In vitro anti-inflammatory, cytotoxic and antioxidant activities of boesenbergin A, a chalcone isolated from Boesenbergia rotunda (L.) (fingerroot)

ABSTRACT

The current in vitro study was designed to investigate the anti-inflammatory, cytotoxic and antioxidant activities of boesenbergin A (BA), a chalcone derivative of known structure isolated from Boesenbergia rotunda. Human hepatocellular carcinoma (HepG2), colon adenocarcinoma (HT-29), non-small cell lung cancer (A549), prostate adenocarcinoma (PC3), and normal hepatic cells (WRL-68) were used to evaluate the cytotoxicity of BA using the MTT assay. The antioxidant activity of BA was assessed by the ORAC assay and compared to quercetin as a standard reference antioxidant. ORAC results are reported as the equivalent concentration of Trolox that produces the same level of antioxidant activity as the sample tested at 20 µg/mL. The toxic effect of BA on different cell types, reported as IC50, yielded 20.22 ± 3.15, 10.69 ± 2.64, 20.31 ± 1.34, 94.10 ± 1.19, and 9.324 ± 0.24 µg/mL for A549, PC3, HepG2, HT-29, and WRL-68, respectively. BA displayed considerable antioxidant activity, when the results of ORAC assay were reported as Trolox equivalents. BA (20 µg/mL) and quercetin (5 µg/mL) were equivalent to a Trolox concentration of 11.91 ± 0.23 and 160.32 ± 2.75 µM, respectively. Moreover, the anti-inflammatory activity of BA was significant at 12.5 to 50 µg/mL and without any significant cytotoxicity for the murine macrophage cell line RAW 264.7 at 50 µg/mL. The significant biological activities observed in this study indicated that BA may be one of the agents responsible for the reported biological activities of B. rotunda crude extract.

Keyword: Boesenbergia rotunda; Boesenbergin A; Cytotoxicity; Antioxidation; Anti-inflammatory