Article Abstract

Title: **Purification of domestic sewage by water-hyacinth (Eichhornia crassipes)**

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Journal: *International Journal of Environmental Technology and Management 2009 - Vol. 10, No.3/4 pp. 286 - 294*

Abstract: Sewage management is posing serious techno-economic problems in cities, particularly in developing countries. A new technology, sewage purification by water-hyacinth (Eichhornia crassipes), is a possible solution. This paper studied the suitability and effectiveness of water-hyacinth in treating domestic sewage. A 28-day experiment was performed under a controlled environment of a screen-house subjected to natural conditions. Several parameters were measured and analysed, including the Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), faecal coliform count, nitrate and phosphate contents, pH value, heavy metals, turbidity, odour and colour at intervals of seven days. Laboratory analyses indicated that the water-hyacinth culture drastically reduced the faecal coliforms by about 80%. BOD dropped from 900 to 460 mg litre^{-1}. COD was reduced from 1,424 to 766 mg litre^{-1} while the nitrogen content increased by about 77.5% and the phosphorus content rose by 63.3%. The pH value fell slightly from 8.58 to 7.81. The initial pungent odour of the raw sewage gradually disappeared during the purification period while the deep yellowish colour turned almost colourless in the final effluent sample. The sludge from the culture was rich and applicable as a bio-fertiliser. After comparison with the World Health Organisation Stream Standards, it was determined that the final effluent from water-hyacinth could be used for irrigation and fishing activities, or recycled to a flowing stream for other uses except for drinking purposes.

Keywords: domestic sewage; effluent; hyacinth culture; water hyacinths; Eichhornia crassipes; sewage purification; sewage management; developing countries; biofertilisers; sewage treatment.

DOI: 10.1504/IJETM.2009.023735

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