

A099 Rapid methods for the comparative analysis of antibacterial and free radical scavenging activity of essential oils

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Essential oils are well known as strong antimicrobials and are used in cosmetics, pharmaceutical and foodstuff industries. Recent studies (1) suggest that pharmacological activities of essential oils may be related to their antioxidant properties. In this study, TLC-methods (dot-blot technique) were evaluated for comparative analysis of antibacterial and scavenging activity of essential oils. The essential oils were isolated by the hydrodistillation from the aerial parts of following plant species: *Ocimum basilicum* L., *Origanum vulgare* L. and *Thymus vulgaris* L. Scavenging activity of essential oils was confirmed by following the neutralisation of DPPH[•]-radical (2). Antioxidants reduce the radical form of DPPH, producing yellow spots on a purple background. Bioautography is a very convenient and simple way of testing plant extracts for their effects on different pathogenic microorganisms. However, in the case of essential oils, this method has to be modified, due to their low ability to diffuse in media. In the present study, combination of three techniques (3) -TLC, bioautography and agar diffusion (with tetrazolium salt (MTT)- were applied. After incubation, MTT was converted to a formazan dye by the microorganism. Inhibition zones were observed as clear spots against a purple background. The results of present study point out that the most powerful compounds in examined essential oils were oxygenated monoterpenes such as thujones, menthone, carvone, thymol. Some of these compounds also exhibited strong antibacterial effects (thujones, carvone, thymol). Both methods were confirmed as very successful for fast and precise identification of bioactive compounds in essential oils.

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A100 Evaluation of the radical scavenging activity of distilled and non-distilled fennel in relation to its phenolic composition

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Fennel (*Foeniculum vulgare* Mill., Apiaceae) is a herb of commercial interest for its essential oils. Although it contains other non-volatile compounds such as flavonoids (1), it has not received much attention with regard to its pharmacological properties. The aim of this work is to evaluate the radical scavenging activity of both distilled and non-distilled fennel in relation to its chemical composition. Two extracts (crude and defatted) and four fractions (hexane, dichloromethane, ethylacetate and aqueous) of different polarity were evaluated for their antiradical activity by the DPPH, superoxide-nitroblue tetrazolium (NBT) hypoxanthine/xanthine oxidase, and luminol/chemiluminescence methods. The total phenolic content (TPC) was also determined by the Folin-Ciocalteu method. The highest TPC values (549 GAE/mg) and DPPH (IC₅₀ 11.7) and superoxide radical (89 % inhibition) scavenging activities were found in the ethylacetate fractions. The highest activity in the luminol/chemiluminescence method was shown by the dichloromethane fractions (IC₅₀ 4.9). In general, distilled material was found to exhibit a higher radical scavenging activity than the non-distilled one. Extracts and fractions were chromatographed by RP-HPLC (2) to identify polyphenols, as chlorogenic acid, coumaric acid, vanillic acid, vanillin, caffeic acid, syringic acid, sinapinic acid, and quercetin. A bioguided isolation procedure (3) was carried out to isolate and identify these active compounds. The obtained results support the possibility that fennel waste can be regarded as an easily accessible source of natural antioxidants.

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