

Evaluation of Alpha-Glucosidase Inhibitory Effect of Two Plants from Brazilian Cerrado

Authors : N. A. P. Camaforte, P. M. P. Vareda, L. L. Saldanha, A. L. Dokkedal, J. M. Rezende-Neto, M. R. Senger, F. P. Silva-Jr, J. R. Bosqueiro

Abstract : Diabetes mellitus is a disease characterized by deficiency of insulin secretion and/or action which results in hyperglycemia. Nowadays, acarbose is a medicine used by diabetic people to inhibit alpha-glucosidases leading to the decreasing of post-feeding glycaemia, but with low effectiveness and many side effects. Medicinal plants have been used for the treatment of many diseases including diabetes and their action occurs through the modulation of insulin-depending processes, pancreas regeneration or inhibiting glucose absorption by the intestine. Previous studies in our laboratory showed that the treatment using two crude extracts of plants from Brazilian cerrado was able to decrease fasting blood glucose and improve glucose tolerance in streptozotocin-diabetic mice. Because of this and the importance of the search for new alternatives to decrease the hyperglycemia, we decided to evaluate the inhibitory action of two plants from Brazilian cerrado - B.H. and Myrcia bella. The enzymatic assay was performed in 50 μ L of final volume using pancreatic α -amylase and maltase together with their commercial substrates. The inhibition potency (IC₅₀) was determined by the incubation of eight different concentrations of both extracts and the enzymes for 5 minutes at 37°C. After, the substrate was added to start the reaction. Glucosidases assay was evaluated measuring the quantity of p-nitrophenol in 405 nmin 384 wells automatic reader. The in vitro assay with the extracts of B.H. and M. bella showed an IC₅₀ of 28,04 μ g/mL and 16,93 μ g/mL for α -amilase, and 43,01 μ g/mL and 17 μ g/mL for maltase, respectively. M. bella extract showed a higher inhibitory activity for those enzymes than B.H. extract. The crude extracts tested showed a higher inhibition rate to α -amylase, but were less effective against maltase in comparison to acarbose (IC₅₀ 36 μ g/mL and 9 μ g/mL, respectively). In conclusion, the crude extract of B.H. and M. bella showed a potent inhibitory effect against α -amylase and showed promising results to the possible development of new medicines to treat diabetes with less or even without side effects.

Keywords : alfa-glucosidases, diabetes mellitus, glycaemia, medicinal plants

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