Title: **The bacteriological quality and the receiving waters of Nairobi and Athi Rivers**

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Abstract: Wastewater is known to contain microbes that are deleterious to human health. Epidemiological reports show that wastewater associated disease outbreaks are common around the world. This suggests that wastewater must be processed carefully before release into natural waters and the environment. The purpose of this study was to determine the total bacterial load and microbial types in Dandora Sewage Treatment Plant (DSTP) and its handling capacity in terms of pathogen removal. In addition, the seasonal and temporal relationship of bacterial load variation was estimated. Antecedent bacterial load of Nairobi and Athi rivers was also established to reveal the microbial load emptied into Athi River by the DSTP. Standard methods for collection and examination of wastewater were used to elucidate bacterial counts in the samples. The mean bacterial load at the influent was 7.1 x 107 CFU / 100 mL. Escherichia coli was the dominant bacterial type and the least common bacterial type was Vibrio parahaemolyticus. Other bacterial types found in the influent were Klebsiella aerogenes, Enterococcus faecalis, Salmonella typhi, Pseudomonas aeruginosa, Salmonella paratyphi, Vibrio cho/erae, Proteus mirabilis and Shigella flexneri. At the end of DSTP processing, the bacterial characteristic of the effluent was as follows: Enterococcus faecalis with mean total load of 2.7 x 104 ;:I: 1.7 x 103 CFU / 100 mL (Id = 0.0806), Escherichia coli estimated at 1.3 x 104 ± 1.1 x 103 CFU /100 mL iki= 0.1260), Pseudomonas aeruginosa measured as 2.5 x 102 ± 1.0 x 101 CFU /100 mL (Id = 0.1581), Salmonella typhi with load of 4.4 x 101 ± 5 x 10° CFU / 100 mL (Id = 0.1615) and Klebsiella aerogenes measured as 4.1 x 101 5 x 10° CFU / 100 mL (Id = 0.1897). In this regard, Enterococcus faecalis (Id = 0.0806) was the most resilient human pathogen. Seasonal variation in terms of quantity of bacteria was significant in both influent (F = 14.795, P = 0.001) and the effluent (F = 23.574, p = 0.000) with more bacteria found during the dry season. Bacterial load in the DSTP effluent showed diurnal variation with higher counts being found in the morning session (F = 22.788, p = 0.000). The bacteria types in Nairobi River, DSTP and Athi River were similar. The levels were higher in Nairobi River than in the DSTP effluent (F = 55.12, p = 0.001) and Athi River upstream (F = 13.638, p = 0.009). The performance of DSTP in terms of efficiency to remove bacteria from wastewater is below the set World Health Organization (WHO), Environmental Protection Agency (EPA) and National Environmental Management Authority (NEMA) guidelines for processed wastewater. The failure was replicated irrespective of the seasonal and diurnal variation. In conclusion, the DSTP and the Nairobi River portends a health risk to downstream communities and remedial intervention is urgently required.