

Corynespora Leaf Spot of Balsam Pear Caused by *Corynespora cassiicola* in Korea

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Corynespora leaf spot occurred severely on balsam pear (*Momordica charantia*) at Changwon, Gyeongnam province in Korea in November and December 2003. The causal fungus isolated from infected leaves of the plants grew well on potato dextrose agar showing gray to brown color. Solitary or catenary conidia of the fungus were obclavate to cylindrical in shape, and pale olivaceous brown or brown in color. The number of isthmus pseudosepta ranged from 4 to 20 and measured 36~186×8~19 μm in size. Conidiophores were pale to light brown in color and measured 94~648×3~8 μm in size. Optimal temperature for mycelial growth was 30°C. On the basis of mycological characteristics and pathogenicity, the fungus was identified as *Corynespora cassiicola* (Berk. & Curt.) Wei. This is the first report on the corynespora leaf spot of *M. charantia* caused by *C. cassiicola* in Korea.

Keywords : Balsam pear, *Corynespora cassiicola*, leaf spot, *Momordica charantia*

Balsam pear (*Momordica charantia* L.) was originated in Asia and tropics. It was one of important vegetables exporting to Japan. During a disease survey on *M. charantia* grown in a greenhouse from September 2003 to April 2004, a severe corynespora leaf spot caused by *Corynespora cassiicola* was observed at Changwon, Gyeongnam province, Korea. Until now, only three diseases such as mosaic (*Cucumber mosaic virus*), powdery mildew (*Oidium* sp.), and leaf spot (*Phoma* sp.) have been recorded on the plant in Korea (The Korean Society of Plant Pathology, 2004). However, new or unrecorded diseases occurred on the plants as the cultivation area increased. As a matter of fact, many important diseases impeding safe cultivation of the vegetable have not been studied yet.

Among the diseases, the corynespora leaf spot caused by *C. cassiicola* is one of the most destructive diseases on the

plants. The fungus infects fruits as well as leaves. Incidence of infected plants reached to 80% in three fields at Changwon, Korea. Corynespora leaf spot occurred on various crops in Korea such as *Glycine max*, *Sesamum indicum*, *Pleuropterus multiflorus*, *Cucumis sativus*, *Lycopersicon esculentum*, *Hibiscus mutabilis* and *Trifolium repens* (The Korean Society of Plant Pathology, 2004). Recently, severe corynespora leaf spot on pepper (*Capsium annuum*) that occurred at the major pepper cultivation areas in Jinju was reported (Kwon et al., 2001). However, the disease on *M. charantia* has never been reported in Korea and Japan (Kishi, 1998; The Phytopathological Society of Japan, 2000), but it was recorded in the U.S. (Farr et al., 1995).

Symptoms. The disease mainly occurred on leaves; however, fruits were also infected by the fungus (Fig. 1A, B). Typical symptoms on leaves developed as a small brown spot with halos. The irregularly round necrotic lesions became dark often with wavy border and sized up to 3 cm in diameter. Infected leaves became chlorotic, blighted and dried eventually (Fig. 1C). Severely infected plants were wilted or blighted under the humid environmental conditions favorable to the disease development. Hyphae covered the lesions with abundant conidia and conidiophores.

Pathogen isolation. Naturally infected leaves and fruits with fresh symptoms were collected from the fields and cut into small pieces (3×3 mm) for isolation of the causal pathogen. The pieces were disinfected in 1% NaOCl solution for 1 min. A total of 40 isolates of the fungus were collected from the diseased tissues of *M. charantia* cultivated in the greenhouses.

Mycological characterization. The fungal colonies were gray to brown on potato dextrose agar (PDA) 8 days after incubation (Fig. 2A). Conidiophores were iridescent under a binocular dissecting microscope. Conidia were solitary or catenary, variable in shape, obclavate to cylindrical, smooth,

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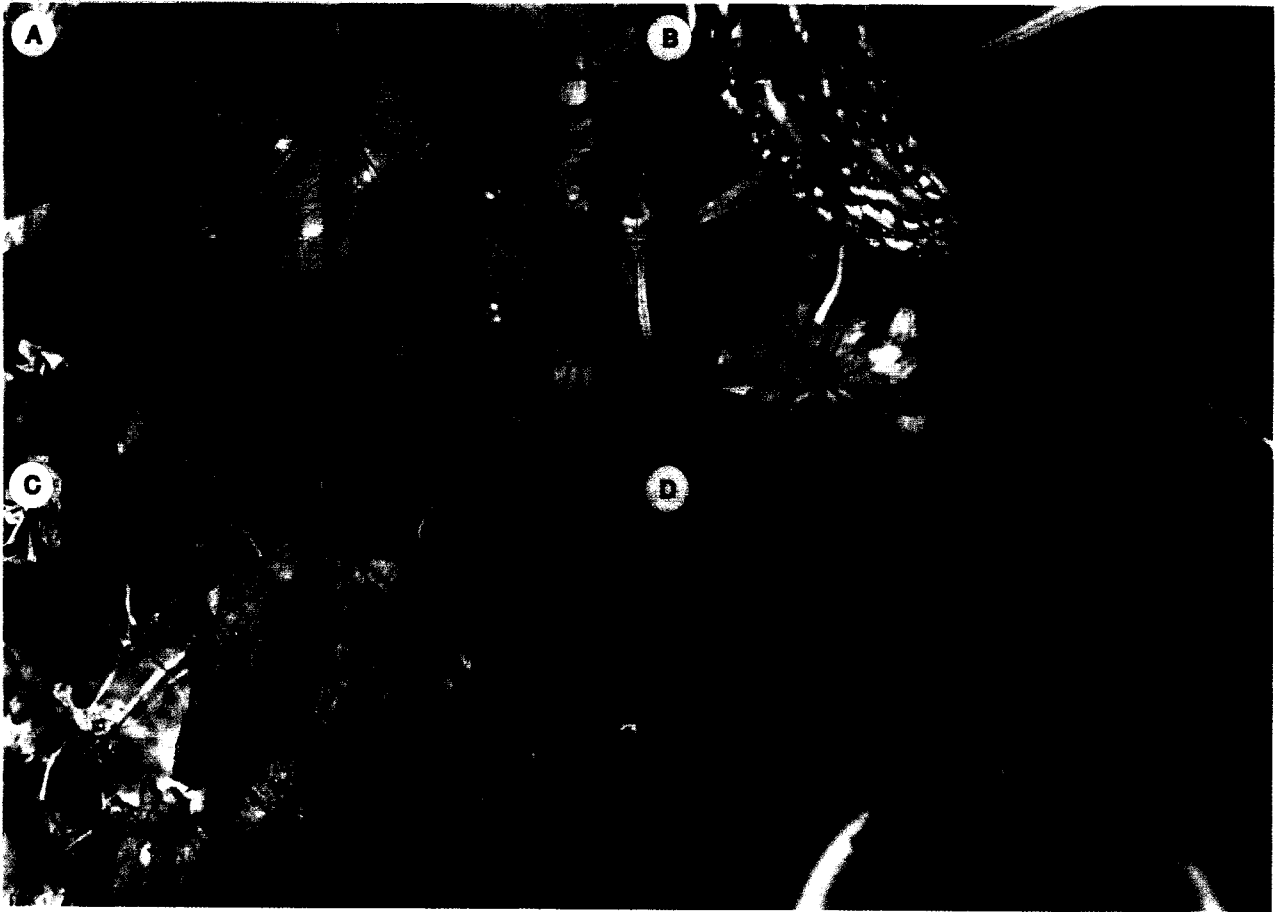


Fig. 1. Symptoms of corynespora leaf spot on *Momordica charantia* caused by *Corynespora cassicola*. Typical symptoms on leaves with halos (A) and a fruit (B). C: Severely Infected leaves became chlorotic, blighted and dried eventually. D: Artificially inoculated leaves.

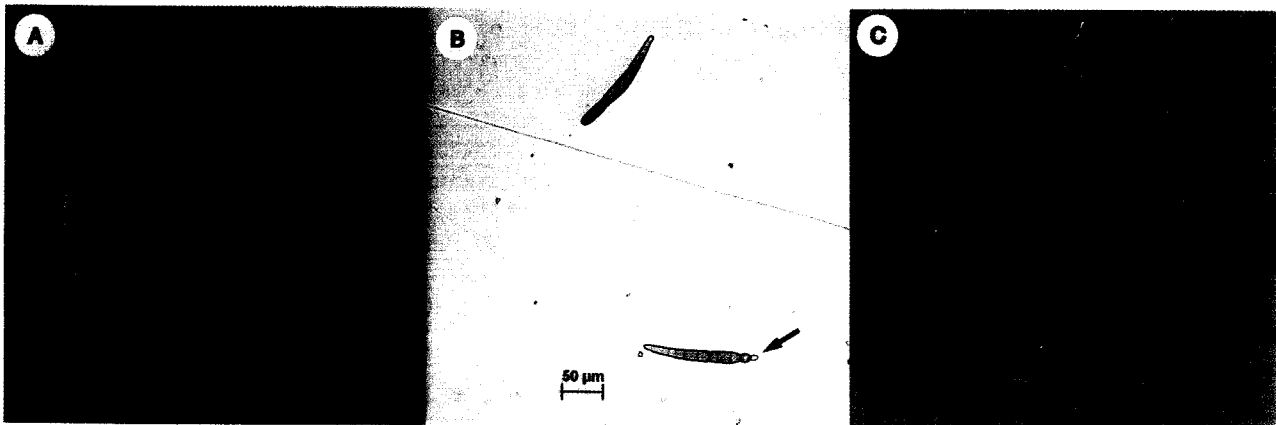


Fig. 2. Morphological characteristics of by *Corynespora cassicola* isolated from diseased *Momordica charantia*. A: Colony of mycelia 8 days after incubation on PDA, B: Conidia and isthmus (arrow), C: Conidiophores.

straight or curved, subhyaline to rather pale olivaceous brown or brown in color. Conidia were $36\text{--}186 \times 8\text{--}19 \mu\text{m}$ in size, pseudosepta were 4-20 and isthmus (Fig. 2B). Germination type was bi-polar. Conidiophores emerged through leaf epidermis were slightly or conspicuously

swollen at apex, single, simple, straight or slightly flexuous, pale to mid brown in color, smooth, septate, thick, monotretic determinate or in tufts, proliferating terminally through scars of previous conidia. Conidiophores were measured $94\text{--}648 \times 3\text{--}8 \mu\text{m}$ in size (Fig. 2C, Table 1). The

Table 1. Comparison of mycological characteristics of the fungal isolate from corynespora leaf spot on *Momordica charantia* and *Corynespora cassiicola* described by Ellis and Holliday

		Present Isolate	<i>C. cassiicola</i> ^a
Colony	color	gray or brown	gray or brown
Conidia	color	pale olivaceous brown or brown	pale olivaceous brown or brown
	shape	obclavate or cylindrical	obclavate or cylindrical
	size	36~186×8~19 μm	40~220×9~22 μm
Isthmus		present	present
No. of pseudosepta		4~20	4~20
Type of germination		bi-polar	bi-polar
Conidiophore	color	mild brown	mild brown
	size	94~648×3~8 μm	110~850×4~11 μm

^aDescribed by Ellis and Holliday (1971).

optimum temperature for mycelial growth was about 30°C. Most characteristics of the fungus examined in this study were almost identical to those of *Corynespora cassiicola* (Berk. & Curt.) Wei described previously by the authors (Kwon et al., 2001) and others (Gobayashi et al., 1992; Ellis and Holliday, 1972; Farr et al., 1995; Udagawa et al., 1980). Accordingly, we identified the causal fungus of *M. charantia* as *C. cassiicola* Wei.

Pathogenicity. The plant was cultivated in 1/5000a wagner pots for 40 days in a greenhouse. Conidial suspension of the isolate was prepared from PDA cultures, and adjusted to 2×10^5 /ml by using a hemacytometer. Conidia were spray-inoculated with 100 ml per plant on leaves without wounds. Inoculated plants were placed in a humid chamber with 100 ml relative humidity at 25°C for 24 hours and returned to a greenhouse with high humidity and temperature. Typical symptoms on *M. charantia* appeared at seven days after inoculation showing pathogenicity to *M. charantia* (Fig. 1D). The fungus was re-isolated from the lesions of inoculated plants fulfilling Koch's postulation. The fungal isolate used in this study was deposited to the Korean Agricultural Culture Collection (KACC No. 41704), National Institute of Agricultural Biotechnology, Rural Development Administration, Suwon.

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