

Exploring bioactive compounds and antioxidant activity of selected Sri Lankan medicinal plants for skincare innovation

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Skin cancer, premature aging, and wrinkle formation are major global health concerns caused by prolonged exposure to UV radiation. There is an emerging trend for applying natural plant extracts as a solution of antioxidants and other bio-active compounds. Seeds and leaves of 17 medicinal plants used in Sri Lankan traditional healing practices were extracted with a 1:1 (v/v) methanol-dichloromethane solvent at a 1:5 (w/v) plant-to-solvent ratio. The extracts were screened for phytochemicals, identified by GC-MS, and assessed for antioxidant activity using DPPH (2,2-diphenyl-1-picrylhydrazyl). The phytochemical screening confirmed the presence of flavonoids, alkaloids, phenols, tannins, terpenoids, saponins, carbohydrates, sterols and triterpenes in plant extracts. Among the 17 tested plants, those with the highest antioxidant activity included the leaves and fruits of *Elaeocarpus serratus* (Ceylon Olive), *Psidium guajava* (Guava), *Punica granatum* (Pomegranate), *Psidium cattleianum* (Cherry Guava), leaves of *Flueggea leucopyrus* (Katupila), fruits of *Ixora coccinea* (Rathmal) and seeds of *Dialium ovoideum* (Tamarind velvet). GC-MS analysis revealed key antioxidant compounds with significant peaks, including *trans*-4-methoxychalcone and 2*H*-pyran-

2,6(3*H*)-dione in *E. serratus* leaves and fruits, humulene and methyl 10-*trans*,12-*cis*-octadecadienoate in *P. guajava* leaves and fruits, (2*R*,3*S*,4*S*,5*R*)-2,5-bis(3,4-dimethoxyphenyl)-3,4-dimethyltetrahydrofuran in *P. granatum* leaves, caryophyllene oxide and 9-oxabicyclo[6.1.0]non-6-en-2-one in *P. cattleianum* leaves and fruits, 1-methyl-1*H*-Pyrrole in *F. leucopyrus* leaves, 2-oxo-butanoic acid in *I. coccinea* fruits, and scyllo-inositol in *D. ovoideum* seeds. The fruit of *E. serratus* exhibited the highest significant antioxidant activity (73.8%, $p < 0.05$), followed by its leaves (54.8%). In contrast, the lowest activity was observed in *D. ovoideum* seeds (3.6%) compared to 200 ppm ascorbic acid (standard) showed 62.26%. The results of the current study identify the fruit and leaf extracts of *E. serratus* as a promising source for pharmaceutical products aimed at addressing skin cell damage and preventing skin cancer. Further studies will evaluate their anti-cancer potential, advancing the development of nature-based skincare formulations.

Keywords:

GC-MS; Antioxidant; Phytochemicals; *E. serratus*