

telophase stage. A few evidences of spiral structure in the chromosome is visible even in the photograph. From similar observations it is inferred that colchicine may prove a valuable tool in studying chromosome structure. Koshy's⁴ and other recent publications show that there are important problems in chromosome behaviour which can be solved by accurate study of chromosome structure and in those problems the new tool will be of help.



C

Fig. C

Nucleus from treated root tip of *Allium cepa*

3. Sprouted *Lathyrus* seeds were arranged to let the radicle grow into aqueous colchicine. Three strengths were used, 1 in 500, 1 in 1000, and 1 in 2000. At extreme dilution no cytological peculiarities were observed. At the other two dilutions results were obtained, which can be interpreted as a disintegration of dividing nuclei brought about by the drug. The reasons for such an interpretation are: (a) the cells concerned were not in the resting stage for they were totally unlike the normally fixed resting nuclei, (b) the appearance could not have been due to faulty technique, for root tips of *Rheo discolor* which were fixed and imbedded along with the treated material showed normal division, (c) there were deep staining spiral fragments within the nuclear membrane. The disintegrative action of colchicine on the nucleus suggests that in less harmful doses the drug may increase the mutation rate of *Lathyrus*. Such a possibility is being investigated.

Another feature of interest was noticed when respiration rate was studied in treated material. Sprouted seeds were soaked for 6 and 18 hours in 1 in 1000 aqueous solution of colchicine. The rate was 0.311 mgm. and 0.204 mgm. of CO₂ per hour per gram fresh weight, after 6 and 18 hours respectively. A control batch of seeds

kept under similar conditions, gave the readings 0.103 and 0.293 after 6 and 18 hours interval respectively. Possibly the result may be due to an initial stimulation followed by a retardation. The possible connection between the naturally occurring alkaloid in a few dicotyledonous species and the response of those species to colchicine is being investigated.

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¹ Blakeslee and Avery, *Jour. Heredity*, 1937, 28, 393.

² Dontcho Kostoff, *Curr. Sci.*, 1938, 7, 108.

³ Nebel and Ruttle, *Jour. Heredity*, 1938, 29, 3.

⁴ Koshy, *Jour. Roy. Micros. Soc.*, 1933, 53, 299.

Koleroga Disease of Areca Nut

IN North Kanara, Bombay Province, *Phytophthora arecae* (Coleman) Pethybridge has not as yet been found occurring on any plant other than areca nut, nor have the oospores of the fungus been discovered under natural conditions. It is, therefore, difficult to explain the carry-over of the disease from one year to the next. However, in infected gardens one usually meets with diseased tree-tops, the infection of which takes place either from the affected bunch or through the leaf-sheaths which form the protective covering to the growing-point of the tree. Sometime ago it was suggested by one of us that the fungus, probably hibernates, as dormant mycelium in the dying tree-tops and, on the return of favourable conditions in late May or early June, it resumes vegetative activity and produces numerous sporangia which are disseminated by wind and initiate centres of infection in the same or neighbouring gardens from which the disease may be spread rapidly during the monsoon.

Beginning with October, isolations were made at intervals of one month by planting bits of diseased tops cut out aseptically on plates of Quaker-oats agar. The fungus was readily brought into pure culture, but later in the dry season it was found mixed with saprophytic

bacteria which invade infected tops. The pathogenicity of the isolates was tested on young areca nuts. It was also noticed that, as the dry season advanced, the number of successful isolations was somewhat less than in the months immediately following the wet season. The position, however, seems to change as the weather becomes cool and moist before the onset of the monsoon. The fungus now wakes to activity from its dormant state and resumes vegetative growth. Fig. 1 is a photograph of an infected tree-top taken on May 25, 1938, showing profuse vegetative growth when

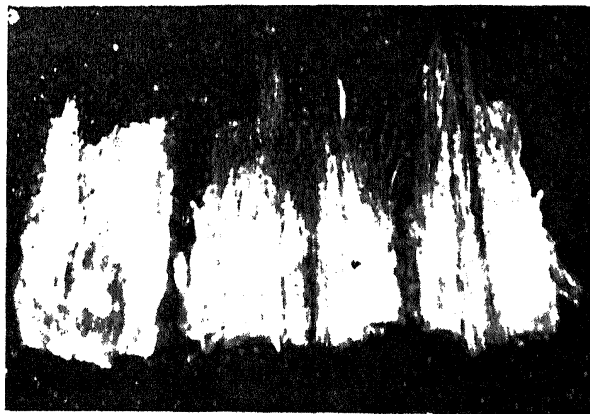


FIG. 1

the top was split open; young nuts were readily infected with material taken direct from the diseased top. However, under favourable conditions it is not uncommon to encounter dying tree-tops early in the dry season, in which cavities develop in the pith, usually containing a more or less dense growth of the mycelium of the fungus. Fig. 2 is a photograph of an infected top taken on February 4, 1939, showing vigorous growth of mycelium in the cavities of the pith.

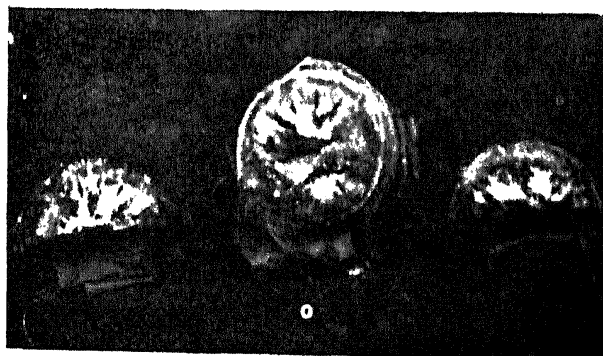


FIG. 2

In 1930, Narasimhan¹ reported the occurrence of heterothallic strains of *P. arecae*. He showed, for example, that when single-

spore cultures of the Areca and Santalum strains are grown together on Quaker-oats agar medium in Petri dishes, oospores are formed at the junction of the two mycelia. He further showed that the Areca strain possesses male characteristics as its mycelium bears antheridia and that the Santalum strain is female. He thus came to the conclusion that the absence of oospores in *P. arecae* may be explained on the basis of the two sexual strains having been isolated on different host plants in nature.

Evidence has been obtained that heterothallic strains of *P. arecae* may occur on areca nut in nature. Isolations of the fungus were made from diseased nuts in different localities in North Kanara and grown in different combinations on Quaker-oats agar medium in Petri dishes. The results of one of the experiments given in Table I show that the Tyaghi and

TABLE I

Results obtained by pairing strains of *P. arecae* isolated from areca nut growing in different localities

Strains paired		Oospore formation
Hipnalli	Vargheshwar	:
Hipnalli	Dambheshwar	:
Honavar	Dambheshwar	:
Nilekani	Harogar	:
Tyaghi	Hipnalli	:
Tyaghi	Vargheshwar	:
Tyaghi	Dambheshwar	:
Tyaghi	Honavar	:
Tyaghi	Nilekani	:
Tyaghi	Harogar	:
Analgar	Hipnalli	:
Analgar	Nilekani	:
Tyaghi	Analgar	:

N.B. The strains take their names after the villages in which they occur.

Analgar strains possess similar sexual potentiality and always produce oospores when

paired with any one of the other six strains. It appears that the sexual strains of the fungus have become definitely isolated in different areas, and this localisation of the two sex strains may explain the absence of oospore formation in nature. The case reported by Narasimhan¹ when Coleman once obtained oospores in areca nuts placed in Roux tubes and inoculated with a culture of *P. arecæ*, can now be satisfactorily explained by assuming that the nuts were carrying natural infection with one of the strains occurring on areca nut trees and that the culture used for inoculation must have been of the opposite sex.

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¹ Narasimhan, M. J., *Phytopath.*, 1930, 20, 201-14.

A Re-description of *Lemdana marthæ* Seurat, 1917

Lemdana marthæ, the only species of its genus was described by Seurat in 1917. This nematode has so far not been recorded from India. The figures given by Seurat do not show the specific characters. The description

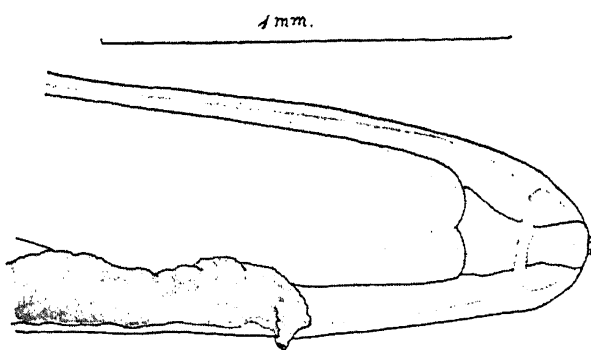


FIG. 1

Lemdana marthæ. Anterior end of female, lateral view showing the vulva

also is hazy, hence it is considered to re-describe this nematode.

Five females and two males of *Lemdana marthæ* were found under the epithelium in the neck region of a Spotted Babbler—*Pellorneum ruficeps*.

The females measure 32.9 mm. \times 0.63 mm. to 45.3 mm. \times 0.7 mm. The mouth is simple

without lips. There is a pair of head-papillæ and a pair of amphids present. The nerve-ring is found just behind the anterior end.

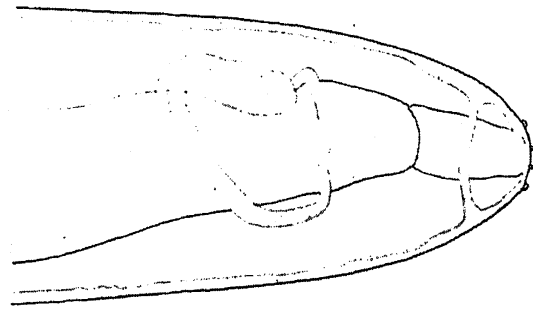


FIG. 2

Lemdana marthæ. Anterior end of male, dorsal view showing the head-papillæ and amphids

Cuticle is thick and smooth. The œsophagus is divided into two parts—an anterior short clear muscular portion measuring 0.36 mm., and a large dark glandular portion measuring

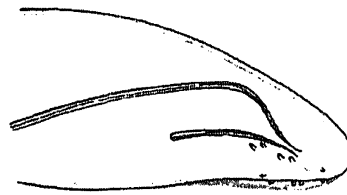


FIG. 3

Lemdana marthæ. Posterior end of male showing the position of papillæ

9.22 mm. in a female 32.9 mm. long. The vulva is very prominent and lies at a distance of 0.74 mm. from the anterior end. The anus lies near the conical posterior end and bears three subventral papillæ.

The males measure 18.9 mm. \times 0.46 mm. Caudal alæ are absent. There are four pairs of pre-anal and a single pair of post-anal papillæ. The spicules are very unequal. The right spicule measures 0.32 mm. and the left spicule is 2.15 mm. in length.

The microfilaræ are unsheathed and found in the blood.

Host—*Pellorneum ruficeps*.

Location—Neck region.

Distribution—Aligarh, U.P., India.

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¹ Sprehn, *Lehrbuch der Helminthology*, Berlin, 1932.

² York and Maplestone, *The Nematode Parasites of Vertebrates*, London, 1926.