STUDIES ON QUALITY ASSESSMENT OF COMMERCIAL MYANMAR FERMENTED TEA

PhD (DISSERTATION)

THIDA WYNN

DEPARTMENT OF CHEMISTRY

UNIVERSITY OF YANGON

MYANMAR

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ABSTRACT

Samples were collected randomly two each from ten markets, one as Grade I and another as Grade II as classified in each markets. In order to assess the quality of the first and the second grades commercial Myanmar fermented tea, both chemical and microbiological studies were made. The former involved the main and nutritive constituents such as water, fat, total nitrogen, protein, ash, mineral elements, tannin, caffeine contents and flavonoid were determined including pH. Tannin content of fermented tea sample was determined by Lowenthal-Procter method, found in the range of 0.20-0.49 %. Quantitative determination of caffeine was made by simple alkaline-dichloroethane extraction method, and the %(s) of caffeine were found to be in the range 1.75-2.33 %. Characterization of isolated caffeine was also carried out by determination of melting point, TLC and by spectroscopic methods UV, FT-IR and GC-MS spectroscopy. Consequently, the relation between fat contents and caffeine contents against ash contents were also considered. Extraction and isolation of flavonoid were accomplished by successive extraction method using petroleum ether and ethyl acetate. From ethyl acetate extract, myricetin (0.011 %), a flavonol was isolated. It was confirmed by UV-Visible spectral data, comparing with the reported data. In the latter part, the total bacteria count and yeast and mould count were determined by the standard plate count (SPC) method. Only aerobic cultivation was carried out. Isolation and identification of microflora in each sample were also performed. For identification of fungi, colony morphology and Lactophenol cotton blue mount were made for mould colonies and Germ tube formation test, sugar fermentation test and sugar assimilation test were carried out for yeast colonies. The Gram's staining method, biochemical tests and API 20E strips were used for the identification of bacteria. Pathogenic enteric bacteria *i.e.*, *Escherichia coli*, *Salmonella*, *Staphylococcus aureus* and *Vibrio cholerae*

were also determined with their specific media. Examination of 20 samples of fermented tea showed the presence of yeasts and yeastlike organisms (*Geotrichum candidum, Candida krusei, C. lusitaniae, C. stellatoidea, C. guilliermondii*), and moulds (*Aspergillus niger, A. fumigatus, Penicillium spp.*). In addition, species of *Bacillus, Staphylococcus, Aerococcus, Micrococcus, Stomatococcus, Citrobacter, Enterobacter, Cardiobacterium, Pantoea, Klebsiella,* and *Escherichia* were identified in commercial fermented tea samples. *E. coli* was isolated from two samples of the second grade fermented tea collected from First Quarter Zay (Ward (1) Zay) (Thaketa) and Theinphyu Zay (Botataung). In the present work, it was found that lower ash content and higher caffeine content were present in the first grade fermented tea sample and lower bacteria count, total yeast and mould count in the first grade fermented tea sample. Some of the first grade fermented tea samples were contaminated with mould and Gram negative bacteria and this contamination was lower than that in the second grade fermented tea samples. So the quality of the first grade fermented tea samples was higher than the second grade samples generally due to younger leaves, less fiber content, reasonable fat and tannin content and less population of bacteria and fungi.

Key words : fermented tea, fat, ash, mineral elements, protein, tannin, caffeine, flavonoid, microflora, isolation, identification, pathogenic bacteria