

Polyhydroxybutyrate Production in Bacteria Isolated from Estuaries along the Eastern Coast of India

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Abstract : Odisha is one of the coastal states situated on the eastern part of India with 480 km long coastline. The coastal Odisha is referred to as "Gift of Six Rivers". Balasore, a major coastal district of Odisha is bounded by Bay of Bengal in the East having 26 km long seashore. It is lined with several estuaries rich in biodiversity. Several studies have been carried out on the macro flora and fauna of this area but very few documented information are available regarding microbial biodiversity. In the present study, an attempt has been made to isolate and identify bacteria found along the estuaries of Balasore. Many marine microorganisms are sources of natural products which makes them potential industrial organisms. So the ability of the isolated bacteria to secrete one such industrially significant product, PHB (Polyhydroxybutyrate) has been elucidated. Several rounds of sampling, pure culture, morphological, biochemical and phylogenetic screening led to the identification of two PHB producing strains. Isolate 5 was identified to be *Brevibacillus* sp. and has maximum similarity to *Brevibacillus parabrevis* (KX83268). The isolate was named as *Brevibacillus* sp. KEI-5. Isolate 8 was identified as *Lysinibacillus* sp. having closest similarity with *Lysinibacillus boroni-tolerance* (KP314269) and named as *Lysinibacillus* sp. KEI-8. Media, temperature, carbon, nitrogen and salinity requirement were optimized for both isolates. Submerged fermentation of both isolates in Terrific Broth media supplemented with optimized carbon and nitrogen source at 37°C led to significant accumulation of PHB as detected by colorimetric method.

Keywords : Bacillus, estuary, marine, Odisha, polyhydroxy butyrate

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