

EFFECT OF LACTOBACILLI ON AUTOCHTHONOUS MICROFLORA OF FISH PONDS

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The abundance of bacterioplankton and bacteriobenthos in fish ponds is largely determined by three main factors: water temperature, fish stocking density and fertilizers used. As the water temperature rises, the intensity of the metabolic processes of the microbiota increases, and their number increases significantly. The greatest number of microorganisms is contained in the surface layer of bottom sediments. Intensive consumption of the oxygen by bacterioplankton and bacteriobenthos can lead to fish kills. The use of probiotics in aquaculture is of great interest: their influence on the immunostimulation of farmed fish, direct inhibition of pathogenic bacteria and improvement of pond water quality have been studied by many researchers.

In order to determine measures to improve water quality in fish ponds, the laboratory experiment with the probiotic *Lactobacillus acidophilus* was carried out in the conditions of the Laboratory of Hydrobiology and Ecotoxicology. In this experiment, water samples were collected from the fish ponds of the "Ghidrin-Falesti Fish Enterprise" in RM. The degree of water body organic pollution is characterised by the hydrochemical parameter BOD₅, which varied from 8 to 28 (mg/L O₂) in water samples of these fish ponds. In accordance with the "Regulations" in force in the Republic of Moldova (2013), BOD₅ values > 7 (mg/L O₂) correspond to water quality class V. Thus, in terms of the amount of organic substrate, the water in these ponds is a good habitat for heterotrophic microorganisms. As a result of the development of the scientific basis of the theory of fertilisation of fishponds by Soviet hydrobiologists (N. Arnold, G. Vinberg, V. Zhadin, A. Rodina, etc.) the following was revealed: when fish is raised in high stocking with artificial compound feed, the task arises to limit bacterial development, i.e. to manage bacterial processes in the fish ponds. The task remains relevant today.

The aim of the experiment was to test the ability of lactobacilli to survive in the bottom layer of a fish pond in comparison with autochthonous microflora. For this purpose, water samples from the Calugar, Girla and Fagadau ponds were divided into two aliquots: matrix (natural sample) and matrix + lactobacilli. Lactobacilli are non-pathogenic Gram-positive microorganisms with high enzymatic activity. In relation to oxygen, they are microaerophiles. By type of nutrition, they are chemoheterotrophs, using organic compounds as a source of energy and carbon. All aliquots were incubated at 22°C without aeration and also without access to light to minimise the photosynthetic activity of phytoplankton. After five days, each aliquot was inoculated (at the appropriate dilution) into Petri dishes on Tergitol 7 agar (without TTC) and incubated at 22°C. In sanitary microbiology, MRS agar is used for testing lactobacilli and cultivation is carried out at (30 - 35) °C. In our experiment, the aim was not to create the specific conditions for lactobacilli. We used Tergitol 7 agar, which contains lactose as opposed to MRS agar, which contains dextrose. To find out the ability to grow on Tergitol 7 agar and to determine the specific characteristics of the colonies, a *Lactobacillus acidophilus* culture was inoculated on this medium and cultivated under the same conditions as the test samples. The results of the experiment are presented below:

	Fagadau	Girla	Calugar
Matrix on the day of sampling, 10 ³ CFU/mL	3,3	3,2	2,5
Matrix after 5 days, 10 ³ CFU/mL	30	10	5
Matrix + <i>L. acidophilus</i> after 5 days, 10 ³ CFU/mL	4725	1805	2625

Thus, under oxygen-deficient conditions, the autochthonous microflora of fish ponds cannot withstand competition with lactobacilli, which are microaerophiles. If the results of the laboratory experiment are confirmed in real conditions, lactobacilli may be recommended for the suppression of autochthonous microflora, which are intensive oxygen consumers in summer biocenoses.

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