

## STUDY OF ANTIOXIDANT AND GASTROPROTECTIVE PROPERTIES OF LINDEN POLYPHENOLIC COMPLEX

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**Introduction.** Gastric ulcer and duodenal ulcer are common diseases and affect 10-20% of the entire adult population of the planet. In Ukraine alone, the number of registered patients is 5 million people.

For the purpose of pharmacotherapy of peptic ulcer, many groups of drugs are used. However, the variety of antiulcer drugs does not solve the problem of successful treatment of peptic ulcer. In this regard, it is urgent to search and study new effective and safe drugs, which will optimize the therapy of peptic ulcer and duodenal ulcer. In this regard, herbal medicines are of interest because they differ from synthetic drugs in their low toxicity and the possibility of long-term use without serious complications. In addition, medicinal plants contain many biologically active substances, which make it possible to influence various pathogenetic links of the disease.

One of the medicinal plants that is promising for the creation of new antiulcer drugs is linden (*Tilia cordata*, Mill.). Analysis of literature sources indicates that the phytochemical and known pharmacological properties of linden cordifolia inflorescences (anti-inflammatory, reparative, antioxidant, antimicrobial, sedative effects) suggest the presence of gastroprotective activity in this medicinal plant raw material, and the creation of drugs based on it will expand and optimize herbal medicine peptic ulcer disease.

The aim of our work was an experimental study of the antioxidant and gastroprotective properties of the polyphenolic complex of linden (PPhCL) on a model of subchronic ulcerative lesions in rats.

**Materials and methods.** The study of the antioxidant and gastroprotective properties of the linden polyphenolic complex was carried out on a model of subchronic ulceration – an aspirin ulcer in rats. The aspirin ulcer was reproduced by 5-time administration of acetylsalicylic acid for 3 days. This ulcerogenic agent was administered intragastrically at a dose of 150 mg/kg. As a reference drug, we chose altan as a drug of plant origin with proven antioxidant and gastroprotective properties. The studied object in a dose of 25 mg/kg and the reference drug altan in a dose of 1 mg/kg were administered intragastrically 1 time per day, daily in prophylactic mode (3 days before the administration of acetylsalicylic acid).

At the end of the experiment, the animals were euthanized, their stomachs and blood were removed and examined. A biochemical study of animal blood serum was also carried out, determining the content of total protein (TP), the level of TBA-active products (TBA-AP), reduced glutathione (RG); activity of alanine aminotransferase (ALT) and aspartate aminotransferase (AST). The level of TBA-AP was determined by reaction with 2-thiobarbituric acid spectrophotometrically according to the method of I.D. Steel, T.G. Garishvili. The amount of RG was determined by reaction with Elman's reagent. The activity of the enzymes ALT and AST, which are the main markers of cytolysis in blood serum, was determined by the Reitman-Frenkel method.

The determination of total protein content was carried out using the biuret method. The method is based on the ability of peptide groups of proteins and polypeptides to form a complex compound with  $\text{Cu}^{2+}$  ions in an alkaline medium, colored violet and characterized by an absorption maximum at 540-580 nm. Protein concentration was determined using a calibration graph and expressed in g/ml.

**Results and discussion.** The formation of model pathology was accompanied by the following biochemical changes in the blood serum: compared with intact animals, the level of TBA-AP increased by 72.87%, ALT activity – by 80.0%, AST - by 96.0 %; the content of RG decreased by 33.33%, and TP – by 39.33%. That is, as a result of the experiment, it was established that modeling an aspirin ulcer in rats is accompanied by changes in biochemical parameters in the blood serum, indicating the development of a pathological process, namely an increase in the intensity of free radical oxidation (FRO) processes, a decrease in the activity of endogenous antioxidant system (AOS), disruption of reparative processes and activation of cytolysis.

The use of PPhCL had a pronounced normalizing effect on the state of biochemical parameters of the blood serum of rats: the level of TP significantly increased by 19.45%, and the content of RG - by 18.27%. The level of TBA-AP decreased by 28.31%, which indicates a decrease in the intensity of the processes of peroxide destruction of membranes. The activity of ALT in the group of animals treated with PPhCL decreased by 17.17%, and the activity of AST – by 16.33%, compared with the control pathology group, on the basis of which we can talk about the presence of a membrane-stabilizing and antioxidant effect of the studied linden drug.

The administration of the reference drug altan caused a significant inhibition of FRO compared to the control pathology group: the content of TBA-AP decreased by 31.38%. The activity indicators of ALT and AST, reflecting the presence of the membrane-stabilizing effect of the reference drug, decreased by 18.35% and 12.27%, respectively. The levels of TP and RG in this case increased by 14.82% and 12.66%, respectively.

Thus, the prophylactic use of PPhCL for this pathology had a gastroprotective effect, and this activity was not inferior to the activity of the reference drug altan, as evidenced by the indicators of biochemical studies. The results of the studies indicate the prospects for further preclinical and clinical study of the antiulcer activity of linden cordifolia extract with the aim of creating new domestic herbal medicines for the treatment and prevention of stomach and duodenal ulcers.