Thesis Title	Investigate the Role of Microbes in Tea and Coffee Fermentation and Their Impact on Quality of Tea and Coffee
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ABSTRACT

This study aims to develop a yeast culture technique for use in the fermentation of Robusta and Arabica coffee while identifying processing methods and oxygen conditions that enhance coffee quality, using *Saccharomyces cerevisiae* SafAle s-33 in fermentation. Notably, SIAF fermentation resulted in higher concentrations of volatile compounds such as pyrazine ethyl, pyrazine 2,6-dimethyl, and furfuryl, which enriched the coffee's aroma with nutty notes (almond, hazelnut, peanut, and walnut) and chocolate and cocoa characteristics. Additionally, furfuryl compounds imparted sweet, caramel, and toasty, bread-like aromas Sensory evaluation by Q-graders and PCA analysis revealed distinct profiles of organic acids and volatile compounds in roasted coffee beans processed with SIAF and anaerobic fermentation. These findings suggest that yeast-based fermentation, particularly SIAF, can enhance Robusta coffee's sensory profile, offering a promising approach for improving its market potential.

Additionally, the study investigated the fermentation of green tea using fungal strain BT01, identified as *Aspergillus cristatus*, and its effects on tea quality. Tea bricks (BT01) were successfully inoculated with *A. cristatus*, leading to a 1.5-fold increase in caffeine content after 16 days of fermentation. GC-MS analysis identified 88 volatile compounds, with linalool and methyl salicylates as components distinguishing fermented tea from controls. Additionally, post-fermentation resulted in significant shifts in organic acid composition, notably reducing malic and citric acids

while increasing fumaric acid, which is associated with an enhanced “mellow and fresh” taste. These finding highlight the potential of *A. cristatus* in modulating tea aroma and taste through fermentation.

Keywords: Fuzhuan Brick Tea, Fermentation, Polyphenols, Green Tea, Robusta Coffee, Secondary Metabolite, *Camellia senensis*, *Coffea cenaphora*, *Saccharomyces cerevisiae*, *Aspergillus cristatus*