Assessment of total phenolic, antioxidant, and antibacterial activities of Passiflora species

ABSTRACT

This study focused on total phenolic content (TPC) and antioxidant and antibacterial activities of the leaves and stems of Passiflora quadrangularis, P. maliformis, and P. edulis extracted using three solvents: petroleum ether, acetone, and methanol. The maximum extraction yields of antioxidant components from the leaves and stems were isolated using methanol extracts of P. edulis (24.28%) and P. quadrangularis (9.76%), respectively. Among the leaf extracts, the methanol extract of P. maliformis had the significantly highest TPC and the strongest antioxidant activity, whereas among the stem extracts, the methanol extract of P. quadrangularis showed the highest phenolic amount and possessed the strongest antioxidant activity. The antibacterial properties of the Passiflora species were tested using the disc diffusion method against 10 human pathogenic bacteria. The largest inhibition zone was observed for the methanol extract of P. maliformis against B. subtilis. Generally, extracts from the Passiflora species exhibit distinct inhibition against Gram-positive but not Gram-negative bacteria. Based on the generated biplot, three clusters of bacteria were designated according to their performance towards the tested extracts. The present study revealed that methanol extracts of the Passiflora contain constituents with significant phenolic, antioxidant, and antibacterial properties for pharmaceutical and nutraceutical uses.

Keyword: Total Phenolic Content (TPC); Antioxidant activity; Antibacterial activities; Passiflora; Phenols