

PP111. Evaluation of the anticancer potential of *Aloysia citriodora* and its major components, isomeric citral, and their potential synergy with conventional chemotherapeutic drugs in human colon carcinoma

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Aloysia citriodora Palau (syn. *Lippia citriodora* (Palau) Kunth), commonly known as lemon verbena, is a perennial shrub, belonging to the family Verbenaceae, with a very pleasant lemony aroma that was first cultivated in South America and brought to Europe in the 17th century [1]. While its aqueous extracts have been studied a lot for their biological properties, few studies exist on the bioactivities of the essential oil [2]. We previously identified citral (geranial and neral) as the main component of the lemon verbena essential oil (LVO) isolated from Greek plants and showed that they both possess significant antiproliferative activity, with LVO being less genotoxic and more cytoprotective than citrals *in vitro* [3]. The aim of this study was to investigate the mode of antiproliferative action of LVO/citral and their potential synergy effects with conventional chemotherapeutic drugs used in the treatment of colorectal cancer and further study the molecular mechanisms of cytotoxicity of these combinations. Flow cytometry analysis revealed a G2/M arrest of colon cancer cells (Caco2, HT-29) after the treatment with the oil and citral. Neither the oil nor citral induced caspase-dependent cell death, while LVO did not alter significantly the expression of a number of proteins related to apoptosis (Caco2), apart from the proteins survivin, claspin, TRAILR2, clusterin, HSP60, and Fas. Sulforhodamine B assay was conducted after a co-incubation of LVO or citral with irinotecan or oxaliplatin, where both agents showed a synergistic effect with the drugs. Our results further deepen our understanding of the bioactivities of lemon verbena essential oil and citral for their future use as chemopreventive or chemotherapeutic agents in the battle against cancer.

References:

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