

ABSTRACT

Najwa Saffana Refaldy, 24020222140081. **Bioprospecting and Molecular Identification of Bacterial Isolates from Tombo Black Tea and Their Antioxidant Activity Potential** (under the supervision of Hermin Pancasakti Kusumaningrum & Anto Budiharjo)

Black tea (*Camellia sinensis*) is one of the types of tea that is widely consumed in Indonesia because of its abundant availability and easy processing process. Black tea is processed entirely through fermentation, where this process greatly affects the content of the phenolic compounds of tea leaves. During fermentation there is an enzymatic oxidation that converts simple polyphenols into various complex phenolic compounds that play an important role in the antioxidant activity of tea. The purpose of this study is to determine the species of bacteria from the results of molecular identification and analyze the antioxidant ability and phenolic levels of bacteria contained in Tombo black tea. The bacterial identification method was carried out using 16S rRNA through PCR analysis and sequencing. Antioxidant activity testing was carried out using the DPPH method using the IC₅₀ parameter, for total phenolic testing was carried out using the Folin-Ciocalteu method and expressed in mgGAE/L. The identification results showed A2 isolates as *Bacillus cereus*, A21 isolates as *Delftia tsuruhatensis* and A4 isolates as *Lysinibacillus fusiformis*. The results of antioxidant testing obtained IC₅₀ values of A2, A21, and A4 isolates of 92.98%, 105.35% and 85.52%. The results of the total phenolic test showed values of 58.43 mgGAE/L in A2 isolate, 28.72 mgGAE/L in A21 isolate, and 60.16 mgGAE/L in A4 isolate. Data analysis using the One-Way ANOVA test showed a significant difference in antioxidant activity between isolates with a value of ($p < 0.001$). The results showed that the bacterial isolate from Tombo black tea has the potential as a source of antioxidants and showed a relationship between phenolic levels and antioxidant activity.

Keywords : Black tea, Molecular identification, Bacteria, Fermentation, Antioxidant test, DPPH.