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# The Second Japan-Turkey International Symposium on Pharmaceutical and Biomedical Sciences

September, 11-12, 2017 Trabzon, TURKEY

## ABSTRACT BOOK

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JATUSPAB-2 ABSTRACTS  
(The Second Japan – Turkey International Symposium on Pharmaceutical and Biomedical Sciences)  
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ABSTRACT BOOK**

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**ANTIBACTERIAL PROPERTIES OF ESSENTIAL OILS AGAINST SPECIFIC OPPORTUNISTIC PATHOGENIC BACTERIA**

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**Objective / Purpose:** The problem of microorganisms' resistance to anti-microbial materials grows continually worse. One of the main causes of bacteria's resistance to antibiotics has been irrational application of antibiotic therapy. The problem becomes even more serious with regard to the agents of opportunistic infections classified as opportunistic pathogenic microorganisms being part of the facultative microflora of human organisms [1-2]. Under such conditions, it becomes especially important to perform research aimed at the search for alternative anti-bacterial materials. The sources for such materials are the plants that have for a long time been used in popular and conventional medicine – for instance, essential oils which are promising anti-bacterial remedies [3] used in cosmetology, medicine, food industry, etc.

**Material and Methods:** The purpose of this work has been to study the anti-bacterial activity of essential oils against test cultures of *Escherichia coli* and *Staphylococcus aureus*. For that purpose, the essential oils of the following plants were used: *Thymus vulgaris* L., *Rossmarinus officinalis* L., *Hyssopus officinalis* L., *Menta piperita* L. (produced by «Calendula», Eubovňa); *Lavandula angustifolia* Mill., *Melaleuca alternifolia* L., *Abies alba* Mill., *Salvia sclarea* L. (produced by «Aromatika», Ukraina). As test culture, the following bacteria from the ATCC (American Type Culture Collection, USA) collection were used: *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC. Antimicrobial activity of essential oils was determined using agar diffusion method (hole diameter 6 mm). Bacterium inoculate 100 µL in physiological solution were adjusted to the equivalent of 0.5 McFarland standards, and evenly spread on Muller-Hinton agar surface. The diameters of the inhibition zones were measured in millimeters including hole diameter after inoculation for 24 hour at 37 C. The oil was added to the holes in the volume of 50 µL.

**Results:** The results of the study have proved that oils from *Thymus vulgaris* L., *Hyssopus officinalis* L., *Rossmarinus officinalis* L., *Menta piperita* L. have the most efficient anti-microbial activity against *Staphylococcus aureus* ATCC. Growth inhibition zones for the test cultures exceeded 25 mm, proving these bacteria's high sensitivity to the given essential oils. As for *Escherichia coli* ATCC 25922, the most efficient were the oils from *Hyssopus officinalis* L. and *Melaleuca alternifolia* L. In case of the other oils, growth inhibition zones for the test cultures varied between 10±0.01mm and 15.7±0.58 mm.

**Conclusion / Discussion:** The obtained results have proved the actuality of further studies of the impact of essential oils upon bacterial isolates, including those with multiple resistance to medical preparations.

**Keywords:** essential oils, anti-bacterial activity, *Escherichia coli*, *Staphylococcus aureus*

**References:**

- [1] Yoko Furuya & Franklin D. (2006) Lowy Antimicrobial-resistant bacteria in the community setting. *Nature Reviews Microbiology* 4, 36-45.  
[2] Kačániová, M., Terentjeva, M., Vukovic, N., Puchalski, C., Roychoudhury, S., Kunová, S., Klüga, A., Tokár, M., Kluz, M., Ivanišová, E. (2017). The antioxidant and antimicrobial activity of essential oils against *Pseudomonas* spp. isolated from fish. *Saudi Pharmaceutical Journal*. 2017.07.005