

## Screening of various parts of phaleria macrocarpa plant for alpha-glucosidase inhibitory activity

### ABSTRACT

Phaleria macrocarpa is an herbal plant used in Malaysia to enhance vitality. The aim of this study was to screen the  $\alpha$ -glucosidase inhibitory activity of different parts (fruit flesh, leaves and stem) of *P. macrocarpa*. Methanol (polar) and n-hexane (nonpolar) extracts, obtained by room temperature solvent extraction, were evaluated for in vitro  $\alpha$ -glucosidase activity inhibition. The compounds were identified by using gas chromatography-mass spectrometry (GC-MS) according to their similarity index of >70%, which might be responsible for  $\alpha$ -glucosidase inhibitory activity. The methanol extract of the fruit flesh had the highest yield ( $25.6 \pm 0.5\%$ ), whereas the n-hexane extract of the stem is more effective against  $\alpha$ -glucosidase activity ( $IC_{50} 0.8 \pm 0.1 \mu\text{g/mL}$ ). The fruit flesh ( $IC_{50} 1.3 \pm 0.2 \mu\text{g/mL}$ ) and leaves ( $IC_{50} 1.6 \pm 0.6 \mu\text{g/mL}$ ) had also well effectively. The identified metabolites are predominantly phenolics, carbohydrates, triterpenes and organic acids, such as D-fructose, squalene,  $\alpha$ -linolenic acid and  $\alpha$ -D-glucopyranoside. In-depth chemical profiling using GC-MS was performed for the first time for this plant to assess the likely compounds present in the extract that could be associated with anti-hyperglycemic activity. Of the three parts tested, every part indicates the potential  $\alpha$ -glucosidase inhibitory activity and hexane extract of stem showed more inhibitory activity among all extracts. Thus, *P. macrocarpa* can attenuate hyperglycemia by potently inhibiting carbohydrate hydrolyzing enzymes, making it a viable plant as a source of natural compounds for the management of type 2 diabetes mellitus.

**Keyword:** Phaleria macrocarpa; Herbal plant; Alpha-glucosidase inhibitory activity