

Impact of Calcium Carbide Waste Dumpsites on Soil Chemical and Microbial Characteristics

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Abstract : Disposal of industrial solid wastes in the environment is a major environmental challenge. This study investigated the effects of calcium carbide waste dumpsites on soil quality. Soil samples were collected with hand auger from three different dumpsites at varying depths and made into composite samples. Samples were subjected to standard analytical procedures. pH varied from 10.38 to 8.28, nitrate from 5.6mg/kg to 9.3mg/kg, phosphate from 8.8mg/kg to 12.3mg/kg, calcium carbide reduced from 10% to 3%. Calcium carbide was absent in control soil samples. Bacterial counts from dumpsites ranged from 1.8×10^5 cfu/g - 2.5×10^5 cfu/g while fungal ranged from 0.8×10^3 cfu/g - 1.4×10^3 cfu/g. Bacterial isolates included *Pseudomonas* spp, *Flavobacterium* spp, and *Achromobacter* spp, while fungal isolates include *Penicillium notatum*, *Aspergillus niger*, and *Rhizopus stolonifer*. No organism was isolated from the dumpsites at soil depth of 0-15 cm, while there were isolates from other soil depths. Toxicity might be due to alkaline condition of the dumpsite. Calcium carbide might be bactericidal and fungicidal leading to cellular physiology, growth retardation, death, general loss of biodiversity and reduction of ecosystem processes. Detoxification of calcium carbide waste before disposal on soil might be the best option in management.

Keywords : biodiversity, calcium-carbide, denitrification, toxicity

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