Czech University of Life Sciences in Prague

Faculty of Agrobiology, Food and Natural Resources

Department of Quality of Agricultural Products

Antimicrobial activity of essential oils from *Eucalyptus deglupta*

Diploma Thesis

Author: Rafael Sumar Valdivia

Supervisor: Ing. Pavel Nový, Ph.D.

Antimicrobial activity of essential oils from *E.deglupta*

Summary

Plant essential oils are known to exert potent antibacterial and antifungal activities against broad spectrum microorganisms. This activity has previously been confirmed for various *Eucalyptus* spp. In this study, the antimicrobial activity of leave essential oil of *Eucalyptus deglupta* Blume collected in the Independent State of Samoa, was evaluated using the broth microdilution method *in vitro*. The essential oil composition was analyzed using gas chromatography-mass spectrometry. The antibacterial activity of the essential oil tested against potentially pathogenic gram-positive and gram-negative bacteria *Bacillus cereus*, *Enterococcus faecalis*, *Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella enteritidis*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Klebsiella pneumoniae*.

The chemical analysis revealed *trans-nerolidol* and *α-pinene* as the predominant constituents of the oil with the content of 61.92 % and 11.02 %, respectively.

No minimum inhibitory concentrations were obtained by the antimicrobial assy. The *E. deglupta* essential oil showed only very weak inhibitory effect against the bacteria tested with ≤ 50 % inhibition of the bacterial growth whereas *B. cereus* was the most sensitive organism and E.faecalis was the most resistant one. The low antimicrobial activity can be explained by the total absence of eucalyptol, an antimicrobial compound typical for *Eucalyptus* spp.

Keywords:

Eucalyptus deglupta; essential oil; antimicrobial; antibacterial