

Biodegradation of phenol by co-cultural of bacteria isolated from liquid or solid industrial waste

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Contemplate the dangerous threat resulted in phenol and its derivatives in industrial wastewater, it is highly eligible to develop effective abatement tools for their removal or neutralization. In this study, aerobic bacteria in solid and liquid waste such as effluent of ceramic factories, sewage sludge, effluent of paper mill factories, crude oil, olive oil waste and soil contaminated with petrochemical soil (taken from Cairo airport's area in Egypt) were isolated and examined for their ability to degrade phenol using enrichment technique containing phenol as sole source of carbon and energy (150 mg/L phenol in a mineral salt medium). Eight strains (named EC, SS1, SS2, SS3, EP, CO, OW and SP) were isolated and characterized by morphological, biochemical and molecular characteristics. These isolates of bacteria were significant to grow up to the level of 2000 mg/L phenol compared to the control. The results showed that these strains of bacteria were highly effective for the removal of phenol after 72 h at 30 °C, strain EC and SS2 degraded 78.14% and 84.29% phenol from the initial concentrations of 1000 mg/L respectively; strain SS1 and SP degraded 75.55% of phenol from the initial concentration of 2000 mg/L. The co-culture of all these bacteria in the same medium had highly effective on the phenol degradation activity compared to each culture alone. The conclusion of this investigation could be contribute new useful resources for treatments of wastewater, solid wastes and soils contaminated with phenolic wastes.