ABSTRACT

Antioxidant and Antimicrobial Activity of Various Extracts of Green Tea, Black Tea and Pickled Tea

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Chiang Rai is the major tea production area in Thailand. Different processing methods not only yielding various characteristics of tea but also affect amount of bioactive compounds in the final products. Therefore, this study aims at comparing the bioactive compounds as well as antioxidant and antimicrobial activities of Assam green tea, black tea and pickled teas. Pickled tea, or Mieng, is a local tea product made by steaming the stacks of old tea leaves. The cooked leaves may be subsequently fermented by lactic acid bacteria to obtain the sour taste and aroma. In this research, all kinds of tea samples were extracted with water (at 60-90^{o}C), ethanol and acetone (at 40-60 ^{o}C). The extracts were analyzed for total polyphenol (TPC) and catechin contents. Antioxidant activity by 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging method was also determined. The antimicrobial properties on *Escherichia coli*, *Salmonella*, *Staphylococcus aureus* and *Bacillus cereus* were screened by Agar diffusion method followed by minimum inhibition concentration (MIC) determination. It was found that aqueous extracts gave significantly ($p \leq 0.05$) higher TPC but lower in EGCG content than solvent extracts. TPC was highest in Assam green tea, followed by Assam black tea, un-soured pickled tea and soured pickled tea, respectively. Increasing extraction temperature could increase TPC, in case of water and acetone, but decreased EGCG content. Assam green tea showed higher antioxidant and antimicrobial activities than Assam black tea, while acetone extracts showed better performances than ethanol and aqueous extracts, respectively. Although the solvent extracts could inhibit all the four tested bacteria, affects were stronger on *E. coli* and *B. subtilis.*

Keywords: Assam tea, Extracts, Antioxidant activity, Antimicrobial activity