

FOLIAR BLIGHT OF *CENTROSEMA PUBESCENS* (BENTH) AT IBADAN IN THE LOWLAND HUMID TROPICS

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ABSTRACT

The aetiology and epidemiology of leaf blight of centro (*Centrosema pubescens* Benth) was investigated at Ibadan in the lowland humid tropics of Nigeria. *Rhizoctonia solani* was associated with the leaf blight of centro. The pathogen was harboured by itchgrass (*Rottboellia cochinchinensis* (Lour) Clayton), a weed growing within and outside the centro plot. High inoculum population of $4.0 \pm 0.3 \times 10^6$ /g soil was estimated in the soil. The seed of centro were free of *R. solani*. Field infection of the disease occurs during the peak of the rainy season beginning in patches which later spread causing extensive defoliation of the sward.

KEYWORDS

Leaf blight, *Centrosema*, epidemiology, aetiology, *Rhizoctonia solani*, *Rottboellia cochinchinensis*

INTRODUCTION

Centro has hitherto been one of the most popular forage legumes in southern Nigeria (McIlroy, 1972). In recent studies (Cobbina, 1992; Ezenwa, 1995), however, the reported potential of centro has not been confirmed due to disease infection. No disease or pest problem had been reported in centro in Nigeria. However, other workers (Sonoda et al., 1971; Lenne et al., 1981; Vergas and Lenne, 1983) have reported the occurrence of fungal and bacterial diseases of centro in different parts of the world.

This paper reports an investigation of the aetiology and epidemiology of leaf blight of centro at Ibadan in the lowland humid tropics of southwest Nigeria.

MATERIALS AND METHODS

The centro plots utilized in this study were located in the Teaching and Research Farm of the University of Ibadan (7° 20'N, 3° 50'E; 200 m above sea level), Ibadan, in the lowland humid rain-forest zone of Nigeria. The mean annual rainfall of 1150 - 1500 mm fall mainly between April - October with the major peak in June. The development of leaf blight disease in the centro plot was monitored fortnightly. Centro leaves showing symptoms of blight were collected and kept in sterile sampling bags. Soil samples were also collected (1 - 5 cm deep) randomly from the infected plots. The following weeds: *Acanthospermum hispidum* (DC), *Synedrella nodiflora* (Gaertn), *Rottboellia cochinchinensis* (Lour) Clayton, *Acalypha ciliata* (Fork), *Euphorbia heterophylla* (Linn), *Commelina benghalensis* (L) and *Chromolaena odorata* (L), found in the centro sward and within a 10-m radius with symptoms of the infection were also collected. All the samples were taken to the Plant Pathology Laboratory of the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria, for isolation of the pathogens following the methods described by Amusa (1994). The identity of the pathogen were certified using cultural, morphological and pathogenicity tests as well as comparing them with confirmed representatives of the different species.

Three week old seedlings grown in non-sterile soil contained in 15 cm-diameter plastic pots were inoculated by spraying to run-off with mycelial suspension as inoculum on the leaflets using a master hand sprayer. A drop of Tween 8 per 1000 ml inoculum was added to the mycelial suspension as a wetting agent. The control (check) plants

were sprayed with sterile distilled water.

The inoculated and control plants were incubated for 48 hr in transparent polytene bags in a mist chamber at 80 - 85% relative humidity and 22 - 25°C. The plants were then placed on a bench in the greenhouse and observed for symptoms of the disease. The pathogens were later isolated and compared with the initial isolates.

RESULTS AND DISCUSSION

The fungus associated with the blighted leaves of centro was *R. solani*. The initial observable symptoms of the disease of the plants were water-soaked lesions on the leaflets which developed into tan-coloured necrotic areas similar to the initial symptoms of web blight due to *R. solani* as reported by Sonoda et al. (1971) and Vergas and Lenne (1983) in centro and other forage species. Field infection began in patches from mid-June and by end of July over 50% of the sward were blighted. This phase was then followed by severe blighting and total defoliation. Under humid conditions, the lesions of *R. solani* develop rapidly and coalesce leading to extensive blighting and defoliation (Emechebe and Shoyinka, 1979). On two occasions, *Colletotrichum lindemuthianum* was isolated at low rates alongside *R. solani*. This might suggest that the organism is a transient resident on the plant or is a secondary invader.

Of the seven weeds growing in and around the centro plots (Table 1), only *R. cochinchinensis* harboured *R. Solani*. This weed may serve as a reservoir for the pathogen. The soil assay of the fungal pathogens revealed that *R. solani* had the highest inoculum load of $4 \pm 0.3 \times 10^6$ per g soil (Figure 1). Soil is, therefore, the major source of inoculum for infection. This is in agreement with the reported soil-borne nature of the pathogen (Onesirosan, 1977). The other fungi had between 0.5 - 2.5 x 10⁶ inoculum/g soil. The fungi found associated with centro seeds were species of *Aspergillus*, *Penicillium* and *Fusarium*. Seeds were, therefore, not a source of *R. solani* inoculum for the disease initiation.

The pathogenicity test revealed that *R. solani* induced blight on the test plants. The cultural and morphological features of the fungal isolates, when re-isolated was the same as the initial inoculum. The control plants had no symptoms of infection.

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Figure 1
Population of fungal pathogens in the soil

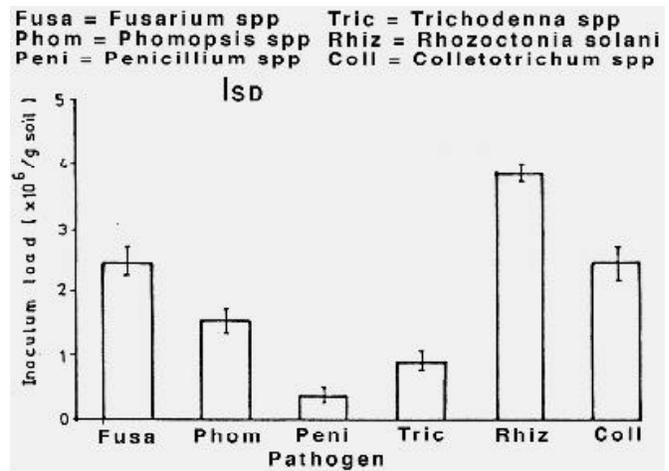


Table 1

Weeds and their fungal pathogens at various frequencies of occurrence.

Weed	Fungal pathogen	Frequency of Occurrence (%)
<i>Acanthospermum hispidum</i>	<i>Curvularia</i> spp.	75
	<i>Drechslera</i> spp.	25
<i>Synedrella nodiflora</i>	<i>Colletotrichum</i> spp.	100
<i>Acalypha ciliata</i>	<i>Colletotrichum</i> spp.	75
	<i>Curvularia</i> spp.	25
<i>Euphorbia heterophylla</i>	<i>Pestalotia</i> spp.	100
<i>Commelina beghalensis</i>	<i>Fusarium</i> spp.	20
	<i>Curvularia</i> spp.	20
	<i>Colletotrichum</i> spp.	60
<i>Rottboellia cochinchinensis</i>	<i>Cladospora</i> spp.	25
	<i>Rhizoctonia solani</i>	75
<i>Chromolaena odorata</i>	<i>Colletotrichum</i> spp.	100