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BIOECOLOGY AND BIOGEOCHEMISTRY OF MEDICINAL ONIONS IN MOUNTAIN  
SOILS OF UZBEKISTAN

Isomiddinov Zokirjon Jaloldinovich, PhD, docent  
Abdupattoyeva Mubinabonu, student  
Nabiyeva Mohigul, student  
Kokand State Pedagogical Institute

**Annotation:** This article presents concise information regarding the bioecology of black onion (*Allium karataviense* Regel.), Seversov onion (*Fritillaria sewerzowii* Regel.), and Anzur onion (*Allium suworowii* Regel.) distributed in brown mountain soils. It is imperative to investigate the geochemical landscapes of mountain zones, particularly the biogeochemical properties of plants in elementary systems, such as mountain soils and medicinal plants, which remain largely unexplored.

**Keywords:** onion (*Allium cepa* L.), soil, biogeochemical.

**Introduction.** The mountainous region occupies the eastern and southeastern parts of the territory of Uzbekistan and includes a number of ranges of the Tien Shan and Pamir-Alai mountain systems. Their average absolute height ranges from 1500 to 3500 m and above. Mountain ranges are divided into high, medium, and low mountains, taking into account the depth of separation. Mountains with a separation (division) depth of more than 500 m were classified as high mountains, 200-500 m as medium mountains, and up to 200 m as low mountains [1].

The formation of soils in this mountainous region is unique, changing from bottom to top from mountain brown to mountain brown to mountain meadow steppe soils. These soils are distributed according to the vertical zonation law, and exhibit unique fertility properties under the influence of biotic and abiotic climatic factors. The geochemical landscapes of mountainous regions, especially the biogeochemical properties of plants in elementary systems, including the mountain soil-medicinal plant chain, have not been practically studied.

The genesis of mountain brown soils, the determination of their changes, and the study of the bioecology of medicinal plants in mountainous regions are among the important research areas.

Currently, a number of scientific studies are being conducted to determine the distribution, cenopopulation, medicinal properties, changes in the composition and amounts of chemical substances and elements, and biogeochemical properties of local and introduced medicinal plants [2, 3, 4]; however, these studies cannot be considered sufficient.

**MATERIALS AND METHODS.** The research areas were mountain brown soils formed in the Chodaksoi mountain region, Pop district, Namangan region, and black mountain onion (*Allium karataviense* Regel), Severtsov's onion (*Fritillaria sewerzowii* Regel) plants, and mountain brown soils, 1500-2600 meters above sea level.

Morphogenetic, physicochemical, and neutron-activation methods were chosen as the main methods of soil research, and standard methodologies and methods generally accepted in soil science today are widely used. Elemental analysis of the soil and plant was carried out using the neutron activation method. In this case, the samples were  $5 \times 10^{13}$  neutrons/cm<sup>2</sup> s in the atomic reactor irradiated with a neutron beam, and their quantities were determined based on the half-life periods of the chemical elements.

**RESULTS AND DISCUSSION.** Our research covers the dry steppe area of the middle mountain region, which is covered with wheatgrass and sparse juniper forests. Among the medicinal plants,

the black onion (*Allium karataviense* Regel), Seversov onion (*Fritillaria sewerzowii* Regel) and Anzur onion (*Allium suworowii* Regel) were selected as the object of research, distributed at altitudes of 1200-2100 m above sea level. Information on the medicinal properties, bioecology and use of these plants for various diseases has been presented as a result of research by many researchers [5, 6]. Therefore, it is important to study the soil-medicinal plant chain.

*Allium karataviense* Regel is a perennial, with an ovoid bulb 2-6 cm thick, a thin outer skin of dark or grayish papery color. The stem is 10-25 cm high, 5-10 cm of it is underground. The leaves are 1-2-3 cm wide, elliptical, 3-15 cm long, and had serrated edges. The node is 4-lobed, the seeds are obovate, and 8 mm wide. It blooms in April-May. The seeds ripen in May-June. It grows in the conditions of the mountain brown soils of the mountain region. It is found in the lower and middle parts of the high mountains of Tashkent and Fergana Valley.

In folk medicine, a decoction of black onion is used to treat shortness of breath and lung disease.

Seversov onion (*Fritillaria sewerzowii* Regel) is a perennial plant belonging to the onion family - Alliaceae. The onion is white, covered with a thin husk, 3-5 cm in diameter. The stem is thick, erect, glabrous, 20-60 cm high. The leaves are light green, glabrous, and half-enveloping the stem. The flowers were arranged in a panicle at the tip of the stem. The flowers are 3-13 in number, the bracts are short, and when blooming, they point downwards. The fruit rises upward when ripe. The flower parts are brownish green on the back and dark brownish reddish on the inside. The calyx was 3-5 cm long, and the seeds were dark brown with thin wings.

It blooms and seeds from April to June depending on the altitude of the growing area. It grows in areas covered with gravel and sparse vegetation from the foothills to the central regions of the mountains. It is widespread in the Tashkent, Fergana, Samarkand, and Kashkadarya regions, mainly on the southern slopes of the mountains. In the early spring or after the seeds ripen, the bulbs are harvested and used to restore the liver, biliary tract, and impotence.

Anzur onion (*Allium suworowii* Regel) is a perennial plant belonging to the Alliaceae family, with a spherical bulb, 2-3 cm thick. The multi-layered bark is gray, and the stem is 30-100 cm high. The leaves are 2-6 long, strap-like, 5-20 mm wide, and the umbel is spherical. Numerous flowers were densely located. The flowers are pinkish-purple, ovate, and 5 mm wide. It blooms in May, and the seeds ripen in June. It grows as a weed in the rocky soils of oases. It is distributed in the Tashkent, Fergana, Namangan, Samarkand, and Bukhara regions.

In folk medicine, the smell and taste of garlic are similar to those of onions; however, garlic has a stronger smell and a more bitter taste. Onions marinated in wine vinegar are used to treat hemoptysis, the early stages of tuberculosis, and respiratory diseases.

**Conclusion.** Bioecological research on medicinal plant species, in particular, determining the quantitative supply of nutrients in medicinal plants such as black onion, Seversov onion (olive), and Anzur onion, and studying their biogeochemical properties in the soil-medicinal plant chain, is of important scientific and practical importance, and is one of the problems awaiting solutions in the study and protection of the productivity and medicinal properties of medicinal plants.

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