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Empty Fruit Bunches Compost and Germination of *Raphanus sativs* L.

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ABSTRACT

Overabundance of empty fruit bunches (EFB) from palm oil industries has opened opportunity for its exploitation for agricultural use as compost. In this study, palm oil EFB compost was prepared by the addition of wood chips as a bulking agent and chicken manure to enhance the composting rate. Moisture was maintained at 50-70% during the 2-month composting. Results showed that the EFB compost containing high mineralisation index compared to the initial EFB samples after two months of the composting process. The important macronutrients; N, P, K, Ca and Mg and micronutrients Fe, Zn, Mn, Ni, Cu and B were found present in the EFB composts. The final stage of EFB compost B showed high nutrient content with N, P, and K values of 2.21%, 3.65%, and 0.49%, respectively. Fe was the most outstanding element in the EFB compost as high as 9000 ppm. Germination results showed that EFB compost with EFB:wood chips at 1:3 ratio exhibited better growth of leaves and root of *Raphanus sativs* L. compared to 1:2 ratio. This indicated that the EFB compost is capable in improving soil fertility and growth of plants.

Keywords: aerobic composting, oil palm empty fruit bunch, *Raphanus sativs* L., wood chips

INTRODUCTION

Malaysia is one of the world's largest producers of palm oil products and generated a significant amount of agricultural by-products annually, such as empty fruit bunch (EFB). It is estimated that 15 million tons of EFB is produced annually in Malaysia (Abdul *et al.*, 2016). Current practices for managing EFB as an agricultural waste is by utilising it as mulch and fertiliser for soil conditioning (Abdul *et al.*, 2016). However, direct application alone could not solve the problem of overabundance of EFB. In some cases EFB is incinerated to provide energy for boilers but incineration process could cause air pollution. There are also some studies looking into the potential use of EFB for sugar (Abdul *et al.*, 2016) and bioethanol production (Sugiharto *et al.*, 2016). However, more than often EFB are left to be naturally degraded on site, causing breeding of rhinoceros beetles and rats (Lim *et al.*, 2015). Thus it is important to find as much ways as possible to utilise the EFB.

Another alternative for utilising EFB is by converting it into compost via composting process. During composting, a compound is stabilised either aerobically or anaerobically, and the end product could be used to enhance plant growth. Studies have been conducted on the use of EFB compost, for instance its use as additive in soilless culture system for vegetable crop production (Ismail *et al.*, 2004), potting material for ornamental plants (Kala *et al.*, 2009), co-composting of EFB with chicken manure and palm oil mill effluent (POME) (Baharuddin *et al.*, 2009), and co-composting with oil palm decanter cake (Adam *et al.*, 2016). In this study, an attempt was made to produce EFB compost via co-composting with another wastes namely wood chips and chicken manure, under aerobic condition. The effectiveness of the compost on the growth of *Raphanus sativs* L. seedling was also investigated.

MATERIALS & METHODS

Materials

The EFB and wood chips samples were collected from palm oil mills and sawmills in Kuching, Sarawak respectively. EFB samples were ground using a food grinder (SINGER) while the wood chips were shredded into size 5-20 mm prior to use.

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