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BIOLOGY AND MEDICAL SIGNIFICANCE OF THE CAPPARIS SPINOSA L. PLANT

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ABSTRACT

This article examines the biological characteristics and medicinal value of *Capparis spinosa* L., which grows in Karakalpakstan. The morphological characteristics, ecological conditions, cenopopulation characteristics, and economic value of the species are studied. The plant has been shown to possess high ecological flexibility and is resistant to drought and extreme temperatures. *Capparis spinosa* contains biologically active substances that determine its widespread use in traditional and modern medicine. The need to preserve natural populations and rationally use this medicinal resource is emphasized.

KEY WORDS: *Capparis Spinosa*, Medicinal Plants, Bioecology, Cenopopulation, Karakalpakstan, Medicinal Raw Materials, Medicine.

INTRODUCTION

The study of wild medicinal plants is a priority area of modern biology and ecology. Uzbekistan's flora comprises over 4,300 plant species, of which approximately 750 have medicinal properties. Karakalpakstan is home to approximately 360 medicinal plant species, representing a significant portion of the region's biodiversity.

Capparis spinosa L. (caper), a plant widely found in arid regions of Central Asia, occupies a special place among valuable medicinal plants. The plant is characterized by high drought tolerance, its ability to grow in poor soils, and its significant content of biologically active substances. Due to this, it is widely used in folk medicine, the food industry, and pharmacology. The aim of this study was to investigate the biological characteristics, environmental conditions, and medicinal value of *Capparis spinosa* L. in the Kuskanato Upland of Karakalpakstan.

MATERIALS AND METHODS

The research was conducted in 2024–2025 on the territory of the Kuskanatovsky Upland, located in the northwestern part of the Republic of Karakalpakstan. The study area is characterized by a sharply continental climate with hot, dry summers and cold winters. The average annual precipitation is 100–140 mm. The object of the study was *Capparis spinosa* L., a perennial subshrub of the *Capparaceae* family. The current state of populations was studied using the cenopopulation analysis method according to the methodology of O.V. Smirnova et al. (1976). Phenological observations were carried out according to the methodology of I.N. Beidman (1976). The root system was studied according to the methodology of M.S. Shalit (1960). During the field research, route surveys, habitat descriptions, and consideration of the age structure of populations and the phenological phases of plant development were carried out.

RESULTS AND DISCUSSION

Studies have shown that *Capparis spinosa* L. is well adapted to the extreme conditions of the arid zone of Karakalpakstan. The plant grows on gypsum, sandy, and rocky soils, and is found on dry slopes, along roadsides, in ravines, and in abandoned areas. Morphologically, the plant is a perennial subshrub with spreading shoots up to 2.5 meters long. The leaves are alternate, elliptical or obovate, dense, and leathery. The flowers are large, white or light pink, up to 8 cm in diameter. Flowering occurs from May to July, and fruiting continues from July to September.

A population analysis revealed a significant number of young individuals, indicating favorable natural regeneration of the species. However, negative anthropogenic impacts, including intensive grazing and land development, were noted. Young plants are particularly vulnerable due to their poorly developed root systems and protective spines. The chemical composition of *Capparis spinosa* is characterized by high levels of alkaloids, saponins, ascorbic acid, essential oils, and carbohydrates. The roots contain the alkaloid stachydrine, which has pronounced biological activity.

The plant's medicinal value is associated with its anti-inflammatory, antioxidant, hypolipidemic, antidiabetic, and neuroprotective properties. Caper-based preparations are used for cardiovascular diseases, metabolic disorders, inflammatory processes, and nervous system disorders. The plant also plays an important role in economic activity. Unopened flower buds are used in the food industry as a valuable food product. The flowers are a good source of honey. According to local surveys, caper thickets provide high honey production and contribute to the development of beekeeping. The plant's economic value is also linked



to the export of medicinal plants. High demand for its fruits and roots makes this species a promising candidate for sustainable use and cultivation.

CONCLUSION

Research has shown that *Capparis spinosa* L. is a valuable medicinal and economically significant plant in the arid regions of Karakalpakstan. The species is characterized by high environmental resilience, the ability to grow in extreme conditions, and effectively regenerate in natural populations. It has been established that the plant contains a wide range of biologically active compounds, which determine its medicinal properties and potential for use in the pharmaceutical industry. Despite the satisfactory state of the population, increased anthropogenic pressure may lead to a decline in the number of young individuals. To preserve the natural resources of *Capparis spinosa*, it is necessary to organize the protection of its natural habitats, regulate grazing, and implement measures for the rational use and restoration of natural populations.

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