

Colletotrichum coccodes Found in Seeds of *Capsicum annuum* and Pathogenicity to Solanaceae Plants

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고추 종자에서檢出된 *Colletotrichum coccodes*와 가지科 植物에 對한 病原性

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ABSTRACT: *Colletotrichum coccodes* generally regarded as soil borne, was for the first time observed in seed samples of pepper (*Capsicum annuum*). Detailed descriptions were given on the habit character of the fungus and the morphology of conidia. The fungus caused anthracnose on fruits of pepper, tomato and egg plant under laboratory conditions.

KEYWORDS: *Colletotrichum coccodes*, Seed-borne, *Capsicum annuum*, Pathogenicity

Colletotrichum coccodes (Wallr.) Hughes (syn. *Colletotrichum atramentarium* (Berk. & Br.) Tauben, *Colletotrichum phomoides* (Saccardo) Chester) is a well known pathogen of plants from tropical and warm temperate areas, inciting anthracnose on different hosts (Arx, 1957; Chesters and Hornby, 1965 a, b; Mordue, 1967). Over 37 species, representing 13 families, chiefly in the Solanaceae, Cucurbitaceae and Leguminosae have been reported to be the hosts of this pathogen from all over the world (Chesters and Hornby, 1965 a, b; Mordue, 1967; Pantidou and Schroeder, 1955; Verma, 1973). In Korea, the anthracnoses of potato and tomato caused by this pathogen have been reported (Korean Society of Plant Protection, 1986), but incidence of these diseases has been sporadic. The fungus is soil borne in several crops (Farley, 1976; Mordue, 1967); it forms sclerotia on infected plants and survives in soil as sclerotia for long periods. So far, the pathogen has never been recor-

ded on seed.

During seed health testing at our laboratory, seed samples of pepper (*Capsicum annuum*) produced locally showed occurrence of this pathogen in low percentages. The purpose of this investigation is to demonstrate the presence of this fungus associated with the pepper seed and the pathogenicity of this fungus to Solanaceae plants.

Materials and Methods

Seed Health Tests

Fifteen seed samples were tested on moistened blotters. Twenty-five seeds were spaced in each of 16 plastic Petri dishes (9 cm diameter) and incubated under 12 hours of alternating cycles of near ultraviolet light (NUV) and darkness at 20°C. Observations were made under stereo-binocular microscope on the habit characters of the fungus after 7 days of incubation. Preparations from the acervuli

were studied under the compound microscope to record the shape and size of conidia, and of setae. Isolations of the pathogen were made directly from the infected seeds on potato-dextrose agar(PDA) and v-8 juice agar.

Infection Experiments

Three isolates of this pathogen were tested for pathogenicity to injured fruits of Solanaceae plants. Greenhouse-grown fruits of pepper(cv. Hongsanho), tomato(cv. Seokwang) and egg plant(Local var.) were washed with tap water,

rinsed with distilled water, and allowed to air dry. These fruits were injured with sterilized needle and sprayed with spore suspension(10^6 spores/ml) made from cultures grown on v-8 juice agar in light(Barksdale, 1967). After inoculation, the fruits were placed in moist chambers on wet paper towels and incubated at 25°C.

Results and Discussion

Descriptions of *Colletotrichum coccodes* on

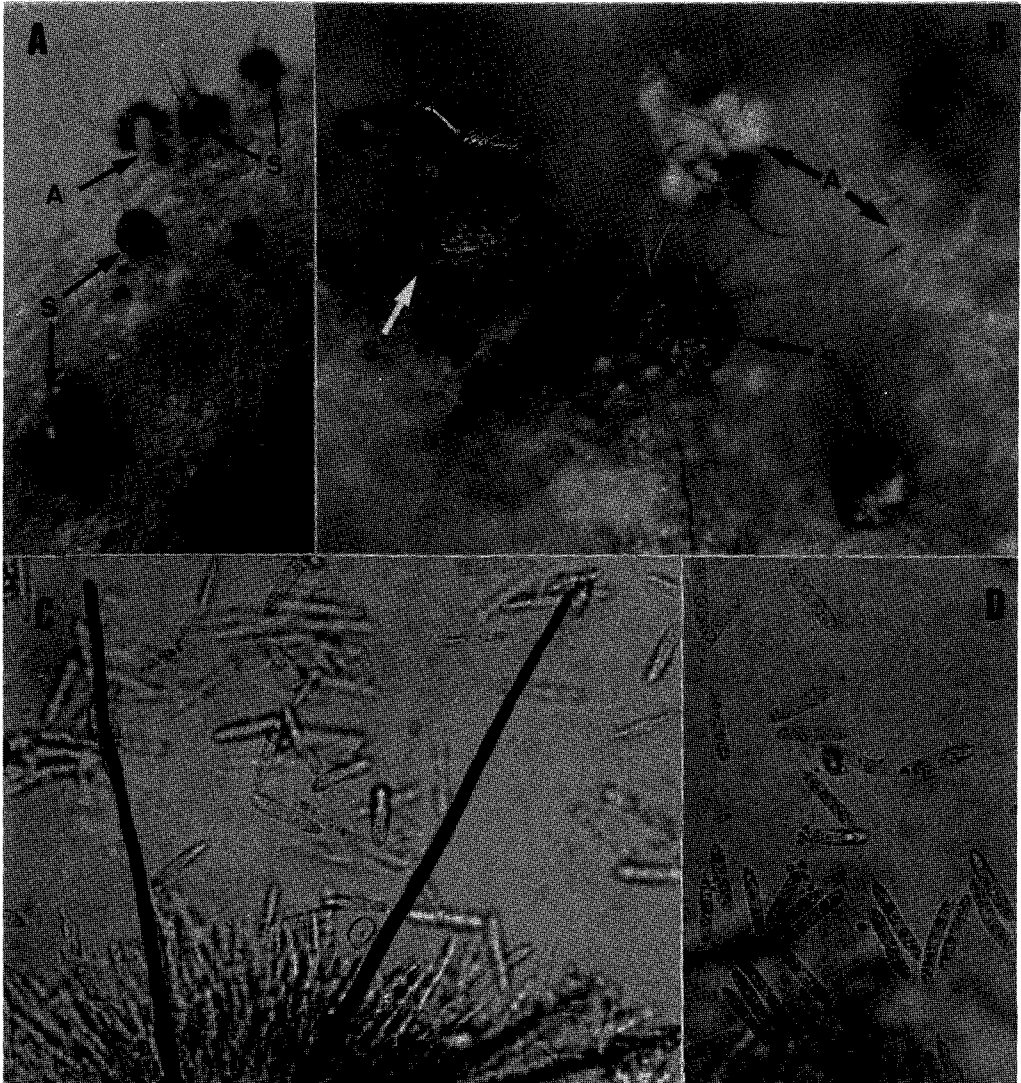


Fig.1. *Colletotrichum coccodes*. A & B: Acervuli(A) and sclerotia(S) on pepper seed under stereo-microscope. C & D: Acervulus and conidia under compound microscope. A, x40. B, x100. C & D, x400.

Pepper Seed

Habit Characters on Seed(under stereo-binocular microscope): Acervuli single or in groups, rounded or elongated. Setae mostly numerous, rarely inconspicuous, brown to brownish black, septate. Conidial mass dull white to salmon orange. Blackish brown, setose sclerotia usually abundant. Mycelium mostly absent(Fig.1-A,B).

Conidia(under compound microscope): Hyaline, aseptate, straight, cylindrical with obtuse ends, 20-26 x 3-4 μ, formed from unicellular hyaline cylindrical phialidic conidiophores(Fig.1-C,D).

Detection in Seed Samples

Out of 15 seed samples tested, 2 samples were found infected with *C. coccodes*. The percentage infection was low, ranged 1-2%.

Although *C. coccodes* has been known to be an important pathogen of different hosts including Solanaceae(Chesters and Hornby, 1965 a, b; Mor-due, 1967; Verma, 1973), it has never been found in seed. It is the first time that this fungus has been found in seeds. The fungus forms sclerotia and acervuli on seed of pepper in the blotter test and is very easy to recognize by its setose sclerotia. Since the fungus is seed-borne, the pathogen may easily introduced into areas where it is not known.

Pathogenicity

On green fruits of pepper, only one isolate caused dark brown to black lesions 6 days after inoculation. Later these lesions slowly increased in size and became sunken. On red fruit of pepper, all the 3 isolates produced more severe symptoms(Table 1). Dark brown to black lesions were developed 5 days after inoculation. Later these lesions increased in size, coalesced with other lesions involving larger fruit areas. On fruits of tomato and egg plant, the initial sunken symptoms were formed 5 days after inoculation. As the lesions increased in size, coalescence took place and all the fruit became completely infected. Control fruits of the three hosts did not show any symptoms of disease during the course of the pathogenicity tests. *C. coccodes* was invariably re-isolated from inoculated fruits.

Although *C. coccodes* has been known in Korea(Korean Society of Plant Protection, 1986) under the name *C. atramentarium*(potato anthracnose) and *C. phomoides*(tomato anthracnose), the role of the fungus in causing disease in red

Table I. Pathogenicity of *Colletotrichum coccodes* isolated from pepper seeds to fruits of pepper, tomato and egg plant.

Isolate	Pathogenicity to ^a			
	Pepper		Tomato fruit	Egg plant fruit
	Green fruit	Red fruit		
C-1	- ^b	++	++	++
C-2	+	++	++	++
C-3	-	+	+	++
Control	-	-	-	-

a: Greenhouse-grown fruits of each plant were injured with sterilized needle and sprayed with spore suspension(10⁶ spores/ml). After inoculation the fruits were placed in moist chambers on wet paper towel, incubated at 25°C for 7 days and observed symptom development.

b:-: no symptom developed, +: symptom developed slowly, and ++: severe symptom developed rapidly.

pepper under such conditions remains to be established through proper field surveys and isolations of the pathogen from growing crops.

摘 要

土壤傳染性菌으로 알려진 *Colletotrichum coccodes* 가 고추 種子에서 처음으로 檢出되었다. 이 菌의 種子上에서의 生育相과 分生孢子의 形態의 特徵을 記 術하였다. 病原性 實驗의 結果 이 菌은 고추 뿐 아 니라 토마토, 가지의 열매에 炭疽病을 일으켰다.

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