

Phytochemistry and Alpha-Amylase Inhibitory Activities of Rauvolfia vomitoria (Afzel) Leaves and Picralima nitida (Stapf) Seeds

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Abstract : Diabetes mellitus is a disease that is related to the digestion of carbohydrates, proteins and fats and how this affects the blood glucose levels. Various synthetic drugs employed in the management of the disease work through different mechanisms. Keeping postprandial blood glucose levels within acceptable range is a major factor in the management of type 2 diabetes and its complications. Thus, the inhibition of carbohydrate-hydrolyzing enzymes such as α -amylase is an important strategy in lowering postprandial blood glucose levels, but synthetic inhibitors have undesirable side effects like flatulence, diarrhea, gastrointestinal disorders to mention a few. Therefore, it is necessary to identify and explore the α -amylase inhibitors from plants due to their availability, safety, and low costs. In the present study, extracts from the leaves of Rauvolfia vomitoria and seeds of Picralima nitida which are used in the Nigeria traditional system of medicine to treat diabetes were tested for their α -amylase inhibitory effect. The powdered plant samples were subjected to phytochemical screening using standard procedures. The leaves and seeds macerated successively using n-hexane, ethyl acetate and methanol resulted in the crude extracts which at different concentrations (0.1, 0.5 and 1 mg/mL) alongside the standard drug acarbose, were subjected to α -amylase inhibitory assay using the Benfield and Miller methods, with slight modification. Statistical analysis was done using ANOVA, SPSS version 2.0. The phytochemical screening results of the leaves of Rauvolfia vomitoria and the seeds of Picralima nitida showed the presence of alkaloids, tannins, saponins and cardiac glycosides while in addition Rauvolfia vomitoria had phenols and Picralima nitida had terpenoids. The α -amylase assay results revealed that at 1 mg/mL the methanol, hexane, and ethyl acetate extracts of the leaves of Rauvolfia vomitoria gave (15.74, 23.13 and 26.36 %) α -amylase inhibitions respectively, the seeds of Picralima nitida gave (15.50, 30.68, 36.72 %) inhibitions which were not significantly different from the control at $p < 0.05$, while acarbose gave a significant 56 % inhibition at $p < 0.05$. The presence of alkaloids, phenols, tannins, steroids, saponins, cardiac glycosides and terpenoids in these plants are responsible for the observed anti-diabetic activity. However, the low percentages of α -amylase inhibition by these plant samples shows that α -amylase inhibition is not the major way by which both plants exhibit their anti-diabetic effect.

Keywords : alpha-amylase, Picralima nitida, postprandial hyperglycemia, Rauvolfia vomitoria

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