



the groups were distributed according to the age and sex. Total cholesterol (TCS), triglycerides (TG), high-density lipoproteins (HDL), low-density lipoproteins (LDL) in the blood plasma were determined in all the patients. The obtained data were statistically processed. Informed consent was obtained from all participants.

The analysis of clinical-laboratory findings of the examined patients revealed the disorders of the lipid metabolism in the blood serum: significant increase in the TCS, TG, and LDL levels respectively ( $p < 0.05$ ) against the background of decreased HDL levels compared to conditionally healthy individuals. At the same time, severe imbalance of the lipid metabolism was found in patients with DN, II degree CKD and II degree AH.

More severe lipid imbalance was found among women than among men. A considerable increase of LDL was shown to be found both among men and women with DN against CKD II degree ( $p < 0.05$ ). Therefore, a considerable lipid imbalance in patients with DN against CKD I-II degrees and AH II degree was found among all the patients with a probable gender difference especially in case of CKD II degree. Thus, the analysis of the obtained results found that the values of lipid metabolism differed most substantially in persons of an elderly age as compared with the results of patients of a mature age, and they depend more on the stage of CKD than the degree of AH, although in elderly patients the values differ considerably according to the degree of AH. Therefore, the values of TCS were significantly higher in all the group of patients in comparison with appropriate values of healthy individuals ( $p < 0.05$ ), but it should be noted that in patients with II degree CKD and II degree AH the levels of TCS were higher than in patients with I degree CKD and I and II degree AH (according to the comparison in the age groups ( $p < 0.05$ )). The levels of TG and LDL was also considerably increased in patients with II degree CKD and II degree AH in comparison with other groups of the study ( $p < 0.05$ ). The level of HDL decreased in all the patients with DN against the background of CKD I-II degrees ( $p < 0.05$ ), but it was the lowest in all the patients with II degree CKD with I and II degree AH.

Thus, in significant gender differences of lipid imbalance are found in patients with IV degree diabetic nephropathy against the background of I-II degree chronic kidney disease and II degree hypertension with their prevailing among women. Lipid imbalance is most pronounced in elderly patients, which is confirmed by a significant increase of low-density lipoproteins level.

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**THE STUDY OF POPULUS SIMONII (SIMON POPLAR)  
TOXIC INFLUENCE ON RATS' ORGANISM**

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One of the main tasks of modern medicine and pharmacy is to find and create new herbal medicines. The main advantages of phytotherapeutic drugs are a wide range of pharmacological activities, the possibility of use in chronic diseases, high bioavailability, a limited range of side effects and low toxicity.

An important characteristic in the process of a potential drug research in addition to the therapeutic properties examination is studying  $LD_{50}$  index, which characterizes the degree of drugs toxicity, the range of their pharmacological effects, and also enables to evaluate the examined substance danger to the body in the short-term action.

To determine  $LD_{50}$  and simulate the clinical manifestation of acute poisoning, acute toxicity of Simon poplar leaf extract was studied in white adult lab rats with the body weigh 180-200 g. The animals of the control group were given an equivalent volume of 1% starch suspension. The period of the animals monitoring was 14 days, during which their appearance, the skin condition, the dynamics of body weight, mortality were evaluated, and after the animals were removed from the experiment, macroscopic evaluation and determination of the mass coefficients of the internal organs were performed.



As a result of the experiment, after a single oral intragastric administration of Simon poplar leaf extract in the dose 15000 mg / kg no signs of intoxication in rats were observed. Animals of the experimental and control groups maintained motor activity, responded to sound and light stimuli, the processes of defecation and urination were within normal range, respiratory disturbances and convulsions were not observed. Reflex excitability was maintained in all animals, and the death of rats was not observed.

The dynamics of the rats' body weight after intragastric administration of Simon poplar leaves extract matched the body weigh gain. The consumption of food and water in the experimental animals did not differ from the animals of the control group. During the whole experiment period the animal mortality was not registered.

Throughout the examination of wool, mucous membranes of saline holes, as well as during autopsy at macroscopic examination of internal organs in all animals, no signs of inflammation, irritation or other manifestations of the pathological process were found. The size, color, location of the internal organs of the experimental rats did not differ from the animals of the control group. The surface of the liver, kidneys and adrenal glands was smooth. The organs colors, shapes and sizes were normal. The pancreas was grayish-pink in color, the spleen was full-blooded, elastic, the mucous membrane of the stomach with a pronounced relief of folds, the mucous membrane of the intestine was not changed. In the chest, all the organs were located anatomically correct. The heart muscle in section was dark red, in the lungs the pleural layers were not changed. The mass coefficients of the internal organs indicate the absence of pathological changes.

Therefore, a single intragastric administration of Simon poplar leaf extract in the dose of 15000 mg / kg indicates no toxic effect.

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## **NANOCHROMIUM CITRATE EFFECT ON THE STATE OF OXIDANT/ANTIOXIDANT BALANCE IN INTACT ANIMALS**

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Development of nanotechnologies and making nanomaterials is a dominating area for investigation in practically all the branches of present science and technology. Nanoproducts are already used in power engineering, cosmetics, chemical and construction industry. Nanoparticles and nanostructured materials are used as new medical agents, biosensors, devices for visualization and diagnostics. At the same time, development of nanotechnology and getting new nanomaterials induces scientists to the necessity of investigation of their safety in order to avoid possible unfavorable consequences both for human health and environment.

Chromium nanoparticles can be promising structures to be applied in nanomedicine. New chromium compound – nanochromium citrate (NCC) – was obtained at the Scientific-Research Institute of Nanobiotechnology and Resource-Saving (Ltd “Nanomaterials and Nanotechnology”, Kyiv) by Doctor of Technical Sciences V.G. Kaplunenko and Candidate of Technical Sciences M.V. Kosinov by means of electropulse aquanotechnology method. Today NCC is found to produce a positive effect on biochemical processes in the body. It is recommended as a food additive in veterinary practice.

Objective of the study is investigation of nanochromium citrate effect on the state of oxidant/antioxidant balance in intact animals.

The study was conducted on 12 mature male rats. The state of oxidant/antioxidant balance in animals was studied under conditions of repeated (14 days) intragastric administration of NCC in the dose of 0,01 mg/kg. The animals from the control group received distilled water not containing chromium. The content of *thiobarbituric acid* reactive substances (TBARS) was determined in blood erythrocytes. General antioxidant activity, protein oxidation modification (POM) and free SH-groups were determined in the blood plasma.