

PETIOLE DISEASE OF COCONUT IN PAPUA

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ABSTRACT

A disease with dark brown lesions leading to frond break of coconut in Papua, caused by Anthostomella cylindrospora, is described. The control measures adopted against the disease, perhaps combined with a drought, have to date prevented any further occurrence of the condition. The area is being kept under close surveillance.

INTRODUCTION.

IN early August 1965, specimens of diseased coconut petioles were collected on a coconut plantation in the Gulf District of Papua by Mr. A. E. Charles and the owner of the plantation. The latter stated later in correspondence that the condition appeared to be confined to young palms, 538 being affected in the main block. Of these all except two were affected in the lower fronds only; the two exceptions were badly affected in all fronds and even the new centre fronds were breaking. The owner further stated that young palms in the "Abuku" block (about one mile from the main block) were not badly affected at the time—only a few slightly affected areas comprising 95 palms had been found.

SYMPTOMS.

The condition involved infections of coconut leaf petioles with lesions leading to frond break (Plate I).

The lesions were dark brown, from a centimetre long to over 30 cm. when coalesced, at first nearly circular, later more angular (Plates II and III). A fine line a few millimetres outside the edge of the lesion surrounded some young lesions (Plate III). The lesions were more extensive on the upper (adaxial) surface than on the lower surface. The surface of most lesions showed slight blistering with some depressions. Ad-

vanced lesions caused a collapse of the tissue resulting in a bend in the petiole leading to frond break, as shown in Plates I and II. The leaflet midribs and the blades were not affected in the specimens examined.



Plate I.—Crown of 8-year old coconut showing
(a) brown lesions and break in petiole and
(b) small depressions on undersurface of petiole.

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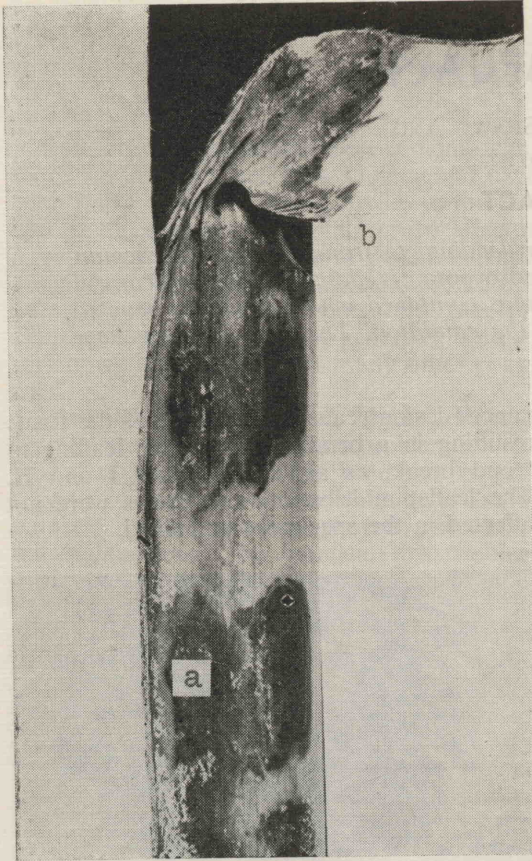


Plate II.—Coconut petiole showing (a) dark brown lesions and (b) petiole collapse at site of advanced lesion.

The fungus permeated the tissue of the coconut petiole, especially the parenchyma. In advanced lesions the hyphae became congregated and eventually formed a very dark brown stromatic tissue immersed in the host tissue. The deeply embedded locules were lined with ascogenous hyphae, paraphyses and immature asci. Ascospores were found free in the locules as well as extruded on the surface.

EXTRUSION OF SPORES.

When first received from the field the lesions on the petioles were covered by a fine deposit of spores, but during the next few days masses of spores were noticed build-

ing up on the surface of the lesions in the laboratory (Plate IV). Later the specimens were moved to a position undisturbed by air movements, and then cirri extruded from many small circular openings about 0.5 mm. wide or less in the surface of the lesion.

One lesion was placed under the stereomicroscope and the extruding spores were kept under continuous observation. The cirri did not resemble the coiled tendrils of some species of *Sphaeropsidales* but appeared as slightly stiff irregularly jointed fragile brown strings comprising longitudinal rows of spores about six or so spores wide, all loosely adhering and not moulded together as in slimy pycnidial cirri. When the stick or stiff string of spores reached a certain length—perhaps

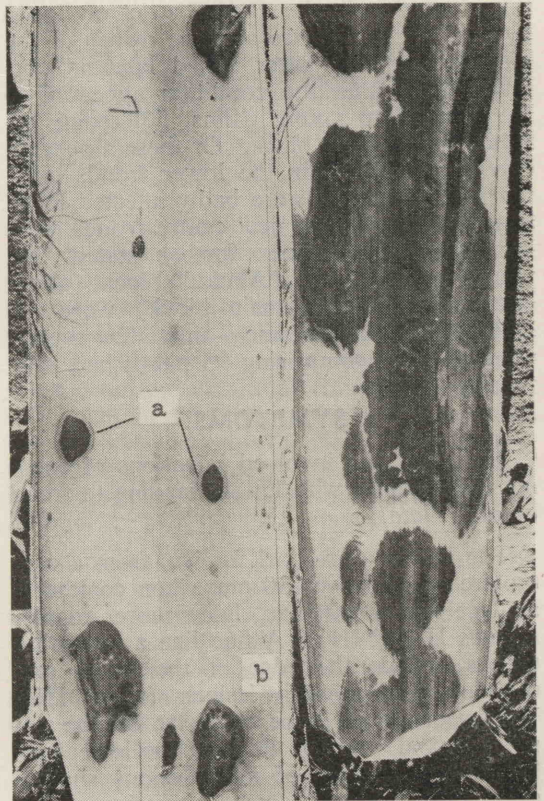


Plate III.—Upper surface of coconut petiole showing different stages in the development of lesions. Note (a) fine line around younger lesions and (b) spore dust around some lesions.

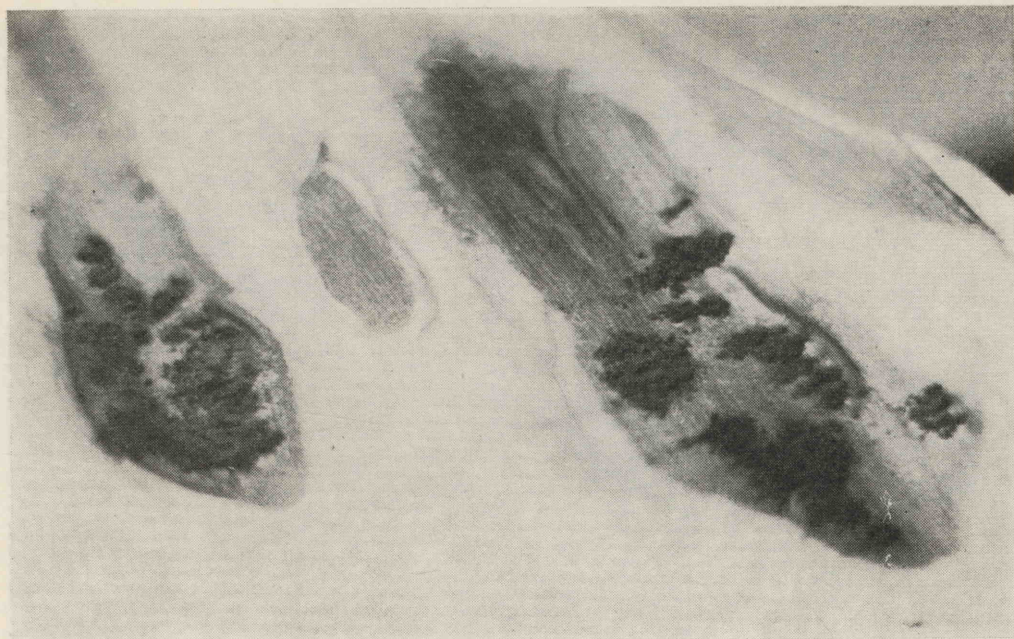


Plate IV.—Ascospores massed on surface of lesions of coconut petiole.

over a centimetre or more long—it collapsed under its own weight, and fell on to the surface of the substrate with the spores still more or less in position. Many such strings issued out of one exit and fell

in lines radiating from it, the position of the lines being determined by the angle of the substrate. *Plate V* shows the deposit patterns of spores extruded in cirri from the lower surface of the petiole while cirri ex-



Plate V.—Deposit of ascospores in cirri on microscope stage in the laboratory.

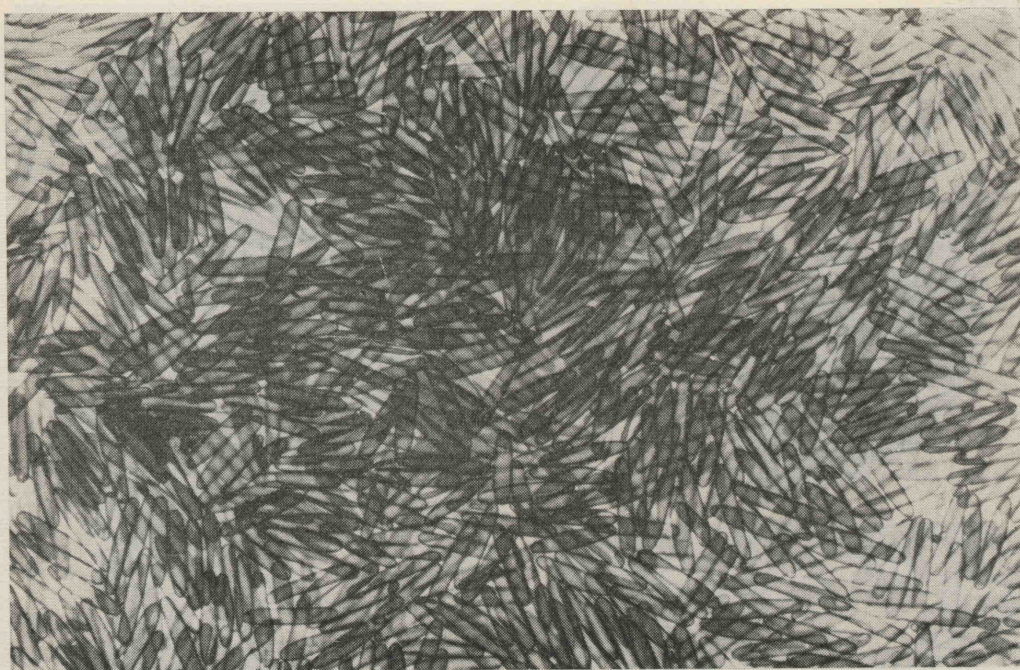


Plate VI.—Abundant ascospores deposited on slide from lesion. x 300.

truding from the upper surface were being kept under observation. The remains of the cirri can be easily distinguished on the microscope stage.

The spores of the fungus in this collection, therefore, were passively, not actively, dispersed by extrusion of "dry" cirri in the relatively still air of the laboratory.

Plate VI shows some of the abundant extruded ascospores.

IDENTITY OF THE FUNGUS.

The fungus has been described by Booth and Shaw (1967) as a new species, *Anthostomella cylindrospora*.

CONTROL MEASURES.

Measures to control the disease carried out by the owner involved the cutting off of diseased fronds which were then hauled away from the coconut area by tractor and trailer, and burnt. It was realised that spores would be spread during the cutting off and subse-

quent hauling, but this was considered preferable to leaving the thick diseased petioles on the palms, where even the application of a protectant fungicide would have little or no effect on the fungus in the tissues. Because of the drought being experienced at the time, the planter considered it inadvisable to attempt burning in the vicinity of the plantation. The two badly diseased palms mentioned in the Introduction were cut out and burnt. After the diseased fronds on the remaining palms had been lopped, removed and burnt, the crowns still standing were sprayed with fungicide.

That the above treatment, perhaps combined with the drought, was apparently effective, is evident from the owner's letters of 26th April 1966, and of 19th September, 1967, in which he stated that up till that time (i.e., 25 months after the treatment), no sign of the disease had occurred since the control measures had been carried out. He considered that the fungus may have been

able to spread in the plantation because of the weakened condition of the palms due to the severe drought.

The area is being kept under close surveillance in order to detect any future outbreak.

Planters throughout the Territory are requested to notify H.Q. immediately if a similar condition is noticed on their coconuts.

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ACKNOWLEDGEMENTS

The owner of the plantation is thanked for reporting the condition, for the prompt measures taken to control the disease and for his continued surveillance of the area. The assistance of Mr. A. E. Charles in bringing the specimens to Port Moresby in good condition and for Plate I is gratefully acknowledged.

REFERENCE

- BOOTH, C. AND SHAW, DOROTHY E., (1967). *Anthostomella fusispora* sp. nov. and *A. cylindrospora* sp. nov. on *Cocos nucifera*. *Papua and New Guinea agric. J.* 19: (2). 94-98.