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Diuretic activity of Sri Lankan black tea (*Camellia sinensis* L.) in rats

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ABSTRACT

The aim of this study was to evaluate the diuretic potential of Sri Lankan black tea (*Camellia sinensis* L.). This was assessed in rats using high grown Dust grade No: 1 tea, which is consumed widely by the tea drinkers worldwide. Different doses of hot black tea brew (BTB) (84, 167, 501 or 1336 mg/ml respectively equivalent to 1.5, 3, 9 and 24 cups) were made and orally administered to previously starved (24 h) but subsequently hydrated (with 15 ml of isotonic saline) rats and their urinary output was monitored cumulatively at hourly intervals for 6h. The reference drug used was frusemide (13 mg/kg). The results showed that BTB induced significant ($P < 0.05$), mild to moderate and dose- dependent diuresis (starting from 167 mg/ml). This diuretic activity had a fairly rapid onset (within 2 h) and relatively short duration of action (3 h). BTB also significantly ($P < 0.05$) increased the overall urinary frequency. Further, the diuretic activity of BTB was less potent to frusemide (by 45%). Decaffeination of black tea almost completely abolished the diuresis. The diuresis of the BTB was solely due to increased (by 55 %) urinary Na^+ excretion (with no urinary K^+ loss). Further, the chronic daily administration of the BTB did not develop tolerance or induce toxicity (general, renal and hepatic). It is concluded that BTB made from Sri Lankan high grown Dust grade No :1 tea has safe, mild to moderate diuretic activity with rapid onset and relatively short duration of action. Further, this study supports the claim made by Sri Lankan indigenous physicians that it is a diuretic.

KEYWORDS: *Camellia sinensis*, black tea, diuresis, Sri Lankan tea, dust grade tea

INTRODUCTION

Regular consumption of black tea brew (BTB) of *Camellia sinensis* (L.) O.Kuntz (family: Theaceae) on a daily basis (1.5 to 3 cups) is recommended by traditional physicians practicing in Polonnaruwa district (in the dry zone), North Central province of Sri Lanka to promote urinary flushing (1) possibly by acting as a diuretic. Indeed, some studies have demonstrated diuretic potential of BTB of *C. sinensis* (2,3). In these studies, the origin of the black tea is however not specified. In contrast, in a preliminary study, conducted in Sri Lanka by Goonaratna et al. (4), using a single dose of BTB (possibly made from black tea of Sri Lanka), have failed to demonstrate any diuretic activity (in terms of urinary volume, osmolality, sodium and potassium levels). This result

cannot be simply overlooked and needs validation. This reportedly insignificant diuretic activity of BTB of Sri Lankan *C. sinensis* is possible, since it is known that several factors such as the country of origin, the geological background of the soil, the elevation of the tea plantation, the collecting season, technological processes during tea production and brewing conditions affects the final composition of BTB (5, 6, 7) and hence its pharmacological effects. BTB is claimed to possess antimalarial activity in traditional medicine (8) but a recent experimental study conducted using murine models has failed to show antimalarial potential, of BTB made from Sri Lankan tea, atleast against, *Plasmodium falciparum* (9). Therefore, reinvestigation of diuretic potential of Sri Lankan black tea was taken up.