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Phytochemical screening and in vitro evaluation of antioxidant and antimicrobial efficacies of Pteropyum scoparium (Jaub. & Spach) Sidaf crude extracts

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Abstract
Objective: Pteropyrum scoparium Jaub. & Spach locally known as “Sidaf” is a meal known to the ancient Omani people with many health benefits. It is traditionally used in Oman to treat high cholesterol, hypertension, indigestion problems, wound healing, and diabetes. However, these claims are yet to be scientifically proven. Hence, this study aimed to perform phytochemical, antioxidant, and antimicrobial analysis of P. scoparium leaves aqueous and alcoholic extracts to confirm its medicinal potential. Methods: A detailed phytochemical analysis of ethanol and aqueous extracts of leaves was carried out to confirm the presence of bioactive substances. DPPH (2,2′-diphenyl-1-picrylhydrazyl), agar-well diffusion and disc diffusion methods were used to evaluate antioxidant and antimicrobial potential, respectively. The extracts were tested against four microorganisms viz. E. coli (ATCC 25922), S. aureus (ATCC 23235), Penicillium sp. (ATCC 11597) and Rhizopus stolonifer (ATCC 14037). Results: The ethanol extract exhibited higher DPPH scavenging activity than aqueous extract that was confirmed with IC50 values of both extracts. However, the aqueous extract was found to be significantly more effective as an antimicrobial agent than the ethanol extract. This could be due to higher coumarins content that is thrice as much as in ethanol extract. One-way repeated measure RM ANOVA showed that there was a statistically significant difference in the antimicrobial susceptibility of all four organisms for the aqueous and ethanol well diffusion extracts (DF = 7; SS = 56.350, MS = 8.050; F = 5.865; P < 0.001). The highest mean zone of inhibition was recorded for S. aureus (12 ± 3.851 mm) well diffusion aqueous extract followed by R. stolonifer (11.750 ± 4.250 mm) well diffusion aqueous extract, and S. aureus (10.625 ± 3.771 mm) well diffusion ethanol extract. Conclusions: Phytochemical screening of ethanol and aqueous extracts revealed the presence of alkaloids, glycosides, carbohydrates, amino acid, fats & fixed oils, phenolic compounds & tannins, proteins, phytosterols, saponins, gum & mucilage, terpenoids, coumarins and anthocyanins. The findings from this study will be useful in evaluating the phytochemical constituents present in the extract and developing commercial drugs as antioxidant and antimicrobial agents based on this plant. © 2023 The Authors

Author Keywords
Antibacterial activity; Antifungal activity; Phytochemical; Pteropyrum scoparium; Radical scavenging activity

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