

HWI (300, 600, 2400 mg/kg, body weight), furosemide (positive control) and water (negative control) were orally administered to previously starved (18 h) hydrated male rats (n=9/group). Acute (6 h) and chronic (28 d) diuretic activities were assessed by measuring the cumulative urine output at hourly intervals up to 6 h. Electrolyte levels ( $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Ca}^{2+}$ ,  $\text{H}^+$ ,  $\text{Cl}^-$ ,  $\text{HCO}_3^-$ ), pH, osmolarity of urine and glomerular filtration rate (GFR) of treated rats were determined. Administration of HWI induced a significant ( $p < 0.05$ ) and dose-dependent diuretic activity which varied with agro-climatic elevations. Diuretic activity had a rapid onset (1<sup>st</sup> h), peaked at 2<sup>nd</sup> h and maintained up to 4<sup>th</sup> h (except the low dose). Further, there was a dose-dependent increase in micturation frequency which peaked at 2<sup>nd</sup> h. A close association between phyto-chemicals (especially caffeine) and diuretic activity was evident. HWI induced diuresis was accompanied with an increased urine volume, urinary  $\text{Na}^+$  and GFR. The diuresis is mediated via multiple mechanisms: inhibition of aldosteron secretion (in terms of increased  $\text{Na}^+ / \text{K}^+$  ratio), inhibition of carbonic anhydrase (in terms of decreased  $\text{Cl}^- / (\text{Na}^+ + \text{K}^+)$  ratio) and via thiazide type of diuretic action (evaluated in terms of increased  $\text{Na}^+ / \text{Cl}^-$  ratio). It is concluded that, the Sri Lankan BOPF grade black tea possesses mild oral diuretic activity whose efficacy differs with the agro-climatic elevations.

**An assessment of the contents of some heavy metals in Sri Lankan black tea (*Camellia sinensis* L.) and effect of oral administration of tea infusion in rats.**

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Hot water infusions (HWI) of black tea manufactured using fresh bud and tender leaves of *Camellia sinensis* L. (O) Kuntze ( Family: Theaceae) plant is a popular daily consumed beverage in Sri Lanka. Some heavy metals are inherently present in black tea. Ingestion of excessive amounts of these metals could cause health risk. Therefore, in this study, Copper, Mercury, Lead and Arsenic content of BOPF grade black tea, sampled from major agro-climatic elevations: low, mid and high grown in Sri Lanka and their HWI were determined using Atomic Absorption Spectrophotometer. The serum metal contents were assessed (using AAS) in rats orally administered with different doses of black tea HWI of high grown (human equivalent of 1.5, 3 and 12 cups per day), high dose (equivalent of 12 cups) of mid and low grown or water (control), thrice a day for consecutive 90 days. During the treatment, rats were daily observed for overt signs of toxicity and at the end of the treatment on chronic toxicity (renal and hepato-toxicity) were assessed. The total contents of heavy metals in black tea differ according to the agro-climatic elevations: Cu, 27.3 – 75.6 mg/kg; Hg, 0.01 – 0.026 mg/kg; Pb, 0.02 – 0.065 mg/kg and As, 0.003 – 0.006 mg/kg. The percent releases from black tea to their infusions were: Cu, 86 ± 8 %; Hg, 78 ± 6 %; Pb, 42 ± 3 % and As, 56 ± 9 %. Compared to control, blood serum metal contents were significantly ( $p < 0.05$ ) and dose-dependently increased by black tea tested with high grown: Cu, 1.14 – 1.93 µg/dl; Hg, 0.10 – 0.19 µg/dl and Pb, 3.78 – 6.84 µg/dl. In contrast, As content was not altered (0.05 – 0.07 µg/dl). All metals tested were below the permissible limit prescribed by FAO. Further, there were no signs of toxicity. Therefore, daily consumption of even 12 cups of Sri Lankan black tea may not produce any health risk.