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FLORA OF THE YOZYOVON STATE NATURE MONUMENT AND THE BIOECOLOGICAL CHARACTERISTICS OF POPULUS PRUINOSA SCHRENK

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Abstract
This article presents the results of research on the composition and bioecological characteristics of plant species in the flora of the Yozyovon State Nature Monument, with a focus on the bioecological properties of Populus pruinosa Schrenk, a species found in this flora.

Keywords: Yozyovon State Nature Monument, Populus pruinosa, riparian ecosystem, Central Fergana deserts.

Introduction

The unique ecological balance in nature is largely dependent on the level of biological and landscape diversity preserved. Globally, environmental changes pose serious threats not only to biological species but also to the human habitat and the provision of life-essential resources. One of the most pressing global issues today is the degradation of virtually all types of landscapes, which is driven by the increasing anthropogenic load on ecosystems.

During the Soviet era, the economy of our republic was turned into a raw material supplier sector, and agriculture, particularly cotton monoculture, exerted a strong impact on the nature-society relationship until our independence. As a result, unique ecosystems in desert and steppe regions have been shrinking, soil salinization has increased, aquatic ecosystems have changed, large artificial water reservoirs have formed, and the environment has been increasingly contaminated with hazardous defoliants and pesticides. Furthermore, fragmentation processes have intensified in Uzbekistan, particularly in the Fergana Valley, leading to significant disturbances in regional ecological and economic balances. These factors have contributed to the extinction of rare and unique ecosystems and species.

The landscapes of the Central Fergana Desert are surrounded by anthropogenic landscapes and are distinct from the adjacent steppes and mountain areas. This has had an impact on the area's climate and environmental conditions, which differ from those of other desert regions. This process not only affects the flora and fauna of the region but also influences the adaptation of protected species to new ecological conditions.

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The Yozyovon desert is surrounded by cultural landscapes (irrigated crop fields), and as a result, many weedy species, including indicator species, thrive in the borders of natural habitats. Among other ecosystems, riparian ecosystems are the most favorable for plant growth and development, and therefore, they are rich in plant species. However, riparian vegetation in the Yozyovon State Nature Monument is not well-developed, and only some elements, such as *Populus pruinosa* and *Tamarix*, have been preserved in the transitional zones. The rest of the riparian vegetation has been converted into crop fields, with artificial riparian forests formed by planting poplars. Thus, only remnants of riparian vegetation remain today.

Populus pruinosa Schrenk is a species that thrives in sandy and saline soils, forming large areas of riparian zones. This species is the most salt-tolerant among the desert trees and shrubs. Its seeds are highly viable and germinate rapidly, with some seeds sprouting overnight after falling onto wet soil. However, seed viability rapidly decreases after 2-3 days. The male and female flowers of *Populus pruinosa* differ in size, with the male flowers measuring 3-4 cm and the female flowers 5-6 cm. Each flower cluster contains 17 to 32 capsules, each of which produces 123 to 129 seeds. As a result, the species produces a large number of seeds. The seeds are tiny, measuring 1-1.5 mm in size, and each cluster weighs between 88.4 mg and 124.8 mg. Based on experiments, it is recommended to plant 30-35 mg of seeds per square meter, which yields approximately 60-70 seedlings. This equates to around 600,000 to 700,000 seedlings per hectare. However, mass propagation of *Populus pruinosa* by seed is not widely practiced in forestry. While small-scale seed propagation has shown promising results, it does not yield the desired outcomes on larger areas. The uniformity of seed germination depends on various factors such as moisture, soil condition, weeds, temperature, and wind. When these factors are insufficient, germination is not uniform.

The species also propagates through root suckers, and new shoots sprout from the cut stumps of mature trees. However, over time, these shoots become sparse, and after 5-6 years, only one or two shoots remain, while others die off. This cycle continues as old *Populus pruinosa* stands regenerate. To ensure the proper regeneration of these forests, they must be protected from various threats such as human activity, livestock grazing, drought, and others. In the Yozyovon and Zilxa nature monuments, shoots from the stumps are harvested annually for basket weaving, which disrupts the natural regeneration process. As a result, there is no opportunity for long-term regeneration of these forests.

In order to propagate *Populus pruinosa* in a controlled environment, an experiment was conducted on February 4, 2025, where 5 cuttings of 15-20 cm in length and 15 mm in diameter were prepared. Two cuttings were taken from the upper branches, and three from the root suckers. These cuttings were placed in water, with the water changed daily.

1. A cutting from the branch developed its first buds by February 8 and produced its second leaf and shoot by February 10. By February 15, the shoot had grown to 1 cm in length. However, after March 1, the cutting started drying out.
2. A cutting from the root sucker began producing leaves by February 8, and by February 10, it had formed a second shoot. By February 15, the shoot had grown to 1.5 cm. Over time, it continued to grow, and by March 1, it reached 3 cm. However, no roots were formed. When planted outside, only one of the three cuttings started rooting. The other two dried out. This indicates that this method of propagation is not very effective for *Populus pruinosa*.

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While there are some natural plant species in the Fergana Valley's desert region, most of the area consists of cultural landscapes. Desert plants are relatively diverse, but uncontrolled usage and the expansion of cultivated land have led to a reduction in their range, while rare species are becoming more endangered. To preserve these species for future generations, it is necessary to use natural resources sustainably and to allow for their natural regeneration.

Despite numerous regulations aimed at preserving and utilizing plant resources, illegal activities, such as unauthorized grazing, crop cultivation, and illegal logging, continue. These activities contribute to the shrinking of natural forest areas, replacing them with cultural landscapes. To preserve and pass on natural desert and riparian ecosystems, a protected area should be established in Central Fergana's desert regions. This area could serve as a scientific research center and a tourist attraction, providing opportunities for scientific monitoring of natural changes, preservation of biological diversity, and restoration of natural ecosystems.

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