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Isolation, identification, and characterization of rubber degradation by a mixed microbial culture

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The present research was directed to exploit the potential bacterial and fungi strains for the biodegradation of Polyisoprene (Natural Rubber). In current study, twelve different bacterial strains were isolated from the sewage sludge sample through enrichment and soil burial techniques. The microbes isolated from the samples showed good growth and biodegradation activities on culture medium. Later on these strains were identified and characterized on the basis of morphological and biochemical test. Among these, seven were *Bacillus*, three *Aerococcus* and two were *Staphylococcus* sp. Consequently, two fungal strains were also identified and named as *Aspergillus sydowii* and *Aspergillus candidus*. Biodegradation activities of the mixed culture of microorganism were monitored through UV spectrophotometer and functional groups changes were analyzed through FTIR spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR) (Bio-Rad Merlin) analysis displayed the changes in the region 1200-1400 cm⁻¹ representing the degradation of Polyisoprene rubber after culturing in liquid media. CO₂ evolution in Sturm test was gravimetrically calculated as 42.88 g/l in case of test. However 20.58 g/l in case of control was noted. The difference in amount of CO₂ produced both in test and control indicated the degradation of rubber. This study determined that a mixed microbial culture had a potential tendency toward the degradation of rubber.

Biography

Munzer Ullah did Master and MPhil. from Quaid –e-Azam university Islamabad Pakistan and currently enrolled in prestigious Center of Bioengineering and Biotechnology Chinas University of Petroleum. East China. Zhu hu is currently working as a prof in the said center.

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