

## ANTAGONISTIC ACTIVITY OF LACTOBACILLUS STRAINS AGAINST PATHOGENIC CORYNEBACTERIA IN DIFFERENT CULTIVATION CONDITIONS

*Ryzhkova T.A., Babych E.M., Kalinichenko S.V., Sklyar N.I.*

*SI "Mechnicov Institute of Microbiology and Immunology of NAMS of Ukraine",  
laboratory of specific prophylactic of drop infections*

The most abundantly used probiotic strains come from the genus *Lactobacillus*. It is well known that probiotics can improve patient condition in medical disorders such as diarrhoea, gastroenteritis, short-bowel syndrome, and inflammatory intestinal diseases (Crohn's disease and ulcerative colitis) and only a few studies have investigated their role in oral health. Even if a positive correlation has been established between the saliva *Lactobacillus* count and dental caries, this genus is generally recognized as safe. In oral cavity, probiotics can create a biofilm, acting as a protective lining for oral tissues against oral diseases. Moreover, lactobacilli could in some cases play a beneficial role by inhibiting the growth of some oral pathogenic bacteria. This activity could justify their use as probiotic. Likewise it must be noted that conditions of bacteria persistence in microaerophilic niches of oropharynx characterized by scarcity of oxygen and can also affect the biological properties of the microorganisms with the development of adaptive responses in their subpopulations.

The aim of the present study was to establish the potential health benefit of *Lactobacillus* strains against pathogenic corynebacteria in culture conditions differing by oxygen concentrations.

Competitive properties of *Lactobacillus* strains were studied by the quantitative method for delayed antagonism determination. *Lactobacillus acidophilus* and *Lactobacillus plantarum*, obtained from probiotic preparations, 7 *Lactobacillus* spp. strains, isolated from tonsils, and 26 museum and circulating strains of *Corynebacterium diphtheriae* were used as test objects. Microaerophilic cultivation conditions were created using Generator GENbox microaer (bioMerieux, France) or appropriate gas mixture (5% O<sub>2</sub>, 10% CO<sub>2</sub> та 85% N<sub>2</sub>). It was established that *Lactobacillus plantarum* and *Lactobacillus acidophilus* obtained from probiotic preparations inhibited growth of pathogenic corynebacteria no in aerobic neither in microaerophilic conditions of cultivation. Other *Lactobacillus* spp. strains manifested antagonistic activity against *Corynebacterium diphtheriae* in (85.7±13.2) % cases. During cultivation of antagonist strains and corynebacteria test-objects in microaerophilic conditions all *Lactobacillus* strains showed increased competitive properties against corynebacteria. Average zones of corynebacteria growth retardation in microaerophilic conditions increased in 1.4-2.7 fold for all above mentioned clinical isolates of *Lactobacillus* as compared with aerobic cultivation conditions (p<0.01).

It is known that final result of competitive antagonism between microorganisms depends on the capability of antagonist to produce some abscopal substances and on the reverse sensitivity of bacteria to these substances. Experiments with different conditions of test-cultures cultivation and identical conditions of antagonists' cultivation were performed in order to determine directedness of microaerophilic conditions influence on competitive interaction participants.

Comparative analysis of corynebacteria growth retardation zones under different conditions of test-cultures cultivation and identical conditions of antagonists' cultivation didn't show any differences.

Thereby it was established that some *Lactobacillus* strains manifest antagonistic activity against pathogenic corynebacteria. Microaerophilic cultivation conditions result in increasing of *Lactobacillus* strains competitive properties but not in increasing of sensitivity of *Corynebacterium diphtheriae* strains.