

COMPARATIVE BIOACTIVITY ASSESSMENT OF *Garcinia mangostana* PERICARP AND *Gymnema sylvestri* LEAVES: ANTIOXIDANT POTENTIAL, ENZYME INHIBITION AND CYTOTOXICITY

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Plants are a rich source of bioactive compounds that can help prevent non-communicable diseases by neutralizing free radicals in the body and acting as enzyme inhibitors. This study evaluated the bioactivity of methanolic extracts from *Garcinia mangostana* pericarp, and *Gymnema sylvestri* leaves. Crude extracts were investigated for antioxidant activity using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay and ferric reducing antioxidant power (FRAP) assay. In addition, α -amylase inhibitory assay, brine shrimp lethality assay, and lettuce seed germination assay were performed to assess their potency as pharmaceuticals. The DPPH assay demonstrated higher free radical scavenging activity for *G. mangostana* with a lower IC₅₀ value of 8.76 ± 0.06 mg/L, and *G. sylvestri* had a lower activity with an IC₅₀ value of 264.97 ± 3.51 mg/L, compared to ascorbic acid as the positive control (IC₅₀ = 1.90 ± 0.01 mg/L). *Garcinia mangostana* showed higher antioxidant activity by the FRAP assay with a value of 2290.91 ± 3.67 μ mol FeSO₄/g, while *G. sylvestri* showed a lower antioxidant capacity (393.91 ± 8.15 μ mol FeSO₄/g) compared to Trolox as the positive control (12070.12 ± 0.30 μ mol FeSO₄/g). Furthermore, *G. mangostana* showed high amylase inhibitory activity, with an IC₅₀ value of 61.46 ± 2.55 mg/L while *G. sylvestri* showed comparable activity with an IC₅₀ value of 75.40 ± 2.00 mg/L compared to acarbose as the positive control (IC₅₀ = 15.97 ± 0.58 mg/L). A higher brine shrimp lethality was observed for *G. mangostana* extracts with an LC₅₀ of 38.32 ± 1.53 mg/L, whereas *G. sylvestri* showed lower lethality with an LC₅₀ of 583.25 ± 23.33 mg/L against K₂Cr₂O₇ as the positive control (34.40 ± 0.30 mg/L). Only *G. mangostana* showed phytotoxicity by the lettuce seed germination assay with an IC₅₀ of 462.22 ± 4.84 mg/L and 221.41 ± 23.09 mg/L for root and shoot, respectively. These results highlight a higher antioxidant potential and effective enzymatic inhibition of *G. mangostana* compared to *G. sylvestri*. However, the higher brine shrimp lethality of *G. mangostana* necessitates consideration of its dosage and application in pharmaceutical formulations.

Keywords: Amylase inhibition, DPPH assay, FRAP assay, Methanolic extract