

Tea which is made from the topmost immature leaves and the buds of the perennial evergreen shrub, *Camellia sinensis* (L) O. Kuntz (Family: Theaceae) is the most widely consumed drink in the world, besides water. Depending on the manufacturing technique there are three main types of teas; black, green and oolong. Black tea accounts for 78% of world's tea production and about 80% of global tea consumption. Sri Lanka produces about 310 million kg per year of black tea. Nevertheless, health benefits of Sri Lankan black tea and its toxic effects, if any, following heavy long term consumption are poorly documented. This study therefore investigated its potential bioactivities and its toxic effects in rats and/ or mice using Sri Lankan high grown Dust grade No: 1 black tea.

Concentrations used in *in vitro* studies ranged from 0.125 to 20 mg/ml and the doses in *in vivo* studies were 84, 169, 501 and 1336 mg/ml, equivalent to 1.5, 3, 9, and 24 cups, respectively. The bioactivities examined were anticlotting (using calcium-induced clotting test), thrombolytic (% lysis test), gastroprotection (ethanol-induced gastric lesion model), gastric ulcer healing (acetic acid-induced model), anxiolytic (hole-board and neophobic suppression of eating and drinking tests), antinociceptive (tail flick, hot plate, formalin and writhing tests), anti-inflammatory (carrageenan- and formalin-induced paw oedema and cotton pellet granuloma tests), antidiarrhoeal (normal defaecation and castor oil-induced diarrhoea tests) and diuretic (hydrated rat model). In addition, its effects on the oestrous cycle (vaginal smearing technique), pregnancy (pregnant rat model), male sexual competence (rat copulatory behaviour test) and male fertility (serial mating test) were investigated. Toxicity was evaluated in terms of general toxicity (in terms of overt clinical signs), hepatotoxicity (in terms of SGOT, SGPT and serum proteins), renotoxicity (in terms of serum creatinine, urea, Na^+ , K^+ and Na^+/K^+ ratio) and haemotoxicity (RBC count, WBC count, DC, PCV, haemoglobin level, MCV, MCH and MCHC) using rats.

As incriminated by *in vitro* studies, Sri Lankan high grown Dust grade No:1 black tea possesses anticlotting and thrombolytic effects. In *in vivo* studies, Sri Lankan high grown Dust grade No:1 black tea exhibited marked gastroprotective, gastric ulcer healing, anxiolytic, antinociceptive, anti-diarrhoeal, anti-inflammatory, diuretic, and aphrodisiac actions. These effects were mediated via multiple mechanisms such as antioxidant activity, nitric oxide inhibition activity, prostaglandin inhibition activity and antihistamine activity. But, on the other hand, some of the mechanisms were unique to the particular bioactivity tested. Gastroprotective, gastric ulcer healing, antinociceptive, anti-inflammatory, diuretic, anti-diarrhoeal, anxiolytic, thrombolytic effects were dose-dependent other than the blood clotting activity which showed an all or none response. The presence of a dose response relationship suggested that these effects were genuine and treatment related. Further, Sri Lankan high grown Dust grade No: 1 black tea was not disruptive to the oestrous cycle and pregnancy, and male fertility. No general, renotoxicity, hepatotoxicity and haemotoxicity were evident even with heavy chronic administration of black tea brew (BTB). On the other hand, it induced a reduction in body weight.

In conclusion, this study, for the first time, showed that Sri Lankan high grown Dust grade No:1 black tea possesses a plethora of bioactivities which offer potential health benefits to man. In addition, the thrombolytic, gastroprotective, antipyretic and aphrodisiac activities of Sri Lankan high grown Dust grade No:1 black tea are novel findings for any kind of black tea. Further, this study indicates the possibility of developing safe oral active new drugs, with lesser side effects. This study also scientifically validated therapeutic claims made by Sri Lankan traditional medicine. In addition, the health benefits claimed herein may be used for value addition and hence promotional tools of Sri Lankan high grown Dust grade No:1 black tea an important export product for earn foreign exchange to the country.