

# BACTERIA AND YEAST ADHESION TO ABIOTIC SURFACES TREATED BY PREPARATIONS OF MICROBIAL SURFACTANTS

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Formation of microbial biofilms on various equipment surfaces of food industry and medicine is undesirable. The danger of biofilms formation is associated with the resistant forms of bacteria emergence, materials' surface destruction and the spread of humans infectious diseases. One of the ways cleaning and disinfection such surfaces is using of surface-active substances (SAS) of microbial origin as antyadhesive agents that can prevent the biofilm formation or stimulat the destruction of existing structures.

The producers of microbial surfactants *Nocardia vaccinii* IMB B-7404 was grown in liquid mineral medium with sunflower oil (2%, v/v). The cultivation duration was 5 and 7 days. The following preparations were used for researches: preparation 1 – supernatant of culture fluid; preparation 2 – solution of surfactant, dedicated by Folch mixture extraction (chloroform and methanol, 2: 1) from the supernatant of culture fluid (preparation 1). Bacteria (*Bacillus subtilis* BT-2, *Escherichia coli* IEM-1) and yeast (*Candida albicans* D-6) were used as test culture. The adhesion degree of test-cultures to plastic, polyvinylchloride, tile and steel was determined by spectrophotometric method.

Results have shown that surfactant preparations synthesized on 7th day of cultivation are more efficient antiadhasive agents than similar one received during 5 days of cultivation. Thus, *B. subtilis* BT-2 vegetative cells adhesion on all investigated surfaces was 21-48% after treatment by preparations 1 and 2 (0.01 mg / ml), synthesized on 7th day of cultivation. Similar preparations synthesized on 5th day showed antiadhasive properties at 0.02 mg/ml concentration. Related results were obtained in *C. albicans* D-6 adhesion studies. Materials processing by solution of surfactants (0.01 mg/ml) synthesized during 7 days, accompanied by decrease in yeast adhesion on 70% and synthesized during 5 days - 50-60%. Other patterns were observed during *E.coli* IEM-1 adhesion study. In this case, more effective antiadhasive agent was solution of surfactants synthesized on 5th day of cultivation.

However, irrespective of cultivation duration, test-culture type and abiotic surfaces natura, surfactants solutions (preparation 2) reduced bacteria and yeast adhesion more effectively compared with supernatant in similar concentrations of surfactants.

These data shows the dependence of surfactants biological properties on producer's cultivation conditions, and the possibility to use *N. vaccinii* IMB-7404 surfactants as antiadhasive preparation component.