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SINGLE CELL OIL PRODUCTION FROM AGRICULTURAL WASTES AND ITS CHEMICAL TRANSFORMATION FOR PRODUCTION OF LONG CHAIN A,Ω-DICARBOXYLIC ACIDS

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Single cell oil (SCO) production from lignocelluloses by oleaginous microorganisms is still high in production cost, making the subsequent production of biofuels inviable economically in such an era of low oil prices. Therefore, how to upgrade the final products of lignocellulose-based bioprocess to more valuable ones is becoming a more and more important issue. Differently sourced cellulases were compared in the enzymatic hydrolysis of the steam-exploded corn stover (SECS) and the cellulase from the mixed culture of *Trichoderma reesei* and *Aspergillus niger* was found to have the highest enzymatic hydrolysis yield 86.67±4.06%. Three-stages enzymatic hydrolysis could greatly improve the efficiency of the enzymatic hydrolysis of SECS, achieving a yield of 74.24±2.69% within 30 h. Different bioprocesses from SECS to SCO were compared and the bioprocess C with the three-stages enzymatic hydrolysis was the most efficient, producing 57.15 g dry cell biomass containing 31.80 g SCO from 327.63 g SECS. An efficient and comprehensive process from corn stover to long chain α,ω-dicarboxylic acids (DCAs) was established by employing self-metathesis, capable of producing 6.02 g long chain DCAs from 409.54 g corn stover and 6.02 g alkenes as by products. On-site cellulase production by the mixed culture of *T. reesei* and *A. niger* is proven the most efficient in providing cellulase to the lignocellulose-based bioprocess. Three-stages enzymatic hydrolysis was found to have very good application value in SCO production by *Trichosporon cutaneum* from SECS. A whole process from corn stover to long chain DCAs via a combination of biological and chemical approaches was successfully established and it is an enlightening example of the comprehensive utilization of agricultural wastes.

BIOGRAPHY

Hao Fang obtained his PhD degree in 2014 at the Department of Biochemical Engineering, Zhejiang University, China. Then, he joined National Engineering Laboratory of Cereal Fermentation Technology, Jiangnan University, China as Senior Lecturer. In 2016, he moved to College of Life Sciences, Northwest A&F University, China as Associate Professor. His research interests include Biochemical Engineering, Industrial Microbiology and Biotechnology and Green Bio-manufacturing. He has published more than 20 journal papers.

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