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Evaluation of bioactivities of extracts obtained from flowers of *Senna spectabilis*

S.M.H. Binari and D.N. Udukala*

College of Chemical Sciences, Institute of Chemistry Ceylon, Rajagiriya, Sri Lanka

Tyrosinase enzyme is responsible for the synthesis of melanin in the skin. By inhibiting this enzyme, the rate of production of melanin can be decreased. Nowadays most women prefer to be fair skinned but adverse effects caused due to skin whitening agents have become a significant problem. Due to this reason, herbal skin whitening agents are becoming more popular in cosmeceutical industry. Researchers have found that, flowers of *Senna fistula* and *Senna auriculata* species show high anti tyrosinase activity. Hence, *Senna spectabilis* was chosen in this study and its total phenolic and flavonoid content, antioxidant activity and anti-tyrosinase activity were evaluated to find a potential skin whitening compound. The afore-mentioned bioactivities were selected to find out an existence of a correlation among them because these bioactivities are related to phenolics. The flower of *Senna spectabilis* was used in this study because of its high antioxidant activity. Sequential extraction was carried out into hexane, ethyl acetate and methanol, respectively. Water extraction was also carried out separately and extract was freeze dried. Phenolic content was determined using Folin-ciocalteu method whereas AlCl_3 colorimetric method was used to determine the total flavonoid content. Water extract showed a high phenolic (6.91 GAE g^{-1}) and flavonoid content (6.78 mg g^{-1}) compared to methanol extract. The antioxidant activity was evaluated by the 2, 2-diphenyl-1-picrylhydrazil (DPPH) assay. Methanol extract showed a better antioxidant activity with the highest value ($72.19 \pm 0.01\%$) for 4 mg/ml solution compared to water, hexane and ethyl acetate extracts. Methanolic extract showed a significant antioxidant activity compared to other extracts. The effect of skin whitening was evaluated using *in vitro* anti-tyrosinase assay. Unexpectedly, lipophilic extract (hexane) of *Senna spectabilis* displayed considerable anti-tyrosinase activity ($40.13 \pm 0.03\%$) for high concentration (4 mg/ml) compared to hydrophilic extracts (methanol, ethyl acetate and water). Although there is no specific correlation between the four bioactivities, different extracts have shown significant results for different bioactivities. These preliminary studies provide new insights to further evaluate the correlation of different bioactivities in different extracts of *Senna spectabilis* plant.

Keywords: Antioxidant activity, cosmeceutical, *Senna spectabilis*, tyrosinase

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E-mail: dinusha@ichemc.edu.lk