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### **Investigation of antioxidant and antityrosinase activities of *Premna serratifolia***

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In recent times, cancer and hyperpigmentation have been the most problematic issues faced by the people. As cancer is caused mostly by the free radicals in the body, antioxidants, which are radical scavengers, may reduce the mutations in the body. Hyperpigmentation is reduced by the compounds inhibiting the tyrosinase enzyme's activity. So, the compounds responsible for antioxidant and antityrosinase activities are analysed. Many harmless bioactive compounds responsible for many bioactivities are present naturally in plants. For this research work, the Sri Lankan species *Premna serratifolia* was chosen as the focal subject with specific attention to its leaves, traditionally employed for alleviating ingestion related issues. Considering the absence of prior research on this plant in previous studies, the leaves and twigs were chosen to determine the antioxidant and antityrosinase activities. The leaves were extracted by maceration process (cold extraction) through a sequential extraction using hexane, ethyl acetate and methanol. The twigs were extracted using the Soxhlet apparatus (hot extraction) through a sequential extraction using ethyl acetate and methanol. The antityrosinase activity was determined by the tyrosinase enzyme's catalytic reactions. The methanol extracts of leaves and twigs show higher antityrosinase activity (the IC<sub>50</sub> value of leaves is 6.83 ± 1.31 mg/mL and the IC<sub>50</sub> value of twigs is 8.20 ± 5.54 mg/mL) than their respective ethyl acetate extracts (IC<sub>50</sub> value of leaves is 87.06 ± 54.90 mg/mL and IC<sub>50</sub> value of twigs is 168.82 ± 2.60 mg/mL). The methanol extracts of leaves and twigs show similar antityrosinase activity within the concentration range of 0.200 – 1.600 mg/mL. At a concentration of 0.025 mg/mL, the methanol extracts of leaves and the twigs show higher antityrosinase activity than the standard Kojic acid yet, the twigs show more than the leaves. In ethyl acetate extracts, at a concentration of 0.025 mg/mL, twigs show higher antityrosinase activity than the standard Kojic acid and the leaves. The DPPH-radical scavenging method was employed to determine the antioxidant activity. The EC<sub>50</sub> values of ethyl acetate extracts of leaves and twigs are higher (2.63 ± 1.61 mg/mL and 3.89 ± 1.57 mg/mL, respectively) than their respective methanol extracts (1.21 ± 0.64 mg/mL and 1.10 ± 0.65 mg/mL). Despite the methanol extracts having lower EC<sub>50</sub> values, indicating high potent antioxidant activity, the ethyl acetate extracts of leaves and twigs exhibit higher antioxidant activity within the concentration range of 0.025 – 0.800 mg/mL. In ethyl acetate extracts of leaves and twigs, at a concentration of 0.025 mg/mL, the leaves show highest antioxidant activity than the twigs, but the twigs show higher antioxidant activity than the leaves within the concentration range of 0.100 - 0.200 mg/mL.

**Keywords:** Antioxidant, Antityrosinase, DPPH-radical scavenging, Kojic acid, *Premna serratifolia*