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Study of acute toxicity of an aqueous abstract obtained from the flowers of *Kigelia africana* in Balb/c mice

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Abstract:
Kigelia africana is used in traditional medicine and toxicological effects of the different extracts of the fruit, bark of the stem and leaf but not of its flowers have been reported, so the present investigation aims to determine the toxic potential of the aqueous extract obtained from the flowers of *Kigelia africana* by the acute toxic class method in Balb/c mice. An aqueous extract of the flowers was obtained, which was administered orally at a single dose of 50, 500 and 2000 mg/kg and three Balb/c mice of different sexes were used in each level. With the administration of 50 and 500 mg/kg doses, 100% survival was obtained, the daily systematic observations, the macroscopic analysis of the organs and their body weight showed no evidence of any sign of toxicity unlike the doses of 2000 mg/kg where the deaths were observed in 48 hours being the main clinical symptoms depression of the central nervous system and polyuria marked with signs and symptoms of dehydration. The product can be classified in category 4.

Keywords: *Kigelia africana*; acute toxic class method; Balb/c mice; aqueous extract; toxicological effects.

1. Introduction

Kigelia africana (Lam.) Benth is an arboreal species that is currently gaining great interest since the experiments on the effect of its extracts and some of its pure compounds have corroborated its medicinal properties[1]. Toxicological effects of the different extracts of the fruit, bark of the stem and leaf but not of its flowers have been reported[2]. So the present investigation aims to determine the toxic potential of the aqueous extract obtained from the flowers of *Kigelia africana* by the method of the acute toxic class in Balb/ c mice.

2. Results and Discussion

K. africana is a rich source of many chemical compounds as it is known in *Bignoniaceae* [3] so many of its therapeutic activities and folkloric use lies in this. The aqueous extract is the most commonly used in traditional African medicine and although the plant is not extremely toxic [2] in

our study the product can be classified in category 4. As a result of the administration of doses 50 and 500 mg/kg, it was obtained 100% survival, the daily systematic observations, the macroscopic analysis of the organs and their body weight showed no evidence of any signs of toxicity, unlike the doses of 2000 mg/kg where only one male survived and the deaths were observed in the first 48 hours, the main clinical symptoms were depression of the central nervous system and marked polyuria with signs and symptoms of dehydration. The results of acute toxicity in this study were supported by Farah, *et al* in 2017[4] who reported that the aqueous extract of the fruit administered orally in Wistar rats at a dose of 50, 500 mg/kg was well tolerated by the animals since there are no signs of toxicity such as restlessness, piloereccion, nasal or lacrimal secretions and non coordinated march. However, in 2000 mg/kg, unlike ours, they obtained 100% survival of the animals, but presented alterations in the hematological and biochemical parameters where hepatorenal toxic effects were evidenced as in our work (Fig 1).

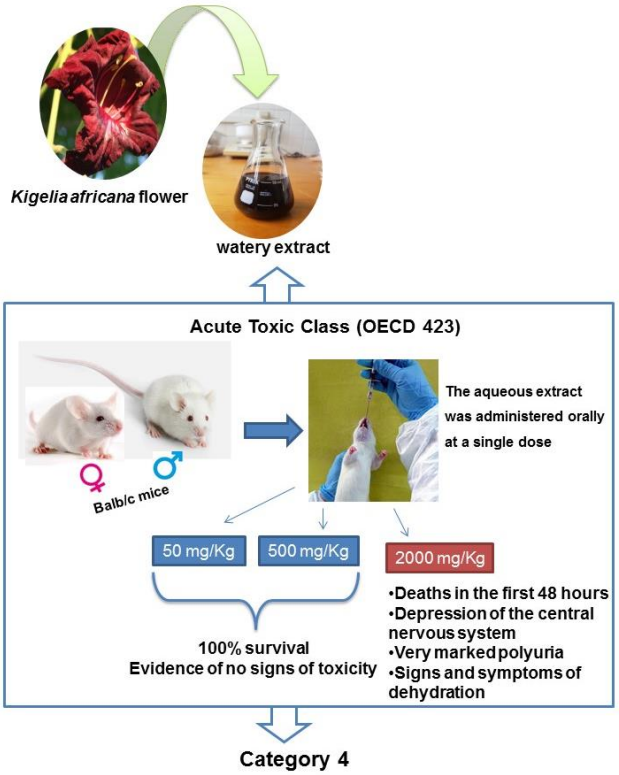

Fig 1.Experimental methodology used in acute toxicity class method

3. Materials and Methods

Fresh flowers of *Kigelia africana* were collected in the forest surrounding Botanical Garden of Central University of Las Villas. *Phytochemical procedure:* Aqueous extract (**KPAE**) was obtained by decoction. 50 g of dry flowers (powder) was boiled with distilled water (500 ml) in a balloon for 10 minutes and then allowed to cool to room temperature. To determine the quality of the drug used, we proceeded according to the methods of quality control for herbal materials by the World Health Organization [5], routinely applied in the Pharmaceutical Chemistry laboratory of the Faculty of Chemistry and Pharmacy of the Central University " Marta Abreu " of Las Villas.

Male and female Balb/c mice from the National Laboratory Animal Producer Center (CENPALAB) were used, which were kept at 25 ± 2 ºC, 12/12 h in a night / day cycle, with food and water *ad libitum*. Three dose levels of 50, 500 and 2000 mg / kg were evaluated and three Balb/c mice of different sexes were used in each level according to Organization for Economic Cooperation and Development (OECD) guidelines No.423 [6]. The aqueous extract was administered orally at a single dose and anatomopathological and weight studies were carried out.

4. Conclusions

The findings revealed that the aqueous extract of the leaves of *K. africana* in low doses was safe, but high dose can have hepatorenal toxic effects. More work is needed for the determination of LD50 as well as running a standard battery of toxicological tests since no single test is capable of providing the total safety of a product.

References and Notes

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