

ABSTRACT

Amelia Zata Amani Putri, 24020221140048. **Secondary Metabolite Screening and Molecular Identification of Bacteria in Tombo Black Tea** (under the supervision of Agung Suprihadi & Hermin Pancasakti Kusumaningrum).

Black tea (*Camellia sinensis*) is a type of tea with the strongest and most complex character due to its fermentation process. The fermentation of black tea produces polyphenols, such as theaflavins and thearubigins, which are beneficial for stimulating the body's natural antioxidant formation. Furthermore, the microorganisms present in black tea influence the process and the final product's characteristics. This study aimed to identify the secondary metabolite compounds and molecularly isolate bacteria in Tombo black tea. A qualitative screening of secondary metabolites was conducted using Gas Chromatography-Mass Spectrometry (GC-MS). Molecular identification was performed using PCR with 16S rRNA sequencing. The GC-MS analysis identified 15 secondary metabolite compounds, with three dominant compounds having peak areas above 10%: an Acetic acid derivative (40.57%), 9-Octadecanoic acid, methyl ester (22.39%), and Hexadecanoic acid, methyl ester (21.48%). The dominant bacterial isolate identified molecularly was confirmed to be *Enterococcus faecalis*. This species is characterized as Gram-positive, coccus-shaped, with cream-colored colonies, convex elevation, a smooth texture, and a dispersed cellular arrangement. The fermentation of Tombo black tea contains secondary metabolites and bacterial isolates that support its potential as a functional beverage.

Keywords: *Bacteria, Black tea, Fermentation, GC-MS Screening, Secondary Metabolite.*