



Evaluation of the Irritating Effect of the Insecticide Seller on the Skin and Mucous Membranes of the Eyes

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Abstract: Resume based on our experience, it was found that seller is a class III drug with a 20% toxicity. The drug has an irritating effect on the skin and eye mucosa. The daily dose 0,72mg/kg/day. Has no carcinogenic, mutagenic, embryotoxication. As a result of the research, the insecticide is determined by the amount of atmospheric air and jobs allowed, maximum permissible levels in food, and possible levels in food, and possible soil contamination.

Keywords: seller, pesticide, cumulation, insecticide, toxicological assessment, permissible daily dose, blepharospasm.

Relevance. The world's population itself is demanding a solution to the food problem on all continents. It must be ensured that the productivity of agricultural crops around the world is affected by pests, production and weeds, or that it is urgent to get rid of all the weeds. The solution to this problem today is the production of chemicals in agriculture. "to whom, from the economic point of view, the import of foreign goods, in any case, requires development," he said. For this reason, it is important to study the level of safety of such pesticides in the environment and in the human body. Targeted scientific research is being carried out on pesticide toxicological improvement and hygienic standardization of the environment objects. In this policy, the toxicity of Celler insecticide in experimental animals is associated with acute and one-time toxicity, the degree of accumulation in the body, long-term effects associated with carcinogenic, mutagenic, embryotoxic, gonadotoxic drugs, chemical structure and biological activity of the insecticide, insecticide biological activity. Particular attention is paid to the system, the growing season and the amount of wetting, the degree of soil fertility in hot climates, the movement in the soil layer and the degree of transition to the plant organism.

Seller insecticide was developed in Uzbekistan by Euro Team Uzbekistan-Germany. Commercial synonym of the drug is Seller active substance: alpha-cyano-3phenoxybenzene-3(2,2-dichlorovinyl)-2,2-dimethylcyclopropanecarboxylate, a mixture of 2 isomers.

Chemical class: synthetic pyrethroid.

Concentration, in g / l or g / kg: 200g / l (20%)

Preparation form: suspension concentrate.

Purpose: Seller insecticide is used in agriculture against pests of cereals.

Empirical formula: C₂₂H₁₉Cl₂N₃O₃

Molecular weight: 416.3

Aggregate state: A small crystalline powder with a faint chemical odor.

Water solubility: 0.005-0.01 mg / l at a temperature of 20°C

-WAYT 35.1 mg / l in alcohol, 2.4mg / l in hexylene, 14.4mg / l in diocithol, 51.5mg / l in cyclohexane, 1.44mg / l in methanol, 62mg / l in acetone

Melting point: 80.50s.

The drug has no volatility and explosive properties. Seller insecticide belongs to the class of synthetic pyrethroids and is used in agriculture against pests of cereals. It does not have mutagenic and phytosanitary effects on plants.

The pest effect is maintained for one season. To achieve the goal of this scientific study, 240 white non-breeding rats were conducted. The toxicity of Seller insecticide was studied in acute (one-month), acute subcutaneous (four-month), and chronic (12-month) experiments.

Toxicity of seller insecticide in mice and rats

The acute toxicity of alpha-supermethrin is due to the solvents that are sent with it into the stomach, like most pesticides. According to the World Health Organization in 1992, alpha-supermethrin had acute toxicity (LD₅₀) 35 (26-48) mg / kg when administered to rats' stomachs with 5% corn oil and 798 (514-912) mg / kg when administered with 40% dimethyl sulfoxide, 798 (564-1074) mg / kg when 50% aqueous suspension is delivered.

In rats (LD₅₀), 79 mg / kg was administered with a 50 per cent aqueous suspension, 40 to 80 mg / kg when administered with 10 per cent corn oil, and 368 mg / kg when administered with 20 per cent corn oil.

Seller insecticide was found to be less toxic when injected into the skin, and no mortality was reported in mice and rats within 24 hours when administered at a dose of 500 mg / kg in experimental animals.

Symptoms of acute poisoning in experimental animals include: salivation, gait disturbances, muscle contractions, tremors, and death after 2-3 hours, depending on the dose administered. As a result of acute poisoning, more liver, kidney, nervous system are injured. In two years of experience, chronic injuries of the gastrointestinal tract were observed.

Seller insecticide has low accumulation properties in the body, the pesticide has no oncogenic, terratogenic and embryotoxic properties.

In conclusion, it should be noted that the chemical structure of Seller insecticide includes chemicals that contain the methyl group. It has low toxicity. Environmentally unstable. Does not have long-term effects (oncogenic, terratogenic, mutagenic).

Methods for studying the acute toxicity of seller insecticide

The following tasks were set for the study of acute poisoning:

- Determine the average killing or concentration (LD₅₀, SL₅₀);
- Determination of maximum tolerable and absolutely lethal doses or concentrations (LD₁₀₀ and SL₁₀₀);
- Determination of the dose or concentration (Limac) of the powder (that is, causing a change in a very sensitive organ);
- Determine the sensitivity of experimental animals depending on their sex;
- To study the level of accumulation of pesticides in the body;

The amount of doses administered to experimental animals in acute poisoning was selected based on the chemical composition of the Seller insecticide.

It is known from the literature that if the fourth and sixth grids of synthetic pyrethroids have a methyl ring, they are almost insoluble in water and show low toxicity.

The acute toxicity of Seller insecticide was studied in white rats of both sexes weighing 150–200 g. All experiments were performed with environmental and biological safety [5].

In order to study the acute toxicity, an aqueous solution of Seller insecticide 50, 100, 250, 500 mg per 1 kg body weight was administered to both sexes of the rat through a metal probe under starvation conditions.

The amount of pesticide fluid administered to each rat's stomach was 3–4 ml. All calculations were performed at the expense of the active dose. Each dose (50, 100, 250, 500mg / kg) was tested in 10 units (4 experiments and 1 control group in a total of 40 rats) to determine the average lethal dose of Seller insecticide (LD₅₀).

Acute experiments focused on the appearance of animals, their response to the external environment, their reaction to external stimuli, the condition of the wool coat, the rhythm and number of breaths, and the time of death.

Fifteen days and 30 days after the start of the experiment, 3 rats from each group were dissected and their liver, kidney, stomach, and small intestine were pathologically examined anatomically.

The effect of a single dose of Seller insecticide on hypersensitive organs (powder dose and concentration) was determined on the basis of animal weight, body temperature, motor activity, movement reflexes, and by calculation (p 0.05).

A method of studying the irritating effect of Seller insecticide on the skin

The skin irritating property of Seller insecticide has been studied in white rats. This experiment was conducted in six experiments and in six control groups. To do this, the fur of the rats skin was cut in 1x1cm. A suspension of Seller insecticide was infused at a rate of 20 mg per centimeter area.

20 ml of distilled water was added to the control group. 4 hours after the experiment, the drug was washed from the skin and 1; 4; 24; 48; Observed for 96 and 120 hours. Insecticide leaks during the experiment were placed in special cages for experimental animals.

The experiment was performed on male white rats divided into 6 experimental and 6 control groups weighing 150–200 g. Attention was paid to redness of the skin, wound formation, cracking, bleeding.

The state of erythema in the skin was determined using a calorimetric ruler SV Suvorov (1992).

A method for studying the irritating properties of celery insecticide on the mucous membrane of the eye

The experiment was performed on 12 white rats weighing 200-250 grams (6 experiments, 6 control groups). In the eyes of the experimental rats, 2 drops of Seller insecticide were instilled naturally once using a glass pipette (distilled water was instilled into the eyes of the control group). The insecticide was not washed out of sight for 24 hours and the animals were 1; 24; 48; Observed for 96 and 120 hours. Observation began from 15 minutes of the experiment. The condition of the eyes of the experimental animals was assessed on a scale of:

Score - no reaction;

1-point - light redness of the conjunctiva;

2-points - redness of the conjunctiva and partially the white layer of the eye;

3-points - the conjunctiva and the white layer of the eye are rapidly reddened and pus has formed. The cases in the eyes of all experimental animals were summarized and averaged.

A method of studying the level of accumulation of cellar insecticide in the body. The accumulation of pesticides in the body is inextricably linked with its level of danger, chemical structure, absorption into organs, distribution, chemical changes, excretion from the body.

The degree of accumulation of Seller insecticide in the body was studied by the method recommended by S.N. Cherkensky (1989). This method requires less labor and does not take into account the validity coefficient (r). The nature of the accumulation is considered positive even if one of the experimental animals dies.

The level of accumulation of Seller insecticide in the body was studied in 10 white rats weighing 80-100 g. The experiments were administered to rats in the amount of 1/5, 1/10 LD₅₀ (60 and 30 mg / kg, respectively) daily for 20 days. During the experiment, the appearance of signs of poisoning in animals was observed for 20 days and 60 days. Cumulation (S sum) was calculated by the following formula.

$$S_{sim} = \frac{D_{\kappa}}{LD_{50} \times P} \times \frac{50}{a}$$

where - the total dose received by dead and surviving rats;

P - number of experimental animals (10);

a - animals that died within 20 days, as a percentage.

If S_{sim} is less than 5, the accumulation rate is high, and if it is higher than 20, (S_{sim20}) is considered to have no accumulation feature.

To determine the level of accumulation of Seller insecticide in the body, white rats weighing 150-200 grams were given 1/5 (60mg / kg) and 1/10 (30mg / kg) LD₅₀ in the stomach of animals through a metal probe for 2 months. was sent in the form of a suspension at the expense of the substance. Experimental rats were divided into two groups (experimental 20, control 20 rats).

Toxicity of seller insecticide

In the study of the toxicity of Seller insecticide, the amount of doses administered to experimental animals was selected based on its chemical structure. It is known from the available literature that if the fourth and sixth grids of synthetic pyrethroids have a methyl ring, they are almost insoluble in water and show low toxicity. The acute toxicity of Seller insecticide was studied in white bees of both sexes weighing 150–200 g.

All experiments were performed with environmental and biological safety [9]. In order to study the acute toxicity properties of rats under two species-dependent conditions, an aqueous solution of Seller insecticide 50.0; 100; 250; 500mg / kg body weight was sent. The amount of pesticide fluid administered to each rat's stomach was 3-4 ml. All calculations were performed at the expense of the active dose. Each dose (50, 100, 250, 500mg / kg) was tested in 10 rats (a total of 40 experiments and 10 control groups) to determine the average lethal dose (LD₅₀) of the seller insecticide. [6]

The experimental animals were observed for 30 days. During the observation period, attention was paid to the appearance of the animals, their reaction to the external environment, their reaction to external stimuli, food reflex, wool layer, respiratory rhythm and number, and time of death.

Experiments have shown that in rats only on the sixth day after administration of the drug at a dose of 50 mg / kg was observed discomfort, runny nose.

After 4 hours of administration of the drug 100 mg / kg, all rats reported discomfort and salivation.

When the administered dose of the insecticide increased to 250 mg / kg, tremors, tremors, hyper salivation, and some respiratory difficulties were observed in rats, and 4 out of 10 rats died. When the insecticide was administered at 500 mg / kg, the rats had difficulty lying on their side and breathing at the same time, and all the rats died within 1 hour.[5]

Rats were pathomorphologically examined in their stomachs, livers, and kidneys. Studies have shown that the acute toxicity of Seller insecticide was found in the stomachs of experimental rats. Zones of ischemia were found in the gastric muscle and mucosa.

Results of the study of the irritating properties of Seller insecticide on the eyes and skin

The skin and eye irritating properties of Seller insecticide have been studied in white rats. This experiment was conducted in 6 experimental and 6 control groups.

A) Skin effects

To do this, the fur of the rat skin was cut to a size of 1x1 cm. Seller insecticide was infused into this area at the rate of 20mg. 4 hours after the experiment, the drug was washed and 1; 4; 8; 12; 24; 48; 96; Observed for 120 hours. The experiment was performed on 6 male rats weighing 150-200 g. Attention was paid to redness of the skin, wound formation, cracking, bleeding.

Skin erythema S.V. It was determined using Suvorov's (1992) calorimetric ruler. As a result of the experiment, redness, swelling, cracking of the skin were observed with instillation of the drug. These clinical signs lasted for 3 to 4 days and disappeared within 5 days. Hence, Seller insecticide has an irritating effect on the skin.[7]

B) The effect of the insecticide on the mucous membrane of the eye

The experiment was performed on white rats weighing 200-200 g (6 experiments and 6 control groups). 2 drops of Seller insecticide emulsion (at the rate of 50 mg) were instilled into the eyes of the experimental rats. The drug was not washed out of the eye for 24 hours.

Experimental animals 1; 24; 48; 96; Observed for 120 hours.

The condition of the experimental animals was assessed on a point scale.

0 - score - no reaction.

1 - point - the conjunctiva of the eye is slightly red.

2 - redness of the conjunctiva and part of the white layer of the eye.

3 - point - the conjunctiva and the white layer of the eye are rapidly reddened and purulent.

As a result of the experiment, cases of redness and tearing after 1 hour were recorded in experimental animals. At 4 hours of the experiment, pus appeared in the eye and a state of shrinkage was observed in the eyeball. These clinical signs decreased on the fifth day. [8]

As a result of the experiment, Seller insecticide has a stimulating effect on the mucous membrane of the eye.

Results of the study of the level of accumulation of cellar insecticide in the body

The accumulation of pesticides in the body, its level of danger, the degree of their accumulation in the body depends on the structure of chemicals, the degree of absorption into organs, distribution, chemical changes, excretion from the body. The level of accumulation of Seller insecticide in the body was studied in 10 white rats weighing 80-100 g. The experimental rats were injected daily with a metal probe in the amount of 1/5, 1/10 LD50 (60 and 30mg, respectively). During the experiment, it was observed whether the animals showed any signs of poisoning. The follow-up lasted 20 to 60 days.

The accumulation rate (S_{sim}) was determined by the following formula.

$$S_{sim} = \frac{D_k}{LD50 \times P} \times \frac{50}{a}$$

where - the total dose (mg / kg) received by dead and surviving rats.

P - number of experimental animals (10)

- Animals that died within 20 days (as a percentage)

The results of 20, 30, 60 days of observation in the experiment showed that no deaths were reported in animals administered the drug orally. However, based on some clinical signs (animal disturbances) that occurred in the experimental animals, it was concluded that Seller insecticide has low accumulation (functional accumulation) properties.

Analysis of the chemical structure and biological activity of synthetic pyrethroids showed that their toxicity is inextricably linked with the chemical composition of pesticides.[9]

For example, when the ethyl group in the sixth state of the pyrethroids structure is replaced by the butyl group, their water solubility increases and their toxicity increases.

Now, in the fourth and sixth cases, doubling the ethyl group leads to a further increase in the toxicity of pyrethroids. This pattern is also observed when the isopropyl group is replaced by the methyl group in the fourth case.

When workers use celery insecticide, the drug can get on their skin and mucous membranes if workers do not follow safety rules. Therefore, the skin and eye irritating properties of the pesticide were studied. The experiment was performed on white rats. The drug was instilled into the skin in the form of an emulsion. Immediately after instillation of the pesticide on the skin appeared clinical signs of redness, swelling, cracking. These clinical signs disappeared after 5 days.

As a result, it was concluded that Seller insecticide has skin irritating properties. Seller insecticide was applied to the eyes of white rats in the form of an emulsion of 2-3 drops.

In the first hour of the experiment, clinical signs of redness, pus, and shrinkage of the eyeball appeared in the eyes of the experimental animals. As a result of the experiment, we came to the conclusion that Seller insecticide has a stimulating effect on the mucous membrane of the eye.

CONCLUSIONS

As a result of complex toxicological and hygienic examinations, the following conclusions were drawn about the skin and eye irritating properties of Seller insecticide:

1. Cellar insecticide is a pesticide that is absorbed by pests and acts as a result of contact:
 - Insecticides are applied to pests of grain fields when they are treated twice during the growing season;
 - Clinical signs of acute poisoning are manifested in injuries of the central nervous system. Seller insecticide has a stimulating effect on the skin and mucous membranes of the eye;
 - The insecticide has a very low chronic effect. Its sensitive concentration is 3.0 mg / kg, the unaffected dose is 0.6 mg / kg, and the allowable daily dose is 0.72 mg / kg.
 - The distance between the areas where the seller insecticide is used and the residential areas should be 100 meters (sanitary protection zone) and access to the area where the insecticide is used is allowed after 15 days.

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