Phytoecdysteroids as promising immune stimulating agent
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Фитоэкдистероиды как перспективные иммуностимулирующие средства
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Abstract: *studied total ecdysteroid-containing preparations of Silene brahuica and Ajuga turkestanica when administered to mice simultaneously with the immunization of sheep red blood cells stimulate the primary antibody, significantly increasing the number of antibody producing spleen cells. In its overall activity of ecdysteroid-containing preparations Silene brahuica and Ajuga turkestanica in all the experiments showed a more pronounced effect than the comparison drug taken for immunal.*
Аннотация: *изучаемые суммарные экдистероидсодержащие препараты из Silene brahuica и Ajuga turkestanica при введении мышам одновременно с иммунизацией их эритроцитами барана стимулируют процесс первичного антителообразования, существенно увеличивая в селезенке число антителообразующих клеток. По своей активности суммарные экдистероидсодержащие препараты из Silene brahuica и Ajuga turkestanica во всех проведенных экспериментах проявили более выраженный эффект, чем взятый для сравнения препарат иммунал.*

Keywords: *phytoecdysteroids, immunostimulants, T-activin, immunal, secondary immunodeficiency.*
Ключевые слова: *фитоэкдистероиды, иммуностимуляторы, Т-активин, иммунал, вторичных иммунодефициты.*

It is well known that many plant extracts, tinctures and individual compounds possessing the similar activity (Eleutherococcus extract, ginseng, Echinacea, cycloartane glycosides, pectin, flavonoids and others.) Also behave as efficient immunostimulating agents [4, 6, 9]. In addition, in a number of scientific reports provided examples of their high protein synthesis activity [8, 2], which certainly had an impact on the process of antibodygenesis.

Phytoecdysteroids are polyhydroxylated steroid compounds isolated from plants. In a series of experiments conducted with the use of ecdysterone isolated from Rhaponticum carthamoides, turkesterona isolated from Ajuga turkestanica, as well as the total ecdysteroid-containing preparations from Ajuga turkestanica, Silene brahuica, Silene viridiflora it was found that when them injected per os at doses of 5-10 mg / kg there is a pronounced stimulation of the process of the primary antibody production in experimental animals (mice, rats, hamsters) in response to their thymus - dependent antigen - sheep erythrocytes. Most clearly the immunostimulatory effect phytoecdysteroids manifested in secondary immunodeficiency states, developing toxic hepatitis induced by CCl4, strong emotional stress (immobilization in an uncomfortable position, excessive exercise), radiation exposure to sublethal dose, anemia caused by phenylhydrazine.

In all cases, ecdysterone, and especially turkesteron total ecdysteroid preparation of Ajuga turkestanica or not inferior or even superior to the known immune-boosting drugs for activity: T-activin and immunal.

Phytoecdysteroids addition to humoral, also have an activating effect on the cellular part of the immune response, indicating the increase of the functional activity of T-lymphocytes. When used in higher doses was an increase in the number of phagocytic macrophages, and increased phagocytic index. Our data on the effectiveness of phytoecdysteroids under certain pathological conditions are supplemented by the data L. Dinan (2009), considered in its review of their positive effects on the body of mammals.

Thus, the results of the research show that both individual and total ecdysteroid-containing drugs have a pronounced immunostimulating effect. Based on data obtained, it is associated with amplification processes intercellular cooperation, and hence the subsequent synthesis of a cascade of cytokines involving heterogeneous population of cells (T-helper 1 st and 2nd type), B-lymphocytes and other cells in the immune response strengthening not only lymphopoiesis but leucopoiesis erythropoiesis and in secondary immunodeficiencies caused by stress, radiation, acute toxic hepatitis and anemia.

When completely unidirectional action against immuno- and hemocorrection phytoecdysteroids with reference drugs T-activin and immunalom attracted attention that some of the test substances (ecdysterone, turkesteron and total ecdysteroid drugs Silene viridiflora, Silene brahuica especially Ajuga turkestanica) or not inferior or have had a

distinct advantage over them in the expression of action, which manifested itself most clearly in the modeling of secondary immunodeficiencies. In principle, a good immune-stimulating effect was observed by us in this work [7]; in total ecdysteroid preparation isolated from Rhapontium intergifolium, containing in its composition α-ecdysone, 24 (20) – degidromahisteron, ecdysterone, itegristeron A. et al. [1, 5]. Under the influence of the studied drugs also significantly increased cellularity central and peripheral organs of immunity, red blood cells and white blood cell count.

Phytoecdysteroids are not toxic, have an optimizing effect on metabolic processes in the body of animals.

The data obtained open up a broad perspective of phytoecdysteroids usage for correction of the immune system, with a wide variety of pathological conditions.

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