



Tyrosinase Inhibitory Potential in Selected Medicinal Plants in Sri Lanka

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Abstract

“Fair skin” is a desire of most of the women in Asian countries that demands the availability of skin-whitening cosmetic preparations. Tyrosinase is the key enzyme in the mammalian melanin biosynthesis and has been a long-term target in the field of cosmetics for skin whitening purposes. Although a variety of tyrosinase inhibitors are reported, only a few of them are being marketed due to various safety concerns. Therefore, as a safer alternative, there is an increased interest for plant-based natural skin lightening agents. Hence, the present study was undertaken to evaluate the tyrosinase inhibitory activity of methanol-water/methanol extracts of eight medicinal plants (*Acorus calamus*, *Averrhoa carambola*, *Clitoria ternatea*, *Sesbania grandiflora*, *Nyctanthes arbor-tristis*, *Tagetes erecta*, *Leucas zeylanica* and *Mukia maderaspatana*) in Sri Lanka that have been widely employed in traditional medicine to improve the complexion and as treatment options for various skin diseases. The skin whitening effect of the extracts was determined by *in vitro* tyrosinase inhibitory assay while the antioxidant activity was evaluated by 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. Among the tested extracts, methanol extract of *T. erecta* and methanol-water extract of *N. arbor-tristis* inhibited the tyrosinase enzyme ~ 50% or higher at the initial concentration of 333.3 µg/mL in a micro-well. Except *A. calamus* and *M. maderaspatana*, all the other extracts have displayed an inhibition of the enzyme in the range of 10-27% at this concentration. The dose response study revealed an IC₅₀ of 48.27 µg/mL for the most potent *T. erecta* extract. In addition, this extract has displayed strong antioxidant activity with an EC₅₀ value of 14.82 µg/mL suggesting a possible correlation between tyrosinase inhibition and antioxidant activity. These preliminary findings revealed that Sri Lankan medicinal plant preparations have a high potential to be used as natural skin whitening agents. The identification of secondary metabolites in the active extracts and incorporation of the active extracts into topical formulation for further studies are in progress.

Key words: Antioxidant, Medicinal plants, Skin whitening, Tyrosinase

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