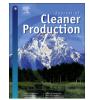


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## Efficient utilization of oil palm frond for bio-based products and biorefinery



Mior Ahmad Khushairi Mohd Zahari<sup>a,d</sup>, Sharifah Soplah Syed Abdullah<sup>b,e</sup>, Ahmad Muhaimin Roslan<sup>b,c</sup>, Hidayah Ariffin<sup>c,\*</sup>, Yoshihito Shirai<sup>b</sup>, Mohd Ali Hassan<sup>a,c</sup>

<sup>a</sup> Department of Process and Food Engineering, Faculty of Engineering, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

<sup>b</sup> Department of Biological Functions and Engineering, Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology, 2-4 Hibikino, Wakamatsu-ku, Kitakyushu, Fukuoka 808-0196, Japan

<sup>c</sup> Department of Bioprocess Technology, Faculty of Biotechnology and Biomolecular Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malavsia

<sup>d</sup> Faculty of Chemical and Natural Resources Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia

e Universiti Kuala Lumpur, Malaysian Institute of Chemical and BioEngineering Technology, Lot 1988 Vendor City Taboh Naning, 78000 Alor Gajah, Melaka, Malavsia

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## ABSTRACT

The prospect of oil palm frond (OPF) juice as fermentation feedstock was investigated by taking two bioproducts, i.e. poly(3-hydroxybutyrate), P(3HB) and bioethanol as example. P(3HB) was successfully produced by Cupriavidus necator NCIMB 11599 from OPF juice through fed-batch fermentation with cell dry mass and PHB content of 40 g/l and 75 wt.%, respectively. On the other hand, bioethanol fermentation from OPF juice was conducted by using Baker's yeast, with and without nitrogen source supplementation. Ethanol yield of 0.49 g/g sugars was recorded when OPF juice was supplemented with nitrogen source. Furthermore, OPF pressed fiber obtainable after pressing the OPF juice was saccharified in order to obtain more fermentable sugars from OPF petiole. Hydrolysis of OPF fiber holocellulose into sugars was very high at 95%, contributed by the low lignin content in OPF and pre-treatment by wet disc-mill. Apart from fermentation, OPF pressed fiber is also useful for bio-based plastics, ruminant feed, reinforce material for biocomposites and bio-briquettes. Efficient utilization of OPF petiole proposed herewith can be an alternative pathway to the contribution of green and sustainable biorefinery.

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Corresponding author. Tel.: +60 3 89467515; fax: +60 3 89467510. E-mail address: hidayah@upm.edu.my (H. Ariffin).

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