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Anti-inflammatory effect induced by *Euphorbia tirucalli* latex

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ABSTRACT

The effect of *Euphorbia tirucalli* L. latex was studied by carrageenin-induced edema in hind paw of the rat method. It has been shown that *Euphorbia tirucalli* L. latex administrated at the dose of 100 mg/kg by oral route induces an anti-inflammatory effect that was more pronounced than the one induced by acetyl salicylic acid (ASA) 100 mg/kg.

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KEYWORDS

Euphorbia tirucalli L. latex;
Anti-inflammatory effect
in the rat.

INTRODUCTION

The latex of *Euphorbia tirucalli* L. (Euphorbiaceae) is used as an ointment in rheumatism, asthma, earache, cough, toothache and warts in traditional medicine^[7]. It is also used for skin tumors and syphilis ulcers^[2]. However, *Euphorbia tirucalli* L has been associated with Burkitt's lymphoma and thought to be a cofactor of the disease rather than a treatment^[5,6]. A biopolymeric fraction with anti-arthritis activity has been isolated from *Euphorbia tirucalli* L. It has particularly been demonstrated that this fraction induces dose dependent anti-arthritis activity and *in vivo* immunomodulatory capacity being a major component in inhibiting arthritis^[1].

In Tunisia, where *Euphorbia tirucalli* L. is a ornamental garden plant, the latex is locally used in popular medicine as anti-inflammatory drug especially in skin eczema. Hence, the present work was undertaken to test whether the plant latex possesses an anti-inflammatory activity in animals.

MATERIALS AND METHODS

Plant material

Latex from *Euphorbia tirucalli* L. was collected in spring from a garden located at 5 km from the coast in the region of Sfax, Tunisia where the plant was growing among fruit trees. Stems were incised into 1 to 2 cm fragments from the distal part and, the latex was collected from the proximal part of the stems in a sterile recipient.

Determination of the anti-inflammatory activity

Carrageenin-induced edema in hind paw of the rat method^[8] was used to test this activity. Experiments were performed on male Wistar rats weighing from 200 to 220g and obtained from an homogenous breeding center (Central Animal House, Tunisia Pharmaceutical Industries Society). The animals were divided into groups of 10 rats each. The drugs were administered orally (1 ml/100 g) one hour before the injection of the carrageenin suspension (0.05 ml). Carrageenin was

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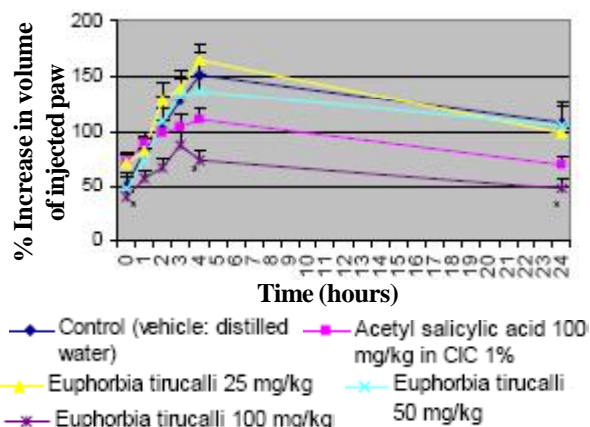


Figure 1: Carrageenin-induced paw edema (values are means and vertical bars represent s.e.m)

prepared as 1% suspension in distilled water. *Euphorbia tirucalli* L latex was administered orally as a suspension in distilled water at 25, 50 and 100 mg/kg to 10 rat groups. Two other groups of 10 rats each respectively received the vehicle (distilled water) and ASA 100 mg/kg (suspension in 1% CMC). Plethysmographic measurements^[4] were made before and 0.5, 1, 2, 3, 4 and 24 h after carrageenin injection. The percentages of increment in volume of injected paw were determined as:

$$\frac{V - V_0}{V_0} \times 100$$

Where V and V_0 are respectively the volume of injected and measured paw and the volume of initial and measured paw.

Statistical analysis

All results in the text, tables and figures are expressed as means \pm s.e.m. Statistical analysis of the results was performed by using Student's test.

RESULTS

Figure 1 shows that *Euphorbia tirucalli* L. latex did not induce any significant anti-inflammatory effect when it is administered to the rat at the doses of 25 and 50 mg/kg. However, the same figure shows that, when the latex is administered at the dose of 100 mg/kg, it induces an anti-inflammatory effect that is significant at $t = 4$ h and $t = 24$ h compared to control group ($p < 0.01$). Indeed, measurements at times $t = 4$ h and $t = 24$ h gave respectively an increase in volume of injected paw of $73.91 \pm 8.10\%$ and $47.67 \pm 9.67\%$ when the animals are treated by 100 mg/kg of *Euphorbia tirucalli* L. latex whereas, these percentages were of $151.19 \pm$

20.90% and $107.27 \pm 19.94\%$ when the animals are receiving the vehicle ($p < 0.01$). Compared to the anti-inflammatory effect induced by ASA 100 mg/kg, it is possible to notice that *Euphorbia tirucalli* L latex 100 mg/kg induced a more pronounced effect starting at $t = 0.5$ h giving an increase in volume of injected paw of $39.05 \pm 6.39\%$ versus $72.32 \pm 8.60\%$ when animals are treated by ASA ($p < 0.01$). This effect is also significant at $t = 4$ h and $t = 24$ h with a respective percentage of increase in volume of injected paw of $73.91 \pm 8.10\%$ and $47.67 \pm 9.67\%$ versus $110.46 \pm 10.37\%$ and $69.59 \pm 6.39\%$ when animals are treated by ASA 100 mg/kg ($p < 0.05$).

DISCUSSION AND CONCLUSION

The present work shows that *Euphorbia tirucalli* L. latex administrated to the rat at the dose of 100 mg/kg by oral route induces a significant anti-inflammatory effect. Compared to the one induced by ASA 100 mg/kg in the same animals, this effect is more pronounced, precocious and lasting in time.

The mechanism of action by which *Euphorbia tirucalli* L. latex induces an anti-inflammatory against carrageenin-induced paw edema needs to be clarified. It could result as suggested by Bani et al.^[1], from an immunomodulatory action induced by the plant.

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