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Learning The Effect of Basagran to The Paramagnitic Centres of Mammal's Blood

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Annotation: The article studies the effect of pesticides in mammalian blood on free radicals and paramagnetic centers. We studied the effect of basagran on mammals, as well as free radicals formed in living organisms as a result of the combined action of basagran and nitrites. For the first time, an increase in the number of free radicals in the blood under the influence of basagran was revealed, and the effect of nitrites on the change in paramagnetic centers in the blood was also studied.

Key words: pesticides, nitrate, blood, hemoglobin, nitrogen oxide, free radicals, paramagnetic centers, Electron paramagnetic resonance (EPR) spectrometer.

Introduction:

Pesticides are chemical agents that are widely used in the fight against various parasites, weeds, pests of grain and grain products, wood, cotton products, wool, leather, pet ectoparasites, as well as carriers of human and animal diseases. is used. Pesticides are also widely used in agriculture to control plant pests in fruits, vegetables and wheat.

Pesticides are often used in combination with mineral fertilizers. Due to the widespread use of fertilizers, there is a risk of excessive accumulation of nitrates and nitrites in soil, groundwater and plant foods. There is information in the literature about the toxic effects of nitrites on humans and animals [1-5]. The main toxic effect of nitrites is their activity in the formation of methemoglobin. As nitrites form methemoglobin in the blood, nitrites in the blood can be reduced to nitric oxide. Nitric oxide interacts with hemoglobin to form $R-va\ T-$ conformers of $Hb-NO$ complexes [6-8]. Carriers of pesticides and nitro compounds can cause serious toxic effects on humans and animals, and their mechanisms of action have not been studied in many cases. This paper examines the effects of bazagran on mammals, as well as the free radicals formed in living organisms as a result of the combined action of bazagran and nitrites.

Materials and research methods.

In the study of the effect of pesticides on the paramagnetic properties of mammalian blood, blood and hemoglobin from donor humans and Vistar rats were used as the object of study.

EPR spectra were recorded using high-frequency magnetic field modulation (100 kGs) and a computer-controlled 3-x cm Rubin radio spectrometer with a magnetic field.

The following pesticides are used in the experiments: bazagran zenkor, devrinol, tenoran.

The effects of pesticides have been studied in Vistar rats weighing 190-200 grams. The blood sample was placed in 0.6 ml Teflon cartridges and frozen in liquid nitrogen. The amplitude values of the EPR signals were correlated with the weight of the wet sample and averaged for samples from one group.

Hemoglobin was obtained by the method of Antonini and Brunori [9].

Results and discussion.

The effects of the pesticide on the blood of rats are studied when they are injected into the abdomen. In in vitro experiments, blood and hemoglobin were incubated at different concentrations with basagran. Previously, pesticides such as atrazine, zenkor, devrinol, and tenoran, which were injected into the abdomen, did not significantly affect the composition and amount of paramagnetic centers in the blood when rats were injected into the abdomen. However, administration of JID_{50} doses of dikvat, promethrin, hydrel, and catarrh

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into the abdomen resulted in a 2–6-fold increase in free radicals in the blood after 30–60min[10].

Experiments used bazagran pesticide. In vitro experiments showed a 5-10-fold increase in the amount of free radicals in the blood during the first minutes of blood interaction with basagran (1-3 minutes). In vitro experiments, the amount of free radicals in the blood decreases over time 5-10 minutes after the interaction of blood and basagrans, and returns to normal after 15-30 minutes.

Intravenous administration of basagran (LD50 = 110 mg / 100 g), as well as its in vitro incubation with blood (5-50 mg / ml), reveals a new paramagnetic center. The signal width for this center was determined to be 50–60 e and g = 2,285. Experiments were performed to study the effect of this substance on paramagnetic $Hb-NO$ complexes in order to understand the nature of the effect of bazagran on blood paramagnetic centers and to reveal the essence of the new signal. The EPR spectra of the $Hb-NO$ complexes are well studied [8]. It is known that the conformational changes of the $Hb-NO$ complexes in the interaction with several substances (2,3-diphosphoglycerate, ATF, IGF, sodium dodecyl sulfate sulfate) lead to a change in the shape of the EPR spectra. According to the literature, pesticides can interact with animal cell membrane proteins and lipids, as well as with plant cell proteins [11 - 13]. Therefore, $Hb-NO$ complexes can serve as an experimental model for studying the effect of basagran on blood protein components. In addition, as mentioned above, pesticides can enter the body of humans and animals against the background of nitrate-nitrite intoxication. Therefore, this form of intoxication may have its own characteristics.

I have not come across any data on the effects of pesticides on paramagnetic blood centers under nitrate-nitrite intoxication. In this regard, the $Hb-NO$ complexes formed during nitrate-nitrite intoxication can be not only an experimental model for studying the effects of pesticides on proteins, but also a research model for studying the binary (combined) effects of pesticides and nitro compounds. can serve as. The addition of bazagran to a hemoglobin solution containing $Hb-NO$ complexes (concentration 10–3 m) at a dose of 5–100 mg / ml was shown to alter the EPR signal of these complexes. As a result of the Bazagran effect, a decrease in the intensity of the EPR signal of $Hb-NO$ complexes was noted. In addition, in a number of cases, the appearance of a triplet signal specific to the T-conformers of $Hb-NO$ complexes has been observed. Such changes in the EPR spectra of $Hb-NO$ complexes have previously been observed in the acidification of the pH of the incubation medium, under the influence of substances that cause protein denaturation, and when various doses of $NaNO_2$ are administered intravenously [9]. Changes in basagran doses from 5 mg / ml to 100 mg / ml did not affect the value of hemoglobin pH in the incubation medium. Therefore, the change in the shape of the EPR spectra of the $Hb-NO$ complexes must be due to some other reason than the change in the environment pH the second reason for the change in the shape of the EPR spectra of the $Hb-NO$ complexes may be a change in the nitric oxide concentration. As previously shown [9], additional infusion of NO through a hemoglobin solution containing blood-pigmented NO complexes has been shown to lead to the formation of triplet STS in the EPR spectrum of $Hb-NO$ R-conformers. If basagran can exhibit electron donor properties relative to nitride ions, then the increase in the EPR signal of hemoglobin, sodium nitrite, and $Hb-NO$ complexes during basagran incubation may be due to decreased activation. Experiments on methemoglobin, sodium nitrite, and basagran incubation were performed to test the ability of basagran to participate in the return of nitride ions. NO with blood pigment in these experiments complexes were not observed. This suggests that bazagran cannot affect the EPR spectra of $Hb-NO$ complexes by activating the reduction of nitrite ions. As previously shown [9], protein denaturants can cause $R \rightarrow T$ transitions of $Hb-NO$ complexes with the formation of triplet STS in the EPR spectrum. Thus, it can be assumed that one of the reasons for the appearance of triplet STS under the influence of bazagran is the denaturating effect of bazagran. To compare the effect of basagran on hemoglobin (blood) with the effect of sodium dodecyl sulfate, experiments were performed to study the effect of sodium dodecyl sulfate. These experiments showed that sodium dodecyl sulfate was able to alter the EPR spectrum of hemoglobin, as observed under the action of bazagran. However, the EPR spectra of hemoglobin after exposure to sodium dodecyl sulfate were determined to some extent from the EPR spectra of blood pigment after exposure to basagran. Thus, it was not entirely clear whether the change in the EPR spectra of the $Hb-NO$ complexes was related to the denaturation effect of the bazagran. Therefore, we conducted experiments to study the effect of thermal protein denaturation on the EPR spectrum of hemoglobin. The results of this experiment show that there were changes in the blood under the influence of thermal denaturation, as well as after the effects of

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bazagran. Experiments have shown that the toxic effects of some pesticides, which are able to alter the paramagnetic properties of the blood, may be related to their denaturation effect on proteins.

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