

Heribert Insam, Sabine M. Podmirseg, Andreas Wagner (eds.)

**8<sup>th</sup> International Symposium on  
Anaerobic Microbiology (ISAM8)  
Innsbruck, Austria, June 12-15, 2013**

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Universität Innsbruck

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ISBN 978-3-902936-03-5

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Villa Blanka, Weiherburggasse 31 • 6020 Innsbruck

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Cover picture: copyright Leis, Sandbichler: straw particle with *Neocallimastix* sp culture

## ***In vitro* antibacterial activity of essential oils against clostridia**

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*Clostridium* is an anaerobic, endospore forming Gram-positive bacillus genus containing many important pathogenic species. Many naturally occurring compounds present in plants, herbs, and spices have been shown to possess antimicrobial effects against foodborne pathogens. In the present study, the antimicrobial activities of the 10 essential oils were investigated. The antimicrobial activities were determined by using agar disc diffusion and broth microdilution methods against *Clostridium* genus. Antibacterial activity was assessed on the clostridia: *Clostridium butyricum*, *Clostridium hystoliticum*, *Clostridium intestinale*, *Clostridium perfringens* and *Clostridium ramosum*. The original *Lavandula angustifolia*, *Carum carvi*, *Abius alba*, *Mentha piperita*, *Chamomilla recutita* L., *Pinus sylvestris*, *Oleum saturejae*, *Origanum vulgare* L., *Pimpinella anisum* and *Rosmarinus officinalis* L. essential oils samples produced in Slovakia (Calendula a.s., Nova Lubovna, Slovakia) were obtained. The results of the disk diffusion method showed a very high activity against all the tested strains of microorganisms. The best antimicrobial activity against *C. butyricum* was found at *Pimpinella anisum*, against *C. hystoliticum* was found at *Pinus sylvestris*, against *C. intestinale* was found at *Oleum saturejae*, against *C. perfringens* was found at *Origanum vulgare* L. and against *C. ramosum* was found at *Pinus sylvestris*. The results of broth microdilution assay showed that the essential oil was not active against all the tested clostridia. The best antimicrobial activity against *C. butyricum* was found at *Abius alba*, against *C. hystoliticum* no antimicrobial activity was found, against *C. intestinale* was found at *Abius alba*, against *C. perfringens* was found *Oleum saturejae* and against *C. ramosum* was found *Abius alba*.

**Key words:** antibacterial activity, clostridia, *in vitro*, essential oils

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