

DIFFERENCES IN *IN VITRO* ANTIBACTERIAL ACTIVITY OF *Dracocephalum moldavica* L. ESSENTIAL OIL AND HYDROLATE

Olja Šovljanski¹, Milica Aćimović², Jovana Stanković Jeremić³, Vanja Šregelj¹,
Ana Tomić¹, Aleksandra Ranitović¹

¹Faculty of Technology Novi Sad, University of Novi Sad, Bulevar cara Lazara 1,
Novi Sad, Serbia

²Institute of Field and Vegetable Crops Novi Sad, Maksima Gorkog 30, Novi Sad, Serbia

³Institute of Chemistry, Technology and Metallurgy, University of Belgrade,
Njegoševa 12, Belgrade, Serbia

oljasovljanski@uns.ac.rs

ABSTRACT

Large-scale steam distillation under industrial conditions has been applied for extraction of essential oil from Moldavian Dragonhead (*Dracocephalum moldavica* L.) plants, while hydrolate was obtained as a by-product. Therefore, samples were tested in view of antimicrobial activity against pathogenic bacteria (*Escherichia coli*, *Pseudomonas aeruginosa*, *Salmonella* Typhimurium, *Bacillus cereus*, *Staphylococcus aureus*, and *Listeria monocytogenes*). *In vitro* evaluation of antimicrobial activity was done by the disk diffusion method as well as the method for determination of minimal inhibitory concentration (MIC). According to the obtained results, tested samples have an antimicrobial effect against almost all tested bacteria, but on different levels. A significant antimicrobial effect of *D. moldavica* essential oil against all other mentioned bacteria was demonstrated, while the same effect for hydrolate was on a lower level. Briefly, tested oil was inhibitory against *E. coli*, *S. aureus*, *L. monocytogenes*, and *S. Typhimurium*, but did not show antimicrobial effect against *B. cereus* and *P. aeruginosa*. The antimicrobial effect of hydrolate was absent against *B. cereus*, *P. aeruginosa*, and *S. Typhimurium*. It could be noted that essential oil showed good antibacterial activity, with low MIC values (≤ 3.125 $\mu\text{g/mL}$). In the contrast, a higher MICs (3.125-12.5 $\mu\text{g/mL}$) of hydrolate were noted. Antibacterial performance of *D. moldavica* essential oil and hydrolate may contribute to their use in reducing foodborne pathogens and extending the shelf life of food products or as a potential natural and green replacement of synthetic antibiotics and preservatives in food and cosmetics industries.

Keywords: Moldavian dragonhead; antimicrobial testing; steam distillation;