

ONTOGENETIC STRUCTURE OF *FRITILLARIA KARELINII* (FISCH. EX D. DON) BAKER COENOPOPULATIONS ON VOZROZH DENIYA ISLAND

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Abstract. Studied coenopopulations (CP) of *Fritillaria karelinii* on Vozrozhdeniya Island, normal but incomplete. It has been established that the ontogenetic structures of the CP belong to the centered and left-sided types. The current state of the CP of the studied species, environmental conditions caused by climate change and the drying up of the Aral Sea require protection.

Keywords: *Fritillaria karelinii*, dried bottom of the Aral Sea, Vozrozhdeniya Island, rare, endemic, plant communities, coenopopulation, ontogenetic structure.

INTRODUCTION

It is known that the sediments of the bottom of the Aral Sea contain from sand to clay. Especially the places near the eastern coast and around the islands of Lazarev and Vozrozhdeniya consist of thick sand. These areas are dominated by barhan and sand dunes. Vegetation is developed depending on the location of the groundwater level, mineralization level, soil type and its salt regime. Relief-forming factors - deflation, erosion, accumulative processes act most actively in the dry part of the sea. Currently, Vozrozhdeniya Island is bordered by Kyzylkum from the south and southeast, and Ustyurt from the west by huge salt marshes and sand massifs.

As a result of the retreat of the island, the dewatered sands below it create eolian accumulative landforms due to deflationary activity. The typical dune-barkhan landforms in this region have now reached the stage of full development, and wind-driven sand landforms have been formed on their basis. As a result of the drying up of the sea, not only in the dry bottom of the Aral Sea, but also in the entire Aral Sea region, the natural complexes that developed in the previous hydromorphic conditions are now developing in automorphic conditions, the process of desertification is taking place in large areas, and it leads to the change of the natural geographical conditions and the aggravation of the social and ecological situation. As a result of the change of the natural conditions here and the increasing expansion of the land freed from sea water, unique natural geographical complexes, which are considered the youngest among the Central Asian landscapes, are emerging [1]. For this reason, the structure, dynamics, activity and succession of plants, the changes of the landscapes based on them require careful study of the dry part of the island.

The study of flora around the Aral Sea has been going on for a long time. Plant species of the dry northern part of the sea (belonging to the Republic of Kazakhstan) have been fully studied

by scientists from Kazakhstan, Russia, and Germany. Many scientists [2-9] have conducted research on the flora of the southern regions freed from the water of the Aral Sea.

Research aimed at the protection of rare and endemic plant species, as well as the assessment of the modern state of rare plant populations based on the indicators of coenopopulations of species and ensuring their stability, the formation of their list, and the preservation of species whose area is shrinking due to various factors, are being conducted in the world's leading scientific centers. In our republic, a number of scientists have carried out comprehensive scientific research on the assessment of the modern state of the cenopopulations of endemic, rare and disappearing plant species [10-13].

MATERIALS AND METHODS

Climate change, increased anthropogenic activity, desertification and other negative factors threaten the preservation of natural vegetation. As a result of deflation, the ontogenetic structure of *Fritillaria karelinii* coenopopulations (CP) was studied along with rare species *Astragalus brachypus*, *Allium caspium* as part of the rarest communities for Uzbekistan in some areas of Vozrozhdeniya Island.

Fritillaria karelinii (Fisch. ex D. Don) Baker is a perennial plant with white spherical bulbs and low (up to 15 cm) gray stems (Figure 1). The lower leaves are almost opposite, oblong, the upper ones alternate, much narrower. Flowers are wide bell-shaped, hanging. The fruit is a round ribbed box.

According to the literature, the plant is a honey-succulent, decorative species. The bulbs of some species of the category are harvested and exported to China because of their medicinal properties. The genus *Fritillaria* L. includes about 180 species widely distributed in Europe, Central Asia, China, Japan, and North America [14].

Among the generally accepted methods for studying the structure of CP [15, 16], and for researching their types were used by A.A. Uranov and O.V. Smirnova [17].



Figure 1. *Fritillaria karelinii*

RESULTS AND DISCUSSION

In the course of research (2022), a community of *Haloxylon ammodendron*–*Artemisia terrae-albae*+*Salsola orientalis*) was studied on Vozrozhdeniya Island (45°06'06.3" N 059°30'69.5" E), the soil - the corn. The floristic composition consists of 14 vascular plants. In the vegetation cover, *Haloxylon ammodendron* is dominant, *Artemisia terrae-albae* and *Salsola orientalis* are subdominant. Also, in some places, *Eremopyrum orientale*, *Poa bulbosa*, *Ceratocarpus utriculosus*, *Leontice inserta*, *Fritillaria karelinii*, *Scorzonera pusilla*, *Senecio subdentatus*, *Arnebia decumbens*, *Stipa szovitsiana*, *Climacoptera lanata*, *Eremopyrum bonaepartis* bushes grew individually in the plant community. Projective coverage did not exceed 15%.

Haloxylon aphyllum–*Ceratocarpus utriculosus*–*Eremopyrum orientale*) community (45°04'85.9" N 059°22'0.8" E) was also studied on Vozrozhdeniya Island, the soil is sandy. Projective coverage was 18%. Along with dominant and subdominant species, *Climacoptera lanata*, *Anabasis salsa*, *Salsola orientalis*, *Allium sabulosum*, *Fritillaria karelinii*, *Chorispora tenella*, *Arnebia decumbens*, *Leontice inserta*, *Arabidopsis pumila* were also found.

According to the classification of A.A. Uranov and O.V. Smirnova [17], the studied CP are normal, but not incomplete. It was found that the ontogenetic structures of *Fritillaria karelinii* CP belong to the centric and left-sided type (Figure 2).

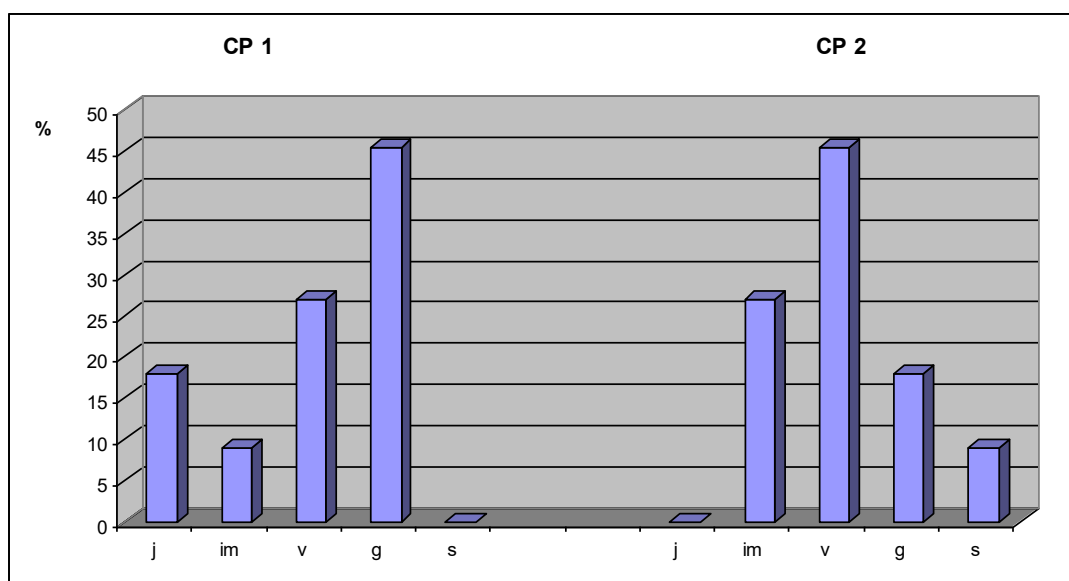


Figure 2. Ontogenetic spectrum of coenopopulations of *Fritillaria karelinii*

With a centralized spectrum CP 1 is explained by the fact that the amount of bushes before the generative period is small, they cannot reach the generative period as a result of various factors. Also, the duration of the generative period of the species is much longer compared to the previous and subsequent periods, which is the reason for the abundance of generative bushes in this CP. The highest percentage of generative bushes was recorded in this CP and made 45.4%. The low number of immature bushes is explained by the fact that reproduction from seeds was not carried out at the same rate in this CP.

The left ontogenetic spectrum corresponded to the virginal age bushes. In CP 2, a greater number of shoots in the virginal state was noted, which is explained by the large percentage of virginal shoots, that is, the duration of this stage compared to the immature stage. Most of the young seedlings developed from the seed die during the grass season due to various factors. This

situation also affects the general and ecological density of bushes in CP. In the studied CP, the average density of bushes was 1.1 bushes per 1 m², and the ecological density was 2.7 bushes, and it was found that they belonged to the young type.

CONCLUSION

To sum up, we can see the influence of increasing desertification process, climate changes, soil salinity and other factors in the reduction of CP of the studied species. Taking into account such circumstances, although *Astragalus brachypus*, *Allium caspium*, *Fritillaria karelinii* are currently not included in the Red Book of the Republic of Uzbekistan, they require long-term monitoring. As a result of the drying up of the Aral Sea, the ecological situation in the area did not fail to affect all ecotopes. Thousands of hectares of salt marshes and shifting sands caused by the drying up of the sea have a negative impact on the surrounding biodiversity and their condition. As a result, the range of psammophyte and halophyte species is expanding. The current conditions of CP of the studied species, the environmental conditions caused by climate change and the drying up of the Aral Sea require their protection.

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