

TITLE: CHEMICAL COMPOSITION AND ANTIMICROBIAL ACTIVITIES OF *Schinus molle* ESSENTIAL OILS

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ABSTRACT:

The essential oils (EO) are mixtures of volatile compounds, usually odoriferous and liquid obtained from leaves, roots, bark and seeds. Many have antimicrobial activities, and thus potential alternatives for use in the therapy of infectious diseases in humans or animals. Among the numerous plant species already studied, *Schinus molle* ("aroeira-salsa") (Anacardiaceae family), plant usually employed in landscaping, had its antibacterial and antifungal action studied, suggesting so the expansion of the knowledge of its chemical composition and action on various bacteria and fungi, mainly pathogenic fungi and bacteria resistant to conventional antibiotics. Thus, we aim to determine the chemical composition of the essential oil of *S. molle*, evaluate its antimicrobial and antifungal activity, as well as determining if there are synergistic actions with drugs used in infectious diseases treatment. The EO was extracted from plant biomass (branches and leaves) using the methodology of steam drag and chemical composition was determined by gas chromatography-mass spectrometry (GC/MS). The antibacterial properties were assessed by microdilution (REMA-Resazurin Microtiter Assay) and the minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) were performed against *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Escherichia coli*, *Enterococcus faecalis* and Methicillin-resistant *Staphylococcus aureus* (MRSA) strains. The antifungal properties were by serial dilution, when the concentration from 2.44 to 5000 µg mL⁻¹ against ten fungal strains (*Candida albicans*, *Candida guilliermondii*, *Cryptococcus neoformans*, *Paracoccidioides brasiliensis* and *Trichophyton mentagrophytes*) were performed. The EO of *S. molle* showed presence of monoterpenes, and α-pinene in the majority (19.67%), β-pinene (26.51%), myrcene (12.13%), epi-α-cadinol (10.35%) and sabinene (5.27%). Three of the bacteria showed MIC in concentrations tested, the most sensitive was *E. faecalis*, which presented a MIC of 2500 µg mL⁻¹, while the MRSA and *A. baumannii* presented MIC 5000 µg mL⁻¹. The bacteria MRSA and *E. faecalis* showed a MBC of 5000 µg mL⁻¹. About the fungi strains, half of them were sensitive to this EO in relatively low concentrations and the MIC of *Cryptococcus neoformans* and *Trichophyton mentagrophytes* was 625 µg mL⁻¹ and 39 µg mL⁻¹ against *Paracoccidioides brasiliensis*. In conclusion, we can see a variation of EO composition compared to literature, which can be explained by the secondary metabolism and influence of the environmental factors and/or physiological plants. Thus, the inhibitory activities of the EO against three bacteria and five fungi, especially *P. brasiliensis*, encourages future investigations aiming potential use in the treatment of infectious diseases.

Keywords: Essential oils, *Schinus molle*, antimicrobial activity, synergistic antibacterial activity.

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