

The project concerns the role of bacterial viruses (bacteriophages) in the processes of mineral phase precipitation in the aquatic environment. From mineralogical and sedimentological point of view, the bacteriophages have unique properties, among which the most important are very small sizes (on average 50-100 nm) and regular, crystal-like structure of viral particles. Additionally, the bacteriophages are widespread in the natural environment, in quantities significantly exceeding the number of bacteria. Therefore, it should be assumed that in aqueous environments, in which various mineral phases may precipitate (such as carbonates or sulphates and phosphates), viral particles may act as crystallization seeds initiating the precipitation of mineral phases. It can be also hypothesized that such precipitated mineral structures may differ from analogous structures crystallizing from an abiotic solution. So far, scientific studies in this area have mainly addressed to the issue of the impact of bacterial cells and their associated structures on the formation and biotransformation of mineral phases, which has led to numerous discoveries. The formation of characteristic mineral structures in the presence of microorganisms, whose origin was hitherto unclear, was shown. A classic example are the unique morphological forms of carbonate minerals. The presence of these forms in the environment can be regarded as indicator of certain sedimentation conditions because the presence of microorganisms was required for their formation. There is therefore no doubt that microorganisms can take an active or indirect role in the sedimentation environment and can initiate the precipitation of specific mineral phases. It is not clear, however, whether viral particles can also affect the precipitation processes. On the one hand they are very small and common in the environments, on the other hand metabolic activity does not exist in case of free viruses. The few researches to date are inconclusive and, in principle, the vast majority concern only carbonate issues. The impact of viruses on the other mineral groups such as sulfates, phosphates, silicates and sulfides were not studied at all.