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## PHYTOCENOTIC AND TYPOLOGICAL STRUCTURE OF VEGETATION IN THE CHODAKSOY BASIN

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### Abstract

The study examines the phytocenotic and typological structure of vegetation in the Chodaksoy Basin, a southeastern segment of the Qurama mountain system in the northern Fergana Valley. The vegetation cover includes 53 associations, 13 formations, and 9 types. Xerophytic semi-shrublands and thermophilic juniper forests dominate a vast area (50176 ha), well adapted to the arid conditions of the basin. A detailed vegetation map (1:50,000 scale) of the Chodaksoy has been developed, identifying 653 species of vascular plants from 315 genera and 72 families. This work integrates historical botanical data and field studies to define the basin's unique floristic structure and proposes management recommendations for overgrazing and ecological conservation.

**Keywords:** Chodaksoy Basin, phytocenosis, juniper forests, vegetation mapping, plant diversity, Qurama mountains.

### Introduction

The Chodaksoy Basin, part of the southeastern Qurama Range, represents a region of high biodiversity in the western Tian Shan. Previous botanical explorations, beginning in the late 19th century, highlighted its rich flora, influenced by altitudinal gradients and complex geology. Prominent works by A.P. Fedchenko, A.E. Regel, V.I. Lipsky, and later researchers laid the foundation



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for understanding the flora of this region. Despite its ecological significance, much of the vegetation structure remained underexplored until recent efforts to classify and map its plant communities.

### **Method**

The research was conducted through geobotanical surveys of the Chodaksoy Basin, with detailed fieldwork focusing on altitudinal belts ranging from 1500 to 2700 meters above sea level. Vegetation mapping was performed using large-scale topographic maps (1:50,000), alongside species inventory, floristic classification, and phytocenotic analysis. Historical botanical literature and herbarium collections from institutions such as the Institute of Botany were reviewed to supplement field observations.

### **Discussion**

Vegetation in the Chodaksoy Basin exhibits distinct zonation, with xerophytic communities dominating dry southern slopes and mesophilic shrubs in moist northern terrains. Key vegetation types include semi-shrublands with *Artemisia* and *Ferula* species, and extensive juniper forests dominated by *Juniperus seravschanica*. Forests are generally young, with sparse coverage due to prolonged summer droughts. The vertical stratification of plant communities reflects both climatic gradients and soil heterogeneity. Notably, the basin lacks broadleaf deciduous forests common in adjacent ranges, a phenomenon explained by Popov's 'western slope effect'. Flora consists of 653 species, many of which are endemic or regionally rare. Overgrazing has significantly reduced pasture capacity, necessitating reduced livestock numbers.

#### Broadleaf Deciduous Forests — *Oritherodendra*

Broadleaf deciduous forests, widely distributed across the western ranges of the Tian Shan (referred to as "chernolesye" by Ovchinnikov, 1957; Zapryagaeva, 1976; "mountain broadleaf forests" by Korovin, 1962; Karmysheva, 1973; Allanazarova, Butkov, Khamidov, 1984; "broadleaf forests" by Pavlov, 1980; "deciduous tree and shrub communities" by Arifkhanova, 1967; Vernik, 1984;



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“deciduous woodlands” by P.K. Zakirov, 1989, etc.), are typically formed by tree species such as *Juglans regia*, *Malus sieversii*, *Acer semenovii*, and others.

However, such forests do not occur in the Qurama Range, including the Chodaksoy Basin. This phenomenon can be explained by M.G. Popov’s (1958) “western corner theory.”

Nevertheless, certain species such as poplar (*Populus*), willow (*Salix*), and birch (*Betula*) are found in narrow strips along stream banks and terraces, growing on gravelly and rocky soils.

In our region, junipers begin to appear sporadically at elevations of 1600–1700 meters. Well-developed juniper forests are found between 1800 and 2400 meters above sea level. According to V.N. Pavlov (1980), junipers in Western Tian Shan are known to occur within a broader altitudinal range of 500–3500 meters.

Only a small portion of junipers form continuous stands. These dense communities are typically located on moist northern slopes. The herbaceous layer in such forests exhibits, to varying degrees, the characteristics of mesophilic meadow vegetation, particularly in shashir-type juniper woodlands.

One notable feature of the juniper forests in the Chodaksoy Basin is the dominance of pure stands of black juniper (*Juniperus seravschanica*). Other tree species, such as *Acer semenovii* and *Sorbus tianschanica*, are occasionally found as isolated individuals in moist sites near streams.

The distribution range of black juniper in Chodaksoy is extensive. Moreover, the mountain slopes are composed of diverse ecotopes, including exposed bedrock, steep cliffs, screes, gravelly, stony, and fine-textured soils. As a result, juniper forests form a variety of plant communities with differing densities, structured according to edaphic and climatic conditions.

### **Conclusion**

The Chodaksoy Basin is a floristically rich and ecologically significant region within the Qurama Range. Its plant cover is characterized by diverse xerophytic and juniper-dominated communities shaped by complex orography and arid climatic conditions. Conservation efforts should prioritize reducing grazing



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pressure and protecting rare habitats. Further studies are needed to monitor vegetation dynamics and assess the impacts of climate change.

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