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Research Article

BIOGEOCHEMICAL PROPERTIES OF SALINE GRASSLAND SOILS AND SALT MARSHES AND THE BENEFITS OF USING MICRO FERTILIZERS

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ABSTRACT

The elemental composition of soils and the biogeochemical processes taking place in them are shown in the article. Opinions are given on the composition of microelements of saline meadow soils and salt marshes and the biophilicity of these elements. Microfertilizers are substances that contain microelements and are used in small amounts for the normal growth of plants. The presence of most of the elements in D.I. Mendeleev's periodic system of elements in the soil, plants and living organisms. However, the measurement of their quantity is about making a very wide range n "10-3- n "10-5 and even n "10-9- n "10-10 %.

KEYWORDS

Biogeochemistry, migration, Clark, salinity, genesis, salinity, migration, taxonomy, trace elements.

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INTRODUCTION

Elements in soils, which are considered the main blocks of modern biogeochemistry of the landscape, in particular in saline hydromorphic soils, salt marshes, soil, plants and living organisms contain most of the elements in D. I. Mendeleev's periodic system of elements. However, the measurement of their amount is very wide range n "10-3- n "10-5 and even n "10-9- n "10-10 % [1-4]. Most of the elements in the periodic system are studied in terms of their amount, migration, concentration, and biological absorption coefficient, taking into account such parameters as their ability to move, formation of minerals, and radioactivity. From this point of view, saline soils and salt marshes formed in Uzbekistan and their ability to move in them, formation of minerals, considering quantities such as radioactivity is almost unexplored [5-9]. Therefore, this article was written in order to highlight the above example of Central Fergana.

The main part

The elemental composition of soils determines their genesis and chemical, physicochemical and other processes, so far there is no single idea that fully explains the composition of soil and the processes occurring in it. To summarize the ideas in this area, they can be cited as follows:

1. The process of transformation of soil organic, organomineral and mineral substances.
2. Specific processes that form the soil profile, or rather individual layers.
3. Process of migration of chemical substances (oxides, salts, bases, acids) and elements in the soil.

The most complex and important thing here is the combination and elemental composition of soils, and most of the elements in D.I. Mendeleev's periodic system can be found. For the soil, its first and main description is the composition of elements, which in turn determines the genesis and fertility of the soil [10-14].

More than a hundred years have passed since Clark's table was published. A lot of work has been done in this regard, that is, on Earth, soil, vegetation, atmosphere, biosphere Clarks. Among them, first of all, Vinogradov A.P. [1] works should be included. A.E. Fersman predicted in this regard in 1944 that "Geochemistry has taken over the new constant of the world." In it, the great scientist meant the distribution and concentration of chemical elements throughout our planet. This situation, that is, the ubiquitous distribution of chemical elements, is called the Clark-Vernadsky law. If we look directly at the soil, the concept of its elemental composition is often replaced by its gross chemical composition [15-19]. Of course, the composition of elements should be understood as individual atoms and ions. Determination of the direction of the processes in the soil element composition in the study of the process of its formation, and determination of its productivity is of great theoretical and practical importance. Many examples can be given in this field, one of them being the separation of genetic layers depending on the element content. For example, if there are many elements such as C, N and P, it can be defined as a humus-accumulative or humus layer.

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If there is a lot of carbon and calcium and little or no N, R, such a layer can be a carbonate-illuvial layer, etc. We also know that layers with a high content of carbonates and gypsum play the role of special barriers. The composition of elements also plays a decisive role in determining the potential fertility of various soils, determining the characteristics of salinity, pollution, toxicity, etc. Therefore, the study of these elements, their distribution and migration in the soil is one of the practical and theoretical problems of soil science and is inextricably linked with geochemistry and soil geochemistry. The migration of elements in soil types, types and differences is as diverse as it is in different geomorphological elements of the Earth's crust. The geochemical properties of the elements are related to their formation of gas, solution, and solid-state substances. According to A.I. Perelman and M.A. Glazovskaya, the following should be paid attention to when describing elements from a geochemical point of view [2,3]:

1. The situation that determines or determines the migration of an element is its place in the periodic system, atomic structure, atom, ion radius, isotopes, the solubility of compounds, Eh, pN.
2. Clarks in different systems, in which we can add concentrations of Clark's different genetic layers.
3. Movement of the element in the magmatic, hydrothermal and hypogenic system, place in mechanical, physicochemical, biogenic migration, a form of movement.
4. Geochemical history of the element.
5. The role of the element in the noosphere: technophily, impact on the environment, place and importance in medicine, agriculture.

Analyzing the groups separated above, elements Perelman A.I. [4], Orlov D.S. [5] and one of them has the following form:

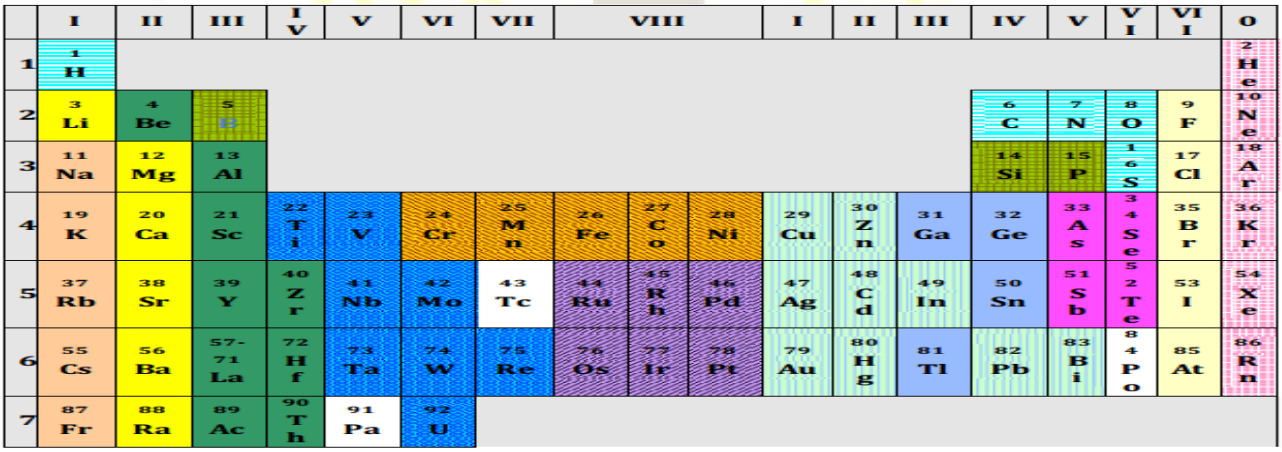

Figure 1. Classification of earth elements

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Orlov D.S. As for the classification [5], this classification was made directly for soils, based on the quantity and quality of the element in it, i.e. the soil, and divided into groups: 1. It consists of silicon and oxygen, which together make up 80-90% of the soil. Therefore, this group can also be called a group of silicon compounds. 2. Al, Fe, Ca, Mg, K, Na, C group, which can be from 0.1% to several per cent in the soil. 3. It is a group of Ti, Mn, N, P, S and H, which forms the transition group from microelements to macroelements. 4. A group of micro- and ultra-microelements, which include Ba, Sr, B, Rb, Cu, V, Cr, Ni, Co, Li, Mo, Cs, Se, etc., their amount in the soil is 10-3-10-1% is D.S. These classifications of Orlov are also not without flaws. For example: A.I. Perelman's classification was created for the earth's crust, but if we consider the soil as a geomembrane on the uppermost part of the earth's crust, some features of the classification can be used. In the classification of D.S. Orlov, there is no place for rare, rare elements, etc. Another classification that can be used in soil science belongs to A.I. Perelman, in which elements are divided into 2 large groups:

1. Air migrants.
2. Water migrants.

Air migrants, in turn, are divided into active and passive groups: inert gases are passive migrants; O, N, S, N, that is, elements that form chemical compounds in the biosphere, are active migrants. Water migrants, in turn, are divided into several groups:

1. Mobile and very mobile elements: Cl, Br, S, Ca, Na, Mg, Sr, Ra, F, B.
2. Weakly moving cations and anions: K, Ba, Rb, Li, Ra, F, B.
3. Mobile elements in reversible, clay environment: Fe, Mn, Co.
4. Inert in redox hydrogen sulphide environment, mobile and weakly mobile in clay, oxidizing environment: Zn, Cu, Ni, Rb, Cd.
5. Less mobile, in most natural cases Al, Ti, Cr, Bi, V and lanthanides.

Depending on the biophilicity of these elements, Perelman A.I. [6] made a special series of them. This series includes the highest biophilicity - S, high biophilicity - N, N, medium biophilic - O, Cl, S, R, B, Br, etc., low biophilicity - Fe, Al. If we consider according to the above classifications, the macro-microelements in the grassland soils belong to the group of rare elements (Ca, Mg, K, Na, S, R, Cl, Se, B, N, La, Sn, As, Cd, Au , Fe, Ba, Rb, Th, Ce, Cs, Ta, U, Eu, Hf, Sb, Ve, Lu, etc.) are placed in different groups of classification according to their clarki and concentration clarki, geochemical spectra, migration coefficients in water. So, in our research, different groups of migrating elements were identified in grassland soils and salt marshes [20-24].

The group of inert gases, the group of platinum and platinoids and the group of lithophile-chalcophile elements in A.I. Perelman's classification have not been determined, and more than two of the elements belonging to other groups have been confirmed in these soils. If we look at the microelement composition of irrigated grassland soils, Fe, Rb, Th, Ce, Cs, Ta, U, Eu, Tb, Hf, Sb, Yb, Lu, La, Sm, As, Sr is also found in these soils

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according to their taxonomic position. can be seen in different quantities. If we pay attention to biomacro and micronutrients, Ca, Mg, K, Na, Mn, Co, Mo, B, Cu, Zn, Cr have been determined in the irrigated meadow soils, and these are distributed according to the taxonomy of the soil in terms of quantity and composition [8].

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