Identification and pathogenicity of Ceratocystis manginecans causing wilt disease on Acacia mangium in Sabah, Malaysia

ABSTRACT

Yunus NM, Maid M, Yong WTL, Anthony FE, Sudin M, Taylor PWJ. 2024. Identification and pathogenicity of Ceratocystis manginecans causing wilt disease on Acacia mangium in Sabah, Malaysia. Biodiversitas 25: 2170-2182. An alarming incidence of wilt disease has been reported in an Acacia mangium plantation in Ulu Kukut, Kota Belud District, Sabah, Malaysia. Infected trees exhibited symptoms such as severe wilting, sapwood discoloration or black lesion, and a fruity-sweet odor emanating from the fermentation exudate at the wound lesion. This is the first investigation of the causal wilt pathogen in a commercial A. mangium plantation in Ulu Kukut, located in the western region of Sabah. This study aimed to identify the causal fungal pathogen from infected A. mangium trees using morphological characterization and DNA sequence comparisons for the regions of Internal Transcribed Spacer (ITS), beta-tubulin 1 (bt1), transcription elongation factor-1 alpha (tef1), guanine nucleotide-binding protein subunit beta-like protein (ms204), and second largest subunits of RNA polymerase II (rpb2). The fungal isolates shared morphological characteristics with the wilt pathogen Ceratocystis sp., including a globose base with a long neck-ended tip with ostiolar hyphae. Sequence-based phylogenetic analysis confirmed the identity of Ceratocystis manginecans, distinguishing them from all other Ceratocystis species. Bioassays inoculating phyllodes and twigs of 1-year-old A. mangium trees confirmed that C. manginecans was the cause of wilt disease. Confirming the identity of the causal agent of the increasingly destructive and severe wilt disease aids in developing effective disease management strategies for Acacia-based plantations.