

Efficiency on the Enteric Viral Removal in Four Potable Water Treatment Plants in Northeastern Colombia

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Abstract : Enteric viruses are cosmopolitan agents present in several environments including water. These viruses can cause different diseases including gastroenteritis, hepatitis, conjunctivitis, respiratory problems among others. Although in Colombia there are not regulations concerning to routine viral analysis of drinking water, an enhanced understanding of viral pollution and resistance to treatments is desired in order to assure pure water to the population. Viral detection is often complex due to the need of specialized and time-consuming procedures. In addition, viruses are highly diluted in water which is a drawback from the analytical point of view. To this end, a fast and selective detection method for detection enteric viruses (i.e. Hepatitis A and Rotavirus) were applied. Micro- magnetic particles were functionalized with monoclonal antibodies anti-Hepatitis and anti-Rotavirus and they were used to capture, concentrate and separate whole viral particles in raw water and drinking water samples from four treatment plants identified as CAR-01, MON-02, POR-03, TON-04 and located in the Northeastern Colombia. Viruses were molecularly by using RT-PCR One Step Superscript III. Each plant was analyzed at the entry and exit points, in order to determine the initial presence and eventual reduction of Hepatitis A and Rotavirus after disinfection. The results revealed the presence of both enteric viruses in a 100 % of raw water analyzed in all plants. This represents a potential health hazard, especially for those people whose use this water for agricultural purposes. However, in drinking water analysis, enteric viruses was only positive in CAR-01, where was found the presence of Rotavirus. As a conclusion, the results confirm Rotavirus as the best indicator to evaluate the efficacy of potable treatment plant in eliminating viruses. CAR potable water plant should improve their disinfection process in order to remove efficiently enteric viruses.

Keywords : drinking water, hepatitis A, rotavirus, virus removal

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