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A mini-review on new disinfection alternative: bacteriophages and pathogen removal potential from water and wastewater

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ABSTRACT

Disinfection is a practice that inactivates and destroys pathogenic organisms. The conventional disinfectants for water and treated wastewater effluents have defects such as dangerous disinfection by-products, the resistance of bacteria and the related biofilms to disinfectant, high costs, no residual disinfecting action, and high risks involved in producing, transporting, and handling a large amount of chlorine and ozone. Accordingly, investigating new disinfection alternatives has been a necessity. Bacteriophages are used to treat a bacterial infection, which is known as phage therapy. In the recent decades, some studies revealed the role of phages in water and wastewater treatment, especially disinfection. In addition, the abundance of phages specific to enteric bacterial pathogens in natural water bodies is disclosed in many studies. This review discusses the phages specified to fecal coliform and other waterborne bacteria, the main advantages for applying the phages to reduce pathogens, restrictions of disinfection using phages, and the prospective applications of phages in order to improve the design and operation of the treatment plants.

Keywords: Disinfection; Bacteriophage; Pathogen; Water; Wastewater

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