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THE IMPORTANCE OF HEAVY METAL PRODUCTION IN THE SOIL DURING THE GROWTH OF WINTER GRAINS

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Abstract:
Soil microorganisms have mercury-resistant populations that convert metallic mercury into substances that are toxic to developed organisms. Some algae, fungi and bacteria can accumulate mercury in their cells. Heavy metals such as iron, copper, zinc, molybdenum are involved in biological processes and in certain amounts are trace elements necessary for the functioning of plants, animals and the human body.

Keywords: soil, microorganism, fungus, biological, cell, toxic, population, heavy metal, criterion, chemical element, oxidation-reduction, process, polutant

Heavy metals are chemical elements that have metallic properties and have a large atomic mass and density. There are about forty definitions of the term heavy metals, all of which are used. According to different definitions, the list of heavy metals includes different elements. When a criterion with an atomic mass greater than 50 is used, this list includes all metals, starting with vanadium, regardless of density.

Another criterion is the use of a density equal to the density of iron (8 g/cm^3), in which the list includes lead, mercury, copper, cadmium, cobalt, while the lighter tin is not included in the list. There are other classifications based on the density limit or other values of atomic mass [1-3].

One of the strongest and most common pollutants is contamination with heavy metals (pollutants include more than 40 chemical elements with an atomic mass greater than 50 in the D.I. Mendeleev periodic table). Man-made wastes in the form of aerosols that fall into the natural environment spread over long distances and lead to global pollution [4].

Another part falls into stagnant waters, where heavy metals accumulate and become secondary sources of pollution, i.e. dangerous sources of pollution as a result of physicochemical processes occurring in the environment itself (e.g. formation of phosgene toxic gas from non-toxic substances). Heavy metals accumulate mainly in the upper humus layer of the soil and are slowly lost as a result of alkalinization, assimilation by plants, and erosion [5].

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Heavy metals have the ability to undergo many chemical, physicochemical, and biological reactions. Many of them have variable valences and participate in oxidation-reduction processes. Heavy metals and their compounds, like other chemical compounds, can be dispersed and distributed in the living environment. Migration of heavy metal compounds occurs in the form of organic-mineral compounds. Organic compounds to which metals are bound are products of microbiological activity. Mercury has the ability to accumulate in the "food chain".

Soil microorganisms have mercury-resistant populations that convert metallic mercury into substances that are toxic to developed organisms. Some algae, fungi and bacteria can accumulate mercury in their cells. Heavy metals such as iron, copper, zinc, molybdenum are involved in biological processes and in certain amounts are trace elements necessary for the functioning of plants, animals and the human body. Toxic elements for living organisms, such as vanadium or cadmium, may be beneficial to some plants.

Soil also serves as a secondary source of water and air pollution. Heavy metals from the soil are assimilated by plants and then fall into the feed of advanced living organisms. The variability of pollutant components in the soil is very high compared to other parts of the biosphere, which changes the composition and properties of the soil and ultimately leads to an imbalance of ecological processes.

Under natural conditions, all the processes that take place in the soil are in equilibrium.Toxic elements are in any case absorbed by the leaves or accumulate on the surface of the leaves. Then when the leaves fall off, these compounds fall to the ground.

The amount of heavy metals in the soil is determined primarily in areas where environmental damage has occurred, agricultural lands close to sources of soil contamination with heavy metals, and areas intended for the cultivation of environmentally friendly products.

Studies have shown the amount of heavy metals, phenols and flavonoids in herbaceous plants. Fe, Mn, and Cu were found to accumulate more than heavy metals. It was found that the content of Fe is higher in the territory of metallurgical plants than in other regions and heavy metals.

In plant samples, Pb and Cd levels were 1.5 and 0.4 mg / kg, respectively. The antioxidant system of plants (relative to phenols and flavonoids) is high or low depending on their resistance to pollutants. In some cases, there is a correlation

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between heavy metals and phenols and flavonoids, which is based on the biological stress of plants.

Our research was carried out on samples of wheat grains grown in Kasan, Karshi, Mirishkor, Kasbi, Mubarek, Dehkanabad districts of Kashkadarya region, which produce high yields of grain, to determine the content of toxic elements and their share in sanitary rules and norms.

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