Diseases Caused by Fungi and Fungus-Like Organisms

First Report of Postharvest Tuber Rot of American Groundnut (*Apios americana*) Caused by *Fusarium acuminatum*

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Apios americana Medik, commonly known as American groundnut, is a leguminous perennial vine crop native to North America and is cultivated in Japan and Korea (Chu et al. 2019). Its tubers are edible and believed to be very nutritious, especially for women just after childbirth. The tubers also contain secondary metabolites, saponin and genistein, which are good for human health (Ichige et al. 2013). However, the storage of tubers at inappropriate temperatures and humidity levels can cause severe fungal infection and adversely affect tuber quality. During March and April 2020, white to pale-orange fungal mycelia were observed on stored American groundnut tubers, with 10 to 15% of seed tubers rotten. Infected tubers were collected, and fungal isolates were isolated on potato dextrose agar (PDA) using the single-spore isolation method (Leslie and Summerell 2006). A pure culture (isolate JC20003) was obtained and stored at the Bioenergy Crop Research Institute, NICS, Muan, Republic of Korea. The fungus was cultured on PDA and V8 liquid media for 7 days at 25°C to observe its morphological characteristics. The length and width of macroconidia ranged from 20.6 to 52.9 µm and 2.9 to 5.1 µm, respectively ($n = 30$). The microconidia were 8.5 to 14.9 µm and

2.3 to 4.2 µm in length and width, respectively ($n = 30$). Macroconidia were broadly falcate, strongly septate, two to six septations with dorsiventral curvature; chlamydospores were formed in chains; and microconidia were fusiform with zero to one septation observed. Genomic DNA of the isolate was extracted using a Solgent DNA extraction kit (Solgent, Daejeon, Korea), followed by PCR analysis using the internal transcribed spacer (ITS5/ITS4) and elongation factor (EF1/EF2) genes (O'Donnell 2000; White et al. 1990). PCR products were sequenced and analyzed to confirm species identity (Yang et al. 2018). These sequences were deposited in GenBank (accession nos. MT703859 for ITS and MT731939 for EF). BLASTn search analysis showed 100% sequence similarity with *Fusarium acuminatum* (isolates N-51-1 for ITS and WXWH24 for EF). Based on morphological and molecular data analysis, the fungus was identified as *F. acuminatum* (Leslie and Summerell 2006; Marín et al. 2012). Pathogenicity tests were conducted on five tubers inoculated with 5-mm mycelial plugs with three replicates, whereas a nonmycelial plug served as the control. After 5 days of incubation in plastic containers at 25°C with high humidity, typical symptoms developed. No symptoms were observed on the control tubers; *F. acuminatum* was reisolated from artificially inoculated tubers to complete Koch's postulates. This is the first report on postharvest tuber rot caused by *F. acuminatum* in *A. americana*.

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