Nutritional composition and biological activities of the edible shoots of Bambusa vulgaris and Gigantochloa ligulata

ABSTRACT

The nutritional composition of the raw and boiled shoots of two bamboo species, Bambusa vulgaris and Gigantochloa ligulata were investigated. Boiling the shoots at 100 °C for 20 min significantly increased the crude fat and crude fiber contents while it decreased the crude protein content for both species. In general, the boiled shoots of both species were high in moisture (≥92 g/100 g fw), crude protein (≥29 g/100 g dw), and crude fiber (≥7.7 g/100 g dw) but low in crude fat (≤3.7 g/100 g dw). Boiling had varying effects on the mineral contents of both shoots, depending on the mineral. Potassium was the most abundant mineral for the raw and boiled shoots of B. vulgaris (310 and 240 µg/100 g dw, respectively) and G. ligulata (240 and 120 µg/100 g dw, respectively). The extracts (sequentially: hexane, ethyl acetate, ethanol, water) obtained from the boiled shoots of both species showed stronger antifungal activity (MIC: 0.01–2.50 mg/mL) than antibacterial activity (MIC: 0.31–2.50 mg/mL). All extracts from B. vulgaris showed stronger DPPH radical scavenging activity and ferric-reducing antioxidant power but similar cellular antioxidant activity with HeLa cells, and higher total phenolic and flavonoid contents than G. ligulata. However, the lowest half-maximum inhibitory concentration values for α-amylase and α-glucosidase were shown by the ethanol (300 µg/mL) and hexane (71 µg/mL) extracts of G. ligulata shoots, respectively. The results suggested that the shoots of B. vulgaris and G. ligulata are a potential health food and a source of bioactive compounds.