PS6: 14

Activity of essential oils on growth and sporulation of aflatoxigenic *Aspergillus* spp.

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The control of fungal growth and potential mycotoxin contaminations are of interest in food mycology. As a matter of consequence, many strategies have been taken to prevent food born fungal contaminations. New search for biological active secondary compounds present in essential oils of plants has been seen as a potential way to control fungal contamination. The aim of this study was to evaluate antifungal activity of essential oils (EOs) of ginger (*Zingiber officinale*), mint (*Mentha* sp.), sage (*Salvia officinalis*), sweet fennel (*Foeniculum vulgare*) and thyme (*Thymus vulgaris*). Essential oils were obtained from Ferquima Industry and Trade Ltda. The EOs were tested against mycotoxin producers *Aspergillus flavus* and *A. parasiticus* isolated from food products bought in a local market in Lavras, MG, Brazil. Minimum inhibitory concentration (MIC) was determined by solid medium diffusion procedure. FUN-1 fluorescent staining for cell viability test, using broth macrodilution, assay was used. High Resolution Gas Chromatography was applied to analyse chemical constituents of essential oils. Effects on mycelial growth and sporulation were determined for each EO at the concentration established in MIC procedure. After 5, 7 and 9 days the extent of inhibition zone of fungal growth and spore counts in a Neubauer chamber were determined. Trans-anethole, zingiberene, menthol, bornyl acetate and thymol are the major component of essential oils of sweet fennel, ginger, mint, sage and thyme, respectively. MIC for sage, ginger, sweet fennel, mint and thyme were 100%, 80%, 50%, 50% and 50% (oil/DMSO; v/v), respectively. The five essential oils under study have showed an antifungal effect on mycelial growth and fungal sporulation capacity. Thyme was the EO with the best inhibitory effect. Additionally, as FUN-1 staining was applied for the first time to broth macrodilution assay it showed to be a rapid and sensitive method for determine viability of hyphal cells under this assay conditions. In conclusion, essential oils can be an alternative to the use of chemical preservatives.