Effects of aqueous seed extracts of *Mangifera zeylanica* and *Persea americana* on enhancing *in vitro* tyrosinase activity

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Abstract

Melanogenesis is the production of the pigment melanin which governs the skin color of humans. Abnormal loss of melanin can lead to disorders such as tinea versicolor, vitiligo, pityriasis alba, etc. Although these pigmentation disorders do not manifest any critical clinical conditions, they severely affect the quality of a patient's life and psychosocial health. As *P. americana* (Avocado) and Indian Mango fruits have been reported with a wide array of nutrients and bioactive phytochemicals potentially affecting melanogenic pathways, the aim of the current study was to evaluate the synergistic and individual effects of aqueous seed extracts of Avocado and *M. zeylanica* (Sri Lankan wild Mango) on tyrosinase-enhancing activity, which in turn increase pigmentation, via stimulating melanogenesis. The freeze-dried extracts were screened for the presence of phytochemicals and for tyrosinase activity by the spectrophotometry method using mushroom tyrosinase and L-dopa. Both *P. americana* (20, 40, 60, and 80 µg/ml) and *M. zeylanica* (40 and 80 µg/ml) extracts showed statistically significant tyrosinase-enhancing activity compared to the control ($P<0.05$). *P. americana* and *M. zeylanica* extracts stimulated tyrosinase activity with a maximum effect of 147.6±6.9% (20 µg/mL) and 63±8.8% (40 µg/mL) respectively. In contrast, all tested combinations showed antagonistic activity resulting in a decrease in tyrosinase activity compared to the individual extracts. The phytochemical analysis of *P. americana* extract showed positive results for flavonoids and saponins whereas *M. zeylanica* showed positive results for flavonoids, phenols, and tannins. With in-depth *in vivo* and clinical investigations, both *P. americana* and *M. zeylanica* seed extracts (individually) could be used as potential melanogenic stimulants to treat hypopigmentation disorders.

Keywords: *Hypopigmentation disorders, Melanogenesis, Mangifera zeylanica, Persea americana, Tyrosinase-enhancing activity*