

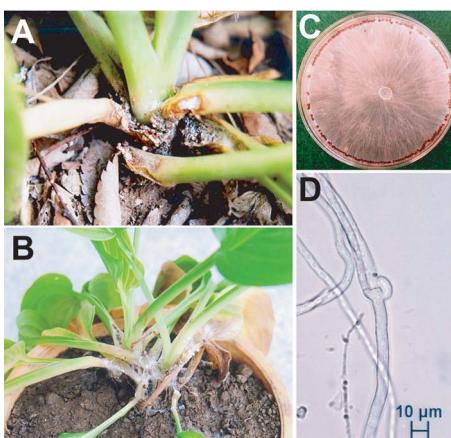
**Disease Reports****First Report of Stem Rot on *Hosta plantaginea* caused by *Sclerotium rolfsii* in Korea**Jin-Hyeuk Kwon<sup>1\*</sup>, Tran Thi Phuong Chi<sup>2,3</sup> and Jinwoo Kim<sup>3</sup><sup>1</sup>Gyeongsangnam do Agricultural Research and Extension Services, Jinju 660-360, Korea; <sup>2</sup>Plant Protection Subdepartment of Dongnai, Bienhoa City, Dongnai Province, Vietnam; <sup>3</sup>Department of Applied Biology, Gyeongsang National University, Jinju 660-701, Korea

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A stem rot disease caused by *Sclerotium rolfsii* sporadically afflicted fragrant plantain lily (*Hosta plantaginea* Aschers.) from 2008 to 2010 in the herb exhibition garden at Gangju Pond, which is located in Jeongchon-myon, Jinju, Korea. The fragrant plantain lilies, which are perennial plants grown in home gardens, recently were planted en masse in parks and public gardens for ornamental purposes, where they form dense communities. During summer, the stems of the plants under the canopy are exposed to warm temperatures and high humidity, which favor disease development. The disease developed mainly on stems near the soil line. Infected stems gradually died, and white mycelial mats appeared on the stem surfaces (Fig. 1A). Often, numerous sclerotia were produced on stem surfaces near the soil line. The heavily infected stems became rotted and blighted, and the whole plant eventually died.

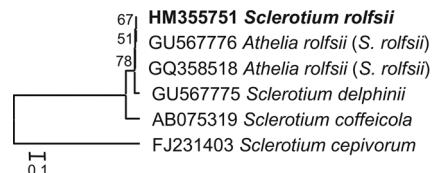
The freshly isolated pathogenic fungus grown on potato dextrose agar (PDA) was examined microscopically and culturally. The optimal growth temperature on PDA was 30°C. Aerial mycelia usually formed many narrow hyphal strands 3-9 µm wide. The white mycelium had a typical clamp connection structure for 4 days after growth at optimum temperature (Fig. 1D). Small globose sclerotia formed abundantly on the PDA after 20 days of mycelial growth (Fig. 1C). The sclerotia, which were relatively uniform in size at 1-3 mm, were white at first, and then turned dark brown. The maximum number of sclerotia was produced at 25-30°C. To test pathogenicity, inoculums were prepared with mycelial mats and mixed with autoclaved soil. Then, soil inoculums containing mycelial mats were artificially inoculated onto *Hosta plantaginea*. The same fungal fruiting symptoms were reproduced, and the fungus was re-isolated based on these symptoms (Fig. 1B).

To identify the causal fungus, we amplified and sequenced a partial internal transcribed spacer (ITS) rDNA region of the isolate using the primers ITS1 and ITS4, as described by White et al. (1990). The resulting sequence of 684-bp was deposited in GenBank



**Fig. 1.** Symptoms of stem rot in fragrant plantain lily (*Hosta plantaginea*) and mycological characteristics of the pathogenic fungus, *Sclerotium rolfsii*. A: Typical field symptoms on stems and near the soil line. B: Symptoms after artificial inoculation. C: Mycelial mat and sclerotia grown on PDA after 18 days. D: Clamp connection.

(accession no. HM355751). Phylogenetic analysis was performed using MEGA4 software, with the neighbor-joining method and Tajima-Nei distance model. Previously published ITS sequences of *S. rolfsii* strains were included for reference, and *S. cepivorum* was used as the outgroup (Harlton et al., 1995). Neighbor-joining analysis showed that the two species had similar ITS sequences (Fig. 2). In the phylogenetic tree (Fig. 2), the isolate was placed within a clade comprising reference isolates of *S. rolfsii*.



**Fig. 2.** Phylogenetic tree using ITS sequences shows closest known relatives of *Sclerotium rolfsii*, including stem rot fungus infecting *Hosta plantaginea*. Numbers above branches indicate bootstrap values. Bars indicate number of nucleotide substitutions per site. The isolate infecting *H. plantaginea* is indicated in bold.

Thus, on the basis of symptoms, mycological characteristics, molecular data and pathogenicity to the host plant, this fungus was identified as *S. rolfsii* Saccardo (Mordue, 1974). Cultures of *S. rolfsii* have been deposited with the Korean Agricultural Culture Collection (KACC 42087), National Academy of Agricultural Science, Rural Development Administration, Suwon. The stem rot on *H. plantaginea* caused by *S. rolfsii* has not been reported previously in Korea (The Korean Society of Plant Pathology, 2009). The recent occurrence of the disease in newly planted fragrant plantain lilies in parks and public gardens suggests that *S. rolfsii* is spreading widely and posing a serious threat to these plants in Korea.

**Acknowledgment**

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**References**

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