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STUDIES ON HOWARDULA APTINI (NEMATODA-SPHAERULARIIDAE)
PARASITIC IN MEGALURIOTHRIPS SP. IN INDIA

BY

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A parasitic nematode, *Howardula aptini* is reported from India, parasitising a new host the thrip *Magaluriothrips* sp. a pest of leguminous crops. Details of morphology, percentage of infection of the host and seasonal incidence are given. The life history, biology of the parasite and the damage caused to its host are described, usefulness of the parasite as biological control agent is suggested.

NEMATODES ASSOCIATED WITH COTTON IN HARYANA AND
PUNJAB WITH DESCRIPTION OF TWO NEW LEPTONCHID
NEMATODES

BY

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Nematodes associated with cotton in Hissar and Sirsa districts of Haryana and Abohar area of Punjab have been listed. *Ditylenchus* spp., *Hoplolaimus indicus*, *Longidorus siddiqii*, *Meloidogyne javanica*, *Paratrichodorus mirzai* and *Pratylenchus thornei* were the commonly occurring species of phytophagous nematodes in these areas. Two new species of leptonchid nematodes, viz., *Leptonchus dissipularis* sp. n. : L=0.80-0.96 mm, a=22-39, b=3.6-4.5, c=60-75, V=57-62, spicules dissimilar, ventromedian supplements five and *Funaria indica* sp. n. : L=0.88-1.15 mm, a=33-38, b=3.0-3.7, c=57-64, V=56-64, spicule 27-30 μ m, males abundant, ventromedian supplements four have been described, *L. capitatus* Baqri & Jairajpuri, 1968 and *L. microdens* Thorne, 1974 are transferred to the genus *Funaria* van der Linde, 1938.

EFFECT OF FEW SYSTEMIC PESTICIDES AS SOIL TREATMENTS
ON THE GROWTH AND DEVELOPMENT OF *MELOIDOGYNE*
GRAMINICOLA IN RICE ROOTS

BY

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Therapeutic effects of four systemic pesticides viz., oxamyl, phorate, carbofuran and fensulfothion were studied, as soil treatments to rice plants transplanted 10 days earlier in a field infested with *Meloidogyne graminicola*. All these pesticides at 15 kg ai/ha showed equal effectiveness in reducing the growth and development of the nematode in rice roots. The pesticides reduced the endoparasitic populations, delayed the nematode development and also increased the number of males in the total adult populations. The egg-mass production by females was inhibited, till 20 days following treatments.

EFFECT OF pH, MINERAL SALTS AND FATTY ACIDS ON THE
PREDATORY NEMATODE, *PARAHADRONCHUS SHAKILI*
(JAIRAJPURI, 1969)

BY

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Observations on the effects of pH, mineral salts and fatty acids showed that these chemicals are toxic to *Parahadronchus shakili* (Jairajpuri, 1969) Mulvey, 1978. The high susceptibility to the pH gradients ranging from 2.2 to 4.0 and 6.4 to 8.0 showed that these nematodes can not survive either in high acidic media or low alkaline media. The maximum life span at pH 5.8 to 6.0 shows that is the optimum pH range. The mineral salts of concentrations ranging from 0.4M to 0.05M showed different effects at different concentrations. The rate of survival was lower at higher concentrations. Copper sulphate was most toxic, while potassium carbonate was least. The fatty acids ranging from 1N to 0.01N also proved highly toxic, but the toxicity at lowest concentration of 0.001N was less. Formic acid proved highly toxic. The adults, in general, were more tolerant than the juveniles. The adult females were least susceptible while the first stage juveniles were most. The exposure to various chemicals also brought about changes in the posture and movement of the nematodes.

**IN VITRO STUDIES ON FEEDING OF SOME PLANT
PARASITIC NEMATODES**

BY

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In vitro feeding of some plant parasitic nematodes has been studied on some vegetable crops. *Tylenchus filiformis* fed away from root tips with feeding mainly confined to epidermal cells of secondary roots and root hairs. *Tylenchorhynchus swarupi* fed all over the root surface but mostly in the meristematic zone. *Hoplolaimus dubius* preferred primary roots and root-lets and preferred feeding on *Trigonella foenum-graecum*, *Brassica rapa* and *Spinacia oleracea*. *Rotylenchulus reniformis* penetrated all along the roots except the root tips. *Criconemoides brevistylus* fed mostly on thick primary and secondary roots for 15-30 minutes at particular place. However, continuous feeding for 16 hours was recorded on *T. foenum-graecum* where it resulted in brown discolouration of the spots at the feeding site.

TAXONOMIC STUDIES ON NEMATODES OF VIDARBHA REGION OF
MAHARASHTRA INDIA I THE FAMILY DISCOLAIMIDAE
(DORYLAIMIDA) WITH PROPOSITION OF TWO NEW GENERA

BY

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Taxonomic status of the genera *Discolaimus*, *Discolaimium* and *Discolaimoides* is discussed and these are accommodated under the family Discolaimidae after suitably amending the diagnosis of the latter. For the species earlier included either in *Discolaimus* or *Discolaimoides* having mono-opisthodelphic female gonad a separate new genus is proposed and diagnosed alongwith the description of a new species. *Discolaimium dubium* Das *et al*, 1969 is being accommodated in a newly proposed genus. A key to the genera of Discolaimidae is provided.

TAXONOMIC STUDIES ON NEMATODES OF VIDARBHA REGION
OF MAHARASHTRA INDIA II. TWO NEW SPECIES
BELONGING TO THE FAMILY NORDIIDAE
(DORYLAIMIDA : NEMATODA)¹

BY

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Longidorella suviswa sp. n. and *Enchodorella jagannathi* sp. n. collected from soil about the roots of lesser millet and chilli respectively from Vidarbha region of Maharashtra are described. *Longidorella suviswa* is distinctive by having L=0.65-0.80 mm, stylet=38-44 μ m, rounded continuous head, c=13-21, and tail ending with a sub-acute rounded terminus, *Enchodorella jagannathi* is characterized by L=0.40-0.50 mm, odontostylet=30-37 μ m, stylet extension=25-33 μ m, guiding ring located $1\frac{1}{2}$ labial widths from head end and a dorsally convex-conoid tail ending with a pointed terminus.

HOST-RANGE OF THE SPIRAL NEMATODE,
HELICOTYLENCHUS ABUNAAMAI

BY

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Out of the 61 plant types belonging to 21 families tested in replicated pot culture experiments as possible hosts of *Helicotylenchus abunaamai*, 38 botanical species were found to be susceptible and favourable hosts in consideration of significant multiplication of the initial level of nematode inoculum. The highest nematode population was recorded on little millet "gulji" followed by rice. The rest of the 23 plant species were unsuitable for the nematode, 12 were recorded as poor hosts and the following 11 plant types, such as, niger, marigolds, rape seed, mustard, karanja, coriander, bitter gourd, knolkhol, radish and margosa were noted to be non-hosts as the final nematode populations were less than the recoveries made from fallow soil.

COMMUNITY ANALYSIS OF SOIL AND PLANT PARASITIC
NEMATODES OF HILLY AREAS OF SOUTHERN
DISTRICTS OF TAMIL NADU¹

BY

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A study on the community analysis of soil and plant parasitic nematodes of hilly areas of southern districts of Tamil Nadu was carried out by analysing 131 soil samples collected from rhizosphere of 65 different crop plants with a view to provide information about the absolute and relative frequency, density, biomass, prominence and importance values of 45 different nematode species which are identified under 26 genera, 17 families, 8 super-families, 5 sub-orders and 3 orders viz., Tylenchida, Aphelenchida and Dorylaimida. From this study, it is found that *Helicotylenchus indicus* ranked first in Prominence whereas potato cyst nematode *Globodera pallida*, *G. rostochiensis* ranked first in its importance value.

**IN VITRO TOXICITY OF DBCP TO SOME PHYTOPHAGOUS
NEMATODES AND HATCHIBILITY OF *HETERODERA CAJANI***

BY

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Toxicological tests with different concentrations of DBCP and exposure of *Pratylenchus zae*, *Tylenchorhynchus vulgaris* and *Hemicriconemoides cocophillus* revealed that the percentage mortality was directly proportional to both the increased concentration and exposure period. There was almost complete kill of all three nematode species when exposed to 160 ppm or more for 24 hours. Using CTP as parameter, *T. vulgaris* was found to be more susceptible to DBCP exposure as compared to *P. zae* and *H. cocophillus*. Further, *P. zae* was found to be more susceptible at 20° than at 10° or 30°C. Similarly, larval emergence from cysts of *Heterodera cajani* was proportionately affected with an increase of DBCP concentration and exposure period. Larval emergence was reduced to 9.5, 4.8 and 0.8 per cent in 640 ppm for 2, 4 and 8 days respectively as against 41.0 per cent emergence in check treatment.

EFFECT OF TEMPERATURE ON LARVAL EMERGENCE FROM CYSTS OF *HETERODERA AVENAE*

BY

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Larval emergence at constant temperatures, *i.e.*, 10, 15, 20, 30 and 40°C from old and new cysts of *H. avenae* was studied. At fluctuating room temperature larval emergence from only old cysts was studied. The contents of field-collected cysts were also recorded during April, 1973 to November, 1974. In all, there were 100 cysts in four replicates at each temperature. The weekly observations revealed that differences in larval emergence from old cysts at 10°C, 15°C and 20°C were significant. As was evident from total hatch, the optimum temperature, the maximum larval emergence took place at 18°C. This points to the possible existence of optimum temperature between 15°C and 20°C. For larval emergence from new cysts, there was significant increase at 15°C as compared to 10°C, a significant decline at 20°C and little emergence at higher temperatures. This indicated that for larval emergence from new cysts the optimum temperature might be between 10°C and 15°C. Thus, there appeared to be different temperature optima for larval emergence from old and new cysts of *H. avenae*. The monthly observations on contents of the field-collected cysts did not show any much greater variation except a slight decline during winter months.

EFFECT OF SIMULTANEOUS INOCULATIONS AND PRIOR
ESTABLISHMENT OF *HETERODERA ZEA*E, *MELOIDOGYNE*
INCOGNITA AND *TYLENCHORHYNCHUS VULGARIS*
ON PENETRATION OF CYST AND ROOT-KNOT
NEMATODES INTO MAIZE ROOTS*

BY

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Larval penetration of *Heterodera zae* and *Meloidogyne incognita* into maize roots (Cy. Ganga 5) continued upto 7 days with majority being achieved by 4th day. *H. zae* penetrated root tissues at both meristematic and zone of elongation as compared to *M. incognita* which predominantly invaded at meristematic zone. In case of simultaneous inoculations *M. incognita* did not seem to interfere with the penetration of *H. zae* while penetration of *M. incognita* was adversely affected by presence of *H. zae*. On the other hand, *T. vulgaris* tended to enhance the penetration of *M. incognita*. Prior establishment of any of the nematode species by three days either singly or in combination significantly reduced invasiveness of the other species. Larval penetration of both cyst and root-knot nematodes was more whenever they were inoculated earlier.

DESCRIPTION OF *HIRSCHMANNIELLA KAVERII* SP. N.
(RADOPHOLIDAE : NEMATODA) WITH A KEY FOR
IDENTIFICATION OF *HIRSCHMANNIELLA* SPP.

BY

C.V. SIVAKUMAR* and E. KHAN**

Hirschmanniella kaverii sp. n. collected on rice roots from Kaveripattinam, Tamil Nadu, India, is illustrated and described. It can be distinguished from *H. oxycrena* Sultana, 1978 and *H. mangalorensis* Mathur & Prasad, 1971, by the presence of five distinct lip annules, pointed central extension of tail and the absence of mucro at tail terminus. It differs from *H. exigua* Khan, 1972, by the longer stylet (24-25 μm vs. 17-18 μm) and larger anteriorly sloping stylet knobs and absence of mucro in tail). It can be distinguished from *H. shamimi* Ahmad, 1972, by the absence of ventral notch near tail terminus.

INTERACTION AMONGST *HETERODERA ZEA*E, *MELOIDOGYNE INCOGNITA* AND *TYLENCHORHYNCHUS VULGARIS* ON ZEA MAYS*

BY

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Interaction studies amongst *Heterodera zea*e, *Meloidogyne incognita* and *Tylenchorhynchus vulgaris*, carried out at two levels of inoculum, namely, 500 and 1000 nematodes per 500 cc. of soil indicated that the combined effect of *H. zea*e & *M. incognita* or *H. zea*e & *T. vulgaris* or *M. incognita* and *T. vulgaris* at both levels of inoculum on plant growth was similar to that of their individual effects. In combined inoculations of three nematode species while the inoculum levels of *H. zea*e and *T. vulgaris* tended to interact differently in different combinations with respect to plant growth, *M. incognita* tended to suppress it progressively with increasing inoculum. Lower levels of *T. vulgaris* at 500 larvae of *H. zea*e and lower levels of *M. incognita* at 1000 level had synergistic effect on cyst production. Gall formation by *M. incognita* was adversely affected by presence of one or both of the other nematode species. Final population of *M. incognita* was adversely affected by both inoculum levels of *H. zea*e but not with those of *T. vulgaris*. Final population of *T. vulgaris* was found to be reduced by low levels of *H. zea*e and both levels of *M. incognita*.

SPECIES OF *BASIRIA* SIDDIQI, 1959 ASSOCIATED WITH FRUIT
TREES IN INDIA (NEMATODA : PSILENCHINAE)

BY

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Basiroides Thorne and Malik is considered as valid genus. *Basiria asaraensis* sp. n. is distinctive by having annulated head, a longer basal bnlb, relatively smaller post-uterine sac and spermatheca and a long tail. *B. shahidi* sp. n. is characterized by having a comparatively longer metenchium, post uterine sac measuring about half the vulval-body-width in length, vulva anus distance less than tail length and a finely pointed tail terminus. *B. aberrans* (Thorne, 1949) Siddiqi, 1963 is reported from Imphal, Manipur and key to the species of *Basiria* is provided.

**NEOBASIRIA CITRI GEN. N. SP. N. IN THE SUBFAMILY BASIRINAE
(TYLENCHIDA : PSILENCHIDAE) FROM RAMTAKE, MAHARASHTRA
INDIA**

BY

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Neobasiria, a new genus is being proposed in the subfamily Basirinae Andrassy, 1976 for reception of nematodes closely resembling the genera *Basiria* and *Basiroides*. From *Basiria* it differs mainly in having cylindrical basal oesophageal bulb, comparatively shorter tail, longer bursa and longer vulva-anus distance. From *Basiroides* it differs in having cylindrical basal oesophageal bulb, posteriorly located dorsal oesophageal gland opening and median oesophageal bulb.

THREE NEW SPECIES OF GENUS *ORIENTYLUS* JAIRAJPURI &
SIDDIQI, 1977 ASSOCIATED WITH FRUIT TREES IN INDIA
(ROTYLENCHOIDINAE : NEMATODA)

BY

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Three new species of *Orientylus* Jairajpuri and Siddiqi, 1977 associated with fruit trees in India are described. *O. elegans* sp. n. is distinctive by the posterior location of orifice of dorsal oesophageal gland, short basal oesophageal lobe and rounded annulated tail; *O. peculiaris* sp. n. by the size of spear, V value and gubernaculum with a curved proximal end. *O. basiri* sp. n. can be distinguished by the size of spear, location of phasmid and number of tail annules.

DESCRIPTION OF TWO NEW SPECIES OF *SCUTELLONEMA*
ANDRASSY 1958 (HOPLOLAIMOIDEA : NEMATODA)

BY

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Scutellonema conicaudatum sp. n. and *S. conicephalum* sp. n. are described from Tamil Nadu, India. *S. conicaudatum* can be distinguished by its hemispherical narrow head and tapering conoid, rounded tail. It resembles *S. unnum* Sher, 1963 but differs in having only six longitudinal striations on basal annule instead of 16-22, more posteriorly located excretory pore, absence of epiptygma and intestine not overlapping rectum. *S. conicephalum* has a truncate conical lip region with three annules. It differs from closely related species, *S. truncatum* Sher, 1963, by the presence of lip annules, epiptygma, more posterior excretory pore, rounded tail, and absence of longitudinal lines at the base of lip region. It can be distinguished from *S. brabanum* Khan, Saha & Chawla, 1980 by the oval-shaped stylet knobs with indented interior surface, presence of epiptygma and areolation at the region of phasmids.

THREE NEW SPECIES OF HOPLOLAIMID NEMATODES
FROM SOUTH AMERICA

BY

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Peltamigratus annulatus sp.n. and *Dolichorhynchus parvus* sp.n. from Chile and *Helicotylenchus angularis* sp.n. from Belize have been described and illustrated. *P. annulatus* is similar to *P. longistylus* and *P. perscitus* in having distinctly annulated lip region and areolated lateral fields at the phasmids, but differs from them in having a smaller body and shorter spear. *Helicotylenchus angularis* is unique in the genus in having an angular lip region. *Dolichorhynchus parvus* is the smallest species of the genus.

AN EVALUATION OF TECHNIQUES OF EXTRACTION AND
SEPARATION FOR CYSTS OF *HETERODERA AVENAE* AND *H. ZEA**

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Different extraction and separation techniques for cysts of *Heterodera* species have been evaluated with respect to two soil type populations of *H. avenae* and one pot culture population of *H. zea*. The effect of sample size and soil type on the recovery of cysts and the effect of the processing techniques on the emergence of larvae have been investigated also.