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Microbial status of tea *(Camellia sinensis)* during different stages of processing in up country

U G A I Sirisena[1*], P A Weerasinghe[1], A Balasuriya[2] and J W K K Jayasundara[2]
[1]*Faculty of Agriculture, Rajarata University of Sri Lanka, Puliyankulama, Anuradhapura*
[2]*Plant Pathology Division, Tea Research institute of Sri Lanka, St Coombs, Talawakelle*

A study was conducted at Tea Research Institute of Sri Lanka, Talawakelle to evaluate the microbiological variations of tea in different stages of processing. Quad replicate samples were taken from intact leaves, pre-withering, post-withering, pre-fermentation, post-fermentation, post- firing and from the made tea grades of BOP, BOPF, PEKOE and dust 1. Microorganisms were extracted from each sample using standard microbiological techniques and assessed the bacteria, moulds and yeast populations.

Bacteria contamination levels were very high at pre-withering ($1.01x10^7$ $cfug^{-1}$) and pre-fermentation ($7.3x10^6$ $cfug^{-1}$) steps. The level of bacterial colony counts at pre-withering was positively correlated (R^2=0.37) with the final grades of tea. Yeast and moulds levels were very low up to post withering stage ($8.48x10^2$ $cfug^{-1}$ & $1.1x10^4$ $cfug^{-1}$ respectively) and very high during pre ($4.08x10^5$,$1.2x10^5$$cfug^{-1}$) and post-fermentation ($5.3x10^4$$cfug^{-1}$,$8.7x10^4$ $cfug^{-1}$). The amount of yeast and moulds at pre and post-fermentation steps directly influenced the amounts in the final grades.

Firing of tea dhools reduced all microbial populations significantly (P< 0.0001) due to high temperature (88 ºC - 91 ºC) condition. Under these temperatures tea was not sterilized but only reduced the bacterial ($6.7x10^4$ $cfug^{-1}$) and fungal ($2.7x10^2$ $cfug^{-1}$) counts. Withering and fermentation steps were identified as the critical points where microbial contaminations take effect. The prominent

moulds found in samples were *Aspergillus spp, Penicillium spp, Pestalotia spp, Mucor, Fusarium.* Among these *Penicillium* and *Aspergillus* were found the most common.

Tel: 081-5685061