P10: STATISTICAL INVARIANCE ANALYSIS OF CONVENTIONAL AND NATURALLY GROWN GREEN COARSE TEA (BANCHA) METABOLITE

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Given that culture condition of crops affects metabolites of products and consequently consumers' metabolism, we investigate the metabolic difference of conventional and naturally grown green coarse tea (Bancha). Previous work in 2015 showed that only naturally grown Bancha tea was observed to significantly increase the consumers' locomotive energy expenditure with counter decrease of household activities, resulting in a higher shift of exercise level. In terms of metabolite categories that distinguished between the culture conditions, conventional tea was observed to express higher primary metabolite such as amino acid, while naturally grown tea contained superior dose of secondary metabolites, especially flavonoid. Here we show replication analysis which uses Green Coarse Tea produced in 2016. Same as the previous work, naturally grown tea contained superior dose of secondary metabolites, especially flavonoid. The occurrence of intrinsic compounds in each culture condition was weaker than the quantitative features of common compound in explaining the difference. Statistically significant invariant features of culture conditions were found both in expression patterns and intensity of distinctive common compounds considerably overlapping with drug categories. These results suggest that tea cultured in conventional farming method could decrease the health protective effects that the tea plant originally possesses in natural environment. Incorporation of macroscopic elements such as culture conditions may be as important as food composition analysis in discussing long-term health effect.