

## Determination of Glycemic Index, Antidiabetic and Antioxidant Activities of Palmyra/*Borassus flabellifer* Treacle

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### Abstract

*B. flabellifer* treacle is a well-known local traditional sweetener. This study was performed to determine the glycaemic-index (GI), antidiabetic, and antioxidant activities of methanolic (ME) and aqueous extract (AE) of *B. flabellifer* treacle. Healthy undergraduates of KAATSU University were selected as subjects (n=30). The food containing 50g of carbohydrates was consumed by fasted volunteers. Capillary blood was taken at fasting, 15, 30, 45, 60, and 120 min after the meal. The GI was calculated by dividing the incremental area under the curve for the treacle by the glucose and multiplying by 100. To determine the antidiabetic properties, glucose absorption by yeast cells (GAYC), and glucose adsorption capacity (GAC) assays were performed, and Metformin served as the standard. Ferric-Reducing Antioxidant Power (FRAP) assay and H<sub>2</sub>O<sub>2</sub> scavenging were performed to determine the antioxidant activity, and ascorbic acid served as the standard. Absorbance was measured, and IC<sub>50</sub> values were calculated. GI of the treacle was 61.72 ± 17.44, and the glycemic load was 42.03. In GAYC, it showed IC<sub>50</sub>=0.4609 g mL<sup>-1</sup> and IC<sub>50</sub>=0.2119 g mL<sup>-1</sup> for AE and ME respectively, compared to metformin IC<sub>50</sub>=0.0819 g mL<sup>-1</sup>. AE and ME adsorbed 74.44%, and 71.60% of, 100M glucose. In H<sub>2</sub>O<sub>2</sub> scavenging, AE and ME showed IC<sub>50</sub>=0.1204 g mL<sup>-1</sup> and IC<sub>50</sub>=0.3559 g mL<sup>-1</sup> respectively, compared to ascorbic acid IC<sub>50</sub>=4.421 g mL<sup>-1</sup>. In the FRAP assay, AE and ME showed IC<sub>50</sub>=0.02783 g mL<sup>-1</sup>, and IC<sub>50</sub>=0.02716 g mL<sup>-1</sup> respectively, compared to ascorbic acid IC<sub>50</sub>=0.02971 g mL<sup>-1</sup>. The study revealed that *B. flabellifer* treacle should be classified as medium GI food, with high antidiabetic and antioxidant activities. Further studies are recommended to study the adaptability of treacle for the diet of diabetic subjects, and subjects at risk.

**Keywords:** Antidiabetic, *Borassus flabellifer* treacle, Glycemic index