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Rose-scented Geranium Essential Oil: Chemical composition, Antibacterial and Antifungal effects in vitro and a Real Food System (Orangina Fruit Juices)

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Background: In spite of the use of all available means of food protection, spoilage of foods is still a major problem in different parts of the world. Yeasts and filamentous fungi are widely distributed in nature and are responsible for the microbiological spoilage of an extensive range of food. Alternative sources of safe, effective and acceptable natural preservatives need to be explored, such as essential oils. Natural antimicrobials can be used alone or in combination with other novel preservation technologies to facilitate the replacement of traditional approaches in food preservation.

Material/Methods: The antifungal activity of Algerian rose-scented geranium (Pelargonium graveolens L'Hérit.) essential oil (RGEO) was evaluated against several pathogenic yeasts and filamentous fungi through disc diffusion and vapour diffusion methods. The chemical profile of RGEO, characterized through Gas Chromatography-Mass Spectrometry analysis, revealed citronellol (29.13%), geraniol (12.62%) and citronellyl formate (8.02%) as major components. RGEO exhibited promising antifungal effect against Candida albicans and Aspergillus niger, with different inhibition zone diameters (IZD) (45–30 mm). Significantly, higher anti-Candida activity was observed in the vapor phase. C. albicans and C. famata were inhibited completely by the RGEO vapors at 60 µL per disc. Moreover, the zone of inhibition increased with increasing oil volume. Furthermore, the anti-yeast efficacy of RGEO, alone and in combination with thermal treatment was evaluated in a real food system (Orangina fruit juices). Results confirmed the effectiveness of RGEO in providing an immediate and significant protection of Orangina juice to yeast proliferation. Using the fragrance of geranium as a food preservative seems fully justified.

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