Antioxidant and hypoglycaemic effects of local bitter gourd fruit (Momordica charantia)

ABSTRACT

Antioxidant and anti-diabetic properties of two local bitter gourd species namely peria kambas and peria katak were screened with 3 antioxidant assays (2,2-diphenyl-1-picrylhydrazyl [DPPH], the ability of ferricion reduction in plasma [FRAP] and total phenolic content [TPC]) and 2 inhibition assays of key enzymes in carbohydrate metabolism (α-amylase and α-glucosidase). Mature peria katak appeared as stronger antioxidant vegetables in three antioxidant assays (51.1 % in DPPH inhibition, 0.63 g gallic acid equivalent and 2.29 g Trolox equivalent/100 g dried weight of peria katak) than peria kambas. Besides, it also reported to be 21% and almost three fold stronger in inhibiting the activity of enzymes α-amylase and α-glucosidase as compared to another bitter gourd cultivar. These pharmacology properties of peria katak were further determined along the ripening stages. Again, it was found that mature peria katak showed the highest antioxidant potential as well as the highest half maximal inhibitory concentration (IC50) values of 0.63 mg/mL and 0.62 mg/mL for α-amylase and α-glucosidase enzyme inhibition assays respectively. Interestingly, mature peria katak was more effective than acarbose, one of the commonly used oral anti diabetic drug in inhibiting α -amylase activity and almost as good as acarbose in inhibiting α-glucosidase activity. In conclusion, peria katak is more effective than peria kambas in suppressing free radical and decreasing hyperglycemia post-ingestion. Therefore, the local mature peria katak can serve as a better antioxidant and anti-diabetic tool in food and nutraceutical product development.

Keyword: Bitter gourd; Ripening stage; Antioxidant; Anti diabetic; Acarbose