

## ABSTRACT

Azkiya Rodliya Tsani, 24020221120012. **The Potential of Lactic Acid Bacteria Isolates from Naniura Fermented Food as Antibacterials and Antioxidants and Their Molecular Identification.** Under the guidance of Siti Nur Jannah and Arina Tri Lunggani.

Naniura is a traditional food of the Toba Batak people of North Sumatra, which is processed through fermentation of carp without high temperature heating, but rather by soaking in jungga lime and spices. This fermented fish product contains lactic acid bacteria that can produce metabolite compounds, contributing to antibacterial and antioxidant activities. This study aims to determine the antibacterial and antioxidant potential of LAB isolates from naniura, as well as to determine the molecular identification of potential isolates. The research method, begins with the preparation of naniura, isolation of LAB using the spread plate method, and purification of isolates using the streak plate method. Isolate characterization was carried out macroscopically, microscopically, catalase tests, and fermentation types. Antibacterial tests were carried out against *Escherichia coli* and *Staphylococcus aureus* using the Kirby-Bauer method, and antioxidant tests using DPPH. Isolates with the best antibacterial and antioxidant activities were identified using the 16S rRNA gene. This study succeeded in isolating 12 isolates from naniura, which generally showed milky white colonies, round colonies, Gram-positive bacteria in the form of bacilli, catalase negative, and homofermentative group. In the bacterial test against *E. coli*, isolate N3R4 was the most effective with an inhibition zone of  $14.3 \pm 1.7$  mm (strong category) so that it had the most potential as an antibacterial, while other isolates varied from weak (<5 mm), medium (5-10 mm) to strong (10-20 mm) categories. Against *S. aureus*, only 8 isolates produced inhibition zones in the medium category, with N1R3 being the most effective ( $8.12 \pm 4.06$  mm). Antioxidant tests showed that isolate N6R5 produced the best activity with an IC<sub>50</sub> value of 108.61 ppm. Analysis of the 16S rRNA gene revealed that isolates N3R4 (potentially antibacterial) and N6R5 (potentially antioxidant) were closely related to *Lactiplatibacillus plantarum*. This finding reveals the potential of *Lactiplatibacillus plantarum* from naniura as a source of antibacterial and antioxidant.

*Key words: Antibacteria, Antioxidant, Lactic acid bacteria, Molecular identification, Naniura.*