# Hasil Fermentasi dan Identifikasi Bakteri Asam Laktat Pada Kombucha Air Kelapa Tua Dan Kulit Buah Naga

## INTISARI

Kombucha merupakan teh fermentasi kaya akan manfaat. Seiring perkembangan ilmu pengetahuan telah banyak bahan alternatif yang digunakan dalam pembuatan kombucha. Air kelapa tua dan kulit buah naga yang tidak termanfaatkan sangat potensial dimanfaatkan menjadi produk kombucha bernilai ekonomi. Bahan tersebut masih mengandung nutrien bagi metabolisme mikrobia dalam fermentasi kombucha. Produk asam organik dan keberadaan Bakteri Asam Laktat yang dihasilkan pada kombucha berpotensi dalam menjadikan produk kombucha sebagai minuman probiotik. Oleh karena itu, penelitian ini dilakukan untuk mengetahui aktivitas fermentasi dan pertumbuhan Bakteri Asam Laktat berdasarkan konsentrasi gula dan kulit buah naga. Pengamatan juga dilakukan terhadap bioselulosa yang dihasilkan. Pengujian aktivitas fermentasi, pertumbuhan bakteri dan produksi bioselulosa dilakukan pada fermentasi kombucha hari ke- 0, 3, 6, 9, 12 dan 15. Aktivitas fermentasi meliputi kadar pH diukur dengan pH meter digital, total asam asetat dengan titrasi, kadar gula dengan reagen DNS menggunakanspektrofotometer, jenis asam organik dengan HPLC dan profil sensorik dengan panelis sebanyak 15 orang. Pengamatan pertumbuhan bakteri dianalisis berdasarkan jumlah sel menggunakan *Total Plate Count* (TPC) dan kualitas bioselulosa dianalisis dengan SEM. Hasil penelitian menunjukkan bahwa penambahan gula dan kulit buah naga sebesar 20 % ke dalam air kelapa tua mampu meningkatkan profil fermentasi dan probiotik aktivitas fermentasi lebih tinggi dari pada kadar 10 %, yang ditandai dengan peningkatan nlai pH, total asam, penurunan gula, peningkatan kesukaan profil sensorik kombucha dan peningkatan total bakteri serta ketebalan produk bioselulosa SCOBY. Peningkatan profil fermentasi Bakteri Asam Asetat dapat terlihat dari hasil pengamatan bioselulosa dengan SEM dimana semakin lama waktu fermentasi, semakin banyak serat selulosa disintesis oleh bakteri. Sedangkan keberadaan BAL dalam kombucha dibuktikan berdasarkan karakter isolat bakteri yang diperoleh berdasarkan pengamatan morfologi, biokimiawi dan molekuler dengan marker gen 16S Rrna dan teridentifikasi sebagai bakteri *Lactobacillus reuteri*.

**Kata Kunci** : *Kombucha, Air Kelapa Tua, Kulit Buah Naga, Bakteri Asam Laktat, Probiotik.*

# Fermentation Result and identification of lactid acid bacteria from Mature Coconut Water and Dragon Fruit Peel

## ABSTRACT

Kombucha is a fermented tea rich in benefits. Along with the development of science, there have been many alternative ingredients used in making kombucha. Old coconut water and dragon fruit peels that are not utilized are very potential to be utilized into kombucha products of economic value. These materials still contain nutrients for microbial metabolism in kombucha fermentation. Organic acid products and the presence of Lactic Acid Bacteria produced in kombucha have the potential to make kombucha products as probiotic drinks. Therefore, this study was conducted to determine the fermentation activity and growth of Lactic Acid Bacteria based on the concentration of sugar and dragon fruit peel. Observations were also made on the biocellulose produced. Testing of fermentation activity, bacterial growth and biocellulose production was carried out on days 0, 3, 6, 9, 12 and 15 of kombucha fermentation. Fermentation activity includes pH levels measured with a digital pH meter, total acetic acid by titration, sugar content with DNS reagent using a spectrophotometer, types of organic acids with HPLC and sensory profiles with 15 panelists. Bacterial growth observations were analyzed based on cell count using Total Plate Count (TPC) and biocellulose quality was analyzed by SEM. The results showed that the addition of sugar and dragon fruit peel at 20% to old coconut water was able to improve the fermentation profile and probiotic fermentation activity higher than the 10% level, which was characterized by an increase in pH, total acid, a decrease in sugar, an increase in the liking of kombucha sensory profile and an increase in total bacteria and the thickness of SCOBY biocellulose products. The improvement of Acetic Acid Bacteria fermentation profile can be seen from the observation of biocellulose with SEM where the longer the fermentation time, the more cellulose fibers are synthesized by bacteria. While the presence of LAB in kombucha is proven based on the character of bacterial isolates obtained based on morphological, biochemical and molecular observations with the 16S Rrna gene marker and identified as Lactobacillus reuteri bacteria.

**Keywords:** Kombucha, Old Coconut Water, Dragon Fruit Peel, Lactic Acid Bacteria, Probiotics.