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A toxicological Study of Aqueous Bark Extract of *Gmelina arborea* in Wistar rats

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Introduction: Medicinal plants are of great concern as a re-emerging health aid globally. However the general acceptability of herbal medicines has been limited by inadequate toxicity data to evaluate their safety. Therefore it has become imperative to assess the safety of medicinal plants for possible toxicity. The *in vivo* acute antihyperglycaemic activity of the aqueous bark extract of *Gmelina arborea* (Verbenaceae) was proven previously by our group. However, the safety profile of the aqueous bark extract is yet to be scientifically investigated. The present study aims to determine the acute and chronic toxic effects of aqueous extract of *G. arborea* in healthy male rats.

Methodology: The healthy Wistar rats (n=6) were divided into eight groups. Group 1 consisted of untreated healthy rats. Group 2-7 were healthy rats administered a single dose of bark extract of *G. arborea* at 0.25, 0.50, 0.75, 1.00 (minimum effective dose), 1.25 and 2.00 g/kg orally. The general behavior of animals was continuously monitored for the next 24 hours and thereafter for two days. The chronic single dose toxicological effect of the extract was determined in healthy rats receiving the aqueous bark extract of *G. arborea* (1.00 g/kg) for 30 days. At the end of the study full blood count, serum concentration of alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP), relative weight of organs (heart, lung, liver, pancreas, kidney and spleen) were determined and a histopathological study on body organs was performed. Results were compared with untreated healthy rats.

Results: All animals were physically active and no death was observed up to the dose of 2.00 g/kg in the acute toxicity study. The haematological parameters, serum concentration of liver enzymes and relative organ weight did not differ significantly in treated rats as compared to the untreated healthy rats ($p<0.05$). The histopathological study revealed no treatment-related gross cellular changes in vital organs in treated rats.

Conclusion: The acute toxicity study suggests that aqueous extract of *G. arborea* is safe in healthy rats up to a dose of 2.00 g/kg. Further, the repeated administration of the extract at a dose of 1.00 g/kg was found to be toxicologically safe as a potential antihyperglycaemic plant extract for further investigations.

Keywords: *Gmelina arborea*, toxicological study, acute and chronic dose toxic effects