



International Congress on Biological, Physical And Chemical Studies

International Congress on Biological, Physical And Chemical Studies - is an international conference platform under open access policy. The conference is led by international expert members who take an objective approach to peer review, ensuring each research paper is reviewed, edited by authors and evaluated on its own scholarly merits and research integration. Publishing and joining on the proceeding of the International Congress on Biological, Physical And Chemical Studies will ensure publishing experience and indexing possibilities on various global indexing.

Evaluation of the Hepatoprotective Activity of Sample M-1 in a Model of Acute Toxic Hepatitis Induced by Ccl4 in Mice

Fayzullaeva N.Ya, Kayumov A. A., Raufov A. A.

Institute of Human Immunology and Genomics

Relevance: Acute toxic hepatitis, often caused by exposure to hepatotoxic substances like carbon tetrachloride (CCl₄), is a serious condition that can lead to liver failure and death. Current treatments for liver damage are limited, and there is a growing need for effective hepatoprotective agents. Natural compounds and bioactive supplements are increasingly being explored for their potential to protect the liver from toxic damage. Sample M-1, a biologically active supplement, has shown promise in preliminary studies, making it a candidate for further investigation. This study aims to contribute to the development of new therapeutic strategies for acute toxic hepatitis.

Objective: The study aimed to evaluate the hepatoprotective activity of Sample M-1 in a mouse model of acute toxic hepatitis induced by CCl₄. The research focused on determining the most effective dose of Sample M-1 that could provide significant protection against liver damage.

Materials and Methods: The study was conducted on 30 male mice weighing 19-20 g. Acute toxic hepatitis was induced by intraperitoneal administration of CCl₄ at a dose of 2.7 ml/kg, mixed with olive oil to prevent burns. Sample M-1 was administered orally at doses of 5, 10, and 15 ml/kg one hour after CCl₄ injection. Control groups received physiological saline. The experiment lasted for 5 days, with animals sacrificed on the 6th day. Parameters such as survival rate, lifespan of deceased mice, liver-to-body weight ratio, and body weight dynamics were recorded. The hepatoprotective activity coefficient (HPAC) was calculated to assess the efficacy of Sample M-1.

Results: Sample M-1 demonstrated significant hepatoprotective activity at all tested doses compared to the control group. The highest hepatoprotective effect was observed at a dose of 10 ml/kg, as indicated by improved survival rates, prolonged lifespan, and better liver-to-body weight ratios. The HPAC values confirmed the high hepatoprotective activity of Sample M-1 at this dose. Additionally, the 10 ml/kg dose showed a significant reduction in liver damage markers compared to the control group. The body weight dynamics of the treated mice also indicated better overall health compared to the untreated group. These results suggest that Sample M-1 not only protects the liver but also supports overall recovery in mice with acute toxic hepatitis.

Conclusions: The findings suggest that Sample M-1 possesses strong hepatoprotective properties, particularly at a dose of 10 ml/kg. This makes it a promising candidate for further development as a therapeutic agent for acute toxic hepatitis.

References:

1. Aydeniz B., Guneser O., Yilmaz E. Physicochemical, Sensory and Aromatic Properties of Cold Press Produced Safflower Oil. *J. Am. Oil Chem. Soc.* 2013;91:99–110. doi: 10.1007/s11746-013-2355-4.2. Johnson, L. et al. (2019).
2. Barmak MJ, Nouri E, Shahraki MH, Ghalamfarsa G, Zibara K, Delaviz H, Ghanbari A. Safflower seed oil, a rich source of linoleic acid, stimulates hypothalamic neurogenesis in vivo. *Anat Cell Biol.* 2023 Jun 30; 56(2):219-227. doi: 10.5115/acb.22.220. Epub 2023 Mar 27. PMID: 36967238; PMCID: PMC10319475.
3. Cho S.-H., Jang J.-H., Yoon J.Y., Han C.-D., Choi Y., Choi S.-W. Effects of a safflower tea supplement on antioxidative status and bone markers in postmenopausal women. *Nutr. Res. Pr.* 2011;5:20–27. doi: 10.4162/nrp.2011.5.1.20.
4. Dajue IL, Munde HH, Carthamus Tinctorius. *Международный институт генетических ресурсов растений; Рим, Италия: 1996. Safflower; стр. 10.5.* Wang, Y. et al. (2016). "The role of oxidative stress in CCl4-induced hepatotoxicity." *Free Radical Biology and Medicine*, 90, 1-10.
5. Ghareghani M, Zibara K, Azari H, Hejr H, Sadri F, Jannesar R, Ghalamfarsa G, Delaviz H, Nouri E, Ghanbari A. Safflower seed oil, containing oleic acid and palmitic acid, enhances the stemness of cultured embryonic neural stem cells through notch1 and induces neuronal differentiation. *Front Neurosci.* 2017;11:446. doi: 10.3389/fnins.2017.00446.66efc589a6fa45e19842f4d4ae55e563