

Abstract – AVOCET Project

Everywhere in the world, faecal pollution remains one of the major problems in water resource management. In order to assess water quality, a large panel of faecal indicators, including bacteria and bacteriophages, has been proposed. The indicative value of these microorganisms is indisputable. On the contrary the way microbial indicators are evolving in time and space is still largely unknown. This is therefore sometimes difficult to analyse the significance of microbial indicators in river monitoring programmes. Although the importance of rainfall events in the transfer of microbes from land surfaces or sediments to waterbodies is known, the link between hydro-climatology and viral propagation still needs to be ascertained. Moreover, despite structural similarities, bacteriophages and pathogenic viruses can widely differ in their surface properties. These dissimilarities are suspected to be at the origin of distinct behaviour in water, questioning the accuracy of bacteriophages for predicting the environmental fate of pathogenic viruses.

The aim of the present project is to understand the dynamics and mechanisms of viral propagation in a Luxembourgish watershed in relationship to the hydro-climatological conditions. The research work is split into two parts. The first one deals with the dynamics of the target viruses in the river under different hydrological regimes (base flow, floods). A second one is concentrate on the fate of viruses under laboratory controlled conditions, in reactors. Then, *in situ* observations and the results of the mechanistic experiments determined in the laboratory are confronted in order to produce a consolidated view and a modelling of the mechanisms governing the fate of viruses in aquatic systems.