

ASSESSMENT OF CYTOTOXICITY OF SELECTED EDIBLE LEAFY PLANTS OF SRI LANKA

B.S.K. Ulpathakumbura^{1,2}, J.M.N. Marikkar^{1*} and U.L.B. Jayasinghe¹

¹National Institute of Fundamental Studies, Hanthana Road, Kandy, Sri Lanka.

²Postgraduate Institute of Science, University of Peradeniya, Peradeniya, Sri Lanka.

*nazrim.ma@nifs.ac.lk

This study was carried out to assess the cytotoxicity of extracts of leafy plants, namely *Premna procumbens* Moon (*Le-kola pala*: LE), *Memecylon umbellatum* (*Kora kaha*: KK), *Polyscias scutellaria* Fosberg (*Koppa*: KO), *Stevia rebaudiana* Bertoni (*Stevia*: ST) and *Atlantia ceylanica* (*Yaki naran*: YK) using brine shrimp (*Artemia salina*) lethality bioassay. According to traditional knowledge, these plants may be believed to have medicinal properties. However, scientific evidence is scarce on their biological properties. Therefore, these plants were selected to assess their cytotoxic property. Plant leaves were sequentially extracted with hexane, ethyl acetate (EtOAc), and methanol (MeOH) as solvents. Brine shrimp eggs were hatched and the active nauplii were used in the bioassay. The cytotoxicity of plant extracts was reported as lethal concentration (LC₅₀). A concentration series (62.5-2000 mg L⁻¹) of crude extracts was prepared by dissolving the crude plant extracts in artificial seawater. Ten active nauplii were added to each 1 mL of extract in 24 well semi microplate and kept at room temperature for 24 h under illumination. The lethal concentration (LC₅₀) was determined by counting surviving nauplii after 24 h. Among hexane extracts, the strongest cytotoxicity was observed for YK (LC₅₀ = 190.98 ± 4.92 mg L⁻¹), while KO and ST showed moderate cytotoxicity with LC₅₀ of 500.00 ± 0.00 mg L⁻¹ and 1724.70 ± 80.65 mg L⁻¹, respectively. No cytotoxicity was observed for hexane extract of LE and KK. Among EtOAc extracts, the strongest cytotoxicity was displayed by YK (LC₅₀ = 234.18 ± 13.79 mg L⁻¹), while lower cytotoxicity potential was observed for KO and ST. EtOAc extracts of LE and KK did not show any cytotoxicity. All MeOH extracts showed moderate to weak cytotoxicity. Among them, the strongest activity was observed for KO (LC₅₀ = 486.16 ± 30.23 mg L⁻¹). When compared with all plant extracts, the positive control (K₂Cr₂O₇) showed significantly (p < 0.05) higher cytotoxic activity (LC₅₀ = 14.62 ± 0.87 mg L⁻¹). This study concludes that YK and KO have higher cytotoxicity when compared to other leafy plants. Therefore, YK and KO maybe sources of anti-cancer compounds and can have the potential to be used to develop drugs against cancers.

Keywords: Brine shrimp lethality, Cytotoxicity, Edible leafy plants, Lethal concentration