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CONTROL OF THE DAMPING-OFF DISEASE OF PEA BY  
*APHELENCHUS AVENAE*

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**Abstract :** The strain of the mycophagous nematode, *Aphelenchus avenae*, used in these tests, fed and multiplied on *Pythium ultimum*, but not on pea seedlings when tested *in vitro* and in sterilized soils. When 50,000 to 100,000 nematode of this species were added simultaneously with *P. ultimum* to 10 cm clay pots of non-sterilized soil the emergence and survival percentages of pea seedlings ranged from 33 to 86 compared to 0 to 26 when *P. ultimum* was the only inoculum. In sterilized soils with 50,000 to 100,000 nematodes plus *P. ultimum*, the emergence percentages were between 46 and 73, whereas the fungus alone reduced the percentage to 13.

**Key words :** Damping-off disease, *Aphelenchus avenae*, pea



**TYLENCHORHYNCHUS ZEAЕ IN THE CULTIVATED SOILS OF  
BANKURA AND BURDWAN**

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**Abstract :** Population density, vertical distribution and seasonal fluctuations of *Tylenchorhynchus zae* were studied in the rotations and monoculture of crops from cultivated fields around Burdwan and Bankura (West Bengal). *T. zae* was abundant in all cropping sequences ; monoculture supporting more than rotations. Numbers increased as crops grew and the rate of increase was greater in earlier than in later stages of plant growth. Number of *T. zae* decreased in soils containing linseed and under an excess of soil moisture. There were more larvae than either females or males, especially 0-5 cm deep. Most adults were found in the 5-10 cm layer. Numbers showed two seasonal peaks, one during February-March and the other in October.

**Key words :** *Tylenchorhynchus zae*, population, vertical distribution, cropping sequence

ON SOME SPECIES OF THE GENUS *HELICOTYLENCHUS* STEINER, 1945  
(HOPLOLAIMIDAE : NEMATODA), COMMON PLANT PARASITIC  
NEMATODES IN KASHMIR, INDIA

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*Abstract* : Seven species of the genus *Helicotylenchus* Steiner, 1945, 5 as new records from Kashmir, *H. caroliniensis* Sher, 1966; *H. cavenessi*, Sher, 1966; *H. erythrinae* (Zimmermann, 1904) Golden, 1956; *H. indicus* Siddiqi, 1963 and *H. minzi* Sher, 1966, and two new species, *H. pteracercusoides* and *H. trapezoidicaudatus* are described. The latter species differs from all other species in having trapezoid head and tail. *H. pteracercusoides* differs from *H. pteracercus* Singh, 1971 in having a longer spear, lesser number of tail annules and short, indented ventral projection.

**Key words** : *Helicotylenchus caroliniensis*, *H. cavenessi*, *H. erythrinae*, *H. indicus*, *H. minzi*, *H. pteracercusoides*, sp. n., *H. trapezoidicaudatus* sp. n.,

**AUTOFLUORESCENT SUBSTANCES IN ROOT-KNOTS INDUCED BY  
*MELOIDOGYNE INCOGNITA* ON *DAUCUS CAROTA* L.**

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**Abstract:** Localization of lignin, cutin, suberin and cellulose was studied by fluorescence microscopy. The walls of degenerated syncytia, their adjacent tissues, all the necrotic cells especially those lining the nematode cavity and elements of normal and reaction xylem stained positive for lignin. All these lignified walls autofluoresced bright greenish-white, a characteristic of lignin. In necrotic patches, the cell contents autofluoresced white; when stained with Sudan dyes it confirmed the presence of suberin. The outer tangential walls of peripheral cells of healthy roots and galls of carrot autofluoresced for cutin and was histochemically confirmed. The parenchyma cell walls in the gall and healthy roots stained for cellulose and autofluoresced faintly.

**Key words:** *Meloidogyne incognita*, Carrot, lignin, suberin, cutin, cellulose

ON THE LARVAL PENETRATION AND BIOLOGY OF *HETERODERA*  
*ZEAE* ON MAIZE<sup>1</sup>

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**Abstract :** Penetration of larvae of *Heterodera zae* into maize roots, cv. Shakti and Histarch, started within 12 hrs. of inoculation and increased gradually reaching maximum by 5th day. The nematode was found to complete its life cycle at temperature ranging between 27 and 38°C in 15 to 17 days of inoculation from second stage to second stage larvae.

**Key words :** *Heterodera zae*, root penetration, life cycle, biology.

## NUCLEIC ACID CHANGES IN THREE CARROT CULTIVARS INFESTED WITH *MELOIDOGYNE INCOGNITA*

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*Abstract* : Nucleic acid content in galls of all the three carrot cultivars-Early Nantes (highly susceptible), Pusa Kesar (moderately susceptible) and Black (moderately resistant) was higher as compared to their healthy roots. In galls, RNA and DNA were concentrated more in giant cells and the nematode bodies. RNA was localized in nucleoli, nucleoplasm and cytoplasm and its amount increased as the syncytium developed and decreased only when it degenerated. The intensity of feulgen stain, depicting the presence of DNA, paralleled the nuclear volume which was maximum in syncytium associated with the spike-tail stage of larva. The giant cells of the same complex stained differently for DNA. The syncytial nuclei were larger and lobed in susceptible cultivars, Pusa Kesar and Early Nantes than in moderately resistant cultivar Black.

**Key word** : *Meloidogyne incognita*, Carrot, RNA, DNA.

**EFFECT OF VARIOUS PESTICIDES ON THE CONTROL OF THE  
BURROWING NEMATODE, *RADOPHOLUS SIMILIS*  
INFESTING BANANA<sup>1</sup>**

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*Abstract* : Nuvacron, dimecron, carbofuran and phenamiphos were tested for their efficacy against the burrowing nematode, *Radopholus similis* in a pot trial. A single application of phenamiphos, either at 2, 4 or 6 g a.i. plant or carbofuran at 6g a.i./plant and two applications of dimecron at 2 g a.i. plant were effective in reducing the nematode population and improving plant growth. Phytotoxicity was recorded with increasing concentration of the pesticide or when applied twice.

**Key words** : Pesticides, *Radopholus similis*, banana

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MOVEMENT AND LOCOMOTION OF *TYLENCHORHYNCHUS BRASSICAE*  
SIDDIQI, 1961 ON WATER AGAR MEDIUM

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**Abstract:** Undulatory or serpentine movement was observed in *Tylenchorhynchus brassicae*. No track formation was observed on 0.5% water agar medium. However, on 1.0% water agar, nematodes left sinusoidal track. At 3.0%, nature of track was erratic crest and trough and almost a linear pattern on 5.0%. There was also a corresponding increase in the number of waves per body length of the nematode, but the rate of movement (speed =  $\mu\text{m}/\text{sec.}$ ) of both sexes and larvae decreased in higher concentrations of agar medium.

**Key words :** *Tylenchorhynchus brassicae*, movement on water agar

REACTION OF DIFFERENT VEGETABLES TO ROOT-KNOT NEMATODE  
*MELOIDOGYNE INCOGNITA* AND THEIR EFFECT ON THE  
MORPHOMETRICS OF NEMATODE

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- *Abstract* : Different vegetable crops were inoculated with single egg mass population of *Meloidogyne incognita* in order to determine the extent of morphometric and allometric variations. The different hosts influenced the female dimensions to a varied degree. Large and robust females were produced on highly susceptible plants like *Trigonella foenum graecum*, *Pisum sativum* and *Coriandrum sativum* while smaller females were produced on plants like *Lycopersicon esculentum*, cv *Pelicum*, *L. pimpinellifolium* (Red fruit), which are tolerant to nematode attack.

**Key words** : *Meloidogyne incognita*, morphometrics, reation, vegetables

## EFFECT OF NEMATICIDES ON THE AVAILABLE NITROGEN IN SOIL AND GROWTH OF TOMATO PLANTS

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*Abstract* : While studying the effect of application of carbofuran (2,3-dihydro-2,2-dimethyl-7 benzofuranyl methyl carbamate) and oxamyl (methyl N'-N'-dimethyl-N (methyl carbomoyl) oxy-1 thio oxamimidate) in soil on the changes in pH, EC, organic matter, available N and growth of tomato (cv. Marglobe), it was observed that available N increased with the increase in dose of nematicides, i.e., up to 10 ppm in carbofuran and 50 ppm in oxamyl, followed by a decline. After 50 days, there was also a decline in available N and EC of the soil as a result of treatment. However, both the nematicides failed to bring about an effect of pH and organic matter of the soil. The increase in growth of plants in nematicide treated soil appears to be linked with increase in available N.

**Key words** : Nematicides, soil nitrogen, tomato

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HOST EFFICIENCY OF TALL AND DWARF WHEAT AND BARLEY  
CROPS TO CEREAL CYST NEMATODE (*HETERODERA AVENAE*)

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**Abstract :** Wheat and barley crops, infested by *Heterodera avenae*, differ in their efficiency as host and in damage, with barley being damaged more than wheat. However, wheat was more efficient host than barley in respect of nematode multiplication. Tall varieties, of both the crops; suffered more damage than dwarf counterparts, but nematode multiplication was more on the latter varieties.

**Key words :** Host Efficiency, Dwarf Wheat, Barley, Cereal Cyst Nematode, *Heterodera avenae*

ON *PANAGROLAIMUS MIGOPHILUS* POINAR & GEETHA BAI AND  
*PELODERA* SP. (NEMATODA : RHABDITIDAE) PARASITISING  
*MUSCA DOMESTICA* L. (DIPTERA : MUSCIDAE) IN INDIA

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*Abstract* : The life-cycle and developmental stages of *Panagrolaimus migophilus* and *Pelodera* sp., two rhabditid nematode parasites of *Musca domestica* in India, are described. The adults and all larval stages of the host are susceptible to attack. Both species pass through one generation in about a week and can be bred in the laboratory. Possibilities of their use in biological control are considered. *P. migophilus* appears to be the more promising of the two species.

**Key words** : *Panagrolaimus migophilus*, *Pelodera*, *Musca domestica*, Parasites, biology.

**PATHOGENICITY OF ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA* ON BOTTLEGOURD. (*LAGENARIA SICERARIA*) USING TWO METHODS OF INOCULATION**

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*Abstract* : Pathogenicity of *Meloidogyne javanica* on bottlegourd (*Lagenaria siceraria*) was tested by inoculating different levels of second stage larvae of *Meloidogyne javanica* at the time of sowing and in 10 day-old plants. Significant reduction in growth characters, number of galls and egg mass/plant over control (uninoculated) was observed at and above 100 larvae/kg soil in both the methods. More number of galls and egg masses/plant was observed in the second method  $M_2$  (where inoculation was done in 10 day-old plants) as compared to  $M_1$  (where inoculation was done in the soil at the time of sowing).

**Key words** : *Meloidogyne javanica*, Bottlegourd, Pathogenicity, Method of inoculation

ANALYSIS OF CROP LOSSES IN TOMATO DUE TO  
*MELOIDOGYNE INCOGNITA*

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*Abstract* : Losses caused by the root-knot nematode, *Meloidogyne incognita*, in tomato were assessed under field conditions. At a preplant nematode population density of 20 larvae per g of soil, yield of tomato was reduced by 39.7 per cent. The losses were due to few in number and low weight fruits and also because of delayed fruit ripening.

**Key words** : *Meloidogyne incognita*. Tomato, Crop losses.

EFFECT OF DIFFERENT pH LEVELS ON ROOT-KNOT DEVELOPMENT  
AND MORPHOMETRICS OF *MELOIDOGYNE INCOGNITA*

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*Abstract* : Seedlings of tomato cv. Marglobe grown in soil maintained at different soil pH were inoculated with single egg mass population of *Meloidogyne incognita* for determining the extent of morphometric and allometric variations in the female of the nematode. At both, acidic and alkaline pH levels, smaller females were observed as against bigger ones at neutral pH.

**Key words** : *Meloidogyne incognita*, pH, development, morphometrics.

EFFECT OF VARIOUS TREATMENTS, BOTH INDIVIDUALLY AND  
IN INTEGRATION, IN CONTROLLING THE BURROWING  
NEMATODE, *RADOPHOLUS SIMILIS*, INFESTING  
BANANA<sup>1</sup>

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*Abstract* : Hot water treatment, paring, *neem* cake application and phosphamidon were evaluated individually and in integration, against *Radopholus similis* infesting banana. Hot water treatment and paring of the suckers, both individually and in integration with other treatments, were most effective in reducing the nematode population and improving the plant growth.

**Key words** : Control, *Radopholus similis*, banana, hotwater treatment, integration of treatment.

**TWO NEW SPECIES OF *IPONEMA* (NEMATODA-DRILONEMATIDAE)  
FROM BODY CAVITY OF EARTHWORMS**

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**Abstract :** Two new species of *Iponema* Timm & Maggenti (1966) are described from the body cavity of earthworm *Lampito mauritii* (Megascolecidae). The new species *Iponema hyderabadensis* differ from other species of the genus by its smaller size, presence of a depression at the base of the head and cuticularized buccal cavity. *Iponema timmae* also differs from other species in its smaller size and shape of the gubernaculum.

**Key words :** *Iponema hyderabadensis* sp. n., *I. timmae* sp. n.

**PERSISTENCE AND BASIPETAL TRANSLOCATION OF NEMATICIDAL  
ACTIVITY OF UC 54229, A CARBOFURAN ANALOG, IN PEA**

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*Abstract* : Basipetal translocation of UC 54229 residues was evaluated in pea following foliar application at the rate of 0.5 kg a.i./ha under field conditions. The compound moved quickly into the roots and its residues persisted up to 75 days. The residues on foliage degraded rapidly and became non-detectable in 90 days. The residues in green pods, from different pickings, were less than 0.06  $\mu\text{g/g}$ .

**Key words** : Persistence, Basipetal translocation, UC 54229, Pea

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## EVALUATION OF CYST EXTRACTION TECHNIQUES AND THEIR EFFECT ON BIOLOGY OF *HETERODERA CAJANI*

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**Abstract :** Sieving, modified Fenwick-can and Fenwick-can, in the respective order were best for extraction of cysts of *Heterodera cajani*. A sample size of 50-100 ml was most appropriate for good recovery of cysts. Cyst extraction through flask method or centrifuge method was not satisfactory. For separation of cysts from debris, organic liquids were better than inorganic/sugar solutions, with acetone or acetone + carbon tetrachloride as the most effective. However, hatching was adversely affected in the case of cysts recovered through these organic solutions. In comparison to hand-picked cysts, best hatching was obtained from cysts recovered through sugar, followed by sodium chloride and acetone drying of cysts and debris at 25°C. A scheme for extraction and separation of cysts of *H. cajani* is given.

**Key words :** *Heterodera cajani*, extraction and separation techniques, biology.

TWO NEW SPECIES OF THE GENUS *HELICOTYLENCHUS* STEINER, 1945  
(TYLENCHIDA : HOPLOLAIMIDAE)

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*Abstract* : Two new species of *Helicotylenchus* are described and illustrated. *H. reversus* sp. n. is characterized by body 0.64–0.69 mm long, 4–5 lip annules, spear 25–28  $\mu\text{m}$  long, phasmids 3–10 annules anterior to level of anus and tail equal to one anal body diameter long, curved dorsally with a pointed terminus. *H. caudatus* sp. n. is characterized in having a body 0.52–0.61 mm long, 3–4 lip annules, spear 25–28  $\mu\text{m}$  long, phasmids 0–7 annules anterior to level of anus and tail equal to one anal body diameter long with a projection at terminus.

**Key words** : *Helicotylenchus reversus* *H. caudatus* sp. n.

## EFFICACY OF DUROFUME, RABBING AND ALDICARB AGAINST ROOT KNOT NEMATODE AND WEEDS IN TOBACCO NURSERIES

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*Abstract* : Durofume, rabbing and aldicarb were compared for their efficacy in controlling root knot nematodes and weeds in tobacco nurseries. Durofume (1 : 1, methyl bromide 50 : EDB 50) effectively controlled root knot nematodes and weeds. Rabbing with paddy husk @ 20 Kg/sq. m was effective against nematodes up to 45 days and partly against weeds. Aldicarb 8 kg a.i./ha controlled the nematodes up to 50 per cent. Adoption of Durofume application by cultivators is suggested.

**Key words** : Methyl bromide, EDB Aldicarb, Durofume, *Meloidogyne incognita*, Control, Tobacco.