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Marine Biodiversity and Ecosystems

Bacterial-derived Polyhydroxyalkanoate (PHA) Bioplastic: A Biodegradable Substitute for Common Petrochemical-based Plastics and the Possible Impacts on Marine Environment

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Time: 2022. 10. 07 Fri. 13:30

Venue: Auditorium, 1st Floor,
Interdisciplinary Research Building
跨領域科技研究大樓1樓演講廳

Host: Dr. Tzu-Hao Lin 林子皓助研究員
Dr. Yi-Ta Shao 邵奕達副教授

~Attendee must wear mask~
~與會者請配戴口罩~

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Abstract

Polyhydroxyalkanoate (PHA) is a bacteria–derived biodegradable polymer with material properties similar to common petrochemical-based plastics. PHA is often considered as the eco-friendly substitute for common plastics. This biodegradable polymer is produced by some bacteria under limited nutrient condition and in the presence of excess carbon source. The PHA is completely biodegradable and non-toxic. The bioprocess development of PHA bioplastic involves statistical optimization in shaken-flasks cultures and scale-up production in fermenters. Agro-industrial by-products from sugar cane refining processes and oleochemical industries are used as the renewable carbon sources for production. The potential applications of PHA encompass various fields including aquaculture, agriculture, medical and pharmaceutical sciences. The use of PHA as biodegradable micro-exfoliating agent in cosmetics and its fate in marine organism is being investigated as potential replacement of plastic-based beads and solution for microplastic contamination. The sustainability in PHA production and applications emphasizes waste-to-wealth concept of eco-friendly materials and progress towards managing plastic pollution.