

FREQUENCY OF OCCURRENCE AND DISTRIBUTION OF PLANT PARASITIC NEMATODES IN RUBBER NURSERY SOILS

Studies on the distribution of important plant parasitic nematodes in a particular area is necessary for regulating the cropping system and thereby controlling rapid multiplication of nematodes. The effect of soil type on the population density and distribution of nematodes has been documented (Upadhyay *et al.*, 1972; Sundararaj *et al.*, 1994). Rajendran and Jayarathnam (1977) reported the occurrence and infestation of plant parasitic nematodes in rubber plantations and associated cover crop *Pueraria phaseoloides*. Nehru *et al.* (1991) identified root-knot nematode, *Meloidogyne incognita* as a pest of rubber seedlings. However, a precise information on the frequency of occurrence, population density and distribution of plant parasitic nematodes associated with rubber nursery soils is still lacking. Hence, the present investigation was undertaken.

A systematic survey was conducted in ten rubber nurseries in Kerala and Tamil Nadu to study the intensity, frequency and distribution of plant parasitic nematodes. Soil samples were collected at random from a depth of 15 to 30 cm. About 500 g of composite sample was drawn by mixing five subsamples from each site, labelled and brought to the laboratory. Each sample was thoroughly mixed and 200 g of soil was drawn from the homogeneous mixture for processing. Extraction of nematodes was done by Cobb's sieving and petridish extraction method (Volcy, 1978). Nematodes extracted were collected after 24 h, identified and counted under a stereomicroscope.

The population and distribution of the important genera were evaluated.

Data on the survey and distribution of parasitic nematodes occurring in rubber growing soils are presented in Tables 1 & 2. Among the parasitic nematodes five genera, viz., *Meloidogyne*, *Helicotylenchus*, *Hemicriconemoides*, *Aphelenchus* and *Tylenchus* were identified. *Meloidogyne* spp. was the predominant parasitic nematode observed with the population density ranging from 110 in Paraliar to 2100 per 200 g soil in Kanhikulam nursery. *Helicotylenchus* spp. and *Hemicriconemoides* spp. were also found in large numbers whereas the population of *Aphelenchus* spp. and *Tylenchus* spp. were comparatively low.

Table 1. Distribution of nematodes in rubber nursery soils

Location	Total population (per 200 g soil)	Parasitic nematodes	
		Population (%)	Frequency (%)
Paraliar	666	50.00	30
Kadackamon	3000	80.00	100
Perumpulickal	5000	60.00	100
Chethackal	1000	40.00	60
Karikattoor	1666	39.97	40
Kanhikulam	7200	61.11	100
Manjeri	3200	56.25	100
Peruvannamoozhy	6400	65.62	90
Alakode	1666	39.97	70
Ulickal	999	33.33	100

Table 2. Generic distribution of plant parasitic nematodes in rubber nursery soils (population/200 g soil)

Location	Genus					
	<i>Meloidogyne</i>	<i>Helicotylenchus</i>	<i>Hemicriconemoides</i>	<i>Aphelenchus</i>	<i>Tylenchus</i>	Others
Paraliar	110 (33.03)	92 (27.63)	64 (16.82)	40 (9.61)	16 (7.51)	10 (5.40)
Kadackamon	1400 (58.33)	560 (23.33)	210 (8.75)	117 (4.87)	76 (3.16)	37 (1.54)
Perumpulickal	1240 (41.33)	918 (30.60)	422 (14.06)	174 (5.80)	188 (6.26)	58 (1.93)
Chethackal	168 (42.00)	59 (14.75)	46 (11.50)	45 (11.25)	39 (9.75)	43 (10.75)
Karikattoor	282 (42.34)	176 (26.43)	87 (13.06)	48 (7.21)	42 (6.31)	31 (4.65)
Kanhikulam	2100 (47.72)	1300 (29.54)	480 (10.91)	232 (5.27)	168 (3.81)	20 (0.45)
Manjeri	844 (46.88)	485 (26.94)	202 (11.22)	197 (10.94)	44 (2.40)	28 (1.55)
Peruvannamoozhy	1800 (42.85)	1400 (33.33)	515 (17.17)	272 (6.47)	199 (4.74)	44 (0.33)
Alakode	430 (43.00)	264 (26.40)	172 (17.20)	68 (6.80)	36 (3.60)	30 (3.00)
Ulickal	122 (36.64)	80 (24.02)	56 (16.82)	32 (9.61)	25 (7.51)	18 (5.40)

Figures in parantheses represent per cent population

The regional nursery at Kadackamon showed the maximum per cent population of *Meloidogyne* spp. (58.33%) followed by Kanhikulam (47.72%). The maximum per cent populations of other parasitic nematodes recorded are *Heliotylenchus* spp. (33.33%) at Peruvannamoozhy, *Hemicriconemoides* spp. (17.20%) at Alakode, *Aphelenchus* spp. (11.25%) and *Tylenchus* spp. (9.75%) at Chethackal. The occurrence of root-knot nematodes on rubber has been reported from Malaysia (Rao, 1965), Vietnam (Erashenko *et al.*, 1985) and Brazil (Lordello *et al.*, 1989). Incidence of *M. incognita* on leguminous cover crops grown in association with rubber has been reported from India (Mammen, 1973). Raveendran and Nadackal *et al.* (1975) reported *Hevea brasiliensis* as a host plant of root-knot nematode, *Meloidogyne incognita*.

The rubber seedlings collected from nurseries where the population of *Meloidogyne* spp. was above 40 per cent showed the symptoms of nematode infestation. The infested seedlings had conspicuous swellings on the lateral roots. The species of root-knot nematode was identified as *Meloidogyne incognita*. The high occurrence of *Meloidogyne* spp. in rubber

growing soils indicates its establishment and potential threat to rubber seedlings and the need for evolving control strategies.

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- S. Thankamony (for correspondence)
C. R. Nehru
K. Jayarathnam
Rubber Research Institute of India
Kottayam - 686 009
Kerala, India.