

Antifungal Activity of Methanolic Extracts of Ceylon Green Tea and Black Tea against *Candida tropicalis*, *Candida albicans* and *Candida parapsilosis*

Camilaa Navaratnasingham¹, Chandrani Wijeyaratne², Deepthi K. Gunasena³

‘Ceylon’ tea is one of the popular beverages around the world. Its wide range of organoleptic and chemical characteristics is partly due to the topographic differences in the cultivating regions. In this research antifungal property of ceylon green tea and black tea were investigated by comparing different grades of *Camellia sinensis* grown at different elevations to find out whether topography has an influence on antifungal activity due to its high amino acid and low total polyphenol contents in higher elevations. High grown (elevation >1200m) green tea grade Gun powder (GP); high grown black tea grades Orange Pekoe (OP), Broken Orange Pekoe (BOP) and mid grown (elevation 600- 1200m) black tea grades Orange Pekoe, Broken Orange Pekoe were used in this investigation. Methanolic extracts of tea samples were prepared by macerating 20.0g of each sample in 200ml of 85% methanol at 800rpm in a magnetic stirrer for 6 hours at constant temperature of 50° C. Extracts were filtered with Whatman No 1 filter paper, dried at 45o C and stored in refrigerator. A concentration gradient (1%, 2%, 4%, 6% and 8% w/v) of crude extract was prepared from 10% w/v in 85% methanol and were tested five times (n=5) against three human pathogenic fungal species *Candida tropicalis* (NCYC 2699), *Candida parapsilosis* (ATCC 22019) and *Candida albicans* (ATCC 10231) which are resistant to many antifungal agents. 0.25ml of the above concentrations was tested against 0.2ml of fungal suspension which was standardized with 0.5 McFarland standards. Agar well- diffusion method was used with Mueller- Hinton agar plates and diameters of inhibition zones were measured after incubating the cultures at 25° C for 48 hours. Diameters of inhibition zones were categorized as susceptible (≥ 20 mm), intermediate (15- 19mm) and as resistant (≤ 14 mm) based on CLSI standards and the mean diameters of the inhibition zones were used to identify the statistical significance using Minitab15. Mean diameters of inhibition zones for high grown GP were 23.2mm (SD ± 0.84), 21.4mm (SD ± 0.55), 21.2mm (SD ± 0.84) for 10%, 8%, 6% concentrations against *C. parapsilosis* and 20.0mm (SD ± 1.00) for 8% against *C. albicans*. Statistically significant differences among mean diameters of inhibition zones were high between high grown GP and BOP where 83% of p- values were ≤ 0.05 . High grown black tea grades, mean diameter for BOP were 21.2mm (SD ± 0.84), 21.2mm (SD ± 0.45) for 10% and 8% concentrations against *C. parapsilosis* where it was higher than OP in 54.7%, 44.2% respectively. However mean diameters of inhibition zones for mid grown black tea grades were not statistically significant where 60% of p- values ≥ 0.05 . Thus, it could be concluded that the topographical differences have influence on antifungal property of Sri Lankan tea.

Keywords: Green tea; Black tea; Antifungal activity; Candida; Agar- well diffusion

¹ Univeristy of Kelaniya, Kelaniya, Sri Lanka, camnifer15@gmail.com

² University of Sri Jayewardenepura, Nugegoda, Sri Lanka

³ Univeristy of Kelaniya, Kelaniya, Sri Lanka