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## **EFFECT OF *MELOIDOGYNE INCOGNITA* ON ROOT BIOCHEMISTRY AND FUNCTIONING OF NODULES IN GREEN GRAM**

K.C. MOHANTY, P.K. MOHANTY AND T. PRADHAN

Department of Nematology, Orissa University of Agriculture and Technology,  
Bhubaneswar- 751003, (Orissa)

**Abstract:** *Meloidogyne incognita* beside being pathogenic to green gram, was found to interfere with the functioning of nodules and normal root biochemistry. Higher concentration of amino acids (except L-tryptophan) and total sugar were observed in nematode, rhizobium and both rhizobium and nematode inoculated roots. The chlorophyll content of leaves reduced only in nematode inoculated plants. Leghaemoglobin and nitrogenase activities were also reduced in nematode infected nodules.

**Key words:** *Meloidogyne incognita*, green gram, biochemical change, nodulation.

## SECRETION OF GLYCOPROTEINS DURING HATCHING OF *HETERODERA AVENAE*

RAJAN AND S.K. IBRAHIM\*

National Bureau of Plant Genetic Resources, I.A.R.I., New Delhi- 110 012

**Abstract:** The study of the chemical nature of the exudates, water permeability and other changes at the time of hatching from eggs as well as from freshly hatched larvae of two ecotypes of cereal cyst nematode, *Heterodera avenae* showed that water content of hatched and unhatched larvae was 70%. Uptake of water by eggs and larvae inside eggs seemed to have no role in hatching process, while glycoproteins were released in the hatching media.

**Key words:** Water content, exudates, enzymes, dormancy, permeability of eggs and larvae, cereal cyst nematode.

## **ON THE TAXONOMIC STATUS OF SPECIES OF *HELICOTYLENCUS* STEINER, 1945. II. HAVING A ROUND TAIL TERMINUS FROM INDIA**

MANOHAR LAL AND E.KHAN

Division of Nematology, Indian Agricultural Research Institute, New Delhi-1100 12

**Abstract:** Variations in the Indian populations of three nominal species of the genus *Helicotylenchus* viz. *H. retusus* Siddiqi & Brown, 1964; *H. goodi* Tikyani, Khera & Bhatnagar, 1969 and *H. girus* Saha, Khan & Chawla, 1973 are recorded. Fourteen new synonyms viz. *H. arachisi*, *H. bihari* Mulk & Jairajpuri, 1975; *H. wajihi* Sultan, 1981; *H. incisus*, *H. obtusicaudatus* Darekar & Khan, 1978; *H. paragirus* Saha *et al.*, 1973; *H. steineri* Fotedar & Mahajan, 1974; *H. gratus*, Patil & Khan, 1982; *H. kashmirensis*, Fotedar & Handoo, 1974; *H. microdorus*, Prasad *et al.*, 1965; *H. rohtangus* Baqri & Jairajpuri, 1973; *H. tangericus*, *H. valecus* Sultan, 1981 and *H. willmottae* Siddiqi, 1972 are proposed. A list of valid species from India with rounded tail terminus is presented.

**Key words:** *Helicotylenchus*, morphology, morphometric and taxonomic status.

**MANAGEMENT OF ROOT-KNOT NEMATODE, *MELOIDOGYNE JAVANICA*  
ON VEGETABLE CROPS WITH *TAGETES* SP.**

KUM KUM WALIA AND D.C. GUPTA

Department of Nematology, CCS Haryana Agricultural University, Hissar - 125 004

**Abstract:** Aqueous extracts from 30 and 60 day-old marigold plants (*Tagetes* spp.) inhibited juvenile hatch considerably at all the concentrations compared to control. The juveniles hatched in 60 day-old plant extracts were immobile too. The extract without dilution had irreversible toxic effect and no hatching was observed in this treatment. Root exudates without dilution irrespective of the age of the plant, inhibited maximum hatch which decreased with the increase in dilution. Incorporation of chopped *Tagetes* leaves (40 and 80 g per kg soil) significantly increased tomato and brinjal plant growth and reduced number of galls, eggmasses and final juvenile population in soil.

**Key words:** Marigold, organic amendment, tomato, brinjal, root exudates

## **CONTROL OF *MELOIDOGYNE INCOGNITA* ON OKRA THROUGH BOTANICALS AS SOIL AMENDMENTS**

S. RAMAKRISHNAN\*, C.R. GUNASEKARAN AND SIVAGAMI VADIVELU

Department of Nematology, Tamil Nadu Agricultural University, Coimbatore- 641 003, Tamil Nadu

**Abstract:** A study under glass house conditions indicated that among the various botanicals *Melia azedarach* (80 g/pot) recorded maximum shoot length, fresh shoot weight and pod yield. The highest reduction in root-knot index and nematode population was also recorded in this treatment followed by *Azadirachta indica* leaves (80g/pot). *A. indica* (80g/pot) recorded maximum dry shoot weight.

**Key words:** *Meloidogyne incognita*, botanicals, okra, standard control

## **NEMATICIDAL EFFICACY OF ORGANIC MANURES, INTERCROPS, MULCHES AND NEMATICIDE AGAINST ROOT-KNOT NEMATODE IN MULBERRY**

GOVINDAIAH, D.D. SHARMA, M.T. HIMANTHARAJ AND A.K. BAJPAI

Central Sericultural Research and Training Institute, Sreerampura, Mysore - 570 008

**Abstract:** Among different treatments against root-knot nematode *Meloidogyne incognita* infecting mulberry, sebufos (Rugby 10G) was found most effective. It has increased 10-14 per cent leaf yield, reduced 80-90 per cent root-galls and egg mass production. Organic manures namely neem and pongamia cakes and also the direct mulching of their green leaves were equally effective. While poultry manure, sewage manure, saw dust and mulching of *Parthenium*, *Vinca rosea*, *Calotropis*, *Euphorbia* spp. were least effective. Intercropping of marigold and *Sesamum* was more effective than sunhemp. Bio-assay studies did not show any residual toxicity on silkworms 40-50 days after treatment. For effective management of root-knot disease sebufos (@ 2 kg ai/ha/yr) or neem/pongamia cake (@ 2 ton./ha/yr) is suggested.

**Key words:** Sebufos, root-knot nematode, organic manures, mulches, intercropping, mulberry.

**EVALUATION OF NEMATICIDES FOR THE CONTROL OF  
*PHYTOPHTHORA -MELOIDOGYNE* DISEASE  
COMPLEX IN TOBACCO**

**K. SITARAMAIAH\* AND K. KRISHNA KUMARI**

Department of Plant Pathology, Andhra Pradesh Agricultural University, Agriculture College,  
Bapatla - 522 101

**Abstract:** Non-volatile nematicides carbofuran and phorate each at 4, 6 and 8 kg. a.i./ha dosages were tested as pre and post inoculation treatments for the control of *Meloidogyne javanica* on tobacco when *M. javanica* and *Phytophthora parasitica* var. *nicotianae* were inoculated simultaneously. Carbofuran was found to be the most effective treatment followed by phorate as pre-inoculation treatment and decreased root-knot severity and the black shank disease incidence at higher dosages (@ 6 and 8 kg. a.i./ha) of application than in the post inoculation treatment compared to the untreated control.

**Key words:** Nematicide, control, *Phytophthora-Meloidogyne* disease complex, tobacco.

## **VIRULENCE SPECTRA OF AGGRESSIVE *GLOBODERA PALLIDA* POPULATION\***

S.F.A. AMALRAJ\*\* AND G.R. RAO\*\*\*

Botany Department, Bharathidasan University, Tiruchirappalli, Tamil Nadu - 620 024

**Abstract:** Twelve isolates representing diverse *G. pallida* natural populations of virulent pathotypes were studied by rearing them on two highly resistant potato differentials. The isolates were different from each other and the virulence was steeply increasing in level with clone VTN<sup>2</sup> 62. 33. 3 than with clone 69-13377/94. With clone 62. 33. 3 the isolates spread into two groups while with the other clone they formed one group. It was found that in heterogenous field populations virulence occurred after many generations. Virulence increase was significantly high in soils of bad management by nematicide use. Elevation created variation in virulence build up.

**Key words:** Virulence, *Globodera pallida*, isolates.

## **INFLUENCE OF EDAPHIC FACTORS ON SOIL ACARINES AND PLANT PARASITIC NEMATODES AND THEIR INTERACTION**

**KUM KUM WALIA AND SUDHA MATHUR\***

Department of Nematology, CCS Haryana Agricultural University, Hisar - 125 004

**Abstract:** Influence of soil temperature, moisture, pH and organic carbon was studied on soil acarine and nematode fauna and their interaction at four field sites at Hisar. Acarine populations were high from July to September at all the sites due to favourable soil temperature and moisture. Soil pH and organic carbon did not vary much during the sampling period and hence did not influence mite/nematode populations. Phytonematode populations were more influenced by host crop than edaphic factors. In citrus, papaya and vegetable fields, the mite populations were positively correlated with nematode populations, whereas in sugarcane field, nonsignificant negative correlation was observed between mite and nematode population.

**Key words:** Nematophagous mites, plant parasitic nematodes, predator-prey relationship, seasonal fluctuation.

## PLANT PARASITIC NEMATODES ASSOCIATED WITH THREE MEDICINAL PLANTS AND THE PATHOGENICITY OF ROOT-KNOT NEMATODE

RAKESH PANDEY AND AKHTAR HASEEB

Central Institute of Medicinal and Aromatic Plants (CIMAP), P.O. CIMAP, Lucknow- 226015 (U.P.)

**Abstract:** A survey of plant parasitic nematodes carried out in the rhizosphere of *Anmi visnaga* Lamark, *Costus speciosus* (Koen Ex. Retz.) Sm. and *Solanum indicum* L. in the crop museum and fields revealed the occurrence of *Tylenchus* sp., *Tylenchorhynchus vulgaris*, *Hoplolaimus* sp., *Helicotylenchus* sp., *Pratylenchus thornei*, *Rotylenchulus reniformis*, *Longidorus pisi* and second stage juvenile of *Meloidogyne* species. Pathogenicity test undertaken in a glasshouse with root-knot nematode, *Meloidogyne incognita* (Kofoid and White) Chitwood, with different initial levels revealed significantly low plant growth and suppressed root development in all the three medicinal plants. Damage varied proportionally to the nematode initial density and nematode reproduction was inversely proportional to initial density.

**Key words:** Association, medicinal plant, pathogenicity, root-knot nematode.

## PARASITIC NEMATODES ASSOCIATED WITH MEDICINAL AND AROMATIC PLANTS

M. SIVAKUMAR AND SIVAGAMI VADIVELU

Department of Nematology,  
Tamil Nadu Agricultural University, Coimbatore

**Abstract:** Forty six medicinal and aromatic plants were studied for the presence of phytoparasitic nematodes. The root knot nematode *Meloidogyne hapla* was the predominant nematode species, followed by *Helicotylenchus incisus*, *Pratylenchus coffeae*, *Tylenchorhynchus maritini*, *Xiphinema americanum*, *Scutellonema conicephalum* and *Hemicriconemoides mangiferae*. The spiral nematode *Helicotylenchus incisus* was the most frequently occurring species. *Solanum khazianum*, *Rawolfia serpentina*, *Gaultheria fragrantissima*, *Cinchona officinalis*, *Ammi majuls* and *Eucalyptus citriodora*, were the important species of medicinal and aromatic plants which lodged most of these nematode species.

**Key words:** Medicinal and aromatic plants, plant parasitic nematodes, association.

## LARVAL EMERGENCE FROM CYSTS OF *HETERODERA AVENAE* AND *H. CAJANI* AS AFFECTED BY PLANT LEAF EXTRACTS

D.S BHATTI, RAVI DUTT AND K.K. VERMA

Department of Nematology, Haryana Agricultural University, Hisar 125004

**Abstract:** Besides toxicity to the second stage larvae of cyst nematodes (*Heterodera avenae* and *H. cajani*), larval emergence from cysts was also influenced by some plant leaf extracts. Two dilutions of leaf extracts, i.e., 1:5 and 1:20 at 3,6 and 9 days intervals greatly enhanced/retarded larval emergence. Although plant leaf extracts revealed non-significant larval hatch, yet plants, viz., *Euphorbia hirta* and *Oxalis corniculata* effectively reduced hatch in *H. avenae* and *Solanum xanthocarpum* in *H. cajani*.

**Key words:** Larval emergence, *Heterodera avenae*, *H. cajani*, leaf extracts.

**EFFECT OF SOME ORGANIC OILS AND THEIR CAKES ON THE  
INFECTIVITY OF ROOT-KNOT NEMATODE, *MELOIDOGYNE  
INCOGNITA* AFFECTING TOMATO**

K. POORNIMA AND SIVAGAMI VADIVELU

Department of Nematology, Tamil Nadu Agricultural University, Coimbatore- 641 003

**Abstract:** Higher concentrations of organic oils of karanj, neem, mahua and castor proved effective in preventing larval penetration and gall production in the roots of tomato. Cakes of these plants also gave significant reduction in gall number. The best cake treatment i.e. neem produced light infection while the infection produced by the dilution of oil with highest strength was negligible. Thus, treatment with oil was relatively more effective than soil treatment with cakes in controlling root-knot nematode infection.

**Key words:** Organic oil, cakes, infectivity, *M. incognita*, tomato.

## **EFFICACY OF ORGANICS IN CONTROL OF *MELOIDOGYNE INCOGNITA* ON OKRA \***

S. RAMAKRISHNAN\*\*, C.R. GUNASEKARAN AND SIVAGAMI VADIVELU

Department of Nematology, Tamil Nadu Agricultural University, Coimbatore 641 003, Tamil Nadu

**Abstract:** The pot experiment under glass house conditions was conducted for the control of *Meloidogyne incognita* in okra cv. Pusa Sawani, through the use of various organics as soil amendments. Maximum shoot length, fresh and dry shoot weight, root length, fresh and dry root weight and pod yield were recorded with neem cake @ 13.5g/pot . It was followed by mustard cake @ 13.5 g/pot. Maximum reduction in number of females, number of egg masses, number of eggs per egg mass and soil nematode population were also recorded in soil amended with neem cake @ 13.5g pot .

**Key words:** *Meloidogyne incognita*, organics, Okra, control.

**QUANTITATIVE CHANGES IN SUPEROXIDE DISMUTASE, CATALASE AND PEROXIDASE WITH REFERENCE TO RESISTANCE IN TOMATO TO *MELOIDOGYNE INCOGNITA***

S.P. RAJASEKHAR, A.K. GANGULY AND S.C. SWAIN

Division of Nematology, Indian Agricultural Research Institute, New Delhi- 110012

**Abstract:** Investigations were carried out to establish a link between the activities of superoxide dismutase (SOD), peroxidase (PO), catalase and accumulation of superoxide radicals ( $O_2^{\cdot -}$ ) in tomato-*Meloidogyne incognita* interactions. Time course studies on SOD revealed that the activity of the enzyme was of lower magnitude as compared to the healthy counterpart during entire post infectional period in the resistant cultivar. There was a corresponding increase in the production of superoxide radicals in the nematode inoculated resistant host. These observations were suggestive of the fact that in resistant host, nematode infection leads to inactivation of SOD which results in production of  $O_2$ , consequently affecting the biology of the invading pathogen adversely. The increase in the enzyme activity in susceptible host was found to be maximum at 72 hrs after inoculation. There was also an increase in PO activity in inoculated Pusa Ruby, a susceptible host but was of lower order as compared to resistant host. The trend of catalase activity followed the same pattern as that of SOD activity in both the cultivars.

**Key words:** Superoxide dismutase, peroxidase, catalase, *Meloidogyne incognita*, tomato.

## FIVE NEW SPECIES OF *XIPHINEMA* COBB, 1913 ASSOCIATED WITH THE FRUIT CROPS FROM NORTH AND NORTH-EASTERN INDIA

M. SINGH AND E. KHAN

Division of Nematology, Indian Agricultural Research Institute, New Delhi- 110012

**Abstract:** Five new species of *Xiphinema* viz., *X. filicaudatum*, *X. digicaudata*, *X. gracilicaudatus*, *X. arunachalensis* and *X. pruni* have been diagnosed, figured and reported. *X. filicaudatum* n.sp. is characterized by small arc like body, asymmetrical didelphic female gonads, and ventrally curved, elongate tail with three pairs of caudal pores. *X. digicaudata* n.sp. collected around roots of orange at Gompa, Distt. Tawang, Arunachal Pradesh is distinctive by having ventrally arcuate body, continuous rounded head, anteriorly located vulval slit, with single opisthodelphic female gonad, tail dorsally convex conoid with digitate terminus. *X. gracilicaudatus* n.sp. is characterized by having short ventrally curved body, dorsally curved tail less than three anal body width in length with a digitate terminus and protoplasmic core extending upto half of tail length. *X. arunachalensis* n.sp. is characterized by having an open C-shaped body with slightly constricted, continuous rounded head, female gonads short, tail subacute with a rounded terminus. *X. pruni* n.sp. isolated from soil around roots of apricot at Dehradun, U.P., is distinctive by having longer open C-shaped body with continuous elevated truncate head; presence of lateral body pores, didelphic female gonads, tail 1.3 times anal body width long and long non-protoplasmic region in tail measuring slightly less than one anal body width and less number of caudal pores.

**Key words:** New species, *Xiphinema arunachalensis* n.sp., *X. digicaudata* n.sp., *X. filicaudatum* n.sp., *X. gracilicaudatus* n.sp., *X. pruni* n.sp., Taxonomy

**ONE NEW AND FIVE KNOWN SPECIES OF *TYLENCHORHYNCHUS* COBB,  
1913 FROM ORNAMENTAL CROPS IN UDAIPUR  
REGION OF RAJASTHAN**

MANISH PATHAK\* AND A.U. SIDDIQUI

Division of Nematology, College of Agriculture, Rajasthan Agricultural University, Udaipur

**Abstract:** *Tylenchorhynchus crotoni* sp.n. from *Croton* sp., has been described and illustrated. *T. crotoni* sp.n. is distinguished by having smaller body length, smaller stylet and also by having a conoid tail with blunt terminus. Five known species of *Tylenchorhynchus* viz., *T. ewingi*, *T. mashhoodi*, *T. punensis*, *T. brassicae* and *T. leviterminalis* have been reported from the rhizosphere of different ornamental crops grown in Udaipur, Rajasthan.

**Key words:** *Tylenchorhynchus crotoni* sp.n. *Croton* sp., *T. ewingi*, *Rosa* sp., *T. mashhoodi*, *Hibiscus rosa-sinensis*, *T. punensis*, *Psidium guajava*, *T. brassicae*, *Nerium*, sp., *T. leviterminalis*.

## **COMMUNITY ANALYSIS OF PREDACEOUS AND FREE LIVING NEMATODES OF ALIGARH DISTRICT**

ANWAR L. BILGRAMI, RAJEEV KULSHRESHTHA AND RASHID PERVEZ

Section of Nematology, Department of Zoology, Aligarh Muslim University, Aligarh - 202002

**Abstract:** A study on the community analysis of predatory nematodes belonging to Aligarh district was made. Fifty soil samples containing predatory nematodes were collected from the rhizosphere of thirty one different crops from fifty different localities. Twenty species of predatory nematodes were recorded. Fourteen species belonged to Dorylaimida, three to Mononchida and one each to Nygolaimina, Enoplida and Diplogasterida. Community analysis of predatory nematodes was done for parameters like frequency, density, biomass, importance and prominence values. Dorylaim nematodes on the whole were very important group of predators as they were present more abundantly in high density and biomass. Some of the dorylaim predators viz., *Dorylaimus stagnalis* and *Laimydorus baldus* were most prevalent and formed a major constituent of the nematode community. The population of mononchs was localized but their numbers were more prevalent.

**Key words:** Community analysis, Nematodes, Predators.