Keynote Presentation

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LONGDOM CONFERENCES

Utilization of marine yeast for the generation of value-added products

Current industrial yeasts are mainly derived from the terrestrial environment, while marine yeasts have evolved to survive high salt content, high concentrations of inhibitors and low availability of carbon and nitrogen. In this study, the development of a marine yeast-based biorefining process for the production of biofuels and biochemicals was reported. Current the 1st and 2nd generations of bioethanol production utilize land crop-based feedstock, which has a significant high water footprint. A marine resource-based bioethanol production process using marine yeast, seawater, and marine biomass could significantly reduce the water footprint of biofuels. An efficient yeast isolation method was developed and over 200 marine yeasts were isolated from various marine samples. The isolated yeast strains were screened for sugar utilization (glucose, xylose, mannitol, and galactose). A marine yeast *Saccharomyces cerevisiae* AZ65 was identified and selected for bioethanol fermentation due to its highly efficient fermentation capacity in fermentations using seawater instead of marine water. Fermentations using 15-liter fermenters showed 52.23g/L ethanol was produced using molasses media prepared in seawater with productivity of 1.43g/L/h. The inhibitor tolerance test demonstrated that marine yeasts were statistically more tolerate to the presence of acetic acid, formic acid, furfural, ionic liquid, and salt in comparison to terrestrial yeast strains. In fermentations within the presence of common inhibitors derived from lignocellulosic raw materials, marine yeasts demonstrated a higher fermentation yield in comparison to a terrestrial yeast, especially when seawater was used. The result indicated that marine yeast could be a valuable source for the industrial biotechnology.

Biography: Chenyu Du is a Reader in Chemical Engineering in the School of Applied Sciences at the University of Huddersfield. He was awarded a B.Eng. in Chemical Engineering from Tsinghua University, China in 2010. Then he completed his Ph.D. in 2005 in the department of Chemical Engineering at Tsinghua University. In 2006, he moved to the University of Manchester as a Postdoctoral Research Associate working on a platform chemical production from sustainable raw materials project (funded by EPSRC). In 2009, he joined a research and development company in London contributing to the development of the 2nd generation of biofuel. In June 2010, he was appointed as a lecturer in the University of Nottingham. He has been involved in the research pertaining to the Lignocellulosic Conversion to Ethanol programme (LACE programme, funded by BBSRC Sustainable Bioenergy Centre). He was responsible for developing and directing a brand new M.Sc course on Sustainable Bioenergy. In January 2015, he moved to the University of Huddersfield, joining the newly established Chemical Engineering team.

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