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Anti-inflammatory activity of Sri Lankan black tea (*Camellia sinensis* L.) in rats

W.D. Ratnasooriya* and T.S.P. Fernando

Department of Zoology, University of Colombo, Colombo 03, Sri Lanka.

Author for Correspondence : Dr. Ratnasooriya : wdr@zoology.cmb.ac.lk

ABSTRACT

This study examined the anti-inflammatory potential of Sri Lankan black tea (*Camellia sinensis* L. Family: Theaceae) using both acute (carrageenan-induced paw oedema) and chronic (formaldehyde-induced paw oedema and cotton pellet granuloma test) rat inflammatory models. Three dose of black tea brew (BTB) [84 mg/ml, equivalent to 1.5 cups; 168 mg/ml, equivalent to 3 cups; and 501 mg/ml, equivalent to 9 cups] were made using high grown unblend Dust grade No: 1 black tea samples and was orally administered to rats (n = 6-9/ dose/ test). The results showed that Sri Lankan BTB possesses marked and significant (P < 0.05) oral anti-inflammatory activity against both acute and chronic inflammation. This anti-inflammatory activity was dose-dependent in the carrageenan-induced paw oedema test and cotton pellet granuloma test. Further, in the carrageenan paw oedema model, the anti-inflammatory activity of BTB was almost identical to green tea brew of both Chinese and Japanese types. Further, the BTB had significant antihistamine activity (in terms of wheal test) phagocytic cell migration inhibitory activity (in terms carrageenan-induced leucocyte peritoneal infiltration test), nitric oxide production inhibitory activity, antioxidant activity (DPPH method) and prostaglandin synthesis inhibition activity (in terms of rat enteropooling test). It is concluded that Sri Lankan black tea has marked anti-inflammatory potential against both acute and chronic inflammation which is mediated via multiple mechanisms.

KEY WORDS: *Camellia sinensis*; black tea; anti-inflammatory activity; anti-inflammation

INTRODUCTION

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 (1). Depending on the manufacturing technique there are three main types of teas. Black (fully aerated or fermented), green (unaerated or unfermented) and oolong (partially aerated or semifermented) (1). Tea and health have been inextricably linked. There is an increasing interest on the role of tea in maintaining health and treating disease. Many health benefits of tea are now scientifically shown (1,2). One such potential health benefit attributed to tea, particularly

to the green type, is anti-inflammatory activity (2). This is an important and an useful bioactivity of tea because inflammation is a common medical condition for which available drug therapies are poor (3); current anti-inflammatory therapies rely heavily on non steroidal anti-inflammatory drugs, steroids and board spectrum immunosuppressives, an unacceptable position that is increasingly leading to the characterization and use of biologicals and neutraceuticals. Tea falls within the latter category and receiving considerable attention as an anti-inflammatory agent. However, the anti-inflammatory activity of Sri Lankan black tea has not been tested