

## **Comparative study on passive aerated in-vessel composting of food wastes with the addition of Sabah ragi**

### **ABSTRACT**

The aims of this study are to determine the effect of Sabah ragi on food waste and dry leaves composting as well as to compare the composting performance from a previous study that had no addition of Sabah ragi. The composting process was conducted using an in-vessel passive aerated bioreactor with turning every 3 days for 40 days. Based on the physiochemical analysis, the stability and maturity of the compost were evaluated. Parameters such as temperature, total organic carbon, moisture content, pH, conductivity, and C/N were monitored. During the composting process, the highest temperature of 54.2 °C and the highest heat generation rate per initial mass of compost dry matter of 4098 kJ kg<sup>-1</sup> day<sup>-1</sup> was achieved on day 7. Furthermore, when compared to previous studies, this study achieved a faster thermophilic phase ( $\geq 45$  °C), a longer thermophilic period (4 days), and a higher cumulative temperature. Elementary kinetic analysis was performed based on the TOC profile and evaluated using coefficient correlation ( $R^2$ ). In this study, application of the second-order model resulted in good responses. Low pathogen levels and higher nitrogen content were detected in the final compost, while some of the nutrients were not in the recommended range. An estimated ragi cost of RM 1.22 was required for every 1 kg of compost with a selling price of RM 6.00/kg of compost.