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# Two New Species of *Bursaphelenchus* Fuchs, 1937 (Nematoda : Aphelenchoididae) from Pine Wood and Insect Frass from India

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**ABSTRACT :** Two new species of *Bursaphelenchus* from dying pine trees (*Pinus wallichiana* Jackson) and insect frass on *Bombax ceiba* L. from India are described and illustrated. *B. minutus* sp. n. : Female : L = 0.222 – 0.292 mm; a = 20.6 – 26.4; b = 5.6 – 6.1; c = 9.3 – 13.2; V = 78 – 81; stylet = 8-9 mm; Male : L = 0.199 – 0.243 mm; a = 23.1 – 26.8; b = 5.4 – 6.2; c = 13.5 – 19.8; stylet = 8 – 9 mm; spicule = 9 – 12 mm. Stylet with knobs; vulval flap absent; spicules with cucullus, prominent, high condylus and long, finely pointed rostrum. *B. baujardi* sp. n. : Female : L = 0.583 – 0.881 mm; a = 24.9 – 35.8; b = 9.5 – 13.3; c = 20.6 – 28.5; V = 73 – 78; stylet = 14 – 15 mm. Male : L = 0.595 – 0.806 mm; a = 29.8 – 36.4; b = 9.0 – 11.9; c = 19.9 – 29.9; stylet = 14 – 15 mm; spicules = 25–28 mm. Stylet without knobs; vulval flap present; tail mucronate; spicules with cucullus.

**Key Words :** *Bursaphelenchus minutus* sp. n., *B. baujardi* sp. n., *Pinus wallichiana*, insect frass, *Bombax ceiba*, systematics, new record, India.

## **Bio-Management of Root-Knot Nematode, *Meloidogyne hapla*, in Carrot (*Daucus carota* L.)**

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**ABSTRACT :** A field study was conducted to evaluate the influence of organic farming in comparison with the conventional farming on growth and yield of carrot infested with the root-knot nematode, *Meloidogyne hapla*. Organic treatment was most effective in improving plant growth and yield. It also provided maximum reduction in nematode population both in soil and root. Organic farming system is highly incompatible with the conventional chemical methods of farming.

**Key Words :** Organic farming, carrot, *Meloidogyne hapla*.

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# Development of *Heterodera avenae* on Resistant and Susceptible Cultivars of Barley and Oat\*

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**ABSTRACT :** The development of *Heterodera avenae* (Sirsa population, pathotype Ha 21) was studied on 4 cultivars, 2 each of barley (RD 2052 and RD 103) and oat (OS 7 and a local cultivar). Penetration of second stage juveniles of *H. avenae* occurred in susceptible as well as in resistant cultivars. Resistant barely cv. RD 2052 exhibited the initial symptoms of lateral branching and syncytium formation almost at par with susceptible check, RD 103. Fewer number of second stage juveniles that had penetrated the root could reach J3/J4 female stage as compared to susceptible one. A good number of males were recorded in RD 2052 indicating male : female ratio in favour of males as compared to susceptible check. On OS 7 and local oat cultivars, majority of the second stage juveniles that had penetrated the roots failed to develop further and there was no swelling or branching of infected roots.

**Key Words :** *Heterodera avenae*, development, susceptible, oat and barley.

# Bio-efficacy of Fluorescent Pseudomonads Isolates against Reniform Nematode, *Rotylenchulus reniformis* Infecting Cotton

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**ABSTRACT :** Various *Pseudomonas fluorescens* isolates collected from cotton rhizosphere and TNAU commercial formulation strain of PF1 were evaluated for management of reniform nematode in cotton. Maximum colonization of rhizobacterium on cotton roots was observed in plants treated with PF1 strain @ 2.5 kg/ha. Significant reduction in soil and root population of *R. reniformis* and subsequent increase in cotton plant growth characteristics were observed in *P. fluorescens* treated plants. Strain PF1 effected maximum population reduction of nematode to the extent of 70.4% in soil and 44.8% in roots. It was followed by isolates PFSP1, PFTH and PFCO3, which were at par with each other in reducing reniform nematode population in soil and roots of cotton.

**Key words :** *Pseudomonas fluorescens*, *Rotylenchulus reniformis* and cotton.

# **Survival and Pathogenicity of Native *Heterorhabditis* sp. (Rhabditida: Heterorhabditidae) as Influenced by Soil Temperature, Moisture and Relative Humidity**

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**ABSTRACT :** The studies on the survival and pathogenicity of locally isolated *Heterorhabditis* sp. was carried out in laboratory by simulating the various parameters viz., soil temperature, soil moisture and relative humidity, in sandy loam soil collected from Chidiyatapu, South Andaman. It was found that for the survival and pathogenicity of *Heterorhabditis* sp. eight per cent soil moisture and temperature of 24°C at a relative humidity of 100% resulted in mean pathogenicity of 75.27%. Moisture levels above or below 8% and temperatures above or below 24°C at 100% relative humidity led to decrease in survival and virulence of nematodes. The survival and pathogenicity of nematodes declined as the time progressed.

**Keywords :** Survival, pathogenicity, *Heterorhabditis* sp., temperature, moisture, relative humidity.

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## **Effect of Leaf Extract of *Leucaena leucocephala* on *Phaseolus mungo* Infected by *Meloidogyne incognita***

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**Abstract:** Aqueous extracts of *Leucaena leucocephala* (koo-babool) leaves suppressed reproduction and population build up of *Meloidogyne incognita* on *Phaseolus mungo* and also improved the plant growth. Infection resulted in sugar depletion and elevated protein and phenol levels in the host plant. The total organic constituents were observed to be high in the infected treated plant, thereby induced resistance against the nematode infection.

**Key words:** *Leucaena leucocephala*, *Meloidogyne incognita*, induced resistance.

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## A New UV-LC Method for Estimation of $\alpha$ -Tomatine and $\alpha$ -Solanine in Tomato

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**ABSTRACT:** A rapid and reliable High Pressure Liquid Chromatographic (HPLC) method was developed for simultaneous detection and estimation of two major tomato glycoalkaloids (GA)  $\alpha$ -tomatine and  $\alpha$ -solanine deployed in defense of tomato plants against phytopathogens. The technique involved methanol extraction of 1-5 g sample of tomato tissues, ammonia precipitation and subsequent detection and quantification by HPLC. Aliquots of 20 ml each were separated on a 200 x 4.6 mm. Hypersil APS 5 $\mu$ m NH<sub>2</sub> reverse phase column using a mobile phase of methanol : acetonitrile : 0.01M potassium dihydrogen orthophosphate buffer in the ratio of 3 : 2 : 1 in isocratic mode at a flow rate of 0.3 ml/min. Under these conditions, the retention time of  $\alpha$ -tomatine and  $\alpha$ -solanine were approximately 14.6 and 16.9 min, respectively. The peak areas were found to be linear in the test concentration range of 25 to 300  $\mu$ g GA/g tomato tissues. The recoveries of the spiked  $\alpha$ -tomatine and  $\alpha$ -solanine ranged from 85 to 93% and the method could satisfactorily detect as low as 25  $\mu$ g  $\alpha$ -tomatine and 5  $\mu$ g  $\alpha$ -solanine/g tomato. The technique was used for analysis of  $\alpha$ -tomatine and  $\alpha$ -solanine in fruits of 3 tomato cultivars, two resistant (PAU-7 and SL-120) and one susceptible (Pusa Ruby) to *Meloidogyne incognita*. The concentration of  $\alpha$ -tomatine was 3 times higher in green fruits of resistant than the susceptible cultivars, but it declined rapidly when fruits ripened.

**Key words:** HPLC,  $\alpha$ -tomatine,  $\alpha$ -solanine, tomato, resistance, *Meloidogyne incognita*.

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## **Management of *Meloidogyne incognita* on Eggplant by Integrating Endomycorrhiza, *Glomus fasciculatum* with Bio-agent *Verticillium chlamydosporium* under Field Conditions**

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**ABSTRACT:** Integration of *Verticillium chlamydosporium* and *Glomus fasciculatum* for management of *Meloidogyne incognita* infecting eggplant, *Solanum melongena*, resulted in significant increase in plant growth and reduction in root galling and nematode population. Further, there was a significant increase in parasitisation of nematode eggs by *V. chlamydosporium*. This bio-agent did not affect root colonisation of endomycorrhiza after transplanting. The results suggest the potential use of these eco-friendly components for management of root-knot nematode on eggplant.

**Key words:** *Glomus fasciculatum*, bio-management, *Verticillium chlamydosporium*, root-knot nematode, eggplant. [Back to Contents](#)

# Integration of Entomopathogenic Nematode, *Steinernema feltiae* with *Helicoverpa armigera* Nuclear Polyhedrosis Virus for the Control of Insect Pests on Vegetable Pigeonpea

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**ABSTRACT:** Studies on the integration of entomopathogenic nematode, *Steinernema feltiae*, with Nuclear Polyhedrosis Virus of *Helicoverpa armigera* (HaNPV) for the control of major pests of vegetable pigeonpea revealed a significant reduction in the population of adult beetles, *Mylabris pustulata*, in treatments incorporating *S. feltiae* @  $3 \times 10^3$  infective juveniles/ml plus HaNPV @  $2 \times 10^6$  polyhedral occlusion bodies (POBs) POBs/ml and endosulfan 0.07% when compared to control. The least population of *M. pustulata* was observed in nematode plus virus treated plot (2.2) compared to control (8.6). There was a significant reduction in the population of *H. armigera* in all the treatments. The least population of *H. armigera* larvae was observed in virus plus nematode treated plot (0.2) compared to control (12.6). Pod damage was significantly lower in virus plus nematode (1.0), virus alone (1.6) and endosulfan (2.8) treated plots. Significant increase in pod yield was obtained in virus plus nematode treatment (5.4 Tons/ha) compared to control (1.6 Tons/ha).

**Key words:** *Steinernema feltiae*, *Mylabris pustulata*, *Helicoverpa armigera*, Nuclear Polyhedrosis Virus, integration, vegetable pigeonpea.

# Management Approaches for Root-Knot Nematode in Onion

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**ABSTRACT:** An assessment of management tactics on the root-knot nematode, *Meloidogyne incognita* infesting onion seedlings indicated that integrated treatments with solarization, marigold intercrop, neem leaf mulch, neem cake amendment, azadirachtin and/ or minimal amount of carbofuran, were effective in reducing nematode population, egg density in host roots, fecundity of nematode, root-knot frequency and infection in plants. Solo treatment with azadirachtin was effective in suppressing nematode population and recorded crop yields at par with carbofuran.

**Key words:** *Meloidogyne incognita*, management, onion.

## **Management of Reniform Nematode, *Rotylenchulus reniformis* on Cowpea through Seed Dressing**

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**ABSTRACT:** Efficacy of leaf and seed kernel of neem, castor and karanj @ 5, 10 and 20 per cent (w/w) as seed dressing for management of reniform nematode, *Rotylenchulus reniformis* on cowpea (Pusa Barsati) has been evaluated. Neem seed kernel @ 20 per cent was the most effective treatment followed by karanj seed kernel @ 20 per cent and neem seed kernel @ 10 per cent in enhancing plant growth and reducing reproduction of reniform nematode, *R. reniformis*.

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**Key words:** Neem, castor, karanj, seed kernel, seed dressing, *Rotylenchulus reniformis*, cowpea.

## **Bio-control of *Radopholus similis* on Black Pepper, *Piper nigrum* L. under Field Conditions**

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**SUMMARY :** The burrowing nematode, *Radopholus similis* is known to cause pepper yellows of black pepper. An attempt was made to manage the burrowing nematode population infesting black pepper under field conditions for four years, using the bio-control agents viz. Arbuscular mycorrhizal fungi (AMF), *Paecilomyces lilacinus* and *Pasteuria penetrans*. The black pepper vines were trailed on to individual live standards of *Glyricidia maculata* stems. The plants inoculated with burrowing nematode alone had the minimum vine length, number of leaves, shoot and root weight, maximum root-lesion index and highest population of burrowing nematodes. The bio-agents individually or in combinations were highly effective in enhancing plant growth and suppressing nematode multiplication. This study clearly indicated that both burrowing and root-knot nematode population on black pepper can be managed using the three bio-agents and can avoid the application of nematicides. The introduction of the bio-agents is to be done to the nursery potting mixture as well as into the planting pits at the time of transplantation in the field.

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**Key words:** Biocontrol, *Radopholus similis*, *Piper nigrum*, *Pasteuria penetrans*, *Paecilomyces lilacinus*.

## **Spatial Distribution of Root-Knot Nematode, *Meloidogyne incognita* in Banana, *Musa* sp.**

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**ABSTRACT:** The spatial distribution of root-knot nematode, *Meloidogyne incognita* in banana cv. Poovan was studied in plant and ratoon crop in field conditions. In plant crop significant higher population of the nematode was observed at a vertical depth of 0-10 cm at the horizontal distance of 30-60 cm away from the corm. In ratoon crop, higher congregation of the nematode was observed at both the depths (0-10 and 10-20 cm). In ratoon crop significant higher population was recorded at the horizontal distances of 30-60 and 60-90 cm away from the corm.

**Key words:** Banana, *Meloidogyne incognita*, spatial distribution.

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## **Influence of VAM Fungi on Cotton (*Gossypium barbadense* L.) Infested with Reniform Nematode**

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**ABSTRACT:** Four vesicular arbuscular mycorrhizal (VAM) fungi viz., *Glomus mosseae*, *G. fasciculatum*, *G. intraradices* and *G. fulvum* were screened to select efficient VAM fungi for management of *Rotylenchulus reniformis* in cotton (*Gossypium barbadense*) cv. TCB 209. Plants inoculated with *G. fasciculatum* were significantly better in all respects of plant growth, mycorrhizal colonization and yield of cotton. *G. fasciculatum* and *G. mosseae* were equally effective in reducing *R. reniformis* population in root and soil.

**Key words:** *Glomus mosseae*, *G. fasciculatum*, *G. intraradices*, *G. fulvum*, *Gossypium barbadense* and *Rotylenchulus reniformis*.

## **Effect of Oil Cakes on Management of Root-Knot Nematode, Yield and Quality of FCV Tobacco**

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**ABSTRACT:** Root-knot nematode is a major threat for successful cultivation of flue cured virginia tobacco in the light soils of Karnataka. Yield reduction due to this menace is 59.4% in nursery and 52.9% in the main field. A study was conducted in sick plot for three years to evaluate the efficacy of neem and pongamia cake in different dosages (10, 20 and 30 g/plant), applied directly to the base. Pongamia cake at 30 g/plant recorded maximum green leaf and cured leaf yield. However, neem cake at 20g/plant recorded least root-knot nematode index followed by pongamia cake at 10 g/plant.

**Key words:** Neem cake, pongamia cake, root-knot nematode, management, green leaf, cured leaf, top grade equivalent.