Characterization and biological activity of several essential oils from different species

R. Piccaglia, B. Biavati, I. Marotti, M. Marotti

Dipartimento di Scienze e Tecnologie Agroambientali, Università di Bologna, Viale Fanin 44, 40127 Bologna, Italy

Introduction

Essential oils are complex mixtures of biologically active substances used for a long time as constituents of commercial products (Morris et al., 1979). In recent years, several researches dealing with the properties of essential oils evidenced their antimicrobial, antioxidant and antifungal activities (Piccaglia et al., 1993; Shapiro et al., 1994). The availability of these substances is of great economical importance considering the increasing demand of natural ingredients in food, cosmetic and pharmaceutical industries.

In this work twenty-four essential oils, obtained from the same number of species belonging to eight botanical families and isolated by steam distillation, were considered.

The essential oils were characterized by GC/MS, tested for their antimicrobial activity towards a series of microrganisms (bacteria, yeasts) determining the MIC (minimun inhibitory concentration) and for their antifungal and antioxidant properties. The oils from thyme, costmary, savory, bee balm and rosemary showed a good inhibition of the bacteria growth, those from costmary, basil, savory, thyme, oregano and cinnamon were very effective against yeasts. The thyme oil exhibited a total control (100%) for the tested bacteria and yeasts. The antifungal activity trials performed in vitro, in greenhouse and in field, resulted very effective in vitro whereas it showed scanty results in field as a consequence of the high volatility of the oils.

References

Morris, J. A., Khettry, A., and Seitz, W., 1979. Journal of the American Oil Chemists' Society, 56, 595-603.

Piccaglia, R., Marotti, M;, Giovanelli, E. Deans S. G. and Eaglesham, E., 1993. Industrial Crops and Products, 2, 47-50.

Shapiro, S., Meier, A. and Guggenheim, B., 1994. Oral Microbiol. Immunol., 9, 202-208.