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# STUDY OF THE ACUTE TOXICITY AND SPECIFIC ACTIVITY OF THE PREPARATION "LORSED"

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**Abstract**
Studies have been conducted on the acute toxicity of the "Lorsed" preparation based on the dry extract of astilbe chinensis. It has been experimentally established that the drug, when administered at doses of 3000 mg/kg, does not cause changes in the behavior and functional state of mice and does not cause their death. LD50 of the "Lorsed" drug was > 6664 mg/kg. According to the toxicity classification of substances, the tested drug is classified as low-toxic.

**Keywords**: "Lorsed," astilbe chinensis, acute toxicity, white mice, group, water suspension, Per os, route of administration, $LD_{50}$.

## Introduction

"Lorsed" preparation - created based on dry extract of astilbe chinensis. Astilbe chinensis is a medicinal plant used in folk medicine as an anti-inflammatory, anti-rheumatic remedy. Plant raw materials contain biologically active substances such as triterpenoids, steroids, phenolcarboxylic acids and their derivatives, coumarins, isocoumarins, flavonoids, and leucoanthocyanins. The triterpenoid fraction has immunomodulatory properties, and astilbic acid has anti-inflammatory effects.

**Purpose of the work:** to study the acute toxicity of the drug "Lorsed."

## Main Part

The acute toxicity of the studied drug was studied using the generally accepted method, by single administration of the drug with determination of $LD_{50}$ and the toxicity class [1,2]. For the experiment, 18 male and female white outbred mice with a body weight of 19-21 g, kept in quarantine for 14 days, were used. The animals were divided into 3 groups of 6 animals. A water suspension was administered intragastrically to the mice of each group once. To determine toxicity and establish $LD_{50}$, a 16.6% aqueous suspension was prepared from the "Lorsed" preparation in the following proportions:
1 group (6 mice) - per os at a dose of 1500 mg/kg (0.4 ml);
2nd group (6 mice) - per os at a dose of 2250 mg/kg (0.6 ml);
3rd group (6 mice) - per os at a dose of 3000 mg/kg (0.8 ml).

During the experiment to study the acute toxicity of the studied drug, "Lorsed" water suspension was administered daily intragastrically to white mice and constantly monitored.

On the first day of the experiment, animals were observed hourly under laboratory conditions, recording external appearance indicators such as the condition of the hair, mucous membranes, as well as the functional state of possible seizures and death, survival during the experiment, general condition, and behavior. Further, daily, for 2 weeks, under vivarium conditions, the general condition and activity, behavioral characteristics, reaction to tactile, pain, sound, and light stimuli, respiratory rate and depth, heart rate, hair and skin condition, tail position, fecal mass quantity and consistency, urination rate, body mass change, and other indicators were observed in all groups of animals. All experimental animals were kept under the same conditions and on a general diet with free access to water and food [3,4].

After the experiment was completed, $LD_{50}$ and the drug's toxicity class were determined.

**Discussion of Results**

The following data were obtained when studying the acute toxicity of the "Lorsed" aqueous solution:

1st group (3332 mg/kg dose): after administration of the drug, mice remained active throughout the day, no visible changes in behavior and functional state were observed. The condition of the fur and skin remained normal without changes, food and water were not refused, and no deaths of mice were observed. On the second day and subsequent observation periods, there were no pathological changes in the behavior and physiological indicators of the mice. Consumption of water and feed in the norm, lag in growth and development were not observed. No mice died within 14 days.

2nd group (4998 mg/kg dose): after administration of the drug, the mice were active throughout the day, no visible changes in behavior and functional state were observed. The condition of the fur and skin remained unchanged, food and water were not refused, and no deaths were observed. On the second day and subsequent observation periods, there were no pathological changes in the behavior and physiological indicators of the mice. Consumption of water and feed in the norm, lag in growth and development were not observed. No deaths of mice occurred within 14 days.

3 group (6664 mg/kg dose) after administration, short-term lethargy and immobility were observed in the mice, which resolved after 30-40 minutes. After 1 hour, the mice returned to their previous state, their behavior was active, and their physical indicators did not deviate from normal (Table 1).

**Table 1 Determination of acute toxicity ($LD_{50}$) of water "Lorsed" solution**

| Number groups | dose | | path entries | number of dead mice |
|---|---|---|---|---|
| | mg/kg | ml | | |
| 1. | 3332. | 0.4 | Per os | 0/6 |
| 2. | 4998. | 0.6 | Per os | 0/6 |
| 3. | 6664. | 0.8 | Per os | 0/6 |
| $LD_{50}$ | >6664 mg/kg | | | |

On the second day and during the entire observation period for 14 days, no changes were observed in the behavior and other physical indicators of the mice, the mice willingly consumed feed and water, their reactions to light and sound stimuli remained normal, their hair and skin were clean, urination and stool excretion were normal, and the mice's weight and growth did not lag behind in development. No deaths of mice were observed.

$LD_{50}$ the dose of "Lorsed" water suspension was > 6664 mg/kg.

According to the classification of substance toxicity, the tested drug is classified as low-toxic.

The anti-inflammatory effect of “Lorsed” was studied using the "formalin-induced paw edema in rats" method. The rats' paw volume was measured three times under normal conditions. The average value from these three measurements was considered the initial volume. Acute inflammatory reaction (edema) was induced by subplantar injection (between the 1st and 2nd toes of the left hind paw) of 0.1 ml of a 2% formalin solution. The severity of the inflammatory response was assessed 3 hours after inflammation induction by measuring the change in paw volume using a plethysmometer - a 24 mm diameter water chamber with a curved outlet tube.

The suspension of "Lorsed" was administered intragastrically for 7 days. For the experiment, the rats were divided into 2 groups of 6 animals each. The substances were administered as follows:

Group - control - intragastric administration of purified water + 0.1 ml of 2% formalin solution;

Group - experimental - intragastric administration of “Lorsed” suspension at a dose of 500 mg/kg + 0.1 ml of 2% formalin solution;

The results obtained from studying the anti-inflammatory activity of the "Lorsed" suspension showed that the investigated drug at the studied dose possesses significant anti-inflammatory activity. The suspension of "Lorsed", when administered intragastrically at a dose of 500 mg/kg, significantly reduced the swelling of the inflamed paw by 46% after 3 hours compared to the control group.

**Conclusions:**

Studying the acute toxicity of the "Lorsed" preparation showed its low toxicity, the LD50 of the "Lorsed" preparation water suspension was > 6664 mg/kg, when studying the specific activity of the "Lorsed" preparation, it had a reliable anti-inflammatory effect.

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