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Histopathology of arecanut roots infected with *Radopholus similis*

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Twentyfive arecanut seednuts, variety 'South Kanara', were sown in sterilised sand, contained in earthern pot (30 cm). On germination, the nuts were removed carefully from the pots and a red silken thread was tied loosely on the main root, 2.5 cm above the root tip. The seedlings were then transferred to small earthern pots (10 cm) and placed horizontally, in moist sand filled to a depth of 8 cm. More dry sand was added just to cover the root except the marked portion. Small quantity of sand was sprinkled on to the marked portion and few drops of water were added to fix this portion on sand surface that remained partially covered and visible. Water suspension, containing about 500 active *R. similis* from axenic culture, was pipetted on to the region between the thread knot and root tip. After inoculation, the pots were filled with sand and sprinkled with water. The control plants received only sterile

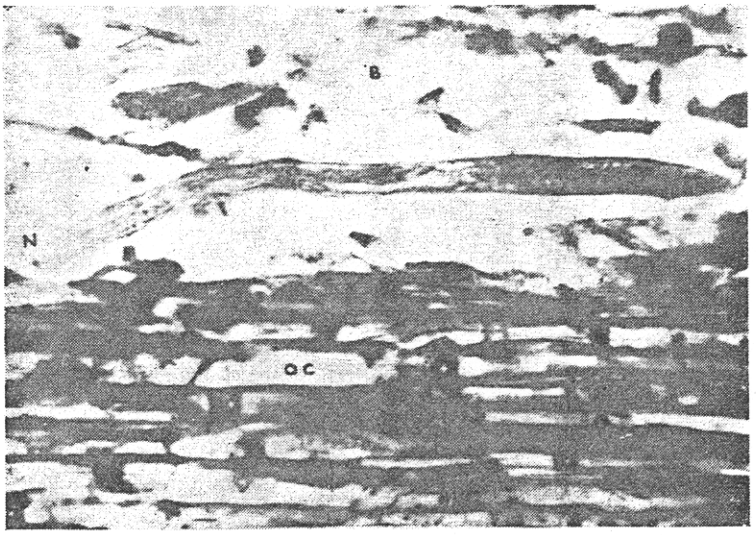

FIG. 1. Longitidinal Section of an arecanout root inoculated with *Radopholus similis* showing the orientation of nematodes in the cortical tissue.
B — Burrow, N — Nematode, OC — Outer cortex

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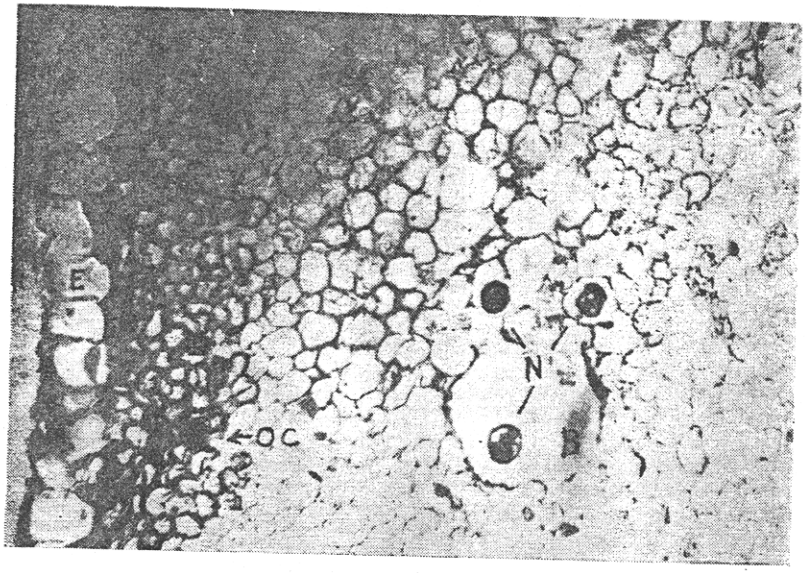

FIG. 2. Transverse section of arecanout root inoculated with *Rodophohus similis* Nematodes are located in the cortical burrows.
B — Burrow, E × Epidermis, N — Nematode, OC — Outer Cortex

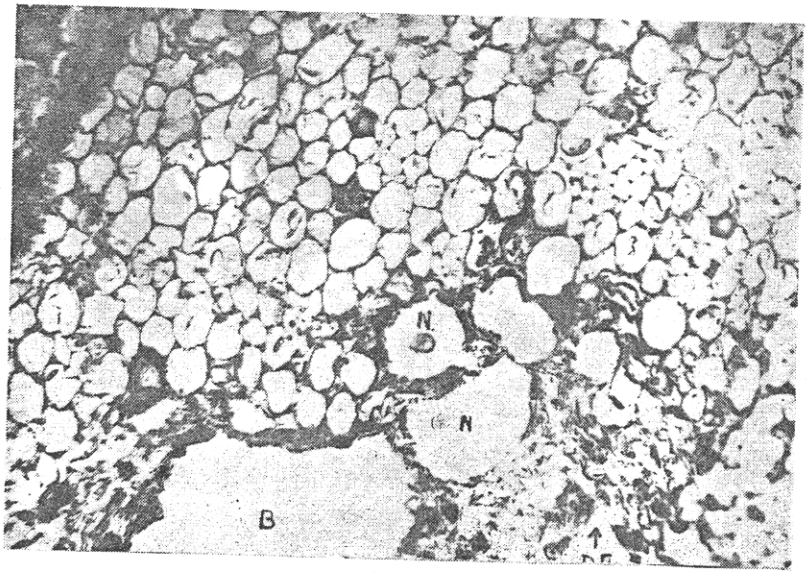

FIG. 3. Transverse section of infected root showing the formation of burrows and extent of tissue damage
B — Burrow, DC — Damage cortex, N — Nematode

water. Root samples were taken after 24, 48 and 72 hours, and on 5th, 10th, 15th and 30th day from inoculated and control plants. Two and a half centimetre portion of the root from the thread knot to the root tip was cut with the help of a sharp blade and fixed in F.A.A. They were dehydrated in TBA (tertiary butyl alcohol) series and embedded in paraffin. Longitudinal and transverse sections of 10 to 15μ thickness were prepared and stained with safranin and fast green (Johansen, 1940).

Longitudinal and transverse sections of *R. similis* infested roots revealed considerable damage to root tissues. Longitudinal burrows developed underneath the outer cortical cell layers and nematodes and their eggs could be located here (fig. 1). Nematodes were also seen in both inter and intra-cellular positions although intercellular orientation was more common. In no case the nematodes were seen intruding stelar tissues. Necrotic changes occurred around the head of the nematodes and the burrows harbouring them (fig. 2). The nematode feeding disintegrated the cytoplasm and cell wall of the host, and coalescence of these led to the formation of cavities or burrows in which the nematodes bred and multiplied (fig. 3).

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