

## Effect of Brewing Time and Temperature on Microbial Load in Ceylon Black Tea

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### ***Abstract***

Tea is one of the most popular beverages consumed worldwide. However, during the production process, made tea can get contaminated with microorganisms. This study was conducted to measure the microbial contamination in made tea samples and the respective tea brew samples brewed using a set of selected time temperature combinations. Contaminated black tea samples were used for the analysis. Samples were analyzed for its microbial load before brewing and after brewing at 70°C, 85°C, 100°C for 3, 5, 6 minutes. The Total Plate Count (TPC), Yeast and Mould Count and Total Coliform Count was done following (ISO 4833 -1:2013), (ISO 21527-2:2008) and (ISO 4831:2006) methods. The study found that the TPC, Yeast and Mould Count and Total coliform counts were  $7.9 \times 10^5 \pm 1.2 \times 10^5$  CFU g<sup>-1</sup>,  $5.1 \times 10^3 \pm 1.5 \times 10^3$  CFU g<sup>-1</sup>, and >1100 MPN<sup>-g</sup> in contaminated made tea samples before brewing. All brewing conditions reduced TPC in tea by more than 99.8%, with the exception of 3 minutes at 70°C, where a reduction of 97.1 % was recorded. Similar behavior was observed in Yeast and Mould count as more than 98.0% reduction was occurred by all brewing conditions. The reduction of microbial load by brewing was significant at 95% confidence level (P<0.05). Total Coliform was reduced to <0.3 MPN<sup>-g</sup> in all brewed samples regardless of the time and temperature. Furthermore, there was no considerable difference in reduction of microbial load between times of brewing or temperatures. The study reveals that microbial load in made tea is reduced to a considerable level in brewing.

***Keywords: Brewing temperature, Brewing time, Total plate count, Yeast and Mould Count***