Assessment of phytochemical content, polyphenolic composition, antioxidant and antibacterial activities of Leguminosae medicinal plants in Peninsular Malaysia.

ABSTRACT

Background: Many medicinal plants from Leguminosae family can be found easily in Malaysia. These plants have been used as traditional medicines by local ethnic groups, where they are prepared as decoction, pastes for wound infections, and some have been eaten as salad. This paper focused on the assessment of antioxidant potential, antibacterial activity and classes of phytochemicals of nine plants from the Leguminosae family. Methods: Acacia auriculiformis, Bauhinia kockiana, Bauhinia purpurea, Caesalpinia pulcherrima, Calliandra tergemina, Cassia surattensis, Leucaena leucocephala, Peltophorum pterocarpum, and Samanea saman were extracted with aqueous methanol and dichloromethane:methanol mixture to test for antioxidant and antibacterial activities. The Folin-Ciocalteu assay was conducted to quantify the total phenolic content and 2, 2-diphenyl-1-picrylhydrazyl (DPPH) assay was used to determine the free radical quenching capacity. Antibacterial activity was assessed using disc diffusion (Kirby-Bauer) assay. Screening for major classes of phytochemical was done using standard chemical tests. Results: B. kockiana flowers and C. pulcherrima leaves contained high total phenolic content (TPC) and strong DPPH radical scavenging ability with TPC of 8280 ± 498 mg GAE/100 g, IC50 of 27.0 ± 5.0 µg/mL and TPC of 5030 ± 602 mg GAE/100 g, IC50 of 50.0 ± 5.0 µg/mL respectively. Positive correlation was observed between TPC and free radical scavenging ability. Most extracts showed antibacterial activity against Gram positive bacteria at 1 mg, while none showed activity against Gram negative bacteria at the same dose. All extracts (except Samanea saman flower) showed antibacterial activity against two strains of methicillin resistant Staphylococcus aureus (MRSA) with MID values ranging between 100 µg/disc and 500 µg/disc. Conclusion: The potential source of antioxidant and antibacterial agents, especially for MRSA infection treatments were found in B. kockiana, C. pulcherrima, C. tergemina and P. pterocarpum. These preliminary results would be a guide in the selection of potential candidates for further pharmacological study and in search of new drug candidate in treating MRSA infections.

Keyword: Phytochemical; Polyphenolic; Antioxidant; Antibacterial; Leguminosae; Peninsular Malaysia.