A CASE STUDY IN ANALYSING CHEMICAL AND MICROBIOLOGICAL PROPERTIES OF ORTHODOX BLACK TEA MANUFACTURED IN UVA HIGH REGION

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ABSTRACT

Sri Lankan teas are accepted as the finest tea produced in the world. Quality of tea is determined by its physical, chemical and microbiological properties. But very few research studies shown the variation of quality parameters during black tea manufacturing against the manufacturing method and selling catalogues. Therefore, this case study was conducted to investigate the variation of selected quality parameters of Orthodox black tea from the Uva high region during its manufacturing process. In Chemical analysis, Total polyphenol content (TPC) (ISO 14502-1;2005) and radical scavenging activity of 2,2-diphenyl-1-picrylhydrazyl (DPPH) (AOAC International standards) were determined with some modifications to the standard analytical methods. Samples were taken (n=3) from six stages of the manufacturing process. The IC50 values of DPPH radical scavenging activity changed from 7.96±0.08 ppm (withering) to 69.79±3.73 ppm (winnowing), indicating that the withering stage has the highest antioxidant content. The TPC ranged from 1.46 ±0.03 to 6.08 ±0.11 mg GAE g-1 dry leaves but no linear relationship exists between TPC and antioxidant activity ($p>0.05$) ($R2 = 0.4803$). In microbial analysis, Total plate and Yeast and mold counts were determined (Sri Lanka Tea Board -SLS 516: part 1 and SLS 516:2;1991) and the highest microbial counts were identified in the winnowing stage as 6.22x106 CFU g-1 (Total plate count) and 2.82 x106 CFU g-1 (yeast and mold count) respectively. However, the tea collected from packing had not exceeded the acceptable levels of the minimum requirement for exportation (ISO 3720:2011). Research findings exhibit that the tea manufactured in the respective factory, is satisfied the minimum requirements for exportation but hand hygiene practices and cleanliness of contacting surfaces may be the cause of the highest microbial counts of tea samples in winnowing. This study recommends further studying microbial parameters to investigate the contaminations of tea in tea factories.

Keywords – Orthodox black tea; Uva high region; Selling Catalogue; Antioxidant activity