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NEMATODES FROM WEST BENGAL (INDIA). XIX. QUALITATIVE AND QUANTITATIVE STUDIES OF PLANT AND SOIL INHABITING NEMATODES ASSOCIATED WITH PADDY CROP IN WEST DINAJPUR DISTRICT

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INTRODUCTION

During May 1982, a random survey was conducted to make the qualitative and quantitative studies of parasitic nematodes associated with paddy crop in West Dinajpur district of West Bengal. Sixtyfive soil sample were collected from the following developmental blocks of West Dinajpur : Balurghat, Islampur, Hilli and Kumarganj.

MATERIAL AND METHODS

The sampling was made at random. For the quantitative study, the samples were processed and the nematode populations were estimated as described by Baqri *et. al.*, (1983).

RESULTS

A. Qualitative Study :

Upon analysis, the samples yielded 16 stylet bearing nematode species belonging to 12 genera of the order Tylenchida. In addition to this, 19 soil inhabiting or predacious species of the orders Dorylaimida and Mononchida have also been identified. The identified species are listed below:

Order TYLENCHIDA Thorne, 1949

1. *Tylenchus goodeyi* Das, 1960
2. *Ditylenchus* spp.
3. *Tylenchorhynchus mashhoodi* Siddiqi & Basir, 1959
4. *Hoplolaimus indicus* Sher, 1963
5. *Helicotylenchus indicus* Siddiqi, 1963
6. *H. egyptiensis* Tarjan, 1964
7. *H. retusus* Siddiqi & Brown, 1964
8. *H. microcephalus* Sher, 1966
9. *Pratylenchus scribneri* Steiner, 1943

10. *Hirschmanniella gracilis* (de Man, 1880) Luc & Goodey, 1963
11. *Rotylenchulus reniformis* Lindford & Oliveira, 1940
12. *Nothotylenchus acutus* Husain & Khan, 1968
13. *Meloidogyne graminicola* Golden & Birchfield, 1965
14. *Macroposthonia ornata* (Raski, 1958) De Grisse & Loof, 1965
15. *M. crenata* (Loof, 1964) De Grisse & Loof, 1965
16. *Aphelenchoides subtenuis* (Cobb, 1926) Steiner & Buhrer, 1932

Order DORYLAIMIDA (de Man, 1876) Pearse, 1942

17. *Dorylaimus thornei* Andrassy, 1969
18. *Laimydorus baldus* Baqri & Jana, 1982
19. *Discolaimium andrassyi* Baqri & Khera, 1976
20. *Discolaimoides bulbiferous* (Cobb, 1906) Heyns, 1963
21. *Lenonchium oryzae* Siddiqi, 1965
22. *Jairajpuria shamimi* Baqri & Jana, 1980
23. *Aporcelaimollus heynsi* Baqri & Jairajpuri, 1968
24. *A. chauhani* Baqri & Khera, 1975
25. *Dorylaimellus indicus* Siddiqi, 1964
26. *Paraoxydirus gigas* (Jairajpuri, 1964) Jairajpuri & Ahmad, 1979
27. *Discomyctus elongatus* Dhanachand & Jairajpuri, 1980
28. *Tylencholaimus pakistanensis* Timm, 1964
29. *Proleptonchus indicus* Siddiqi & Khan, 1964
30. *Tyleptus variablis* Jairajpuri & Loof, 1964
31. *Dorylaimoides teres* Thorne & Swanger, 1936
32. *D. arcuatus* Siddiqi, 1964
33. *D. leptura* Siddiqi, 1965
34. *Laevides imphalus* Ahmad & Jairajpuri, 1980

Order MONONCHIDA Jairajpuri, 1969

35. *Mononchus aguaticus* Coetzae, 1968

B. Quantitative Study :

The results of the quantitative estimation of different parasitic nematode genera and other nematodes (dorylaims, rehabditids and mononchs) have been analysed in TABLE I. The details of the sampling and localities have also been given in the same table. Sixtyfive samples were collected from 14 village centres and their surroundings in four developmental blocks of West Dinajpur district.

TABLE – I

Results of the survey of *Paddy crop in West Dinajpur district of West Bengal State*
Range of Nematode number with its average per 200 of soil
Figures as parenthesis indicate percent frequency of occurrence

		V I L L A G E S				
		Dolla	Tikaderpara	Mamna	Chakkhasi	Mahadevpur
No. of samples collected		4	4	3	7	6
	Nematode associated					
1.	*Ditylenchus*	30-60:50 (75)	20-20:20 (50)	10-20:15 (66.67)	10-30:23 (42.86)	10-50:35 (66.67)
2.	*Helicotylenchus*	10-160:70 (75)	20-30:25 (50)	20-80:40 (100)	10-50:37 (85.17)	20-210:68 (83.33)
3.	*Hirschmanniella*	140-1470:668 (100)	50-710:303 (75)	10-310:160 (66.67)	130-740:434 (100)	450-1150:785 (66.67)
4.	*Hoplolaimus*	—	—	—	—	—
5.	*Macroposthonia*	—	—	—	—	—
6.	*Meloidogyne*	30-2030:810 (75)	—	10-70:40 (66.67)	30-120:75 (23)	10-50:27 (50)
7.	*Tylenchorhynchus*	30-70:48 (100)	30-50:206 (75)	20-30:27 (100)	10-30:18 (85.17)	10-120:77 (50)
8.	Saprophagous	40-480:218 (100)	30-70:53 (100)	40-210:117 (100)	10-770:173 (100)	10-950:302 (100)

Table – I. Contd.

		VILLAGES			
		Saronbadi	Uzal Moza	Barckum	Gopalgaunj
No. of samples collected		3	3	3	3
	Nematode associated				
1.	*Ditylenchus*	30-30:30 (66.67)	20-50:35 (66.67)	10-10:10 (66.67)	10-90:55 (100)
2.	*Helicotylenchus*	20-80:50 (67)	40-110:73 (100)	10-60:43 (100)	210:210 (33.33)
3.	*Hirschmanniella*	110-360:230 (100)	10-60:35 (66.67)	80-260:160 (100)	70-410:193 (100)
4.	*Hoplolaimus*	—	20:20 (33.33)	—	—
5.	*Macroposthonia*	—	20:20 (33.33)	—	—
6.	*Meloidogyne*	20:20 (33.33)	110-450:257 (100)	—	520:520 (33.33)
7.	*Tylenchorhynchus*	10-30:23 (100)	20-690:260 (100)	20-50:33 (100)	10-100:60 (100)
8.	Saprophagous	40-200:106 (100)	120-430:290 (100)	50-200:125 (66.67)	10-570:290 (66.67)

Table – I Contd.

		V I L L A G E S				
		Iluabari	Phoolbari	Khokobasti	Ramgaunj	Taringibari
No. of samples collected		6	5	6	8	4
	Nematode associated					
1.	*Ditylenchus*	10-50:22 (83.33)	30-30:30 (40)	10-50:34 (83.33)	10-20:15 (50)	10-20:15 (50)
2.	*Helicotylenchus*	30-350:132 (83.33)	30-190:98 (100)	40-450:185 (66.67)	10-50:24 (100)	20-270:90 (100)
3.	*Hirschmanniella*	10-110:37 (100)	10-130:66 (100)	20-20:20 (33.33)	10-130:60 (75)	10-70:43 (100)
4.	*Hoplolaimus*	—	—	—	—	170:170 (25)
5.	*Macroposthonia*	10-90:23 (100)	10-170:70 (60)	30-180:85 (66.67)	10-50:25 (50)	10-50:27 (75)
6.	*Meloidoqyne*	40-270:205 (33.33)	20-660:257 (60)	10-30:20 (83.33)	10-20:13 (37.5)	10-150:60 (100)
7.	*Tylenchorhynchus*	10-110:48 (100)	10-190:70 (100)	30-150:77 (50)	10-40:26 (62.5)	10-440:130 (100)
8.	Saprophagous	70-750:366 (100)	150-240:190 (100)	30-1090:320 (100)	50-210:114 (87.5)	60-1200:445 (100)

The quantitative study reveals that among the plant parasitic nematodes in West Dinajpur district, the species of the following four genera are most abundant: *Hirschmanniella* Luc & Goodey, 1963; *Tylenchorhynchus* Cobb, 1913; *Helicotylenchus* Steiner, 1945; and *Meloidogyne* Goeldi, 1887. Upon analysis, the frequency of occurrence of *Hirschmanniella gracilis* has been noted in 83% and was found dominating over other plant parasitic nematodes in 48% samples. The occurrence of *Tylenchorhynchus mashhoodi* and *Helicotylenchus* spp. has been noted in 85% and 82% samples but dominated only in 14% and 20% soil samples respectively *Meloidoqyne graminicola* has been recorded from 45%, samples but the dominance was noticed only in 12% samples. The other potential nematode pests in the area are *Ditylenchus* spp. Though the frequency of their occurrence was noted in 58% soil samples but were found dominating only in 5% samples. *Hoplolaimus indicus* and *Macroposthonia ornata* were also encountered but always in small numbers.

The present study concludes that *Hirachmanniella gracilia* is the key nematode pests in the area surveyed. The other important nematode pest of paddy in West Dinajpur district are *Meloidogyne graminicola, Tylenchorhynchus mashhoodi* and *Helicotylenchus* spp.

SUMMARY

During May 1982, a random survey was conducted at 14 villages under four developmental blocks (Balurghat, Hilli, Islampur and Kumarganj) of West Dinajpur district (W. Bengal) to make the qualitative and quantitative studies of plant and soil inhabiting nematodes associated with paddy crop. Sixtyfive soil samples were collected. In all 35 species belonging to the orders Tylenchida, Dorylaimida and Mononchida have been identified, of which 16 belong to the parasitic group of the order Tylenchida. The quantitative study reveals that *Hirschmanniella gracilis, Tylenchorhynchus mashhoodi* and *Helicotylenchus* spp. are most abundant in the area surveyed. The other important parasitic nematodes are *Meloidogyne graminicola* and *Ditylenchus* spp.

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