

## ABSTRACT

Proper treatment of wastewater is key to the achievement of sustainable environmental management. The use of ultraviolet radiation and ultrasound have continued to be considered as some of the best sustainable practices in wastewater purification. However, despite the suitability of the two emerging techniques in sustainably increasing the purification efficiencies of wastewater, their application has not been fully understood, especially in eliminating faecal pathogenic microorganisms. Moreover, their combined potential in the elimination of *Escherichia coli* resistant genes from wastewater has not been adequately explored. This study was designed to evaluate the potential of individual and combined/integrated ultraviolet radiation and ultrasonic technologies in the removal of antibiotic-resistant *E. coli* from domestic effluents. There was a statistical difference in the mean log units of sulfonamide resistant *E. coli* between the different ultraviolet radiation and ultrasonic dosages ( $P < 0.05$ ), showing that ultraviolet radiation technology was more effective in the removal of both sulfonamide and tetracycline resistant *E. coli* from the wastewater. However, the integrated ultraviolet radiation-ultrasonic technique was highly efficient and is recommended in the removal of antibiotic resistant *E. coli* from wastewater. Nonetheless, further studies also need to be performed to further evaluate the disinfection effectiveness on a different bacteria species under continuous operation.

**Keywords:** sulfonamide, tetracycline, ultrasonic, ultraviolet radiation, wastewater