

## Biodegradability of microbial synthesized Poly- $\beta$ -Hydroxy-butyrates produced from *Pseudomonas aeruginosa* Dw7 local isolate

Nibras M Al-hasan<sup>1</sup>, Iman H Gatea<sup>1</sup>, Saad H Khudei<sup>1</sup>, Nadhem H Hayder<sup>2</sup> and Marwa Sh Mahmood<sup>2</sup>

<sup>1</sup>Ministry of Science and Technology, Iraq

<sup>2</sup>Baghdad University, Iraq

The environmental pollution by petro based plastics a cause of concern, which are non-biodegradable. Hence biodegradable and biologically synthesized polymers with similar properties of conventional plastic are sought. Poly- $\beta$ -hydroxy-butyrates (PHB) is a member of a family of polyhydroxyalkonates synthesized by numerous bacteria as an intracellular carbon and energy storage compound under nutrient-limiting conditions with excess carbon. The use of biodegradable polymers has been increasing in recent years, specifically toward various biomedical applications as these materials not only serve the desired purpose but also get eliminated from the body due to their biodegradable nature. *Pseudomonas aeruginosa* Dw7 local isolate was identified as PHB producing isolate in a previous study. Important properties of the product were studied.

The biodegradability studies of PHB were concluded in solid, liquid and in soil environment using the fungus *Aspergillus niger* which was tested for the degradation of PHB in assay agar medium as well as in liquid cultures was concluded using

*Aspergillus niger* isolate. The contribution of *A. niger* to the microbial degradation of PHB film in soil was studied. The clear zone around the colonies was measured to evaluate the activity of this isolate; it was determined by recording 7 mm of clear zone around the fungal colonies in 7 days of incubation at 30°C. Relatively after 12 days, PHB showed a high ability to degrade, since *A. niger* produces the highest biomass 2.03 g/l leaving less residual PHB in the medium which recorded 16%. The results showed that 100% of degradation after 40 days indicating the high loss in PHB content in the soil as an open system. One of the promising and recently applications of PHB are antimicrobial agent. Antibacterial activity test was carried out using disk diffusion method against gram negative and positive bacteria. The results showed that antibacterial compounds of PHB which was extracted by hypochlorite solution and chloroform are active against selected bacterial isolates showed inhibition zone ranging between (8-40 mm) as indicator of antibacterial activity.

e: alhassany843@gmail.com



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