

# Volatile Organic Compound Analysis Of Durian Infected By Phytophthora Palmivora As Early Detecting Method Approach

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## ABSTRACT

Durian stem rot and shoot death caused by *P. palmivora* are the most feared diseases, where the plant death rate due to attacks can reach 50%. The use of fungicides with metalaxyl-mancozeb mixture, cyprofuram, milfuram and fosetyl-A, gave a positive effect in seedling stage. However, the disease on adult trees are always too late to be recognized. Molecular, serological and sensor-based detection systems were expensive, complicated and time-consuming. Metabolomics analysis can help read the interaction profile of plants and pathogens from the beginning of infection. This analysis is used to determine the volatile organic compounds (VOCs) of the plant part that is infected by the fungus as a plant-disease response.

Based on the GC-MS-MS analysis on both healthy leaf and infected leaf, there were some differences in the chemical compounds detected. In healthy leaves, three major compounds were detected. The compounds were (E)-3-Hexen-1-ol, (Z)-3-Hexenyl acetate and (E)-3-Hexenyl butanoate. These three compounds are known as volatile organic compounds that induce plant response. The increase of these three compounds occurred due to changes in the phenylpropanoid pathway. The increase of these compounds is related to the defense mechanism that occurs in plants in a biotic or abiotic stress condition.

From the unhealthy leaf samples, two major volatile organic compounds were detected, which were (Z)-4-hexenyl butyrate and Hexadecanal. Compared with healthy leaves, the unhealthy one did not produce higher green leaf volatile organic compounds related to stress tolerance mechanisms. (Z)-4-hexenyl butyrate is a volatile organic compound related to the antimicrobial mechanism. This compound can also be found in some extracts such as in ginger.

**Kata Kunci:** *Durian, Phytophthora palmivora, volatile*