

Identification of Plant Nematodes in Sugarcane

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Abstract

Plant nematodes was identified the sugarcane soil sample and sugarcane root sample during July to October 2014 in the laboratory of Nematology lab, Department of Zoology, Osmania University. Plant nematodes identified from soil and root sample of sugarcane fields, for identification of plant parasitic nematodes stylet, esophageal, median bulb, vulva, tail etc were used as main criteria (M.M. Rahman and I.H.Mian.2010).identified genera of nematodes Pratylenchus, Meloidogyne, Heterodera, Rotylenchus, Hoplolaimus. Longidorus, Tylenchus and Aphelenchoides. Pratylenchus and Meloidogyne species which were the serious plant pathogens of sugarcane.

Key words: Sugarcane, Identification, Plant parasitic nematodes, soil, root ,sample

INTRODUCTION


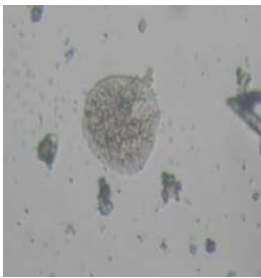
Sugarcane is one of the major crops in Nizamabad district; Telangana State (India) .plant nematodes attack sugarcane crop. Nematodes are important pests of crop plants in both developed and developing countries of the world. The root knot nematode (*Meloidogyne*) and *Pratylenchus* are impotent nematode pests. The *Meloidogyne* nematode cause galls formation of roots and reduced root growth. *Pratylenchus species* is migratory, moving and intra or inter cellular in the root(Trudgill 2001)Plant parasitic nematodes have reported in sugarcane fields (Williams 1969; Prasad, 1972).plant parasitic nematodes were found associated with sugarcane(Martin 1962).More than 15 thousand species of nematodes have been described the world. Of these 2200 species are identified as plant parasitic (Goodey et al., 1965). Plant parasitic nematodes must be stylet while non-parasitic nematodes lack of stylet for identification (M.M.Rahman and I.H.Mian 2010).

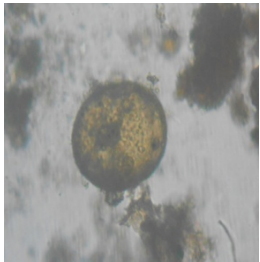

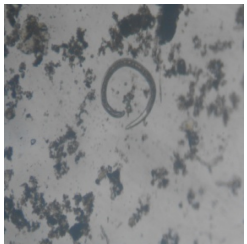

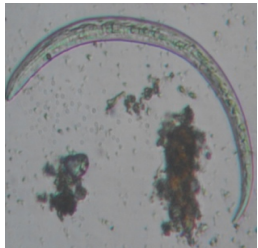

Plant parasitic nematodes are generally from the roots of plants they infect or from the soil surrounding the roots on which they feed. Roots and soil samples collected from sugarcane fields in Nizamabad district, Telangana state (India).After collection the soil and root samples were carrying and stored in a polythene bag. Collected samples were placed following Baermann Funnel Technique. The active nematodes moved through the tissue paper and transfer to the bottom of the rubber tube (M.M.Rahman and I.H.Mian 2010). After 24-48 hours we collected suspected nematodes containing water funnel in to Syracuse dish and observed it under dissecting microscope and plant parasitic nematodes were observed under compound microscope, noted different structures possessing stylet, and finally identified with the help of pictorial key to genera of plant parasitic nematodes (Mai and Lyon 1975).

MATERIALS AND METHODS

RESULT AND DISCUSSION

Table 1 Identified 8 genera of plant parasitic nematodes with their systematic position and identified the nematode

S.no	Genera of nematode	Systematic position	Identifying character of genera	Identified nematode image
1	Pratylenchus	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Tylenchidae	Lip region bears 2, 3 or four annules, stylet is small, and tail is bluntly rounded.	
2	Meloidogyne	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Heteroderidae	The mature females are swollen; pear or sub-spherical shape, the body walls soft and white, tail is absent.	

S.no	Genera of nematode	Systematic position	Identifying character of genera	Identified nematode image
3	Heterodera	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Heteroderidae	Matured female get converted in to a brown or yellow colour cyst in which the eggs are held.	
4	Rotylenchus	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Hoplolaimidae	The female body spiral or kidney shaped, vulva is posterior, and tail is hemispherical.	
5	Hoplolaimus	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Tylenchidae	Spear is massive with strongly developed basal knobs, tail is rounded.	
6	Tylenchus	Phylum: Nematoda Class: Secernentea Order : Tylenchida Family: Tylenchidae	Body arcuate with hooked tail. The body tapering, stylet is long.	
7	Rotylenchulus	Phylum: nematoda Class: secernentea Order: Tylenchida Family: Hoplolaimidae	The head region is rounded, stylet is median length with basal knobs, and the tail is conoid with rounded terminus.	
8	Aphelenchoides	Phylum: Nematoda Class: Secernentea Order: Tylenchida Family: Aphelenchoidae	The body tapers slightly towards the head end, the tail is conical shape, and there are small nematodes.	

DISCUSSION

Eight genera of plant nematodes identified. The different structures such as stylet, basal knobs, and vulva and tail etc, were observed. Nematodes were identified which were

belong to the order Tylenchida and they were under four families such as Heteroderidae, Tylenchidae, Hoplolaimidae and Aphelenchoidae were present in table 1.

CONCLUSION

Eight genera of plant parasitic nematodes identified in soil samples and root samples. For identification of plant parasitic nematodes stylet, vulva, basal bulbs and tail type were very useful. This study will be more helpful to the students, Research scholars and Nematologists.

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REFERENCES

1. Goodey J.B., M.T.Franklin and D.J.Hooper (1965). The nematode parasites of plant catalogued under their hosts, CAB. Farham Royal, Bucks, England 213 pp.
2. Mai M.F. and H.H.Lyon (1975). Pictorial key to Genera of plant parasitic Nematodes, Cornell University press, Ithaca, NY, 219pp.
3. M.M.Rahman and I.H Mian (2010). Isolation and Identification of ten genera of plant parasitic Nematodes, Department of plant pathology, Bangabandhu Sheikh Mujibur Rahman Agricultural University.Gazipur 1706, Bangladesh
4. Martin GC (1962). Population levels of nematodes in root soils around the root zones of tea, sugarcane, tobacco and wheat grown in the Federation of Rhodesia and Nyasaland, Rhodesia Agricultural Journal (Bulletin 2126) 59:28-35.
5. Prasad SK (1972). Nematode disease of sugarcane .pp 144-158 IN: JM Webster(Ed), Economic Nematology, Academic press, London, Newyork.
6. Pratylenchus species is migratory, moving and intra or inter cellular in the root cortex (Trudgill 2001).
7. Williams JR (1969). Nematodes as pests of sugarcane pp 523-530 In: JR Williams, JR Metcalfe, RW Mungomery and R Mathes (Eds), Pest of sugarcane (Published under the auspices of the International society of sugarcane Technologists). Elsevier publishing company, Amsterdam, London, Newyork.