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Exploring trends in digital health for healthcare innovations with sustainable health equity

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Comparative analysis of phytochemical and antioxidant activities of different parts of the medicinal plant; *Ocimum sanctum* Linn in Jaffna district

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Background: *Ocimum sanctum* Linn (*O. sanctum*) (*Tulsi*) (Lamiaceae) is rich in diverse bioactive compounds with therapeutic plant. Its various parts have long been used in traditional medicine to manage the conditions, such as bronchitis, malaria, diarrhea, skin conditions, and rheumatism. It is also renowned for possessing antidiabetic, antimicrobial, cardioprotective, and analgesic actions.
Objective: The goal of this study was to compare the phytochemical analysis and antioxidant activities of *O. sanctum's* leaves and flowers.
Methods: Selected parts of *O. sanctum* that were collected from the Jaffna district were subjected to maceration extractions using ethanol, methanol, and water as solvents. Phytochemical analysis was performed using standard techniques. DPPH (2,2-Diphenyl-1-picrylhydrazyl) and ABTS (2,2'-azino-bis-3-ethylbenzothiazoline-6-sulfonic acid)); two complementary tests, were used to examine antioxidant activity. These assays were conducted in triplicates and the Statistical analysis (Mean ± SD) was carried out using ANOVA using mini tab 17 software and Tukey's multiple comparisons at probability value ($p \leq 0.05$).
Results: The findings demonstrated that the ethanolic and methanolic extracts had higher concentration of flavonoid, phenol, tannin and alkaloid than the aqueous extracts of *O. sanctum*. Further the ethanolic flower extract had the highest contents of flavonoid (50.88±0.62µg QE/g) and alkaloid (75.83±0.55mg/g), while the methanolic and ethanolic leaf extracts had the highest contents of tannin (410.24±0.60µg TAE/g) and phenol (20.96±0.65µg GAE/g) when compared to all other extracts. Additionally, the methanolic flower extract showed the highest DPPH activity (IC_{50}: 0.68±0.19µg/mL) while the lowest DPPH activity was detected in methanolic leaf extract (IC_{50}: 1.95±0.82µg/mL). The ABTS activity was higher in the methanolic flower extract (IC_{50}: 1.82±0.32µg/mL) compared to the methanolic leaf extract (IC_{50}: 2.59±0.44µg/mL).
Conclusions: These tests showed that compared to the *O. sanctum* leaf extract, the methanolic flower extract had a higher antioxidant potential. It provides valuable insights for potential applications of *O. sanctum* in functional medicine and pharmaceutical research.