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Isolation, screening and characterization of plastic degrading microbes isolated from soil samples of Patna region in Bihar

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Abstract : *Plastics, especially polythenes, accumulating in the environment are posing an ever increasing ecological threat. The present study was carried out to explore the microbial world to enumerate plastic degrading bacteria and fungi by survey and collection of the soil samples from different locations in Patna region. After screening, six bacterial isolates labeled as I, II, III, IV, VI and VII; and two fungal isolates labeled as VIII and IX were selected for the investigation. Microbial degradation of plastics in laboratory condition showed that the maximum degradation of plastic was done by the bacterial isolate I (33%) followed by bacterial isolate III (16%). Rest of the bacterial isolates II, IV, VI and VII possessed same potential for plastic degradation (8%). The fungal isolate VIII could not degrade the plastic discs while fungal isolate IX degraded 8% of the plastic discs. From the Gram staining results, biochemical analysis and through ABIS ONLINE (an online program for identification of bacteria), it was found that 82% characteristics of isolate I matched with Bacillus cereus, 50% characteristics of isolate III matched with Staphylococcus aureus. With help of Bergey's Manual of Determinative Bacteriology and Microrao.com, it could be inferred that the isolates II and VI might be Staphylococcus species and isolates IV and VII might be Streptococcus species. On the basis of microscopic observations, both the fungal isolates resembled with the Aspergillus species.*

Key words*: Plastic degradation, Bacillus species, Staphylococcus species, Streptococcus species, Aspergillus species.*

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Introduction :

Plastic is the most versatile synthetic 'manmade' substance created out of the fossil fuel resources that enables most of the industrial and technological revolutions of the 19th and 20th centuries. Plastic materials have gained widespread use as they have been increasingly