Disease Note

Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Fusarium Wilt of Cavendish Bananas Caused by *Fusarium oxysporum* f. sp. *cubense* Tropical Race 4 in the Grande Comoros Island

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Fusarium wilt of banana, caused by the soil-borne pathogen *Fusarium oxysporum* f. sp. *cubense* (*Foc*), is a major constraint to banana production worldwide (Viljoen et al. 2020). Currently, Cavendish bananas are severely affected by *Foc* tropical race 4 (TR4) globally. In Africa, *Foc* TR4 was first detected in northern Mozambique in 2013 (Viljoen et al. 2020) and has since been found on the island of Mayotte in the Mozambique Channel off the coast of southeastern Africa (Aguayo et al. 2021). In early 2023, severe leaf yellowing and wilting of Cavendish banana plants were observed at several small holder farmer properties in Grande Comoros (Ngazidja), including those in Ntsinimoipanga (11.790053°S, 43.429733°E), Batou (11.499714°S, 43.364364°E), Madjeweni (11.441200°S, 43.387311°E), and Mdé (11.736545°S, 43.247634°E). When the pseudostems of diseased plants were split open, a reddish-brown internal discoloration of the vascular tissue became apparent. Discolored strands of diseased plants were collected, and the causal agent was identified using DNA-based techniques, vegetative compatibility group (VCG) analysis, and pathogenicity testing. The samples were plated onto potato dextrose agar, and single-spored isolates were obtained and identified as *F. oxysporum* based on cultural and morphological characteristics. The characteristics included the production of white fungal colonies with a purple center, the infrequent production of macroconidia, but an abundance of microconidia on short monophialides, and the production of terminal or intercalary chlamydospores (Leslie and Summerell 2006). *Foc* TR4 was identified from seven isolates by conventional (Dita et al. 2010) and quantitative (Matthews et al. 2020) PCR and loop-mediated isothermal amplification (Ordóñez et al. 2019). All seven isolates were confirmed as members of the VCG 01213/16 complex when *nit*-1 mutants of the unknown *Foc* isolates were compatible with Nit-M mutants of the *Foc* VCG 01213 and VCG 01216 tester strains. Two isolates were then selected for pathogenicity testing, and 2-month-old tissue culture-derived Cavendish plants (cv. Williams) were inoculated by using the method described by Ndayihanzamaso et al. (2022). After 4 weeks, the *Foc* TR4-inoculated plants produced wilting symptoms and internal rhizome discoloration typical of Fusarium wilt. *Foc* TR4 was reisolated from the inoculated plants and identified by qPCR (Matthews et al. 2020), thereby fulfilling Koch's postulates. These results provide a scientific proof of the presence of *Foc* TR4 in a second island in the Comoros archipelago. Comprehensive surveys will be conducted in all three of the Comoros Islands to assess the presence and impact of *Foc* TR4 to implement containment strategies. Collaborative initiatives and coordinated actions among growers and other stakeholders are needed to prevent the spread of *Foc* TR4 to more Southwest Indian Ocean islands and countries on the East African coasts. Because of the importance of banana for food security and livelihoods and the unique genetic diversity of bananas found on the Comoros Islands, the eradication and isolation of diseased bananas in the short term and the screening of local banana varieties for *Foc* TR4 resistance in the longer term are required.

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