Molecular Identification and Polymer Determination of Poly(3-hydroxy-butyrate) Producing Bacteria Isolated from the Fish Lutjanus sp.

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Abstract:

Poly(3-hydroxybutyrate) is a biodegradable bio-plastic that can be produced by bacteria and used as a substitute for petrochemical plastics. Various sources of Poly(3-hydroxybutyrate) producing bacteria have been successfully studied. However, few bacteria from fish samples have been identified. More sources of Poly(3-hydroxybutyrate) producing bacteria need to be found to obtain potential bacteria. Therefore, it is necessary to carry out molecular identification of poly(3-hydroxybutyrate) producing bacteria isolated from Lutjanus sp. and determine the polymer content. The methods of this research include the isolation and screening of isolates of Poly(3-hydroxybutyrate) producing bacteria, molecular identification of Poly (3-hydroxybutyrate) producing bacteria, and production and determination of Poly (3-hydroxybutyrate) content using gas chromatography-mass spectrometry (GM-MS). The results indicate that during the bacterial screening stage, two isolates capable of producing Poly (3-hydroxybutyrate) were isolated from the intestine (UKA-2) and gill (IKA-4) of Lutjanus species. Molecular identification of UKA-2 and IKA-4 bacteria revealed their similarity to Enterobacter cloacae and Bacillus species. The Poly (3-hydroxybutyrate) content testing by GC-MS showed that the content value of UKA-2 was 1.39%, while IKA-4 had a content of 78%. This demonstrates the significant potential of the IKA-4 isolate, Bacillus sp. isolated from the gill of Lutjanus sp. to produce Poly (3 hydroxybutyrate).