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Environmental Health Risk Assessment of Hospital Wastewater in Enugu Urban, Nigeria

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Abstract : An important hydrogeologic problem in areas of high faults formations is high environmental health hazard occasioned by microbial and heavy metals contamination of ground waters. Consequently, we examined the microbial load and heavy metals concentration of hospital wastewater discharged into the environment at Park Lane General Hospital Enugu Urban, Nigeria. The microbial counts, characteristics and frequency of occurrences of the isolated microorganisms were determined by cultural, morphological and biochemical characteristics using established procedure while the varying concentrations of the identified heavy metals were determined using the spectrophotometric method. The microbiological analyses showed a mean total aerobic bacteria counts from 13.7 ± 0.65 × 107 to 22.8 ± 1.14 ×1010 CFU/ml, mean total anaerobic bacteria counts from 6.0 ± 1.6 × 103 to 1.7 ± 0.41 ×104 CFU/ml and mean total fungal counts from 0 ± 0 to 2.3 ± 0.16 × 105 CFU/ml. The isolated micro-organisms which included both pathogenic and non-pathogenic organisms were Staphylococcus aureus, Escherichia coli, Pseudomonas aeruginosa, Salmonella typhi, Bacillus subtilis, Proteus vulgaris, Klesbsiella pneumonia and bacteriodes sp. The only fungal isolate was Candida albican. The heavy metals identified in the leachate were Arsenic, Cadmium, Lead, Mercury and Chromium and their concentrations ranged from 0.003 ± 0.00082 to 0.14 ± 0.0082 mg/l. These values were above WHO permissible limits while others fall within the limits. Therefore, hospital waste water can pose the environmental health risk when not properly treated before discharge, especially in geologic formations with high fault formations.

Keywords : bacterial isolates, fungal isolates, heavy metals, hospital wastewater, microbial counts
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