

In vitro Bioactivity of *Curcuma longa*

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Sri Lanka's traditional medicine "(Deshiya Chikithsa)," has been practiced for millennia, making it the earliest documented medical system in the country. *Curcuma longa* (CL) has been used to treat viral infections by traditional healers. For this study, a hot water extract of the rhizome of CL was prepared. The total phenolic content (TPC) and total flavonoid content (TFC) were quantified. Antioxidant activity was evaluated using 1,1-diphenyl-2-picrylhydrazyl (DPPH) and 2-2'-azino-bis (3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) assays. Anti-inflammatory activity was determined through human red blood cell (HRBC) membrane stabilization and protein denaturation assays. Cytotoxicity was assessed by 3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide (MTT) assay at 24 and 120 hours, using Vero cells cultured in DMEM complete media at 37 °C and 5% CO₂. TPC was recorded as 40.8 mg/g GAE. TFC was 48.6 mg/g QE. For the DPPH assay, IC₅₀ was <0.0625 mg/mL for both CL and standard Ascorbic acid. For the ABTS assay, IC₅₀ of CL was 0.37 mg/mL while Ascorbic acid showed an IC₅₀ <0.0625 mg/mL. For the protein denaturation assay, IC₅₀ was >1 mg/mL for CL while standard Ibuprofen showed IC₅₀ of <0.0625 mg/mL. HRBC depicted an IC₅₀ of <0.0625 mg/mL for both CL and Ibuprofen. Cytotoxicity was recorded for CL as CC₅₀ 0.81mg/mL for 24 h and >1 mg/mL for 120 h. CL showed remarkably higher TFC and TPC values with moderate antioxidant activity, which can help mitigate the detrimental effects of infection by reducing oxidative stress and protecting host cells. Additionally, CL demonstrated high CC₅₀ values by the MTT assay, suggesting that it would be an interesting candidate for further investigations as a possible anti-viral treatment.

Keywords: *Curcuma longa*, traditional medicine, antioxidant activity, anti-inflammatory activity, cytotoxicity, potential antiviral treatment