

Leaf Blotch of *Allium fistulosum* Caused by *Cladosporium allii-cepae*

Hyeon Dong Shin*

Department of Horticulture, Kangnung National University, Kangnung 210-702, Korea

*Cladosporium allii-cepae*에 의한 파 누른무늬병

신 현 등*

강릉대학교 산업대학 원예학과

ABSTRACT : Leaf blotch of Welsh onion was observed at a farmer's field at Kangnung in July 1990. Further collection of the diseased materials was made in 1993 and 1994. The symptom initially appeared as discolored spot and later yellowish blotch with the long axis parallel to the leaf veins, which turned to sooty colored concentric lesion due to heavy production of conidiophores and conidia. *Cladosporium allii-cepae* (Ranojevic) M. B. Ellis was repeatedly isolated from the leaf lesions. Healthy Welsh onion inoculated with conidial suspension of the fungus produced the typical symptom 10 days after inoculation. Koch's postulates were fulfilled by reisolation of the fungus. This is the first report of a *Cladosporium* leaf blotch of Welsh onion in Korea.

Key words : Welsh onion, *Cladosporium allii-cepae*, leaf blotch.

Occurrence of leaf blotch of Welsh onion (*Allium fistulosum* L.), one of the 10 major vegetables in Korea, was observed at a farmer's field at Kangnung in July 1990. Further survey of Welsh onion in farmers' fields at Kangnung and Daekwallong areas revealed that the disease was common during the cool rainy summer. During the hot dry seasons in the summer of 1991~1992, however, no similar symptoms were noticed at the same areas. In the cool rainy seasons of 1993 and 1994, leaf blotch of Welsh onion was again collected at the two different locations of Kangnung.

The symptom initially appeared as discolored spot and later yellowish blotch with the long axis parallel to the leaf veins, which turned to sooty colored concentric lesion due to heavy production of conidiophores and conidia (Fig. 1-①, ②).

A species of *Cladosporium* was repeatedly isolated from leaf lesions. The morphological characteristics of the causal fungus were as follows: Conidiophores were solitary or 2~5 in a divergent fascicle emerging from small stromata, cylindrical, unbranched but very occasionally branched, 0~3 times geniculate, swollen at the base, 2~6 septate, usually darker

than conidia in color, brown to olivaceous brown but paler upwards, 120~225×9~13.5 μm, conidial scars inconspicuous and unthickened but finely papillated at the final apex. Conidia were solitary or very rarely in short unbranched chains, cylindrical or clavate, rounded at one or both ends, finely papillated at the base, pale brown to pale olivaceous brown, verruculose, somewhat narrower at the center and broader at both end cells, (0-)1-2(-4) septate, not constricted at the septa, 22~94(~130)×10~16 μm. The morphology of conidiophores and conidia was shown in Fig. 1-③, ④, ⑤. The materials examined are deposited in the mycological herbarium SMK (Kangnung National University, Korea) and HAL (Martin-Luther Universität, Halle, Germany). They are SMK 10332 (16 VII 1990, Ponam-dong, Kangnung), SMK 12523 (11 VIII 1993, Chibyon-dong, Kangnung), and SMK 12964 (4 IX 1994, Hoesan-dong, Kangnung).

The fungus was in accordance with the description of *C. allii-cepae* (Ranojevic) M. B. Ellis (1, 6, 7). It was previously reported on onion (*Allium cepa* L.) in Europe (6, 7, 9) and on Welsh onion in Japan (3). According to S. Sugiyama of Japan (1993, personal communication), *C. allii* (= *Heterosporium allii*) on Welsh onion of the previous records in Japan

*Corresponding author.

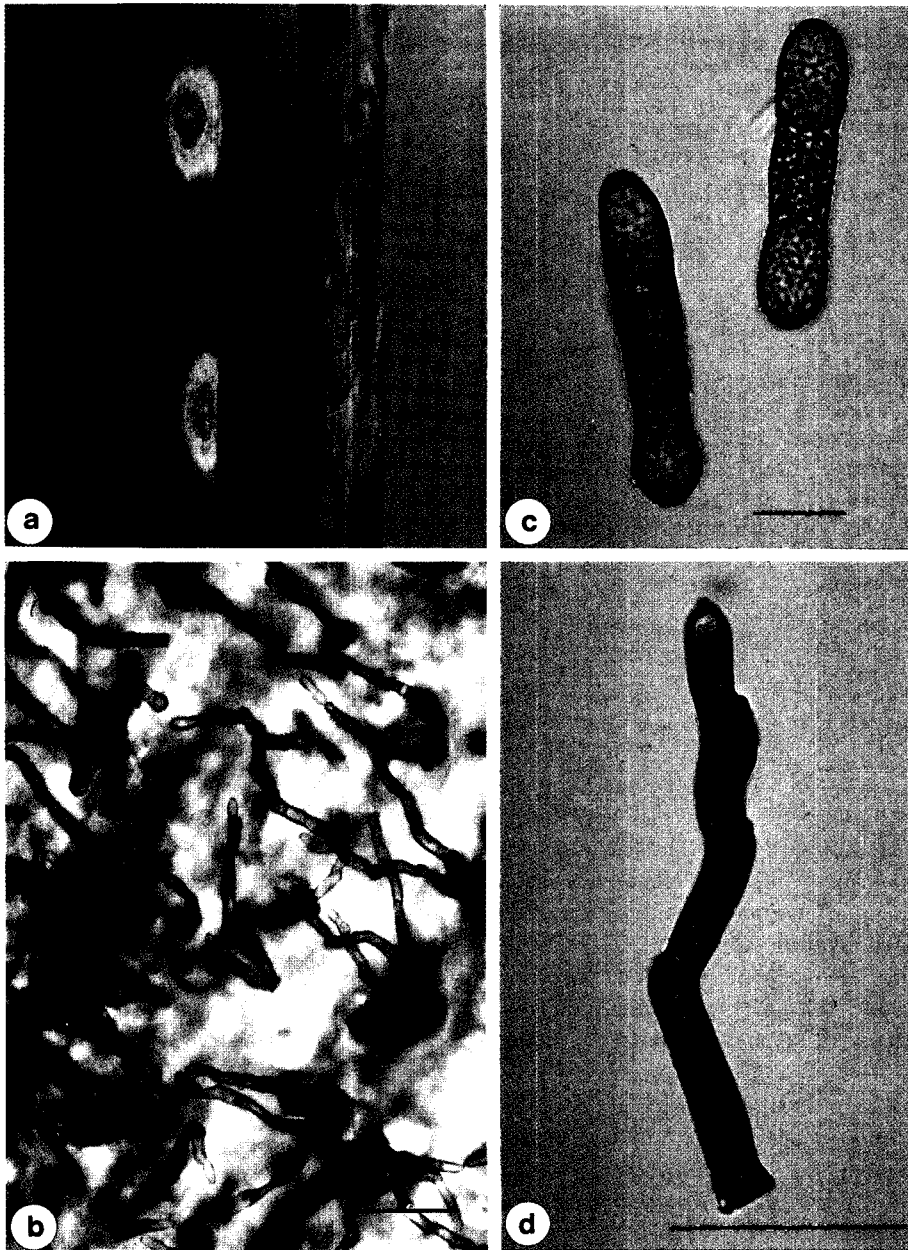


Fig. 1. Ⓐ Symptom of *Cladosporium* leaf blotch on Welsh onion. Ⓑ Mass production of conidiophores and conidia on leaf lesion (bar=100 μ m). Ⓒ Conidia (bar=20 μ m). Ⓓ Conidiophore (bar=50 μ m).

(2.4) is thought to be *C. allii-cepae* rather than *C. allii* (5) in view of morphological description of the causal fungus as well as disease symptoms. Recently he collected *C. allii-cepae* from Welsh onion showing leaf blotch, which supported his assumption.

Inoculation of healthy Welsh onions with con-

dial suspension of the pathogen (ca. 10^4 conidia/ml) prepared from leaf lesions produced the typical symptom in a humid chamber at the daily temperature of 15~25°C about 10 days after inoculation. Small yellowish spots were developed and enlarged into typical blotch as observed in the field. Koch's

postulates were fulfilled by reisolation of the fungus.

Occurrence of the disease seems to be occasional only during the cool rainy season, causing little economic loss at present. In Korea, *C. allii* was recorded as a causal fungus of leaf blotch in garlic (8) but no *Cladosporium* spp. from Welsh onion. Therefore, this is the first record of the *Cladosporium* leaf blotch on Welsh onion in Korea.

요 약

1990년 7월 강릉의 농가포장에서 파에 누른무늬를 형성하는 병반이 다수 관찰되었으며, 1993년과 1994년에도 동일병반을 나타내는 이병엽을 채집하였다. 병반이 처음에는 엽맥을 따라 둥글고 긴 모양의 누른무늬가 생기고 이어 병반의 안쪽에 분생자경 및 분생포자가 밀생하면 회갈색 내지 진갈색 동심원상의 병징을 보였다. 이러한 병반에서는 모두 *Cladosporium allii-cepae* (Ranojevic) M. B. Ellis가 관찰되었다. 병반으로부터 모은 분생포자 현탁액을 건진한 파에 분무접종한 결과 접종 10일 후부터 작은 점이 생기고 이어 전형적인 누른무늬 병징이 나타났다. 이 병반으로부터 동일한 병원균이 재분리되어 Koch의 원칙이 성립되었다. 이 병은 파에서 누른무늬를 형성하는 병징이 가장 특징적이었으므로 병명을 누른무

늬병(黃斑病)으로 제안한다.

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