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# In Vitro Study of the Antifungal Activity of Essential Oils Obtained from Mentha spicata, Thymus vulgaris, and Laurus nobilis

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## Abstract

**Background:** The aim of this study was to determine the antifungal activity of the essential oils isolated from three aromatic plants against 13 filamentous fungal strains.

**Methods:** The major constituents of Mentha spicata, Thymus vulgaris, and Laurus nobilis essential oils were carvone (52.2%), linalool (78.1%), and 1,8-cineole (45.6%), respectively. There are also some patents suggesting the use of essential oils as natural and safe alternatives to fungicides for plant protection.

**Results:** In the present work, M. spicata essential oil exhibited the strongest activity against all tested fungi in which Fusarium graminearum, F.moniliforme, and Penicillium expansum were the most sensitive to mint oil with lower minimal inhibitory concentration (MIC) and minimal fungicidal concentration (MFC) values of 2.5 µL mL-1 (v/v). Thymus vulgaris essential oil was less active compared to the oil of M. spicata. Aspergillus ochraceus was the most sensitive strain to thyme oil with MIC and MFC values of 2.5 and 5 µL mL-1, respectively. Thymus vulgaris essential oil also exhibited a moderate fungicidal effect against the tested fungi, except for A. niger (MFC >20 µL-1). L. nobilis essential oil showed a similar antifungal activity with thyme oil in which A. parasiticus was the most resistant strain to this oil (MFC >20 µL mL-1).

**Conclusion:** Our findings suggested the use of these essential oils as alternatives to synthetic fungicides in order to prevent pre-and post-harvest infections and ensure product safety.

**Keywords:** Antifungal activity; Laurus nobilis; Mentha spicata; Thymus vulgaris; chemical composition; essential oil.



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