by the "Key to plants of Central Asia" [13].

3. Result and Discussion

More than 60 species of the genus are distributed throughout the world, and in Central Asia there are 30 species. In the flora of our republic, 11 species of the category are noted. To date, no specific purposeful research work has been carried out on the ontogenetic structure of the *Acanthophyllum cyrtostegium* species and the state of its cenopopulations, which have spread in Uzbekistan. In the course of the study, a total of 6 cenopopulations were allocated with the participation of the species.

Acanthophyllum cyrtostegium Vved.—half-shrub with a lot of stems, the lower part of the stem is wooded, the height reaches 20 - 30 cm. *A. cyrtostegium*. Rare endemic species of the Kyzylkum. It is spread at the Kyzylkum: the Kuldjuktau, the Auminzatau, the Kingirtau, the Kokchatau (Navoi and Bukhara region). Inhabits sands, stony-sandy substrates, outcrops of gypsaceous beds. Solitary specimens or small groups of 3-5 plants can be found sporadically in sandy places. Limiting factors: trampling down of seedlings by cattle. Measures of protection: it is necessary to control populations and protect young seedlings from trampling down. The leaves are needle-like, three-edged, prickly. Blooming in May, the fruit ripens in June. In the course of the research, 6 cenopopulations were allocated with this participation. A total of 70 plants were recorded in these plant communities. This species is mainly spread in the plains of Bukhara region and the foothills of the residual mountains.

The first cenopopulation was separated from the plains in the eastern part of the village of Churuk (Shofirkon district) (N 40.40.13.3 E 063.47.566, h-399). On the territory *Eremurus korolkovii* and *Peganum harmala* were noted as the dominant. In this region, the level of soil cover with plants is 20%, the share of the investigated species is 1%. In this territory 36 species are registered, the basis of which is herbaceous plants. Cases of feeding livestock during the year were observed in the territory (**Figure 1**).

The next cenopopulation Shofirkon district was separated from the side of the Turtkuduk-Agitma (Kingirtau) road. The plant community of the territory consists of various grassy-cowberry-wormwood. The level of vegetation cover of the soil was 30%, 20 species were registered in the territory. As the Dominant species, it is possible to bring *Artemisia diffusa*, *Ferula foetida*, *Convolvulus hamadae*, *Carex pachystylis* and others.

The third cenopopulation was separated from the side of the Karata-Jongeldi (Romitan) road, from the various grassy-shrubs community. The level of vegetation cover of the territory is 30%, the Botanical composition consists of 30 species.

Figure 1. Cenopopulations of *A. cyrtostegium* (Kyzylkum desert, Uzbekistan).

The soil is made up of sand. The dominant species are *Ferula foetida*, *Convolvulus hamadae*, *Carex pachystylis* and others (**Table 1**).

The fourth cenopopulation was separated from the Kyzylkum steppe at a distance of 18 km, along the Jongeldi-Shafirkon road. The plant community of the area consists of various grassy-wormwood (N 400 77.718 E 0630 58.843 h-373). The level of soil cover with plants is 17%. The Botanical composition of the territory was rich, 32 species were registered. *Salsola arbuscula* as the dominant species, *Artemisia diffusa* Krasch.ex Poljakov, *Acanthophyllum stenostegium* Freyn. also participating species *Astragalus ammotrophus* Bunge, *Ferula foetida* (Bunge) Regel, *Cousinia hammadae* cuz., *Astragalus villosisimus* Bunge and other plants.

The next cenopopulation was separated from the western slopes of the Kuljuktag, from the sand surrounding the village of Kalata (Peshku) (N 400 53.36 E 0630 09.08, h-168). The plant community of the territory consists of amatamus-white saxaul. The level of vegetation cover of the 14%, the Botanical composition consists of 17 species. As the Dominant species *Haloxylon persicum*, *Salsola arbuscula*, *Astragalus villosissimus*, *Ammothamnus lehmanii*, *Carex physodes* Bieb. and we can admit others.

The sixth cenopopulation was separated from the submersible water at a distance of 7 km (N 390 49.27.8 E 0640 39.57.4, 273). The plant community of the region consists of *Convolvulus korolkovii*, *Lagochilus inebrians*. The soil is sandy soil. The level of soil cover with plants is 10%. The botanical composition of consists of 20 species. *Convolvulus korolkovii*, *Lagochilus inebrians*, *Zygophyllum oxianum* and others were recorded as dominant species (**Table 1**).

Table 1. Species composition of the studied cenopopulations.

№	Species	Life form	Projective cover, % (CP)					
			I	II	III	IV	V	VI
1.	*Haloxylon aphyllum* (Minkw.) Iljin	Tree	–	+	–	–	–	–
2.	*Haloxylon persicum* Bunge ex Boiss. & Buhse	Tree	–	–	–	–	3	–
3.	*Ammothamnus lehmanii* Bunge	shrub	–	–	–	–	6	–
4.	*Salsolaarbuscula* Pall.	shrub	1	+	–	3	2	–
5.	*Tamarix* hispida Willd.	shrub	–	–	–	–	–	+
6.	*Astragalus villosissimus* Bunge	shrub	1	–	1	+	1	+
7.	*Reaumuria* turkestanica Gorschk.	Semi shrub	–	–	–	–	–	+
8.	*Artemisia diffusa* Krasch.ex Poljakov	Semi shrub	5	10	5	1	–	+
9.	*Acanthophyllum stenostegium* Freyn	Semi shrub	+	–	+	–	–	–
10.	*Halothamnus subaphyllus* (C.A. Mey.) Botsch.	Semi shrub	+	–	–	–	+	–
11.	*Lagochilus inebrians* Bunge	Semi shrub	–	–	–	–	–	+
12.	*Eremurus korolkovii* Regel	Perennial	3	–	–	–	–	–
13.	*Rhinopetalum karelinii* Fisch.ex D. Don	Perennial	+	–	+	+	–	–
14.	*Acanthophyllum cyrtostegium* Vved.	Perennial	1	2	2	2	1	+
15.	*A. pungens* (Bunge) Boiss.	Perennial	+	+	+	+	+	+
16.	*Astragalus subbijugus* Ledeb.	Perennial	–	–	–	+	–	–
17.	*Astragalus ammotrophus* Bunge	Perennial	–	–	–	1	–	–
18.	*Cousinia hammadae* Juz.	Perennial	–	–	–	+	–	–
19.	*Cousinia sogdiana* Bornm.	Perennial	–	–	–	–	+	–
20.	*Cousinia dichotoma* Bunge	Perennial	–	–	–	–	+	–
21.	*Climacoptera lanata* (Pall.) Botsch.	Perennial	–	–	–	–	–	+
22.	*Salsola implicate* Botsch.	Perennial	–	–	–	–	–	+
23.	*Zygophyllum oxianum* Boriss.	Perennial	–	–	–	–	–	+
24.	*Allium kyzylkumii* Kamelin	Perennial	–	–	–	+	–	–
25.	*Tulipa lehmanniana* Merckl.	Perennial	+	–	+	+	–	–
26.	*Tulipasogdiana* Bunge	Perennial	+	+	+	–	–	–
27.	*Poa bulbosa* L.	Perennial	2	+	+	+	–	–
28.	*Carex pachystylis* J. Gay.	Perennial	+	+	+	–	–	–
29.	*Carex physodes* Bieb.	Perennial	–	–	–	+	1	–
30.	*Peganum harmala* L.	Perennial	5	+	–	+	–	+
31.	*Ixiolirion tataricum* (Pall.) Schult. & Schult. Fil.	Perennial	+		+	+	–	–
32.	*Convolvulus hamadae* (Vved.) V. Petrov	Perennial	+	+	+	–	+	–
33.	*Convolvulus* korolkovii Regel & Schmalh.	Perennial	–	–	–	–	–	6
34.	*Merenderarobusta* Bunge	Perennial	+		+	–	–	–
35.	*Ferula foetida* Bunge (Regel)	Perennial	–	3	3	1	–	–
36.	*Eremurus korolkowii* Regel	Perennial	–	–	–	+	–	–
37.	*Stipa hohenackeriana* Trin. & Rupr	Annual	–	–	–	+	–	–
38.	*Takhtajanianthapusilla* (Pall.) Nazarova	Annual	–	–	–	+	–	–

Continued

39.	*Holosteum polygamum* C. Koch	Annual	+	–	+	–	–	–
40.	*Ceratocarpus utriculosus* Bluk.	Annual	+	+	+	–	–	–
41.	*Papaver pavoninum* Schrenk	Annual	+	+	+	–	–	–
42.	*Roemeria refracta* (Stev.) DC.	Annual	–	–	–	+	–	–
43.	*Koelpinia linearis* Pall.	Annual	+	+	+	+	+	–
44.	*Arnebia decumbens* (Vent.) Coss. &Král	Annual	+	–	+		+	–
45.	*Ceratocephala testiculata* (Crantz) Bess.	Annual	+	–	+	+		–
46.	*Strigosella grandiflora* (Bunge) Botsch	Annual		–	–	+	+	–
47.	*Veronica capillipes* Nevski	Annual	+	–	+	–	–	–
48.	*Goldbachialaevigata* (Bieb.) DC.	Annual	+	+	+	–	–	–
49.	*Meniocus linifolius* (Steph.) DC.	Annual	+	+	+	–	–	–
50.	*Amberboa turanica* Iljin	Annual	+		+		+	–
51.	*Ziziphoratenior* L.	Annual	+	+	+	+	–	–
52.	*Salsola sclerantha* C.A. Mey.	Annual	+	–	+	–	–	–
53.	*Astragalusbakaliensis* Bunge	Annual	+	–	–	–	–	–
54.	*Astragalusharpilobus* Kar. & Kir.	Annual	+	–	–	–	–	–
55.	*Astragaluscampulorrhynchus* Fisch. & C.A. Mey.	Annual	+	–	–	–	–	–
56.	*Astragalus* sp.	Annual	–	–	–	+	–	–
57.	*Lallemantia royleana* (Benth.) Benth.	Annual	+	+	+	+	–	–
58.	*Delphinium barbatum* Bunge	Annual	–	–	–	+	–	–
59.	*Delphinum* camptocarpum Fisch. & C.A. Mey.	Annual	–	–	–	–	+	–
60.	*Cuminum setifolium* (Boiss.) K.-Pol.	Annual	+	+	+	–	–	–
61.	*Nonea caspica* (Willd.) G. Don fil.	Annual	+	–	+	–	–	–
62.	*Bromus tectorum* (L.) Nevski	Annual	–	+	–	–	–	–
63.	*Bromus danthoniae* Trin.	Annual	–	–	–	+	–	–
64.	*Alyssum desertorum* Stapf.	Annual	–	–	–	+	–	–
65.	*Onobrychistavernierifolia* Stocks ex Boiss	Annual	–	–	–	+	–	–
66.	*Amberboa turanica* Iljin	Annual	–	–	–	+	–	–
67.	*Psammogetoncanescens* (DC.) Vatke	Annual	–	–	–	+	–	–
68.	*Climacoptera ferganensis* Fisch. & C.A. Mey.	Annual	–	–	–	–	+	–
69.	*Eremopyrum orientalis* (L.) Jaub. & Spach	Annual	–	–	–	–	+	–
70.	*Eremopyrum bonaepartis* (Spreng.) Nevski	Annual	–	–	–	–	+	–

4. Conclusion

The result of the studies shows that *Acanthophyllum cyrtostegium* is a species of endem, preserved in the residual mountains of the Kyzylkum and its environs. The territory is used as a spring. At the same time, it was observed that geological exploration work was also carried out. It was determined that this plant, which is considered rare in this region, has a spread area of 10 - 12 hectares, the total number of 750 - 850 pcs. The results obtained will be used in carrying out monitoring work on this species for many years. Sixth cenopopula-

tions used for pasture all year round, the pasture load is more than twice higher than the permissible one, and this naturally leads to the depletion of the plant population. The absence of young individuals in this coenopopulation is primarily the result of trampling.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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