# Quality and Antioxidant Property of Black Tea Prepared Involoing Cellulase, Polyphenol Oxidase, and Peroxidase Treaments


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**ABSTRACT**

Black tea is a fully fermented tea. During the manufacturing process of tea, enzymatic transformation plays as an important role on the quality of tea. In this study, TRES No. 18 tea planted in the experimental tea garden of Yu-Chih branch, Tea Research and Extension Station, Council of Agriculture, Executive Yuan and harvested in summer and autumn was used as raw materials, and the quality and antioxidant properties of the tea produced by treating with cellulose during rolling and with polyphenol oxidase and/or peroxidase during fermentation were investigated. In the results of tea liquor component analysis, it showed that the total catechins, total polyphenols and total solubles in the liquors of summer and autumn tea obtained with enzymatic treatments were decreased significantly, and the total theaflavin, total thearubigen, TRS I, TRS II and total liquor color were increased significantly. As for the tea liquor color, the lightness of the tea liquor obtained with enzymatic treatments was decreased, and its color exhibited more yellow and red. The sensory evaluation results showed that the total score of the tea liquor obtained with enzymatic treatments was increased apparently. Among the sensory evaluation items, liquor color and tea dregs were the items increased most significantly. Regarding the antioxidant properties of the tea liquor, the tea liquor obtained by treating with enzymes at the beginning of the fermentation process exhibited higher superoxide anion scavenging activity and ferrous ion chelating ability than that obtained by treating with enzymes at the 45th minute of the fermentation process. The Trolox equivalent antioxidant capacity of the tea liquor obtained with enzymatic treatments was also increased significantly. As for the test of the differences between and autumn tea, the amounts of the components in summer tea were higher than those in autumn tea, especially for total catechins, total polyphenols, and total solubles. Summer tea liquor exhibited brighter in color, and autumn tea liquor exhibited redder and darker. Both summer and autumn tea obtained with enzymatic treatments had higher sensory evaluation scores than those without enzymatic treatments. Summer tea was higher in total score than autumn tea. Summer tea exhibited a trend of higher ferrous ion chelating ability than autumn tea.



Keywords : Antioxidant properties ; Black tea ; Cellulase ; Peroxidase ; Polyphenol oxidase


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