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Evaluation of anti-tyrosinase activity and antioxidant activity in the leaf extract of *Senna auriculata* (L.) Roxb. and the flower petal extract of *Couroupita guianensis* Aubl

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Discovering natural products with the ability to inhibit melanogenesis has become a major area of interest in both cosmetic and pharmaceutical research. The demand for such products stems from the drawbacks associated with commercially available synthetic tyrosinase inhibitors, which often exhibit high toxicity and are known to cause adverse side effects. As a result, researchers have turned their attention towards exploring natural sources for safer and more effective alternatives. This study focuses on the anti-tyrosinase activity of the ethanolic extract of leaves of *Senna auriculata* and the ethanolic extract of flower petals of *Couroupita guianensis*. The skin whitening potential of the extracts was measured by conducting an in-vitro anti-tyrosinase assay. In addition, DPPH assay was used to measure the antioxidant activity of the extracts. A topical formulation was developed using the ethanolic extract of the flower petals of *Couroupita guianensis* and its tyrosinase inhibitory potential was further investigated. The ethanolic extract of *Couroupita guianensis* was found to have a tyrosinase inhibitory activity with an IC₅₀ of 1296 mg/L compared to kojic acid (standard), which had an IC₅₀ value of 79 mg/L. However, the ethanolic extract of *Senna auriculata* leaves did not show any tyrosinase inhibitory or activating properties. In addition, in the DPPH assay, ascorbic acid (standard) had an EC₅₀ value of 41 mg/L, while the ethanolic extract of *Senna auriculata* showed more potent antioxidant activity with an EC₅₀ value of 85 mg/L, in comparison to the ethanolic extract of *Couroupita guianensis* which had an EC₅₀ of 623 mg/L. The formulation prepared with the flower petal extract of *Couroupita guianensis* showed moderate tyrosinase inhibition with an IC₅₀ value of 6250 mg/L, in contrast the positive control showed an IC₅₀ value of 1541 mg/L. The findings of this study reveal that there is a tyrosinase inhibitory potential in the flower petal extract of *Couroupita guianensis* and it offers a promising avenue for the development of a potential skin lightening agent in the cosmetic industry.

Keywords: *Couroupita guianensis*, Enzyme activity, *Senna auriculata*, Topical formulation, Tyrosinase inhibitors