

Environmental Virology: EV



IN SEDIMENT SAMPLES FROM RURAL PROPERTIES OF ROLANTE AND RIOZINHO, VALE DO PARANHANA, RS, BRAZIL

Staggemeier, R., Bortoluzzi, M., Pacheco, A.M., Kluge, M., Luz, R.B., Fabres, R.B., Soliman, M.C., Bianchi, E., Bergamaschi, B., Rodrigues, M.T., Fleck, J.D., Fontana, T., Spilki, F.R., Almeida, S.E.M.

Universidade Feevale; FEEVALE; • RS-239, 2755, Bairro Vila Nova, Novo Hamburgo, RS, Brasil. CEP 93352-000

Contamination of the soil (sediment) has become one of the major environmental concerns, since, generally, the contamination affects the global environment of the affected area (soil, surface water and groundwater, wildlife and vegetation) and may also be in the origin of public health problems. Virus can settle into soil or water, when associated with particulate matter in suspension or in solid matrices of sediments, they tend to remain viable longer. Enteric viruses in the soil have the ability to migrate through it by the successive adsorption-desorption phenomena, thus, providing risk of contamination of groundwater by the ease of penetration of viral particles in the soil. Among these viruses are the adenovirus (AdV), enterovirus (EV) and the rotavirus genogroup A (GARV), which causes diseases in humans and animals. This study aims to evaluate the presence of AdV, EV and GARV in sediment samples of slopes, dams and streams from rural properties of Riozinho and Rolante. Eighteen sediment (100 g) and water (500 mL) samples of slopes, dams and streams were collected and submitted to extraction of DNA/RNA, followed by, when necessary, the synthesis of cDNA by reverse transcription. The viral detection was performed by polymerase chain reaction (PCR). PCR products were submitted to electrophoresis and analyzed under UV light. Of the 18 sediment samples, 7 were positive for AdV and 6 for GARV. In water samples, 5 for AdV, 3 for GARV and 1 for EV. For the collection points where water was running (ie slopes) there was not viral detection in sediment, only in water. On the other hand, dams and streams in which the water keeps direct contact to the soil for a long time, viruses were detected only in sediments. The results suggest the capacity of viruses present in water to concentrate on the sediment. The presence of these pathogens in soil may contribute to an increased risk of contamination of groundwater.

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EV121 - INCIDENCE OF ENTERIC VIRUSES IN GROUNDWATER FROM WELLS LOCATED AT IVOTI, CAÍ WATERSHED, RS, BRAZIL

Soliman, M.C., Pacheco, A.M., Luz, R.B., Staggemeier, R., Fabres, R.B., Kluge, M., Fontana, T., Jung, M., Rodrigues, M.T., Bortoluzzi, M., Schalemberger, G., Bianchi, E., Rech, N., Fleck, J.D., Spilki, F.R.

Universidade Feevale; FEEVALE; • RS-239, 2755, Bairro Vila Nova, Novo Hamburgo, RS, Brasil. CEP 93352-000

Enteric viruses are mainly associated to waterborne viral gastroenteritis. Adenoviruses (AdV, Adenoviridae family, double-stranded DNA), enteroviruses (EV, Picornaviridae family, single-stranded RNA) and rotaviruses from the genogroup A (GARV, Reoviridae family, segmented double-stranded RNA) could be candidates as indicator organisms of fecal pollution for different water sources. The aim of this study was to verify the presence of AdV, EV and GARV in groundwater samples collected in the municipality of Ivoti, RS. Twenty-three (23) samples were collected from artesian and dug wells in sterilized glass bottles and submitted to virological analysis. Putative present viral particles were concentrated through adsorption-elution process, using a negative polarity membrane. After, the extraction of viral DNA and/or RNA. For EV and GARV, it was performed the synthesis complementary DNA (cDNA) by reverse transcription. Conventional Polymerase Chain Reaction (PCR) was applied aiming the detection of the specific genomes. Oligonucleotides with potential alignment in conserved regions of the genome of each virus were used, corresponding to the hexon protein gene of AdV, the region 5' untranslated (5'UTR) of ENT and the VP6 GARV gene. The reaction products were marked with SYBR-Safe®, submitted to electrophoresis on 2% agarose gel and visualized under ultraviolet light. From the 23 samples analyzed, 34.7% were positive for ADV, 30.4% positive for GARV and all samples were negative for EV. These results indicate contamination by AdV and GARV in the region in study and demonstrate that the isolated analysis of a single virus (EV, for this study) may be not enough to reveal fecal contamination. From the knowledge of the authors, it was the first assessment of groundwater contamination within the Caí watershed, one of the most populated river basins in the south of Brazil.

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EV122 - MOLECULAR DETECTION OF HEPATITIS A VIRUS (HAV) IN MAIN WELLSPRING OF WATER SUPPLY OF THE CITY OF BELÉM, PARA, BRAZIL.

Gurjão, T.C.M., Garza, D.R., Teixeira, D.M., Souza, D.S.A., Spada, P.K., Mascarenhas, J.D.P., Gabbay, Y.B., De Paula, V.S., Sá, L.L.C.

1. Instituto Evandro Chagas; IEC; Rua Br. 316, S.N. Km07-Levilândia Cep 67030-000-Ananindeua - PA
2. Fundação Oswaldo Cruz; FIOCRUZ; Avenida Brasil-Rio de Janeiro

HAV is the main causative agent of hepatitis in Amazon region, In the North of Brazil, infection by this virus is highly endemic, varying by location depending on the socioeconomic and sanitary conditions. HAV needs an extremely low infectious dose and can remain viable in water for several months resisting the processes of water and sewage treatment, such as chlorination. Studies show that the concentration of coliforms, current microbiologic

indicator, isn't correlated with the presence of viral waterborne pathogens. This study aims the detection of HAV in samples collected monthly, from 08/2010 to 07/2011, at Utinga Wellspring: Bolonha Lake (PT 01), Água Preta Channel (PT 02), and the Bolonha water treatment plant (ETA). Two liters of each sample were concentrated by the adsorption-elution method using a negatively charged membrane followed by centrifugation using an Amicon Ultra (Millipore) with a final volume of 2 mL. Sterilized water was used as a negative control. Bacteriological test were performed using the Collilert kit. Viral RNA was extracted by the QIAGEN kit. After reverse transcription, the region of HAV VP1/2A was amplified by Nested-PCR method. Of the 48 tests, 36 are samples and 12 controls. One sample from the PT 01, collected in June 2011, was positive for HAV (2,8%). The bacteriological analyses showed that the samples located in PT 01 and PT 02 exceeded the values established by the CONAMA Nº 357/05 for class 2 waters. Samples collected in the ETA were in accordance to the values established by Ordinance Nº 518/04 MS for drinking water. The result of this study demonstrated a possible evaluation of disease risk associated with water resources in Belém. Although the bacteriological analysis showed no correlation with the presence of HAV, the significant amounts of fecal coliforms present on PT 01 and PT02 indicate a potential risk in water use.

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