

ABSTRACT

Sofhia Marshelly Br Ginting, 24020222130032. **Isolation and Characterization of *Aspergillus* spp. and Analysis of Aflatoxin Levels in Robusta Coffee Beans (*Coffea canephora*) Processed by Natural and Wine Fermentation Methods.** Under the guidance of Siti Nur Jannah and Endang Kusdiyantini.

Robusta coffee (*Coffea canephora*) is one of the important plantation commodities in Indonesia with high economic value. However, coffee beans are susceptible to fungal contamination during post-harvest processing, particularly by fungi belonging to the genus *Aspergillus* spp., which are known to produce hazardous mycotoxins such as aflatoxins. The presence of aflatoxins in food products is a major concern due to their carcinogenic properties and potential to compromise product safety. This study aimed to isolate and characterize *Aspergillus* spp. fungi and to detect the presence of aflatoxins in robusta coffee beans processed using natural and wine fermentation post-harvest methods. Fungal isolation was performed using DG18 (Dichloran Glycerol 18% Agar) medium, yielding four isolates designated as NS-1, NS-2, WS-1, and WS-2. Macroscopic characterization revealed variations in colony color, texture, diameter, and reverse colony morphology, while microscopic characterization demonstrated septate hyphae, terminal vesicles, metulae, phialides, and conidial chains consistent with the genus *Aspergillus*. Aflatoxin detection was conducted using Thin Layer Chromatography (TLC) and confirmed by Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). TLC results revealed faint fluorescent spots with R_f values of 0.37 and 0.50 in both samples; however, their characteristics did not correspond to typical aflatoxin profiles. LC-MS/MS analysis showed that aflatoxins B₁, B₂, G₁, and G₂ were not detected or were below the limit of detection (LOD). This study demonstrates that robusta coffee beans under the conditions examined were not found to contain detectable levels of aflatoxins, despite the presence of fungi identified as *Aspergillus* spp..

Keywords: Aflatoksin, *Aspergillus* spp., robusta coffee, LC-MS/MS, post-harvest processing