till death. Fecundity ranges between 189–330 with an average of 249 eggs. The sex ratio in a brood works out at 1 : 3 for females to males.

The early instar caterpillars are gregarious in habit. They feed on tender foliage. The full grown caterpillars are voracious feeders and are active during night only. During the day, they congregate on tree trunks or branches and quite often escape notice. The caterpillars can completely defoliate young cashew trees.

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C. P. RADHAKRISHNAN NAIR
V. A. ABRAHAM
G. B. PILLAI
Central Plantation Crops Research Institute,
Kasaragod 670 124,
Kerala State,
India.

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Brown Rot of Turmeric

WHILE recording various pests and diseases affecting turmeric rhizomes in the germplasm collection of *Curcuma aromatica* Salisb, and *C. longa* Linn., we noticed an unusual discolouration and rotting of mature rhizomes in *C. aromatica* at the time of harvest during 1973-74. Our observations are given below.

During the early stages of infection, the rhizomes are dull in colour. In advanced stages, they become deep grey to dark brown, less turgid, lose some weight, wrinkled and exhibit dry rot symptoms. The fingers are more severely affected than the mother rhizomes. When cut open affected rhizomes show dark brown necrotic lesions starting from the margin into the internal tissues. In initial stages, these necrotic lesions are localized, remain discontinuous and extend to a depth of 2–5 mm. At later stages, the lesions coalesce to form larger necrotic areas and progressively extend over a major portion of the rhizomes.

Thin hand sections of the rhizomes revealed the presence of nematodes and eggs in cortex and pith. The affected tissues were dark brown and showed, in some cases, cell disruption. When stained with cotton blue the sections showed intra and intercellular hyphae. From the affected tissues, *Fusarium* sp. was isolated on potato sucrose agar medium. The nematodes in the tissues were extracted, stained with lactophenol-acid fuchsin, and identified as *Pratylenchus* sp. While confirming the identification of the nematode, Dr. Orton Williams of the Commonwealth Institute of Helminthology, London, opined that it might be a new species.

The infected rhizomes were chopped and mixed with sterile soil (50 g/bag) contained in polythene bags of size 25·0 × 15·0 cm. Two pieces of seed rhizomes (about 10 g each) of *Ca* 67 *Jobedi* variety were sown in each bag. The plants thus raised were stunted in growth. On detailed examination after 5 months the root system was only poorly developed with varying degrees of discolouration. The rhizomes also showed brown rot symptoms. Thin hand sections showed the presence of *Pratylenchus* and *Fusarium* in the tissues. This implies a combined role for these two organisms in the causation of the malady. *Pratylenchus-Fusarium* association has been reported in the case of several diseases (Hutton, Wilkinson and Mai, 1973).

The only nematode that has been so far recorded on turmeric (*C. longa*) is the root knot nematode *Meloidogyne javanica* (Nirula and Kumar, 1963).

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Central Plantation Crops Research Institute, Kasaragod 670 124, Kerala State, India.
Y. R. SARMA
K. K. N. NAMBIAR
C. P. RADHAKRISHNAN NAIR

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Effect of Different Fungicides on the Control of Damping Off of Cardamom Seedlings

DAMPING off is one of the nursery diseases of cardamom which takes a considerable toll of seedlings. The disease is especially severe when nursery beds are raised in wet lands. The disease is caused by *Pythium* sp. under excessive soil moisture conditions or crowding of seedlings in the nurseries (Cardamom Board, 1970). The small spots of infected areas which are noticed in the early stages grow into bigger patches after a short period and the stand of the seedlings in the nursery presents a gappy appearance due to seedling lethality.

Heavy incidence of damping off was noticed during 1966–67. An experiment was conducted during 1968 to study the effect of soil application of different fungicides on the control of the disease.

The experiment was laid out in a randomised block design with five treatments and four replications. The treatments were : (A) formaldehyde (1 : 50) ; (B) Bordeaux mixture (5 : 5 : 50) ; (C) Blue copper 0·4% ; (D) Cuman 0·2% ; and (E) control. Fifteen days before seed sowing beds receiving treatment with formaldehyde were drenched with its solution at the rate of 15 l/m^2. The beds were then covered with moist gunny sheets for 24 hr. As regards the other treatments, the beds were drenched with the various solutions at the rate of 10 l/m^2 a day before sowing. Freshly extracted seeds were sown in lines and the beds were mulched and watered regularly.

Germination data as given below showed that the treatment with formaldehyde gave the highest germination.

Treatments :	A	D	C	E	B
Germination percentage after 60 days	45	34	29	26	23
C.D. at 5% : 10·3					

Treatment of seed beds with Bordeaux mixture, Blue Copper, or Cuman had no beneficial effect on germination over that of control. The seedlings in the beds treated with formaldehyde looked healthier and had grown one and half times taller than those of seedlings of other treatments. This initial advantage in growth also helped them to withstand the adverse effect of leaf spot and leaf rot disease much better.

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University of Agricultural Sciences, Regional Research Station, Mudigere 577 132, Karnataka State, India.
H. V. PATTANSHETTI
R. S. DESHPANDE
T. G. SHIVAPPA

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Record of a Stem Borer on Cacao from India

A STEM borer has been observed to cause wilting and drying of some of the 3–4 year old cacao plants grown as an intercrop in the arecanut garden of the Station. The

external symptoms of attack are a round hole on the stem, drying of the upper portions above the hole, and excreta and chewed up fibres strewn out at the base of the plant. The larvae make unramified hollow tunnels inside the stem. Out of seven plants infested, four were dead, where the main stem had been attacked ; and in the others, the attacked terminal branches alone had dried up.

The adult moths are white in colour. They are characterized by sexual dimorphism. The male moth is smaller with 21 mm length and 37 mm width, the female large with 32 mm length and 55 mm width. In the male the antenna is bipectinate almost upto the middle and filiform distally, and in the female, it is filiform throughout. The wings in the male overlap only a part of the abdomen, and in the female they cover the entire abdomen. The abdomen is slender and elongated ending in a brush of hairs in the male and it is broad and thick with a well developed ovipositor in the female. Longevity of adult in the laboratory is 6–7 days (male lived one day longer than female). The female lays about 510 eggs within 5 days. Full grown larva measures 42 mm in length and 6 mm in thickness. Head is prominent with very strong mandibles. Pupa is reddish brown in colour with a hard spine-like projection at the anterior region. Pupa measures 27–32 mm in length and 3–5 mm in width. Pupal period lasts for 9–13 days.

The pest is identified as *Zeuzera coffeae* N. (family : Cossidae ; subfamily : Cossoidea ; order : Lepidoptera). It is well known as the red borer of coffee (Somasekhar, 1958). The related *Zeuzera nyrina* Linn. the leopard moth is destructive to the stem of many fruit trees in India (Imms, 1957 ; Metcalf and Flint, 1951).

Central Plantation Crops Research Institute, Regional Station, Vittal-574 243, Karnataka State, India.

B. SATHIAMMA
K. SHAMA BHAT

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ERRATA

Journal of Plantation Crops, Vol. 2, No. 1 (June 1974), page 38, para 2, line 5 : *for* KNO_3 *read* HNO_3.