

from buffaloes. The identification was further confirmed as the faeces of the young calves became positive for the eggs of *S. papillosus*. The finding of *S. papillosus* larvae in the milk of buffaloes is, obviously, a first record.

Neoscaris vitulorum (Figs. 4 and 5)

In all, 3 larvae were recovered from the milk samples of 2 buffaloes on 8 and 24-day post-parturition. Larvae, with a bluntly rounded anterior and gradually tapering posterior end, measured 425–510 in length and 14–20 in maximum width. The 3 lipped condition was apparent at the anterior end. Nerve ring and excretory pore were situated at 78–81 and 81–90 distance respectively from the anterior end. The oesophagus measured 136–146 in length and 10–12 in maximum width. The tail measured 38–42 in length. The faeces of these suckling calves later became positive for the eggs of *N. vitulorum*.

Tongson⁶ encountered two types of *N. vitulorum* larvae (third stage) in the milk of buffaloes in Philippines: (i) Smaller sized found in majority, measured 442–628 μ and (ii) A few larger sized measured 1150–1580 μ in length. Our material resembled the smaller sized *N. vitulorum* larvae described by Tongson⁶. Present report, on the occurrence of *N. vitulorum* larvae in the milk of buffaloes, is evidently a first record from India.

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DRY ROT OF GINGER CAUSED BY *MACROPHOMINA PHASEOLINA* (TASSI) GOID.

THE cultivation of ginger (*Zingiber officinale* Roxb.) is seriously handicapped by the incidence of soft rot or rhizome rot disease caused by *Pythium* sp. in several tracts of Kerala. The fungus causes pre-emergence and post-emergence rotting of rhizomes during the South-West monsoon from June to September. Under Kasaragod conditions

the total rainfall received during June to September 1972 was 2521.1 mm with a mean temperature range of 23.0–30.8° C and a mean relative humidity range of 90.4–95.0%. During the course of investigations on soft rot disease, incidence of another type of rot in mature rhizomes of ginger was noticed from late October onwards till the time of harvest, i.e., February. This rot was found to persist even during storage. During this period (October 1972–February 1973) the total rainfall received was 236.1 mm with a mean temperature range of 20.0–32.7° C and a mean relative humidity range of 87–93%. A perusal of the literature shows that no similar disease has been recorded in ginger and hence reported here.

Affected plant under field conditions shows slight yellowing of leaves in the initial stages, and in advanced stages the whole plant presents a blighted appearance. Unlike in soft rot disease, the base of the stem does not decay and as such the plant does not snap away at the collar region on a slight pull. During advanced stages of the disease, the rhizomes appear shrunken and the inner tissues show discolouration and start disintegrating. Later the inner core of the rhizome shows dark sclerotia of a fungus adhering loosely to the fibrous tissues. The affected tissues do not exhibit any wet rot. Such rhizomes shrink and dry up. Hence this disease is termed as dry rot (Fig. 1).

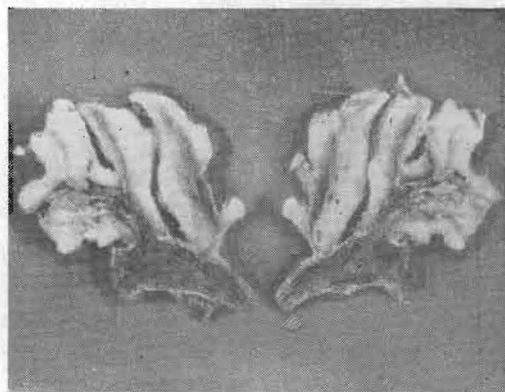


FIG. 1. Longitudinal section of dry rot-affected ginger rhizome.

Two fungi, viz., *Fusarium* sp. and another sclerotial form were isolated consistently from affected rhizomes. On potato sucrose agar medium *Fusarium* sp. sporulated abundantly while the sclerotial form produced large number of sclerotia. Both in culture and infected tissues the sclerotia appeared as black, minute, anastomosed dark hyphae, the interior of which is light brown to dark in colour with thick walled cells. Sclerotia were either

globose, oval, oblong, or irregular in shape and $20\text{--}200\ \mu \times 28\text{--}172\ \mu$ in size.

For pathogenicity tests fresh rhizomes of ginger variety 'Maran' were sown in beakers of 500 ml capacity containing garden soil mixed with oat meal inoculum at 3:1 ratio. Both the isolates were tested individually and in combination. The moisture content was maintained at 50% water holding capacity of the soil. The inoculated beakers were incubated at room temperature ($28\text{--}30^\circ\text{C}$). In eight days rhizomes inoculated with the fungus producing sclerotia showed darkening and shrinking to a depth of 5–10 mm. Similar result was obtained when both the isolates were inoculated in combination; but no synergistic action was noted. Pathogenicity tests with *Fusarium* sp. alone gave negative results. Thin hand sections of the infected rhizomes showed both inter- and intracellular hyphae. Reisolations from the deeper portion of the affected tissue yielded sclerotial form only.

Under field conditions the rhizomes, which are injured either mechanically or by pests like rhizome weevil grubs, showed extensive colonisation by the sclerotial fungus. Therefore it appears that in majority of cases initial injury of rhizomes predisposes them to the fungal invasion, and subsequent colonisation.

The organism has been identified as *Macrophomina phaseolina* (Tassi) Goid., by Dr. Mordue of C.M.I., London (IMI. 172541). Only the sclerotial form of the fungus was produced in culture maintained in this laboratory. *M. phaseolina* has not so far been recorded as a causative organism of dry rot of ginger. The only dry rot that has been reported from ginger is the one caused by *Diplodia natalensis* (Wilson and Balagopal, 1971). Thus this appears to be a new record on ginger. Detailed studies on the fungus and its control measures are under way.

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