

Screening of microbial population in Sabah tea kombucha pellicle for its potential as prebiotic and probiotic supplement

ABSTRACT

This research aimed to determine and analyze the microbial population in kombucha pellicles derived from Sabah black tea, specifically focusing on bacteria and yeast, to gain insights into their abundance, diversity, and potential as prebiotic and probiotic supplements. Despite the growing interest in kombucha in Malaysia, the specific microbial composition of the pellicle from locally sourced Sabah black teas remains underexplored. Understanding this composition could reveal its potential as a sustainable source of health-promoting microbes. It is hypothesized that Sabah tea kombucha pellicle harbours a beneficial microbial population that can be utilized as a low-cost prebiotic and probiotic supplements. The kombucha pellicle was prepared using 10 g of Sabah black tea, 1 L of sterile water containing 10% sugar (w/v), and a 10% kombucha symbiotic culture of bacteria and yeast (SCOBY). The process included boiling black tea with sugar, adding SCOBY culture, and allowing fermentation for 30 days to obtain cellulosic pellicles. After fermentation, the pellicle was separated, homogenized, and stored for further use. Then, kombucha pellicle genomic DNA was extracted and subjected to 16S and ITS metagenomic analysis to identify the bacteria and fungi population. The 16S and ITS metagenomic results showed that Sabah tea kombucha pellicle contains a potentially beneficial microbial population, mainly *Komagataeibacter*, *Zygosaccharomyces* and *Starmerella*, that may serve as a sustainable probiotic. This current study provides promising evidence for using Sabah tea kombucha pellicle as a low-cost prebiotic and probiotic supplement. This will indirectly help advertise and commercialize Sabah tea as one of the local products in Sabah.