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Hyparrhenia hirta: A Potential Protective Agent against DNA Damage and Liver Toxicity of Sodium Nitrate in Adult Rats

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Abstract : The present study investigated the protective role of Hyparrhenia hirta on nitrate-induced liver damage. Experiments were carried out on adult rats divided into 3 groups, a control group and two treated groups. NaNO3 was administered daily by oral gavage at a dose of 400 mg/kg bw in treated groups either alone or coadministered with Hyparrhenia hirta methanolic extract via drinking water at a dose of 200 mg/kg bw for 50 days. Liver toxicity induced by NaNO3 was characterized by higher serum levels of glucose, total cholesterol and triglyceride and lower serum total protein than those of controls. Transaminases and lactate deshydrogenase activities in serum were elevated indicating hepatic cells' damage after treatment with NaNO3. The hyperbilirubinemia and the increased serum gamma glutamyl transferase activities suggested the presence of cholestasis in NaNO3 exposed rats. In parallel, NaNO3 caused oxidant/antioxidant imbalance in the liver as reflected by the increased lipid peroxidation, the decreased total glutathione content and superoxide dismutase, catalase and glutathione peroxidase activities. Nitrate caused also a significant induction of DNA fragmentation as evidenced by the presence of a smear without ladder formation on agarose gel. Hyparrhenia hirta supplementation showed an improvement of all parameters cited above. We conclude that the present work provides ethnopharmacological relevance of Hyparrhenia hirta against the toxic effect of nitrate, suggesting its role as a potential antioxidant.

Keywords : Hyparrhenia hirta, liver, nitrate toxicity, oxidative stress, rat
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