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Protective effect of diterpene manool against doxorubicin-induced DNA damage in V79 cells

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Statement of the Problem: *Salvia officinalis* is a plant species used in cooking and with many therapeutic properties, such as anti-inflammatory, antiseptic and eupeptic. Phytochemical studies of this species have identified diterpenes as their main special metabolites. Among the diterpenes of *S. officinalis*, manool is notable for its anti-microbial activity, chemopreventive activity in HepG2 (human hepatocarcinoma) and antiproliferative effect in different tumoral cell lines. In this sense, to better understand the action of manool on genetic material, the present study aimed to evaluate the modulating effect of diterpene on *doxorubicin* (DXR)-induced genotoxicity in V79 cells (Chinese hamster lung fibroblast). For this purpose, the cell cultures were treated simultaneously, for three hours, with three different concentrations of manool (0.5, 1.0 and 2.0 µg/mL) and DXR (0.5 µg/mL). Negative (without treatment) and solvent (DMSO, dimethylsulfoxide, 1%) control groups were included. The micronucleus assay with blocking of the cytokinesis was used to determine the frequency of micronuclei in V79 cells submitted to the different treatments.

Findings: The results showed that manool at the lowest concentration tested (0.5 µg/mL) could reduce the frequency of micronucleus induced by the mutagen. The reduction was approximately 65%.

Conclusion & Significance: In view of the above, it can be concluded that manool presented a protective effect against doxorubicin-induced genotoxicity. The action on free radicals or on the enzyme topoisomerase II can be possible mechanisms by which the diterpene revealed chemopreventive capacity. Furthermore, the anti-inflammatory effect proves to be involved in this preventive process, since parallel studies developed by our research group indicated that manool can significantly reduce the levels of nitric oxide produced by *macrophages*.

Biography

Nicolella H D has completed her graduation in Biomedicine in 2014, at University of Franca, Franca, and Sao Paulo, Brazil. Currently, she is a Postgraduate student in University of Franca. She has developed research studies in genetic toxicology of natural products, whose results are published in reputed journals.

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