

**ANTIOXIDANT, ANTIDIABETIC, CYTOTOXIC AND PHYTOTOXIC  
PROPERTIES OF TWO MEDICINAL PLANTS,  
*Buchanania axillaris* AND *Curcuma longa***

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Medicinal plants are a rich source of bioactive compounds with potential applications in pharmaceuticals, nutraceuticals, and agrochemicals. This study aimed to assess the bioactivities of extracts from *Buchanania axillaris* leaves and rhizomes of *Curcuma longa*. They were collected domestically within the Kandy District, Sri Lanka. Plant material was air-dried and ground to obtain a homogenous powder using a grinder. The powdered samples were extracted into methanol by sonicating for 30 min. This procedure was repeated twice, and the filtrates were combined and evaporated to dryness using a rotary evaporator. The crude extracts were evaluated for antioxidant activity using triplicates for 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, enzyme inhibitory activity against  $\alpha$ -amylase,  $\alpha$ -glucosidase, and lipase, and 10 nauplii for cytotoxicity through the brine shrimp lethality assay, and 10 seeds for phytotoxicity by the lettuce seed germination assay. The results demonstrated that *B. axillaris* exhibited potent antioxidant activity, with an IC<sub>50</sub> value of 0.03 ± 0.07 mg/L for DPPH radical scavenging activity, than *C. longa* (61.49 ± 0.57 mg/L). Positive control was ascorbic acid (IC<sub>50</sub> = 3.47 ± 0.45 mg/L). Both extracts displayed  $\alpha$ -glucosidase inhibitory activity, with 100% inhibition at 1000 mg/L, indicating their potential in managing diabetes. *Curcuma longa* showed moderate  $\alpha$ -amylase inhibitory activity, with an IC<sub>50</sub> of 465.81 ± 23.31 mg/L (Positive Control-Acarbose IC<sub>50</sub> = 8.87 ± 1.21 mg/L). Neither extract exhibited significant lipase inhibitory effects within the tested concentration range. The cytotoxicity assay revealed potent brine shrimp lethality for *C. longa*, with a LC<sub>50</sub> of 20.01 ± 3.14 mg/L, against the positive control, atropine, LC<sub>50</sub> = 88.60 ± 8.11 mg/L. *Buchanania axillaris* exhibited phytotoxic potency with IC<sub>50</sub> values of 520.97 ± 15.14 mg/L and 665.14 ± 20.54 mg/L, while *C. longa* exhibited IC<sub>50</sub> values of 625.29 ± 12.76 mg/L and 586.53 ± 9.32 mg/L, compared to the positive control, abscisic acid (IC<sub>50</sub> = 1.46 ± 0.19 mg/L and 1.85 ± 0.31 mg/L) for root and shoot inhibition, respectively, suggesting potential applications as natural herbicides. The findings indicate promising bioactivities of *B. axillaris* and *C. longa* extracts, suggesting further exploration for potential applications in pharmaceuticals, nutraceuticals, and agriculture.

**Keywords:** Antioxidant activity, *Buchanania axillaris*, *Curcuma longa*, Cytotoxicity, Enzyme inhibition