

# **PRIORITY AREAS OF RESEARCH IN THE SCIENTIFIC ACTIVITY OF TEACHERS**

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## ANALYSIS OF THE ANTIMICROBIAL ACTION OF BACTERIA BACILLUS LICHENIFORMIS IN RELATION TO THE MICROFLORA OF PERIODONTAL POCKETS

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**Actuality of theme.** One of the most complex forms of dental pathology is inflammatory processes in the periodontium due to the high prevalence, duration of the course and negative impact on the body as a whole [1,2]. A large number of antibacterial and anti-inflammatory drugs are used for the medical treatment of periodontal diseases. But the capabilities of many drugs, especially antibiotics, are significantly limited due to the rapid habituation and loss of sensitivity to them of the periodonto-pathogenic microflora [2,3]. The refore, the search for new ways to combat with the pathogenic microflora is timely and very justified [3,4]. Pronounced antimicrobial properties of probiotic strains make it possible to consider the possibility of using drugs based on them as an alternative to antibiotics, which is especially relevant in the era of the rapid spread of resistant forms of pathogenic microorganisms and the decrease in the effectiveness of a number of antimicrobial agents [5,6].

**Goal:** identification of antibacterial properties of a composition based on highly dispersed silica gel and *Bacillus licheniformis* bacteria relative to test cultures of opportunistic pathogens and mixed microflora isolated from periodontal pockets of patients with generalized periodontitis (GP).

**Materials and methods.** In this research was used the original mix of highly dispersed silica gel and spore-forming bacteria strain *Bacillus licheniformis* IMB B-7811(EA22) (0.02 kg of silica gel and  $2.5 \times 10^9$  KUO of live microbial cells of *B. licheniformis*). Conditionally pathogenic microorganisms (*S.aureus*, *E. coli* and yeast-like fungi of the genus *Candida albicans*) were selected for research from the museum of the Institute of Microbiology and Virology of the National Academy of Sciences of Ukraine. The mixed microflora isolated from the periodontal pockets of patients with HP was also investigated. The method of diffusion in agar ("wells" method) was used to determine the antibacterial effect of the studied mixture. The results were calculated after 24 hours by determining the zone of inhibition of the growth of microorganisms in mm, including the diameter of the holes.

**Results.** The results of microbiological investigations show the antibacterial activity of the proponated sum of the relevant reference test strains of microorganisms, as well as the microbial flora of the periodontal intestines of diseases on generalization of periodontitis. In vitro cultivation of antagonistic activity of the strain *Bacillus licheniformis* IMB B-7811(EA22) in a proponated warehouse (preparation containing

0.02 kg of silica gel and  $2.5 \times 10^9$  KUO of live microbial cells), viable test cultures (*S. aureus*, *E. coli* and *Candida albicans*) and the mixed microflora seen in periodontal pockets on GP showed an inhibitory effect.

The diameter of the growth inhibition zone should be  $33 \pm 0.3$  mm for *S. aureus*, *E. coli*  $14 \pm 0.6$  mm and *Candida albicans*  $34 \pm 0.4$  mm and mixed microflora, seen from periodontal pockets on GP, become  $30 \pm 0.5$  mm.

**Conclusions.** The conducted microbiological studies showed that the proposed mixture of silica gel and *B. licheniformis* IMB B-7811(EA22) bacteria has a pronounced antimicrobial activity both on the test strains of microorganisms and on the mixed microbial flora of the periodontal pockets of patients with GP. This provides a basis for the clinical use of silica gels with strains of *Bacillus licheniformis* IMB B-7811(EA22) as antibacterial drugs for the treatment of inflammatory processes in the periodontium.

**Key Words:** probiotics, *Bacillus licheniformis* silica gels, antibacterial action, generalized periodontitis

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