Detection of phytosterols in Ganoderma boninense-infected oil palm seedlings through GC-MS analysis.

Abstract

Ganoderma boninense is a fungus known to be pathogenic to oil palm. It causes the basal stem rot (BSR) and upper stem rot (USR) diseases. This study shows that the interaction between Ganoderma and oil palm produced many secondary metabolites including sterol compounds revealed by gas chromatography-mass spectrometry (GC-MS) analysis. The roots of progenies were artificially infected with G. boninense and subjected to metabolite extraction. A total of 13 sterol compounds and two tocopherols were identified from the root extracts of both tolerant and susceptible oil palm seedlings. The main sterol compounds identified were sitosterol, stigmasterol, campesterol and ergostenol. The GC-MS library, namely NIST 08, Wiley 229 and comparison of fragmentation patterns of the mass spectra reported in literature made it possible to identify the sterol components present in the root extracts. The results indicate that the number and level of sterol compounds induced in infected palms were significantly higher than in uninfected seedlings. Variations in the type and level of compounds detected were also observed between infected tolerant and susceptible progenies. This study provides information that relates sterols and tocopherol (antioxidant) compounds to the oil palm defence mechanism against G. boninense.

Keyword: Oil palm; Ganoderma boninense; Sterol compounds; GC-MS; Defense mechanisms.