



Tropentag, September 11-13, 2024, hybrid conference

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## Evaluation of faecal indicator bacteria and antimicrobial resistance of *Escherichia coli* isolated from river Njoro, Nakuru county, Kenya

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### Abstract

Agriculture, urbanisation and industrial activities are a threat to surface water quality. The wastes generated from these activities are discharged into rivers directly or indirectly consequently altering the physical, chemical and biological quality of rivers. Human settlements and associated land use activities have compromised water quality of River Njoro, Nakuru County, Kenya causing environmental and public health concerns including diseases and antimicrobial resistance of microbial risks to medical drugs. The aim of this study was to investigate the effect of human activities on faecal pollution of River Njoro and to evaluate antimicrobial resistance of *Escherichia coli* isolated from the river water to a selected group of antibiotics. Antibiotic susceptibility of *E. coli* isolated from the river water samples was tested using Kirby-Bauer disc diffusion assay. The strain *E. coli* ATCC 25922 was used as antibiotic susceptibility reference standard. Both physico-chemical and bacteriological variables varied significantly among the sampled sites except for total suspended solids ( $p < 0.05$ ). A significant difference in antimicrobial resistance of *E. coli* isolated from River Njoro was observed between the sampling sites except for amikacin and amoxicillin ( $p < 0.05$ ). Antimicrobial susceptibility test revealed that *E. coli* isolated from water at different sections of the river were resistant to multiple antibiotics. A high resistance prevalence was recorded in streptomycin (95.83%), chloramphenicol (86.11%), ciprofloxacin (86.31%), amoxicillin (85.71%) and tetracycline (82.14%). Multiple antimicrobial resistance index were greater than the threshold of 0.2 in all the sites. Results from this study can be used in predicting potential microbial risks to human health and to provide mitigation measures towards protection of water resources against pollution.

**Keywords:** Antibiotic resistance, *Clostridium perfringens*, *Escherichia coli*, *Intestinal enterococci*, water quality