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Antinociceptive potential of Sri Lankan BOPF grade black tea (*Camellia sinensis L.*) produced in different agro-climatic elevations in rats

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Antinociceptive activity of several herbal drugs is claimed to be due to polyphenols. Tea (*Camellia sinensis L.)* contains high levels of polyphenols. Thus it is possible that tea may also have antinociceptive potential. The aim of this study was to investigate the antinociceptive potential of Sri Lankan black tea of three major agro-climatic elevations: high grown (above 1200 m, mean sea level), mid grown(600 m–1200 m, msl) and low grown (below 600 m, msl) using rats. The content of phyto-chemicals in typical black tea brew (BTB) of three elevations (using BOPF grade) were analyzed

using HPLC techniques. Three different concentrations of high grown BOPF grade BTB (containing 60, 120, 480 mg/L tea solids) and vehicle (distilled water) were orally administrated (1mL/100g body weight) to healthy adult male Wistar rats (n = 9/group) and antinociceptive potential was evaluated up to five hours at hourly intervals using hot plate and tail flick techniques. In addition antinociceptive potential of mid and low grown BOPF grade black tea was assessed using high dose (480 mg/L, which is equivalent to 12 cups). Results show that, Sri Lankan high grown BOPF grade black tea posses significant ($P \leq 0.05$) short acting antinociceptive activity when evaluated in the hot plate technique but not in the tail flick technique, indicating a supra spinal antinociceptive activity. The onset of this activity is quick (within two hours) and was dose dependant at 2^{nd} ($r^2=0.91$, $P < 0.05$) and 3^{rd} ($r^2=0.97$, $P < 0.05$) hour post treatment. High dose of mid and low grown BTB of BOPF grade showed comparable antinociceptive activity to that of same dose of high grown BOPF. The BTB of all three agro-climatic elevations did not induce muscle relaxation (as judged by bar holding test) and muscle in-coordination (as evaluated by bridge test) actions, suggesting that the antinociceptive effect observed is genuine. Phyto-chemical analysis of black tea revealed that there is no significant difference($P > 0.05$) between the total polyphenols in BOPF grade of three agro-climatic elevations (22.6 %, 18.2% and 20.8% for high grown, mid grown and low grown respectively). This may account for similar antinociceptive potential of BOPF grade black tea in three elevations. In conclusion, our results demonstrate that Sri Lankan BOPF grade black tea of all agro-climatic elevations possess centrally acting supra spinally mediated short acting oral antinociceptive activity.

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