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PHARMACO-TOXICOLOGICAL PROPERTIES OF ANTIANEMIC BIOLOGICALLY ACTIVE ADDITIVE

Abstract: This article presents the results of a study of the pharmacy-toxicological properties of a biologically active additive prepared from extracts of licorice roots and some medicinal plants, recommended for the prevention and treatment of anemia in children. As a result of laboratory experiments, it was revealed that this biologically active additive belongs to class V of safe substances, does not cause local changes on the skin, does not have an inflammatory effect on the mucous membranes of the eyes, does not cause allergic reactions, or changes in the internal organs of experimental animals.

Key words: licorice, traditional medicine, dietary supplement, anemia, pharmacological properties.

Language: English

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Introduction

Specialists from a number of leading scientific centers state the effectiveness of traditional medicine methods in the treatment of inflammatory and viral diseases [1-3].

Licorice root or licorice is a widely used herbal remedy used in folk and scientific medicine. Licorice, along with ginseng, is highly valued in folk medicine in eastern countries [4]. Based on the extract and

components of licorice roots, medicinal substances, syrups, mixtures and biologically active compositions are produced, which are widely used for the prevention and treatment of certain inflammatory diseases [5,6].

Academician G.A. Tolstikov provides information about 44 dietary supplements and 41 medicinal herbal collections containing licorice root [7].

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In this industry, scientists of Uzbekistan have achieved certain practical results. In particular, the Chairman of the Academy of Traditional Medicine of Uzbekistan, Doctor of Chemical Sciences, Prof. I.R. Askarov together with Doctor of Chemical Sciences, Prof. R. Nuriddinov, acad. I. Kalnins (Latvia), prof. University of Toronto (Canada) F. Polyak based on medicinal plants, including licorice, biologically active compositions AS-CURCUMIN¹, "ANTIVIR", "ASKAROVIR", "ANTIKOVIR", "NONI - ANTIVIR" were developed and introduced for the prevention and treatment of viral diseases [8].

As you know, anemia (anemia) is a disease resulting from a lack of hemoglobin in the blood. According to WHO, 40% of children under 5 years of age, 30% of women under 49 years of age and 37% of pregnant women worldwide suffer from anemia¹. Most of the drugs used to treat this disease are synthetic, and in most cases, they are ineffective. In addition, these drugs are relatively expensive.

Based on the above, together with specialists from the private enterprise VITABIOTK, a biologically active composition was developed and some of its toxicological indicators were studied. This product is intended to increase the body's resistance to diseases, strengthen the immune system and normalize biochemical processes occurring in the body by replenishing missing and deficient vitamins, macro- and microelements in everyday food.

Methods used.

The targeted biologically active additive is available in the form of syrup. It contains extracts of licorice roots, beets, grapes, rose hips, caraway, lemon balm, as well as succinic acid.

One of the main stages in the development of medicines and dietary supplements is determining their compliance with established toxic and hygienic requirements. The toxicological indicators of the biologically active additive developed by us were studied in the toxicological laboratory of the Center for Sanitary and Epidemiological Peace of the Ministry of Health of the Republic of Uzbekistan.

Determination of acute toxicity (LD₅₀).

Experiments to determine LD₅₀ were carried out using the Litchfield-Wilcoxon method [9,10] on 24 white outbred mice weighing 190-210 g. The animals were divided into 4 groups. For this purpose, the test substance was administered orally into the animals' bodies using a probe in single doses of 1000, 2000, 3000, 4000 and 5000 mg/kg. The condition of the animals was observed for 14 days. The appearance of signs of infection and deaths of animals were recorded as criteria for exposure to the test substance.

Study of local effects on the skin. When determining the toxicological parameters of drugs and dietary supplements, their local effects on the skin are studied. To determine this indicator, guinea pigs weighing 360-380 g were used as experimental animals. The test substance was applied to a skin area measuring 2x2 cm, in an amount of 20 mg per cm². At the same time, the main attention was paid to the possible appearance of signs of redness and swelling. Signs of redness were determined visually, and signs of tumors were determined by measuring the thickness of the skin with an electronic micrometer. Observations were carried out over 14 days. During this period, the test substance did not cause redness or swelling on the skin of animals. Therefore, a biologically active additive refers to substances that cause local changes on the skin.

Impact on the mucous membrane of the eyes. This experiment was carried out on experimental rabbits. The animals were observed for 14 days. However, no changes were noted in the eyes of the observed animals. From this we can conclude that the test substance is safe from the point of view of its effect on the mucous membranes of the eyes.

Study of allergenic properties.

These experiments were carried out on guinea pigs weighing 310-320 g, divided into 2 groups. First, the animals of the experimental group were injected with a suspension of 20 µg of the test substance in physiological solution in a ratio of 1:500. At the same time, animals in the control group were injected with saline solution.

The discussion of the results.

During the experiments carried out to determine acute toxicity in the tested doses in behavior, appearance and attitude towards food, as well as the lethal outcome of experimental animals, were not noted.

The test results showed that when administered orally, the acute toxicity indicator LD₅₀ is more than 5000 mg/kg, i.e. According to this indicator, the substance under study belongs to class 5 of safe substances [11].

At the conclusion of the experiments to identify local effects on the skin of experimental animals, no changes were noted. Thus, the test substance does not cause allergic reactions on the skin.

In the study of the properties of accumulation, i.e. accumulation of the test substance in the body, the results were used to identify the indicator of acute toxicity after oral administration. In particular, when the test substance is introduced into the stomach of animals, based on the specific time of their death, the average lethal time is calculated, and the degree of

¹ https://www.who.int/ru/health-topics/anaemia#tab=tab_1

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accumulation is determined according to a special classification (very high, high, medium weak). Since the specific indicator of acute toxicity of the test substance is above 5000 mg/kg, it was not possible to calculate the average lethal time for this substance. Consequently, the biologically active additive we developed can be classified as a substance whose cumulative property is of a functional nature.

Conclusion

Thus, as a result of the research, a biologically active additive containing extracts of licorice roots and some medicinal plants has been developed for the prevention and treatment of anemia in children. Acute

toxicity, local effects on the skin, on the mucous membranes of the eyes, allergenicity and cumulative properties of this biologically active additive were studied in laboratory conditions. At the same time, it was revealed that the studied substance in terms of acute toxicity can be classified as class 5 safe substances, i.e. to practically non-toxic substances. The results of the experiments showed that the biologically active additive we developed does not cause changes in the skin, in the mucous membranes of the eyes, does not cause allergic reactions and does not accumulate in internal organs. Therefore, the studied biologically active additive can be used for its intended purpose.

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