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SUSCEPTIBILITY/RESISTANCE OF WEEDS TO PATHOGENIC NEMATODES OF TEA

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INTRODUCTION

Weeds are unwanted plants growing in cultivated areas. Apart from competing for water and mineral nutrients with the cultivated crops, weeds could also serve as hosts for various pests, such as nematodes and insects and other disease causing pathogens, thereby acting as reservoirs for the spread of these in the field.

An attempt was therefore, made to screen the common weeds found in the tea plantations of Sri Lanka against three species of nematodes now established to be pathogenic to tea: (a) the root-lesion nematode, *Pratylenchus loosi;* (b) the burrowing nematode, *Radopholus similis;* and (c) the reniform nematode, *Rotylenchulus reniformis.*

MATERIALS AND METHODS

Three individual sets of experiments were carried out to screen 45 different species of weeds commonly encountered in the tea areas in Sri Lanka, against the above three species of nematodes.

Experiment I

Pots filled with soil heavily infested with root-lesion nematode, *Pratylenchus loosi* were planted to the above weeds, with three replicate sets of pots for each of the respective weed species. These pots were maintained in the Greenhouse at St. Coombs, Talawakele, for a period of three months prior to the assessment of infestation levels. Three pots planted to the tea clone TRI 1526 which is very sensitive to *P. loosi* were maintained as controls.

Experiment II and III

Similar experiments were carried out by exposing the above weeds to soil heavily infested with *Radopholus similis* (experiment II) and *Rotylenchulus reniformis* (experiment III). Since both these species of nematodes favour warmer soil temperatures, these pots were maintained in the Greenhouse at the TRI Mid-Country Research and Advisory Centre, Hantane, Kandy, at which location the climate is favourable for the build-up of the above two species of nematodes. A set of three replicates of pots containing the clone TRI 2025 which is susceptible to both these species of nematodes was used as the comparable control.

At the end of the trial period of three months, the roots of the respective weeds as well as the check tea plants were processed and analysed for nematode population build-up. The soil in the individual pots was also processed for nematode population build-up.

RESULTS

The results of assessments are presented in Table 1. As seen from the Table, the only weed species among the tested ones which appeared to be resistant to all three species of nematodes was *Oxalis corniculata* (Fig. 1).

TABLE 1 - Weeds screened for resistance/susceptibility to different species of tea nematodes

		SINHALA NAME	TAMIL NAME	*PRATYLENCHUS LOOSI*	*RADOPHOLUS SIMILIS*	*ROTYLENCHULUS RENIFORMIS*
1.	*Achyranthes aspera*	Karal heba	Nai-uruvi	+++	-	+
2.	*Ageratum conyzoides*	Hulan-tala Kadupahara	Poom-pillu Pothu-pillu	-	-	+++
3.	*Alternanthera sessilis*	Mukun-venna	Ponnankani	+	-	+++
4.	*Artemisia vulgaris*	Wal-kolundu	Maru-kolunthu Sev-vanthi kodi	+	-	+
5.	*Amaranthus viridis*	Kura-tampala	Sinna kirai Kuppai kirai	+	-	+
6.	*Bidens chinensis*	Wal-te-kola	Otti-pillu	-	-	+++
7.	*Borreria* sp.			+	-	-
8.	*Centella asiatica*	Gotukola	Vullarai	-	-	+++
9.	*Commelina benghalensis*	Gira-pala Diya meneriya	Amalai (Pundi)	++	+++	+++
10.	*Crassocephalus crepidiodes*	Hulantala	Thondam pillu	+	-	+++

		SINHALA NAME	TAMIL NAME	*PRATYLENCHUS LOOSI*	*RADOPHOLUS SIMILIS*	*ROTYLENCHULUS RENIFORMIS*
11.	*Cyanotis pilosa*	Gira-pala	Amalai	-	-	+++
12.	*Cyperus rotundus*			+	-	+
13.	*Cyperus* sp.			+	-	-
14.	*Desmodium ovalifolium*	Maha-undupiyalli	Peru-siruaday pillu	+	+++	+++
15.	*Desmodium triflorum*	Sulu-geladiya Heen undupiyali	Sirupulladai, Naran-kodi, Ottadi-pillu	++	+++	++
16.	*Digitaria longiflora*		Cosy-pillu Sugam-pillu Usi-pillu Nandukkali-pillu	+	-	+
17.	*Drymaria cordata*	Kukulu-pala Gadu-hade, Kodidel	Kadalai-pillu Pattani-pillu	+	-	+
18.	*Eleusine indica*	Bela-thana Wal-kurakkan	Tippa-ragi	-	+	+
19.	*Emilia sonchifolia*		Shudi-mudi	++	-	+++
20.	*Emilia javanica*	Kadupara	Mammoty-pillu	+	-	+++

		SINHALA NAME	TAMIL NAME	*PRATYLENCHUS LOOSI*	*RADOPHOLUS SIMILIS*	*ROTYLENCHULUS RENIFORMIS*
21.	*Eragrostis nigra*			+	-	++
22.	*Erigeron sumatrensis*	Sudana	Alavangu-pillu Cochi-poom-pillu	-	-	++
23.	*Eupatorium riparium*		Puundu-pillu	+	++	+++
24.	*Galinsoga parviflora*			+	+	+++
25.	*Gnaphalium polycaulon*	Sudana kola	Musal-kathu-pillu	-	-	+++
26.	*Hedyotis auricularia*	Geta-kola	Aval-thatoo-kodi	-	+	+++
27.	*Hydrocotyle mannii*		Sinna vullarai	++	-	+++
28.	*Imperata cylindrica*	Illuk	Varli-pillu, Inanka-pillu	+	-	-
29.	*Ipomoea leari* (Morning glory)		Palkodi	-	+++	+++
30.	*Justicia procumbens*	Mayani	Ottu-pillu Palkodi Poom-pillu	-	-	++
31.	*Mikania scandens*	Loka palu Vatu-pala Kehel Palu	Tuni-kodi Pulun-taliya	-	-	+++

		SINHALA NAME	TAMIL NAME	*PRATYLENCHUS LOOSI*	*RADOPHOLUS SIMILIS*	*ROTYLENCHULUS RENIFORMIS*
32.	*Oxalis corniculata*	Heen-embul-embiliya	Kodi-puliyarai	-	-	-
33.	*Oxalis corymbosa*	Maha-embul-embiliya	Periya puliyarai	+	+	-
34.	*Oxalis latifolia*	Embul-embiliya	Puliyarai	+	-	-
35.	*Panicum repens*	Etora	Aruhu Inji-pillu	+	-	-
36.	*Paspalum conjugatum* (Buffalo grass)			-	++	+
37.	*Phyllanthus niruri*	Navan-embiliya Sudu-pitavaka	Keel-kai-nelli	++	+++	+
38.	*Polygonum nepalense*		Kangany-machan-pillu	+	-	+
39.	*Polygonum capitatum*			+	-	+
40.	*Poganatherm paniceum*			++	-	++
41.	*Sida rhombifolia*	Kotikan-bebila	Chittamadai	+	-	+
42.	*Solanum nigrum*	Kalu-kan webriya	Manal takali	+	+++	+
43.	*Sonchus oleraceus*			+++	+	+++

		SINHALA NAME	TAMIL NAME	*PRATYLENCHUS LOOSI*	*RADOPHOLUS SIMILIS*	*ROTYLENCHULUS RENIFORMIS*
44.	*Vernonia cinerea*	Monara kudumbiya	Neichatti-pillu Neisundi-pillu	-	-	+++
45.	*Viola* sp.			++	++	-
	TRI 1526 (control)			+++		
	TRI 2025 (control)				+++	+++

+++ Highly susceptible

++ Moderately susceptible

+ Lightly susceptible

- Resistant

Eight species of the tested weeds (Fig. 2) were found to be susceptible to all three species of nematodes. These included: *Commelina benghalensis* (Amalai), *Desmodium ovalifolium* (Perusiruaday pillu), *Desmodium triflorum* (Sirrupulladai pillu), *Eupatorium riparium* (Puundu pillu), *Galinsaga parviflora*, *Phylanthes niruri* (Keel-kai-nelli), *Solanum nigrum* (Manal takali), *Sonchus* sp.

The other species of weeds showed varying degrees of susceptibility to at least one or two of the nematodes against which they were screened. Fourteen species of the tested weeds were found to be resistant against *P. loosi* and thirty one against *Radopholus similis*, *Rotylenchulus reniformis* on the other hand, seemed to be a suitable host for almost all the weeds with the exception of only eight species.

CONCLUSION

It is clear from this study that various species of weeds serve as important reservoirs for the spread of nematode infestation in tea plantations.

Fig. 1 — *Oxalis corniculata*, resistant to all three species of nematodes, *Pratylenchus loosi*, *Radopholus similis* and *Rotylenchulus reniformis*.

(a) *Commelina benghalensis*

(b) *Desmodium ovalifolium*

(c) *Desmodium triflorum*

(d) *Eupatorium riparium*

(e) *Galinsaga parviflora*

(f) *Phyllanthus niruri*

(g) *Solanum nigrum*

(h) *Sonchus* spp.

Fig. 2 (a-h) – Weeds susceptible to all 3 species of nematodes, viz- *P. loosi, R. similis* and R. *reniformis*