

that the disease existed in varying intensities in contiguous plantations from Peermade to Pampadumpara.

An examination of lesions on the leaves revealed the presence of *Curvularia* sp. and a gram positive rod-shaped bacterium identified as *Corynebacterium* sp.¹ Nutrient agar and cooked vegetable agar², containing leaf extract of cardamom, were used for the isolation of the bacterium. The culture plates were incubated at 15°C in a BOD incubator for 18hr. Pathogenicity trials with these organisms using potted cardamom plants revealed that only the bacterium was capable of inducing symptoms of the disease. One-year old cardamom seedlings were sprayed with an aqueous suspension of 18 hr culture of the bacterium since Klement³ has observed that the inoculation method which most simulated natural conditions consisted of spraying leaves with bacterial suspensions. Young leaves showed the initial symptom in less than 12 hr. A period of 3-6 days was required for the development of other typical lesions and the leaves withered within a fortnight. The pathogen was reisolated from initial as well as old lesions on the leaves. All the experiments were conducted in an air-conditioned room at 22-24°C temperature and 90-95% RH.

Agnihothrudu⁴ has reported the presence of a bacterium presumed as *Xanthomonas* in the pericarp of cardamom capsules and showing blister-like symptoms. But its involvement in pathogenesis has not been worked out.

This is the first report of a disease of cardamom in which a bacterium is involved and its pathogenicity established.

We thank Dr. (Mrs.) K Radha, Plant Pathologist-in-charge, for guidance.

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Control of Arecanut Spindle Bug (*Carvalhoia arecae* Miller and China) Using Granular Insecticides

ARECANUT palm is infested by a capsid bug *Carvalhoia arecae*. Its adults and nymphs colonise the innermost two leaf-axils of the palm of all ages and suck up sap from tender parts of newly emerging spindle leaves. Like many other capsids, they inject saliva into the plant tissues while feeding. Probably due to its toxic nature, the affected tissues dry, and later when such leaves open, necrotic patches appear on them. Severe infestation

causes reduction in size of leaves, tapering of crowns of palms, loss in vigour, and reduced yield. Nair (1964) found that monthly sprayings of endrin 0.03% or folidol 0.02% controlled the pest. Heavy monsoons can wash off the sprayed insecticides very quickly and hence a trial was carried out using three granular insecticides. Its results are presented here.

The experiment was laid out in a split plot design with 4 main plot treatments, 3 sub-plot treatments, and replicated 4 times. The main plot treatments were the 3 insecticides, phorate 10G, carbaryl 4G, and thiodemeton 5G, at the rate of 10 g per tree, and control. The interval between successive sprayings, 2, 3, and 4 months, were the sub-plots. The control plot did not receive any insecticides. Each treatment contained 6 palms. Four rows of palms were maintained as border around each replication. The two innermost leaf-axils were filled with insecticides using a granular insecticide applicator (Abraham, 1975). The pest populations were recorded just prior to the insecticidal application and at monthly intervals after the insecticide treatment. The data were statistically analysed.

The mean numbers of bugs present were 6.6 in phorate 10G, 7.3 in carbaryl 4G, 8.2 in thiodemeton 5G, and 16.5 in control. All the three insecticides were significantly superior to the control in reducing pest population. The three intervals of insecti-

cidal application also did not show any significant difference. Hence the application of any of the three insecticides in the leaf-axils is recommended for the control of spindle bug in arecanut palm.

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