

PREVALENCE OF ANTIBIOTIC RESISTANCE BACTERIA ALONG THE MAHAWELI RIVER SEGMENT BETWEEN KOTAGALA AND BALAGOLLA

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The release of antibiotics into the environment promotes the selection of Antibiotic Resistant Bacteria (ARB). The objective of the study was to analyse the prevalence of ARB at water inlets and outlets of selected Water Treatment Plants (WTPs) along the Mahaweli River in wet and dry seasons. Two visits were made to 14 WTPs operated by the National Water Supply and Drainage Board along the Mahaweli River between Kotagala and Balagolla in the wet (September 2022) and dry (February 2023) seasons to collect raw and treated water. The membrane filtration technique, using 1 ml of raw water and 100 ml of treated water, was used to separate Fecal Coliforms. Each location confirmed *Escherichia coli* colonies from routine biochemical tests were subjected to Antibiotic Susceptibility Test (AST) using six antibiotics (amoxicillin, ceftazidime, tetracycline, co-trimoxazole, streptomycin and ciprofloxacin) on Mueller Hinton agar medium. Statistical software, SPSS, was used to analyse the data. *Escherichia coli* was absent in all the treated water samples. Eighty-four colonies from both seasons were tested for AST. More than half of the tested colonies (61%) were resistant to at least one antibiotic. A significant seasonal change was observed only in amoxicillin resistance, being high in the wet season (29/35, 83%) and low in the dry season (22/49, 45%) ($p=0.014$). There were no significant seasonal changes in antibiotic resistance among locations ($p=0.410$). Multi-Drug Resistance (MDR) was observed at eight WTPs. Only Nawalapitiya and Paradeka WTPs showed MDR in both seasons. The study showed that the inlet water of the WTPs in the Mahaweli River is contaminated with ARB at most locations, as indicated by *E. coli*. The point contaminations play a major role in the accumulation of ARB rather than the season. Patterns of land use and antibiotic usage may act as key factors for this observation. A study on land use data is required to strengthen these findings further.

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