

Effects of Protease and Viscozyme Enzymes on Physicochemical Properties of Cold-Water-Soluble Instant Black Tea

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Various enzymatic treatments have been invented for manufacturing cold-water soluble instant black tea. However, effects these treatments on physicochemical properties of cold-water-soluble instant black tea have not yet been studied in details. Therefore, this experiment was conducted to optimize the levels of protease and viscozyme enzymes for cold-water-soluble instant black tea manufacture and to investigate their effects on physicochemical properties of cold-water-soluble instant black tea. Samples of filtered hot water extract of black tea were treated separately with different levels of protease and viscozyme (0.1, 0.2, 0.3, 0.4, and 0.5%) based on the total solid in the extract maintaining the temperature at 45°C for 40 min. Then the samples were heated to 90°C and after cooling to room temperature they were centrifuged at 3,500 rpm for 10 min. Supernatants were analyzed for turbidity, color, brightness and total polyphenol content. Data were statistically analyzed by Duncan Multiple Range Test ($p < 0.05$). This experiment was conducted in triplicates. Lower turbidity is always desirable in cold-water-soluble instant tea. Lowest turbidity levels were evident for both protease (12.79±5.08) and viscozyme (4.85±1.20) at 0.3% enzyme level. Total polyphenol content (g/100 mL) of protease treated sample (0.67±0.04) was not significantly different to that of viscozyme treated sample (0.64±0.02) whereas color and brightness of protease treated sample (9.12±0.98 and 15.34±1.47, respectively) were significantly higher than that of viscozyme treated sample (8.73±0.52 and 13.47±0.99, respectively). Nevertheless, turbidity of viscozyme treated sample (4.85±1.20) was significantly lower than that of protease treated sample (12.79±5.68). It can be concluded that protease can improve color and brightness of cold-water-soluble instant black tea and viscozyme is more effective in reducing turbidity.

Keywords: Cold-water-soluble instant tea, Protease, Viscozyme, Physical properties, Chemical properties