

## [P01] THE INVESTIGATION OF THE ANTIMICROBIAL ACTIVITY OF THE EASTERN EUROPEAN AND NEW ZEALAND HONEY TO MULTIDRUG-RESISTANT STRAINS

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**Aim:** To compare the activity of manuka honey from New Zealand prepared from commercial samples of approved for clinical use as a topical antibacterial agent for the treatment of diabetic foot infections and Eastern European natural honey against strains of bacteria with extreme phenotypes of antimicrobial resistance.

**Method:** The study involved isolates of bacteria known profile of sensitivity to antibiotics and established genetic determinants of stability for multiresistant isolates. Investigation totally included 95 strains: *Acinetobacter baumannii* - 22, *Enterobacter cloacae* - 2, *Escherichia coli* - 4, *Klebsiella oxytoca* - 1, *Klebsiella pneumoniae* - 13, *Serratia marcescens* - 3, *Pseudomonas aeruginosa* - 24, *Staphylococcus aureus* (MRSA) - 18, *Staphylococcus aureus* (MSSA) - 5 further 3 control strain. The study used 6 different samples: Manuka (New Zealand), Activon Tube (New Zealand), natural honey (Demidov district, Smolensk, Russia), natural honey (Monastyrshchina district, Smolensk, Russia), natural honey (Gagarin district, Smolensk, Russia), natural honey (Rostov-on-Don, Russia). Determination of sensitivity was conducted in the broth dilution method with the determination of the minimum inhibitory concentrations (MIC) of honey against test organisms. The procedure for determining the sensitivity was carried out on a special protocol comprising the following stages: prepare a solution of honey at a concentration of 30% (weight/volume) in Mueller-Hinton broth, sterilization by filtration through a 0.22 micron membrane filter, a suspension of each test isolate in sterile 0.85% sodium chloride at a density of 0.5 McFarland add to the plates using an automatic multipoint inoculator Mast UriDot (UK), the plates were incubated in a normal atmosphere at 35°C for 18-24 hours. The minimum concentration at which there was no evidence of microbial growth was regarded as MIC of honey in respect of the isolate.

**Results/Discussion:** The samples of commercial antibacterial agent based on manuka honey showed MIC for *P. aeruginosa* from 20% to 30%, 10% and 15% MIC for *A. baumannii*, from 7.5% to 30% MIC for Enterobacteriaceae, 5% to 30% for various phenotypes MRSA and from 5% to 15% for MSSA. Three samples of honey from Smolensk showed similar results to each other. Regarding *P. aeruginosa* strains from 7.5% to 15% MIC, 10% to 20% MIC for *A. baumannii*, from 10% to 20% MIC for Enterobacteriaceae, from 1.88% to 7.5% for different phenotypes of MRSA and from 3.75% to 10% for MSSA. Honey from Rostov-on-Don showed the worst results of all samples.

**Conclusion:** Honey is an effective antibacterial agent in vitro against multi-drug resistant strains of extreme collection from patients with diabetic foot infections from different hospitals in Russia. None of phenotypes has not demonstrated MIC above 30% for all the samples of honey. Eastern European honey exceeds the activity of honey New Zealand manuka for all types of microorganisms tested. With respect to individual strains MIC Eastern European honey 3-4 times lower than the MIC manuka. The difference between MIC honey from Smolensk and New Zealand may be due to  $\gamma$ -sterilization, which runs manuka. As a result of this procedure, some active components (antimicrobial peptides) might collapse. Honey from Smolensk can be the basis for an effective topical treatment for diabetic foot infection even in the face of MDR infection.