



Soft-Leaved Crithmiflower-Malacocarpus Crithmifolius (Retz.) C.A.Mey, in The Flora of The Republic of Karakalpakstan

A.B. Ajiev¹, T.J. Orazbaev², Zh.N. Usnatdinov^{3*}, L.M. Yuldasheva^{4*}

^{1,2,3,4}Department of Methods of Teaching Botany and Ecology, *biology students Nukus State Pedagogical
Institute named after Azhiniyaz

*Corresponding author's E-mail: alishiev@mail.ru

Article History	Abstract
Received: 26 June 2023 Revised: 25 Sept 2023 Accepted: 15 Oct 2023	The article gives the purpose and objectives of the study, botanical description, and biology of the soft-leaved crithmifolius - <i>Malacocarpus crithmifolius</i> in the Republic of Karakalpakstan. Promising food and ornamental plant for widespread use on saline inconvenient lands and for introduction into culture as a berry plant in the industrial areas of Karakalpakstan. Population: In 2022, 7 cenotic populations of the species were noted (on the eastern of Ustyurt), with a total number of about 200 individuals. The main limiting factors were poor renewal in natural conditions. Economic activity in habitats; damage to bushes, stumping of stems by man. <i>M. crithmifolius</i> reproduces by seeds and vegetatively (layering). It resumes from the stump, takes root by layering (covered with stones or soil), creeping shoots. Propagated by seeds, but in nature a small number of individuals survive self-seeding. Keywords: Reproduction of Blackcorn, Chemical Composition of Blackcorn, Biology of Blackcorn, Botanical Description of Blackcorn
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1. Introduction

The study of natural plant populations is one of the most important areas of modern biology. In particular, populations of rare and endangered plants, such as the population of the soft-leaved crystal (*Malacocarpus Crithmifolius* (Retz.) C.A.Mey). This representative of our flora is found only on the eastern chinka of the Karakalpak Ustyurt. The species is rare, medicinal, poisonous and almost "endangered" [1].

Currently, for environmental and phytocenotic reasons, the population is in a digressive state. The restoration of the population of a representative of the Peganaceae family is a very urgent problem and the most optimal way to solve this problem is the repatriation of plants propagated in culture conditions. The results of studies on changes in the conditions of growth and development of wild plants ex situ allow us to accurately determine the condition of the species under study and predict its behavior in conditions of artificially created localities. In addition, this species, having a high tolerance to edaphic growing conditions, is quite decorative and deserves wide use in the practice of decorative gardening to protect cultural plantings from various kinds of pests and rodents [2].

The issues highlighted during the study of ecological features and tolerance to growing conditions indicate that a comprehensive study of *Malacocarpus crithmifolius* is quite relevant and has both theoretical and great practical significance [3].

The purpose of the study was to analyze the state of the natural population of *Malacocarpus crithmifolius* (Retz.) C.A.Mey, to develop the most effective ways of its conservation and agricultural techniques of cultivation in natural conditions and during introduction.

Objectives of the study:

- to assess the state of the natural population of Malacocarpus crithmifolius;
- to identify the limiting factors of the distribution of Malacocarpus crithmifolius in situ and to establish the tolerance of the species to environmental conditions;
- to develop the optimal technology of reproduction of Malacocarpus crithmifolius in culture conditions;
- to establish the possibilities of using Malacocarpus crithmifolius in culture, pharmacology and the creation of artificial populations in situ in territories isolated from the main locality.

The object of our study was a perennial herbaceous plant, the crithmifolous fruit (Malacocarpus crithmifolius (Retz.) C.A. Mey.) Acclimatized in the conditions of the Karakalpak Aral Sea region (KPA). The pilot site was laid on the basis of the ICP under the President of the Republic of Uzbekistan in the Muynak district.

The most saline and abandoned plot of 30 m² was chosen for planting. They were planted with seedlings and seeds (1 and 2 summer seedlings of soft-fruit with 3-5 stems) along the edge of the beds with a distance of 20 cm.

To date, 8 expeditions have been conducted to the Ustyurt plateau, to study the biology of growth and development of Malacocarpus crithmifolius (Retz.) C.A.Mey, coordinate points of growth areas have been mapped. Also, 17 young seedlings were brought and planted in areas where 7 out of 10 seedlings were taken. Seeds have been collected from all plants for further experiments.

Currently, there are 17 seedlings ready for both autumn and spring planting. Also, his vegetative and generative organs were transferred to a biotechnological laboratory for in vitro cultivation.

Plants were determined by the illustrated determinant of higher plants of Karakalpak and Khorezm (1982; 1983), Flora ... (II, IV, V, VI), the determinant of higher plants of the Republic of Uzbekistan, etc.

Phenological observations were carried out according to the method of I.N. Beideman (1974) [4]. Mathematical processing of phenological data was carried out according to the Zaitsev method (1983) [5].

Biological features of plants were studied in the main periods of ontogenesis according to the classification of age conditions proposed by G.A.Rabotnov (1983) [6].

Morphological signs were studied according to I.G. Serebryakov (1964) [7].

The survival rate of plants was established based on the number of plants on sites of 1 m² at the time of mass germination, before leaving in the first winter, and then in spring and autumn annually in subsequent years.

The underground structure of the plant was studied by the method of M.S. Shalyt (1960) [8], excavated by washing (dissecting) three plants in each variant.

One of the ways to preserve populations of rare and endangered plant species is to grow them in culture (ex situ) along with their protection in nature (in situ).

Of the plants of the local flora, 11 species are listed in the Red Book of Uzbekistan [2], among which one of our objects is Malacocarpus crithmifolius (Retz.) C.A. Mey. The soft fruit is also listed in the Red Books: Kazakh SSR (1981); Republic of Kazakhstan (2006); USSR (1978); USSR (1984); Tajik SSR (1988); Republic of Tajikistan (2015); Turkmenistan (1999); Republic of Turkmenistan (2011); Republic of Uzbekistan (2009); Republic of Uzbekistan (2016).

Malacocarpus crithmifolius (Retz.) C.A.Mey. it is a rare, relict species and requires conservation and multiplication, since it has the greatest introduction value.

The soft-leaved crithmiflower (Malacocarpus crithmifolius (Retz.) C.A.Mey) is a rare relic from the family. Harmalovye. A summer-green liana-like deciduous shrub up to 1.5 m tall, with outstretched thin branches up to 1 (1.5) m long, lying on shrubs or creeping on the ground, with bisexual flowers, entomophile, ornithophore and zoo chore, light-loving, irrigative, xerophyte, micromezotherm,

oligotrophe, clcephite, paraphyte, psammophyte. The leaf arrangement is regular, the leaves are fleshy, lanceolate-linear, dissected, 7 cm long and 6 cm wide finely divided. The flowers are bisexual, with a double perianth, lemon-yellow petals, single. The corolla is 1.0-1.5 cm long, 2.5-3.5 cm wide, pollinated mainly by insects: bees, wasps, flies and ants. The corolla is particularly noticeable to insects. In addition, insects are attracted by pollen, but especially nectar, sometimes quite abundant, secreted by the nectar disk.

There are 15 stamens in the flowers, the staminate filaments at the base have tongue-shaped appendages, some of which function as nectaries.

Self-pollination usually does not occur in the soft fruit or happens rarely, from time to time, usually on hot days, the anthers burst in the flower that has not yet opened, while pollen falls on the ripe stigma; self-pollination is also facilitated by the fact that on cloudy days the buds of the soft fruit do not open at all.

The fruits are spherical, brown-red, juicy 3-nest berries are edible, rich in vitamins C and carotene. The fruit is a three-nesting, multi-seeded berry of a rounded-flattened shape, 1-1.5 cm in diameter. The flesh of the fruit is juicy, orange-red in color. The distribution of fruits occurs mainly by birds and other animals.



Fig. 1. Flowers and fruits of *M. crithmifolius* (Retz.) C.A.Mey. (photo A.Ajiev)

The seeds are small, 0.3 mm long. The weight of 1000 seeds are 0.8 gr. Blooms in June–September, bears fruit in July–October. Heat-resistant and drought-resistant. It can grow in extreme environmental conditions where other shrubs cannot.



Fig. 2. Seeds of *M. crithmifolius* (Retz.) C.A.Mey. (photo A.Ajiev)

Status-A rare relict species of a monotypic genus.

It is promising as a groundcover plant for landscaping slopes and vertical walls, as well as when creating a bio group on lawns.

According to the vital form, the plant is a berry semi-shrub vine up to two meters high with creeping long stems with leaves incorrectly twice dissected into lanceolate-linear lobes (another name of the species is myagoplodnik dissected-leaved). The main locations of natural populations are concentrated on the Eastern coast of the Caspian Sea – Mangyshlak, Buzachi, chinki Ustyurt.

The soft-fruit grows on clay and sandy soils, on plains, on rocky slopes of foothills and on scraps of chinks (Fig. 3) [9].



Fig. 2. The general cover of *M. crithmifolius* (Retz.) C.A.Mey., in the cliffs of the chinks of the eastern Ustyurt (photo A.Ajiev)

Myagoplodnik is a weakly competitive species, occurs sporadically and, as a rule, in a depressed state. The natural renewal of the species comes from the stump. Propagation by seeds is noted only in precipitation-favorable years with a sufficient amount of light among the woody and shrubby woodlands. However, in nature, a small number of individuals survive by self-seeding. Myagoplodnik is a promising food and ornamental plant for widespread use on saline inconvenient lands and for introduction into culture as a berry plant in the industrial areas of Karakalpakstan and Ustyurt and in the desert areas of Central Asia. Juicy orange-red soft fruit berries contain a lot of vitamin C, are rich in sugars and organic acids [10]. A high content of alkaloids was found in the leaves of the plant, anabazine was identified, the hydrochloride of which is used as a means of reducing nicotine dependence [11]. The plant is recommended for use in gardening for vertical decorative gardening [12]. In the arid Aralocaspian zone, the soft fruit plays a significant role in the feed ration of sheep and horses [13].

Distribution: Karakalpakstan: Ustyurt plateau. Outside Uzbekistan: Mangyshlak, Ustyurt (cliffs and chinks), Large and Small Balkhans. Western Kopetdag, Badkhyz (the Zulfagar passage and the area of Kush), Northern Pamir-Alai (the basin of the Isfara River, the lower reaches of the Urtachashma river). Outside the USSR — Iran and Afghanistan.

Habitats: Pebbles, saline soils near fresh and mineralized springs. It grows in narrow gorges of low mountains, less often in mountains, on steep slopes of cliffs and karst craters, in sheltered valleys on rocky slopes, outcrops of gypsum-bearing clays, near brackish springs or near the seashore, often with partial shading, sometimes in thickets, very rarely in juniper thickets.

4. Conclusion

Population: In 2022, 7 cenote populations of the species were noted (on the eastern Ustyurt), with a total number of about 200 individuals [16-20].

The main limiting factors were poor renewal in natural conditions. Economic activity in habitats; damage to bushes, stumping of stems by man.

M. crithmifolius reproduces by seeds and vegetative (layering). It resumes from the stump, takes root by layering (covered with stones or soil), creeping shoots. Propagated by seeds, but in nature a small number of individuals survive self-seeding.

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