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In-vitro Antioxidant, Sun Protection, Anti-inflammatory and Antibacterial Properties of *F. leucopyrus, O. octandra* and *H. speciosa*

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Abstract

Rich biodiversity and strong ethnopharmacological traditional knowledge in Sri Lanka provide an opportunity to utilize highly potential medicinal plant resources for sustainable products extending from pharmacological, food/beverages to cosmetic innovation. *Flueggea leucopyrus*, *Osbeckia octandra*, and *Hellenia speciosa* have been a research focus due to their medicinal benefits according to ethnopharmacology. The current study investigates the beneficial bioactivities of *F. leucopyrus*, *O. octandra*, and *H. speciosa* in terms of their antioxidant, *in-vitro* sun protection, and anti-inflammatory capacities, followed by antimicrobial activity in a range of extractions. The plant leaf water, glycerine, and ethanol extracts were subjected to antioxidant assays: Total Phenol Content (TPC) as Gallic Acid Equivalent (GAE), Total Flavonoid Content (TFC) as Rutin Equivalent (RE), and DPPH free-radical scavenging percentage (DPPHfrs%) followed by *in-vitro* Sun Protection Factor (SPF) and egg-albumin anti-coagulation effect for *in-vitro* Anti-Inflammatory percentage (AI%). The antibacterial activities against *Staphylococcus aureus* and *Pseudomonas aureoginosa* strains were tested for water and ethanol extracts of the medicinal plants using disk diffusion and Resazurin assays. The TPC, TFC, and DPPHfrs% of *F. leucopyrus* ranged from 0.154 g/L to 0.852 g/L, 0.009 g/L to 0.455 g/L and 84.349% to 91.713%, while *O. octandra* ranging from 0.131 g/L to 1.113 g/L, 0.008 g/L to 0.160 g/L and 79.607% to 92.387% respectively. *H. speciosa* showed TPC, TFC, and DPPHfrs% ranging from 0.010 g/L to 3.024 g/L, 0.002 g/L to 0.410 g/L and 26.388% to 57.716% respectively. The SPF of *F. leucopyrus*, *O. octandra*, and *H. speciosa*, ranged from 33 to 40, 19 to 40, and 6 to 34 respectively. AI% of *F. leucopyrus*, *O. octandra*, and *H. speciosa* followed 9.037% and 11.940%, 8.418% and 11.852%, 12.515% and 12.000% respectively (water and ethanol extracts respectively)**.** Crude ethanolic leaf extracts of *F. leucopyrus* and *H. speciosa* in a higher concentration of 50 mg/mL showed antibacterial activity against *S. aureus*. Thus, the current plant selection of *F. leucopyrus*, *O. octandra*, and *H. speciosa* can be considered as high potential resources for sustainable products with consideration on the extraction protocols as they can brighten, heal, and hydrate skin and body.

Keywords: *Medicinal plants, Antioxidant capacity, Sun protection factor, Anti-inflammatory capacity, Antibacterial activity*