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

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INTRODUCTION

Baqri *et. al* (1983) published the first paper on the qualitative and quantitative estimations of nematodes associated with paddy crop from Burdwan district of West Bengal This is the 24th paper of the series on Nematodes from West Bengal and 4th on qualitative and quantitave studies. During November 1984, forty root and soil samples were collected from 13 localities of the following three blocks of district Coochbehar : Toofangaunj, Pundibari and Dinhata. In all, 32 species have been identified It is evident from the quantitative estimation of important nematode genera that *Hirschmanniella gracilis* (de Man, 1880) Luc & Goodey, 1963 ; *Meloidogyne graminicola* Golden & Birchfield , 1965; *Tylenchorhynchus* spp.; *helicotylenchus* spp. are the important and abundant nematodes in the area surveyed.

MATERIAL AND METHODS

The sampling was made at random The processing of samples and the quantitative estimation was made as described by Baqri *et. al.* (1983). The nematode population per 200 ml soil was counted from each sample The nematode population of paddy roots / 10 gm was also estimated.

A. *QUALITATIVE STUDY* :

In all, 15 species belonhing to the Orders Tylenchida and Aphelenchida (Stylet bearing nematodes) have been identified. Apart from this, 17 soil inhabiting or predaceous species of the order Dorylaimida have also been identified. The identified species are listed below:

Order TYLENCHIDA THORNE, 1949

1. *Filenchus* sp.
2. *Malenchus* sp.
3. *Basiria tumida* (Colbran, 1960) Geraert, 1968
4. *Tylenchorhynchus nudus* Allen, 1955
5. *T mashhoodi* Siddiqi & Basir, 1959
6. *Hoplolaimus indicus* Sher, 1963

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7. *Helicotylenchus crenacauda* Sher, 1966
8. *H. dihystera* (Cobb, 1893) Sher, 1961
9 *Hirschmanniella gracilis* (de Man, 1880) Luc & Goodey, 1963
10. *Meloidogyne graminicola* Golden & Birchfield, 1965
11. *Ditylenchus* sp.
12. *Nothotylenchus* sp.
13. *Macroposthonia ornata* (Raski, 1958) De Grisse,1955
14. *Gracilacus* sp.

Order APHILENCHIDA

1. *Aphelenchus avenae* Bastian, 1865

Order DORYLALAIDA Deman, 1876

1. *Laimydorus siddiqii* Baqri & Jana, 1982
2. *L. baldus* Baqri & Jana, 1982
3. *L. finalis* Thorne, 1975
4. *Laimydorus distinctus* Dey & Baqri , 1986
5. *Calodorylaimus simplex* Baqri & Jana, 1982
6. *Eudorylaimus* spp.
7. *Thornenema mauritianum* (Williams, 1959) Baqri & Jairajpuri, 1967
8. *Discolaimoides bulbiferus* (Cobb , 1906) Heyns, 1963
9. *Aporcelaimellus heynsi* Baqri & Jairajpuri, 1968
10. *Dorylaimellus indicus* Siddiqi , 1963.
11. *D. deviatus* Baqri & Jairajpuri, 1965
12. *Tylencholaimus obscurus* Jairajpuri, 1939
13. *Discomyctus cephalatus* Thorne, 1939
14. *Proleptonchus clarus* Timm, 1964
15. *Dorylaimoides pakistanensis* Siddiqi, 1964
16. *D. constrictus* Baqri & Jairajpuri, 1968
17. *Neoactinolaimus* sp.

B. *QUANTITATIVE STUDY :*

The results of the quantitative estimation of important parasitic genera and other nematodes from the surveyed localities of Coochbehar district have been furnished in Table I & II. Table I (Pages 66-68) provides the informations about the surveyed localities , number of samples collected , range with average and percent of frequency of occurrence of important nematode genera separately and other nematodes Table II (Page 69) gives the analysis of range with average , and percent of frequency of occurrence and dominance of potential nematodes in soil and paddy roots at Coochbehar district.

It is evident from table I that the species of the genera Hirsch*manniella, Helicotylenchus, Tylenchorhynchus* and *Meloidogyne* are widely distributed in the area surveyed. Amongst these species, *Hirschmanniella gracilis* appears to be a key pest of paddy in

Coochbehar because of its high degree of dominance in 70% soil samples. Table II also concludes that *Hirschmanniella gracilis* occurs in 95% and 48% in soil and rooty samples, respectively. The second important namatodes are the *Helicotylenchus* spp. and *Meloidogyne graminicola* because these have been respectively recorded in 75% and 95% soil samples. Though the frequency of occurrence of *Meloidogyne* is higher but their dominance has been observed only in 5% soil samples. It may further be noted that *Helicotylenchus* spp. dominated in 20% soil samples. The number of *Helicotylenchus* and *Meloidogyne* species recovered from roots was also significant and their occurrence was noted in 20% and 12% root samples respectively The other important nematodes are *Tylenchorhynchus* spp. Their occurrence in soil and roots was noted in 52% and 30% samples respectively, while they were dominant only in 5% soil samples The presence of other parasitic nematodes was not significant.

SUMMARY

The present paper reports 32 species of the orders Tylenchida , Aphelenchida and Dorylaimida from Coochbehar district (W.Bengal). The results of the quantitative estimation of different parasitic genera reveal that *Hirschmanniella gracilis* (de Man, 1880) Luc & Goodey, 1963, *Tylenchorhynchus* spp., *Meloidogyne graminicola* Golden & Birch field, 1965 and *Helicotylenchus* spp., are the important nematode pests associated with paddy crop in the area surveyed.

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Baqri, Q.H., Jana, A., Ahmad, N. & Das, P.K. (1983). Nematodes from West Bengal (India) VIII. Qualitative and quantitative studies of plant and soil inhabiting nematodes associated with paddy crop in Burdwan District. *Rec. zool. Surv. India.*, **80** : 331-340.

TABLE -I

Results of the survey of Paddy crop in Coochbehar district , West Bengal.
Range of nematodes number with its average per 200 ml of soil.
Figures in parenthesis indicate percent frequency of occurrence.

		LOCALITY/ VILLAGE				
		Guriarpar	Nayarhat	Chamta	Ghogalkuti Basakpara	Ghogalkuti Nutanbazar
No. of samples collected		1	3	3	2	2
	Nematodes					
1.	*Tylenchorhynchus*	20: 20 (100)	10-20:15 (66.67)	40:40 (33.33)	200: 200 (50)	10:10 (50)
2.	*Helicotylenchus*	40: 40 (100)	60-580:320 (66.67)	40-180:93.3 (100)	50 -120:85 (100)	20-200:110 (100)
3.	*Hirschmanniella*	120:120 (100)	20-100: 60 (66.67)	20-340-143 (100)	50-50 (50)	100-260:180 (100)
4.	*Meloidogyne*	20:20 (100)	30-410:175 (100)	40-220:80 (100)	110-180:145 (100)	300-350:325 (100)
5.	*Other tylenchs*	-	20:20 (33.33)	-	-	-
6.	*Other dorylaims*	280-280 (100)	160-520: 303 (100)	280-1060: 547(100)	450-1240: (100)	300-340:320 (100)
7.	*Saprophagous*	40:40 (100)	130-380:260 (100)	50-500 243:3 (100)	150-200: 185 (100)	100-630: 365 (100)

		LOCALITY /VILLAGE				
		Chilakhana	Sonari	Baraibari	Singijani Bhataguri	Baladang
	No. of samples collected	3	5	2	5	3
	Nematodes					
1.	*Tylenchorhynchus*	20-120:70 (66.67)	20-280:128 (80)	20-240:130 (100)	20:20 (20)	190:190 (33:33)
2.	*Helicotylenchus*	20-260:137 (100)	30-220:103 (60)	20-80:50 (100)	40-200:123 (100)	80-220:167 (100)
3.	*Hirschmanniella*	40-160:103 (100)	100-790:446 (100)	260-340:300 (100)	170-1060:428 (100)	140-220:173 (100)
4.	*Meloidogyne*	120-160 :140 (66)	10-440:(250) (80)	30-60:45 (100)	20-380:210 (100)	60-220:130 (100)
5.	*Macroposthonia*	20:20 (33.33)	-	-	-	-
6.	*Other tylenchs*	20-90:50 (100)	-	-	-	-
7.	*Other dorylaims*	280- 370 :337 (100)	180-660: 469 (100)	790-800: 795 (100)	60-500:244 (100)	300-880:577 (100)
8.	*Saprophagous*	40:230 :123 (100)	40-350:214 (100)	20-80:50 (100)	80-320:184 (100)	160-680: 333 (100)

Results of the survey of paddy crop in Coochbehar district, West Bengal

	LOCALITY/ VILLAGE		
	Khedkhedia	Chhararkuti	Kharijakakribari
No. of samples collected	4	2	5
Nematodes			
1. *Tylenchorhynchus*	20-230:125 (50)	-	30-100:73 (60)
2. *Helicotylenchus*	20:20 (25)	20:20 (50)	70-260:178 (80)
3. *Hirschmanniella*	280-1090:588 (100)	140:140 (100)	100:900: 462 (100)
4. *Meloidogyne*	30-390:125 (100)	20-140:80 (100)	10-120:45 (100)
5. *Other dorylaims*	40-390:245 (100)	130-240 :185 (100)	240-110:498 (100)
6. *Saprophagous*	190-430:315 (100)	40-140:90 (100)	160-750:366 (100)

TABLE II

Results of the survey of paddy crop in Coochbehar district , West Bengal.

Range of nematodes number (potential parasites) with average per 200 ml soil and 10 gm roots.

Figures in parenthesis indicate percent frequency of occurrence with dominance in soil /occurrence in roots.

Potential nematodes	Soil population	Root population
1. *Hirschmanniella*	20-1090:311 (95:70)	20-860:160 (48)
2. *Helicotylenchus*	20-580:127 (75:20)	20-620:128 (20)
3. *Meloidogyne*	10-440:151 (90:5)	50-340: 180 (12)
4. *Tylenchorhynchus*	10-280:90 (52.5:5)	20-200:77 (30)