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FACTORS AFFECTING DEVELOPMENT OF EAR-COCKLE AND
TUNDU DISEASES OF WHEAT

BY

S. K. MIDHA and GOPAL SWARUP

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

Development of ear-cockle and *tundu* diseases of wheat was found to be dependent on larval and bacterial concentrations, temperature, humidity, age of seedlings and depth of placement of the galls. No ear-cockle or *tundu* was observed to the extent of 10^3 larvae per 1000 g soil. A mixed suspension of $10^4 \times 5$ larvae and 0.40 optical density bacterial solution gave a significantly high percentage of *tundu* symptoms. Again there was a significant increase in *tundu* in 25 days-old inoculated seedlings which had been kept at 25°C and exposed for 72 hours to high humidity conditions. Maximum ear-cockle infection was obtained when the galls were placed along with the seed at 2 cm depth in soil.

STUDIES ON MONONCHIDA OF INDIA
VI SOME OBSERVATIONS ON THE MORPHOLOGY OF *MONONCHUS*
AQUATICUS COETZEE, 1968 WITH REMARKS ON ITS STATUS

BY

SAMER Z. BAQRI and M. SHAMIM JAIRAJPURI

Section of Nematology, Department of Zoology, Aligarh Muslim University, Aligarh, India

Detailed morphological investigations carried out on *Mononchus aquaticus* Coetzee, 1968 confirm the validity of the species. It is very close to the type species, *M. truncatus* Bastian, 1865 but differs in the character of buccal cavity, positions of amphidial apertures, dorsal tooth and the indentation on the subventral walls of buccal cavity and in the length of tail. Material studied included those collected in India and received from South-West Africa.

NEMATODES OF PADDY
I. TWO NEW SPECIES OF THE GENUS *HIRSCHMANNIELLA*
LUC & GOODEY, 1963

BY

SHAKIL AHMAD

Section of Nematology, Department of Zoology, Aligarh Muslim University
Aligarh, India

Two new species of *Hirschmanniella* Luc & Goodey, 1963 associated with paddy, *Oryza sativa* L. are reported from Uttar Pradesh, India. *Hirschmanniella shamimi* sp. n., 1.19-1.38 mm long, spear 16-19 μ , has a distinct mucro and a ventral notch. *Hirschmanniella indica* sp. n., 1.62-2.03 mm long, spear 22-23 μ , has a distinct overlap of the intestine over rectum.

TWO NEW SPECIES OF THE GENUS *HELICOTYLENCHUS* STEINER, 1945
FROM INDIA, WITH A REDESCRIPTION OF *H. SOLANI* RASHID, 1972
(NEMATODA : HOPLLOLAIMINAE)*

BY

A. RASHID and ABRAR M. KHAN

Section of Plant Pathology and Nematology, Department of Botany, Aligarh
Muslim University, Aligarh, India

Helicotylenchus imperialis sp. n., *H. paraconcavus* sp. n. and *H. solani* Rashid, 1972 collected from soil around roots of banana (Jaipur), plum (Pachmarhi) and brinjal (Ghaziipur) respectively are described, illustrated and diagnosed.

**TYLENCHORHYNCHUS VULGARIS SP. N. ASSOCIATED WITH MAIZE
ROOTS IN INDIA, WITH NOTES ON ITS EMBRYOLOGY
AND LIFE HISTORY***

BY

K. D. UPADHYAY**, G. SWARUP and C. L. SETHI

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

Tylenchorhynchus vulgaris sp. n. from around maize roots in Delhi is described. Studies on the life history of the nematode showed that prior feeding was necessary for oviposition and development of successive post-embryonic stages. The life cycle, from egg to egg stage, was completed in 25-27 days at 25-30°C. Males were necessary for reproduction. Intact maize roots were attractive to all stages of the nematode. Larvae, males and females also fed on the root hairs.

CULTURING, HOST RANGE AND FACTORS AFFECTING
MULTIPLICATION OF *TYLENCHORHYNCHUS VULGARIS*
ON MAIZE*

BY

K. D. UPADHYAY** and GOPAL SWARUP

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

Tylenchorhynchus vulgaris was successfully cultured monoxenically on callus tissue and excised roots of *Zea mays*, var. Ganga-3. The nematode has a wide host range and the most suitable hosts for nematode multiplication belong to the family Graminae. Of 73 plants tested, 19 were 'very good hosts', 29 were 'good hosts', 16 were 'poor hosts' and 9 were non-hosts. Soil texture, soil type and soil pH influenced nematode population. A pH range of 5.5 to 7.7 and sandy-loam or loam soil favoured nematode multiplication.

EMBRYONIC DEVELOPMENT AND MORPHOLOGY OF LARVAL STAGES
OF THE RICE ROOT NEMATODE, *HIRSCHMANNIELLA ORYZAE**

BY

V. K. MATHUR and S. K. PRASAD

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

Hirschmanniella oryzae completes its embryonic development in 5-6 days. There are four moults from egg to adult, the first being inside the egg. Feeding is essential for egg laying and moulting. *In vitro* studies revealed that *H. oryzae* feeds not only on the cortical cells but also on the central vascular region; it never fed on the root tip or thin lateral roots. Different larval stages can be distinguished by gonad length. Body and stylet lengths, and the distance from head to anus are additional characters to differentiate these stages.

ROLE OF THE RICE ROOT NEMATODE, *HIRSCHMANNIELLA ORYZAE*
IN RICE CULTURE*

BY

V. K. MATHUR and S. K. PRASAD

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

Hirschmanniella oryzae significantly decreased growth and grain yield of rice. There was a significant negative correlation between the root weight per tiller and the number of nematodes. Irrespective of the dose, nitrogen applied in the field improved plant growth and increased the nematode population but the increase in yield was not corresponding to the increase in nitrogen application. In infected roots *H. oryzae* was observed lying near the vascular bundle and formed big cavities in the cortex.

TWO NEW NEMATODE SPECIES (NOTHOTYLENCHIDAE)
FROM KASHMIR

BY

D. N. FOTEDAR and R. MAHAJAN

Helminthology Laboratory, Post-Graduate Department of Zoology, University
of Kashmir, Srinagar, India

Boleodorus cynodoni sp. n. is distinctive because of its rounded spermatheca, post-uterine sac $1/6$ of body width and presence of a hooked tail in male. *Nothotylenchus srinagensis* sp. n. is characterised by its anteriorly flattened head, clearly set-off basal oesophageal bulb and post-uterine sac being slightly more than one body width long.

HISTOPATHOLOGY OF INFECTION BY THE RENIFORM NEMATODE,
ROTYLENCHULUS RENIFORMIS LINFORD & OLIVEIRA, 1940
ON CASTOR, PAPAYA AND TOMATO*

BY

C. V. SIVAKUMAR and A. R. SESHADRI**

Nematology Section, Agricultural College & Research Institute, Coimbatore, India

Histological studies have shown that the reniform nematode, *Rotylenchulus reniformis* is mainly a phloem feeder in castor, papaya and tomato. The infected tissue at the site of feeding shows hypertrophy, hyperplasia, thickening of cell walls, granular protoplasm and enlarged nuclei and nucleoli. 'Giant Cells' are formed in all the three hosts, as many as 150-200 in castor and 100-150 in tomato. Histochemical tests on infected castor root show that the cell wall thickening in the hyperplastic and hypertrophic cells may be due to deposition of lignin or suberin. The cells at the feeding site further show presence of numerous starch granules and excess of proteins compared to normal cells. In papaya roots, the phloem cells at the site of feeding show a number of round, rod shaped, curved or angular bodies. The exact nature and identity of these cell inclusions are not known. No changes were observed in the xylem.

STUDIES ON SOME SYSTEMIC NEMATOCIDES.
II. FURTHER STUDIES ON THE ACTION OF THIONAZIN AND ALDICARB
ON *MELOIDOGYNE INCOGNITA* AND *ROTYLENCHULUS RENIFORMIS**

BY

D. D. R. REDDY** and A. R. SESHADRI

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

Tomato seedlings grown in thionazin- and aldicarb-treated sand (4 kg a.i./ha) were found to be free of root galls even 15 days after inoculation with 500 larvae of *Meloidogyne incognita*, although active larvae were still present around the roots. However, when treated seedlings were replanted in untreated sand, the nematodes readily invaded the roots. In a similar study when tomato seedlings were grown in soil treated with the two chemicals at 4 and 8 kg/ha, complete control of the nematode was obtained upto 3 weeks and 2 weeks respectively, following treatment with thionazin and aldicarb. Reduced fecundity was observed in *M. incognita* developing on plants treated with thionazin at 8 and 16 kg/ha. However, larvae obtained from egg masses isolated from these plants remained infective and induced galls in tomatoes; few adult females were observed with only gelatinous matrix, but no eggs, in some other cases flask-shaped females were observed without the matrix. Thionazin proved effective as pre-inoculation treatment at 4 kg/ha against *Rotylenchulus reniformis* also.