

SHORT COMMUNICATION

FIRST REPORT OF *CORYNESPORA CASSIICOLA* ON *CODIAEUM VARIEGATUM* (CROTON) IN SRI LANKA

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ABSTRACT

Corynespora cassiicola was a devastating pathogen attributed to heavy leaf fall in susceptible clones of rubber (*Hevea brasiliensis*), in the mid-eighties in Sri Lanka. It is known to have a wide host range. This is the first report of *C. cassiicola* as a leaf pathogen of croton, *Codiaeum variegatum*, an ornamental plant. This report emphasizes the possibility of *C. cassiicola* infecting new hosts which could eventually lead to the development of new and virulent strains that are pathogenic to existing tolerant rubber clones.

Key words: leaf disease, rubber, ornamental plants

INTRODUCTION

Corynespora cassiicola (Berk. and Curt.) Wei is a devastating fungal pathogen of rubber (*Hevea brasiliensis* Muell. Arg.). It has been reported from Sri Lanka since the mid-eighties, on rubber clone RRIC103 causing leaf disease (Liyanage *et al.*, 1986). The extent of damage caused by the disease was high and subsequently the infected clone was completely removed from plantations. Furthermore, later it was found that a new virulent strain was responsible for infecting another clone, RRIC110 (Jayasinghe, 1995) which was earlier known to be tolerant to the same pathogen. However, the mechanism involved in forming new pathogenic strains has not yet been revealed. Since *C. cassiicola* has a wide host range (Anon, 2007) it may have the potential to adapt to different ecosystems and sustain by occasionally producing new pathogenic virulent strains that can infect new host plants including new high yielding rubber clones.

In the early 2007, young leaves of a few plants of *Codiaeum variegatum* (L.) A. Juss. var. Bravo in the Kalutara district were observed to have reddish-brown spots or lesions (Fig. 1), resembling *Corynespora cassiicola* infections on rubber leaves. Initially, the lesions appeared as

reddish spots and later became elliptic to irregular and pale brown in the center leading to extensive necrosis. On the centre of the lesion, the fungus produced conidia similar to that of *C. cassiicola*. This paper reports the biology and pathogenicity of the fungus and the possibility of expansion of its host range, which could be a threat to the rubber plantations in Sri Lanka.

MATERIALS AND METHODS

Isolation and culture of the pathogen

The pathogen was isolated from infected leaf specimens of *C. variegatum* var. Bravo, collected from several locations in the Kalutara district (Western Province, Sri Lanka), including the premises of the Rubber Research Institute at Agalawatta. Diseased leaf specimens were surface sterilized with 70% ethanol and transferred to Petri-plates (9 cm diameter) containing Potato Dextrose Agar (PDA) medium and stored at room temperature (27 ± 2 °C) under normal light and dark conditions. Mycelia that emerged from leaf fragments were transferred on to new PDA plates and pure cultures were used for further investigations on the growth, culture and spore characteristics.

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Figure 1. Leaves of *Codiaeum variegatum* var. Bravo, showing symptoms of infection caused by *C. cassiicola*.

The pathogenicity of the isolate was confirmed according to Koch's postulates. Leaves from different varieties of *C. variegatum* were inoculated with 10 μ l drops of a conidia suspension containing 10^3 conidiospores ml^{-1} , obtained from a pure *C. cassiicola* culture. Inoculated leaves were maintained in moist chambers at room temperature under normal light and dark conditions.

C. cassiicola cultures grown on PDA for 6 days were used to investigate the culture characteristics and for preparing microscopic slides for subsequent investigation of conidial characteristics. Length and width of about thirty randomly selected conidiospores were measured.

Test for pathogenicity of *C. cassiicola*

Leaves from different varieties of *C. variegatum* and the rubber clone RRIC110 which is susceptible to *C. cassiicola* were inoculated with 10 μ l drops of a conidia suspension containing 10^3 conidiospores ml^{-1} , obtained from a pure *C. cassiicola* culture. Inoculated leaves were maintained in moist chambers at room temperature under normal

light and dark conditions. Each treatment consisted of 6 replicate leaves. Controls were inoculated with sterilized distilled water.

RESULTS

Colony and conidiospore characteristics

Colonies on PDA were effuse, grey or brown (Fig. 2a). The underneath was grey or black (Fig. 2b). Conidiophores were cylindrical, straight or curved and un-branched, 3-10 septate, smooth and pale brown. Conidia were variable in shape, isolated or forming acropetal chains, 27-192 μm long and 5-10 μm thick, with a rounded apex and truncate base, 5-14 pseudoseptate, yellowish brown and smooth (Fig. 2c,d). They were similar to the conidia of *C. cassiicola* as described in the Commonwealth Mycological Institute descriptions of pathogenic fungi and bacteria (Ellis and Holiday, 1971). Leaves inoculated with *C. cassiicola* developed lesions (Fig. 3) two days after inoculation from which the fungus was successfully re-isolated.

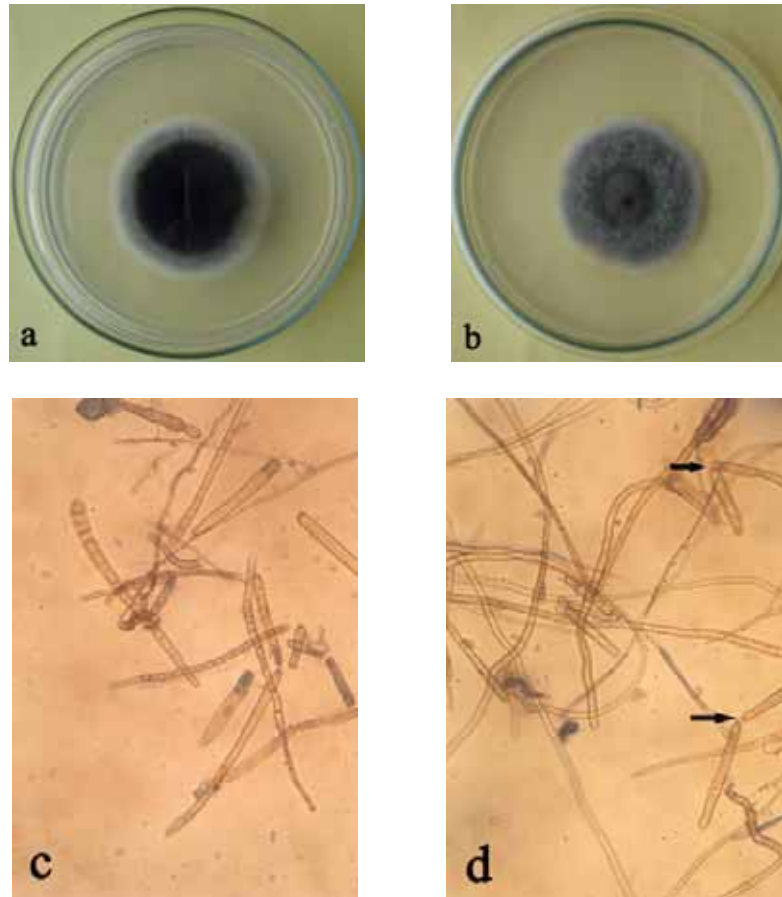


Figure 2. a) Lower and b) Upper view of *C. cassicola* obtained from *C. variegatum* and grown on PDA, c) Conidiospores of *C. cassicola*, d) Conidia forming acropetal chains ($\times 400$).



Figure 3. Leaves of *C. variegatum* varieties and rubber inoculated with *Corynespora cassicola* (a) *Var. Philip Geduldig*, (b) *Var. Bravo* and (c) Rubber clone RRIC110, showing symptoms caused by *C. cassicola*.

DISCUSSION

This is the first record of *C. cassiicola* on *C. variegatum*. The fungus has not been reported previously on this host in the list of 'Diseases of foliage plants' of the American Phytopathological Society (Chase, 1993). Therefore, this finding represents another addition to its host range.

Presence of *C. cassiicola* on this particular croton variety was first detected in the first quarter of year 2007. Other varieties of *C. variegatum* could also be infected, since there are numerous *C. variegatum* varieties in Sri Lanka. In the event of an expansion of the host range of *C. cassiicola*, it is required to critically investigate the available strains for possible infection of tolerant rubber clones. Since *C. cassiicola* causes leaf fall disease in susceptible rubber clones, further studies are required to find out whether virulent strains of *C. cassiicola* could develop from such new strains or cross infections to new hosts could occur. Furthermore, the expansion of the host range of *C. cassiicola* on the existing rubber cultivation may enhance the infection of alternate hosts of *C. cassiicola*. The inoculum density of *C. cassiicola* could be a critical factor that favours its establishment on rubber. When the host range of *C. cassiicola* expands, the inoculum density of *C. cassiicola* may increase, and thereby it can increase the incidence of new infections in rubber.

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REFERENCES

- Anon. (2007). USDA Agriculture Research Service Fungal Data Base *Corynespora cassiicola*. <http://nt.ars.grin.gov/fungaldatabases>.
- Ellis, M.B. (1976). More Dematiaceous Hyphomycetes. Commonwealth Mycological Institute, Kew, Surrey, UK 507p.
- Ellis, M.B. and Holiday, P. (1971). Commonwealth Mycological Institute Descriptions of pathogenic fungi and bacteria No. 303 *Corynespora cassiicola*.
- Jayasinghe, C.K. (1995). Review of the Plant Pathology and Microbiology Department. *Annual Review of the Rubber Research Institute of Sri Lanka* 53-72 Pp.
- Liyanage, A. De S., Jayasinghe, C.K., Liyanage, N.I.S. and Jayaratne, A.H.R. (1986). *Corynespora* leaf spot disease of rubber (*Hevea brasiliensis*) – A new record. *Journal of the Rubber Research Institute of Sri Lanka* **65**: 47-50.