Effect of different drying treatments and solvent ratios on phytochemical constituents of Ipomoea aquatica and correlation with α-Glucosidase inhibitory activity

ABSTRACT

Ipomoea aquatica is an aquatic plant that is widely consumed in Southeast Asia as a vegetable. In this study, the influence of various ethanol ratios (0, 20, 50, 80, and 100%) as an extraction solvent and different drying methods including air drying, sun drying, and oven drying on phytochemical constituents of I. aquatica was investigated using a proton nuclear magnetic resonance-based metabolomics approach. The effect on α-glucosidase inhibitory activity and total phenolic content was also examined. Clear discrimination was observed between different ethanol ratios and different drying processes by principal component analysis. The highest α-glucosidase inhibitory activity was observed for absolute ethanol extract from the oven drying method with IC_{50} value of 204.0 ± 59.0 µg/mL and total phenolic content value of 22.0 ± 0.7 µg gallic acid equivalent/mg extract. Correlation between the α-glucosidase inhibitory activity and the metabolite were analyzed using a partial least square analysis. The metabolites that are responsible for the activity were quercetin derivatives, chlorogenic acid derivatives, sucrose, and fructose. This study highlights the basis for future investigations of I. aquatica as a source of food that has the potential for nutraceutical enhancement and as ingredient in medicinal preparation.

Keyword: ^{1}H NMR metabolomics; Ipomoea aquatica; Alpha-glucosidase inhibitory; PLS