

## **Effects of metabolite changes during lacto-fermentation on the biological activity and consumer acceptability for dragon fruit juice**

### **ABSTRACT**

In this study dragon fruit juice was subjected to lacto-fermentation for 48 h at 37 °C using *Lactobacillus plantarum* FBS05. The antibacterial and antioxidant activity were evaluated using 96 microtiter plate, DPPH and FRAP assays. The bioactive metabolites were identified using <sup>1</sup>H-NMR analysis with multivariate analysis. Fermented juice was mixed with fresh dragon fruit juice at different ratios to evaluate the shelf life stability and consumer acceptability. The antibacterial activity of fermented dragon fruit juice was  $95.52 \pm 0.002$ ,  $95.63 \pm 0.005$ ,  $96.05 \pm 0.009$  and  $93.38 \pm 0.000$  towards *Escherichia coli*, *Salmonella Typhimurium*, *Pseudomonas aeruginosa* and *Staphylococcus aureus*, respectively. The antioxidant activity results demonstrated no significant differences for fermented and non-fermented juice. The principal component analyses showed the presence of 21 and 12 metabolites in the fermented and non-fermented dragon fruit juice. The major compounds contributed to the differences were lysine, alanine, acetic acid, succinic acid, lactic acid, glucose, iso-butyrate and betaine. The 1:9 ratio received the highest scores for the taste ( $6.24 \pm 1.571$ ), aroma ( $6.50 \pm 1.696$ ) and acidity ( $6.21 \pm 1.996$ ) and extended the shelf life for 3 months. This study demonstrated the high potential for the lacto-fermented dragon fruit juice for applications to improve the functional properties, consumer acceptability and shelf life of fresh dragon fruit juice.

**Keyword:** Lacto-fermentation; Biopreservation; Juice; Bioactive compounds; Biological activity