ANTIADHESIVE ACTIVITY OF *RHODOCOCCUS ERYTHROPOLIS* IMV AC-5017 EXTRACELLULAR METABOLITES

Antoniuk S.O., Pirog T.P.
National University of Food Technologies, Kyiv, Ukraine
ossa22@meta.ua

Bacterial adhesion on different surfaces is a key problem in infections that allows subsequent colonization, invasion and internalization of pathogens, particularly in dentistry. A lot of efforts have been directed to avoid bacterial attachment, such as studies of changing the superficial properties of contact surfaces by conditioning surface-active substances (SAS). Surface-active substances are surface active products of microbial origin. They have several advantages over synthetic surfactants, because of their biodegradability, reduced toxicity, availability from cheap raw materials, biocompatibility, the effectiveness at extreme temperature, pH, salinity, emulsifying ability, antimicrobial and antiadhesive properties.

In previous studies the oil-oxidizing bacteria identified as *Rhodococcus erythropolis* EK-1was isolated from oil-contaminated soil samples. The strain EK-1 was deposited in the Depositary of microorganisms of the Institute of Microbiology and Virology of National Academy of Sciences of Ukraine at the number of IMV Ac-5017.

It was also shown the antimicrobial activity of *Acinetobacter calcoaceticus* IMV B-7241 and *Rhodococcus erythropolis* IMV Ac-5017 cell-free supernatant against bacteria and yeast and antiadhesive properties of *Acinetobacter calcoaceticus* IMB B-7241 cell-free supernatant on linoleum, ceramic, steel and plastic.

The aim of this work is to study the antiadhesive activity of *R. erythropolis* IMV Ac-5017 extracellular metabolites on dentures.

It was determined that *R. erythropolis* IMV Ac-5017 extracellular metabolites possessed the antiadhesive activity against all tested microorganisms (*Candida albicans* D-6, *Bacillus subtilis* BT-2 and *Escherichia coli* IEM-1) on denture basis and the antiadhesive effect depended on the dilution factor. The highest reduction of adhesion (60–80%) of tested microorganisms was observed for the cell-free supernatant. The pretreatment of silicon surfaces with cell-free supernatant in low SAS concentration (0.125 mg/ml) significantly decreased the adhesion of all bacteria and yeast: the highest reduction of adhesion for *C. albicans* D-6, *E. coli* IEM-1 and *B. subtilis* BT-2 was 70, 55 and 46% respectively, while D-6, IEM-1 and BT-2 strains adhesion on acrilic surfaces was reduced on 77, 50 and 57%.

Thus, as a result of the work it was stated that *R. erythropolis* IMV Ac-5017 extracellular metabolites are promising for use as anti-adhesive agents in dentistry.