



ISOLATION AND CHARACTERIZATION PHB PRODUCING BACTERIA FROM WASTE COOKING OIL USING POMEGRANATE MOLASSES AS CARBON SOURCE

Laila Muftah Zargoun¹, Nor Azimah Mohd Zain², Shafinaz Shahir¹

¹Department of Biosciences & Health Sciences, Faculty of Biosciences and Medical Engineering, Universiti Teknologi Malaysia Skudai, 81310, Johor Darul Takzim, Malaysia.

²Water Research Alliance, Universiti Teknologi Malaysia, 81310 Skudai, Johor Darul Takzim, Malaysia.

Corresponding author email: azimah@fbb.utm.my

ABSTRACT

Polyhydroxyalkanoates (PHAs) are biopolymers which have similar characteristics with petrochemical plastic but a step better due to its biodegradable property. Polyhydroxybutyrate (PHB) producing bacteria from waste cooking oil (WCO) was isolated and characterized based on its morphological and biochemical properties. Only one strain was isolated from different samples of WCO collected from different restaurants. The isolated bacterium was related to *Bacillus thuringensis* LMA which was identified and characterized using morphological, biochemical and molecular biology methods. In order to detect the PHAs granules, the strain of bacteria was first screened with Sudan Black B staining and Nile Blue A staining was done for further confirmation. During the stationary phase, the LMA strain was subjected to 5 % (w/v) of pomegranate molasses (carbon source). Samples were collected for two time of the incubation period for detection of PHAs using Sudan Black B staining. The PHAs production accumulated up to 50.4% of its cell dry weight. The PHAs produced was characterized using Fourier Transform Infrared Spectroscopy (FTIR) and Nuclear Magnetic Resonance Spectroscopy (NMR). By using these two methods, it was confirmed that the polymer produced by the isolated bacteria is Polyhydroxybutyrate (PHB) polymer.

Keywords — PHB; waste cooking oil; pomegranate molasses; FTIR; NMR