**RESEARCH NOTE**

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# First Report of Sclerotium Rot on *Cymbidium* Orchids Caused by *Sclerotium rolfsii* in Korea

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**Sclerotium rot was found on *Cymbidium* orchids at Seosan-si, Chungcheongnam-do, Korea, in July, 2010. Symptoms occurred on low leaves, which turned yellowish, after which the entire plant wilted. Severely infected plants were blighted and eventually died. White mycelial mats and sclerotia appeared on pseudobulbs. Based on the mycological characteristics and pathogenicity, the causal fungus was identified as *Sclerotium rolfsii*. This is the first report of new Sclerotium rot on *Cymbidium* spp. caused by *S. rolfsii* in Korea.**

**KEYWORDS : *Cymbidium* spp., Orchid, *Sclerotium rolfsii*, Sclerotium rot**

Sclerotium rot caused by *Sclerotium rolfsii* has been found to occur on *Cymbidium* orchids (*Cymbidium* spp.), which are economically important cultivated potted flower plants, in Korea. In July 2010, symptoms of basal rot of the pseudobulbs were observed on *Cymbidium* orchids in a commercial field in Seosan-si, Chungcheongnam-do, Korea.

The infected plants showed poor growth and wilting, and gradually died (Fig. 1A). White cottony mycelia formed on the stems of the diseased plants. Numerous small brown round sclerotia and white mycelial growths were observed on the pseudobulbs (Fig. 1B) and leaf base, as well as along the leaf sheaths. The heavily infected pseudobulbs became rotted and blighted, and the whole plants eventually died.

Fungal isolates from the infected bulbs were grown on potato dextrose agar (PDA). The sclerotia were found to be nearly round, 0.5~1.99 mm in diameter, white but turning brown with age (Fig. 1D), and produced in large numbers over the entire colony surface. Primary hyphae showed clamp connections at the septa (Fig. 1E). The optimal growth temperature on PDA was 30°C. Aerial mycelia usually formed many narrow hyphal strands that were 3~9 μm wide (Table 1). Based on the morphological and cultural characteristics, the isolates were identified as *S. rolfsii* Sacc., which is a major pathogen of many plants [1].

Pathogenicity was tested in the greenhouse on *Cymbidium* orchids grown in pots for two years (one plant per pot, five replicates). Inoculums that consisted of 1 g per pot of sand-oatmeal soil infested with mycelium were placed at the base of each inoculated plant. In addition, five non-

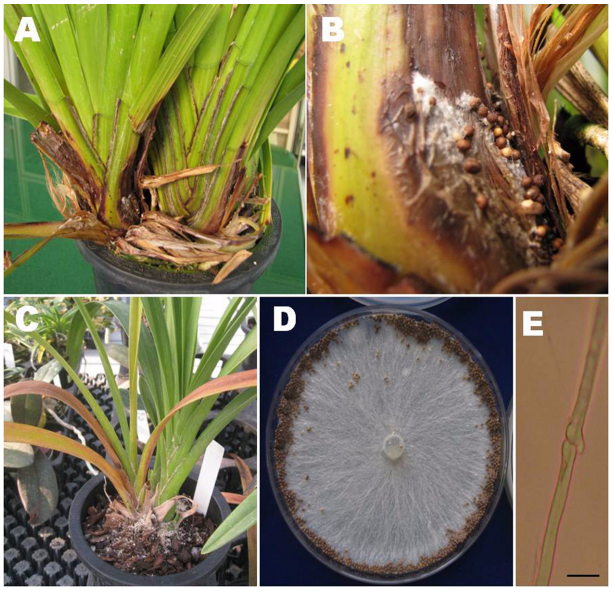


**Fig. 1.** Symptoms of stem rot in *Cymbidium* orchids (*Cymbidium* spp.) and mycological characteristics of the pathogenic fungus, *Sclerotium rolfsii*. A, B, Typical field symptoms on pseudobulbs and near the soil line; C, Symptoms after artificial inoculation; D, Mycelial mat and sclerotia grown on potato dextrose agar after 18 days, E; Clamp connection (scale bar = 2 μm).

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**Table 1.** Comparison of mycological characteristics between the isolate studied and *Sclerotium rolfsii*

| Characteristics | | Studied isolate | *S. rolfsii*[a] |
|---|---|---|---|
| Colony | Color | White | White |
| Hyphae | Diameter (μm) | 4.2~8.3 | 4.5~9 |
| | Clamp connection | Present | Present |
| Sclerotium | Shape | Spherical | Spherical |
| | Size (mm) | 1~3 | 1~2 |
| | Color | White to brown | Brown |

[a]Described by Mordue [1].

inoculated plants served as controls. All plants were maintained at 25°C during the experiment. Within seven days, all inoculated plants developed symptoms that were identical to those observed on naturally infested plants (Fig. 1C). Initially, the leaves became yellow and detached from the pseudobulbs. Gradually, the entire plant turned brown to black and became blighted. *S. rolfsii* was consistently reisolated from symptomatic tissues.

To identify the causal fungus, we amplified and sequenced a partial internal transcribed spacer (ITS) rDNA region of the isolate with the primers ITS1 and ITS4 using the method described by White *et al*. [2]. Phylogenetic analysis (Fig. 2) placed the isolate within a clade composed of reference isolates of *S. rolfsii*. The resulting sequence of 684 bp was deposited in GenBank (accession No. JF751065), and the isolate of *S. rolfsii* was deposited in the Korean Agricultural Culture Collection.

*S. rolfsii* has been reported to cause stem rot and southern blight on several orchid plants in Florida [3] and on *Cymbidium* and its hybrids in India [4, 5]. In Korea, Sclerotium rot on *Neofinetia falcata* and *Phalaenopsis* orchids was recently reported [6, 7].

A survey of the literature confirmed that there is no previous report of disease caused by *S. rolfsii* on *Cymbidium* in Korea [8]. Therefore, this is the first report of *S. rolfsii* affecting *Cymbidium* orchids in Korea.


**Fig. 2.** Phylogenetic analysis of internal transcribed spacer sequences showing the closest known relatives of *Sclerotium rolfsii*, including stem rot fungus infecting *Cymbidium* orchids. Bar indicates the number of nucleotide substitutions per site. The isolate infecting *Cymbidium* orchids is indicated in bold.

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