

## ABSTRACT

No vertical resistance was found among the one hundred and forty-eight cultivars of Cajanus cajan (L.) Millsp. and two species of Atylosia screened for resistance against the fungus, Sclerotium rolfsii Sacc. However, some cultivars of Cajanus cajan and the species of Atylosia showed relatively high levels of tolerance to infection by the pathogen.

A screening technique, which guaranteed effective inoculation of pigeon pea plants with Sclerotium rolfsii, was developed, since it was found that the fungus did not infect the host beyond a distance of 3 cm from an inoculum food base.

Histological examination revealed that the fungus developed intercellularly with extensive tissue maceration in susceptible tissue. In contrast, fungal growth within tolerant tissue was intracellular through pits in adjacent cell walls, with no evidence of tissue maceration. Lesion expansion was rapid in susceptible tissue but was quickly limited in tolerant tissue.

Polygalacturonase activity and oxalate levels were high in culture and infected susceptible tissue extracts, compared with similar extracts of healthy and tolerant tissue, suggesting enzymic maceration of susceptible but not

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of tolerant pigeon pea tissue.

The activities of the oxidative enzymes, phenol oxidase and peroxidase, were appreciably higher in susceptible tissue and located primarily in the lesions, indicating that such activity may be associated primarily with the degeneration and death of invaded host cells rather than with limitation of lesion expansion in tolerant tissue.

Extracts from lesions on both susceptible and tolerant plants caused inhibition of mycelial growth of Sclerotium rolfsii when bioassayed, though the level of inhibition by the former was slight and lasted only for an initial period of 18-24 hr, suggesting the presence of an inhibitory substance (or substances) at different levels of concentration in host tissues susceptible and tolerant to infection by the pathogen. Healthy, uninfected tissue extracts gave no evidence of inhibitory activity. Therefore the inhibitory substance is thought to be produced in response to infection of the host plant by the fungus.

The Rf value and UV absorption spectrum, obtained on analysis of the inhibitor, indicate the presence of an isoflavanoid compound.

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