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Acute and Subacute Toxicity of the Aqueous Extract of the Bark Stems of Balanites aegyptiaca (L.) Delile in Wistar Rats

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Abstract : Background: Throughout West Africa, Balanites aegyptiaca (BA), or Zygophyllaceae, is widely used in traditional medicine to treat diabetes, hypertension, inflammation, malaria and liver disorders. In our recent research, we found that BA has nephroprotective potential against diabetes mellitus, hypertension and kidney disorders. However, to our knowledge, no systematic studies have been carried out on its derivative (toxicity) profile. Aim of the study: The study was conducted to assess the potential potency of the hydroalcoholic extract of BA bark in rats by the acute and sub-acute oral route. Materials and methods: Male and female rats in the acute depression study received BA extract orally at single doses of 500 mg/kg, 2000 mg/kg, 3000 mg/kg and 5000 mg/kg (n = 6 per group/sex). To assess acute depression, abnormal behaviour, toxic symptoms, weight and death were observed for 14 consecutive days. For the subacute impairment study, Wistar rats received the extract orally at doses of 125, 250 and 500 mg/kg (n=6 per group/sex) per day for 28 days. Behaviour and body weight were monitored daily. At the end of the treatment period, biochemical, haematological and histopathological examinations were performed, and gross and histopathological examinations of several organs were carried out. To determine the presence or absence of phytochemicals, the BA extract was subjected to gage phage chromatographic examination. Results: The absence of absorption chromatography of BA indicates the absence of cyanide groups. This suggests that the BA extract does not contain toxic substances. No mortality or adverse effects were observed at 5000 mg/kg in the acute depression test. With regard to body weight, general behaviour, relative organ weights, haematological and biochemical parameters, BA extract did not induce any mortality or potentially treatment-related effects in the sub-acute study. The normal architecture of the vital organs was revealed by histopathological examination, indicating the absence of morphological alterations. Conclusion: BA extract administered orally for 28 days at doses up to 500 mg/kg did not cause toxicological damage in rats in the present study. The median lethal dose (LD50) of the extract was estimated to be over 5000 mg/kg in an acute hyperglycaemia study.

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