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Investigation of the effects of polyphenols present in *Phyllanthus debilis* Klein ex Willd Plant on antioxidant activity and evaluation of cytotoxicity against RD (Rhabdomyosarcoma) cells

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Oxidative stress is associated with many diseases including cancer, diabetes, liver diseases and inflammation**.** Plant polyphenols have the capacity to scavenge free radicals and contribute to minimize the oxidative stress. *Phyllanthus debilis* Klein ex Willd (Elapitawakka) belonging to the genus *Phyllanthus* has many medicinal values. This study was carried out to evaluate the effects of polyphenols present in *P.debilis* on antioxidant activity and to evaluate its cytotoxicity against RD cells. Aerial parts of the mature plants were collected from the Colombo District. Dried sample was refluxed with deionized water and lyophilized samples were used for experiments. Polyphenols were removed from the same after reconstitution with water to investigate the effects of polyphenols. Total polyphenolic content was determined by Folin-Ciocalteau reagent as Gallic acid equivalents (GAE). Antioxidant activity was carried out using DPPH (2, 2-Diphenyl-1-picrylhydrazyl) radical scavenging assay. Ascorbic acid was used as the positive control. Light microscopy and the percentage leakage of lactate dehydrogenase (LDH) to the medium (LDH present in the medium to that of medium and the lysate x100) against plant extract concentrations were carried out to determine the cytotoxicity of RD cells after 48 hr treatment. Negative control without the extract and cycloheximide as the positive control were used simultaneously. The EC_{50} values were calculated and expressed as Mean ± SD. Polyphenolic content of *P. debilis was* 12.02 ± 0.44% (w/w %of lyophilized sample GAE). The EC_{50} value for DPPH radical scavenging assay was 8.6 ± 0.4 µg/ml and 3.3 ± 0.2 µg/ml for the plant extract and ascorbic acid respectively. The DPPH scavenging capacity is negligible for polyphenol free extract of the plant extract. Fifty percent LDH leakage (EC_{50}) was showed at a concentration of 161.6 ± 7.7µg/ml. Shoot extract of *P. debilis* contains high antioxidant capacity and lower cytotoxic effect compared to the positive controls. Further, it shows that polyphenolic compounds are responsible for the antioxidant capacity.

Keywords: Antioxidant activity, cytotoxicity, $EC_{50,}$ polyphenolic content.

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