

INVESTIGATION OF THE PHARMACOLOGICAL ACTIVITY OF POLYSACCHARIDE COMPLEX OBTAINED FROM *LEDUM PALUSTRE*

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Introduction. Herbal medicines have more advantages than their synthetic counterparts. Low toxicity, the gradual achievement of pharmacological effects, complex action are some of them. That's why, obtaining and investigation of plants biologically active substances are the actual task of modern pharmacy.

One of the perspective plant materials is *Ledum palustre* shoots (*Cormus Ledi palustri*), which have long been used in folk medicine as an antispasmodic, diuretic, diaphoretic, disinfectant, anti-inflammatory, sedative and antitussive remedy. The wide spectrum of plant biological activities is due to the presence of terpene compounds, flavonoids, tannins, organic acids, polysaccharides and other substances in the plant material .

Terpene compounds of Labrador tea are the most studied. They are component of essential oil, and medicine "Ledin" with antitussive effect was developed on their basis. While the polysaccharide complex of this plant is almost not studied.

So **the aim** of our research was the investigation of the polysaccharide complex (PSC) obtained from *Ledum palustre* shoots and determination its pharmacological activities.

Materials and methods

Object of our research was PSC obtained from *Ledum palustre* shoots. 200 g of chopped raw material, with particle size less than 2 mm, was put in the volumetric flask capacity 2 liters, 1000 ml of water was added and the flask was heated on water bath for 30 minutes with a reflux condenser. Extraction was repeated three times with a new portion of extractant. Water extracts were collected separately in containers, centrifuged and filled to the mark in volumetric flask capacity 1000 ml by water. 25 ml of each water extract was taken for analysis. Extracts were united and evaporated to the volume 100 ml in the vacuum-circulation apparatus at 100 °C. 300 ml of ethyl alcohol was added to the concentrated solution. Precipitation of polysaccharides formed, it was allowed to stand for one hour, centrifuged, washed with 30 ml of 96% ethyl alcohol and dried at room temperature to dryness.

Phytochemical research of PSC was carried out by paper chromatography, gravimetry and spectrophotometry.

Antitussive activity of *Ledum palustre* PSC were analyzed on cough model induced a 10% solution of citric acid. All substances were studied at doses of 10 mg /

kg, 20 mg/kg, 50 mg/kg, 75 mg/kg, 100 mg/kg.

The study of PSC antitussive activity was performed at the pharmacotherapy department of the National University of Pharmacy with the head of prof. Kireev I.V.

The antitussive effect was evaluated as follows: the antitussive activity of the *Ledum palustre* PSC and the reference preparations was compared with the control. The results were calculated by the formula:

$$\text{Antitussive effect} = [(C_{\text{к}} - C_{\Delta}) / C_{\text{к}}] \times 100\%, \text{ where}$$

$C_{\text{к}}$ - the number of cough responses in the control group;

C_{Δ} - number cough reactions in the experimental group.

Results and discussion

PSC was obtained from *Ledum palustre* shoots, the yield was $2.60 \pm 0.07\%$ in terms of absolutely dry raw materials.

It was determined dynamic of polysaccharides yields from *Ledum palustre* shoots, which was $0.97 \pm 0.03\%$ during the first extraction, $1.24 \pm 0.03\%$ during the second extraction, $0.39 \pm 0.01\%$ during the third extraction by Gravimetry. D-glucose, D-Galactose, L- rhamnose and L-arabinose were identified in the hydrolyzate of PSC by the method of paper chromatography.

The amount of monosaccharides in glucose equivalent in PSC was determined by spectrophotometry. After statistical analysis of the results the content was determined as $43.25 \pm 0.80\%$.

Results of study of PSC and drug reference anti-inflammatory activity are given in Table 1.

Table 1. The effectiveness of PSC *Ledum palustre* using ethyl

acetate as compared to control , %

Dose	Number cough shocks in the control group	Number cough shocks in the experimental group	Antitussive activity
10 mg / kg	$18,00 \pm 0,7$	$3,2 \pm 0,8$	82%
20 mg / kg	$18,00 \pm 0,7$	$5,8 \pm 0,8$	68%
50 mg / kg	$18,00 \pm 0,7$	$2,8 \pm 0,8$	84%
75 mg / kg	$18,00 \pm 0,7$	$2,4 \pm 0,5$	87%
100 mg / kg	$18,00 \pm 0,7$	$3,8 \pm 0,8$	79%

From the data we can conclude *Ledum palustre* PSC has the maximum activity observed at 75 mg / kg.