Can rapid pressure decrease induced by supercavitation efficiently eradicate *Legionella pneumophila* bacteria?

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Received 25 March 2014; Accepted 14 October 2014

**ABSTRACT**

The presence of *Legionella pneumophila* bacteria in engineered water systems can pose a significant health risk. Current prevention and outbreak treatments are cost and environmentally ineffective. Moreover they do not prevent rapid bacteria recolonization. Although cavitation was already suggested as a possible water treatment technique a systematic study has not yet been performed. In the present experimental campaign we set out to evaluate the efficiency of removal of *L. pneumophila* by three types of cavitation—the most commonly used acoustic cavitation, the aggressive developed hydrodynamic cavitation, and the supercavitation. We show that it is probably not the pressure peaks or the high local temperatures that cause the eradication of the bacteria, but the rapid pressure decrease which was initiated in supercavitating flow regime. Results of the study show promising ground for further optimization of a methodology for *L. pneumophila* removal by cavitation.

**Keywords:** Cavitation; *Legionella pneumophila* bacteria; Supercavitation; Developed hydrodynamic cavitation; Ultrasonic cavitation

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