A STUDY OF THE ANTIFUNGAL ACTIVITY OF BLACK TEA POLYPHENOLS (CATECHIN AND THEAFLAVIN) AGAINST *CANDIDA* SPECIES

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Catechin and theaflavin are two polyphenols found in black tea, the latter being a dimer of the former, which is a theogallate. Catechin and theaflavin are obtained from fermented leaves of the tea plant (*Camellia sinensis*) by the standard extraction method described by Vuataz et al (1959) and Roberts and Smith (1963). Although anti-oxidant, some antifungal and anti-cariogenic properties of both catechin and theaflavin have been reported there has been no report on any anti-candidal activity of these polyphenols in the literature to date.

The objectives of the study are: 1) to verify the antifungal effect of catechin and theaflavin on isolates of five different species of *Candida;* 2) to determine the minimal inhibitory concentration (MIC) of catechin and theaflavin in respect of *Candida albicans;* 3) to determine the existence of post anti-fungal effect (PAFE) if any, of these polyphenols in respect of *C.albicans* and 4) to assess the qualitative effect if any on the yeast cells exposed to the polyphenols under study using a scanning electron microscope (SEM).

Both catechin and theaflavin solutions were separately prepared to percentage concentrations of 1.25, 0.625, 0.3125 and 0.156 with sterile distilled water. Five isolates of each of the following five *Candida* species were used for this study: *Candida albicans, C.glabrata, C. parapsilosis C.krusei, and C. tropicalis*. Antifungal effect of the polyphenols was studied using the standard gel diffusion method. The isolates were inoculated on Mueller-Hinton agar (MHA) plates.15µL of one of the four concentrations stated above of either catechin or theaflavin was added to wells bored in the middle of the inoculated area. The plates were then incubated for 24-36 hours at 37° C. The experiment was quadruplicated and repeated on a second day. The inhibitory zones observed were measured using an image analysis software on a camera-linked computer. The MIC was determined only with *C.albicans*. It was determined visually and spectrophotometrically at 595nm, following 24 h of incubation at 37°C. Post antifungal effect of both polyphenols was studied using the method described by Ellepola and Samaranayake (1998). *C.albicans* ATCC 90028 was exposed to the MIC of both catechin and theaflavin and the cells were prepared in the standard method for SEM study.

All isolates of all five species were found to be sensitive to both catechin and theaflavin. There was a statistically significant inter-species variation of sensitivity with *C.glabrata* being the most sensitive and *C.tropicalis* being the least sensitive with *C.albicans* and other species occupying intermediate positions. The MIC of both catechin and theflavin for *C.albicans* was found to be 0.625%. PAFE was observed with theflavin but a paradoxical effect of post antifungal enhancement was seen with catechin. Under the SEM the exposed *C.albicans* cells showed structural damage in the form of shrivelling and collapse.