

Nutritional compositions, biological activities, and phytochemical contents of the edible bamboo shoot, *Dendrocalamus asper*, from Malaysia

ABSTRACT

The edible shoots of *Dendrocalamus asper* (family Poaceae) is an underutilised food. The present work was conducted to evaluate the nutritional compositions, biological activities, and phytochemical contents of the shoots of *D. asper* obtained from different regions of Malaysia, Peninsular (DP) and East Malaysia (DS). The nutritional analysis was conducted using the Official Methods of Analysis of the AOAC International. All minerals were quantified using an inductively coupled plasma-mass spectrometer, except for potassium which was measured using a flame atomic absorption spectrometer. Total phenolic content (TPC) was determined using the Folin-Ciocalteu method. Antibacterial and antifungal activities were assayed using a colourimetric broth microdilution method, while antioxidant activity was tested using DPPH radical scavenging activity, ferric-reducing antioxidant power, and cellular antioxidant activity (CAA) assays. Enzyme inhibitory activities were examined using α -amylase and α -glucosidase. Both bamboo shoots (boiled at 100°C for 20 min) were high in moisture (> 93 g/100 g FW), crude protein (> 21 g/100 g DW), and crude fibre contents (> 9 g/100 g DW), but low in fat content (< 4 g/100 g DW). Potassium was the most abundant mineral at 205.67 and 203.83 $\mu\text{g}/100\text{ g DW}$ of bamboo shoots of DP and DS, respectively. The extracts (hexane, ethyl acetate, ethanol, and water) of both shoots showed stronger antifungal activity than antibacterial activity against selected human pathogens. All extracts of DP shoots demonstrated higher CAA in HeLa cells and α -amylase inhibitory activity than that of DS shoots. In contrast, the extracts of DS shoots exhibited stronger inhibition on α -glucosidase and contained higher TPC than that of DP shoots. The *D. asper* shoots obtained from the Peninsular Malaysia and East Malaysia contained different types of secondary metabolites which account for the differences in the biological activities. In conclusion, *D. asper* shoots have potential as a nutritional and functional food.