Effects of Viscozyme, Tannase and Protease Enzymes on Catechin and Caffeine Profiles of Cold-Water-Soluble Instant Black Tea

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Different enzyme treatments have been invented to improve the clarity of cold-water-soluble instant black tea. This research was conducted to study the effects of different enzyme treatments on the catechin and caffeine contents of cold-water-soluble instant black tea. Samples of black tea extract were separately treated in triplicates with different combinations of Viscozyme, Tannase, and Protease enzymes at previously optimized level (0.3% wt/wt, based on tea solid in tea extract) at 40°C for 40 min. Samples were heated to 90°C and cooled to room temperature. Then they were centrifuged at 3500 rpm for 10 min and supernatants were analyzed for catechins and caffeine contents by High-Performance Liquid Chromatography. Data were subjected to Analysis of Variance and mean separation ($p<0.05$). Tannase can degallate gallated catechins releasing gallic acid and degallated catechins. Viscozyme hydrolyzes carbohydrates releasing constituents complexed with it. Therefore, samples treated with a combination of Tannase and Viscozyme contained a significantly higher amount of gallic acid (306.7±35.1 µg ml^{-1}) than the other samples and this sample contained a significantly higher amount of Epigallocatechin (72.5±5.7 µg ml^{-1}) and Epicatechin (89.2±8.4 µg ml^{-1}) than the control and samples treated without Tannase. Moreover, samples treated with Tannase contained significantly higher amounts of total catechins and caffeine than the other samples. Catechins and caffeine positively affect the organoleptic properties of tea infusion. It can be concluded that treatment with a combination of Viscozyme and Tannase will enhance the catechins and caffeine contents of cold-water-soluble instant black tea.

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