ABSTRACT

On-site sanitation facilities, mostly pit latrines are the main points of human excreta disposal in periurban low-income settlements in Kenya. Collection, treatment and final disposal of pit latrine faecal sludge, pose a significant management problem and present public health risks. The choice of appropriate faecal sludge treatment technology depends on precise region based data on the sludge characteristics that are often unavailable. The study analysed physiochemical characteristics of faecal sludge sampled at different depths of pit latrines. Twenty-four samples were collected from six pit latrines along the depth strata at 1-m intervals from the surface to 3 m depth. Samples were analysed for chemical oxygen demand (COD), biochemical oxygen demand (BOD), ammonia, total nitrogen and total phosphorus. The mean COD: BOD ratio was 1:5 with a concentration of 112800 and 24600 mg/L, respectively. Concentrations for all parameters were variable and higher in comparison with properties reported in literature. Upper layers had higher concentrations than lower depths. The concentrations of the sludge were 10-100 higher than acceptable limits for in-fluent sludge into municipal wastewater treatment plants. These results show that disposal of pit latrine faecal sludge into the wastewater treatment plants without co-treatment overload the system since treatment plants in use currently have not been designed to handle pit latrine sludge. The properties of faecal sludge analysed indicate that the wastewater treatment plants may not be capable of treating faecal sludge unless co treatment mechanisms are applied. Therefore, influent faecal sludge must be maintained within allowable concentrations; otherwise, the effluents may lead to significant environmental pollution impacts.

Key words: On-site sanitation, depth strata, faecal sludge disposal, low-income settlements.