

Collar Rot and Leaf Spot of Leea Caused by *Calonectria crotalariae*

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ABSTRACT

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Collar rot and leaf spot of leea at Keaau on the island of Hawaii were caused by *Calonectria crotalariae*, which also caused collar rot of papaya planted in the same area.

Leea (*Leea coccinea* Planch.) is commercially grown in Hawaii for export as an ornamental potted plant. Wilting and death of leea plants established for seed production at Keaau on the island of Hawaii were first noticed in December 1978. Diseased plants had black and rotted basal stem and crown roots that frequently were covered with many orange-red perithecia. A fungus indistinguishable from *Calonectria crotalariae* (Loos) Bell & Sobers, the causal organism of collar rot of papaya (*Carica papaya* L.) growing in the same area (4), was frequently isolated from the advancing margin of lesions. *C. crotalariae* was also consistently isolated from blackish brown, circular spots 5–10 mm in diameter on leaves of leea; the lesions were first observed in the same nursery in May 1979. We report here the new disease of leea caused by *C. crotalariae*.

MATERIALS AND METHODS

Isolation. Diseased tissues (about 10 × 5 × 2 mm) from the advancing margins of basal stem rots of leea were surface-sterilized with 0.5% sodium hypochlorite solution for 3 min, rinsed with sterile distilled water, and plated on 10% V-8 juice agar (10% V-8 juice, 0.02% CaCO₃, and 2% Bacto agar). Infected leaf tissue was dipped into 0.5% NaOCl in 1:2,000 Tween 20 solution for 2–3 sec, and plated

Table 1. Pathogenicity of *Calonectria crotalariae* isolated from leea and papaya

Source of isolate	Pathogenicity on roots and collar (% Seedlings killed) ^a		Pathogenicity on lea leaves ^b
	Leea	Papaya	
Leea collar	100	43	+++
Leea leaf	100	71	+++
Papaya collar	43	100	+

^a A total of 14 seedlings were inoculated.

^b +++ = Strongly pathogenic, causing numerous leaf spots; + = weakly pathogenic, causing relatively few spots.

on water agar.

Pathogenicity tests. For root inoculation, isolates of *C. crotalariae* were grown in a chopped potato and soil mixture (3) for 2 wk at 25 C. This inoculum was mixed with a natural sandy loam soil (1:5) and placed in plastic pots (10.5 cm diameter). Leea or papaya seedlings 1 to 2 mo old were transplanted singly into infested soil. Seedlings transplanted into uninfested soil were used as controls. Seven replicates were used and the experiment was repeated once.

For foliar inoculation, *C. crotalariae* was grown on 10% V-8 juice agar for 1–2 wk at 25 C. Conidia suspended in 1:2,000 Tween 20 solution were adjusted to 10⁴–10⁵ spores per milliliter and sprayed onto leea leaves until runoff.

Inoculated plants were incubated at moisture saturation for 24 hr followed by 6 days on a greenhouse bench. Control plants were sprayed with 1:2,000 Tween 20 solution and incubated in the same manner.

RESULTS AND DISCUSSION

Symptoms. Yellowing and senescence of leaves were the early symptoms of collar rot of leea. These were followed by wilting and death of infected plants as basal stem and crown roots turned black and

rotted. Orange-red perithecia frequently were observed on infected tissues near the soil line. On infected leaves 4- to 7-mm diameter circular spots developed and became dark brown to black with a narrow chlorotic border.

Pathogenicity. Isolates of *C. crotalariae* obtained from infected collar and leaf tissues of leea and collar tissues of papaya caused yellowing, wilting, and death of leea and papaya seedlings; control seedlings remained healthy at the end of the experiment. Isolates of *C. crotalariae* from leea appeared to be more pathogenic to leea than to papaya, but the fungus from papaya was more virulent on papaya than on leea (Table 1). *C. crotalariae* was reisolated from inoculated leea and papaya seedlings, and orange-red perithecia were observed on the basal stems of inoculated leea and papaya.

All isolates of *C. crotalariae* tested caused leaf spots on leea similar to those that occurred in the field (Table 1). Some artificially inoculated plants showed brown to black leaf spots with marked zonation and girdling of leaflet stalk, rachis, and petiole, which resulted in leaf drop. Leea isolates were more destructive than the papaya isolate to leea leaves. *C. crotalariae* was reisolated from spots caused by all three isolates. No spots developed on leaves of control plants.

Our results suggest that collar rot and leaf spot on leea are caused by the same *C. crotalariae* that causes collar rot of papaya in the same area. In Hawaii, *C. crotalariae* also causes collar rot of koa (*Acacia koa* Gray) in the forest (1) and seedling blight of ohia (*Metrosideros collina* (Forst.) Gray subsp. *polymorpha* (Gaud.) Rock) in the greenhouse (2).

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