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Proceedings

Toxicity and phytochemical studies on the root of *Icacina tricantha* (Icacinaceae)

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Abstract

Purpose: To investigate the acute and sub-acute toxicity of the methanol extract of the root tuber of *Icacina tricantha*.

Methods: The toxicity of the methanol extract of the root tuber of *I. icacina* was investigated by administering a single dose of 1.0 g/kg on male and female albino mice and observing and evaluating them for parameters of toxicity after 24 hours and 14 days.

Results: At 24 hours there were no visible signs of toxicity, and no death occurred. However, there was a significant ($p < 0.05$) decrease in temperature of the treated group after 24 hours compared to control. There was also a slight increase in body weight of male animals compared to the female animals, while no changes were observed with respect to organ weight and histological parameters after same time.

There was equally a significant decrease ($p<0.001$) in the lymphocytes and mean corpuscular volume of treated animals compared to control, which did not present after 14 days. No death or visible signs of toxicity was observed after 14 days.

Conclusion: The findings of this study suggest that the extract of *I. icacina* may be safe at this dose.

Keywords: *Icacina tricantha*, Icacinaceae, Toxicity, Haematological, Histology

Indexing: Index Copernicus, African Index Medicus

Background

Icacina tricantha is a very small shrub that produces large tubers known as "false yams." It belongs to the family of plants known as Icacinaceae [1]. The root is used as a source of food and in the management of several disease conditions which include; soft myelomas, male sexual dysfunction, toothache, rheumatism and helminthic infections. It is equally used as an abortifacient in ethnomedicine [2]. Anti-inflammatory, analgesic, hepatoprotective, antioxidant, antimicrobial and anti-diabetic activities have been cited for extracts of the plant [3]. It has been reported that prior to eating, the root is soaked in water for several days to remove "bitter principles" contained in it [2]. This suggests the possible presence of toxic principles in the plant. However, there is no report of any toxicity evaluation on the plant hence, this study was undertaken.

Aim/Objectives

The purpose of this study was to investigate the toxicity of the methanol extract of the plant under investigation on mice and to determine the nature of phytochemicals present in it.

Materials and Methods

The root of the plant was collected around the Ugbowo Campus area of the University of Benin, in Ovia North East Local Government Area of Edo State. It was identified by Dr O. Osahon of the Department of Plant Biology and Biotechnology, Faculty of Life Sciences, University of Benin, and the voucher number

UBH 326 was assigned to it. The plant material was cleaned, dried and milled to fine powder and extracted with methanol using the Soxhlet apparatus. The Extract was concentrated and its acute and sub-acute toxicity effects on male and female albino mice (18-22 g) was evaluated using the 24 hours and 14 days single dose test protocol according to the method of Bafor and Igbinuwen [4] at a dose of 1.0 g/kg following ethical approval. Parameters monitored include; temperature, body weight and organ weight. Haematological analysis was carried out on the blood obtained via cardiac puncture from the animals, while histological analysis was carried out on organs such as the heart, liver, kidney, brain, stomach and uterus for the female animals and testis for the male animals. The dried plant material was used for the qualitative phytochemical investigation, using standard procedures as outlined by Harbone [5].

Results

At 24 hours, there were no visible sign of toxicity, and no death occurred. However, there was a decrease in temperature of the treated group compared to control. There was also a slight increase in body weight of male animals compared to the female animals, while no changes were observed with respect to organ weight and histological parameters. There was a significant decrease ($p<0.001$) in the lymphocytes and mean corpuscular volume of treated animals compared to control. At 14 days, no death was recorded and no significant differences were observed in body temperature, body weight or organ weight. Also no significant ($p < 0.01$ and $p< 0.05$) difference was observed in the hematological parameters studied. There was an increase in the number of uterine glands in the female animals treated compared to control. The presence of carbohydrate, tannins, saponin and cardiac glycoside were indicated in the plant.

Conclusion

The methanol extract of *Icacina tricantha* have been shown to be relatively safe from this study which may justify its continued use in ethnomedicine for the management of various diseases. However, further investigation is needful to determine its chronic toxicity and its effect on biochemical parameters.

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