

## Leaf Spot of Cotton Rose Caused by *Corynespora cassiicola* in Korea

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A leaf spot of cotton rose (*Hibiscus mutabilis*) occurred severely in the flower beds of cotton rose around Uiryeong-gun, Gyeongsangnam Province in Korea. The causal fungus was identified as *Corynespora cassiicola* on the basis of cultural and morphological characteristics of the fungus. The fungus grew well on potato dextrose agar and the colony color was gray to brown. Conidia were solitary or catenate, obclavate to cylindrical in shape, and pale olivaceous brown or brown in color. They had 420 pseudosepta, and measured  $35.2\text{--}173.6 \times 8.8\text{--}19.9 \mu\text{m}$ . Conidia germinated as a bipolar type. Conidiophores were pale to mid brown in color, and measured  $74.2\text{--}275.6 \times 3.8\text{--}10.8 \mu\text{m}$ . Optimal temperature for mycelial growth was 30°C. The fungal isolate grown on PDA showed strong pathogenicity to cotton rose plant. This is the first report on the *Corynespora* leaf spot of cotton rose (*Hibiscus mutabilis*) caused by *Corynespora cassiicola* in Korea.

**KEYWORDS:** *Corynespora cassiicola*, *Corynespora* leaf spot, *Hibiscus mutabilis*

Cotton rose (*Hibiscus mutabilis*) is sporadically cultivated in the flower beds along the roadsides in Korea. During the growing season in summer of 2002, a severe leaf spots on the cotton rose caused by a *Corynespora* species was observed in the flower beds along the roadsides in Uiryeong-gun, Gyeongsang Province. The infection rate of diseased plants ranged from 6.2 to 21.8%.

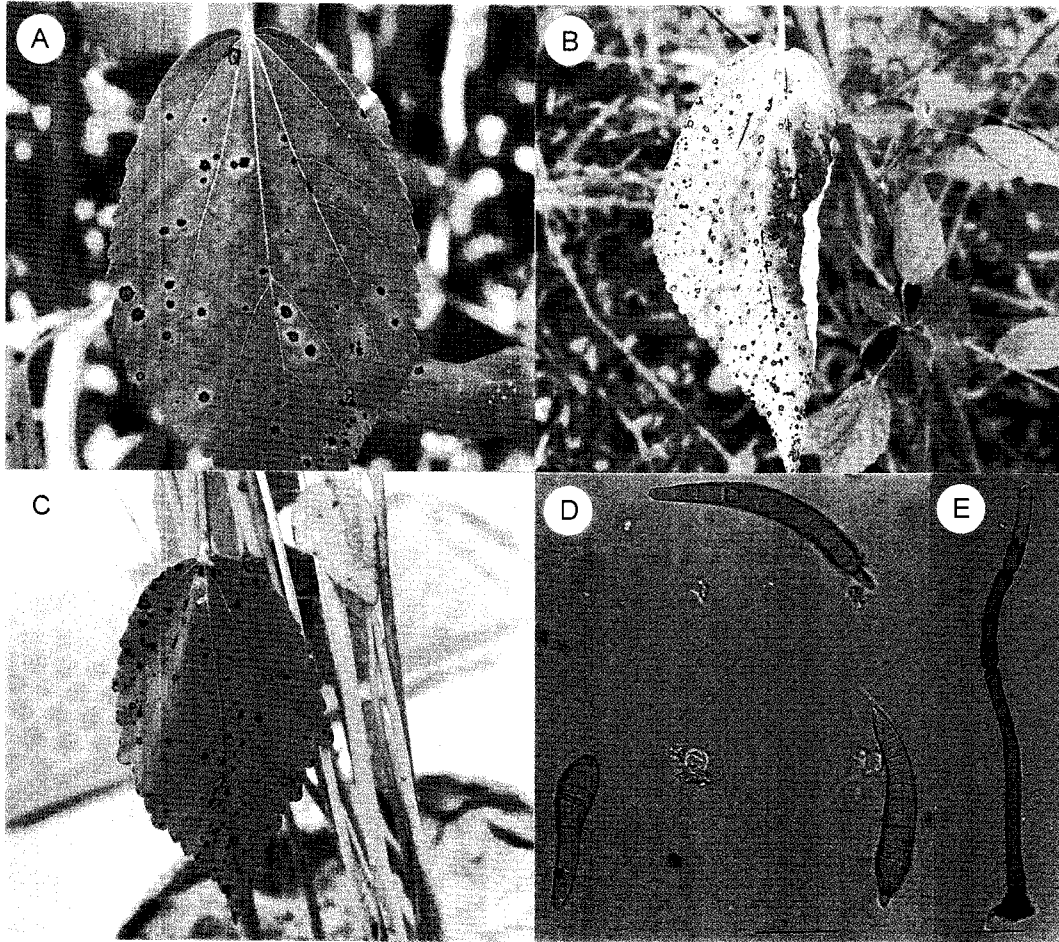
The disease usually started from old leaves. Typical symptoms on leaves developed as a small brown spot with halo surrounding (Fig. 1A). The average spot size was approximately one cm in diameter. The irregularly round necrotic lesions became darker often with wavy border and frequently zonated up to 0.5 mm in diameter, sometimes made puncture. Severely infected leaves became blighted and defoliated eventually under the humid conditions that favorable to the disease development (Fig. 1B). Fungal hyphae grew internally in leaf tissues and the lesions were covered with abundant conidia and conidiophores. A total of 65 isolates of the fungus were collected from the diseased leaves of cotton rose grown in open field. The fungal colonies were gray or brown and thinly hairy on potato dextrose agar (PDA) and the conidiophores were viewed iridescently under a binocular dissecting microscope (Table 1). Conidia were solitary or catenate, very variable in shape, obclavate to cylindrical, straight or curved, subhyaline to rather pale olivaceous brown or brown in color, smooth, 4~20 pseudoseptate, and measured  $35.2\text{--}173.6 \times 8.8\text{--}19.9 \mu\text{m}$ , with a thick, colorless exospore and prominent, dark basal scar (Fig. 1D). Germination was bipolar type. Conidiophores emerged through leaf epidermis were erect, slightly or conspicu-

ously swollen at apex, simple or occasionally branched, single, 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, and measured  $74.2\text{--}275.6 \times 3.8\text{--}10.8 \mu\text{m}$  (Fig. 1E). The maximum, optimum and minimum temperatures for mycelial growth were 35°C, 30°C and 10°C, respectively. Most characteristics of the fungus examined in this study were almost identical to *Corynespora cassiicola* described by previous workers (Barnett and Hunter 1986; Gobayashi *et al.*, 1992; Farr *et al.*, 1995; Udagawa *et al.*, 1980). Accordingly, we identified the causal fungus of leaf spot of cotton rose as *Corynespora cassiicola* Wei.

For pathogenicity test, conidial suspension of the isolate was prepared from PDA cultures, and the conidial concentration was adjusted to  $2 \times 10^5/\text{ml}$  using hemacytometer. The cotton rose plants were cultivated in 1/5000a Wagner pots and kept in a greenhouse for 98 days. They were spray-inoculated with 100 ml of the spore suspension per pot. Inoculated plants were placed in a humid chamber with 100% relative humidity at 25°C for 24 hours. Typical symptoms on cotton rose were appeared at eight days after inoculation (Fig. 1C). The fungus was re-isolated from inoculated plants.

Although *Corynespora* leaf spot was reported on sesame, soybean and tomato in Korea, the disease has not been reported on the cotton rose (The Korea Society of Plant Pathology, 1998). The disease on cotton rose (*Hibiscus mutabilis*) has been reported in U.S.A. (Farr *et al.*, 1995), and *Corynespora cassiicola* has been reported from variety of plants such as hyacinth bean, *Cucumis* spp., cucumber, perilla, east indian lotus, tomato, saintpaulia, hortensia in Japan (The Phytopathological Society of

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**Fig. 1.** Symptoms of leaf spot of cotton rose (*Hibiscus mutabilis*) and mycological characteristics of *Corynespora cassiicola*. A: typical symptoms of brown leaf spot with halo surrounding, B: severely infected leaf showing chlorotic and yellowing symptom, C: artificially inoculated leaf, D: conidia of the fungus, E: conidiophore. Scale bar: 20  $\mu\text{m}$ .

**Table 1.** Mycological characteristics of the fungal isolate from leaf spot on cotton rose and *Corynespora cassiicola* described by Ellis and Holliday

		Present isolate	<i>C. cassiicola</i> <sup>a</sup>
Colony	color	gray or brown	gray or brown
Conidia	color	pale olivaceous brown or brown	pale olivaceous brown or brown
	shape	obclavate or cylindrical, straight or curved	obclavate or cylindrical, straight or curved
	size	35.2~173.6 $\times$ 8.8~19.9 $\mu\text{m}$	40~220 $\times$ 9~22 $\mu\text{m}$
	pseudosepta	4~20	4~20
	germination	bipolar	bipolar
Conidiophore	color	pale to mid brown	pale to mid brown
	shape	erect, simple or occasionally branched, stright or slightly flexuous, septate, monotretic	erect, simple or occasionally branched, stright or slightly flexuous, septate, monotretic
	size	74.2~275.6 $\times$ 3.8~10.8 $\mu\text{m}$	110~850 $\times$ 4~11 $\mu\text{m}$

<sup>a</sup>Described by Ellis and Holliday (1971).

Japan, 2000).

Cotton rose plants are often cultivated under a high temperature and humid condition. Such environments seem to promote the occurrence of the corynespora leaf spot.

The morphological characteristics of the fungus isolated from cotton rose leaves were similar to those of

*C. cassiicola* previously described (Ellis and Holliday, 1971).

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