Chemical composition and antimicrobial activity of the essential oils of selected Apiaceous fruits

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Abstract

Antimicrobial properties of plants essential oils are continuously investigated to use them as potential drug candidates to overcome the problem of microbial drug resistance. The aim of this research is to study the antimicrobial effects of the essential oils of ten Apiaceous fruits [Pimpinella anisum L. (anise), Carum carvi L. (caraway), Apium graveolens L. (celery), Coriandrum sativum L. (coriander), Cuminum cyminum L. (cumin), Anethum graveolens L. (dill), Foeniculum vulgare L. (fennel), Petroselinum crispum L. (pasley), Daucus carota L. var. sativus (yellow carrot) and Daucus carota L. var. boissieri (red carrot)].

Results of agar-well diffusion method revealed that the maximum inhibition zones were obtained with cumin, coriander and caraway oils against the standard bacterial strains Escherichia coli, Bordetella bronchiseptica followed by Staphylococcus aureus.

Results of viable count time-kill method revealed that coriander oil had the highest antimicrobial activity with more than 99.99% killing of the exposed cells of the standard E. coli and Bordetella bronchiseptica standard strains. GC/MS was carried out to identify the chemical composition of the most active oils. The percentage of identified compounds by GC/MS was 92.5%, 99.43% and 98.66% for cumin, coriander and caraway oils, respectively. Monoterpenes were the most abundant components in the three oils.

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