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Antidiuretic activity of methanolic extract of *Aporusa lindleyana* (Wight) Bali. on rats

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Aporusa lindleyana (Family: Euphorbiacea), (Kebella or Barawa-Embilla in Sinhala and Vittil, Kodali, Vettikan, Vittil or Vitti in Tamil) possesses several bioactivities and is reported in traditional medicine of Sri Lanka. Among them, its main claimed activity is diuretic activity. The diuretic activity of this plant has not been proven scientifically. The purpose of this study was therefore to investigate the effect of urine output of methanolic extract (ME) of leaves and bark (5:1 ratio) of *A. lindleyana* (500, 1000 and 1500 mg/kg doses) on healthy, adult, female Sprague Dawley rats (Weight = 180.0 – 250.0 g, n = 49). Standard drugs, furosemide (13 mg/kg) and vasopressin (0.13 ml/rat) were used in this study as diuretic and antidiuretic references respectively. Distilled water (2 mL/rat) was used as control. Urine output was recorded up to 6 hrs at hourly intervals. The results showed that the 500 mg/kg dose decreases urine output significantly ($p > 0.05$). Further, the antidiuretic mechanism of ME (500 mg/kg) was evaluated using urinary parameters: pH, specific gravity (SG), density, conductivity, total dissolved solids (TDS), Na^+, K^+, Cl^-, Ca^{2+}, Mg^{2+} and HCO_3^- concentrations. Leucocytes, nitrite, urobilinogen, protein, blood, ketones, bilirubin and glucose level were tested for abnormalities. A significant ($p < 0.05$) increase of Na^+, K^+ and Cl^- levels of urine were observed ($p = 0.0453$, 0.0131 and 0.0528 respectively) without an alteration in the serum electrolytic levels of Na^+, K^+, Ca^{2+} and Mg^{2+} ($p = 0.2453$, 0.8973, 0.8973 and 0.8973 respectively) after 6 hrs of administration. However, a significant reduction ($p < 0.05$) of the urinary Na^+/ K^+ ratio (aldosterone secretion index) and Na^+/Cl^- ratio (thiazide secretion index) were observed compared to the control group ($p = 0.0131$ and 0.0202 respectively). Glomerular filtration rate (GFR) was also determined in terms of creatinine clearance. Significant alteration ($p < 0.05$) of GFR was not observed ($p = 0.5309$). After 30 days post treatment of 1500 mg/kg of ME was non toxic in terms of overt signs of toxicity, serum ALT, AST, urea and creatinine levels. There is a strong possibility to suggest that ME acts on the V2 receptor and absorbs solute free water. A significant decrease ($p < 0.05$) of aldosterone secretion index causes to increase potassium excretion. A combination of both mechanisms ultimately leads to a significant decrease of urine output ($p = 0.0318$) and aldosterone secretion index (Na^+/K^+ ratio) while increasing potassium excretion. Phytochemical evaluation of extract revealed the presence of alkaloids, unsaturated sterols, unsaturated terpenes, unsaturated lactones, leucocyanins, tannins and polyphenols and cyanogenic glycosides.

Keywords: *Aporusa lindleyana*, antidiuresis, methanolic extract, toxicity, Sri Lankan traditional medicine

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