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Original Article

Acute toxicity and analgesic effect of aqueous extract of *Milletia vesicolor* Baker (Fabaceae)

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ABSTRACT

The aqueous extract of *Milletia vesicolor* (Fabaceae) was studied for toxicity and analgesic activity induced by acetic acid writings hot plate and tail flick reactions. No acute toxicity was observed at 200 to 3200 mg/kg; the results also revealed that the doses of 200, 400 and 800 mg/kg of extract were efficient on acetic acid induced writings and hot plate but not in tail flick reaction.

Key words: Acute toxicity, Analgesic effect, *Milletia vesicolor*

INTRODUCTION

Milletia vesicolor Baker is a plant which belongs to the family of Fabaceae close to 30 m of top and 60 cm large. It is a spicy met in the forest zones meadow of the pan Congolese and in the raised savannhas. It is very used in Congolese traditional pharmacopeia. Its leaves, barks and roots are used for primary health against lumbar pains, pains of kidneys, and rheumatisms, teeth pain and against the ascaris [1,2]. These pathologies are often followed by inflammatory syndromes. Pain is a data bound to the inflammation because every inflammatory reaction is followed by pain. Because of the dangerous character of its leaves described [2] and of the accidental death of a father and his two children after touching a decocted of this plant [3], it seems necessary for us to value first, the toxicity of leaves extract. The aim of this study is to evaluate the acute toxicity and the analgesic effect of the leaves of *Milletia vesicolor*.

MATERIALS AND METHODS

Material Collection and Extract: Animal material consisted of albinos mice of both sexes (18-25 g), housed in standard environmental conditions at the Faculty of Health Science of University Marien NGOUABI (Brazzaville-Congo)

Preparation: The plant leaves specimen was collected from Mossaka area (Department of Cuvette Central) in Congo-Brazzaville and was identified in the Botanic Laboratory Center of Study of Vegetal Resources (CERVE).The collected leaves of plants were previously washed, air dried during 10 days and grounded into powder, thanks to a mortar. 50 g of powder was subjected to decoction extraction with 500 ml of distillate water during 30 min. The solution was filtrated and concentrated at 55°C for pharmacological tests.

Acute toxicity: The letale dose is the minimal dose of a substance likely to drag the death of half animals by a unique administration after 72 hours of observation. In order to search for the letale dose, the acute toxicity was studied according to standard methods [4] for the dose of 200, 400, 800, 1600 and 3200 mg/kg. 6 shares of 3 mice each have been treated as follows:
- Share 1 or share witness received 0,5ml/100g of bodily weight of distilled water;
- Shares 2, 3, 4, 5 and 6 received the aqueous extract of the doses 200, 400, 800, 1600 and 3200 mg/kg of bodily weight respectively. Immediately after administration of the doses, the albino mice have been placed in cages for the macroscopic observation of the general behavior during 72 hours. The general state and mortality was appreciated in comparison to that the animal control.

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Analgesic activity: The method consists of provoking the cramps among the rat, by the injection of a diluted solution of acetic acid to 0.6% by intrapéritonéale way [5], has been used. The efficiency of the extract managed is function of the number of abdominal cramps observed. 5 shares of 5 mice each received 0.5ml/100g of water distilled respectively (share control); 200, 400 and 800 mg/kg of the extract and 50 mg/kg of paracetamol as reference product. An hour after the oral administration of the products, we injected acetic acid to 0.6% (10 ml/kg) to the mice by intrapéritonéale way. After 5 min of latency, the number of torsions achieved by every mouse is noted during 20 min. [6].

The percentage of the inhibition of the pain is given by the relation:

% Inhibition = $[(N_a - N_b) / N_a] \times 100$ (1)

N_a: Number of cramps among the animals treated to the distilled water (control)

N_b: Number of cramps among the animals treated to the aqueous extract

Hot plate [7] and tail flick [8] reaction to evaluate the analgesic effect after the oral administration of 200, 400 and 800 mg/kg of the aqueous extract was tested. Statistically the results were analyzed by using ANOVA, followed by student t test.

RESULTS AND DISCUSSION

The results of acute toxicity didn't show any modification of the general state of the animal that denotes a certain toxicity of the leaves. No mortality has been observed with the aqueous extract to the doses included between 200 and 3200 mg/kg. The DL50 could be certainly above the dose of 3200 mg/kg. The aqueous extract of *Milletia vesicolor* was therefore atoxiques contrary to the affirmations expressed by the first investigating (3). The farming populations use the aqueous extracts indeed more than organics. These results could reinforce the accidental hypothesis of death observed in Mossaka area. The research of analgesic effect (table 1) showed that, aqueous extract of *Milletia vesicolor* Baker reduced significally the painful abdominal contractions provoked by the acetic acid among the mice to the respective doses of 200, 400 and 800 mg/kg in relation to the witness, as well as the paracetamol (50 mg/kg) used as reference product (65.73%) which inhibits the abdominal cramps in relation to the control. The aqueous extract of *M. versicolor* doses used in tests protect very significally ($p < 0.001$) the mice against the abdominal contractions led by the acetic acid injection. The inhibition of the abdominal cramps lets think that the aqueous extract of *M. vesicolor* could act by the inhibition of the biosynthesis of the prostaglandins [5, 9]. The test of hotplate is a mixage of pain localized sharp and of sensation, by which is combined the two types of pain [10]. The results (table 2) reveal that the time of reaction increases very significally ($p < 0.001$) with the dose in relation to the witness as well as morphine (59.60 ± 4.00) min. These facts join and confirm the inhibition of abdominal cramp observed before in table1. It would explain the abundant use of this spicy comfortably by the populations for needs in care of primary health. The set of our results joins those of works achieved by other studies on the analgesic properties of other species[6,7,8].

Table 1: Effect of *M. vesicolor* leaves extract on acetic acid induced writings in mice

Treatment	Doses (ml or mg/kg)	Number of writhings	% of inhibition
Control	0,5 ml/100g	58.40 ± 1.32	-
Paracetamol	50	20.60 ± 2.03 (***)	65.73
Milletia vesicolor	200	36.20 ± 1.20 (***)	38.01
	400	28.00 ± 1.55 (***)	52.05
	800	29.00 ± 0.89 (***)	50.34

Values are means ± SEM of five animals differences from control were assessed statistically.
*** $P < 0.001$

Table 2: Effect of *M. vesicolor* leaves extract on hot plate induced writings in mice

Treatment	Doses (ml or mg/kg)	Reaction time (sec.)
Control	0,5 ml/100g	4.60 ± 0.67
Morphine	2	59.60 ± 4.00 (***)
Milletia vesicolor	200	19.40 ± 1.96 (***)
	400	21.60 ± 2.13 (***)
	800	30.20 ± 2.53 (***)

Values are means ± SEM of five animals differences from control were assessed statistically.
*** $P < 0.001$

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