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Anti-inflammatory activity and participation of the glutamatergic system on the antinociceptive activity of ethyl acetate phase of *Herisantia crispa* (L.) Briziсky

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Background

hrough the link between traditional knowledge and scientific knowledge, the importance of bioprospecting is the exploration and investigation of resources from flora and fauna in order to identify the active principles to obtain new products and processes. The integration of bioprospecting and pharmacology is an important strategy for biotechnological innovation. In this context, this study aims to contribute to the inception of a therapeutic option, particularly from natural sources, which can be effective in removing the main signs and symptoms of inflammation and pain, diminishing the problems related to drug resistance and the various toxic and side effects caused by drugs currently available. Herissantia crispa, known as malvaísco, belongs to the Malvaceae family [1] and various effects are related to this plant: antiulcer [2], antimicrobial [2] and antinociceptive [3]. The aim of this study was to evaluate the anti-inflammatory activity and participation of the glutamatergic system in the antinociceptive effect of the ethyl acetate phase of Herissantia crispa (FAEHc).

Methods

Swiss male mice, 25 - 35 g, divided into experimental (250, 500 or 750 mg/kg), control (vehicle) and standard (dexamethasone or MK-801) groups. All procedures were approved by the Ethics Committee (CEUA) at UFPB, # 0106/10. Carrageenan (1%) was administered into the right hind paw in the carrageenan-induced paw edema assay. Paw thickness was measured 1, 2, 3, 4, 6 and 24 hours later. In the test of glutamate-induced nociception all animals were observed individually for 15 min, following glutamate injection (20 µL) into the right hind paw. Values were analyzed by one-way ANOVA followed by Dunnett's post-test's, expressed as mean ± sem and percentage (n = 8). Results with $P < 0.05$ were considered statistically significant.

Results

In the carrageenan-induced edema assay, FAEHc (250, 500 and 750 mg/kg) after one hour, reduced the paw edema 40%, 50% and 50% respectively compared to the control group (1.0 ± 0.1 cm). After two hours, FAEHc reduced 250 (40%), 500 (60%) and 750 mg/kg (40%) compared to control (1.0 ± 0.1 cm). At the third hour, FAEHc reduced 250 (45.5%), 500 and 750: (54.5%) compared to control (1.1 ± 0.1 cm). at the fourth hour FAEHc showed similar reduction of edema at all doses (46.2%) compared to control (1.3 ± 0.1 cm). At the sixth hour, 250: (36.4%), 500: (45.4%) and 750: (36.4%) compared to control (1.1 ± 0.1 cm). 24 hours after treatment FAEHc reduced 250 (57.1%), 500 (71.4%) and 750 (57.1%) respectively, compared to control (1.4 ± 0.1 cm). 24 hours after administration of carrageenan, dexamethasone reduced edema at 1 hour: 40.0%, 2 hours: 60.0%, 3 hours: 54.4%, 4 hours: 69.2%, 6 hours: 63.6% and 24 hours: 50.0%. The results showed suggest that FAEHc has antiedematogenic effect. FAEHc (750 mg/kg) showed significant reduction in paw licking time by 84.0% compared to control (56.9 ± 3.9s); since FAEHc decreased the effect produced by glutamate, it is possible that its antinociceptive effect is related to glutamatergic system. The results of this study indicate that FAEHc has glutamatergic- related antinociception and anti-inflammatory properties.

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