

Impact of Human Urine Contamination on Soil Biota

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Abstract

The role of human urine as an organic pollutant to soil biota was examined in this study. Using standard methods, the impact of human urine on the physicochemical parameters, fauna and microbial load in the soil microcosm was considered. Ten replicates of Urine contaminated soil (UrCS) and Uncontaminated Agricultural soil (UnCS) samples respectively were collected from points pedestrian urine deposition within Olabisi Onabanjo University, Ago-Iwoye and University of Agriculture, Alabata both in Ogun State. pH was determined using the pH meter. Moisture content (MC) was determined by drying and difference in weight method. Organic Carbon (OC) was determined using the Walkley-Black method and Organic Matter (OM) was estimated by the formula $\%OC = \%OM \times 1.729$. Phosphate and nitrate concentrations were determined by spectrophotometric method while sulphate concentration was determined by the turbidimetry method. Ammonium concentration was determined by distillation method using 40% boric acid with methyl red indicator. The fauna record was conducted by heat extraction into alcohol or normal saline while microbial load was estimated by the pour plate and serial dilution techniques. UrCS recorded a significantly higher MC, OC, bM, phosphate, nitrate, sulphate, ammonium concentrations and lower pH ($p < 0.05$) than UnCS. A complete absence of microfauna (protozoa), mesofauna (mites, lion ants, insects, insect eggs) and macrofauna (beetle, beetle caterpillars, millipedes, pill millipedes, earthworms; earthworm castings) was recorded in UrCS while UnCS samples recorded their presence. UrCS recorded a significantly lower ($p < 0.05$) microbial loads than UnCS. The most adverse impact of human urine on soil biota is the lowered pH and increased acidity which unleash a vicious cycle on soil biota persisting as long as urine deposition continues unhindered on the same spot.

Keywords: human urine, soil fauna, microbial load, impact, vicious cycle
