WORLDLY KNOWLEDGE
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCHERS
ISSN : 3030-332X IMPACT FACTOR (Research bib) – 7,293

ANALYSIS OF SOIL SAMPLE COMPOSITION IN DEFOLIANTS AREA, MIRZAABAD DISTRICT, SIRDARYA PROVINCE

Jumaboeva Iroda Muratkasimovna
The main doctoral student of the Laboratory of Experimental Biology of Gulistan State University,
e-mail: irodajumaboyeva88@gmail.com.

Abstract: In the article, the amount of toxic organic heterocyclic compounds and heavy metals in the soil sample taken in the autumn season from the territory of Mirzaabad district of Sirdarya region and the problem of their negative impact on human health was considered in the laboratory of experimental biology. As a result of the analysis, the pH environment of the soil, the defoliant contained in 14.924 minutes 2-(1-phenyl-ethylamino)-2-thioxo-acetamide; Ethyl ether N-benzoylglycine (N-benzoylglycine ethyl ether) at 14.831 minutes; 5-phenyl-N-butyl- 5-phenyl-N-butyl at 14.066 min; penta-2,4-diene acid at 14.979 min; 1,3,5,7-cyclooctatetraene and heavy metals were analyzed at 8.445 minutes. Mobile forms of elements such as Cr, Hg, Cu, Pb are defined in the article.
Keywords: Syrdarya region, Mirzaabad region, pesticide, soil sample, defoliant, MSD detector, heterocyclic compounds, heavy metals.

Special attention is being paid to the development and improvement of the "hybrid" method of detecting heavy and toxic and carcinogenic metal ions in the environment in the development and improvement of production of the chemical industry in Uzbekistan.

Currently, research on changes in the ecological state and composition of the soil is expanding. Environmental degradation of the soil, as well as the agrochemical state of the soil, and the contamination of agricultural products are increasing. Pesticides and heavy metals in agriculture affect soil, water, air, flora and fauna and cause significant damage.

Decree No. PF-5303 of the President of the Republic of Uzbekistan dated December 16, 2018 "On measures to further ensure food security of our country", Decree No. PF-5853 of the President of the Republic of Uzbekistan dated October 23, 2019 "Uzbekistan "On approving the strategy of agricultural development of the Republic of Uzbekistan for 2020-2030" and the Decree of the President of the Republic of Uzbekistan dated June 17, 2019 No. PF-5742 "Effective use of land and water resources in agriculture" - serves in the implementation of the tasks specified in the decree, decisions and other normative-legal documents [1, 54-55 p].

In the conditions of rapid development of industrial energy and transport communications, extraction of minerals, active chemicalization of agriculture, the level of pollution of the natural environment and, first of all, soil and plants is increasing sharply. Recently, pesticides and heavy metals have been included among the most dangerous pollutants. The fact that their migration is too widespread in the components of the ecosystem depends on the whole complex and nature of natural factors [2, p. 125-130].

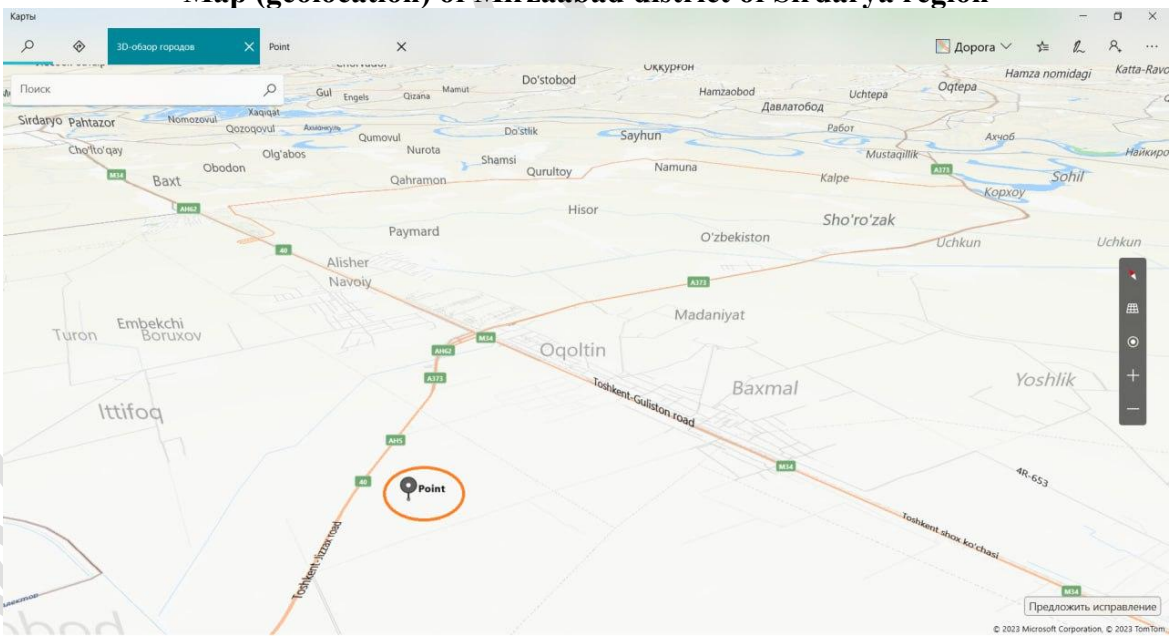
One of the main reasons for environmental contamination with heavy metals, including lead, is the large-scale use in industry. Heavy metals are one of the main sources of soil pollution. Soil pollution with heavy metals includes various metals, especially Cu, Ni, Cd, Zn, Cr and Pb. Heavy metals and pesticide residues also have a toxic effect on the soil. The absorption of heavy metals by plants and subsequent accumulation along the food chain is a great threat to human health. Heavy metal pollution poses a great threat to humans and other living organisms, as heavy metals often accumulate in large quantities in soil and plants. The most common motor fuel is gasoline. Tetraethyl lead is released from gasoline, which is a very toxic compound. The most harmful elements include mercury, lead, cadmium, zinc, arsenic [3, 729-732 p].

In the absence of pest control measures, crop losses can reach up to 13% of the crop. raw materials with high technological qualities play a very important role, defoliation of cotton before harvesting with the help of chemicals called defoliants plays an important role. A number of requirements are imposed on these preparations: they should be low in toxicity, low in consumption per hectare, highly effective,

WORLDLY KNOWLEDGE
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCHERS
ISSN : 3030-332X IMPACT FACTOR (Research bib) – 7,293

ensure more than 80% of cotton leaves fall, "soft" supply to plants. to secrete, so it should not have a negative effect on them, that is, it does not reduce the yield of raw cotton and its quality. [3, 5-6 p].
Defoliants disrupt various aspects of plant metabolism. In particular, drugs such as butifos and butylcaptax inhibit the Hill reaction, cyclic and non-cyclic photophosphorylation, disrupt carbohydrate metabolism in plants, and inhibit oxidative phosphorylation. Undoubtedly, such significant changes in the metabolism of plant cells, as well as changes in the phytohormonal balance, lead to a decrease in new, auxin transport, ethylene accumulation, and eventually leaf fall [4, p. 179]. Cotton defoliation is an agricultural technique of preparing cotton for timely harvesting of cotton. [p. 5.40]. Among the available assortments of defoliants of inorganic origin, the most convenient in terms of production and use are preparations containing chlorate (sodium, calcium and magnesium chlorates). In this regard, it is of particular interest to improve and expand the assortment of chlorinated defoliants with added triazole, among which is 4-amino-1,2,4-triazole, which is an active ingredient in a number of nitrifications. inhibitors, defoliants and plant growth regulators are of particular interest [6, 16-p].
A single injection of defoliant causes structural, hemodynamic disturbances and degenerative changes in the cortical and medulla cells of the organ. The relative weight of the adrenal glands was significantly increased compared to the control. There is an expansion of the adrenal cortex and the relative width of its zones. Compared to the control, the size of the nuclei of cortical and chromaffin cells was significantly increased. After a single injection of the pesticide, there is a decrease in the synthetic processes of the secretory cycle in the cells of the cortical substance zones, and a decrease in the amount of lipids and ascorbic acid indicates an increase in the hormone release phase. [7, p. 18]. N - Benzoylglycine (1a) (5.58 mmol, 1.00 g) was dissolved in anhydrous toluene (16 mL), DMFDMA (22.3 mmol, 2.97 mL) was added, and the reaction mixture was heated at 900 for 30 min. Volatile components were evaporated in vacuo and the residue was crystallized from a mixture of ethanol and water [8, 21-p].

Map (geolocation) of Mirzaabad district of Sirdarya region



Research object and methods

A soil sample was brought from the area where defoliants were stored in Mirzaabad district of Sirdarya region. The Chromatek Kristal 9000 NP (Russia) mass spectrometric detector device in the chemical analysis department of the Laboratory of Experimental Biology was selected for the research. Components were identified using the Wiley8 – Mass Spectral Library and NIST-17.1 integrated mass

spectral libraries. Processing of the obtained data was carried out with the help of "GCMSsolution" and "LabSolutions Insight" software.

Soil samples were collected with a stainless steel shovel at a depth of 15-50 cm from the surface layer and by envelope method. The soil sample was ground and weighed on an analytical balance (XYSCALE, FA2204N) from 300 g. The measured soil sample (Haver blocker 59302 OELDE (Germany)) was passed through a 200 µm sieve. We extracted the sieved soil sample in 100 ml of acetone, the extraction process was mixed in an ultrasonic mixer (GT SONIC Professional ultrasonic cleaner, China) for 30 minutes.

The extraction was re-extracted by adding 400 ml (chemreactivesnab (XRS) S6 N14, chda, batch 4-160153) of hexane and mixed in an ultrasonic mixer for another 30 minutes. Then 100 ml of bidistilled water was added. The hexane part was separated from the extract and evaporated in a rotary evaporator, and the remaining residue was heated with 5 g of anhydrous sodium sulfate (Na2SO4) salt in 20 ml. It was left for a day and filtered. 1 ml of the filtered part was placed in the auto-sampling part, i.e. vial, and analyzed. The resulting substances were compared to the NIST software library on the MSD detector, and the following substances were identified.

2-(1-phenyl-ethylamino)-2-thioxo-acetamide at 14.924 min; Ethyl ether N-benzoylglycine (N-benzoylglycine ethyl ether) at 14.831 minutes; 5-phenyl-N-butyl- 5-phenyl-N-butyl at 14.066 min; penta-2,4-diene acid at 14.979 min; Substances such as 1,3,5,7-cyclooctatetraene were detected at 8.445 min.

Table 1. The state of the mass spectra of the MSD detector

Temperature vaporizer	280 °C
Thermostat temperature program	100 °C/1 min, 160 °C/20 min, 240 °C/8 min, 280 °C/15min.
Temperature ion temperature	230 °C
Interface temperature	280 °C
Velocity of the carrier gas through the column	1.35 sm3/min
Coefficient division ratio	1 : 5
Energy ionization	70 eV;
Pressure detector	7 min
Total analysis time	56 min

Figure 1. MSD soil analysis chromatogram

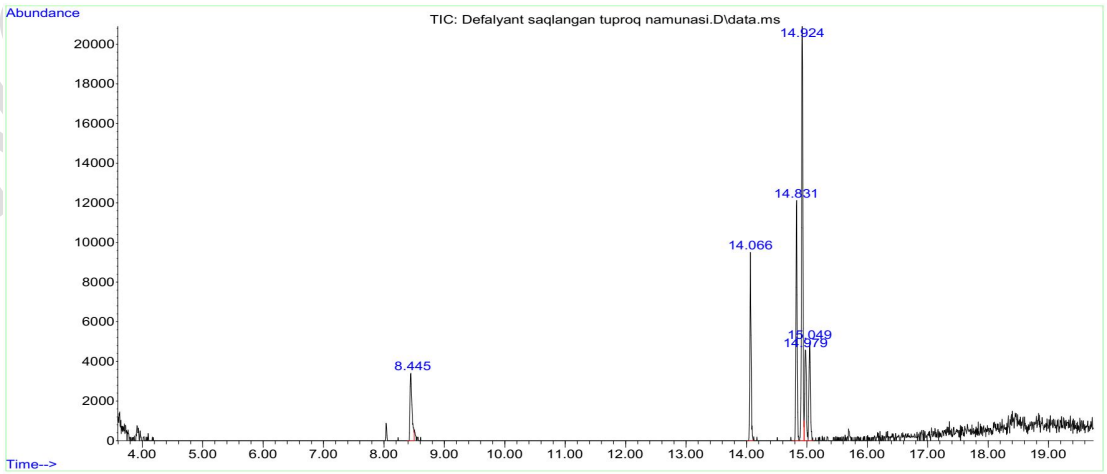
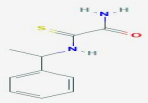
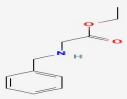
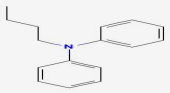
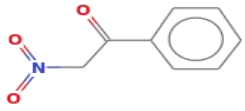
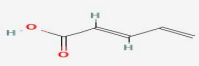


Figure 2. The name and time of the formed substances in the chromatogram

Pk#	RT	Area%	Library/ID	Ref#	CAS#	Qual
1	8.445	8.83	D:\MassHunter\Library\NIST17.L 1,3,5,7-Cyclooctatetraene	5416	000629-20-9	72
2	14.066	14.61	D:\MassHunter\Library\NIST17.L Valeramide, 5-phenyl-N-butyl-	104912	1000420-50-4	40
3	14.831	19.16	D:\MassHunter\Library\NIST17.L N-Benzoylglycine ethyl ester	77668	001499-53-2	35
4	14.924	37.33	D:\MassHunter\Library\NIST17.L 2-(1-Phenyl-ethylamino)-2-thioxo-acetamide	78332	1000275-68-0	25
5	14.979	10.04	D:\MassHunter\Library\NIST17.L Penta-2,4-dienoic acid, 5-(2-furyl)-3-methyl-	49608	100340-71-4	17
6	15.049	10.03	D:\MassHunter\Library\NIST17.L .alpha.-Nitroacetophenone	38903	000614-21-1	10

Table 2. Chemical properties of the substance that appeared in the chromatogram as a result of the analysis of the soil analysis

Analysis of soil analysis				
Output time is in minutes	The name of the substance	Chemical formula	Molecular weight	Chemical structure
14, 924 min	2-(1- phenyl-ethylamino)-2-thioxo-acetamide	$C_{10}H_{12}N_2OS$	208,28	
14, 831 min	N-Benzoylglycine ethyl ester	$S_{11}H_{15}NO_2$	193,24	
14,066 min	5-phenyl-N-butyl-	$C_{11}H_{19}N$	225.33	
15,049 min	alpha.-Nitroacetophenone	$C_8H_7NO_3$	165.1461	
14,979 min	Penta-2,4-dienoic acid, 5-(2-furyl)-3-methyl-	$C_{11}H_{15}NO_2$	193,24	
8,445 min	1,3,5,7-Cyclooctatetraene	C_8H_8	104.1491	

WORLDLY KNOWLEDGE
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCHERS
ISSN : 3030-332X IMPACT FACTOR (Research bib) – 7,293

Ndetermination of macro and microelements in aminos by AVIO 200 (ISP - OES) optical emission spectrometric method

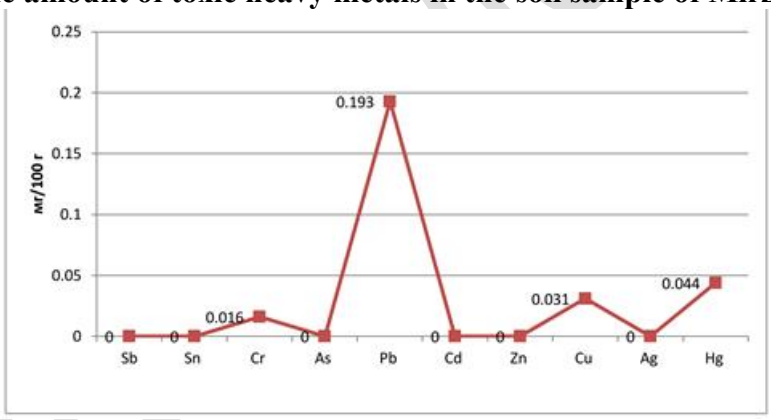
It was ground from a soil sample brought from Mirzaabad district of Syrdarya region, weighed out on a 10 g scale and prepared with distilled water. The soil solution environment was tested on a PHS-3E (Ph Meter) and was found to be pHq6.39 on a pH meter.

In order to dry the moisture contained in the sample for analysis, it was first dried in a drying cabinet (VWR DRY-line, Germany) until its mass did not change. 200 mg of the completely dried sample is taken on an analytical balance (FA220 4N) for mineralization, i.e. to turn it into a clear solution. A mineralization device (MILESTONE Ethos Easy, Italy) was used to mineralize the sample. For this, a sample (200 mg) is placed in a test tube of the device, 6 ml of nitric acid (HNO3) purified on the basis of distillation, i.e. acid distilled on an infrared acid purification device (Distillacid BSB-939-IR) and 2 ml of hydrogen peroxide (H2O2) as an oxidizer. is placed. During 20 min, at 1800C, the whole mixture is mineralized.

After the mineralization process is completed, the mixture in the test tube is diluted with distilled water (BIOSAN, Latvia) to 25 ml in a separate conical volumetric flask.

The solution in the flask is placed in special test tubes in the Autosampling Department for analysis. The prepared sample was analyzed in an Avio200 ISP-OES inductively coupled plasma optical emission spectrometer (Perkin Elmer, USA). The accuracy level of the device is high, it allows to measure the elements contained in the solution up to 10-9 g accuracy.

Diagram of the amount of toxic heavy metals in the soil sample of Mirzaobad district



heavy metals

Summary:2-(1-phenyl-ethylamino)-2-thioxo-acetamide in 14.924 minutes in Mirzaabad district soil of Sirdarya region; Ethyl ether N-benzoylglycine (N-benzoylglycine ethyl ether) at 14.831 minutes; 5-phenyl-N-butyl- 5-phenyl-N-butyl at 14.066 min; penta-2,4-diene acid at 14.979 min; At 8,445 minutes, substances such as 1,3,5,7-cyclooctatetraene and heavy metals have the highest lead metal content, mercury and copper heavy metals are relatively low in lead metal content, and antimony and tin metals. was analyzed for the first time in the Laboratory of Experimental Biology.

References:

1. O‘zbekiston Respublikasi Davlat tabiatni muhofaza qilish qo‘mitasi. O‘zbekiston Respublikasida atrof-muhit holati va tabiiy manbalardan foydalanish to‘g‘risida Milliy ma’ruza (1988-2007 yillar bo‘yicha retrospektiv tahlil). T.: 2008. 54-55 b.

2. Н.В.Прохорова, Н.М. Матвеев “Тяжелые металлы в почва и растениях в условиях техногенеза” Вестник СамГУ.1996. Специалный выпуск.

3. Л.И.Даль. Эколого-геохимическая оценка почвенно-го покрова нефтегазовых районов // Современные научные исследования и инновации. 2015. № 11. (55). С. 729-732.

4. З.Х.Адилов, Д.А.Эргашев, Р.Р.Тожиев, Ш.Ш.Хамдамова. Получение хлорат содержащих дефолиантов, обладающих инсектицидными свойствами. Монография. Фергана-Винница «Европейская научная платформа" 2021. 5-6 ст.
5. К.Р.Очилов. Воздействие различных дефолиантов на энергетические протсессы митохондрий печени крыс ин витро. Биология ва тиббиёт муаммолари, 2017, №2 (94) 179.
6. Ф.Э.Умиров, Г.Р.Номозова, Ж.М.Шодикулов. Физико-химические свойства и агрохимическая эффективност новых дефолиантов на основе хлоратов натрия, магния и калсия, содержащих пав. Универсум. 2021. № 1.
7. Ф.Е.Умиров, Ф.И.,Худойбердиев, С.Т.,Тухтаев, С.Д.Муродова Получение дефолиантов на основе 4-амино-1.2.4- триазола с хлоратами натрия и магния. Вестник наука и образавания №3 (39).2018. 16 ст. Ф.Е.Худойбердиев, Ф.И.Тухтаев.
8. Stanovnik, B.; Svete, J.; Tišler, M.; Žorž, L.; Hvala, A.; Simoniˇc, I. Transformation of Amines and N-Heteroarylformamidines into Esters of Substituted β-Amino-α,β-dehydro-α-amino Acids. Heterocycles 1988, 27, 903-909. [CrossRef] m II).
9. Design, Synthesis and Biological evaluation of Novel Thienylpylpyridyl-and Thieoether-Containing Acetamides and Their Derivatives as Pesticidal Agents. Huan Li, Na Yang, Lixia Xiong, Baolie Wang. Molecules 2021, 26(18) 5649, (21-34) p.