Effect of Pond Depth on Bacterial Mortality Rate

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Abstract
The bactericidal action of solar radiation was investigated in pilot scale waste stabilization ponds under the tropical climate of Dar es Salaam, Tanzania. Bacterial reduction was observed to proceed with increasing direct solar intensity and hydraulic detention time. The mortality rate of faecal coliforms used as test micro-organisms was higher in samples incubated near the surface and decreased rapidly when the samples were incubated at greater depths in the pond. The disappearance rate of faecal coliforms for samples incubated at the pond surface and at a depth of 1.0 m was 1.66 d-1 and 0.37 d-1 respectively. Faecal coliforms were also found to be reduced rapidly in shallow ponds. The mortality rate in 1.0 m and 1.5 m deep ponds was respectively 0.43 and 0.32 d-1. The dieoff rate constant was observed to vary significantly with pond depth but was independent of hydraulic detention time.