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INFLUENCE OF MYCORRHIZAL FUNGUS, *GLOMUS FASCICULATUM* SPORE CONCENTRATION ON *ROTYLENCHULUS RENIFORMIS* POPULATION DYNAMICS AND COTTON GROWTH

K. SITARAMAIAH¹ AND R.A. SIKORA

Institute Fur Pflanzenkrankheiten, Universitat Bonn,
Nussallee - 9, W - 5300 Bonn, Germany.

Abstract : Green house tests were conducted to evaluate the influence of different spore levels of *Glomus fasciculatum* on growth of cotton, *Gossypium hirsutum* cv. 'Coker Carolins Queen' and on the population dynamics of *Rotylenchulus reniformis*. Lower numbers of adult females with eggmasses were recorded on mycorrhizal roots inoculated with a spore concentration of 300 and above when compared to controls. Increasing the spore concentration of the fungus from 300 to 1800/plant reduced soil population ranging from 40 to 80% at low nematode inoculum level (100/plant). In general, the nematode did not have any effect on the number of spores produced or root colonization of the fungus. There was a positive vegetative growth response of cotton plants to increased spore concentration of *G. fasciculatum*. The mycelium and chlamydospores of *G. fasciculatum* were consistently observed in eggmasses of *R. reniformis*.

Key words : Mycorrhizal fungus, reniform nematode, cotton growth, nematode population dynamics.

STUDIES ON THE PATHOGENIC POTENTIAL OF *HETERODERA ZEA* AND *PRATYLENCHUS ZEA* ON MAIZE IN HARYANA

R.S. KANWAR, B.P. RANA, KUM KUM WALIA AND R.K. WALIA

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

Abstract : In green-house experiments, both *Heterodera zea* and *Pratylenchus zea*, either singly or in combination did not prove pathogenic to maize. The pathogenic potential of either *H. zea* or *P. zea* was not discernible in different soil types. Soil texture, however, influenced the nematode multiplication. Lighter soils favoured higher multiplication for both the nematode species. *P. zea* did not interact with *Fusarium pallidorozeum*. *H. zea*, however, favoured fungal damage when inoculated one week after the fungus.

Key words : Pathogenicity, Maize, *Heterodera zea*, *Pratylenchus zea*

**OBSERVATION ON *TYLENCHORHYNCHUS BREVILLINEATUS* WILLIAMS ,
1960 (= *T. VULGARIS* UPADHYAY ET AL., 1972) (NEMATODA:
TYLENCHORHYNCHIDAE) WITH AMENDED DESCRIPTION**

M.R KHAN AND E. KHAN

Division of Nematology, Indian Agricultural Research Institute
New Delhi - 110 012

Abstract: Study of *Tylenchorhynchus* populations from IARI farm, New Delhi, showed overlapping morphological and morphometric characters with *Tylenchorhynchus brevilineatus* Williams, 1960 (= *T. indicus* Siddiqi, 1961). In depth, evaluation of morphological and morphometric characters of these populations led to conclude that *T. vulgaris* Upadhyay et al. 1972 is synonymous with *T. brevilineatus*. Amended description of *T. brevilineatus* is discussed.

Key words: *Tylenchorhynchus vulgaris*, *T. brevilineatus*, *T. indicus*, morphological and morphometric characters, amended description, synonym.

HOST PREFERENCE OF SIX GEOGRAPHICAL ISOLATES OF RENIFORM NEMATODE, *ROTYLENCHULUS RENIFORMIS*

G.M.V. PRASADA RAO AND SUDERSHAN GANGULY

Division of Nematology, Indian Agricultural Research Institute
New Delhi - 110 012

Abstract: The host preference of six geographical isolates of *Rotylenchulus reniformis* were studied using cotton var. H-777, cowpea var. Pusa Komal, castor var. Ch-1, bajra var. Pusa-23 and mustard var. Pusa Bold. The isolates of *R. reniformis* used were Andhra Pradesh grape (AP-1) Andhra Pradesh castor (AP-2), Delhi grape (DL-1), Delhi castor (DL-2), Gujarat castor (GJ-1) and Manipur pineapple (MN-1) isolate. The populations of these isolates were maintained on castor which served as source of inoculum for studying their reproduction variabilities. All the isolates could reproduce on cotton, castor and cowpea, but differed in their reproduction behaviour towards bajra and mustard. The existence of four physiological variants was indicated, being represented by (i) AP-1 and MN-1 isolate which did not reproduce on bajra, mustard (ii) AP-2 and GJ-1 isolates which reproduce on bajra, but not on mustard (iii) DL-2 isolate which reproduce on mustard and not on bajra and (iv) DL-1 isolate which reproduced on both bajra and mustard.

Key words: *Rotylenchulus reniformis*, geographical isolates, host preference.

TOXICITY OF WATER SOLUBLE LEAF EXTRACTS AGAINST LARVAE AND EGG MASSES OF THREE *MELOIDOGYNE* SPECIES

S.S. HUSSAINI, R.V.V. PRASADA RAO AND H.K. PANDU

Nematology Section, CTRI Research Station, Hunsur 571 105.

Abstract: The study on the effect of water-soluble leaf extracts of 11 plant species viz., *Adhathodavesica*, *Ageratum conyzoides*, *Argemone mexicana*, *Calotropis procera*, *Catharanthus roseus*, *Eucalyptus globulus*, *Euphorbia pilulifera*, *Leucas aspera*, *Ocimum canum*, *Synedrella nodiflora* and *Tagetes erecta* on second stage juveniles and egg masses of *Meloidogyne incognita*, *M. javanica* and *M. arenaria* showed that *Tagetes erecta* and *Eucalyptus* at all dilutions were very effective in inhibiting egg hatch of the three species. *Argemone*, *Ocimum* against *M. javanica* and *M. arenaria*; and *Ageratum*, *Leucas*, *Synedrella* *Catharanthus* were effective against *M. arenaria* egg masses.

Total larval mortality of all species was observed in *Euphorbia* extract without revival on transfer to fresh water for 48 hours. *Adhathoda* and *Tagetes* were effective against *M. incognita*/*M. arenaria* larvae, *Calotropis* against *M. javanica* and *M. arenaria*, and *Tagetes* against *M. javanica* at 1:2 and 1:4 dilutions, and *Calotropis* and *Catharanthus* against *M. incognita* and *M. arenaria* larvae respectively at 1:2 dilution.

Key words - Toxicity, leaf/extracts, *Meloidogyne* spp.

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GROWTH OF MUNGBEAN AS INFLUENCED BY DIFFERENT INITIAL INOCULUM LEVELS OF *MELOIDOGYNE INCOGNITA*

G.J. SAMATHANAM AND C.L. SETHI

Division of Nematology, Indian Agric. Research Instt.
New Delhi - 110 012

Abstract: Initial inoculum level of 0.5 larva/g of soil was the minimum damaging threshold of *M incognita* on cvs PS-16 and Pusa Baisakhi of mungbean and the reproduction of nematode was found to be density dependent with higher rate of multiplication at lower inoculum levels.

Key words: *Meloidogyne incognita*, mungbean, pathogenicity

EFFECT OF SOIL MOISTURE ON THE DEVELOPMENT OF *HETERODERA CAJANI* ON *SESAMUM INDICUM*

NEERAJA SHARMA AND P.C. TRIVEDI

Department of Botany, University of Rajasthan,
Jaipur-302 004.

Abstract : Optimum soil moisture required for the development of *H. cajani* ranged between 35 to 45 per cent. Maximum number of cysts and final nematode population was observed at 45 per cent soil moisture level but maximum plant growth was observed at 35 per cent moisture level.

Number of cysts and final nematode population was recorded maximum, when plants were irrigated twice in twenty four hours. Declining in cyst and final nematode population was observed when plants were watered once in twenty four hours and once in forty eight hours.

Key words: *Sesamum indicum*, *Heterodera cajani*, soil moisture, water stress.

STUDIES ON AQUEOUS EXTRACT OF DIFFERENT PARTS OF *TARGETES ERECTA* ON HATCHING, LARVAL MORTALITY AND LARVAL PENETRATION OF *MELOIDOGYNE JAVANICA*

D.S. DHANGAR, D.C. GUPTA AND R.K. JAIN

Department of Nematology,
C.C.S. Haryana Agricultural University,
Hisar- 125 004.

Abstract: *In vitro* aqueous extract prepared from different plant parts of *Tagetes erecta* (cv. crackjack) inhibited the egg hatching of *Meloidogyne javanica*. However, extract obtained from roots was most effective. Egg hatching was inversely proportional to extract concentration and directly proportional to exposure time. Larval mortality was also maximum in root extract, which decreased with increase in dilution. But, it increased with increase in duration of exposure time.

Key words : Hatching, larval mortality and penetration, *Tagetes* extract, *Meloidogyne javanica*.

NEMATODES AND RHIZOSPHERE MICROFLORA IN RELATION TO ENDOMYCORRHIZAL ROOT COLONIZATION OF COTTON

K. SITARAMAIAH¹, M. KRISHNA SRI¹ AND N. TRIMURTHLU³

Department of Plant Pathology, Andhra Pradesh Agricultural
University, Agricultural College, Bapatla- 552 101.

Abstract: The intensity of mycorrhizal root colonization and recovery of mycorrhizal spores from the four important cotton growing regions was maximum at 180 days of sowing cotton. Mycorrhizal root colonization was correlated negatively with electrical conductivity at 180 days of cotton growth and found to be significant ($r = -0.9578$). Mycorrhizal root colonization was also negatively correlated with soil phosphorus content at 120 days of growth. Rhizosphere microbial population (total fungi, bacteria and actinomycetes) and different groups of nematodes (saprozoic, mycophagous, predatory and plant parasitic) recovered could not be correlated with the mycorrhizal colonization of roots.

Key words : Cotton, endomycorrhizal fungi, root colonization, rhizosphere microflora, nematodes, mycorrhizal spores.

**MORPHOMETRIC VARIATIONS IN *HIRSCHMANNIELLA MUCRONATA*
(DAS, 1960) LUC AND GOODEY, 1963**

NARPINDER JEET RANDHAWA,* S. KHERA AND E.KHAN **

Department of Zoology,
Panjab University, Chandigarh

Abstract: Stylet length, body width, V% in females and spicule length in males are the most stable characters (cv. -2-5%). Body length, tail length, length of body from head and to vulva, vaginal length, gubernaculum and bursal length, a and c values show moderate variations (c.v. 5-10). Opening of DOG, median bulb distance from anterior end, excretory pore, 'b' and 'c' values are highly variable characters (c.v. 11-16%). Body width is a more stable character than 'a' value, tail length than 'c' value and V% than distance of vulva from head end.

Key words: Morphometric variations, *H.mucronata*, Taxonomy

**REDESCRIPTION OF *HELICOTYLENCHUS INCISUS* DAREKAR & KHAN,
1978 AND OBSERVATIONS ON *HELICOTYLENCHUS RETUSUS* SIDDIQI &
BROWN, 1964**

P. FAZUL RAHAMAN AND IRFAN AHMAD

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

Abstract : *Helicotylenchus incisus* Darekar & Khan, 1978 is redescribed from Gujarat and additional morphological data are provided for *Helicotylenchus retusus* Siddiqi & Brown, 1964.

Key words : Species, *Helicotylenchus*, SEM.

**EFFECT OF CHEMICAL SEED DRESSING AND ORGANIC AMENDMENT
ALONE AND IN COMBINATION FOR THE MANAGEMENT OF ROOT-KNOT
NEMATODE, *MELOIDOGYNE INCOGNITA* ON GREEN GRAM**

BARMAN, M. AND P.DAS¹

Department of Nematology, Assam Agril. University, Jorhat-785 013.

Abstract : Seed treatment with carbofuran 3g @ 3%(W/W) and organic amendments viz. neem cake, poultry manure and mustard oil cake each at 2t/ha alone and combined application of seed dressing followed by organic amendements @ 1t/ha each were found effective in improving plant growth characters and yield of green gram, while the number of galls, egg masses and final nematode population of root-knot nematode *Meloidogyne incognita* were reduced over untreated control. However, best result were obtained with poultry manure applied @ 2t/ha followed by combined application of seed dressing + neem cake @ 1 t/ha.

Key words: Root-knot nematode, *Meloidogyne incognita*, organic amendements

ALTERATION OF EFFECTIVENESS OF *STEINERNEMA CARPOCAPSAE* WEISER (STEINERNEMATIDAE : RHABDITIDA) AGAINST *SPODOPTERA LITURA* (F.) (NOCTUIDAE : LEPIDOPTERA) LARVAE ON SUNFLOWER BY ADDITION OF AN INSECT PHAGOSTIMULANT

N. SEZHIAN, C.V. SIVAKUMAR AND M.S. VENUGOPAL

Tamil Nadu Agricultural University, Coimbatore, 641 003

Abstract:- Addition of an insect phagostimulant (PS) 'Entice' to nematode suspension at 0.032% in addition to the antidessicant glycerine 0.1% and the surfactant 'Triton' 0.05% enhanced the effectiveness of *Steinernema carpocapsae* (Strain DD-136) against the fourth-instar larvae of *Spodoptera litura* feeding on sunflower heads, in laboratory and field tests. The nematode infected insect larvae showed suppressed feeding activity, which was enhanced and brought about to near normalcy by PS. The addition of PS increased the rate of insect mortality especially at lower nematode doses. In field trial foliar application of 2×10^6 IJ/ha in 5001 of water suspension, exclusively to flowerheads (=approximately 500 IJ/flowerhead), with a high volume sprayer gave an insect kill of 21.7% and 11.7% with and without the addition of PS, respectively.

Key words: *Steinernema carpocapsae*, *Spodoptera litura*, phagostimulant, antidessicant.

NEMATICIDES IN MANAGEMENT OF MELOIDOGYNE JAVANICA ON GROUNDNUT

P. R. JOSHI AND H. R. PATEL¹

Department of Nematology, B.A. College of Agriculture, Gujarat Agricultural University
Anand Campus, Anand - 388 110.

Abstract: Seed treatment and soil application of nematicides for management of *Meloidogyne javanica* on groundnut (GG 2) revealed that seed treatment with carbofuran and quinalphos both @ 1.5 per cent (w/w) reduced the nematode penetration in roots and significantly improved plant growth. Among the soil applications phorate was found most effective followed by carbofuran in improving plant growth, while phenamiphos was found most effective in reducing host infestation.

Key words: Groundnut, *Meloidogyne javanica*, seed treatment, soil treatment.

CONTROL OF RENIFORM NEMATODE, *ROTYLENCHULUS RENIFORMIS* LINFORD AND OLIVEIRA, 1940 ON SOYBEAN USING NEMATICIDES

CHANDRA SEKHAR, A. U. SIDDIQUI AND ARUNA PARIHAR

Department of Nematology, Rajasthan College of Agriculture,
Rajasthan Agricultural University Campus - Udaipur

Abstract: Seed soaking with nemaqur 40 EC and seed dressing with carbosulfan 35 ST at 2% and application with phorate 10 G at 3 kg ai/ha was found to be the best in improving plant growth characters of soybean and reducing nematode multiplication of the reniform nematode.

Key words : *Rotylenchulus reniformis*, nematicide, seed-soaking, seed dressing, soil application, management.

MANAGEMENT OF PLANT PARASITIC NEMATODES IN BETELVINE GARDENS THROUGH NON-CHEMICAL METHODS

D.V. SUBBA RAO, K. SITARAMAIAH¹ AND S. MAITI²

Andhra Pradesh Agricultural University
Agricultural Research Station, A.I.C.R.P. on Betelvine
Chinthalapudi, Ponnur 522 124.

Abstract: Field trials with soil solarisation showed a reduction of 43.8 and 24.3 per cent in the population of *Rotylenchulus reniformis* and *Helicotylenchus indicus* respectively. Application of *Calotropis* leaves @ 80 t/ha in the first year gardens was found significantly better than neem and castor leaves which was proved as effective as carbofuran granules in reducing the nematodes populations.

In the second year gardens, significantly minimum root gall incidence (27 galls/5g root) was recorded when neem cake was applied @ 2 t/ha compared to check plots (70 galls/5 g root). An increased leaf yield of 29.6 percent and 25.9 over check was recorded in the plots treated with saw dust @ 2 t/ha + N.P.K. and neem cake @ 2 t/ha respectively.

Key words : Betelvine, soil solarization, green manure organic amendment, nematodes.

**OBSERVATIONS ON PATHOGENICITY AND LIFE CYCLE OF
ROTYLENCHULUS RENIFORMIS ON SOYBEAN AND
REACTION OF SOME VARIETIES**

CHANDRA SHEKHAR, A.U. SIDDIQUI AND ARUNA PARIHAR

Department of Nematology, Rajasthan College of Agriculture, Rajasthan Agricultural
University Campus, Udaipur

Abstract: The study on pathogenic effect of reniform nematode, *Rotylenchulus reniformis* on soybean var. Gaurav revealed significant decrease in shoot weight at the level of 1000 with minimum nematode multiplication. This nematode was found to complete its life cycle within 15 days. In resistance studies, 49 soybean varieties were screened out of which DS-9 and EC-93741 were found resistant, MACS-190 and MACS-153 moderately resistant, eleven were tolerant and the remaining were found susceptible.

Key words : - *Rotylenchulus reniformis*, soybean, pathogenicity, life cycle, resistance.