

**THE STATE OF COENOPOPULATIONS of CRAMBE EDENTULA FISCH.
& C.A. MEY. EX KORSH IN THE CONDITIONS OF KARAKALPAK
USTYURT**

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Annotation. The state of 4 cenopopulations of a rare species *Crambe edentula* for the Republic of Uzbekistan has been studied. This is evidenced by the types of cenopopulations, which are assessed as young, maturing, transitional, and mature. The investigated species is recommended for inclusion in the Red Book of the Republic of Uzbekistan.

Key words. Coenopopulation, juveniles, succession, Red Book.

Introduction. *Crambe Edentula* Fisch. & C.A. Mey. Ex Korsh – katan toothless (Brassicaceae) perennial; root thin, woody; several stems, 45-70 cm tall, glabrous, ribbed, branched, deciduous from below, leafless from above; leaf blades ovate, somewhat diamond-shaped, 4-8 cm long, 3-6 cm wide, slightly wedge-shaped at the base, PET-iols (2-2.5 cm long) rigidly hairy, especially from below, also along veins and edges, angularly toothed or subtentire; upper stem leaves linear-awl-shaped, small. Inflorescence loose, branching, elongated branches; the leaves are oblong, up to 3 mm long, glabrous; the petals are white, 4-5 mm long, oblong-ovate, tapering at the base, up to 2.5-3 mm wide; all filaments are toothless, longer, slightly expanded on both sides; the peduncles are 3-7 mm long, upright; the gynophore is very short, but distinct (1-1.5 mm long), elliptical, firm, smooth, glaucous. Flowering time: May-June; fruiting: July. (Mohammad Sadegh Amiri, Shahryar Saeidi Mehrvarz & Mohammad Reza Joharchi 243 – 247,)

According to P. V. Veselova (2012), *Crambe edentula* is included in the Red Book of Kazakhstan (1981), a Southwestern Turan (or East Caspian) rare, relict species. Within the Northern Turan, it is found in Mangishlak and Ustyurt. According to the literature, *Crambe edentula* – katan toothless (Brassicaceae) is found in Karakalpakia (Ustyurt) on the slopes of ravines. It usually grows in places that are difficult for humans and livestock to reach, in particular, along the edges of chinks,

canyons, and chalk hills. It is protected in the Ustyurt Nature Reserve. According to the research conducted within the framework of the creation of the "State Plant Cadastre of the Mangistau region" (2004-2006), the state (number, dynamics of age composition, etc.) of the natural populations of the toothless katran does not cause concern. This circumstance, together with the inclusion of *C. edentula* in the Red Book of the Mangistau region and the protection of the species at the regional level, gives grounds for the recommendation to exclude it from the list of rare species of the Republican Red Book.

Two rare and interesting species of *Crambe edentula* (Brassicaceae) and *Crinitariagrimmii* (Asteraceae) have been studied in Iran (Amirietal., 2018). *C. edentula* is very rare in Iran and only one location is known. In particular, its habitat has recently been severely affected by road construction and intensive grazing. Therefore, it is recommended to protect the territory and propagate the species in Botanical gardens. The article presents diagnostic morphological features, taxonomic observations, conservation status, and the distribution map.

The article by H. F. Shomurodov and others (2015) describes the distribution of some rare species not listed in the Red Book of Uzbekistan growing in the Karakalpak part of Ustyurt (*Crambe edentula*, *Lagochilus acutilobus*, *Crataegus korolkowii*, *Allium delicatulum*), provides geographical coordinates, information about the habitat, the species composition of communities with these species, and the number of individuals. *Crambe edentula*, which grows on the scree, rocks and on the clay slopes of ravines, is mainly distributed on the eastern coast of the Caspian Sea (Mangishlak, Ustyurt, Bolshiye Balhani) and in Kopet-Daga.

However, there is still no data about the state of the population of *Crambe edentula* in the conditions of the Karakalpak Ustyurt – the rarest relict species of the Turan deserts. Current climate data shows a sharp increase in drought in the last 15 years in the territory of Southern Ustyurt, where the populations of the species are confined, which confirms the need to study the current state of the coenopopulation of the species.

Research methods.

The objects of the study are *Crambe edentula* Fish. Et Mey.

Crambe edentula is a perennial herb. It is found in the scree, rocks, on the clay slopes of ravines. Collected in the vicinity of the wells of Dahli, Goklenkui, Kazahli and on the northern shore of the Sarikamish Lake. It grows in thickets, sometimes separately on the washed-out slopes of ravines, on stony-gravelly and fine-grained soils. The range of the species is Ustyurt, Kizilkum, Mangishlak Peninsula, the eastern coast of the Caspian Sea, Bolshiye Balhani and Kopet-Daga (Allaniyazov and Saribaeva, 1983).

The material was collected in 2019-2020. Route studies cover various ecotopes of the Karakalpak part of the Ustyurt plateau. Familiarized with the herbarium samples of *Crambe edentula*, stored in the fund of the National Herbarium (TASH) of the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan.

Geobotanical descriptions were made in all communities where the population structure of the species was studied, according to the generally accepted method on sites of 100 m² (Field Geobotany, 1964; Shennikov, 1964).

The degree of participation is indicated by numbers according to the 7-point Drude system [1907]: single-sol, rarely-sp¹, quite rarely-sp², mediocre-sp³, often-cop¹, very often-cop², copiously-cop³.

The names of plants are given according to the latest summary of S. K. Cherepanov [Cherepanov, 1995] and according to the site www.theplantlist.org. The life form of plants is given according to the 11-volume "Plant Determinant of Central Asia" [1968-2016].

Coenopopulations are described according to the classifications of A. A. Uranov and O.V. Smirnova [1969] and "delta-omega" by L.A. Jivotovskiy [2001]. Delta (Δ) is the age index [Uranov, 1975], which evaluates the age level of a coenopopulation at any given time, and omega (ω) is the efficiency of a plant of the i – th ontogenetic state (the value of the "load" on the energy resources of the environment, expressed as a fraction of the load produced by plants of the average age generative state of this population). According to this classification, coenopopulations can be young, mature, transitional, aging, and old.

Population density is determined by the number of individuals per unit area. At the same time, special attention was paid to the average density, that is, the number

per unit of total space, or ecological density – the number per unit of inhabited space that can actually be occupied by a population [Odum, 1986].

Results and discussion. In the course of field studies on Ustyurt (2019-2020), four communities with the participation of *Crambe edentula* were identified. A brief ecological and phytocenotic description of these coenopopulations (CP) is given below.

The first coenopopulation of *C. Edentula* is found in the Kaplankir area as part of the goji-katran community. The soil of the territory described is sandy. Geographic coordinates: N41, 2221E56, 0401. The plant community is dominated by *C. edentula*. The projected grass cover is 8%. In the place where this coenopopulation grows, 18 species of vascular plants have been recorded.

In the salsola-saxaul-caragan community (studied in the Shorja region), *C. edentula* is found as a member of the community. The soil of the territory described is gypsum – bearing. Geographical coordinates: N42, 2148 E57, 4128. CP 2 grows under cliffs, where *Caragana grandiflora*, *Haloxylon aphyllum* and *Salsola orientalis* are dominant and subdominant in the plant community. The projected grass cover is 12%.

The third coenopopulation of the studied species is found in the northern part of the lake Sarikamish in the sagebrush-saxaul community between the chinka gorges in the say. The soil of the territory described is gypsum – bearing. Geographic coordinates: N56, 6511E42, 2154. The plant community is dominated by *Haloxylon aphyllum*.

The fourth coenopopulation of *C. Edentula* was recorded in the eastern part of the lake Sarikamish (8 km north of the border of Turkmenistan) as part of the atraphaxis-white sagebrush community along the dry watercourse (say). The soil of the territory described is sandy. Geographical coordinates: N57, 6458E42, 2138.

Conclusion. The studied species is recommended for inclusion in the Red Book of the Republic of Uzbekistan. The total area of the populations is no more than 6 hectares. The number of populations within the studied coenopopulations does not exceed 500 individuals.

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