ABSTRACT

Many strains of *Escherichia coli* can be pathogenic leading to diarrheal diseases. The occurrence of antimicrobial resistant bacteria is increasing in aquatic environments infecting fish which are later consumed by humans when not well cooked posing a major problem in the management of bacterial infections. *Rastrineobola argentea* is food for many people living around Lake Victoria due to its nutritive value and high protein content. Sun dried *R. argentea* retailed in Kisumu city markets have been shown to be contaminated with antimicrobial resistant *E. coli* which could be as a result of how they are processed including drying them on the sand and dirty mats. Studies done so far with *Salmonella* species have indicated a difference in *Salmonella* species contamination in different types of beaches and different bacteria concentrations at different distances from the shoreline into the lake interior. *Vt1* gene has been shown to be a determinant factor for virulence. This was why this study was undertaken to determine the antimicrobial resistance of *E. coli* isolated from freshly fished *R. argentea* and in lake water in Dunga and Uyoma Naya beaches in Lake Victoria Kenya. A cross sectional study design was used to collect 36 *R. argentea* and 36 water samples from Dunga beach and 36 *R. argentea* and 36 water samples from Uyoma Naya beach in sterilized plastic bags and bottles. Standard microbiological procedures were used to isolate and determine *E. coli* phenotypes from the samples within which 16 *R. argentea* and 9 water samples from Dunga and 8 *R. argentea* and 8 water samples from Uyoma Naya were found to be contaminated with verotoxin - producing *E. coli* (VTEC). The isolates were later screened for antibiotic resistance using the disk – diffusion technique. All 41 isolates were resistant to Ampicillin/Cloxallin, 65.9% were resistant to Tetracycline, 4.9% were resistant to Cefuroxime, and 2.4% were resistant to Nalidixic Acid. There was no resistance to Chloramphenicol, Gentamicin and Co-Trimoxazole. Monoplex PCR was performed on eight of the *E. coli* isolates that were both resistant to Ampicillin/Cloxallin and Tetracycline using a verotoxin gene (*vt1*) as the primer of $^{5'}$CGCTGAATGTCATTCGCTCTGC$^{3'}$ nucleotide base sequence and a 772 – 812 product size in base pairs. Dunga and Uyoma Naya beaches have antimicrobial resistant *E. coli*. There was a significant difference in *E. coli* contamination levels between the two beaches shown by $T_s = 36.9928$ (P< 0.05). The results give an insight for continuous research on antibiotic susceptibility surveillance in the aquatic environments where *R. argentea* and water are obtained for human consumption since the rate of antibiotic resistance keep

on changing from time to time due to the fact that *E. coli* is a hardy environmental isolate and is indicative of fecal contamination in food stuff or water for it is only found as a resident microbe in the intestine.