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Master Thesis Defense

Entitled

*THE USE OF BACTERIOPHAGES TO CONTROL LEGIONELLA SPP. IN ENVIRONMENTAL WATER
SAMPLES.*

by

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Abstract

Legionnaires' disease is a potentially fatal form of pneumonia which can affect human, but principally affects those who are susceptible and predesposed to infection due to old age, illness, immunosuppressed and patients at risk. Legionnaires' disease is caused by Gram negative rod bacteria called *Legionella pneumophila*. More than 2.4 million cases of pneumonia is reported each year in the USA, and an estimation of 8,000 to 18,000 are actually of confirmed cases of Legionnaires' disease. *Legionella pneumophila* is found virtually in most natural aquatic and soil environments, and also can be found in man-made habitats, such as cooling towers, spas and water distribution systems. To reduce or eliminate the risk of Legionellosis, it is necessary to minimize the concentrations of *Legionella* in the affected system, and/or prevent *Legionella* transmission from the affected system to susceptible individuals. Decontamination of contaminated water systems usually preformed by "superheating" raising the water temperature to at least 70° C for 24 hours and flushing each outlet for 20 minutes. Alternative method is the use of metal ions, such as chlorine, copper or silver in solution. The major aim of the present thesis is to search for a safe method to reduce the presence of *Legionella* in water samples in the UAE by using super lytic polyvalent phages. The phages were isolated from waste water and/or sea water samples and we were testing its activity against *Legionella*. The phages were then be propagated, cultivated and used to treat water samples in order to reduce or minimize the use of chemicals during decontaminating the environmental water samples. The outcome result of the current thesis might introduce an environmentally friendly procedure to replace the application of chemical disinfectants currently in use in the UAE.

Keywords: *Legionella*, Legionnaires, phages, environment, environmental friendly, decontamination, control, waste water, UAE.