

## INTISARI

Kombinasi temulawak (*Curcuma xanthorrhiza*) dan proses fermentasi pada kombucha temulawak menawarkan potensi sebagai produk pangan fungsional. Penelitian ini mengamati perubahan komunitas mikrobial dan perubahan sifat fisikokimia selama proses fermentasi. Kultur kombucha teh diadaptasi ke media temulawak sebelum digunakan dalam fermentasi temulawak. Kombucha temulawak dibuat dalam tiga konsentrasi yang berbeda (0,5%, 1%, dan 1,5%) dan dilakukan proses fermentasi selama delapan hari. Analisis metagenomik dilakukan pada kultur yang akan digunakan. Analisis mikrobial, pH, total asam tertitrasi (TAT), dan total padatan terlarut (TPT) dianalisis setiap dua hari sekali selama proses fermentasi. Aktivitas antioksidan (DPPH, ABTS, FRAP), kandungan fenolik total, dan kandungan kurkumin dievaluasi pada awal dan akhir proses fermentasi. Hasil dari penelitian ini menunjukkan bahwa kultur kombucha teh dan temulawak memiliki dominasi bakteri yang sama, yaitu *Komagataeibacter* dan *Acetobacter*, namun terjadi pergeseran kelimpahan keduanya, sedangkan yeast didominasi oleh *Candida*, namun terdapat perbedaan dominasi yang kedua yaitu *Zygosaccharomyces* pada kultur teh dan *Hanseniaspora* pada kultur temulawak. Kombucha temulawak memiliki jumlah sel mikrobial lebih rendah dibandingkan kombucha teh, nilai pH, TAT, TPT, dan total fenolik mengalami penurunan pada akhir fermentasi. Aktivitas antioksidan DPPH dan ABTS meningkat, sedangkan FRAP konstan. Sementara itu, kandungan kurkumin pada sampel 0,5% dan 1% mengalami peningkatan dan 1,5% mengalami penurunan pada akhir fermentasi.

**Kata kunci:** Temulawak, Kombucha, Mikrobial, Aktivitas Antioksidan, Fisikokimia

## ABSTRACT

The combination of Javanese turmeric (*Curcuma xanthorrhiza*) and the fermentation process in Javanese turmeric kombucha offers potential as a functional food product. This study is of paramount importance in comprehending the alterations in microbial communities and their repercussions on physicochemical properties during the fermentation process. The tea kombucha culture was adapted to Javanese turmeric media prior to its utilization in Javanese turmeric fermentation. The Javanese turmeric kombucha was produced in three distinct concentrations (0.5%, 1%, and 1.5%) and underwent a fermentation process for a period of eight days. Prior to the initiation of the experiment, metagenomic analysis was performed on the cultures intended for utilization. Microbial analysis, pH, titratable acidity (TA), and total soluble solids (TSS) were analyzed at two-day intervals throughout the fermentation process. The antioxidant activity (DPPH, ABTS, FRAP), total phenolic content, and curcumin content were evaluated at the commencement and conclusion of the fermentation process. The results of this study indicated that tea and Javanese turmeric kombucha cultures have the same bacterial dominance, namely *Komagataeibacter* and *Acetobacter*, but there is a shift in the abundance of both, while yeast is dominated by *Candida*, but there is a difference in the dominance of the second, namely *Zygosaccharomyces* in tea cultures and *Hanseniaspora* in Javanese turmeric cultures. Javanese turmeric kombucha has a lower number of microbial cells than tea kombucha, the pH value, TA, TSS, and total phenolics decreased at the end of fermentation. The antioxidant activity of DPPH and ABTS increased, while FRAP was constant. Meanwhile, the curcumin content in the 0.5% and 1% samples increased and 1.5% decreased at the end of fermentation.

**Keywords:** Javanese turmeric, Kombucha, Microbia, Antioxidant Activities, Physicochemical