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IN-VITRO INHIBITORY EFFECTS ON ALPHA-AMYLASE AND ALPHA-GLUCOSIDASE AND MODES OF INHIBITION OF *Vateria copallifera* SEEDS

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Abstract

The objective of present study was to determine the inhibition capacity and modes of inhibition of fresh and debittered *Vateria copallifera* seed extract against alpha-amylase and alpha-glucosidase enzymatic reactions. In vitro assessment of alpha-amylase and alpha-glucosidase enzyme inhibition capacity was evaluated for 80% ethanol, 80% methanol and aqueous extract of fresh and debittered *V. copallifera* seeds. Modes of inhibition (Kinetic analysis) were identified using Michaelis Menten and Lineweaver-Burk (double-reciprocal) plots. Results revealed that, 80% ethanol extracts showed the significantly ($p<0.05$) highest alpha-amylase enzyme inhibition capacity (fresh IC_{50}: 36.97±1.28 μg/mL, debittered IC_{50}:98.58±0.55 μg/mL) followed by aqueous extract (fresh IC_{50}: 258.14±12.41 μg/mL, debittered IC_{50}: 410.44±1.24 μg/mL) compared to positive control Acarbose. The highest alpha-glucosidase enzyme inhibition capacity is given by 80% ethanol extract of fresh *V. copallifera* seeds (IC_{50}: 1469.10±10.01 μg/mL). Kinetic analysis revealed that, 80% ethanol extract inhibited the alpha-amylase competitively although extract displayed a non-competitive mode of inhibition towards alpha-glucosidase. Thus, *Vateria copallifera* seeds can be considered a good natural resource for the management of Type 2 diabetes with postprandial hyperglycemia due to their traditional acceptability as a healthy food ingredient, availability and low costs with the necessity of further investigations on its active components.

Keywords: *V. copallifera*, enzyme inhibition activity, Type 2 diabetes mellitus