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Analysis of Assam Tea Processing in Small Scale Factories in the Highlands of Northern Thailand

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Abstract

As a perennial high value crop Assam tea (*Camellia sinensis* (L.) var. *assamica*) contributes to the livelihood of many highland farming communities and helps to protect steep slopes from erosion. To evaluate the potential of broader market access for locally produced tea, three small-scale orthodox tea processing units in Chiang Rai Province (Northern Thailand) have been analysed on-site and evaluated according quality of their black and green tea.

Field observation of local tea processing units was done and interviews were conducted to analyse processing structures. To evaluate tea quality, three batches of samples were collected throughout each step of tea processing and analysed for moisture content, caffeine content and anti-oxidative compounds, including total polyphenol content (TPC), total catechin content (TCC) and eight individual catechin types.

In contrast to common practice, black and green tea are produced in a similar way. In both cases, fresh tea shoots are harvested, withered, heated, rolled and dried. For the production of black tea only, leaves are oxidised prior to final drying. The heating process, which deactivates tea-inherent enzymes in green tea, is unusual for black tea processing, as it inhibits the wanted enzymatic oxidation process later on. Because of intuitive process management, moisture contents varied greatly amongst sampling batches and processing units. Caffeine contents were lower than expected and significantly higher in black than in green tea.

Due to the heterogeneity of fresh tea leaves, TPC levels did not decrease steadily throughout processing. TPC in black tea was not statistically lower than in green tea. Further, black tea did not show the typical biochemical changes in individual catechin composition occurring during oxidation. Even during early stages of tea processing, the detected catechin structure showed characteristics of degradation, both in TCC and in configuration of individual catechins.

It was concluded that tea quality was not stable due to intuitive management of the tea producers resulting in poor quality tea products, which can only be marketed locally. Quality control of each processing step is necessary to improve tea quality for opening new markets for small-scale tea producers.

Keywords: Caffeine, catechins, product quality, TPC