

An assessment of *in-vitro* and *in-vivo* antioxidant activity of fresh high grown Ceylon black tea (*Camellia sinensis* L.)

K R W Abeywickrama^{1*}, A M T Amarakoon² and W D Ratnasooriya³

¹Analytical Laboratory, Sri Lanka Tea Board, Colombo

²Bio-Chemistry Division, Tea Research Institute, Talawakelle

³Department of Zoology, University of Colombo, Colombo 03

Hot aqueous infusion of black tea, contains 15 – 30% antioxidant flavonoids on a dry weight basis. Therefore, tea could be a major source of dietary antioxidants. "Ceylon tea" accounts for 20% of tea consumed in the world. However, antioxidant activity of Ceylon tea, specially the *in-vivo* antioxidant activity, is poorly studied. In this study, the *in-vitro* and *in-vivo* antioxidant activity of Ceylon black tea (fresh high grown BOPF grade) obtained from St. Coombs Estate, Talawakelle was estimated using the DPPH free radical scavenging assay. The antioxidant activity of a typical tea brew (prepared by adding 100ml of boiling distilled water to 2 g of black tea and allowing to stand for 5 minutes) was compared with Trolox (a water soluble analogue of Vitamin E) and results are expressed as the concentration of α -Trolox equivalent. The mean antioxidant activity of black tea was $1.990 \pm 0.001 \mu\text{g/mL}$. Healthy adult male Wistar rats were used to measure the *in-vivo* antioxidant activity. Thirty six rats were randomly divided in to 4 groups ($n = 9/\text{group}$). Vehicle (distilled water;DW) and three different concentrations of tea brew (containing 60, 120, 480 $\mu\text{g/mL}$ tea solids in DW) were orally administrated (1 mL/100 body weight) to rats thrice a day (8, 12 and 16 h) for 90 consecutive days. Animals were fasted for 14-17 hrs. and blood was obtained from the tail (under light ether anesthesia using aseptic precautions) at 30 days intervals for 90 days and a post treatment samples were also obtained after 45 days. The results (expressed as percentage scavenged by the DPPH) show that tea brew dose- and time-dependently increased the serum antioxidant activity at 30th ($r^2 = 1.0$, $P < 0.05$), 60th ($r^2=0.9724$, $P < 0.05$) and 90th ($r^2 = 0.9805$, $P < 0.05$) day of treatment : the mean serum antioxidant activity of the control, low, mid and high dose groups after 30 days were $68.5 \pm 0.5\%$, $70 \pm 2\%$, $69.8 \pm 0.8\%$, $71.7 \pm 0.3\%$ respectively. After 60 days it was $70 \pm 2\%$, $73 \pm 2\%$, $74 \pm 1\%$, $76.2 \pm 0.7\%$. After 90 days, it was $70 \pm 2\%$, $75 \pm 1\%$, $76.9 \pm 0.5\%$, $79.4 \pm 0.7\%$ and post treatment values were $70 \pm 2\%$, $74.0 \pm 0.7\%$, $75.0 \pm 0.5\%$, $75 \pm 1\%$. It is concluded that tea brew of Sri Lankan high grown BOPF possess marked antioxidant activity both *in-vitro* and *in-vivo*. Thus consumption of this grade of tea may be good dietary source of antioxidant to man.

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*lab@pureceylontea.com

Tel: 011 2581576