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***In vitro* antioxidant, anti-inflammatory and anti-cancer activities of plant extracts used in Ayurvedic medicine**

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Traditional medicine may provide leads for potential new therapeutics. Sri Lanka is home to numerous plant species with reported anti-cancer properties according to traditional medical practices. Further, polyphenolic compounds extracted from various plant products have been reported to exhibit antioxidant, anti-inflammatory and anticancer activity. In this study we assessed the antioxidant, anti-inflammatory and anti-cancer potential against acute myelogenous leukemia (AML) in several ayurvedic plant species; *Nigella sativa* (Kaluduru) seeds, *Hemidesmus indicus* (Iramusu) roots, *Adenanthera pavonina* (Madatiya) seeds and *Murraya koenigii* (Curry leaves). These plant species have already reported of possessing anti-cancer activity against different cancer types. The main objective of this study is to determine the anti-cancer activity of these plant extracts against AML. All the plant parts were thoroughly cleaned, dried, grounded into fine powder and bioactive compounds were fractionated into different solvents. The Total phenolic content (TPC), antioxidant activity, anti-inflammatory activity and cytotoxicity against AML were evaluated using Folin-Ciocalteu assay, 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging assay, Ferric reducing power antioxidant assay, protein denaturation inhibition assay and Cell TiterGo viability assay using THP-1 cells as a model for AML. *N. sativa* (kaluduru) aqueous extract showed the highest TPC; 3.14 ± 0.01 mg GAE/g dry weight (after tannin removal) and 2.92 ± 0.01 mg GAE/g dry weight (after protein removal), *H. indicus* (iramusu) aqueous extract recorded the highest DPPH radical scavenging activity and ferric reducing power and *N. sativa* (aqueous extract), *A. pavonina* (madatiya) ethanol extract and *M. koenigii* (curry leaves) methanol extract showed significantly high values ($p < 0.05$) for the anti-inflammatory activity compared to other tested extracts. *H. indicus* (aqueous extract) showed the highest cytotoxicity against THP-1 cells with the lowest IC_{50} value (0.37 ± 0.01 mg/mL). All the tested extracts showed more than 50% inhibition of THP-1 cells at the highest tested concentration (15 mg/mL). All the tested plant extracts showed presence of polyphenols with antioxidant, anti-inflammatory and cytotoxic properties. However, the TPC as determined by Folin Ciocalteu assay does not explain the resulting cytotoxicity against AML cells. Further studies are needed to assess whether the observed anti-leukemic activity is due to cytotoxicity that would affect healthy cells and to assess whether the observed activities are specific against AML.

Keywords: Anti-cancer activity, Ayurvedic plant extracts, Antioxidant activity, Acute myelogenous leukemia

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