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**ANTIMICROBIAL ACTIVITY OF *RUTA GRAVEOLENS* L. AGAINST MAIN
CAUSATIVE AGENTS OF ACNE VULGARIS**

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Abstract. *Propionibacterium acnes* - the skin bacterium which plays important role in the pathophysiology of skin disease acne vulgaris, commonly complicated with pyoderma caused by *Staphylococcus epidermidis* and *Staphylococcus aureus*. Widespread use of oral and topical antibiotics for acne treatment has led to selection of resistant strains. In view of increasing resistance to existing antimicrobial agents, which can cause several side effects, interest in medicinal herbs has been progressively increased over the last decade. Particularly promising is the garden root *Ruta graveolens* L. (GR), which has a rich chemical composition and has a wide range of properties, including antimicrobial activity. Garden root is characterized by the specificity of the chemical composition – the simultaneous presence of alkaloids (0.2-1.4%) and essential oil (up to 0.7%).

Aim: to determine antimicrobial activity of *Ruta graveolens* L. water-ethanolic extracts against MLS-resistant strains of *P. acnes*, *S. epidermidis* and *S. aureus*.

Materials and methods. We examined antimicrobial activity of 5 GR water-ethanolic extracts (as extractants 40%, 50%, 70%, 90% and 96% ethanol were used) and tincture of herb by serial microdilution method in HBB (Heart Brain Broth) against MLS-resistant *P. acnes* and in Muller-Hinton broth against *S. epidermidis* and *S. aureus* strains (macrolides, lincosamides, and streptogramin B). The growth rate of cultures in wells of polystyrene tablets with different concentrations of plant extracts was evaluated based on the increase in optical density (OD₄₉₅), which was recorded using a spectrophotometer Synergy™HTX S1LFTA (BioTek Instruments, Inc., USA) at a wavelength 495 nm after 24 – 72 hours of incubation. Anaerobic culturing conditions for *P. acnes* were ensured by the Gas generation pouch system (GasPak™ EZ, Bacton, Dickinson and Co., USA). Gene5 and Microsoft Office Excel 2011 software were used for statistical processing of the results.

Results and discussions. It was found that almost all extracts of GR herb were active in 1:160 dilution against *P. acnes* strains. The highest activity was demonstrated by 96% water-ethanolic extract (MIC – 325 µg/ml). While MS 40%, 50%, 70% and 90% extracts were active in the concentration range 337.5 – 462.5 µg/ml. The infusions of GR herb was the least active against *P. acnes* strains and had an antimicrobial activity at 1:20 dilution (MIC 600 µg/ml). So, the method of plant material extraction has influence on antimicrobial properties of biologically active substances. Different classes of active compounds can be isolated by definite extractants.

S. epidermidis and *S. aureus* MLS-resistant strains showed less sensitivity to GR herb extracts. Growth inhibition by 50% and 70% extracts of 57.9% and 47.4% of the strains was observed at a dilution 1:40 (MIC – 2725 µg/ml). While, 90% GR herb extract showed its activity at a dilution 1:20 against 57.9% of *S. epidermidis* strains (MIC – 3700 µg/ml). All extracts were active at a dilution 1:20 (MIC – 3700-5500 µg/ml) against *S. aureus* strains, indicating their comparatively weaker antimicrobial activity against these microorganisms. But preliminary research revealed antibiotic potentiation activity of 40% water-ethanolic extracts of GR against MLS and tetracycline resistant strains of *S. epidermidis* and *S. aureus*.

Conclusions. Consequently, the results of our research show that antimicrobial properties of garden root depends on extraction method and type of extractant. It is concluded from the present study that *Ruta graveolens* L. could be used as a natural source for antimicrobial compounds and possible applications in dermatology for acne treatment.