



Aydar-Arnasay Lakes System Soil Structure And Its Chemical Composition

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ABSTRACT

The soil structure of the Aydar-Arnasay lake system and its features are described. As a result of the analysis of the chemical elements of soil samples taken from the Boymurad fortress and Arnasay district, the amount of 33 macro- and microelements was determined for the first time.

KEYWORDS

Aydar-Arnasay lake system, elements, neutron-activation analysis, soil, ecosystem, monitoring

INTRODUCTION

The shores of the Aydar-Arnasay lake system, located at the foot of the Nurata ridge, are located in the desert part of Navoi and Jizzakh regions. The separation of the Aydar-Arnasay basin as a whole geosystem and the transfer of its natural boundaries is a rather complicated issue. The southern boundary of the Aydar-Arnasay basin is somewhat clear and passes through the foothills of the Nurata Mountains. The natural boundaries of the western, northern and eastern sides of the Aydar-Arnasay Basin were traversed through areas where changes in soil and vegetation were observed under the influence of groundwater from the Aydar-Arnasay Lakes System (AALS).

The western boundary of the Aydar-Arnasay basin corresponds to the eastern part of the Kyzylkum desert. Here, the areas adjacent to the naturally formed sandy soils and the saline sands formed under the influence of AALS were taken as the boundary of the basin.

THE MAIN FINDINGS AND RESULTS

The north-western part of the northern borders of the basin is bordered by the Eastern Kyzylkum, the northern part crosses the state borders of Uzbekistan and Kazakhstan, and the northeastern part is directly connected with the Sandy Desert. In crossing the border across the northern region, the exchange area of unsalted sandy

soils with saline sandy soils under the influence of AACT and, consequently, the exchange area of psammophytic plants with halophyte plants became the basis for crossing the border. The eastern boundaries of the Aydar-Arnasay basin correspond to the interchangeable areas of light gray soils cultivated with saline sandy soils.

The area is mainly covered with light gray soils, sandy soils and saline soils. Light gray soil type In the lowest areas of the region due to climate change from bottom to top, light gray soil is often composed of lyoss sands, the top layer of grass is light gray, and among the soils there are different types of saline soils. When the amount of salts in the soil exceeds 3%, salts are formed, as a result of which the soil surface is covered with white and thin layers of salt. This is because in places where groundwater is close to the surface, water evaporates due to evaporation, and salts continue to accumulate on the soil surface, resulting in the formation of salts. Saline soils are rich in chlorine, sulfate and sodium salts, which are rapidly soluble in water, which worsens its chemical properties. Humus has almost no humus, only in humid and swampy soils a humus layer is formed. In sandy soils, the surface consists of 8-10 cm of scattered sand, and the plant roots do not branch here. Humus and nutrients are scarce in sandy desert soils. The humus content is 0.3-0.6% [1].

The climate of the region is sharply continental, reflecting the climate of the plains - desert and mountainous areas, with hot summers, cold winters and relatively mild. According to perennial weather data, the average January temperature is 1-4^o C, the minimum temperature is 27^o C, the average monthly temperature in July is 26-28^o C, and the maximum is 45^o C. The average annual rainfall is 400-500 mm in the south and 250-300 mm in the north [2].

The vegetation period of plants lasts 240-260 days. The relative humidity is 70-80 percent in winter and 10-30 percent in summer. [3].

The mineral, organic and some chemical elements of the soil chemical composition of the Aydar-Arnasay lake system vary, the mineral part of which is primary (quartz, feldspar, amphiboles, pyroxine, mica, etc.), secondary (montmorillonite, kaolinite, hydrosilicate, etc.). k.) and minerals and an organic structure. Dissolved substances occur in ionic, molecular, and colloidal forms. One of the main properties of soil is its acidity, the presence of hydrogen ions in the soil solution, as well as hydrogen and aluminum exchange ions in the soil absorption complex, which is important in the metabolism of soil microflora during vegetation [4].

The research was conducted in September 2020 on the basis of soil samples from the area around the Boymurad fortress of the Aydar-Arnasay lake system and soil water samples from the territory of Arnasay district. Soil samples for laboratory analysis were prepared at the Institute of Bioorganic Chemistry of the Academy of Sciences of the Republic of Uzbekistan and carried out at the Institute of Nuclear Physics using neutron-activation analysis in the VVR-SM research reactor.

Samples were prepared in the following order: each soil sample was taken in a separate polyethylene container, and a brief description of the time and place of their collection was recorded. The required amount was then ground in a porcelain vessel under laboratory conditions, dried at 60 ° C and sieved with a 2 mm sieve. Using the quarto method, soil samples were taken for detection of short-lived isotopes for neutron-activation analysis - from 20-30 mg, for detection of medium and long-lived isotopes - from 50-70 mg. Each measured sample was then placed in moistened plastic bags and sent to the VVR-SM research reactor for neutron-activation

analysis to determine its chemical composition.

Amount of chemical elements in some soil samples around Aydar-Arnasay lake system, mkg/l

As a result of laboratory analysis, the content of 33 macro- and microelements in soil samples around the Aydar-Arnasay lake system was determined (table).

Elements	A soil sample around the Boymurod fortress	Soil sample of Arnasay district
As	2,9	3,7
Au	<0,001	<0,001
Ba	310	480
Br	70	2,8
Ca	93500	68300
Ce	22	27
Co	3,9	4,9
Cr	21	62
Cs	1,7	1,9
Eu	0,38	0,57
Fe	10100	13200
Hg	H/o	H/o
K	9700	6500
La	12	16
Lu	0,19	0,13
Mn	217	80

Mo	3,8	1,0
Na	42800	6600
Nd	11	6,2
Ni	<10	<10
Rb	35	66
Re	1,0	1,0
Sb	0,50	0,50
Sc	4,0	4,7
Se	H/O	H/O
Sm	1,8	1,8
Sr	1200	290
Ta	0,32	0,38
Tb	0,26	0,3
Th	3,2	5,2
U	3,5	1,5
Yb	1,2	1,3
Zn	35	36

CONCLUSION

According to the results of neutron-activation analysis of some soil samples taken from the territory of Boymurad fortress and Arnasay district of Aydar-Arnasay lake system, the content of Ca, Fe, K and Na elements was significantly higher, Tb, Lu, Au were relatively low. The amount of biogenic chemical elements in the soil indicates that it has a

direct impact on the diversity and vegetation of plant species distributed around the Aydar-Arnasay lake system.

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