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TECHNIQUES IN NEMATOLOGY II. COMPARATIVE EFFICIENCY OF SAMPLING TOOLS AND NEMATODE EXTRACTION METHODS

BY

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There was no significant difference in the number of nematodes extracted from samples taken with *khurpi** or O'Connor's split corer but the variation between samples was less for the corer. Maximum recovery was obtained with sugar centrifugal flotation but the variation was less in respect of Oostenbrink's funnel elutriator. The rate of upward stream of water (200-140 ml/min) in the Oostenbrink's elutriator did not affect the nematode extraction but 800-1000 ml/min was most satisfactory. A replacement of the funnel in the Baermann funnel assembly with a petri-dish resulted in 1.3 to 14.1 per cent increase in nematode recovery.

INTERACTION OF *MELOIDOGYNE HAPLA*, *PRATYLENCHUS PENETRANS*
AND *TYLENCHORHYNCHUS AGRIS* ON KENLAND RED CLOVER,
*TRIFOLIUM PRATENSE*¹

BY

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The interaction and pathogenicity of *Meloidogyne hapla*, *Pratylenchus penetrans* and *Tylenchorhynchus agris* alone and in all combinations were studied on 'Kenland' red clover (*Trifolium pratense* L.) in the greenhouse. *M. hapla* alone and in all combinations with *P. penetrans* and / or *T. agris* was highly pathogenic to red clover. *T. agris* alone had a slight promotive effect and *P. penetrans* alone a slight negative effect on the top growth of red clover. *P. penetrans* and *T. agris* singly or in combination did not affect nodule formation, whereas the number of nodules was very low on all roots infected with *M. hapla*. This was correlated with marked reduction of the root system. Populations of both *P. penetrans* and *T. agris* increased geometrically when each was alone and when combined, but only arithmetically when each was in combination with *M. hapla*. At a high inoculum level of *P. penetrans* alone and in combination with *T. agris* the gall index of *M. hapla* was significantly reduced ; however the gall index of *M. hapla* was not reduced by *T. agris* at the two inoculum levels used.

STIMULATION OF GROWTH OF RED CLOVER BY
TYLENCHORHYNCHUS AGRIS

BY

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Tylenchorhynchus agri was parasitic on but not pathogenic to Kenland red clover up to 90 days after inoculation. Top growth and weight of red clover increased progressively as inoculum levels of this nematode increased logarithmically. Populations of *T. agri* were generally low after 90 days. *T. agri* was attracted to red clover roots in agar within 12 hours of inoculation. The nematode probed the root cap, epidermal cells in the region of elongation, and root nodules, but feeding was observed only on epidermal cells in the region of elongation.

**EFFECT OF ORGANIC MATERIALS ON NEMATODE BIONOMICS IN
CITRUS AND ROOT-KNOT NEMATODE INFESTED SOIL¹**

BY

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Changes in nematode population dynamics of citrus and field soils after treatment with some basic components of organic soil amendments were studied. The reduction of citrus (*Tylenchulus semipenetrans*) and root-knot nematode (*Meloidogyne incognita*) populations in soil by chitin and cellulose amendments was demonstrated.

**RELATION BETWEEN NEMATODE POPULATION AT HARVEST
AND YIELD OF WHEAT**

BY

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Simple and multiple linear regressions of yield on pre-harvest nematode populations were worked out in case of individual wheat plants growing under field conditions. Significant negative correlations existed between the total plant parasitic nematode population and yield; while among the individual genera *Tylenchorhynchus* spp. only had significant negative correlation with yield. Partial regression coefficients of yield on *Tylenchorhynchus* spp., *Pratylenchus* spp., *Helicotylenchus* sp. and *Hoplolaimus* sp. were non-significant.

PATHOGENICITY OF THE SPIRAL NEMATODE, *HELICOTYLENCHUS*
DIHYSTERA, TO SUGARCANE+

BY

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Helicotylenchus dihystera is pathogenic to sugarcane causing stunting of the plants and reduction in fresh and dry weights of both shoot and root system. The growth of plants is correlated with the initial nematode population. The root systems of the plants receiving an initial inoculum level of 1000 and 10,000 nematodes per pot were sparsely developed and showed discolouration. All the 6 varieties were susceptible.

NEMATODES OF LEGUMINOUS CROPS IN INDIA
I. A NEW SPECIES OF *TELOTYLENCHUS* SIDDIQI, 1960
(TELOTYLENCHINAE : BELANOLAIMIDAE)

BY

M. MUDDASSIRUL MULK and M. SHAMIM JAIRAJPURI

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Telotylenchus tonkiensis sp. n., from soil around roots of *Phaseolus aureus* from Banwasa, district Tonk, Rajasthan ; 0.70-0.85 mm long ; head slightly set off, flat at apex and marked with 7-8 fine annules ; spear 15-17 μ long with anchor-shaped basal knobs ; lateral fields areolated ; post-intestinal blind sac present ; flanges on distal end of gubernaculum ; and female tail terminus striated.

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STUDIES ON NEMATODE BEHAVIOUR
I. EFFECT OF pH AND SALT CONCENTRATIONS ON THE SURVIVAL OF
HOPLOLAIMUS INDICUS, *HELICOTYLENCHUS INDICUS*, *XIPHI-*
NEMA BASIRI AND *MYLONCHULUS MINOR*

BY

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Xiphinema basiri and *Mylonchulus minor* are susceptible to even slight changes in their optimal pH. *Hoplolaimus indicus* and *Helicotylenchus indicus* generally show greater tolerance to wide range fluctuations. The various mineral salts show different effect at different concentrations. In general, the rate of survival is lower at higher concentrations. Copper sulphate is most toxic even at 0.025 M concentration.

INCIDENCE AND DISTRIBUTION OF NEMATODES ASSOCIATED WITH SUGARCANE IN UTTAR PRADESH

BY

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A survey for plant parasitic nematodes associated with sugarcane was conducted in seventeen cane growing districts, representing foothills (*terai*), western, central and eastern regions of U. P. Majority of the collections were made from the western and eastern regions of the State where sugarcane is a major cash crop. A total of 291 soil and root samples were drawn and examined for the presence or association of nematodes. The present study revealed that 40 species comprising of 21 genera are associated with sugarcane. *Hoplolaimus*, *Helicotylenchus*, *Tylenchorhynchus*, *Pratylenchus*, *Tylenchus*, *Hemicreconemoides*, *Longidorus* and *Xiphinema* were the commonly occurring nematodes.

STUDIES ON THE WHITE-TIP NEMATODE OF RICE, *APHELENCHOIDES BESSEYI* IN TAMIL NADU

BY

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The incidence of the white tip nematode, *Aphelenchoides besseyi* and the loss in yield in ten popular varieties of rice were studied. The symptoms of white-tip in the leaves of young crop are not always produced in the local varieties. The plants which appear apparently healthy exhibit spikelet infestation at the boot leaf stage of the crop. Nematodes ranging from 3 to 47 were observed in the infested spikelet causing damage to the lodicules and the ovary. Three varieties ADT. 27, Co. 29 and TKM. 6 recorded a high degree of infestation resulting in estimated loss of 768.00, 616.00 and 401.00 kg per hectare. Hot water treatment of seeds followed by Parathion spray four times after transplanting reduced the nematode induced loss in the field.

TWO NEW SPECIES OF *BASIROIDES* THORNE AND MALEK, 1968
(NEMATODA : PSILENCHINAE) FROM UTTAR PRADESH*

BY

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Two new species of the genus *Basiroides* Thorne and Malek, 1968 viz., *B. elegans* sp. n. and *B. beryllus* sp. n., collected from soil around the roots of *Prunus persica* in Ranikhet, Almora, Uttar Pradesh, are described and diagnosed. A key for the species of the genus is provided. These nematodes are being recorded from this country for the first time.

FIVE NEW SPECIES OF *PRATYLENCHUS* (NEMATODA : PRATYLENCHIDAE) FROM INDIA

BY

E. KHAN and D. B. SINGH*

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Five new species of *Pratylenchus*, have been described and illustrated. *P. ranjani* sp. n. is distinctive by having 4 head annules, non annulated tail tip and inconspicuous spermatheca ; *P. similis* sp. n. by two annules on head, spear 12-13 μ long and tail with 16-18 annules ; *P. impar* sp. n. by two annules of which first being larger, inconspicuous spermatheca, tail terminus subacute indented ; *P. neocapitatus* sp. n. by set off cap like head with two annules, tail terminus smooth, almost clavate while *P. teres* sp. n. by six incisures.

NEMATODES OF LEGUMINOUS CROPS IN INDIA
II. FIVE NEW SPECIES OF *HELICOTYLENCHUS* STEINER, 1945
(HOPLOLAIMIDAE)

BY

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Helicotylenchus bihari sp.n., 0.54-0.62 mm long, head with 5-6 indistinct annules, spear 20-21 μ long with spear knobs which are flattened to slightly concave at anterior surface, tail slightly convex, sub-cylindroid or truncate marked with fine annules at terminus, and phasmids 3-9 annules above anus. *H. arachisi* sp.n., 0.47-0.60 mm long, head with 4-5 faint annules, spear 21-23 μ long, spear knobs with flattened to concave anterior surfaces, tail with broadly rounded striated terminus which is sometimes with a distinct notch on dorsal side, and phasmids pre-anal 2-6 annules anterior to anus. *H. sharafati* sp.n., 0.71-0.84 mm long, head truncate continuous with body and marked with 2-3 distinct annules, spear 24-25 μ long with angular downwardly sloping knobs, tail dorsally hemispherical provided with a ventral digitate process, and phasmids 2-7 annules anterior to anus. *H. macronatus* sp.n., 0.51-0.59 mm long, head continuous with body and marked with 4-5 indistinct annules, spear 20-22 μ long, spear knobs with flattened to indented anterior surfaces, tail dorsally convex-conoid with a bulbous ventral projection, phasmids inconspicuous, 0-3 annules above anus. *H. indenticaudatus* sp.n. 0.58-0.75 mm long, head continuous with body hemispheroid and marked with 5-6 inconspicuous annules, spear 22-24 μ long with anteriorly directed spear knobs, tail notched at terminus marked with 12-17 annules, and phasmids post-anal.