

**FACTA UNIVERSITATIS**

Series: **Physics, Chemistry and Technology** Vol. 16, N° 1, Special Issue, 2018, p. 142
49th International Symposium on Essential Oils (ISEO2018) • Book of Abstracts

PP78. Antimicrobial activity and *in vivo* toxicity evaluation of *Foeniculum vulgare* Mill. essential oil

Betül Demirci^{1*}, Gözde Öztürk¹, Fatih Demirci¹

Keywords: *Foeniculum vulgare* Mill., essential oil, antimicrobial activity, *Caenorhabditis elegans*, toxicity

Foeniculum vulgare Mill. (Apiaceae) is commonly known as “fennel”, a small genus of annual, biennial or perennial herbs distributed in central Europe and the Mediterranean region. It is widely cultivated throughout the temperate and tropical regions of the world for its aromatic fruits, which are used mainly as a culinary spice [1]. Fruits and essential oil of *F. vulgare* are used as flavoring agents in food products, in cosmetic and pharmaceutical products. The essential oil is accredited with antioxidant, antimicrobial, antithrombotic, antidiabetic activities, among others [2].

In this present work, it was aimed to determine the antimicrobial activity of the pharma grade *F. vulgare* essential oil. *trans*-Anethole (68.2%), fenchone (12.8%) and limonene (6.5%) were confirmed as the main constituents; the analysis was performed by GC/FID and GC/MS, simultaneously. Antimicrobial activity of the essential oil was tested against *Escherichia coli* NRRL B-3008, *Bacillus cereus* NRRL B3711, *Salmonella typhimurium* ATCC 13311 and *Streptococcus sanguinis* ATCC 10556 by a broth microdilution assay [3]. Minimum Inhibitory Concentrations (MIC) were found to be: 6.25, 6.25, 3.12 and 12.5 mg/mL, respectively, suggesting that the antimicrobial activity of the essential oil was relatively low against the tested pathogens. In addition, lethal concentration (acute toxicity) was determined using the *in vivo* animal alternative *Caenorhabditis elegans* test [4]. Lethal concentration (LC₅₀, 50% of killed nematodes) for the essential oil was determined to be <25 mg/mL.

References:

- [1] Diao, W.-R. et al., 2014. Food Control 35, 109–116.
- [2] Mimica-Dukić, N. et. al., 2003. Phytother. Res. 17, 368–371.
- [3] Clinical and Laboratory Standards Institute. 2006. CLSI M7-A7, Clinical and Laboratory Standards Institute. Pennsylvania, USA.
- [4] <http://www.wormbook.org>, accessed on 06.06.2018.

Acknowledgments: This study has been financially supported by Anadolu University Scientific Research Projects, BAP No: 1404S106-1605S285. For *C. elegans*, some strains were provided by the CGC, which is funded by the NIH Office of Research Infrastructure Programs (P40 OD010440).

¹Anadolu University, Faculty of Pharmacy, Department of Pharmacognosy, 26470, Eskisehir, Turkey.

*Corresponding author: betuldemirci@gmail.com