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In vitro and *in vivo* antioxidant potential and phytochemical constituents of *Barleria prionitis* Linn. extracts

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Medicinal plants are natural sources of antioxidants. The use of antioxidants in the management of chronic diseases is an emerging therapeutic approach in the present era. Administration of several antioxidant compounds has demonstrated protective effects against nephrotoxicity induced by the anticancer drug; adriamycin in preclinical studies. *Barleria prionitis* Linn. (Family; Acanthaceae, common name: *Katukarandu*), is a medicinal plant with various therapeutic applications in kidney related diseases in Sri Lankan traditional medicine system. It is hypothesized that, nephroprotective effects of the plant is via its antioxidant potential. Herein, we aimed to assess the antioxidant potential of selected extracts of *B. prionitis* whole plant in adriamycin induced nephrotoxicity *in vivo,* to determine the total antioxidant activity *in vitro* and to identify the phytoconstituents in selected extracts. The hexane, ethyl acetate, butanol and aqueous extracts of *B. prionitis* were prepared by sequential Soxhlet extraction. Plant extracts were administered to adriamycin induced (5 mg/kg, ip) nephrotoxic Wistar rats (n = 6) at the human equivalent therapeutic dose (25 mg/kg, 80 mg/kg, 70 mg/kg, 120 mg/kg respectively), and standard drug fosinopril sodium (0.09 mg/kg) for 28 consecutive days as a daily single dose. The kidney tissues were excised from the sacrificed rats on the 28th day. The total antioxidant level and activity of glutathione reductase (EC 1.6.4.2) and glutathione peroxidase (EC 1.11.1.9) were estimated in the kidney homogenates of all experimental rats. Results were analyzed statistically by one-way ANOVA and Dunnett post hoc test and compared against the adriamycin induced nephrotoxic control group. The *in vitro* total antioxidant activity was determined by 2, 2'-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay. The qualitative screening of phytoconstituents was carried out for the presence of phenolic compounds, flavonoids, tannins, terpenoids, steroid glycosides, saponins, coumarins, and alkaloids using standard procedures. A significant increase in the total antioxidant concentration (62%, 71%, 59%, 58%) and in the activity of glutathione peroxidase (439%, 298%, 286%, 234%) was perceived following the treatment with hexane, ethyl acetate, butanol and aqueous extracts of *B. prionitis* respectively ($p < 0.05$). A significant increase in the concentration of glutathione reductase was noted only with the ethyl acetate (32.58 ± 2.55 U/L), butanol (27.66 ± 1.86 U/L) and with the aqueous (26.72 ± 1.57 U/L) extracts. No significant improvement in the activity of antioxidant enzymes was observed in fosinopril treated rats ($p > 0.05$). The *in vitro* total antioxidant capacity was deviated in the descending order of butanol (IC_{50}; 163.1 ± 2.1 µg/mL), aqueous (IC_{50}; 297.0 ± 2.3 µg/mL), ethyl acetate (IC_{50}; 775.6 ± 10.8 µg/mL), and hexane (IC_{50}; 961.7 ± 13.9 µg/mL) extracts of *B. prionitis* respectively. Phenolic compounds, flavonoids, tannins, steroid glycosides, terpenoids and saponins were present in the selected extracts at varying extents. The results revealed that selected extracts of *B. prionitis* improved the antioxidant enzyme levels in adriamycin induced nephrotoxicity in Wistar rats. Further, the selected plant extracts showed relatively high antioxidant activity *in vitro.* The phytoconstituents present in the *B. prionitis* extracts may attribute to its antioxidant potential.

Keywords: Adriamycin induced nephrotoxicity, Antioxidant activity, DPPH assay, Phytochemicals

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