

Phloeospora Leaf Spot on Spiraea

Hyeon-Dong Shin*, Hyun Tae Lee and Jeong Taek Oh 신현동

Department of Agricultural Biology, Korea University, Seoul 136-701, Korea

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A *Phloeospora* leaf spot disease on *Spiraea prunifolia* var. *simpliciflora* was noticed to commonly occur in Korea. The causal organism of the disease was identified as *Phloeospora spiraeicola* based on the morphological characteristics of conidiomata and conidia. Pathogenicity of the fungus was proved by artificial inoculation. This is the first record of *Phloeospora* leaf spot in Korea.

Keywords : *Cylindrosporium*, *Phloeospora*, *Spiraea*.

Trees belonging to the genus *Spiraea* are shrubs with beautiful flowers and widely distributed in Korea. Of these, *S. prunifolia* var. *simpliciflora* Nakai (Chopap-namu in Korean) is widely planted at border flower beds for ornamental purpose or cultivated for obtaining flowered branches as sources for flower arrangement art.

There have been no records of diseases on this plant in Korea (The Korean Society of Plant Pathology, 1998). We found that a leaf spot disease on the tree commonly occurred. The symptom of the disease is grayish to blackish brown spots on leaves (Fig. 1a). These spots are usually surrounded by yellowish haloes as the infected tissue dies (Fig. 1b). Though the number of spots varies on individual leaves, numerous small necrotic spots are present. Each lesion usually remains only less than 2 mm in diameter; however, several spots may coalesce and large areas of the leaf may be killed. Diseased leaves gradually defoliate and heavily infected trees have only a few immature leaves on their shoots before autumn.

Examination of the lesions showed that large creamy to yellowish masses of conidia are extruded from acervuli chiefly on the lower surface and also occasionally on the upper surface of the leaf. The acervuli range from 56-184 μ m in diameter, and epidermal cells of the host plant remain around acervuli (Figs. 2a, 2b). The conidia are filiform, mildly curved to falcate or rarely sigmoid, subobtuse to subtruncate at the basal end, tapering gradually toward the subacute distal end, hyaline to subhyaline, 42-104 \times 24 μ m, 2-3(-4) septate, not constricted at the septa, septa distinct

*Corresponding author.

Phone) +82-2-3290-3063, Fax) +82-2-925-1970

E-mail) hdshin@kucckn.korea.ac.kr

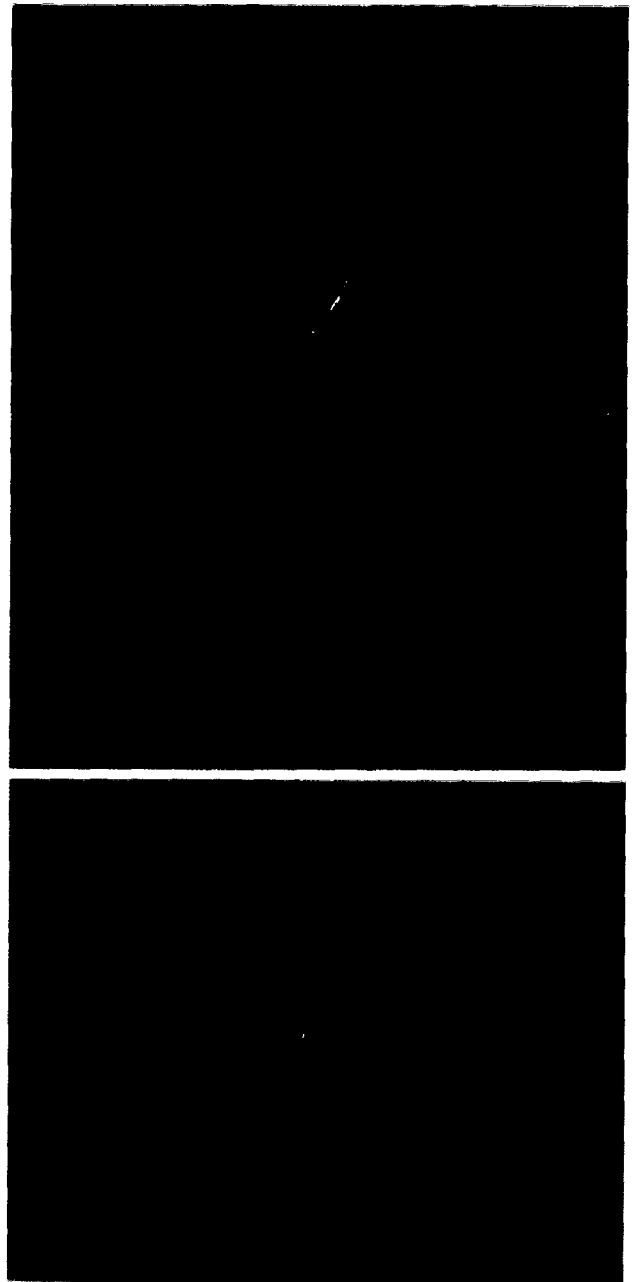


Fig. 1. Symptoms of *Phloeospora* leaf spot on *Spiraea prunifolia* var. *simpliciflora* caused by *Phloeospora spiraeicola*. Note the small necrotic spots scattered on leaves (a) and dark brown spots surrounded by yellowish haloes (b).

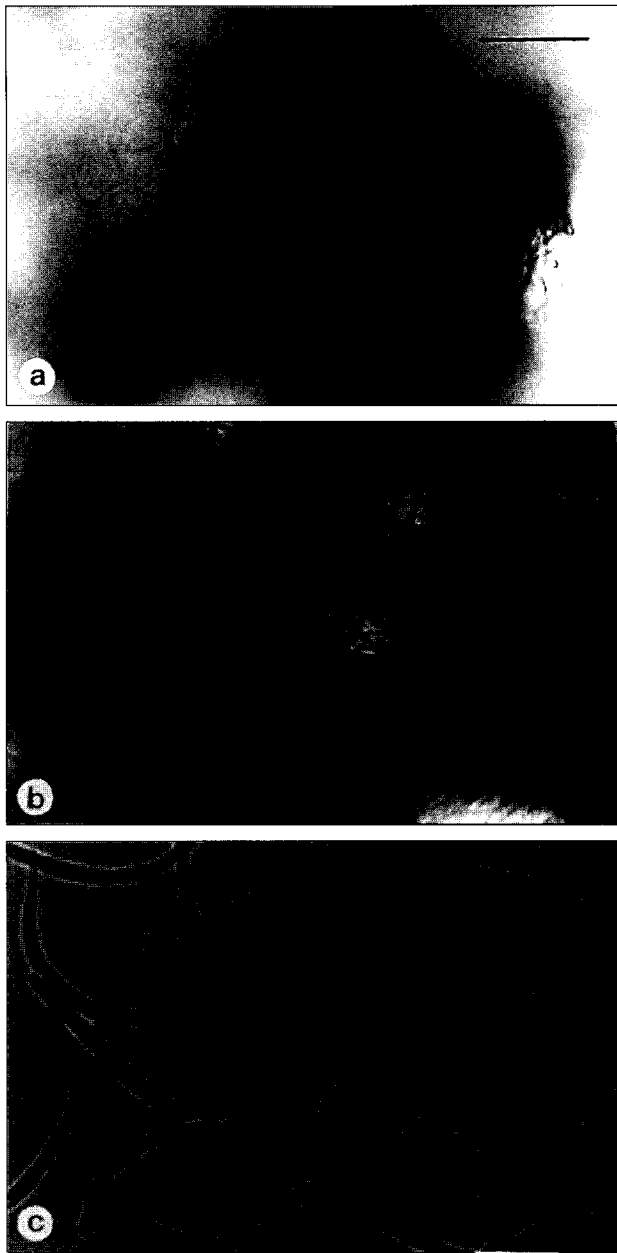


Fig. 2. Photomicrographs of *Phloeospora spiraeicola*. (a) Acervulus formed on the upper surface of the infected leaf. (b) Acervuli producing numerous conidia. (c) Conidia. Scale bars represent 50 μm .

(Fig. 2c). A teleomorphic state of the fungus was not found although many overwintered leaves were examined.

These morphological characteristics of the fungus are in accordance with those of *Cylindrosporium spiraeae-thunbergii* Miura ex Tak. Kobayashi in most aspects (Kobayashi et al., 1979) and very similar to those of *Phloeospora spiraeicola* (Ellis & Everh.) Bubák (formerly, *Cylindrosporium spiraeicolum* Ellis & Everh.) (Fergus, 1957). The descriptions of these two species appear to be conspecific.

Table 1. Comparative morphology of several *Phloeospora* (*Cylindrosporium*) spp. recorded on *Spiraea* and the present isolate

Characteristics	Present isolate ^a	<i>Cylindrosporium spiraeae-thunbergii</i> ^b	<i>Phloeospora spiraeicola</i> ^c	<i>Cylindrosporium filipendulae</i> ^d
Acervulus				
position	hypophyllous, occ. epiphyllous	hypophyllous, occ. epiphyllous	epiphyllous, occ. epiphyllous	hypophyllous
dimension (μm)	56~184	70~125	not described	140~320
Conidia				
morphology	filiform, mildly curved	filiform, usu. curved	filiform	filiform
color	hyaline to subhyaline	hyaline to pale brown	hyaline	hyaline
dimension (μm)	42~104 \times 2~4	18~68 \times 2~3.5	35~70(~100) \times 3~3.5(~5)	35~45(~50) \times 2~3(~3.5)
septation	2~3(~4)	1~6	3~5	1

^aThe present authors.

^bKobayashi et al. (1979).

^cEllis & Everhart (1897), partly emended by Fergus (1957).

^dThümen (1878), partly emended by Fergus (1957). Now named as *Phloeospora filipendulae*.

Although there are minor differences in conidial length and septation (Table 1), they are not clearly distinguished from each other. Since *C. spiraeicolum* antedates *C. spiraeae-thunbergii*, the latter should be considered a synonym under nomenclatural rule. Most of the species formerly included in *Cylindrosporium* with multiseptate conidia were transferred to the genus *Phloeospora* (Sutton, 1980). Therefore, *Phloeospora spiraeicola* is the correct name of current use for the fungus collected in Korea.

To prove the pathogenicity of the fungus, the inoculum was prepared by inducing sporulation of the fungus on leaves of natural infection, holding leaves overnight in a moist chamber. Conidia were dislodged from the lesions of leaves by vigorously shaking the leaves in sterile water with a drop of Tween 20. The concentration of spore suspension was adjusted to approximately 10^4 spores/ml. The inoculum was sprayed onto the leaves of detached shoots. Each shoot (15 cm long) with 2 mature leaves was dipped in water to maintain the vigor of the leaves. Inoculated plants were kept at about 25 °C for 48 hr under moist condition within a plastic box covered with shade screen and then moved on a laboratory bench of room temperature. A total of 3 shoots were used for pathogenicity test. In addition, two shoots of the plant were sprayed with sterile water as control and maintained under the same condition.

Characteristic spots were noticed on the leaves inoculated with conidial suspension 2 days after treatment. The spots were similar to those of naturally infected leaves. Forma-

tion of acervuli was found 7 days after inoculation and the conidia were profusely formed within acervuli. Morphological characteristics of the acervulus and conidia examined from inoculated leaves were in agreement with those of naturally infected leaves. On the other hand, there were no visible spots on the leaves sprayed with sterile water up to 7 days after treatment.

This is the first record of a leaf spot on *S. prunifolia* var. *simpliciflora* in Korea. We collected the infected leaves from several locations and preserved them in the mycological herbarium (SMK) at Korea University. They are SMK 11819 (1 VIII 1992, Kangnung), 14262 (27 IX 1997, Chunchon), 14846 (19 VIII 1998, Chunchon), 15111 (18 IX 1998, Chinju), 15243 (24 IX 1998, Kangnung), and 15487 (15 X 1998, Seoul).

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