GROWTH OF *CRINIPELLIS PERNICIOSA* IN COCOA RESISTANT AND SUSCEPTIBLE TO WITCHES' BROOM

by

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Thesis presented in part fulfilment of the requirement for the Degree of Doctor of Philosophy in the Faculty of Science of the University of London.

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February 1986

ABSTRACT

The growth of two isolates representative of the two pathotype populations on cultivated cocoa of Crinipellis perniciosa, the causal fungus of witches' broom was studied in seedlings with Scavina 6 as one parent. One isolate from Pichilingue in Ecuador (pathotype A) induced significantly more hypertrophy, grew more rapidly up the plant and colonized the tissues at any one level more extensively than did the other isolate from Trinidad (pathotype B). For both isolates there were highly significant correlations between amounts of fungus in the tissues and the hypertrophy produced but no indication that they differed in their ability to induce hypertrophy. In seedlings infected with the Trinidad isolate, groups of necrotic cells associated with the intercellular hyphae of C. perniciosa were found 5 weeks after inoculation. Similar sites of necrosis developed more slowly and less frequently in seedlings infected with the Pichilingue isolate. Thus at 9 to 12 weeks after inoculation, there were significantly more sites of necrosis and more necrotic cells per site in seedlings infected with the Trinidad isolate and more unaffected hyphae in seedlings infected with the Pichilingue isolate.

When basidiospores of the two isolates were germinated in water extracts from Scavina 6 seedlings, the germ-tubes of the Pichilingue isolate were significantly longer than those of the Trinidad isolate. This difference in germ-tube growth appeared to be associated with the phenolic and alkaloid components. However, no significant correlation was obtained between the numbers of hyphal fragments in

Scavina 6 seedlings and germ-tube length in extracts of tissue from the same seedlings.

Similar studies of the two isolates in seedlings of other cocoa-cultivars further indicated the ability of the Pichilingue isolate to grow in those with Scavina 6 parentage though in others e.g. Amelonado, both isolates grew equally well.

Further tests with extracts of other cocoa cultivars were inconsistent and inconclusive. An attempt was made to study the significance of cell death in the C. perniciosa/cocoa relationship by preparing cocoa callus and cell suspensions, but the techniques used were not entirely successful.