MORPHO-BIOLOGICAL ANALYSIS AND RESULTS OF SOILS OF KASHKADARYA REGION

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Anotation This article studies the soil types of Kashkadarya region, their morphological and biological properties. Soil samples were analyzed in the laboratory using agrobiological methods, and the mechanical composition of the soils, humus content, microbial activity, and their effect on plant growth were determined. The results are of important practical importance in the sustainable use of land resources and the optimization of agriculture.

Keywords: Kashkadarya, soil types, morphological analysis, biological activity, humus, microflora.

Introduction Soil is the main factor for the vital activity of plants, and its physical, chemical and biological properties directly affect agricultural productivity. In the Republic of Uzbekistan, including the Kashkadarya region, it is necessary to conduct a thorough analysis of soil properties in order to effectively use land resources and carry out restoration work on degraded lands. The territory of the region is diverse in terms of climate and relief, and various types of soils have formed here: gray soils, brown soils, saline soils and meadow-mountainous soils. This article analyzes the morpho-biological indicators of these soil types.

Materials and Methods

2.1. Research object

The studies were conducted in March-July 2024 in the Karshi, Kitab, Dehqanabad and Nishan districts of the Kashkadarya region. Soil samples were taken from each area at a depth of 0–30 cm.

2.2. Morphological analysis

The external structure, color, layer structure, density and moisture capacity of the soil were assessed according to GOST methods.

2.3. Biological analysis

The number and activity of microorganisms in the soil were determined according to the Serebryakov method, the humus content was determined by the Tyurin method, and the activity of urease and catalase enzymes was determined by colorimetric methods. The composition of the microflora was studied by sowing in nutrient media.

3. Results

The morphological characteristics of the soil are understood as its external and internal structure, the expression of physical characteristics. These indicators play an important role in assessing soil fertility. The morphological characteristics of the main soil types in the Kashkadarya region are different, and they are formed depending on the relief, climate, water regime and vegetation conditions.

Gray soils are usually dark gray in color, have an average density and a crumbly structure. Their density is around 1.2–1.3 g/cm³, and their moisture holding capacity is 28–32%. Brown soils are brown in color, have a granular structure and are slightly denser (1.3–1.4 g/cm³). Their moisture capacity is 25–29%, creating a fairly favorable environment for plants.

Saline soils have a characteristic whitish-gray color, a dense and sticky structure, low moisture retention (20–24%) and a relatively high density (1.4–1.5 g/cm³). Due to the high salt content of these soils, their fertility is considered low. Meadow soils have

the best physical properties: they are dark in color, fine-grained in structure, low in density (1.1–1.2 g/cm³), and their moisture capacity reaches 35–38%.

In conclusion, morphologically, meadow and brown soils are the most favorable for agriculture. Saline and dense gray soils require reclamation measures.

3.1. Tuproq turlarining morfologik ko‘rsatkichlari

Soil type	**Color**	**Structure**	**Density (g/cm³)**	**Wet capacity (%)**
Gray soil	Dark gray	Chunky	1.2–1.3	28–32
Brown soil	Brown	Granular	1.3–1.4	25–29
Salty soil	Leaking gray	Glue	1.4–1.5	20–24
Meadow soil	Black	Fine-grained	1.1–1.2	35–38

3.2. Humus content and microbiological indicators of soils

Soil type	**Humus (%)**	**Bacteria (million/g)**	**Fungi (thousand/g)**	**Catalase (ml O_2)**
Gray soil	1.2–1.5	5–7	30–35	4.1
Brown soil	1.8–2.3	7–9	40–45	5.3
Salty soil	0.4–0.8	2–3	15–20	2.1
Meadow soil	2.5–3.0	8–10	50–60	6.4

4.Discussion The results of the study showed that the highest biological activity in the Kashkadarya region is observed in meadow and brown soils. They are richer in humus, have active soil microflora, and are considered a favorable nutritional environment for plants. Saline soils are physically and chemically weak, have a low

number of microorganisms and enzyme activity, and require reclamation. Gray soils have average indicators, and their productivity can be increased with good agricultural practices. Biological analyses show that as the amount of humus in the soil increases, the activity of microorganisms also increases.

5.Conclusion The soils of the Kashkadarya region differ significantly in their morphological and biological properties. It is important to develop site-specific agrotechnical measures to increase soil fertility and maintain bioactivity. In particular:

• Salt-rich soils require desalting and the application of organic fertilizers.

• Meadow and brown soils are suitable for intensive farming and can be managed using resource-saving methods.

• The results of morpho-biological analysis are of great importance in conducting the regional agrarian policy on a scientific basis.

References

1. Dospekhov B.A. “Methodology of agricultural experience”. Moscow, 1985.

2. Egamberdiev A. et al. “Morphology of soils of Uzbekistan”. Tashkent, 2017.

3. Serebryakov B.V. “Biological analysis of soil”. Moscow, 1983.

4. GOST 26213-91. Soil. Methodology of analysis.

5. Karabaev S.T. “Fundamentals of soil science and agriculture”. Karshi, 2021.