Sri Lanka Bulletin of Nursing and Allied Health Sciences 2009; 1(1) 3-7

Effect of Heavy Consumption of Black Tea Brew of *Camellia sinensis* on Fertility of Male Rats

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Abstract

The aim of this study was to evaluate the effects of a high dose of black tea brew (BTB), made from Sri Lankan high grown Dust grade No: 1 tea on fertility of males using rats. A high dose of BTB (501 mg/ml; equivalent to 9 cups) was orally administered to rats for 72 consecutive days and their libido, ejaculatory competence and fertility were assessed for three days prior to treatment and on days 3, 7, 21, and 72 of treatment by individually pairing overnight with a prooestrous female. Selected pre-natal and early post-natal developmental parameters of pups of mated females were also determined. The results showed that BTB has no effect on libido (in terms of precoital sexual behaviour and index of libido), ejaculatory competence (in terms of vaginal sperm counts) and fertility (in terms of quantal pregnancy, litter index, fertility index, number of uterine implants). Further, all of the pre-natal (the diameter of the first embryo) and post-natal (body weights of pups, cranial length, cranial diameter, cranio-sacral length, tail length and, number of days taken for the appearance of fur, eruption of incisors and opening of eyes) developmental parameters assessed were unaltered. There by it concluded that heavy consumption of short or long term BTB has no detrimental effect on libido, ejaculatory competence and male fertility.

Key words: *Camellia sinensis*; black tea; male fertility; ejaculation

Introduction

We have recently showed that black tea brew (BTB) made from Sri Lankan high grown Dust grade No: 1 tea (*Camellia sinensis* (L).O. Kuntze, Family: Theaceae) has marked aphrodisiac activity: elevates serum testosterone level, prolonges ejaculatory latency and shortens mount *and intromission latencies.*[1] *Interestingly, this aphrodisiac action was* not associated with impairment of other sexual parameters like libido, sexual motivation, sexual arousal, sexual vigour or penile erection. Further, an *in vitro* study has shown that BTB induces marked increase in the amplitude of the lateral head displacement of human spermatozoa[3]. Collectively, these observations suggest that BTB may have the potential to promote male fertility by increasing the sexual competence and fertilizing ability of sperm: unimpaired sexual competence is essential for fertility and there is a positive correlation between the amplitude of lateral head displacement of sperm and fertility[4,5].

On the other hand, BTB inhibits the production of nitric oxide and prostaglandins[1, 6]. Both nitric oxide [7, 8] and prostaglandins[8] are known to play a vital role in male fertility. Further, nitric oxide synthesis inhibitors[9] prostaglandin synthesis inhibitors[10, 11] impair male fertility. Interestingly, green tea is shown to alter testicular lipid profile [12] which is known to induce testicular degereation[13]. Such an effect could inhibit male fertility. Further, according to some traditional practitioners, heavy daily consumption of long term BTB is not favoring male fertility, although it promotes sexual competence. As BTB seems to have diagonally opposing effects on male fertility, it was thought that it is of interest to investigate the practical impact of long term consumption of high dose of BTB on male fertility. This was the aim of this study. This was tested in male rats in a serial mating study using a high dose of BTB (501 mg/ml; equivalent to 9 cups). Consumption of more than 6 cups (1 cup = 170 ml) of BTB can be considered as a high dose or a heavy consumption [14].

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