

Study on the Physicochemical Quality, Active Ingredients, and Optimization of the Brewing Process for Eucommia Black Tea

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Abstract

This study aimed to explore the effects of *Eucommia ulmoides* blending ratio on black tea quality and optimize the brewing process. Three blending ratios were designed, and sensory evaluation confirmed that 1:4 was the optimal proportion for *Eucommia* black tea. *Eucommia* black tea, pure black tea and pure *Eucommia* tea were adopted as materials to compare their physicochemical properties and active components. Pure black tea had the highest water content ($0.96 \pm 0.10\%$) and water extract ($65.60 \pm 0.90\%$), while *Eucommia* black tea showed slightly lower values of $0.88 \pm 0.11\%$ and $62.60 \pm 1.11\%$ with good dissolution performance. It possessed higher tea polyphenols (82.03 ± 0.01 mg/g) and free amino acids (16.03 ± 0.28 mg/g) than pure black tea, compensating for fermentation-induced active substance loss and improving tea flavor. Although fermentation reduced its monomeric catechins, *Eucommia* blending diversified functional components. Brewing conditions significantly affected sensory quality and non-volatile constituents. High-temperature and long-time brewing degraded geniposidic acid and pinoresinol diglucoside and aggravated astringency, while insufficient brewing caused weak flavor. The optimal condition of 80°C for 7 minutes balanced sensory experience and component retention. This study proves *Eucommia* blending effectively improves black tea quality, providing technical support for the development of functional *Eucommia* black tea.

Keywords

Eucommia Black Tea, Blending Process, Physicochemical Quality, Active Ingredients, Sensory Characteristics

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