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SORGHUM CERNUUM PLANT BIOGEOCHEMISTRY

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Abstract
This article studies in detail the chemical elemental composition of cultivated plants-phytomeliorants growing on saline lands, with water-soluble salts from which the plant receives toxic and non-toxic elements of substances that migrate into plant-animal-human chains, the geochemical characteristics of which are described on the basis of log-normal spectra, studied chemical elements.
In addition, the medicinal and phytoremedial properties of the Solanum nigrum plant are discussed in detail.

Keywords: Biogeochemistry, reclamation, phytomelioration, toxic, saline soil, arzik-shox, migration, accumulation, lithosphere, lognormal.

Introduction

Relevance of the topic. A number of scientific and practical studies are being carried out in the world on the preservation of the natural state of blocks of elementary geochemical landscapes with natural and anthropogenic saltpeter, the effective use of medicinal plants, increasing the level of productivity, the use of phytomeliorative measures such as salt washing in their effective use, planting salt-resistant plants. In this regard, special attention is paid to the quality of work aimed at researching the transformation of previously swampy saltpets under the influence of natural and anthropogenic factors, determining the soil-reclamation, soil-geochemical state, chemical and biogeochemical properties, increasing their productivity.

In the following years, Central Fergana has been experiencing a decline in the amount of loamy land that could be attracted to agriculture by inclusion in the relatively easy agricultural circular

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movement as a result of various soil-reclamation activities. From a soil-reclamation point of view, Saltmarsh, saline Marsh soils, Sandy, dwarf-Horned dahas, which are difficult to assimilate, are found in large numbers. The yield of agricultural crops on the acquired lands is increasing rather than increasing.

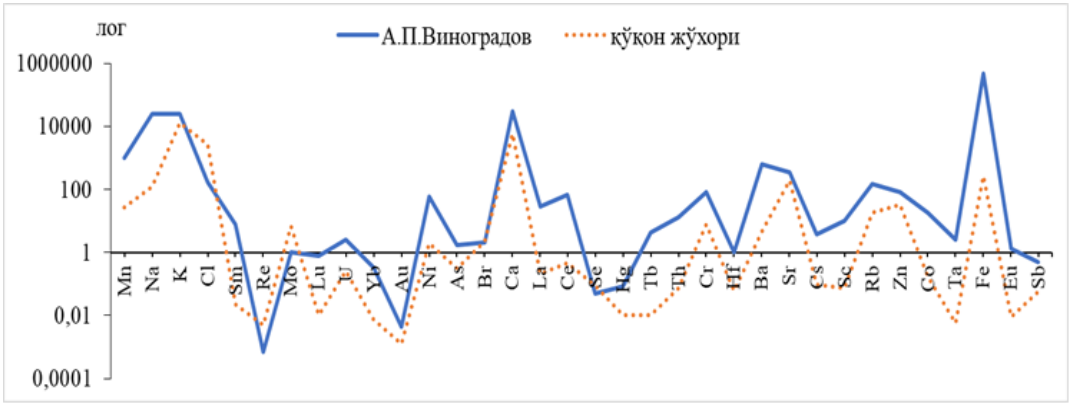
Of particular scientific importance is the research of the geochemical, biogeochemical, agrochemical, chemical, physical and reclamation properties of brine and irrigated soils, the study and research of the causes of migration, accumulations and concentration and deconsentration of existing salt-forming ions in soils and plants. Of great practical and theoretical importance is the identification of biogeochemical and phytomeliative peculiarities of adaptation of plants in saline soils to conditions, as well as their effective use in agricultural production networks on this basis. The absorption of elements into the plant, migration in the soil-plant chain helps to open their mechanism. Work on this is of practical importance in the study of the need for macro - and microelements of plants, the pathology of their diseases. In such changes of them will help to open the role of the environment. The migration of chemical elements in this area, that is, in the soil-plant chain, the solution of accumulations serves as an important theoretical key in the study of the evolution of organisms [1,3].

Research Methods and Results

Studies in the soil-plant chain were carried out on the basis of a formation of cultural and natural plants growing in natural brine and anthropogenic brine, in which these soils, namely brine, are saturated with Na, Ni, Sb, As, MoS, that is, these elements form excessive provincial States in the studied brine, under such conditions white oats and others grow.

Today, about 700 species of plants resistant to drought and soil salinity are used in medicine and phytomeliative activities [2]. But most of these plants are those that grow in natural salt marshes. There are many natural and anthropogenic factors that affect the plant organism, including geochemical, biogeochemical factors, hususan, plant growing substrate, the influence of soil properties. Establishing soil-plant relationship in this regard forms the basis of soil biogeochemistry, and this base depends on soil type, type, plant type, etc [4,5,6].

We can see in the example of the diagram below that the concentration of cyclic elements in natural and anthropogenic conditions in the studied brine is of different quantity and quality in the White oat plant.



Lognormal spectrum of elements in the lithosphere and plant

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As can be seen from the diagram data, it is not difficult to predict the removal of the White oat plant from the soil in their bodies of metallmas and heavy metals and radionuclides, which have the properties of anion and cations of salts dissolved in different amounts of water and toxic effects for plants. In addition, if we make an individual quantitative geochemical spectrum for the White oat plant, it will have the following manifestations.

White sorghum: $^{19}K_{39} > {}^{20}Ca_{40} > {}^{26}Fe_{56} > {}^{38}Sr_{88} > {}^{11}Na_{23} > {}^{30}Zn_{65} > {}^{25}Mn_{55} > {}^{24}Cr_{52} > {}^{42}Mo_{96} > {}^{56}Ba_{137} > {}^{28}Ni_{53} > {}^{33}As_{75} > {}^{27}Co_{59} > {}^{51}Sb_{122}$;

The biogeochemical formulaic spectrum shows that the smallest amount in the studied plant belongs to Surma, with more amounts corresponding to cobalt, arsenic, nickel, etc. These elements are among the heavy metals. But in this case, arsenic and antimony, although non-metallic, are included in some literature among toxic heavy metals, which is not in vain, since their level of toxicity is close to heavy metals, which can be exceeded depending on the conditions.

Conclusion

Cyclic elements are absorbed by brine and plants growing in them, depending on the geochemical properties of the element, the type of plant, the state of the soil, that is, the fact that it is a natural and anthropogenic brine. In this place, the White oat plant is clearly distinguished by Macroelements, it retains the highest amount of chlorine, molybdenum from microelements.

The formation of succulent plants is adapted to obtaining the elements they need from the inner layers of the soil, and those who build their bodies on this basis, form biogeochemical barriers in their bodies so as not to receive toxic, harmful elements, adapted to exclude certain chemical elements from their bodies.

In areas of the desert region, where saline irrigated grassland-saz soils are distributed, sizot water becomes mineralized in weak motion and motionless, to varying degrees and quality. Galophyte plants are adapted to salty soils, are drought-resistant, and in addition, it is advisable to process them every season, having studied medicinal properties.

The cultivation of such a cultural plant as white oats on saline soils is tripartite, that is, the effective use of the plant as a phytomeliorant plant in the fight against soil salinity, studying the properties of fodder and medicinal properties in livestock at a time when global climate change is accelerating, it will not be an exaggeration to say the scientific basis for preventing drought and soil salinity.

References

1. Виноградов А.П. Геохимия редких и рассеянных химических элементов в почвах. М.1957. 238 с.
2. International Institute for Environment and Development (http://www.iied.org) International Center for Bio saline Agriculture (http://www.biosaline.org).
3. Abakumov E., G‘.Yuldashev. et al. The Current State of Irrigated Soils in the Central Fergana Desert under the Effect of Anthropogenic Factors //Geosciences. – 2023. – Т. 13. – №. 3. – С. 90.

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webofjournals.com/index.php/8

Volume 3, Issue 2, February - 2025
ISSN (E): 2938-3781

4. Yuldashev G., Azimov Z., Mamajonov I. Changes in Cyclic Chemical Elements in Saline Landscape //Texas Journal of Multidisciplinary Studies. – 2023. – Т. 17. – С. 38-42.
5. Юлдашев Г., Азимов З. и др. Изменение запаса водорастворимых солей в природных и антропогенных солончаках //Аграрная наука-сельскому хозяйству. – 2023. – С. 140-141.
6. Yuldashev G‘., Raximov A., Azimov Z.M Sho‘rlangan tuproqlar melioratsiyasi. Toshkent 2022. 257 b.

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