

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

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**INTRODUCTION**

During October 1983, a random survey was conducted at seven localities of Darjeeling district (W. Bengal) to make the qualitative and quantitative studies of plant and soil inhabiting nematodes associated with paddy crop. Twenty soil samples were collected.

**MATERIAL AND METHODS**

The sampling was made at random. For the quantitative estimation, the methodology described by Baqri et al. (1983) was followed. The nematode population per 200 ml soil was counted from each sample. The paddy roots of each sample were processed through blender and the nematode population per 10 gm roots was also estimated.

**QUALITATIVE STUDY**

In all, 15 stylet bearing nematode species belonging to 12 genera of the Orders Tylenchida and Aphelenchida have been identified. Besides, 21 species of ectoparasite, soil inhabiting or predaceous nematodes have also been identified under the Orders Doruylaimida and Mononchida. The identified species are being listed below:

**Order TYLENCHIDA Thorne, 1949**

1. *Tylenchus* sp.
2. *Filenchus* sp.
3. *Tylenchorhynchus mashhoodi* Siddiqi & Basir, 1959
4. *Hoplolaimus indicus* Sher, 1963
5. *Helicotylenchus dihystra* (Cobb, 1893) Sher, 1961
6. *H. digitatus* Siddiqi & Husain, 1964
7. *H. pseudorobustus* (Steiner, 1914) Golden, 1956
8. *Pratylenchus scribneri* Steiner, 1943
9. *Hirschmanniella oryzae* (Van Breda de Haan, 1902) Luc & Goodey, 1963
10. *H. gracilis* (de Man 1880) Luc & Goodey, 1963
11. *Meloidogyne graminicola* Golden & Birchfield, 1965

12. *Macroposthonia ornata* (Raski, 1958) De Grisse & Loof, 1965
13. *Hemicriconemoides cocophillus* (Loos, 1949) Chitwood & Birchfield, 1957

Order APHELENCHIDA Siddiqi, 1980

1. *Aphelenchus avenae* Bastain, 1865
2. *Aphelenchoides pusillus* (Thorne, 1929) Filipjev, 1934

Order DORYLAIMIDA Deman, 1976

1. *Laimydorus finalis* Thorne, 1892
2. *L. baldus* Baqri & Jana, 19823
3. *Laimydorus oryzae* Dey & Baqri, 1986
4. *Eudorylaimus* spp.
5. *labronemella andrassyi* (Baqri & Khera, 1976) Andrassy, 1985
6. *Opishodorylaimus cavalcantii* (Lordello, 1955) Corbvonell & Coomans, 1986
7. *Thornenema novum* Dey & Baqri, 1986
8. *Thornenema nodicaudatum* Dey & Baqri, 1986
9. *Aporcelaimellus heynsi* Baqri & Jairajpuri, 1968
10. *Belondira nepalensis* Siddiqi, 1964
11. *Paraoxydirus gigas* (Jairajpuri, 1964) Jairajpuri & Ahmad, 1979
12. *Tylencholaimus pakistanensis* Timm, 1964
13. *T. paradaxus* Loof & Jairajpuri, 1968
14. *Discomyctus cephalatus* Thorne, 1939
15. *Proleptonchus clarus* Timm, 1964
16. *Neoactinolaimus elaboratus* (Cobb, 1906) Heyns & Agro, 1969
17. *Neoactinolaimus* sp.
18. *Xiphinema insigne* Loos, 1949

Order MONOCHIDA Jairajpuri, 1969

1. *Mylonchulus branchyuris* (Butschili, 1873) Altherr, 1954
2. *Paramylonchulus mulveyi* (Jairajpuri, 1970) Jairajpuri & Khan, 1982
3. *Miconchus dalhousiensis* Jairajpuri, 1969

QUANTITATIVE STUDY

The details of quantitative estimation of different parasitic nematode genera and other nematodes from each locality have been furnished in Table I. The number of soil samples collected from each locality has also been provided in the same Table. Table II provides the information regarding the average percent of frequency of occurrence and dominance of potential nematode pests in soil as well as paddy roots at Darjeeling district.

The results reveal that *meloidogyne* (*M. graminicola*) is the most important pest of rice in the area surveyed because it is present in 100% samples while it dominates in 63% soil samples. This may further be noted that *Hirschmanniella* spp. (mainly *H. gracilis*) and *Tylenchorhynchus mashhoodi* are the other potential nematode pests because the frequency of their occurrence has been noted in 70% and 90% soil samples respectively. The former species dominated in 26% sample while the latter in 10.5% samples.

TABLE 1

Results of the survey of Paddy crop in DARJEELING district West Bengal Range of nematode number with its average per 200ml of soil.

Figures in parenthesis indicate percent frequency of occurrence

	LOCALITY / VILLAGE			
	Doodhiya Basti	Poorbum	Tashiding	Tashiding (Upper)
No. of samples collected	4	2	2	1
<b>Nematodes</b>				
1. <i>Meloidogyne</i> (larvae)	50-400:200 (100)	150-610:380 (100)	30-120:75 (100)	120:120 (100)
2. <i>Tylenchorhynchus</i>	10-160:67.5 (100)	50:50 (50)	120-370:245 (100)	100:100 (100)
3. <i>Helicotylenchus</i>	240:240 (25)	— —	320:320 (50)	— —
4. <i>Pratylenchus</i>	—	—	—	—
5. <i>Hirschmanniella</i>	60:60 (25)	10:10 (50)	50:50 (50)	20:20 (100)
6. <i>Hemicriconemoides</i>	20:20 (25)	— —	— —	— —
7. <i>Criconemoides</i>	— —	— —	20:20 (50)	— —
8. <i>Other tylenchs</i>	10:10 (25)	— —	— —	— —
9. <i>Other dorylaims</i>	150:600:295 (100)	190—690:449 (100)	200—420:260 (100)	110:110 (100)
10. <i>Saprophagous</i>	70-320:180 (100)	270—430:350 (100)	160—390:275 (100)	450:450 (100)

## Result of the survey of Paddy crop in DARJEELING district, West Bengal

	LOCALITY / VILLAGE		
	Tashiding (Lower)	Sukna	Salbani
No. of samples collected	2	5	4
Nematodes			
1. <i>Meloidogyne</i> (Larvae)	150:150 (100)	40-340:152 (100)	160-290:210 (100)
2. <i>Tylenchorhynchus</i>	30-60:45 (100)	40-250:152 (100)	10-300:123 (100)
3. <i>Helicotylenchus</i>	—	80:80 (20)	30:30 (25)
4. <i>Pratylenchus</i>	30:30 (50)	— —	— —
5. <i>Hirschmanniella</i>	20:20 (50)	260—390:280 (100)	50—200:113 (100)
6. <i>Hemicriconemoides</i>	—	—	—
7. <i>Criconemoides</i>	—	—	—
8. <i>Other tylenches</i>	10:10 (50)	—	—
9. <i>Other dorylaims</i>	240-280:260 (100)	270-670:432 (100)	120-460:297 (100)
10. <i>Saprophagous</i>	300-490:440 (100)	140-300:193 (100)	60-300:143 (100)

TABLE 2

The results of the survey of paddy crop in Darjeeling district, West Bengal  
Range of nematode number potential pests with its average per 200 ml soil and  
10 gm roots.

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

	Soil population	Root population
1. <i>Meloidogyne</i>	30-610:189 (100:63)	2-980:209 (50)
2. <i>Tylenchorhynchus</i>	10-370:125 (90:10.5)	2-12:9.5 (20)
3. <i>Hirschmanniella</i>	10-390:146 (70:26)	6-106:23 (60)

The high degree of dominance of *Meloidogyne* and *Hirschmanniella* species per 10 gm roots (Table II) further confirms that these are the key pest of paddy in the area surveyed.

The *Pratylenchus*, *Helicotylenchus*, *Criconemoides*, and *Hemicriconemoides* species were also encountered during estimation but their presence was not significant.

#### SUMMARY

The present study concludes that *Meloidogyne graminicola* Golden & Birchfield, 1965; *Hirschmanniella* spp. (mainly *H. gracilis*); and *Tylenchorhynchus mashoodi* Siddiqi & basir, 1959 are the important pests of paddy crop in Darjeeling district (West Bengal). The paper also reports 36 species of the orders Tylenchida, Aphelenchida, Dorylaimida and Mononchida from Darjeeling district.

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#### REFERENCE

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