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Determination and comparison of antibacterial activity, phytochemical content and antioxidant activity of two dragonfruit species cultivated in Sri Lanka.

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The development of fruit-based natural antibacterial and antioxidant agents is an alternative to synthetic agents for the prevention and treatment of several diseases to safeguard and enhance human life. Dragonfruit, also known as pitaya, is a fruit of the genus Hylocereus (Cactaceae). They contain phytochemicals such as polyphenols, flavonoids, and vitamin C, which are known for their antioxidant activity. In Sri Lanka, dragonfruit is cultivated in tropical lowland wet zone, intermediate zone and dry zone. Hence, the aim of this study was to determine the antibacterial activity, phytochemical content and antioxidant activity in flesh extracts of two species of Sri Lankan cultivated dragonfruits, *Hylocereus polyrhizus* (red dragon fruit) and *Hylocereus undatus* (white dragon fruit). Following an ethanol extraction, the antimicrobial activity was evaluated through thedisc diffusion method using two pathogenic bacterial strains *Staphylococcus aureus* and *Escherichia coli*. The phytochemical content was evaluated through the total phenolic content (TPC) and total flavonoid content (TFC) assays. The antioxidant activity was evaluated through total antioxidant capacity (TAC), ferric reducing-antioxidant power (FRAP), 2,2'-Azinobis(3-ethylbenzothiazoline-6- sulfonic acid) (ABTS) radical scavenging assay, and 2,2-Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay. The disc diffusion assay demonstrated that both species of dragon fruit showed antibacterial activity against both bacteria, with red dragon fruit showing higher antibacterial activity than white dragon fruit at 50 mg/mL. TPC and TFC assays demonstrated that flesh of red dragon fruit contained higher phenolic and flavonoid content than the white dragon fruit. TAC, FRAP, ABTS and DPPH assays also demonstrated that flesh of red dragon fruit had higher antioxidant activity than the white dragon fruit. Furthermore, TPC and TFC separately showed positive correlations with TAC, FRAP, ABTS and DPPH. Correlations observed between the phytochemical content and antioxidant and antibacterial activities demonstrated that the flavonoids contributed more towards the antioxidant and antibacterial activities of both the fruit species. Overall, the results suggested that the flesh of the red dragon fruit had higher antibacterial activity, phytochemical content, and antioxidant activity than white dragon fruit cultivated in Sri Lanka.

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