

Oral presentation: 80

## **Isolation of *Salmonella* spp. and *Shigella* spp. from ground and surface water in the lower part of the Kelani river basin: evaluation of resistance against selected antibiotics**

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In recent years, greater attention has been paid by national and international agencies on microbial contamination of ground and surface water sources. Antibiotics are commonly used to treat emerging infectious diseases due to anthropological activities. Improper application of antibiotics both in human and animal therapy has become the main cause of antibiotic resistance. The Kelani River Basin (KRB) is the home to more than 25% of the Sri Lankan population and it provides about 80% of the drinking water to Greater Colombo. Thus, evaluation of the microbiological status along with antibiotic resistance is important to safeguard consumers within the KRB. Therefore, twenty ground and twenty surface water samples were collected from a lower part of KRB for the study during March 2018. Water temperature, Dissolved Oxygen (DO), pH and conductivity were measured at the site itself using standard meters and  $\text{N-NO}_3^-$ ,  $\text{N-NO}_2^-$ ,  $\text{N-NH}_3$ , Total Phosphate (TP), COD and Total Hardness (TH) were measured by following standard spectrophotometric and titrimetric methods. Total Coliform (TC) and Fecal Coliform (FC) counts were obtained from membrane filtration methods where *Salmonella* spp. and *Shigella* spp. were isolated and identified according to the WHO standard protocol. Antibiotic resistance of the isolated *Salmonella* spp. and *Shigella* spp. were obtained using Antibiotic Susceptibility Test (AST) following Agar Disk Diffusion Method (ADDM) for some selected antibiotics by commercially available AST disk. Resistant strains were subjected to Broth Microdilution Assay (BMA) to find Minimum Inhibition Concentration (MIC). All the tested general water quality parameters were within the SLSI drinking water standard except pH and COD. It was found that; out of 40 samples, 39 were contaminated with TC and FC and 39 samples exceeded the bacteriological standards given by SLSI drinking water standards. *Salmonella* spp. and *Shigella* spp. were recorded in a groundwater sample located in Pattipola where poor sanitation practices were observed. Another sampling location in Kanampella, *Shigella* spp. was recorded. AST results of the study revealed that the *Salmonella* spp. and *Shigella* spp. were resistant to 10 µg/disk of Amoxicillin (AMX) and Ampicillin (AMP). The BMA indicates that MICs of the isolated strains against AMX and AMP were up to 70 µg/mL. Accordingly, treatment, awareness and strategic management plan is a must to safeguard both ground and surface water consumers in the lower part of the KRB.

**Keywords:** Antibiotic resistance, Kelani river basin, *Salmonella* spp., *Shigella* spp., water quality