CONTENTS

(*Continued on inner 3rd cover*)

(*Continued from back cover*)

Indian J. Nematol. 5 (1975) : 139-147

FACTORS AFFECTING THE REPRODUCTION, POPULATION DEVELOPMENT AND SURVIVAL OF THE SPIRAL NEMATODE, *HELICOTYLENCHUS DIHYSTERA**

BY

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Inoculation experiments with the spiral nematode, *Helicotylenchus dihystera* on sugarcane in different soils indicate that the soil types have a determinant influence on nematode multiplication. Of the soil types used, the nematode multiplied well on sandy loam, clay loam and loam soils. Growth of sugarcane plants and multiplication of the nematode were better in black plastic containers than in earthen containers.

Back to Contents

Indian J. Nematol. 5 (1975) : 148-154

EFFECTS OF INITIAL INOCULUM LEVELS OF *MELOIDOGYNE INCOGNITA* AND *HETERODERA CAJANI* ON COWPEA AND ON THEIR POPULATION DEVELOPMENT*

BY

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A population level of 100 larvae of either *Meloidogyne incognita* or *Heterodera cajani* per 500 g of soil was the marginal threshold level for producing measurable effects on the growth of cowpea. The host infestation and nematode multiplication were found to be density dependent in both cases. The final population was maximum at an initial inoculum level of 100 larvae in both the nematodes but the rate of multiplication was highest wherein 10 larvae were used. The effect of combined inoculation of these nematodes on plant growth was similar to that obtained wherein either of them was used alone.

Back to Contents

Indian J. Nematol. 5 (1975) : 155-161

MORPHOLOGY AND BIOLOGY OF *APHELENCHUS AVENAE* BASTIAN, 1865 IN TWO DIFFERENT FUNGUS CULTURES**

BY

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Of the two fungi, *Rhizoctonia solani* and *Colletotrichum coccodes*, isolated from infected tomato roots, *Aphelenchus avenae* multiplied more rapidly in the former but no significant difference in any of the morphometric values was observed. A few of the females in the fungus cultures were exceptionally robust containing several eggs at a time and even developing larva/e. These eggs were laid and the larva/e also emerged. Number of eggs laid per female was more in *R. solani* than in *C. coccodes* cultures with no significant difference in the length of egg-laying period. The nematodes were found to survive in dried cultures of the fungi upto 18 months.

Back to Contents

Indian J. Nematol. 5 (1975) : 162-169

HOST-PARASITE RELATIONSHIPS AND INFLUENCE OF SOIL TYPES ON THE LESION NEMATODE *PRATYLENCHUS DELATTREI* LUC, 1958, ON MAIZE*

BY

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Pratylenchus delattrei multiplied well in black sandy clay loam and brown sandy loam having finer fractions, optimum cation exchange capacity and water holding capacity than red sandy loam. The nematode was found pathogenic to maize in red and brown sandy loam and considerably reduced shoot and root weight. Brown to black lesions were caused by the nematode in maize roots, with extensive damage to the cortical region. A positive correlation between initial population level of 1, 2 and 4 nematodes/5 g of soil and final population existed in red sandy loam and a curvilinear relationship was found in black sandy clay loam and brown sandy loam.

Back to Contents

Indian J. Nematol. 5 (1975) : 170-175

ELIMINATION OF ROOT-KNOT NEMATODE INFESTATION FROM TOMATO SEEDLINGS BY CHEMICAL BARE-ROOT DIPS OR SOIL APPLICATION[1]

BY

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Root-knot nematode (*Meloidogyne incognita*) was eliminated from the roots of infested tomato seedlings when they were dipped for 15 minutes in 500 ppm aqueous solution of thionazin. Dip treatments in concentrations upto 5000 ppm for 8 hours gave similar effect as 500 ppm for 15 minutes. Bare-root dip of uninfested seedlings in 500 ppm solution of thionazin for 15 minutes gave very high protection against the root-knot nematode and 500 ppm for 15 minutes was as effective as 5000 ppm for 8 hours. Thionazin dip for 2 and 8 hours at 5000 ppm caused slight phytotoxicity to tomato seedlings. Thionazin and aldicarb at 4 and 8 kg a. i./ha prevented multiplication of the root-knot nematode when infested seedlings were planted in soil treated with these chemicals.

Back to Contents

Indian J. Nematol. 5 (1975) : 176-179

*WILSEREPTUS ANDERSONI** GEN. N., SP. N. (WILSONEMATINAE : PLECTIDAE, NEMATODA) FROM SOIL AROUND ROOTS OF GRASS AT DALHOUSI, INDIA WITH A KEY TO THE GENERA OF THE SUBFAMILY

BY

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Wilsereptus gen. n. is proposed, described and illustrated for those members of Wilsonematinae which have bulbiform annulated cervical expansion with smooth lateral rims, rudimentary non-fimbriate flabella and circular amphidial apertures. *W. andersoni* sp. n. is described as type species of the genus. Key to the genera of Wilsonematinae is provided.

Back to Contents

Indian J. Nematol. 5 (1975) : 180-184

PATHOGENICITY OF *HELICOTYLENCHUS DIHYSTERA* TO CHILLI (*CAPSICUM ANNUUM*) AND ITS HOST RANGE

BY

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Helicotylenchus dihystera has been found pathogenic to chillies at an initial inoculum level of 50 nematodes per pot containing 1500 ml soil, under glasshouse conditions. The rate of multiplication of the nematode followed the usual pattern for many other species, being inversely proportional to the increase in the initial levels of inoculum. Among 13 hosts tested, okra, tomato, egg plant and onion were found to be good hosts.

Back to Contents

Indian J. Nematol. **5** (1975) : 185-188

NEMATODES OF HIGH ALTITUDES IN INDIA
VI. *ENCHODELIUM THORNEI* SP. N. AND THE RELATIONSHIPS OF THE GENERA *ENCHODELIUM*, *OONAGUNTUS* AND *MALEKUS* (DORYLAIMIDA)

BY

QAISER H. BAQRI* and M. SHAMIM JAIRAJPURI

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Enchodelium thornei sp. n. was collected from soil around the roots of *Riccia* sp. from Palampur and Mandi, Himachal Pradesh. Body 0.63-0.75 mm long ; odontostyle 10-11 μm long, attenuated ; female gonad mono-opisthodelphic ; tail elongate-conoid with its posterior third bent dorsally. The relationship of the genus *Enchodelium* Andrássy, 1963 with *Oonaguntus* Thorne, 1974 and *Malekus* Thorne, 1974 has been discussed.

Back to Contents

Indian J. Nematol. 5 (1975) : 189-199

INTERRELATIONSHIPS BETWEEN *MELOIDOGYNE INCOGNITA* AND *RHIZOBIUM SP* ON MUNG BEAN (*PHASEOLUS AUREUS*)*

BY

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Meloidogyne incognita, besides being pathogenic to mung bean, was found to interfere with bacterial nodulation and hamper nitrogen fixation. Inoculation experiments have shown that irrespective of the time of inoculation of the two organisms, the inclusion of nematode in any of the treatments at any levels of population caused significant decrease in height of plants, fresh and dry weights of shoot and root, number of nodules in primary and secondary root systems and in nitrogen content of the shoot and root compared to the uninoculated control. Reduction of nitrogen content may be due to overall reduction in root nodulation, anatomical changes in nodules and the altered physiology of the host.

Back to Contents

Indian J. Nematol. 5 (1975) : 200-206

FURTHER STUDIES ON THE ACTION OF DL-METHIONINE ON *MELOIDOGYNE INCOGNITA**

BY

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Bioassay test using *Meloidogyne incognita* showed that DL-methionine persisted only for one week in tomato plants treated with this amino acid. Application of the amino acid reduced the tryptophan content of the roots 10, 20 and 30 days after the nematode inoculation. However L-tryptophan applied to tomato roots treated with DL-methionine did not increase root galling appreciably. Methionine content was very low in the roots 17 days after DL-methionine application. Methyl mercaptan, an intermediate breakdown product of methionine metabolism, was detected in infested roots 7 and 17 days after the amino acid application. The higher concentration of this metabolite may be responsible for nematode control obtained 7 days after application of the amino acid than later applications.

Back to Contents

Indian J. Nematol. 5 (1975) : 207-213

APHELENCHOIDES WALLACEI SP. N. AND *APHELENCHOIDES JONESI* SP. N. (NEMATODA : APHELENCHOIDIDAE) FROM INSIDE THE ROOTS OF PAPAYA AND EGG PLANT

BY

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Two new species of the genus *Aphelenchoides* are described in this paper. *Aphelenchoides wallacei* sp. n. obtained from within the decaying roots of papaya has offset head, four lateral incisures, knobbed stylet and well developed post-vulvar uterine sac, filled with sperms. *Aphelenchoides jonesi* sp. n. obtained from inside the roots of egg plant has four lateral incisures, small basal thickenings in the spear, excretory pore opposite the nerve ring, spermatheca absent, post-vulvar uterine sac well developed and filled with sperms, and tail about 1.75 to 2.4 anal diameter long with a star-shaped mucro.

Back to Contents

Indian J. Nematol. 5 (1975) : 214-221

CONTROL OF NEMATODES BY CROP ROTATION

BY

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Monoculture of tomato, egg plant, okra, chilli, sponge gourd or rotation in all combinations brings about a manyfold increase in the population of root-knot nematode, *Meloidogyne incognita*. Decrease in root-knot nematode population, on the other hand, occurs following marigold, spinach, bottle gourd or when the field was left fallow. Increase in population of *Tylenchorhynchus brassicae* occurs following egg plant, tomato, okra, spinach, cauliflower, cabbage and mustard ; *Helicotylenchus indicus* increased following chilli, red gourd, okra and cauliflower ; *Hoplolaimus indicus* multiplied following bottle gourd, tomato, spinach and egg plant ; *Longidorus brevicaudatus* and *Pratylenchus coffeae* were not materially affected in any of the combinations tried.

Back to Contents