

Faecal coliforms, faecal enterococci, *Salmonella* Typhi and *Acanthamoeba* spp. UV inactivation in three different biological effluents

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Abstract

Efficiency of UV-light to inactivate microbial indicators, *Salmonella* Typhi and *Acanthamoeba* spp. was studied in three different biological secondary effluents. Even though effluents differed in terms of their total suspended solids content, transmittance and particle size distribution, the UV-light dose required to fulfil WHO agricultural water reuse criteria was the same (30 mW·s/cm²), because the particle content with sizes >40 µm was similar and very small. Using this dosage, 3 log of *Salmonella* Typhi and faecal enterococci were also inactivated. To avoid faecal coliform and *Salmonella* Typhi photoreactivation, the UV dose had to be doubled and in the process 2.5 log of *Acanthamoeba* spp. were also inactivated. This is interesting because its presence in wastewater, pathogenicity and resistance to conventional disinfection processes has been reported in the literature. Additionally, it was found that the faecal coliforms' inactivation rate constant was the lowest one of all the bacteria studied (*Salmonella* Typhi and faecal enterococci), suggesting the limitation of this indicator when several kinds of pathogens are present, as is the case in developing countries.

Keywords: amoebae, UV disinfection, indicators, pathogen, risks assessment, wastewater