P41 Chemical composition, antifungal activity and citotoxicity of the essential oil of *Daucus carota* ssp. *halophilus*

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Carrot seed oil, which includes oils from different subspecies of *Daucus carota* L. (Apiaceae), is well known, since old time, by its antimicrobial action. In Portugal five subspecies grow wild: *D. carota* ssp. *carota*; *D. carota* L. ssp. *maximus* (Desf.) Bal; *D. carota* L. ssp. *sativus* (Hoffm.) Schubl,; *D. carota* ssp. *gummifer* (Syme) Hook. and *D. carota* ssp. *halophilus* (Brot.) A. Pujadas.

D. carota ssp. *halophilus* is an endemic plant from Portugal with a restricted geographical distribution, and studies about this subspecies were not addressed before. The aim of the present work was to investigate the chemical composition, the antifungal activity and the citotoxicity of its essential oil. The oil was obtained by hydrodistillation from aerial parts of plants collected at Cabo de S. Vicente (Algarve, S Portugal) and analyzed by GC and GC-MS. Sabinene (28,3%), α-pinene (12,6%), limonene (11,8%), (*E*)-methylisoeugenol (7,4%), elemicine (6,2%) and β-bisabolene (5,3%) were found to be the main constituents.

Minimal inhibitory concentration (MIC) determined according to the NCCLS protocols (M27-A and M38-A) and minimal lethal concentration (MLC) were used to evaluate the antifungal activity against yeasts (*Candida albicans, C. parapsilosis*, *C. tropicalis, C. krusei, C. guillermondii* and *Cryptococcus neoforman*), *Aspergillus* strains (*Aspergillus niger, A. fumigatus*, *A. flavus*) and dermatophyte strains (*Microsporum canis*, *M. gypseum*, *Trichophyton rubrum*, *T. mentagrophytes*, *Epidermophyton floccosum*). The oil exhibited antifungal activity for the tested strains, particularly against dermatophytes with MIC and MLC values ranging from 0.64-1.25 µl/ml.

Citotoxicity was evaluated on the mouse skin-dendritic cell line by the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) assay, as previously reported. No toxicity effects were found after 3 and 6 h of cell treatment with this essential oil. The absence of citotoxicity in skin dendritic cells supports that this essential oil may be useful in clinical management of fungal infections, justifying future clinical trials to validate their use as therapeutic alternatives for dermatophytosis.

P42 Chemical composition and antifungal activity of the essential oil of *Satureja boliviana*

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Satureja boliviana Briq. (Lamiaceae) is a native plant from Andean countries as Bolivia, Peru and Argentina. It is widely used in traditionally medicine to calm the rheumatic pains, as digestive, vermifuge and insecticide and its essential oil is used in potatoes conservation and against quinua culture plagues.

The aims of the present work were investigate the chemical composition and the antifungal activity of the essential oil obtained from plants collected in Bolivia, near Challapata – Oruro (altiplano) at altitude above 3700 m. The oil was obtained by hydrodistillation from the aerial parts of plants and subsequently analyzed by GC and GC-MS. It was characterized by the presence of small amounts of sesquiterpenes (9.2%), and large amounts of monoterpenes (81.5%), of which pulegone (41.8%), α-phellandrene (11.2%) and myrcene (8.1%) were the major compounds. The composition of this essential oil is different from those reported in the literature for oils from other origin. [1-2]

The minimal inhibitory concentration (MIC) determined according to the NCCLS protocols (M27-A and M38-A) [3-4] and the minimal lethal concentration (MLC) were used to evaluate the antifungal activity against yeasts (*Candida albicans, C. parapsilosis*, *C. tropicalis, C. krusei, C. guillermondii* and *Cryptococcus neoformans*), *Aspergillus* strains (*Aspergillus niger, A. fumigatus*, *A. flavus*) and dermatophyte strains (*Microsporum canis*, *M. gypseum*, *Trichophyton rubrum*, *T. mentagrophytes*, *Epidermophyton floccosum*). The oil proved to be more active against dermatophyte strains, particularly for *Trichophyton rubrum* with MIC value of 0.64µL/mL.

These results may partially justify the use of this plant in the traditional medicine of Bolivia and support the concept that essential oils may be useful in the management of fungal infections.

Referencias: 1. Senatore F. et al. (1998) Flavour Fragr. J. 13: 1-4; 2. Viturro C. et al. , (2000) Flavour Fragr. J. 15:377-382; 3. National Committee for Clinical Laboratory Standards (1997) Reference method for broth dilution antifungal susceptibility testing of yeasts. Approved standard M27-A. Wayne, Pa, USA; 4. National Committee for Clinical Laboratory Standards (2002) Reference method for broth dilution antifungal susceptibility testing of filamentous fungi. Approved standard M38A. Wayne, Pa, USA.