

Occurrence of *Alternaria cassiae* in Seeds of Sickle Senna in Korea

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Alternaria cassiae Jurair & Khan was recorded on seeds of sickle senna (*Cassia tora* L.). Seed infection ranged from 25~45% in two samples. Developing roots and shoots turn brown and died in case of severe infection. Detailed descriptions were given on the habit characters of the fungus and on the morphology of conidiophores and conidia. This is the first report of *A. cassiae* on seeds of *Cassia*.

KEYWORDS: *Alternaria cassiae*, *Cassia tora*, Habit characters, Morphology, Seed-borne

Sickle senna, *Cassia tora* L., is a member of Leguminosae and is well known as a medical crop in Korea. The seeds of the plant are also used as a beverage by infusion in hot water. So far only *Fusarium oxysporum* Schlecht and *Macrophomina phaseoli* (Maubl.) Ashby have been reported as fungal pathogens of the plant in Korea (Anonymous, 1998; Chung *et al.*, 1977).

During the study of seed-borne fungi in Korea, seed samples of sickle senna were found to be infected with a species of *Alternaria*. The *Alternaria* sp. fitted the description of *A. cassiae* Jurair and Khan (David, 1991; Simmons, 1982). *A. cassiae* is a well-known pathogen of *Cassia* or sicklepod in many countries (David, 1991; Simmons, 1982), however information on the pathogen is currently lacking in Korea.

The objective of the present study was to demonstrate the presence of this fungus associated with the sickle senna seeds collected from Korea.

Seed health testing. Seven seed samples were tested by the standard blotter method (ISTA, 1976). Two hundred seeds of each sample were plated in plastic Petri dishes on three layers of water-soaked blotters at the rate of 25 seeds per dish, and incubated under 12 hr 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. Conidiophore and conidial morphology was studied under the compound microscope where details of the shape, colour, size, septation etc. were noted.

Habit characters on seed. Colony amphigenous, woolly or slightly fluffy, olivaceous brown to dark brown, producing conidia mostly solitary, sometimes in chains of two (Fig. 1). Developing roots and shoots turn brown and the

seedlings died in case of severe infection.

Morphological characteristics. Conidiophores solitary or in groups, straight or slightly curved, simple or sometimes branched, more or less cylindrical, septate, pale brown, smooth-walled, usually with a single terminal conidiogenous site, sometimes proliferating sympodially and geniculate with 1~3 pigmented former conidium attachment sites, 30~150 µm long, 4~7 µm wide (Fig. 2). Conidia straight or slightly curved, muriform, obclavate to long ellipsoid, or narrowly ovoid, light to dark brown, verrucose to verruculose when juvenile, becoming smooth at maturity, many have a filiform beak, some are beakless (erostrate) with conoid apical cell, some others have a apical secondary conidiophore (pseudorostrate), analogously to the beak; conidium body 40~105×16~27 (~37) µm, with 6~11 transverse septa and 1 to several longitudinal or oblique septa in a few of the transverse divisions, slightly constricted at the transverse septa; the beak long, filiform, unbranched, hyaline to pale brown, the point of transition from spore body to beak is definite and conspicuous, 30~150 (~230) µm long, 2~3 µm wide along most of its length; secondary conidiophores terminates abruptly from its site of origin in the body apex, 12~40 µm long, 5~6 µm wide, sometimes the tip of a beak converted into a secondary conidiophore ca. 10~12 (~30) µm long (Fig. 2). The above characteristics fitted well to the description of *A. cassiae* Jurair & Khan by David (1991) (Table 1) and Simmons (1982).

Detection in seed samples. Out of seven seed samples tested, two samples were found to be infected with *A. cassiae*. The percentage infection was relatively high, ranged 25~45%.

Although *A. cassiae* has been known to be an important pathogen of *Cassia* (Boyette, 1988; David, 1991), it has never been recorded on seeds. This is the first report

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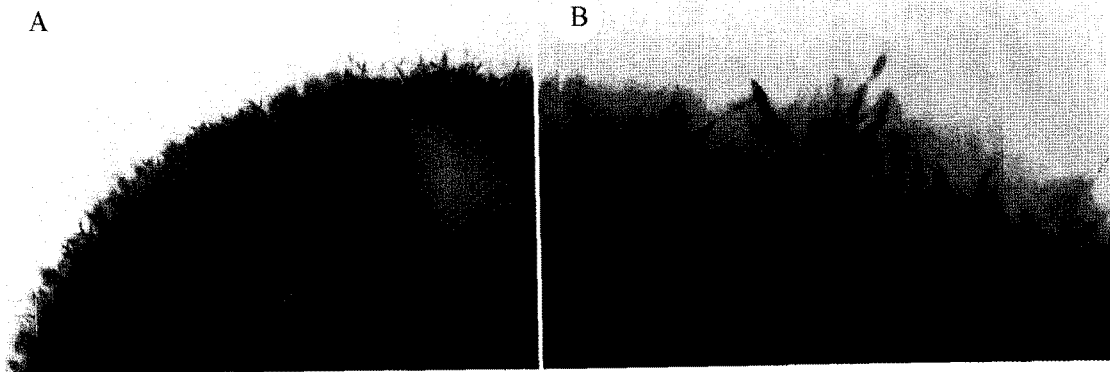


Fig. 1. Heavy growth of *Alternaria cassiae* on sickle senna seeds. (A), $\times 40$. (B), $\times 100$.

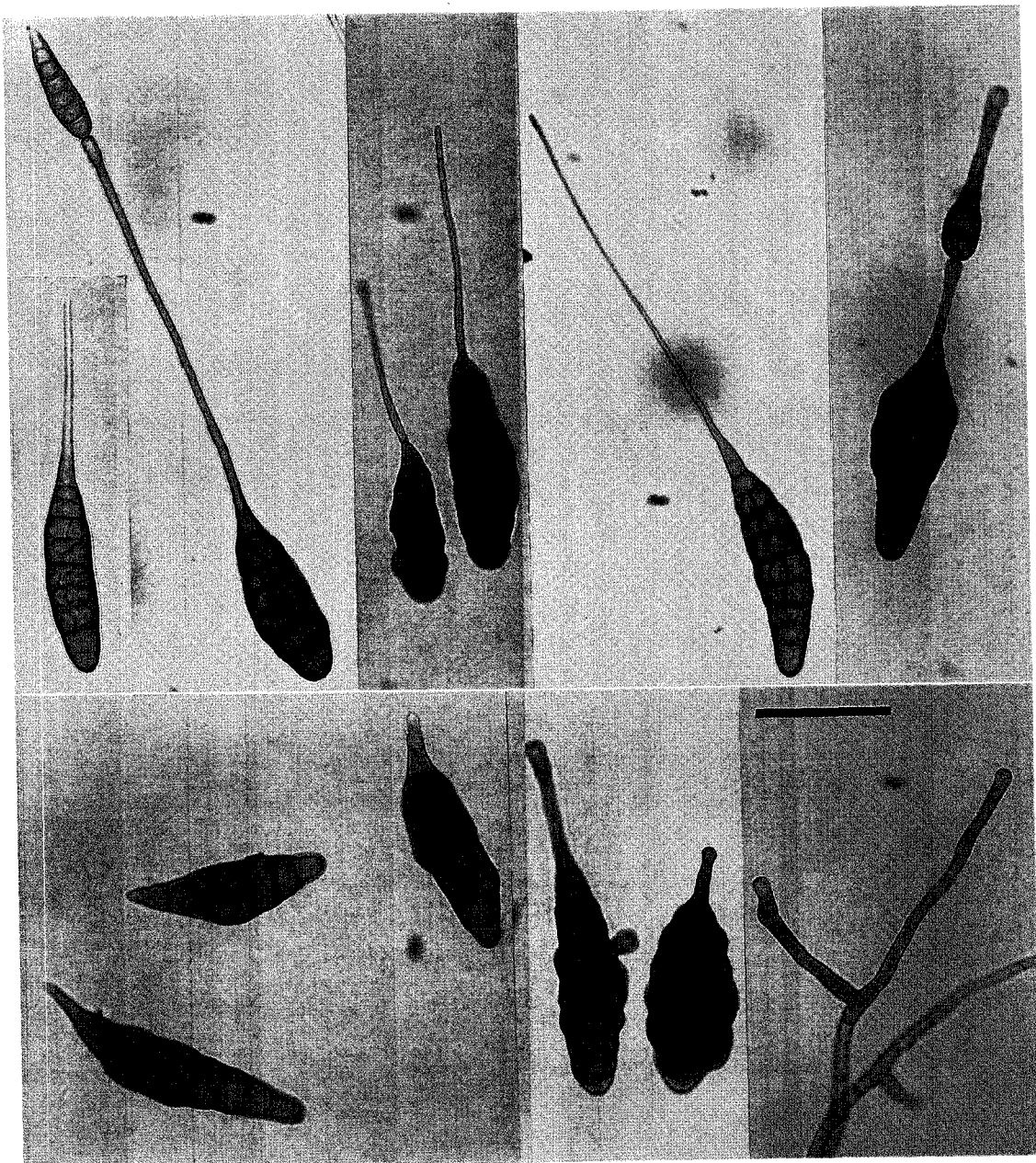


Fig. 2. Conidiophores and conidia of *Alternaria cassiae* isolated from sickle senna seeds. Bar = $50 \mu\text{m}$.

Table 1. Comparison of characteristics of conidiophores and conidia of the fungus isolated from sickle senna seeds with previously described *Alternaria cassiae*

Morphological feature	Present isolate	<i>A. cassiae</i> ^a
Conidiophores		
Size	30~150×4~7 μm	36~112×4~4.5(~6.0) μm
Conidia		
Catenulation	Solitary or in chains of 2	Singly or in short chains of 2~3
Shape	Obclavate to long ellipsoid, or narrowly ovoid, many have a filiform beak, some are beakless, some others have a apical secondary conidiophore	Obclavate, muriform, having a range of beaked, non-beaked and secondary conidiophore
Color	Light to dark brown	Light to dark brown
Conidium wall ornamentation	Verrucose when juvenile, becoming smooth at maturity	Smooth-walled but slightly verrucose when young
No. of septa	6~11 transverse septa	7~12 transverse septa
Size		
Spore body	40~105×16~27(37) μm	ca. 60~90×20 μm
Beak	30~150(~230) μm	100~125(~200) μm

^aDescribed by David (1991).

of *A. cassiae* on seed of *Cassia*. The role of *A. cassiae* causing the disease of sickle senna plants under field conditions should be explored.

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