

Microplastics (MP, i.e. plastic particles with a diameter of <5 mm) pollution of both marine and freshwater environments is currently one of the most intensely studied issues in the field of ecology and environmental protection. Many studies attempt to estimate the distribution and concentration of MP in various environments and determine how MP affects the organisms inhabiting these environments. Decidedly less research concern to the opposite dependence, i.e. how living organisms affect the distribution, concentration and qualitative characteristics of MP. Although the literature on the subject contains several examples of studies demonstrating that the activity of microorganisms (such as bacteria and fungi) significantly affects the quantitative and qualitative characteristics of MP, we have not found such examples for fish and zooplankton. Our project aims to study the effect of the presence of these animals on the concentration, size, shape and microstructure of MP particles and on the concentration of the dissolved products of its decomposition. We predict that the presence of fish and zooplankton reduces the concentration of MP in water mainly due to its consumption and its binding in the faeces, which are deposited in the bottom sediments. We also predict that the presence of fish and zooplankton causes a decrease in the size of MP particles, changes its microstructure, and increases the concentration of the dissolved products of its decomposition both as a result of the mechanical and biochemical processes occurring as the MP passes through the digestive tract, as well as due to the biochemical processes caused by the bacteria occurring in the presence of the fish and zooplankton. We will verify our predictions by conducting numerous laboratory experiments and analyzing the data obtained in these experiments, using for this purpose: (1) advanced scanning electron microscope technique for MP particle microstructure analysis, (2) mass spectrometry for identifying the products of biochemical disintegration of MP and (3) distinguishing major taxonomic groups of bacteria basing on the *16S rRNA* gene and staining with fluorescent dye DAPI, for the analysis of the taxonomic and quantitative composition of the bacterial microflora associated with the presence of fish and zooplankton.