

INFLUENCE OF QUINOLINYLPORPHYRINE BISMUTH AND TIN COMPLEXES ON LACTOPHAGES ACTIVITY

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Introduction. Food fermentations rely on actively growing lactic acid bacteria which either are added as starter cultures or grow spontaneously in the food matrix. Bacteriophage attacks on lactic acid bacteria during the fermentation process result in an unacceptably low production of lactic acid and flavor compounds along with reduced proteolysis. Use of antiphage media for starter propagation reduce risk of phage infection. Porphyrins and their derivatives showed good effect as inhibitors of viral infection *in vitro*. That's why the aim of this work was to test the ability of new synthetic porphyrins to inhibit activity of phages of *Lactococcus lactis*.

Materials and methods. The ability of quinolinilporphyrin bismuth (Bi(III) TQP) and tin (Sn(IV)TQP) complexes to inhibit activity of E3, E5 and E17 lactophages, has been tested by several methods. In the plaque reduction assay bacteriophages were incubated with porphyrins and then standard double-layer method has been performed. In other method bacterial cells and phages have been added simultaneously to the nutrient medium contained porphyrins and after 24 h of incubation OD of samples has been measured and compared with that in control. To study the influence of porphyrins on phages adsorption bacterial culture was incubated with bacteriophage in presence of compounds for 15 min. After this the mixture was centrifuged and the supernatants were assayed for non-adsorbed phages.

Results. The results of investigation show that presence of Bi(III)TQP in the nutrient medium at 10 μ M, 20 μ M and 40 μ M concentrations completely inhibits phage infection process, and presence of 10 μ M and 20 μ M of Sn(IV)TQP has only 50% effect. Determination of direct influence of Bi(III)TQP on the lactophage particles shows that reduction of phage activity reaches up 64%. Antiphage activity of Sn(IV)TQP is equal to 21-29%. Both compounds have no significant influence on the lactophage adsorption process. Inhibition of phage adsorption by the compounds does not exceed 36%.



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Conclusions. Thus, the results show that Zn complex of quinolinilporphyrin can be considered as a perspective antiphage agent and in consideration of aforesaid after additional studies can be used as a medium component for starters in dairy industry.