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

Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang Kuantan, Pahang, Malaysia

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