Antihyperglycemic activity of the mahkota dewa [phaleria macrocarpa (scheff.) boerl.] leaf extracts as an alpha-glucosidase inhibitor

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Alpha-glucosidase (EC 3.2.1.20) is a carbohydrase that catalyzes the liberation of a-glucose from the nonreducing end of the diet carbohydrate. In diabetic patients, inhibition of these enzymes causes the restraint of glucose absorption and decreases the postprandial hyperglycemia. The purpose of this research is to study the antihyperglycemic activity of mahkota dewa [Phaleria macrocarpa (Scheff.) Boerl.] leaf extracts by inhibition test to alpha glucosidase enzyme. This research was conducted in three steps: fractionation and extraction samples with methanol, ethyl acetate, n-butanol, and water, followed by phytochemistry screening and alpha-glucosidase inhibition test. The alpha-glucosidase inhibition test was performed by using alpha-glucosidase enzyme and p-nitrophenyl α-D-glucopyranoside as a substrate.

The result of phytochemistry screening showed that Mahkota dewa leaves contain class of phenolics, thanins, flavonoids, alkaloids, and carbohydrates. The result of alpha-glucosidase inhibition test showed that ethyl acetate fraction extract had the highest inhibition activity with inhibition percentage at 50 ppm for old leaves which is 55.04% and for young leaves which is 56.92%. At 50 ppm, inhibition activity from the methanol extract and boiled water extract of old leaves is higher than that of young leaves with inhibition percentage of old leaves methanol extract which is 14.25% and 10.97% for young leaves and for old leaves; boiled water extract is 10.32% and 6.85% for young leaves. For n-butanol fraction extract, inhibition activity of young leaf extract (14.26%) is higher than old leaf extract (9.49%).