

Evaluation of cytotoxicity and genotoxicity of essential oil of *Xylopi* *frutescens* Aubl. (Annonaceae)

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Introduction: Currently, cancer biology is one of the main lines of research, concerning the development of new chemotherapeutic agents. Assuming that plants and drugs derived from plants have an impressive array of structures and functions, it is clear that they can be the source of new drugs for cancer chemotherapy. *Xylopi frutescens* Aubl., popularly known as "embira", "semente-de-embira" and "embira-vermelha", is rarely reported in the literature both from the phytochemical and pharmacological aspects. Preliminary data suggest that the essential oil from the leaves of *Xylopi frutescens* (O.E.X.) has antitumor activity and, thus, it's essential to study its toxicity. **Objectives:** To evaluate the cytotoxicity against erythrocytes of mice and *in vivo* mutagenic potential of the O.E.X. (the micronucleus test in peripheral blood). **Methods:** Blood from Swiss mice were suspended in phosphate buffer solution (PBS) to obtain a cell suspension at 0.5% (v / v). Then the O.E.X. solubilized in DMSO (5%) was added to cell suspension, which in turn was incubated for 60 min in a homogenizer, centrifuged, and then the supernatant was carefully removed. After removal, it was added a solution of Triton X-100 (0.1%) as positive control. The amount of hemolysis caused by the solution of Triton X-100 was determined spectrophotometrically at 415 nm to determine the concentrations that produce 50% hemolysis (CH₅₀). The negative control (PBS) was also used. For evaluating the genotoxicity, Swiss mice (n = 6) were treated with different doses of O.E.X. (100 and 150 mg / kg). After 24 h of treatment, the mutagenic potential was measured in peripheral blood by determining the frequency of micronucleated erythrocytes. Cyclophosphamide (50 mg / kg) was the positive control. The hemolysis experiments were carried out in quadruplicates, and CH₅₀ was calculated by nonlinear regression with a confidence interval of 95%. For *in vivo* testing, we calculated the mean ± standard error of mean (p < 0,05 was significant). **Results:** The percentage of hemolysis increased concentration dependent manner following treatment with the O.E.X., which produced a 100% hemolysis at concentrations from 375 µg / mL. The CH₅₀ value obtained was 63.87 (57.22 to 71.30) µg / mL, demonstrating that the O.E.X. was active against erythrocytes, these cells commonly affected in the treatments with antineoplastic agents. Studies have shown that the mechanism of cytotoxicity of compounds capable of inducing lysis of erythrocytes at concentrations below 200 mg / mL, is related to damage to the membrane. The O.E.X. did not induce significant increase in the frequency of micronucleated erythrocytes. The values for negative and positive controls were 4.33 ± 0.61 and 26.00 ± 5.01 and 2.67 ± 0.21 and 4.17 ± 0.48 for the O.E.X. (100 and 150 mg / kg), respectively. The *in vivo* data suggest that O.E.X. is not genotoxic, which represents one of the most important safety data, of the preclinical studies. **Conclusions:** The O.E.X. presents considerable toxicity against murine erythrocytes and does not have genotoxic potential under the conditions tested.

Keywords: *Xylopi frutescens*. Essential oil. Cytotoxicity. Genotoxicity.