

α -AMYLASE AND α -GLUCOSIDASE-INHIBITORY AND ANTIOXIDANT ACTIVITIES OF THREE SRI LANKAN PLANTS

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Diabetes is a chronic metabolic disorder that has become a major health problem worldwide. Diabetes is associated with increased blood glucose levels and slowing down the metabolic conversion of carbohydrate to glucose is an effective strategy for managing the disease. α -Amylase and α -glucosidase enzyme inhibitors retard the conversion of carbohydrates to glucose. The search for such inhibitors in medicinal plants is attractive because of the anticipated low adverse effects and high efficacy of natural products present in medicinal plants.

Canarium zeylanicum (Retz.) Blume (Burseraceae) and *Osbekia octandra* (L.) DC. (Melastomataceae) are plants endemic to Sri Lanka and are used in the treatment of diabetes in the indigenous system of medicine. *Piper betle* L. (Piperaceae) is also known to have antidiabetic properties. In this study α -amylase- and α -glucosidase-inhibitory activities of the extracts of these three plants were investigated. Oxidative stress is implicated in the pathogenesis of diabetes and antioxidants may provide therapeutic benefits. Hence, the antioxidant activity of the extracts was also investigated using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. Powders of shade-dried *C. zeylanicum* bark and *O. octandra* leaves and freeze-dried *P. betle* leaves were separately extracted into hot water and a mixture (1:1) of dichloromethane and methanol. The concentrated extracts dissolved in aqueous dimethylsulfoxide (1%) were used in the enzyme-inhibitory bioassays. For the DPPH assay, the concentrated extracts were dissolved in ethanol. The average concentration of each extract for 50% inhibition of activity (IC₅₀) in the bioassays was determined by performing the experiments in triplicate.

The extracts of *P. betle* did not show enzyme-inhibitory activity (IC₅₀ > 5000 μ g/ml) while the extracts of *O. octandra* had some α -glucosidase-inhibitory activity (IC₅₀, 43-128 μ g/ml). The extracts of *C. zeylanicum* displayed the highest enzyme-inhibitory and antioxidant activities (IC₅₀: α -amylase, 8-65 μ g/ml; α -glucosidase, 3-22 μ g/ml; DPPH, 0.2-1.1 μ g/ml). All extracts showed considerable antioxidant activity (IC₅₀, 0.2-67.4 μ g/ml) compared to butylated hydroxyanisole (IC₅₀, 0.6 μ g/ml).

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