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Study on the biosorption of synthetic dyes using immobilized fungal biomass and aquatic weeds

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The large amount of lignin and lignin-derived compounds are primarily responsible for effluent color, due to the inherent high degree of conjugation in these molecules. There is thus the requirement on industries to minimize environmental release of color considered as toxicologically rather innocuous. Biological treatment is the often the most economical alternatives when compared with other physical and chemical processes.

Biosorption potential of fungal species (Aspergillus niger) and Aquatic weed (Eichhornia crassipes) for synthetic dye such as Acid- Lanasyn yellow and Direct- Indosol royal blue studied with respect to temperature, time, pH, adsorbent dosage, agitation time and initial dye concentration to determine the kinetic model. The mechanism of dye sorption by Aspergillus niger and Eichhornia crassipes earned good fits for Freundlich and Langmuir models. Further desorption techniques were studies to recover the loaded pollutants. This study has shown the efficiency of A.niger and E.crassipes immobilized into Ca- alginate beads for the decolourization of synthetic dyes. Batch studies clearly suggest that the high adsorption capacity for the removal of Acid- Lanasyn yellow and Direct- Indosol royal blue dye were obtained at pH- 6. Up to 86% color removal could be achieved in 31/2 days contact with initial dye concentration (2 to 10 mg/ml), respectively. In addition, it is found to be the reusability of the immobilised A.niger and E.crassipes after storage could be a potential advantage in wastewater treatment.

Keywords: Biosorption, Decolourization, A.niger, E.crassipes, Synthetic dye, Acid- Lanasyn yellow and Direct- Indosol royal blue, Immobilization.

Biography

R. Sivashankar is pursuing his Ph.D at National Institute of Technology. He has published a paper in reputed journal. He holds 2 papers in International Conferences proceedings. He has participated & presented about 13 papers in the International and National conferences. His research areas are Environmental science and technology and Biotechnology.

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Effect of compost derived from decomposed fruit wastes by effective microorganism (EM) technology on plant growth parameters of Vigna mungo

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In the present study, the plant growth promoting effect of compost derived from decomposed fruit wastes by commercial formulation of effective microorganisms (EM) on plant growth parameters of Vigna mungo discussed. Effective microorganisms (EM), a culture of co-existing beneficial micro organisms predominantly consisting of lactic acid bacteria, photosynthetic bacteria, yeast, fermenting fungi and actinomycetes that are claimed to enhance the decomposition of organic matter which in turn improves the soil fertility. In the present study ,the fruit wastes were effectively decomposed by applied Effective microorganisms with complete reduction of volume of wastes, development of pleasant odour and formation of finely dispersed nutritious compost with 672.0, 708.0, 2927.0, 13.02 mg/kg and 35.1% of total nitrogen, phosphorous, potassium , humic acid and organic carbon. The plant growth parameters such as shoot length, leaf surface area, and total chlorophyll, height of the plant, total leaves and branches emerged in the plant, total foliage density / plant was increased in compost treated plants and distinct reduction in pest infestation and disease spots were recorded. As in plant growth parameters, compost treated plot reveals maximum phyllosphere, soil heterotrophic microbial population and soil nutrients via total nitrogen, phosphorous, potassium, organic carbon and humic acid. Total yield and cost benefit ratio was also increased in compost treated plots.

Keywords: Effective microorganism, compost, fruit wastes, Vigna mungo, plant growth parameters.

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