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Towards a sustainable future

Book of Abstracts

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Evaluation of biological activity and optimization of lavender essential oil extraction (*Lavandula angustifolia* L.)

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Medicinal and aromatic plants (MAPs) are an important source of natural products, which have gained importance as alternatives in the prevention and treatment of diseases, besides being used as raw material for various industries [1]. *Lavandula angustifolia* L. is one of the most famous aromatic and medicinal plants [2]. Due to its composition, the essential oil of *L. angustifolia* is reported to have analgesic, sedative, antiseptic, diuretic, cytotoxic, anti-inflammatory, and antioxidant properties [3].

In this sense, the lavender essential oil was obtained by two different methodologies, conventional hydrodistillation by clevenger apparatus according to the European Pharmacopoeia, and non-conventional, microwave-assisted hydrodistillation, in which an experimental design was carried out to optimize the process. The optimal point was obtained by a Response Surface Methodology (RSM), using three variables, namely, Time (minutes),Temperature (ºC), and Power (W) to obtain high contents of linalool and linalool acetate, for which biological activities, such as antimicrobial, have been described.

The oils obtained were analyzed by gas chromatography coupled to mass spectrometry, verifying the predominance of oxygenated monoterpenes (79.5-86.4%), with linalool (30.2-29.99%) and linalool acetate (25.6-37.7%) as the main compounds.

Antioxidant activity was evaluated through three in vitro methodologies, namely reducing power (RP), 2,2-diphenyl-1 picrylhydrazyl (DPPH) radical-scavenging activity and cellular antioxidant activity (CAA). Furthermore, cytotoxicity activity was evaluated by the sulforhodamine B method, and antimicrobial activity was tested by the microdilution method.The results obtained show that lavender essential oil exhibits an excellent antioxidant, anti-inflammatory and antimicrobial activity, with particularly interesting results for fungistatic activity. Among the obtained essential oils, the microwave extracts rich in linalool and the extract obtained by clevenger hydrodistillation showed the best results for DPPH and PR assays, while no significant differences were obtained for the cellular antioxidant activity assay and anti-inflammatory activity. The extract obtained by clevenger showed better performance in antimicrobial activity. The oils showed cytotoxic activity for liver cells at the maximum concentration tested, and no toxicity was observed for the concentrations presenting anti-inflammatory activity.

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