European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 07, Issue 03,2020

Determination Of Residual Pesticide In The Liver Of Rats Poisoned With Indoxacarb Pesticide

Parpieva Mashkhura[1] , Mirkhamidova Parida[2], Tuychieva Dilfuza [3]

[1]*Researcher of the Department of Zoology and Biochemistry, Andijan State University*
[2]*Professor of Botany, Tashkent State Pedagogical University*
[3]*Associate Professor of Zoology and Biochemistry, Andijan State University*
e-mail: [1]Parpiyeva87@bk.ru

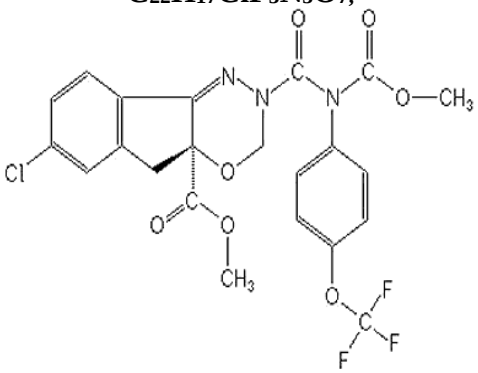
ABSTEACT:
An aqueous solution of indoxacarb pesticide was sent to rats by the Peroz method at a dose of 1/10 LD50 once via zond and the amount of residual pesticides in the rat was determined at 5, 10, 20, 30, 40 days after poisoning. For the analysis of residual pesticide quantities, the HPLC MS (6420) Tripl Quad LC/MS (Agilent Ttchnologies, USA) device was used. As a method of ionization, APCI(Atmospheric pressure chemical ionization) method was used.
Key words: Indoxacarb, decapitation, liver, cumulation, residual pesticide, chromatography method, per os.

1. INTRODUCTION

It is known that pesticides used in agriculture have a detrimental effect on the environment. Pesticides exhibit high biological activity, affecting human and animal organs and causing significant indirect changes [10]. The metabolism of many xenobiotics takes place in liver cells. This is because the liver is highly sensitive to toxic effects due to its central role in the metabolism and portal localization of xenobiotics [1,9,11]. Residual pesticides in the liver cause a number of functional changes, namely, peroxidation of lipids and changes in enzyme activity have been identified [2,3,4].
The purpose of wrapping the cumulative properties of indoxacarb pesticide is to determine the effect of the accumulation of xenobiotics, the residual pesticide on the functional state of a number of organs.

Indoxacarb - suspension concentration-15% - is a synthetic drug, insecticide.

$C_{22}H_{17}ClF_3N_3O_7$,



Indoxacarb [Methyl (R, S) -7-chloro-2,3,4a, 5-tetrahydro-2- [methoxycarbonyl (4-trifluoromethoxyphenyl) carbamoyl] indeno [1,2-e] [1,3,4] oxadiazine -4a (3N) -carboxylate, a mixture of S: R-isomers in a ratio of 3: 1 or 1: 1, active S-isomer] - a chemical active substance of pesticides from the oxydiazine class, used in agriculture and personal subsidiary plots to combat harmful insects [7].

Indoxacarb is a tool used in agriculture and on private plots to control poisonous insects, blocking the sodium channels of insect nerve fibers, stopping feeding. Their coordination is disrupted, followed by paralysis and death. This insecticide is an organochlorine compound that belongs to a new chemical class, oxadiazines [6]. LD in 50-rats (mg / kg) is 5,000. It is less toxic to humans and warm-blooded animals and has a Class 3 toxicity level, but has a Class 1-2 toxicity level for beneficial insects [7].

In agriculture, cotton nightshade has a serious impact on productivity, is widespread in areas planted with peas, beans, and causes severe damage during the ripening of grains. Against these pests in the Republic in 2015-2018 was applied indox 15% s.k., avaunt (active substance - indoxacarb) 15% em.k 0.4-0.45 l / ha and gave high yields in agriculture. In addition to cottonseed meal, the drug indoxacarb is also used in the control of corn leaf blight, mulberry moth, apple cider vinegar and other rodent pests [5,6].

The research was conducted in the laboratory "Physical and chemical testing of substances" of the Institute of Bioorganic Chemistry of the Russian Federation. In the experiment, 21 males, no offspring, 200 ± 2.0 g. body weight white laboratory rats were used. All examinations were performed on healthy, sexually matured rats that had passed the quarantine period of at least 10–14 days. The experiments were carried out according to the following scheme: 3 rats were obtained in each group, the 1st group was the control group, the 2nd group was poisoned with Indoxacarb on the 5th, 10th, 20th, 30th, 40th, 50th days. The drugs studied were administered peroxide to the rats' stomachs at a dose of LD501 / 10. All of the experimental animals were kept in the same usual feeding regimen, with unrestricted access to water and food. During the experiment, the general condition of the animals of the research and control groups was observed every hour on the first day in the laboratory conditions, the state of vibration that may occur. Over the next few days, the general condition, activity, behavior, respiratory rate and depth, changes in body weight, and other parameters of the animals in all groups were monitored daily in a laboratory setting.

No animal deaths were reported during the entire experiment.The following studies were performed to identify residual pesticides in the liver. For the experiment, rat liver contaminated with indoxacarb was isolated on days 5, 10, 20, 30, and 50 by decapitation. In the experiment, we performed the following work with samples from the livers of rats. Liver samples were taken and each sample was extracted in acetonitrile solution containing 0.01 M

NSOON in order to dissolve the pesticides in them. In order to increase the extraction yield, the samples were kept in an ultrasonic bath for 10 min.
As a standard, a 0.1 molar solution of acetonitrile was prepared from a sample of indoxacarb (Sinakem, China).
VEJX MS (6420 TripleQuadLC / MS (Agilent Technologies, USA) was used for quantitative analysis of pesticides in liver samples. APCI (Atmosphericpressurechemicalionization) was used as the ionization method.
The registration of mass spectra was performed at the expense of positive ionized ions. The mass spectrum parameters were selected as follows. Scanning range 50-2200 m / z,
The obtained results (SIM-Single ion monitoring) were calculated by comparing the surface area of the ion fragment [M + H] + = 529 for indoxa carb using the method. Gas consumption 4 l / min, gas temperature 300^0C, gas pressure in the sprayer 20 psi, evaporator temperature 300^0C, capillary voltage 4500 V, fragmentation voltage 30V.
A complete mass spectrometric analysis of each sample was performed.
VEJX MS (6420 TripleQuadLC / MS (AgilentTechnologies, USA) was used for quantitative analysis of pesticides in liver samples. APCI (Atmospheric pressure chemical ionization) was used as the ionization method.
The registration of mass spectra was performed at the expense of positive ionized ions. The mass spectrum parameters were selected as follows.
Scanning range is 50-2200 m / z.
The obtained results were calculated using the SIM-Single ion monitoring method by comparing the surface area of the ion fragment [M + H] + = 529 for indoxacarb to the standard.
Gas consumption 4 l / min, gas temperature 300^0C, gas pressure in the sprayer 20 psi, evaporator temperature 300^0C, capillary voltage 4500 V, fragmentation voltage 30V.
Complete mass spectrometric analysis of each sample was performed and quantitative analysis of pesticides was performed using the EIC-extracted ion chromatogram method.

Chromatographic analyzes of rat liver poisoned with indoxacarb extracted with acetonitrile using the APCI (Atmospheric pressure chemical ionization) method are presented in the following table (Table 1).

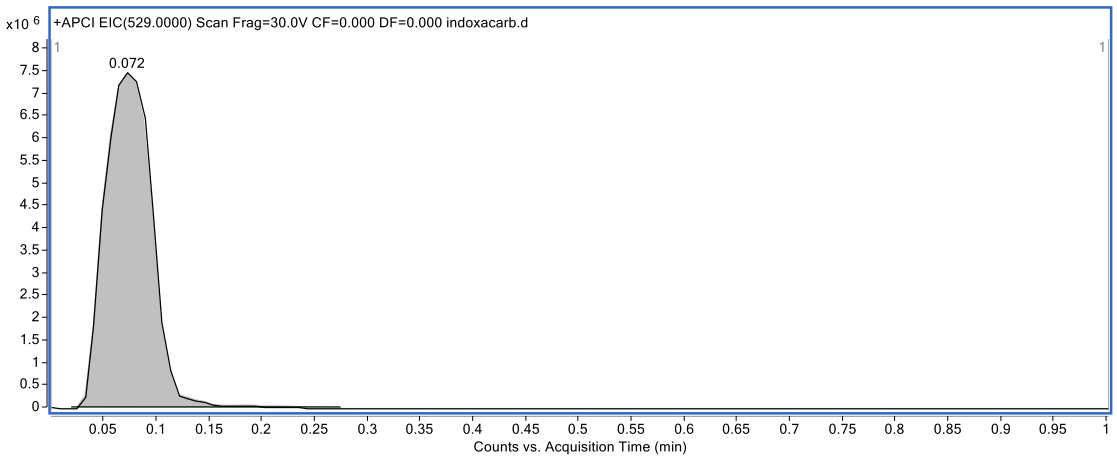
Table-1

Amount of residual pesticides in rat liver poisoned with indoxacarb

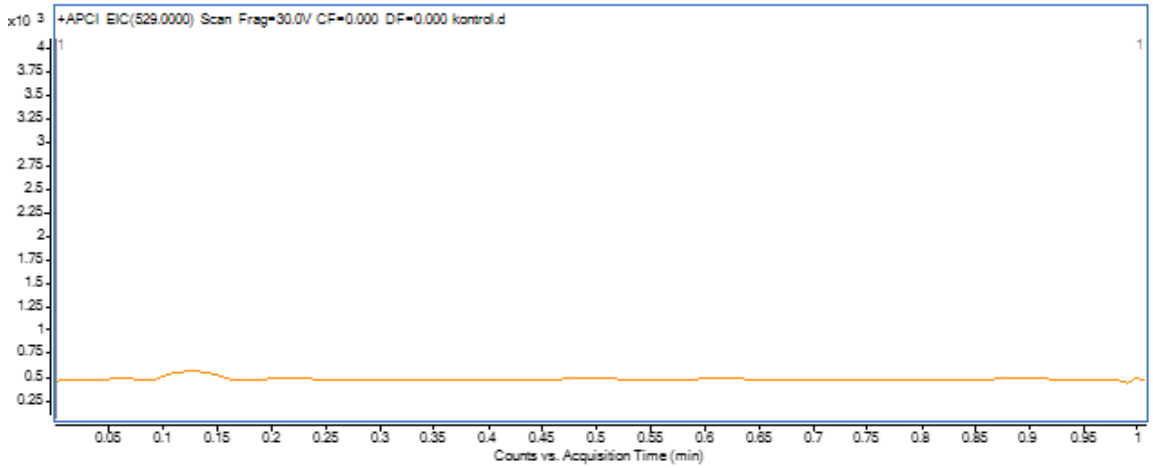
Time after poisoning, days	Residual amount of indoxacarb, 1 gram per sample	
	мкг	%
5	32,74	0,655
10	3,40	0,068
20	0,460	0,0092
30	0,1455	0,00291
40	-	-
50	-	-

The results showed that the highest concentration of residual pesticide was detected on day 5 after rat poisoning and was 32.74 mkg / g.

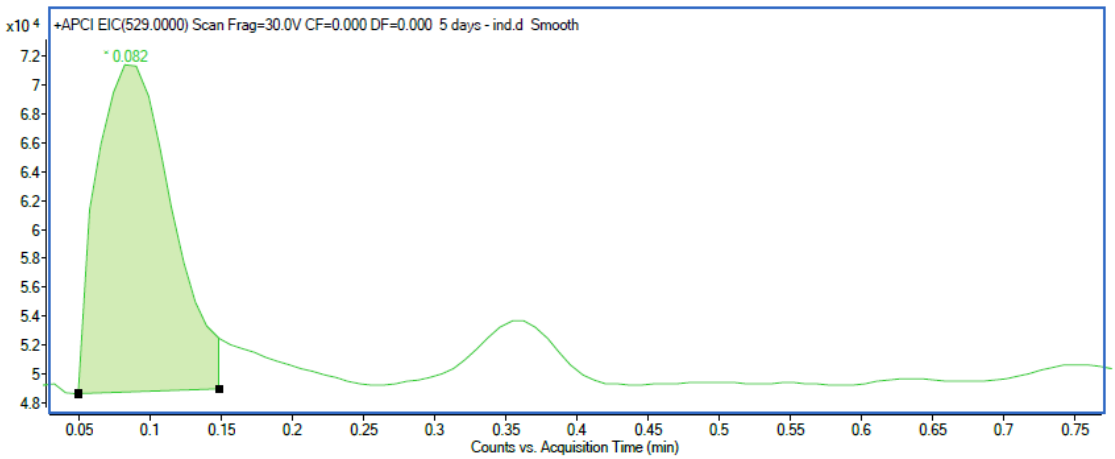
The following chromatograms show a standard indoxa carb.
Standard indoxa carb



Control

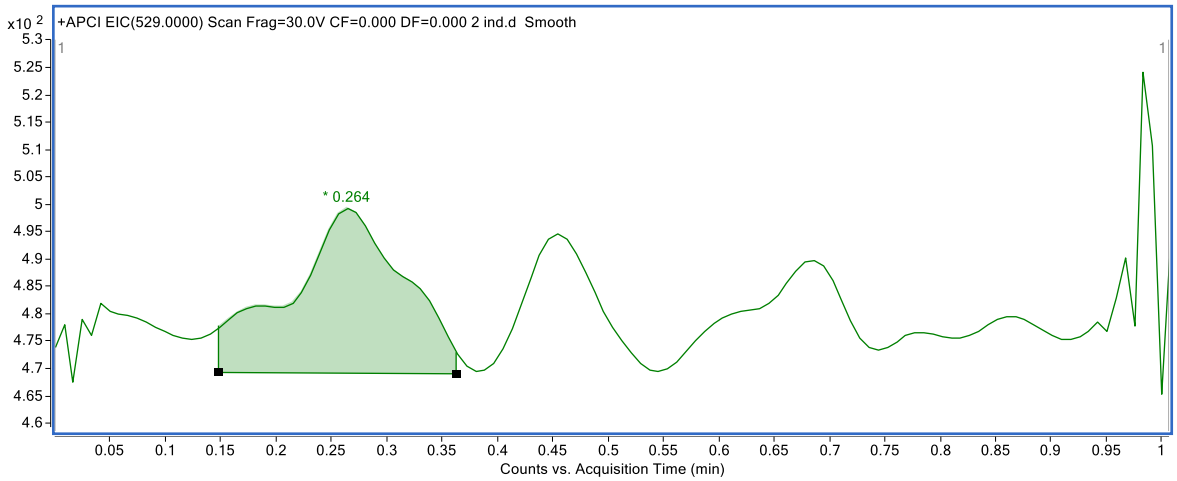


No indoxa carb was detected in the control groups

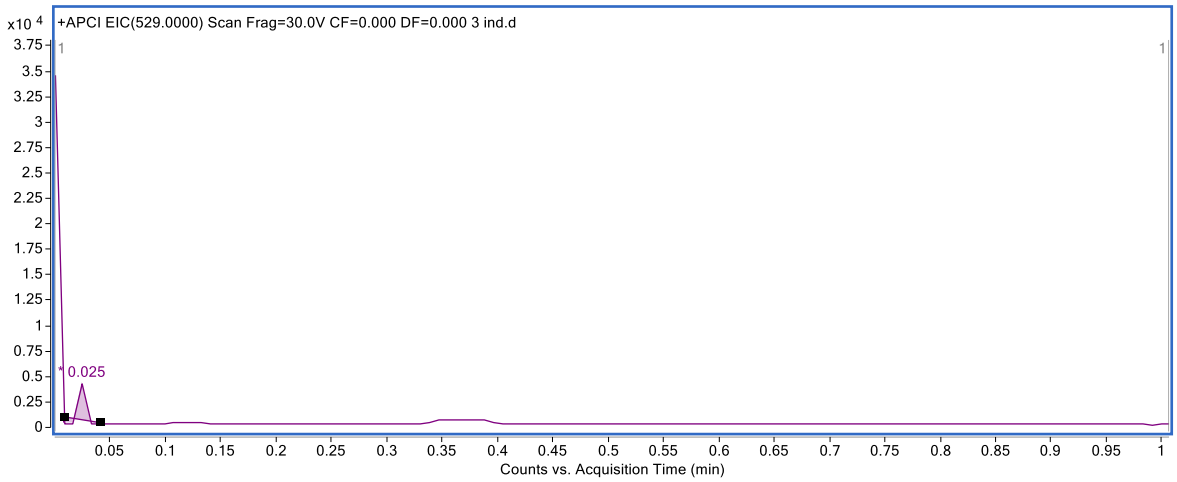


5 day sampleChromatograms on day 5 after intoxication showed a residual of 0.000033274mg i.e. 32.74mkg / g of indoxacarb per 1 gram of sample.Sample 1 for10days

Sample 2 for 10 days

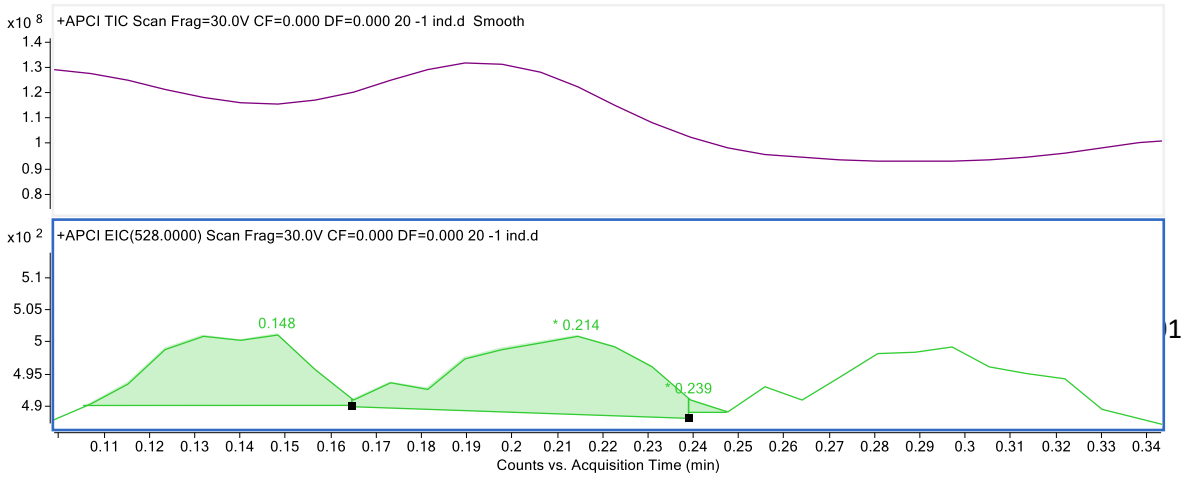


3 samples of 10 days



On the 10th day after intoxication, the residual pesticide averaged 3.40 mcg / gram compared to the 1 gram sample..

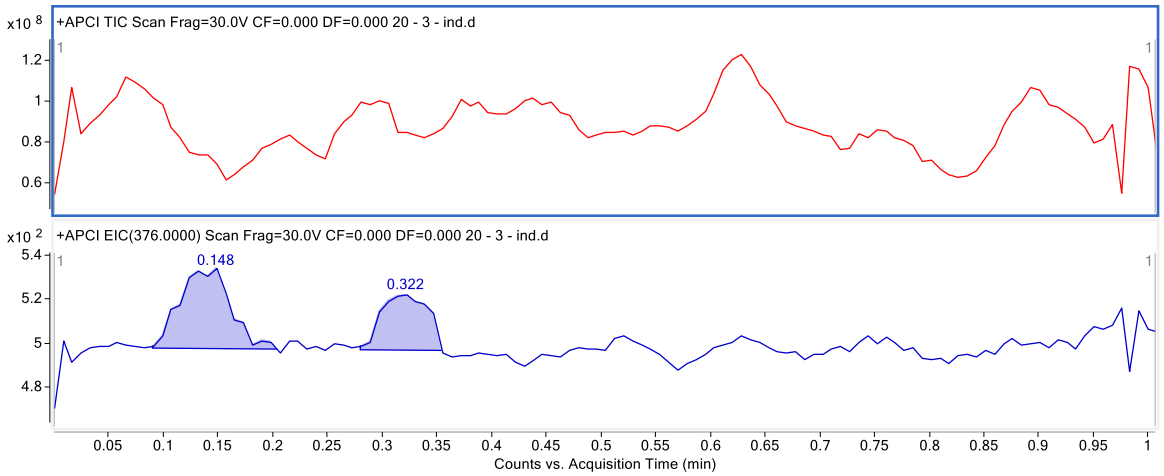
Sample 1 of 20 days



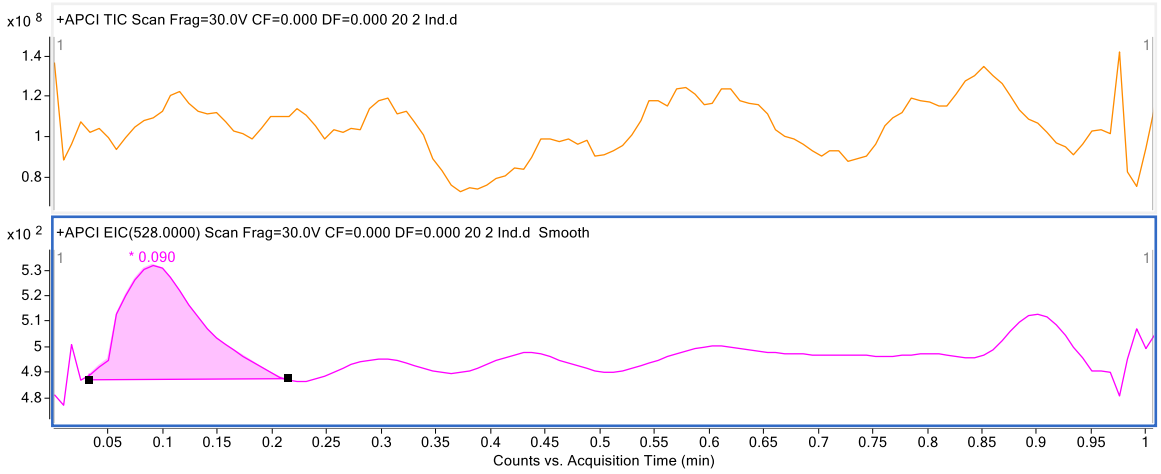
Sample 2 of 20 days

Sample 3 of 20 days

After 20 days of rat poisoning, we observed a decrease in the amount of residual

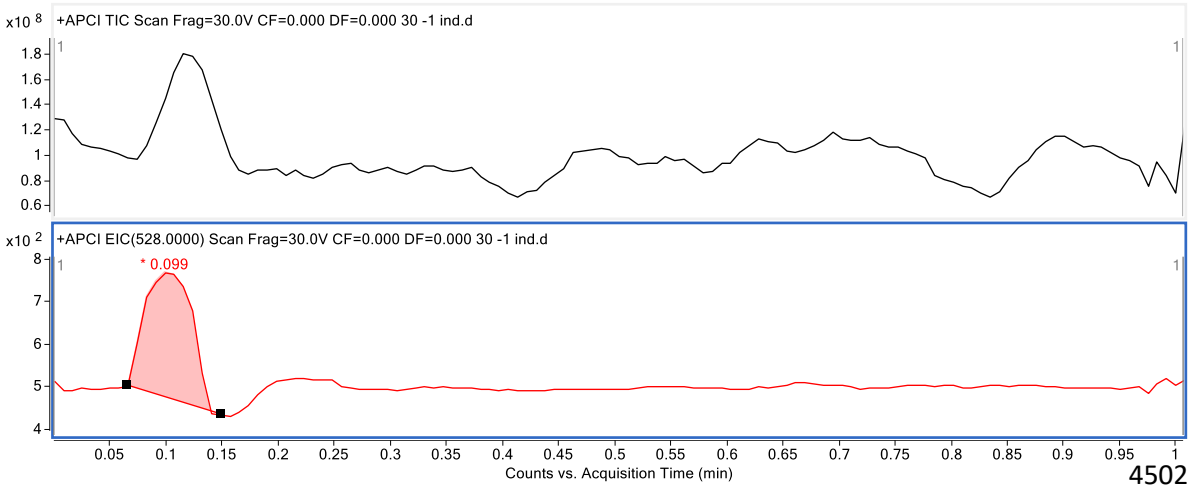


pesticides, the average amount of which was found to be 0.460 µg / g compared to 1 gram of

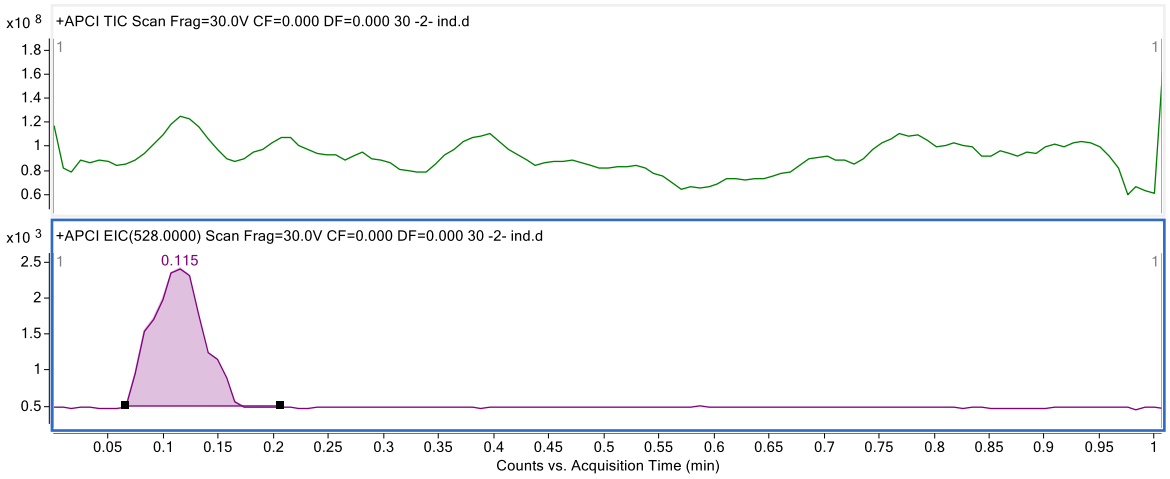


the sample.

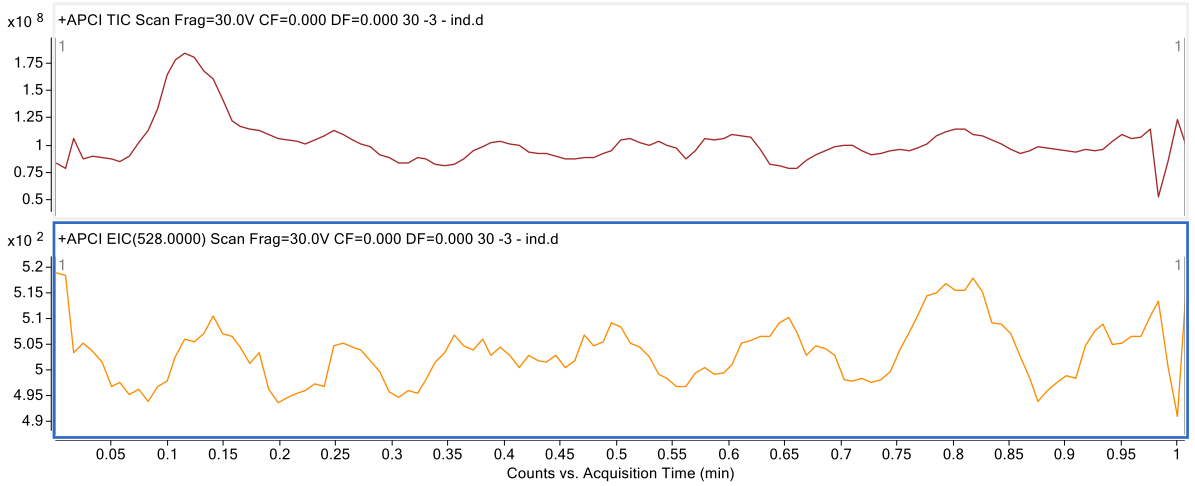
Sample 1 for 30 days



Sample 2 for 30 days

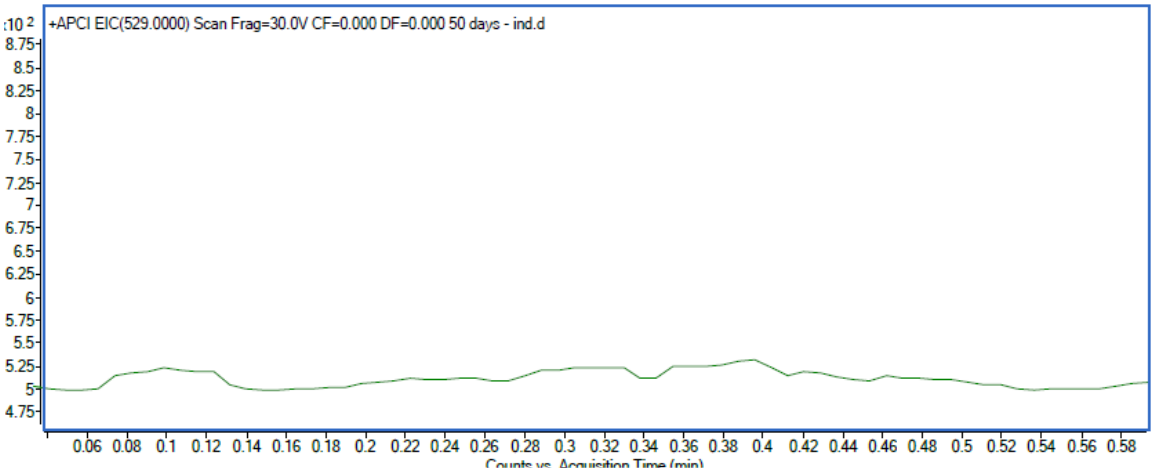


Sample 3 for 30 days

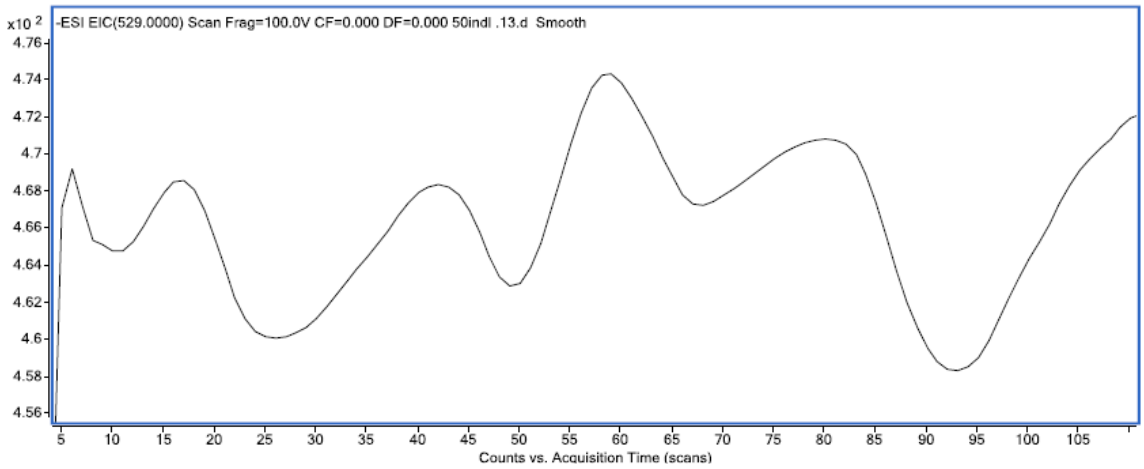


Studies have shown that on the 30th day of intoxication, the amount of residual pesticide decreased dramatically, averaging 0.145 mkg per 1 gram of sample.

40 day sample



50 day sample



No residual pesticide was detected in rat liver on days 40–50 of poisoning.
The results of the study showed that residual pesticide accumulated significantly on days 5 and 10 after rat liver poisoning. On the 20th and 30th days of intoxication, this figure decreased. No residual pesticide was detected on days 40, 50 of the study.

Pesticides pass rapidly into soil, water and air and accumulate in living organisms as residues [4,8]. They mainly accumulate in the body's adipose tissue. In the literature, residual pesticides have been shown to cause peroxidation of lipids and changes in the activity of a number of enzymes [1, 3].

Thus, residual pesticides cause changes in the structure and metabolism of tissues, disrupting the structure and function of the cell and its structural components

2. REFERENCES:

[1] Alimbabayeva N.T., Mirkhamidova P., Isabekova M.A., Zikiryaev A., S.S. Fayzullaev / The effect of residual amounts of karate on the activity of mitochondrial enzymes of hepatocytes. / Uzbekiston Biology journals. 2005 yil, no. 4, 15-bet.

[2] Tuychieva D., Mirkhamidova P., Parpieva M., Babakhanova D., Alimova R./ Effect Of Pesticides On The Content Of Cytochrome P-450 Of The Monooxygenase System And On The Ultrastructure Of Hepatocytes In Rat Embryos./ European Journal of Molecular & Clinical Medicine ISSN 2515-8260 Volume 07, Issue 03, 2020 / p. 2473.

[3] Tuychieva D., Mirkhamidova P., Babakhanova D., Parpieva M., Alimova R. Influence of pesticides on the activity of some enzymes of rat liver and ways of their correction/Norwegian Journal of development of the International Science. ISSN 3453-9875 .VOL.2., №45/2020. p.8.

[4] Mirkhamidova P., Tuychiyeva D., Parpiyeva M., Babakhanova D., Alimova R./Some Indicators of Blood of Rats Poisoned with Pesticide Karate/International Journal of Multicultural and multireligious understanding. ISSN:2364-5369. Volume 7, №7/2020. p.746-757.

[5] Xo'jaev Sh.T. "Modern methods and means of combined protection of plants from pests." Tashkent-2015. Pp. 517-518.

[6] Khojaev Sh., Isaev O., Yuldashev F. / Capacity of the account / Plant protection and quarantine. №2 / 2009 y.12-bet7. www. pesticidy.ru>active_substance>indoxacarb.

[7] P. N. Lepeshko, L. M. Bondarenko / Toxicological and hygienic assessment of new chemicals introduced into production / Teaching aid / Minsk BSMU 2017 / 30-31 pp.
[8] Kagan Yu. S., Pashyshina TN, Sasinovich LM Biochemical effects of the toxic action of synthetic pyrethroids. // Hygiene and sanitation
[9] M. Medicine. 1986. 1.from 7-9.
[10] Mirkhamidova P., Mirakhmedov A.K., Khamidov Zh.Kh. Influence of butifos
[11] on the structure and function of the liver of rat embryos // Uzbek. b iol. magazine
[12] 1981.5.S. 52-56.11. Kosta Grazyna,Palut Danuta, Kopec-Szlezak,Joanna // Toxicology.2000, -142.2.P.135-143.