Abstract

Water samples for heavy metal analysis and microbiological assays were collected from hot spots of agricultural, industrialand municipal pollutionin the Lake Victoria basin. The samples were assayed fornativebacteria, coliforms and enteric pathogens. The isolates were subjected to heavy metal compounds of mercury, nickel, chromium and copper in the laboratory to assess their levels of tolerance. Antibiotic susceptibility testing was carried out to check for antibiotic resistance. The samples recorded mean range of metal ions (mg/l) as follows; -lead;0.77-0.94, manganese; 0.10-3.10, zinc; 0.2-1.16, cadmium 0.02-0.04, and copper 0.51-0.57 mg/l. The study showed a significant difference in percentage tolerance to the four heavy metals tested. ($F = 4.25$, $P = 0.011$, $P < 0.05$). The order of toxicity recorded was Hg>Cr>Ni>Cu. 53.8% of the total isolates showed multidrug resistance, Cefuroxime (67.7%), cotrimoxazole (65%), tetracycline (62.4%) and ampicillin (53%).There was a significant relationship between chromium tolerance with resistance to cefuroxime ($p < 0.000$), Nickel withresistance to cefuroxime ($p < 0.05$) and mercury withresistance to ampicillin ($p < 0.05$). Plasmid DNA finger printof the metal tolerant and antibiotic resistant isolates showed apositive relationship in isolates carrying plasmids and the multidrug resistant isolates ($r = 0.372$, $P = 0.261$) suggesting that heavy metal pollution in wet lands induces multidrug resistance. This poses a potential public health hazard as bacterial strains usually considered harmless could receive R factors that confer multiple drug resistance.