SOIL POLLUTION WITH POLLUTANTS IN SH. RASHIDOV DISTRICT OF JIZZAKH REGION AND PREVENTION MEASURES

Iztleuov Gani Moldakulovich
South Kazakhstan State University named after M. Auezov

Nabiyeva Gulchehra Mirergashevna
National University of Uzbekistan named after Mirzo Ulugbek

Berdiyeva Dildora Shodiyarovna
Jizzakh Polytechnic Institute

Abstract

Sh. Rashidovsky district is one of the territories where the quality of agricultural land has decreased, the main land of the district is located near the city center, industrial enterprises pollute the soil with various pollutants, the natural balance is disturbed and the ecological environment is polluted.

When determining the field composition and assessing the composition of the soil of the Sh. Rashidovsky district during field studies conducted in July 2022, 9 samples of soil layers 0-30 cm, 30-50 cm and 50-70 cm were taken from the sample.

Analysis of soil contamination with heavy metals in the territory shows that a slight increase in the MAC for soils was observed for honey, zinc, chromium, nickel, cobalt and arsenic. The increase occurred mainly in the upper layer of 0-30 centimeters. The concentrations of all other heavy metals do not exceed the MPC, which confirms the conclusions drawn in the review section of the study on the low informative value of heavy metals in environmental monitoring.

Keywords: soil, chemical composition, quality indicators, heavy metals, mineralization, ions, fertile layer.

Introduction

Currently, the problem of soil pollution with heavy metals relevant in the technogenic and agricultural sectors. Heavy metals are one of the main environmental pollutants. Many substances in this group, such as lead, copper, zinc, cadmium, can cause immunological, oncological and other diseases even in very small quantities. Research by scientists from different countries have shown that about 70% of heavy metals enter the body person with food [1-3].

In 2018-2022, developed a set of indicators on the main properties of gypsum soils and seasonal dynamics of biological activity, degradation indicators on the topic "Gypsum soils of the Jizzakh desert and their biological activists" in the Jizzakh region Makhkamova D. Yu. Researcher, Faculty of Biology, National University of Uzbekistan [5]. Researcher Rakhmatov Z.U. conducted research on the topic «Development and implementation of methods, aimed at preserving and increasing the fertility of irrigated soils Jizzakh desert, prevention and control of salinity and improvement all soil properties». The study did not examine these researchers soil contamination of the Jizzakh region with heavy metals [1-5].

From the literary analysis of research works, I revealed following:

The above studies did not examine pollution levels soils of the Jizzakh region with heavy metals and its causes. In the future, it is necessary to develop scientific and practical recommendations for reducing soil pollution in Jizzakh region heavy metals, which is important for the region.

The purpose of this work is to study changes in the composition of heavy metals in the soil of Sh. Rashidov district of Jizzakh region and the importance of their impact.

The main lands of the Sh. Rashidovsky district are located around the city of Jizzakh and in the northeastern part, which is administrative center of Jizzakh region. total area irrigated land in the area is 34,690 hectares, of which: non-saline lands - 8935 hectares (25.8%), saline lands - 25755 hectares (74.2%). Object For the study, light gray soils of the Sh. Rashidovsky district were selected.

Today Sh. Rashidovsky district is one of the territories where the quality of agricultural land has decreased, the main lands of the region are located near the city center, industrial enterprises pollute the soil with various pollutants, disrupting the natural balance and pollute the ecological environment.

Soils of Sh. Rashidovsky district - light gray, average content humus in saline soils is 1-1.5%, in saline soils - 1%, which are considered the most fertile soils in the region. Total the porosity of greygrass soils varies across a range of genetic stages soils (42-56%) depending on the frequency of irrigation.

Soil contamination with heavy metals is associated with their widespread use in industrial production. Due to imperfection purification systems, heavy metals enter the environment, including including into the soil, polluting and poisoning it.

Soil is the main environment in which heavy metals. Heavy metals fall to the ground as if through atmospheric air and through water. It is a secondary source of ocean pollution Earth, surface atmosphere. Heavy metals can be assimilated through the soil and into food [6].

Based on monitoring results, 9 elements were found in the soil Periodic tables. Including: Cu, Zn, Cr, Mn, Ni, Co, As, Cd, Pb.

The largest suppliers of metal-containing waste are enterprises for the smelting of non-ferrous metals (aluminum, aluminum oxide, copper-zinc, lead, nickel, titanium-magnesium, mercury and others.), as well as enterprises for processing non-ferrous metals (radio engineering), electrical engineering, instrumentation, galvanic sky and other).

Since the contours of the Sh. Rashidovsky district represent certain points that do not change, they were designated as sampling points. This is shown in the area of irrigated land in Sh. Rashidovsky district (Figure 1). Field sampling was held in the month of July 2022.

When determining field composition and assessing soil composition Sh. Rashidovsky district during field research conducted in July 2022, 9 samples of soil layers 0-10, 10-20, 20-30, 30-40, 40-50, 50-60 and 50-70 cm samples were taken for 10 grams cup. The hydrogen index of soil composition pH was determined in field conditions.

To analyze soil samples, atomic absorption, gas chromatographic, photometric, photocolorimetric, gravimetric, spectrophotometric, titrimetric and others physicochemical methods [5-6].

Mineralization was determined by gravimetric method. Method detection is based on gravimetric determination of dissolved substances and is determined by filtering the sample to a constant weight at low temperature (105-110 °C) for water with low content minerals (105-110 °C) and at 150 °C, evaporation and drying remainder [7-8].

Methods for analysis of heavy metals. Heavy metals detected photometric and photocolorimetric methods. For example, on based on the reaction of the formation of a yellow alkali complex compound in medium of ferric iron, the formation of colored complex compound in the presence of copper xylenol.

Based on the results of field and laboratory studies and observations, the sources and level of soil pollution in Sh. Rashidovsky district.

Based on the analysis, the quality indicators of soils were studied Sh. Rashidovsky district, soil contamination with heavy metals.

During the survey, soil contamination with heavy metals analyzed the concentration of heavy metals in the soil in layers (0-10, 10-20, 20-30, 30-40, 40-50, 50-60, 60-70 cm) agricultural land.

A significant role in the formation of soil anthropogenic background play ways that heavy metals enter the soil from the atmosphere. For We conducted statistical studies to assess the impact of vehicle emissions on soil pollution with heavy metals. Studying

content of heavy metals in soil samples of the territory, adjacent to the highway, showed that most of it was within and exceeding the permissible concentrations.

Analysis of soil contamination with heavy metals at the study site in the Sh. Rashidovsky district shows that the most pollutants were found in soil samples. Analysis of soil contamination with heavy metals in the territory shows that a slight increase in the maximum permissible concentration for soils was observed for honey, zinc, chromium, manganese, nickel, cobalt, arsenic, cadmium, and lead. The excess occurred mainly in the upper layer of 0-30 centimeters. The concentrations of all other heavy metals do not exceed the MPC, which confirms the conclusions made in the review section of the study about the low information content of heavy metals in environmental monitoring.

Currently, in world practice for environmental refining of fertile soils is increasingly used mineral aluminosilicate adsorbents: various clays, zeolites, zeolite-containing rocks, etc., which are characterized by high absorption capacity, resistance to influences environment and can serve as excellent carriers for fastening to the surface of various compounds during their modification.

To reduce the negative impact of heavy metals on light-gray lands of the Sh. Rashidovsky district it is necessary:

- application of mineral fertilizers (for example phosphate, reduces toxic action of lead, copper, zinc, cadmium);

- growing crops that are resistant to pollution. Improving their reclamation status, soil fertility and increasing crop productivity is recommended application of composts prepared from bird droppings, phosphogypsum and glauconite. Identify the optimal components for preparation of ameliorants and organomineral composts, determine their absorption capacity in relation to heavy metals and their influence on chemical, physico-chemical, physical and agrochemical properties of ordinary terraced irrigated soil in laboratory and field experiments.

REFERENCES
1. Александрова Л.Н. Органическое вещество почвы и процессы его трансформации. Л.: Наука, Ленингр. отделение, 1980. - 285 с.
2. А.И. Везенцев, М.А. Трубицын, Л.Ф. Голдовская-Перистая, Н.А. Воловичева Сорбционная очистка почв от тяжелых металлов. Научные ведомости №3 (43) 2008 Белгородский государственный университет.
3. Павличенко Л.М. и другие. Содержание тяжелых металлов в почве «Мангистауской области». Международный журнал прикладных и

фундаментальных исследований. Выпуск журнала № 2 (часть 1) за 2016 год, стр. 53-58.

4. Газилова Л.Р., Янткрин С.И., Ягафарова Г.А. Тяжелые металлы в почвах на территории бывших отработанных рудников. Вестник ОГУ №6 (100) июнь 2009, стр 552-553.

5. Dildora Sh. Berdieva Soil contamination with heavy metals in the Sh. Rashidovsky district of Jizzakh region and methods of their decrease from the soil composition. https://www.e3s-conferences.org/articles/e3sconf/abs/2021/41/e3sconf_apeem2021_03007/e3sconf_apeem2021_03007.html

6. Sh. D. "Berdiyeva "Soil pollution with heavy metals in the Rashidov district of the Jizzakh region and methods for its reduction" Actual problems of ecology and nature management, collection of scientific papers of the XXII International Scientific and Practical Conference: in 3 volumes.

7. Д. Ш. Бердиева, Г. М. Набиев и С. Рахматова. (2023). Предотвращение и защита эрозии почв. *Британский журнал глобальной экологии и устойчивого развития* , *14* , 26–31. https://www.journalzone.org/index.php/bjgesd/article/view/259

8. Д. Ш. Бердиева, Г. М. Набиева и С. Рахматова. (2023). Изменение тяжелых металлов в почве и снижение их концентрации. *European Scholar Journal* , *4* (3), 18-20. https://scholarzest.com/index.php/esj/article/view/3275.