



Detection of multiple viral biocolloids in the sewage of an urban wastewater treatment plant by molecular techniques

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Background The detection of viruses in the sewage of an urban city by nucleic acid amplification techniques allows the identification of the viral strains that are circulating in the community and gives useful data on the distribution, spread, and frequency of these viruses, supporting epidemiological studies of the related viral infections.

Methods In the present study, a two years survey (2007-2009) was conducted in order to evaluate the presence of human adenoviruses (hAdV), hepatitis A viruses (HAV), hepatitis E viruses (HEV), Noroviruses (NoV), and human Polyomaviruses (hPyV) in sewage samples collected from the inlet of a municipal biological wastewater treatment plant, located in south-western Greece.

Results In total, viruses have been detected in 87.5% (42/48) of the inlet samples collected from the plant entry. Analytically, DNA viruses, adenoviruses, have been recognized in 45.8% (22/48) of the samples and PyVs have been detected in 68.8% (33/48) of the sewage samples. As it concerns RNA viruses, Hepatitis A viruses were detected in 8.3% (4/48), Noroviruses in 6.3% (3/48), while HEV has not been detected at all. After sequencing, the adenoviruses were typed as Ad8, Ad40 and Ad41 and the PyVs viruses have been typed as JC and BK. All noroviruses have been identified as GII4. This study demonstrates the advantages of environmental surveillance as a tool to determine the epidemiology of viruses circulating in a given community.

Conclusions We propose that similar long-term studies could be undertaken in countries such as Greece in order to offer a valuable and complementary tool to current problematic epidemiological surveillance systems.