

Selected Biomarkers from Oil Palm-Ganoderma Infected Tissues for Detection of Basal Stem Rot Disease

Abstract

The oil palm industry has become a substantial contributor to the international market for vegetable oils, with Malaysia and Indonesia as the major producers of palm oil. However, basal stem rot disease caused by a certain fungi *Ganoderma* posed a major problem that affects the oil palm tree and eventually kills it. The aim of this research project is to investigate the specific organic compounds being released during the *Ganoderma* infection with different stages of severity among oil palm. Fresh trunk tissues were collected from oil palm trees at Langkon, Sawit Kinabalu Plantation, Sabah, Malaysia. The oil palm trees were selected based on their disease severity indices which was categorized to Index 0 (healthy), Index 1 (moderate healthy), Index 2 (moderate severe) and Index 3 (severe). The oil colour of palm trunk tissue was distinguished into white-yellowish (index 0), light yellow (index 1), dark yellow (index 2) and yellowish brown (index 3). The identity of the causal pathogen was confirmed as *Ganoderma* sp. BRIUMSa using *Ganoderma* Selective Medium, molecular identification and observation under the light microscope. Differences of the organic compounds released from oil palm tissues among different indices were studied using Gas Chromatography Mass Spectrometry (GC-MS). The GC-MS analysis showed the presence of eleven compounds: mainly, fatty acid methyl esters, and fatty acids, amino acids, esters, alcohols, alkaloids. Among them, dodecanoic acid, methyl ester, 9-Octadecenoic acid (Z)-, methyl ester and methyl stearate may have the potential as the biomarkers for detection of infection in oil palm caused by *Ganoderma* sp.