

Tea Fungus Beverages from Torch Ginger (*Etilingera elatior*): Total microbial, Physicochemical, and Antioxidant Activity

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Author Order	4 of 6
Accreditation	1
Abstract	<p>Functional beverages are needed to maintain health and fitness as a part of the instant lifestyle and degenerative diseases. The scientific findings on torch ginger (<i>Etilingera elatior</i>) flower (TGF) as a tea fungus beverage (Kombucha) are still limited. This research evaluated total microbes, physicochemical properties, and antioxidant activity 7 and 14 days after fermentation (daf) of TGF kombuchas. In addition, TGF in variant 0% (TGF0), 5% (TGF5), 10% (TGF10), and 15% (TGF15) are fermented with 3% of SCOBY, 20% culture, 1% green tea, and 10% sucrose. The antioxidant activities of TGF kombuchas were evaluated by 2,2-diphenyl-1-picrylhydrazyl (DPPH) and 2,2'-Azino-bis 3-Ethylbenzothiazoline-6-Sulfonic Acid (ABTS) assay the phenolic and flavonoid content using Folin-Ciocalteu method-gallic acid equivalent, and quercetin acid equivalent, respectively. The result showed that the fermentation time (p0.05) was affected by the properties of TGF kombuchas. Total microbes, physicochemical properties (pH, acidity, cellulose pellicle weight, phenolic, flavonoid content), and antioxidant activity were higher in 14 than in 7 days. Total soluble solid and total yeast count showed lower values in 14 days. The increase in total bacteria count, TGF15%, led to the highest increasing density from $8.08 \pm 0.02 \text{Log CFU/mL}$ on seven daf to $13.34 \pm 0.04 \text{Log CFU/mL}$ on 14 daf. The TGF 10% and 15% kombuchas in 14 dafs showed abundance in phenolic and flavonoid content, $121.45 \pm 1.07 \text{mg GAE/mL}$ and $1.70 \pm 0.04 \text{ mg QAE/mL}$, respectively. During 14 daf and TGF 10%, the Kombucha of torch ginger flower demonstrated high antioxidant activity at $85.92 \pm 0.07\% \text{ DDPH}$ and $63.05 \pm 0.97 \text{ABTS}$. It is expected to aid future research into developing functional kombucha beverages.</p>
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