Diseases Caused by Oomycetes

First Report of White Rust on Sweetpotato Caused by *Albugo ipomoeae-panduratae* in Guangdong, China

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Sweetpotato (*Ipomoea batatas*) is the eighth most important food crop cultivated worldwide with annual production of 89.5 million tons (FAO 2020). China is the world's biggest producer of sweetpotato, and Guangdong Province has the fourth-largest sweetpotato growing area and the biggest sweetpotato market in China (Huang et al. 2020a). Sweetpotato leaves are a key organ providing nutrients for humans and animals, and are popular with customers in Guangdong. On October 14, 2021, a white rust affecting sweetpotato leaves was observed in the fields of Yunfu, Guangdong (22°54'55"N, 112°02'40"E), when conditions were humid, rainy, and relatively mild. The adaxial surface of the infected leaves initially exhibited irregular light-yellow or yellow spots, which gradually turned brown and necrotic. Meanwhile, tiny, powdery, chalky-white pustules, typical of white rust, dispersed individually or in clusters were observed on the corresponding underside of lesions, resulting in wrinkled leaves or abscission. For further analysis in the laboratory, affected leaf pieces (5 × 5 mm) containing raised pustules were examined using a scanning electron microscope (S-3400N-II, Hitachi, Japan) at 5 kV. The micrographs revealed numerous cylindrical sporangia released from broken pustules. The surfaces of globose oospores were covered with tiny

papillae in a reticular pattern. Based on the morphological analyses, the pathogen was preliminarily identified as an *Albugo* sp. Crude genomic DNA of a few pustules from the diseased leaves were extracted and subjected to PCR amplification using a 2×T5 Direct PCR kit (TSE011, Tsingke, China) with the primers ITS1/ITS4 (White et al. 1990). PCR products were detected using agarose gel electrophoresis and sequenced by Tsingke Company (Guangzhou, China). The sequences were compared against the NCBI database using the BLASTn search tool. The two best-matched alignments with over 90% query coverage showed that the ITS sequence amplified from the sample, which was deposited in GenBank (OM182104), was ≥97% identical to those from two isolates of *A. ipomoeae-panduratae* from China (AY742741) and Korea (DQ643920). *A. ipomoeae-panduratae* primarily causes white rust on sweetpotato (Moyer and Clark 2013) and is an obligate parasite not culturable in vitro. To demonstrate pathogenicity, spores collected from symptomatic sweetpotato leaves were mixed with sterile water and sprayed onto leaves of three healthy sweetpotato plants. Inoculated plants were then placed at 21°C and 93% relative humidity. Three other healthy plants treated with sterile water without spores served as the control group. After 12 days, chlorosis and necrosis were observed on the upper leaf surface, and raised white pustules appeared on the lower leaf surface. No symptoms were observed in the noninoculated control plants. To the best of our knowledge, this is the first report of white rust, caused by *A. ipomoeae-panduratae*, affecting sweetpotato in Guangdong, China. White rust on sweetpotato has also been reported in other provinces in China (Huang et al. 2020b), and the detrimental effects and control measures of this disease should be studied further.

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