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THE USAGE OF ULTRASOUNDS TO DISINTEGRATE *ESCHERICHIA COLI* BACTERIA CONTAINED IN TREATED WASTEWATER

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Abstract

Sewage and sewage sludge is a place of the occurrence of many microorganisms, including pathogenic and relatively pathogenic bacteria. They may reach other environments, e.g. receiver waters or soil, thus creating a biological threat. The aim of this paper was to study, in laboratory conditions, the effect of low-frequency ultrasound on the disintegration of *Escherichia coli* bacteria present in purified wastewater. *E. coli* bacilli and ultrapure water were used for the study. The samples were exposed to ultrasounds at 20 and 40 kHz for variable time of sonication and at two different modes of the ultrasonic cleaner operation: continuous and pulsed. Studies have shown that ultrasound has an effective impact on *E. coli* bacilli. Already the 3-minute interaction of ultrasounds at 20 kHz with the pulsation mode of impact of the device caused a decrease in the number of these bacteria by over 90%. The 20-minute operation of 40 kHz ultrasound waves resulted in a decrease in the amount of bacteria by nearly 70% compared to the control. The obtained results, therefore, indicate the possibility of using the disintegration process of low frequency ultrasounds for removing *Escherichia coli* bacteria present in treated wastewater.

Keywords: Disintegration; Disinfection; Low frequency ultrasounds; Microorganisms; Treated wastewater.