Environmental Research, Technology Demonstration and Conference Project

ECF Project:	ECF 2022-128
Project Title:	Environment and Conservation Fund - Development of a novel combined thermal and biological strategy for food waste digestate disposal
Principal Investigator:	Professor Wong Jonathan (replaced by Dr KRISHNEGOWDA, Manu Mathikere w.e.f. 23 October 2023), Department of Biology and Institute of Bioresource and Agriculture, Hong Kong Baptist University
Total Approved Grant:	$1,000,640
Duration:	15/5/2023 to 14/11/2024
Project Status/Remarks:	On-going
Project Scope:	Composting of food waste digestate is difficult due to high moisture content, high ammonium nitrogen and low C/N ratio, and lack of adequate space availability in urban anaerobic digestion plants. Hong Kong's first food waste treatment plant is also having similar concerns as the plant is originally designed to produce mature compost in 14 days which is difficult due to the ammonium nitrogen inhibition and less space availability. Hence, to address these issues holistically, a novel combined thermal and biological treatment strategy is proposed in this work. Thermal pyrolysis can be used to convert some part of digestate into biochar while the remaining digestate can be composted along with the produced biochar. Based on the previous experience of the project team, biochar produced from different sources significantly improved the composting process and reduced the composting duration. Hence, optimisation of biochar production conditions from digestate and subsequent optimisation of digestate biochar dosage for effective digestate composting is proposed. The outcome of this study will have a significant impact on digestate management in anaerobic digestion (AD) plants in the world and will directly benefit the ORRC1 composting operations as well as serve as a basis for developing digestate disposal strategies in the upcoming ORRCs in Hong Kong.
Summary of the Findings/ Outcomes:	To be available upon completion of the project