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## OCCURRENCE AND DISTRIBUTION OF TETRACYCLINE RESISTANCE DETERMINANTS AND THEIR POLLUTION STATUS IN THE AQUACULTURE ENVIRONMENT OF SRI LANKA

Gayani Yasodara Liyanage and Pathmalal M. Manage\*

Centre for Water Quality and Algae Research, Department of Zoology, University of Sri Jayewardenepura,

Sri Lanka

pathmalal@sjp.ac.lk

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### ABSTRACT

Tetracyclines (TET) and Oxytetracycline (OTC) have been extensively used in aquaculture for chemotherapy against various fish diseases. The tetracycline (TET and OTC) contamination levels in the 16 aquaculture farms in Sri Lanka were analyzed by using High Performance Liquid Chromatography (HPLC). Antibiotic-resistant bacteria in samples were isolated by standard pour plate method and identification was done by the 16s rRNA sequencing. The MIC of resistance bacteria was determined by an agar dilution method following CLSI guidelines. The concentration of OTC in aquaculture farms effluent water was ranged between  $0.008 \pm 0.012$  -  $0.234 \pm 0.014$  ppm whereas TET concentration ranged from  $0.001 \pm 0.011$  -  $0.112 \pm 0.017$  ppm. *Bacillus* and *Staphylococcus* were the most dominant bacterial genera recorded as resistant to both OTC and TET bacteria. *Acinetobacter* sp., *Achromobacter* sp., *Staphylococcus* sp., *Micrococcus* sp. were identified from the samples as OTC and TET resistant bacteria. The MIC values of TET resistance bacteria ranged from 360 ppm to 720 ppm and OTC range was from 360 to 760 ppm. The results of the study indicate that contamination with antibiotics (TET, OTC) potentially lead to development of antibiotic resistance in environmental bacteria and the presence of antibiotic resistance bacteria may limit the effectiveness of antibiotics which are used to treat fish illness as well. This is an alarming aquaculture industry is in a risk on wide range of pathogenic infection diseases.

**Keywords:** Tetracycline (TET), Oxytetracycline (OTC), Antibiotic resistance