

Antimicrobial activity of *Thymus longicaulis* C. Presl essential oil against respiratory pathogens

Research Article

Sanda Vladimir-Knežević^{1,*}, Ivan Kosalec², Marija Babac¹, Marinko Petrović³, Jovica Ralić⁴, Biserka Matica⁵, Biljana Blažeković¹

¹Department of Pharmacognosy, Faculty of Pharmacy and Biochemistry,
University of Zagreb, HR-10000 Zagreb, Croatia

²Department of Microbiology, Faculty of Pharmacy and Biochemistry,
University of Zagreb, HR-10000 Zagreb, Croatia

³Food Control Center, Faculty of Food Technology and Biotechnology,
University of Zagreb, HR-10000 Zagreb, Croatia

⁴Kemika, Zagreb, HR-10000, Croatia;
Present address: Galapagos Research Center,
HR-10000 Zagreb, Croatia

⁵Institute for Public Health "Dr. Andrija Štampar",
HR-10000 Zagreb, Croatia

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Abstract: *Thymus longicaulis* C. Presl is a small aromatic perennial herb used as a traditional remedy for cold, flu and cough. Composition of the essential oil of *T. longicaulis* from Croatia and its *in vitro* antimicrobial activity against the most common respiratory pathogens were evaluated. The yield of essential oil obtained by hydrodistillation from aerial plant parts was 1.2%. According to the GC-MS analysis, a total of forty one compounds (99%) were identified. Thymol (46.3%), γ -terpinene (16.2%), thymyl methyl ether (11.4%), and *p*-cymene (9.4%) were the main components. Antimicrobial activity of the essential oil against six clinically isolated bacterial and yeast strains was determined using standard disc agar diffusion method and microdilution broth assay. The essential oil exhibited antimicrobial activity towards all tested respiratory pathogens. The most sensitive strains were *Haemophilus influenzae* and *Streptococcus pneumoniae* (MIC=0.78 mg/mL), while *Staphylococcus aureus* was the most resistant (MIC>25.00 mg/mL). Our results indicate that *T. longicaulis* essential oil could be effective against clinically relevant respiratory pathogens which have the ability to develop resistance to antimicrobial drugs.

Keywords: *Thymus longicaulis* • Essential oil • Thymol • Antimicrobial activity • Respiratory pathogens

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1. Introduction

Essential oils produced by aromatic plants have been used from ancient times as antiseptics and anti-infectious agents. Since the discovery and development of chemotherapeutic agents, especially antibiotics, the use of essential oils has been reduced, but such oils have been used traditionally for the prevention and therapy of respiratory tract infections [1]. Respiratory infections are the most frequent reason for primary health care consultation. Epidemiological studies indicated

that one fourth to one third of patients visiting general practitioners suffer from acute respiratory infections. Paediatric respiratory tract infections are especially associated with significant morbidity and mortality. Additionally, antimicrobial resistance among respiratory tract pathogens has become an increasing problem world-wide [2,3]. Since infections with respiratory tract pathogens are common in all age groups, their contribution to the total consumption of antimicrobial agents in a population is therefore significant. Despite the many infectious disease control and surveillance

* E-mail: sanda@pharma.hr