Comparative microbial and functional characterization of kombucha from different starter SCOBYs

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Abstract:
The scientific community is showing a growing interest in fermented foods, with attention to the beneficial potential of the microorganisms present in these products. My doctoral project focuses on kombucha, a fermented beverage of Chinese origin produced through the symbiotic fermentation of yeasts and bacteria in sweetened tea [1]. This process is driven by a microorganism mixed culture known as SCOBY ("Symbiotic Culture of Bacteria and Yeasts"), which forms a cellulose film produced by bacteria and acts as a fermentation starter. Kombucha's microbial composition is highly variable and can include numerous genera of yeasts, lactic acid bacteria, and acetic acid bacteria [2]. This variability calls for in-depth studies of SCOBY's microbial biodiversity to better understand the fermentation process and the properties of kombucha.

The project aims to examine intra- and inter-SCOBY diversity to characterize microbial communities for their fermentation performance and for their potential health benefits. In addition, the impact of repeated SCOBY use on kombucha biodiversity is evaluated. Two SCOBYs and the derived kombucha were analyzed for their physiological and functional features by assessing the viable cell count, determining nitrogen content to evaluate nutrient availability, and measuring specific enzymatic activities. Additionally, a metabolite profiling was conducted *via* HPLC and GC-MS in order to highlight specific differences between the two different SCOBYs. Finally, kombucha's safety and functional properties have been assayed on cell lines

References

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