

OCCURRENCE OF POD ROT OF CACAO CAUSED BY *COLLETOTRICHUM GLOEOSPORIOIDES* IN INDIA*

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ABSTRACT

Pod rot of cacao (*Theobroma cacao* L.) caused by *Colletotrichum gloeosporioides* was observed in severe form in three southern states of India. The fungus was isolated in pure form from rotting pods and its pathogenicity was proved on Forestero cacao pods by artificial inoculation. The symptoms of the disease are described. The pathogen caused more damage to cherelles and immature pods. This is the first reported occurrence of pod rot of cacao caused by *C. gloeosporioides* from India.

INTRODUCTION

AMONG the different pod rot diseases of cacao (see Thorold, 1975), the black pod disease caused by *Phytophthora* sp. (Ramakrishnan and Thankappan, 1965) and charcoal pod rot incited by *Botryodiplodia theobromae* and *Macrophoma* sp. (Nambiar and Radhakrishnan Nair, 1972) have been so far reported from India. During October 1974, we observed a new pod rot disease in Criollo and Forestero cacao varieties planted in the Station's garden. Subsequent surveys in a number of government and private gardens showed that the disease is widespread in Karnataka, Kerala, and Tamil Nadu States of India.

Under field conditions, the rotting commences anywhere on the pod surface. In young pods and cherelles, it starts more commonly either at the stalk-end of the pod or at the tip and spreads rapidly all over the surface. In a plantation, as much as 25% cherelles and 13% immature pods were found to have been rotted in January-February 1975. The rodent-damaged mature pods were also infested though to a less extent. The present paper describes the isolation of the causal agent of the disease and finding out of its pathogenicity on cocoa pods of different ages by artificial inoculation.

MATERIALS AND METHODS

The fungal structures occurring on rotting cocoa pods were examined under a microscope. Single spore culture of the fungus was obtained and maintained on potato dextrose agar.

The pathogenicity of the isolate was tested on Forestero cacao pods, since it is the dominant variety grown in India. Pods of different age groups, viz., cherelles (6-8 cm length), medium (10-13 cm length), and mature (above 13 cm length), were inoculated in the laboratory and in field with thick conidial suspensions

after injuring or without injuring the pod surface. The inoculated pods were maintained under high humidity by covering with polythene bags moistened inside and they were regularly observed for disease development. When the pods showed rotting, re-isolation were made to make sure that the disease produced was due to the original isolate.

RESULTS AND DISCUSSION

Only one fungus was consistently isolated from rotting cocoa pods. The fungus was identified as *Colletotrichum gloeosporioides* (Penz.) Sacc. and the identification was got confirmed from the Commonwealth Mycological Institute.

A number of *Colletotrichum* species have been reported to infect cocoa pods in different parts of the world. They are *C. incarnatum* from Cameroons and Sri Lanka, *C. theobromae*, *C. luxificum*, and *C. cradwickii* from West Indies (Britton-Jones, 1934), *C. fructi-theobromae* from Brazil, and *C. theobromicolum* from Congo (Thorold, 1975). Desrosiers and Diaz (1957) recorded the world distribution of *Colletotrichum* infecting the cacao. Recently, Diaz (1967) mentioned about the damage to cacao caused by *Colletotrichum* sp. Corbett (1964) from Malawi and Bailey (1966) from Nigeria have reported that *Glomerella cingulata* caused pod rot of cacao, but no further details are available. The present paper, is the first report of *C. gloeosporioides* inciting pod rot of cacao from India.

The injured cherelles and medium sized pods took up infection in 4-6 days and mature pods in 15 days in both field and laboratory. The non-injured pods got infected mildly after 35-40 days of inoculation. Infection was first noticed on the surface of pods in the form of small, brownish round spots with a yellow-halo. The affected portion later

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became darker and formed depressed lesions. The tissues below the infected spots looked brown and this extended up to the beams inside. In mature pods, however, the browning was restricted to the upper fleshy tissues only. Numerous small yellow to pink coloured pustules appeared over the epidermis. In advanced stages of infection lesions coalesced to form larger discoloured irregular areas (Fig. 1). A greyish white mycelium was seen

7-9 days after the lesions appeared. Re-isolations from the diseased parts always gave the same original fungus. The chercelles and medium sized pods were highly susceptible and shrivelled as a result of infection and the former remained as mummified structures on the trees.

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* Original not seen.



FIG. Rot symptoms on Forestero Cacao pod.