



Natural attenuation in a surface water channel and a coastal aquifer by monitoring presence and removal of indicator bacteria, pathogens and antibiotic resistance gene: model development

Costantino Masciopinto, Fabrizio Visino, Maria Laura Luprano, Caterina Levantesi, and Valter Tandoi
Italy (costantino.masciopinto@ba.irs.cnr.it)

The spreading of microbial contamination into the environment, represents a very relevant problem, which leads to an increasing health concern. For this reason, it is important to identify and characterize the extent of natural depuration in water environmental particularly for reducing the presence of faecal contamination indicator bacteria, pathogens and antibiotic resistance genes (ARG). In this study, the presence of the above reported microbial parameters was analyzed in a surface water channel and in a coastal aquifer in southern Italy (Ostuni) southern Italy, both affected by Ostuni municipal treatment plant effluents and by local run-off. Several samples were collected from surface water, flowing in channels, and from wells in our study area. In particular, the water samples were analyzed to detect 7 fecal contamination indicators (*E. coli*, total coliforms, *Clostridium p.* spores, somatic coliphages, Enterococci and heterotrophic bacteria), *Salmonella* spp and the presence of ARGs. The water samples were also tested for chemical constituents. Finally a mathematical model has been developed in order to simulate pathogen migration pathways in the fractured groundwater and corresponding possible mitigation of pathogens in pumping wells.