



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 aquananotechnology 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.



The study of NCC effect on the state of oxidant/antioxidant balance in rats was indicative of the fact that according to the results obtained daily oral NCC administration during two weeks in the conditionally-effective dose 0,01 mg/kg (0,25% of DL₅₀), with the total course dose of 0,14 mg/kg, was associated with inhibition of intensity of free radical lipid oxidation and protein oxidation modification (POM). It is evidenced by decreased content of TBARS (by 24,5%) and POM in the blood plasma (by 38,6%) in comparison with the control group of rats. Reduction of intensity of free radical lipid oxidation and POM occurs against the ground of activation of antioxidant protection system functioning in the animal body. Hence, during 14 days general antioxidant activity of the blood plasma in the blood of rats receiving NCC was higher than that of the control group. At the same time, the content of free SH-groups in the blood plasma was 29,8% higher as compared with the control group.

The obtained results of our study concerning antioxidant effect of small NCC doses correlate with the literary data. Certain researchers (Iskra R.Y., 2013) found that addition of nanochromium citrate in the dose of 0,01 mg/kg to animal food increased activity of the major antioxidant enzymes – superoxide dismutase, catalase, glutathione peroxidase, glutathione reductase and reduced glutathione-SH in hemolysates of the blood erythrocytes. On the basis of the results of our own studies and literary data it can be suggested that antioxidant activity of MCC low doses is caused by activation of the antioxidant protection system – an increased activity of the key enzymes of the antioxidant protection in order to neutralize oxygen active forms and hydroperoxides.

Therefore, during long administration of NCC in the dose of 0,01 mg/kg the intensity of free radical lipid oxidation, POM content and TBARS decrease in the animal body against the ground of activation of the antioxidant protection system functioning.

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RENOPROTECTIVE EFFECT OF MELATONIN IN CONDITIONS OF ACUTE KIDNEY INJURY AND ALTERED PINEAL GLAND ACTIVITY

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Multiple effects of melatonin make it a potential therapeutic agent. According to Ahmadian (2016), Reiter (2017) and Tavakoli (2014), melatonin, due to its free-radical scavenging activity and ability to potentiate the antioxidant system is a highly important antioxidant. Several researchers (Bonfont-Rousselot, 2010; Espino, 2018; Esrefoglu, 2017; Ničković, 2018; Reiter, 2017) reported a therapeutic effect of melatonin in various pathologies related to oxidative stress. Besides, numerous studies (Majidinia, 2017; Pacini, 2016; Reiter, 2018; Tordjman, 2017) report beneficial immunostimulatory, anti-inflammatory, anti-apoptotic, cytoprotective, oncostatic, and anti-aging effects of melatonin.

The aim of this research was to study the renoprotective potential of melatonin in conditions of aminoglycoside-induced AKI against the background of pineal hypo- and hyperfunction.

Nonlinear mature white rats (n=40) were randomly divided into 5 groups. Animals from the I (Control), and II (AKI) group were kept under the natural light regimen. Pineal hypofunction was simulated in rats from the III group by maintenance under conditions of constant light at 500 lux (24.00 light : 0.00 darkness) for 7 days. Pineal hyperfunction was simulated in rats from the IV group by maintenance under conditions of constant darkness (0.00 light : 24.00 darkness). Toxic AKI (II-IV groups) was induced by daily administration of gentamicin at a dose of 80 mg/kg for 6 days. Animals from the III-IV groups were daily injected with melatonin at a dose of 5 mg/kg. 24 h after the last injection biochemical and histological examination was performed. For the statistical analysis SPSS 17.0 software was used.

Nephrotoxicity of gentamicin caused significant (p<0.05) functional changes and structural alterations of rat kidneys. Treatment with melatonin in conditions of gentamicin-induced kidney injury significantly limited the degree of damage to renal tissue and prevented a critical reduction in kidney function, confirming a protective effect of melatonin. At the same time, significant (p<0.05)