STUDY OF THE BIOLOGICAL PROPERTIES OF THE PROBIOTIC STRAINS OF MICROORGANISMS

I. M. Kushnir, I. S. Semen, U. Z. Maiba

State Scientific and Research Control Institute of Veterinary Medicinal Products and Feed Additives, 11, Donetska str., Lviv, 79019, Ukraine

In the selection of microorganisms to create probiotic preparations, it is necessary to take into account not only the degree of antagonistic activity, but also strain adhesive activity, i.e. the ability to bind with the intestinal mucosa of the macro-organism. Such a strain can ensure the stability of the normal micro-flora and prevent colonization by pathogenic and opportunistic microorganisms.

We extracted 14 strains of Bacillus subtilis from the intestines of healthy birds. The antagonistic activity of the extracted microorganisms of the genus Bacillus were determined to the following test strains of opportunistic and pathogenic organisms: Escherichia. coli, Staphylococcus aureus, Staphylococcus epidermidis, Proteus mirabilis, Pseudomonas aeruginosa, Candida albicans, Salmonella typhimurium. As a result of the research, it was found that only 5 strains, specifically B. subtilis 306, B. subtilis 406, B. subtilis 806, B. subtilis 1206, B. subtilis 1306, proved to be highly antagonistic.

The next stage of evaluation of probiotic properties of the extracted strains involved determining the adhesive properties of antagonistically active strains. This property characterize the ability of the extracted probiotic strain to attach itself to the mucous membrane of the digestive tract of the macro-organism. It has been established that highly antagonistic strains of B. subtilis had varying degrees of adhesiveness, in particular strain B. subtilis 306 turned out to be highly adhesive – its adhesiveness index was 4.45. Medium adhesiveness was characteristic of strains B. subtilis 1306 and 406 – the adhesiveness index of these strains was 3.13 and 2.51 respectively. It has been established that strains B. subtilis and 806 B. subtilis 1206 had a low degree of adhesiveness, with the adhesiveness index of microorganisms within 2.11-2.01.

To compare the effects of opportunistic and pathogenic micro-flora on adhesive properties, we used highly adhesive strain B. subtilis 306 and low adhesion strain B. subtilis 806. It has been established that a more significant decrease of the adhesive properties of the test strains of opportunistic and pathogenic micro-flora occurred when they were subject to joint cultivation with highly antagonistic strain B. subtilis 306,
which also manifested high adhesive activity.

**Keywords:** PROBIOTICS, ANTAGONISTIC ACTIVITY, ADHESION, MICRO-FLORA, INTESTINE.