α-Glucosidase and α-amylase Inhibitory Constituents of Tinospora crispa: Isolation and Chemical Profile Confirmation by Ultra-high Performance Liquid Chromatography-quadrupole Time-of-flight/mass spectrometry

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ABSTRACT

Tinospora crispa has been used in Malaysia to treat diabetes mellitus. We evaluated the effects of compounds isolated from T. crispa vines on the starch digestive enzymes, α-glucosidase and α-amylase. Borapetoside C was the most potent α-glucosidase inhibitor (IC50 = 0.0527 ± 0.008 mg/ml), followed by 4-hydroxy benzaldehyde (IC50 = 0.557 ± 0.004 mg/ml), and the alkaloids lysicamine and liriodenine (IC50 = 0.562 ± 0.003 mg/ml). Borapetoside C also potently inhibited α-amylase inhibitory activity (IC50 = 0.775 ± 0.005 mg/ml). The relationship between compound activity and content in the extracts was determined by ultra-high performance liquid chromatography-quadrupole time-of-flight/mass spectrometry (UPLC-QToF/MS). These results suggest that borapetoside C is the main primary active component of T. crispa extracts, mediating α-glucosidase and α-amylase inhibition.

KEYWORDS: Fine chemicals; Tinospora crispa; Ultra-performance liquid chromatography; α-amylase; α-glucosidase

DOI: 10.1016/j.jff.2015.04.011