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POPULATION CHANGES OF SOME STYLET-BEARING NEMATODES
ASSOCIATED WITH MANGO (*MANGIFERA INDICA* L.)

BY

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The seasonal fluctuation in the population densities of *Hoplolaimus*, *Hemicriconemoides* and *Helicotylenchus* was studied in relation to soil moisture and soil temperature in six mango orchards during the period July 1962 to April 1964. The densities of these genera appeared to be correlated closely with the soil moisture content, although interaction with other factors like soil temperature cannot be excluded (Tables I, II). This was confirmed by means of pot experiments with controlled moisture content (Fig. 1) and controlled temperature (Fig. 2). The direct influence of drought is considered to be one of the main factors in the population dynamics of nematodes infesting mango in the area studied.

DISTRIBUTION OF *HETERODERA AVENAE*, *H. ZEA*, *H. CAJANI*
AND *ANGUINA TRITICI* IN INDIA

BY

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Distribution of three species of *Heterodera* and *Anguina tritici* in India is given along with cyst numbers and per cent infection, respectively. In addition to infested areas already known from Rajasthan, *Heterodera avenae* has been recorded from non-sandy areas of Udaipur and in the States of Punjab, Haryana and Himachal Pradesh. *H. avenae* and *H. zea* were found in combined infestations on maize in Rajasthan State. *H. cajani* was found only in fewer locations.

EFFECT OF ETHREL ON THE ROOT-KNOT NEMATODE,
MELOIDOGYNE JAVANICA

BY

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Effects of foliar sprays of ethrel (2-chloroethane phosphonic acid) were studied in tomato, chillies and brinjal seedlings infected with *Meloidogyne javanica*. The chemical increased galling in all the plant species ; the number of galls increased almost linearly with concentration accompanied by a simultaneous decrease in stem height and fresh and dry weights. It is inferred that ethrel by releasing ethylene accentuates the pathogenic processes in hosts induced by *M. javanica*.

FIVE NEW NEMATODE SPECIES ASSOCIATED WITH COCONUT
IN KERALA, INDIA

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Five new species, *Dolichodorus pulvinus*, *Macroposthonia oachirai*, *Discocriconemella recens*, *Longidorus saginus* and *Paralongidorus flexus* collected from sandy loam soil around the rhizosphere of coconut at Kayangulam (Kerala) are described and differentiated from the related species.

REPRODUCTION, HYBRIDIZATION AND HOST ADAPTATION IN
PHYSIOLOGICAL RACES OF THE RENIFORM NEMATODE,
*ROTYLENCHULUS RENIFORMIS*¹

BY

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Mode of reproduction and interbreeding of ten populations of *Rotylenchulus reniformis* from different parts of India comprising of two races with different host affinities were studied in pot experiments. Males were necessary for reproduction in all the populations and successful interbreeding between one another proved that all ten populations were conspecific, and that sibling species were not involved. All populations had amphimictic type of reproduction; parthenogenesis occurred rarely in only one population from Tamil Nadu.

The two races interbred with each other; the hybrids were fertile and more polyphagous than the parents. Consecutive inoculations of one original population onto a poor host plant upto the 12th generation resulted in the evolution of a more adapted population which could reproduce better on this plant. This evolution of an aggressive population as indicated by higher multiplication on an originally poor host corresponded with gradual increase in the number of females on the root, decrease in the percentage of males and increased fecundity. Prolonged culturing of another aggressive population on a suitable host for 18 months did not alter its adapted capacity to reproduce on other hosts. However, long association with a particular host resulted in preference for that host, when subsequently two suitable hosts were available simultaneously.

The data presented support the polytypic or multidimensional species concepts. Lack of obligatory parthenogenesis and of complete geographical isolation did not alter the essential character of the species and all the ten populations remained conspecific, actually or potentially able to exchange genes among one another. The evolution of host relationships with reference to physiological races in *R. reniformis* is discussed.

REVISION OF THE GENUS *CRICONEMA* HOFMÄNNER AND MENZEL,
1914 AND OTHER RELATED GENERA (CRICONEMATIDAE :
NEMATODA)*

BY

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This revision of nematodes belonging to the genus *Criconema* and related genera included examination of types of 19 species and additional collections from 14 countries and 46 localities. Two subgenera, (*Criconema* and *Variasquamata*) of the genus *Criconema*, and two subgenera in *Crossonema* (*Crossonema* and *Seriespinula*) are proposed. Four new genera are also proposed, *Blandicephalanema*, *Crossonema*, *Neolobocriconema*, and *Pateracephalanema*. Six new species [*Criconema* (*V.*) *gracile*, *Criconema* (*V.*) *rhombosquamatum*, *Crossonema* (*C.*) *latens*, *Crossonema* (*S.*) *venustum*, *Blandicephalanema serratum*], *B. pilatum*], are described and keys are given to the genera of the subfamily Criconematinae and to the species in the above genera. *Criconema inaequale* is found to be conspecific with *Bakernema bakeri* and is transferred to that genus to become genotype of *Bakernema*. New synonymy includes *Criconema boettgeri*, *C. celetum*, *C. eurysona*, *C. vishwanathum* = *Crossonema* (*Crossonema*) *civellae* (Steiner, 1949) comb. n. ; *Bakernema bakeri* = *Bakernema inaequale* ; *C. schuurmans-stekhoveni* = *C. (Seriespinula) cobbi*. Species transferred to *species inquirendae* are *Criconema spasskii*, *C. spinalineatum*, and *C. triconodon*. *Criconema mangiferum* is identified as a juvenile of *Hemicriconemoides communis* Edward & Misra, 1963.

STUDIES ON SOME SYSTEMIC NEMATICIDES. I. EVALUATION FOR
SYSTEMIC AND CONTACT ACTION AGAINST THE ROOT-KNOT
NEMATODE, *MELOIDOGYNE INCOGNITA**

BY

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Six chemicals, viz., thionazin, aldicarb, fensulfothion, methomyl, carbofuran, and TCPP were evaluated for systemic and contact action against the root-knot nematode, *M. incognita* on tomato using various application-inoculation procedures. Thionazin and aldicarb at 4-8 kg a.i./ha in pre-inoculation treatment completely eliminated the root-knot infection. The two chemicals at the same dosage also gave high degree of control in the post-inoculation treatment indicating therapeutic action. Fensulfothion, methomyl and carbofuran gave fairly satisfactory control at higher doses at which, however, they were phytotoxic. Foliar applications of thionazin and TCPP were least effective. Contact action was studied by exposing root-knot larvae and egg masses to various doses of chemicals mixed in sand, for 1 and 5 day-periods and assessing root galling in indicator tomato plants. Except thionazin, no other chemical exhibited any contact toxicity on root-knot larvae in dosages that are safe for the plants. None of the chemicals had any effect on the egg masses.

FACTORS AFFECTING EMERGENCE OF LARVAE FROM CYSTS OF *HETERODERA CAJANI* KOSHY, 1967

BY

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Factors influencing larval emergence from *H. cajani* cysts have been studied. Emergence took place between 15 to 37°C with 29°C as the optimum. There was no emergence at 12 and 40°C but when the cysts subjected to these two temperatures for 20 days were transferred to 29°C, emergence of larvae started. Comparatively more emergence was obtained from cysts conditioned to 40°C than those at 12°C.

Aeration did not affect emergence of larvae but exposure to constant light gave a significantly higher hatch than those subjected to total darkness. The larvae emerged at a wide pH range from 3.5 to 11.5 with 10.5 as the optimum. There was no emergence at 1.5 and 2.5 but when transferred to water after 50 days, hatching started in the case of 2.5 pH-conditioned cysts but not from 1.5 pH cysts. Root leachates from *Cajanus cajan* and *Dolichos lablab* stimulated emergence of larvae from cysts. In 20 days, 100 per cent larvae emerged from egg masses as compared to 89 per cent and 16 per cent from white and brown cysts respectively. Egg sacs and white cysts stored in 0.5 M NaCl solution up to 20 days gave considerable increase in hatch as compared to untreated controls. The cysts stored in air-dried soil under laboratory conditions remained viable for at least two years.

OCCURRENCE AND DISTRIBUTION OF *HIRSCHMANNIELLA ORYZAE* IN
THE INDIAN UNION WITH DESCRIPTION OF
H. MANGALORIENSIS SP. N.*

BY

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Surveys have shown that the rice root nematode, *Hirschmanniella oryzae* occurs at least in 12 states of the Indian Union. *H. gracilis* has been recorded for the first time in this country. *H. mangaloriensis* sp. n. isolated from soil around paddy in Mangalore has been described and illustrated.

PATHOGENICITY OF THE RENIFORM NEMATODE, *ROTYLENCHULUS*
RENIFORMIS TO CASTOR

BY

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The pathogenicity of the reniform nematode, *Rotylenchulus reniformis* has been studied by inoculation experiments with 3 different levels of population, viz., 200, 2000 and 20,000 nematodes per plant and with a control without nematodes. The nematode is pathogenic to castor and causes growth reduction, shedding of leaves, early flowering, and malformation and discolouration of seeds. The growth and yield of castor are correlated with the initial nematode population. The nematode infested plants produce seeds of inferior quality containing lesser amounts of oil. The quality of castor oil is also affected by nematode infestation.

NEMATODES FROM THE BANKS OF STILL AND RUNNING WATERS
XI. SUBFAMILY RHABDITINAE

BY

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One new genus and four new species of Rhabditinae, viz., *Paradoxorhabditis paradoxus* gen. et sp. n., *Rhabditoides contaminata* sp. n., *Pelodera (Cruznema) sambharensis* sp. n. and *Pelodera (Cruznema) dunensis* sp. n. collected from the banks of fresh and salt water lakes in India are described and differentiated from the related species. The diagnosis of the genus *Rhabditoides* is emended.