DEVELOPMENT OF A REDUCTIVE MECHANISM FOR TEA TANNIN EFFECT ON HUMAN HEALTH

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ABSTRACT

The research was carried out to develop a reductive mechanism of Tea Tannin effect, on the human body by incorporating *Phyllanthus emblica* with high grown dust black tea. The value added tea market is expanding significantly so that, these type of herbal product might have a good potential. The theory behind the reductive mechanism of tannin effect is that, when drink tea just after having a meal, may lead to iron deficiency. Hydrolysable tannin polyphenols possess so called anti-nutrient qualities: They act as metal ion chelators considerably inhibiting non-heme iron absorption in human guts. In order to avoid this problem, it is advised to take tea between meals and not with meals, and not consume iron supplements with these drinks either. Adding ascorbic acid (Vitamin C) to tea helps to reduce or neutralize these adverse effects of tannin polyphenols on iron intake. Nelli (*Phyllanthus emblica)* is the most common sources of Vitamin C whereby *Phyllanthus emblica* contains 500-1500 mg/ 100g of pulp. Drinking tea just after having a meal may lead tannin in tea to bind with Fe^{3+} ions in the diet and form an indigestible compound. The proposed reductive mechanism is, when adding ascorbic acid to tea, it donates electrons to the Fe^{3+} ions and further converted in to Fe^{2+} which can be absorb to the human guts easily after bind with tannin. According to the sensory evaluation and Fe^{2+} ion analysis, the best treatment combination was selected as 30 % of dried *Phyllanthus emblica* powder with 70 % of High Grown Dust Black Tea. Data was collected through a standard sensory evaluation sheet. The sensory evaluation was conducted by ranking method, where company tea tasters evaluated the color, strength, taste and aroma to determine the overall quality in both experiments. MINITAB was used to analyze the data. In experiment *Phyllanthus emblica* percentage was significant at $P<0.05$. There is a significant different in overall quality between treatment combinations at $H>9.488$. According to Conover-Inman method, the best treatment combinations were selected as treatment combination 03 and 04. Then according to the cost analysis, using of processed raw materials was the most cost effective method to implement. Therefore, the treatment combinations 03 is the most preferable for value added tea market.

Key Words: Tannin, *Phyllanthus emblica*, Ascorbic Acid, Non-Heam iron, Iron Absorption