

Study of Phyto nematodes in Sugarcane Fields of Shahuwadi Tahsil of Kolhapur District (Maharashtra) India

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Abstract

Sugarcane is one of the major crops in Kolhapur district; Maharastra State (India) Nematodes are important pests of crop plants in both developed and developing countries of the world. Plant parasitic nematodes have reported in sugarcane fields (Williams 1969; Prasad, 1972).plant parasitic nematodes were found associated with sugarcane(Martin 1962) The main object of present study was to seek out soil nematodes related in sugarcane fields in in Kolhapur district; Maharastra State (India). Soil samples were collected from selected site during June 2021to May 2022.

Keywords: Sugarcane, nematodes, parasitic nematodes, pests.

Introduction:

The nematodes are generally found in all types of environment. Most of the population of India depends on the agriculture sector. In India different type of crops are cultivated such as Food grains (Rice, Commercial Crops and Plantation Crops. From this entire crops the sugarcane is the commercial crops of India which are cultivated in different areas of the country. The largest producer of sugarcane in India is the state of Uttar Pradesh. Maharashtra. Phytonematodes as the cause of plant diseases are widely reported in almost all sugarcane growing countries.Nematodes have been known to cause crop losses in vegetables and many cash crop like sugarcane.In Maharashtra Kolhapur district is also largest producer of the sugarcane. Sugarcane cultivating farmers nowadays facing lots of problems like droughts, bad weather, heavy rainfall, infections, and attack of parasitic nematode. The nematode are basically aquatic animals but they have adopted terrestrial habits. Plant parasitic nematode can sugarcane reduce production. Nematodes which can be very infective, pathogenic unhealthful for the

sugarcane plant. One of the earliest reports of observation of plant parasitic nematode in 1743 by Needham. Nematodes that feed on plants are called plant parasitic nematode meloidogyne and partylenchus are the two species of plant parasitic nematode most frequently reported as highly pathogenic to sugarcane world-wide. (Michel et al. 2005). The main aim of this study is to provide information of plant parasitic nematode associatee with sugarcane crop to next researcher, research fellow or to the farmers in Kolhapur district in Maharashtra state of India. Then to develop appropriate nematode Management strategies to reduce nematode population of plant parasitic nematodes which will be beneficial for the farmers in the future

Material and methods

Soil sampling and Nematode extraction: The Sugarcane fields were randomly selected for soil and root sampling from Kolhapur district. After collection the soil and root samples are stored in a polythene bag. Collected samples were placed in Baermann Funnel Technique for nematode extraction .For nematode extraction soil and root samples were kept in Baermann funnel. Baermann funnel kept in

inverted position to the safe place with none disturbance for 24 hours. After 24-48 hours nematode suspension was poured into Syracuse dish and observed it under dissecting microscope.

Study area : Kolhapur district is situated on the banks of the Panchganga river and is surrounded by Sahyadri mountain ranges. Kolhapur is about 387 km from Mumbai, the financial capital of India. Situated at a latitude of 16.69130 and longitude is 74.24486., Kolhapur has a pleasant climate for the major portion of the year. It has an abundance of natural resources like water, fertile soil, minerals, natural vegetation, and animal wealth. It is one of the most agriculturally advanced districts in Maharashtra and is known for being a leading district in agro-based industry. The Sugarcane is the major cash crop of Kolhapur district.

Table 1. Identified Genera's of plant parasitic nematodes in sugarcane fields of Kolhapur District

Sr.No	Genera of nematode	Identifying character of genera
1	Aphelenchoides	The body tapers slightly towards the head end, the tail is conical shape, and there are small nematodes.
2	Meloidogyne	The mature females are swollen; pear or sub-spherical shape, the body walls soft and white, tail is absent.
3	Heterodera	Matured female get converted in to a brown or yellow colour cyst in which the eggs are held.
4	Hoplolaimus	Spear is massive with strongly developed basal knobs, tail is rounded.
5	Rotylenchus	The female body spiral or kidney shaped, vulva is posterior, and tail is hemispherical.
6	Tylenchus	Body arcuate with hooked tail. The body tapering, stylet is long.
7	Rotylenchulus	The head region is rounded, stylet is median length with basal knobs, and the tail is conoid with rounded terminus.
8	Xiphinema	The mature females are swollen; pear or sub-spherical shape, the body walls soft and white, tail is absent

Table 2. List of some species of plant parasitic nematodes in sugarcane fields of Kolhapur District

Sr.No	Species name of Sugarcane field Nematodes
1	<i>Pratylenchus zeae</i>
2	<i>Pratylenchus brachyurus</i>
3	<i>Hoplolaimus indicus</i>
4	<i>Meloidogyne javanica</i>
5	<i>Helicotylenchus dihystra</i>
6	<i>Tylenchus sp</i>
7	<i>Aphelenchus sp.</i>
8	<i>Xiphinema elongatum</i>

Results :

The diversity of plant parasite nematode diversity in sugarcane fields of Kolhapur district is observed during study period from June 2021 to May 2022. The most common nematode genera's are Dorylaimus, Meloidogyne and Partylenchus. These nematodes are observed in all visited fields of the sugarcane crops. It is also observed that due to the population of nematodes in sugarcane fields causes decline in sugarcane productivity.

Discussion:

The current study reveals the new information about plant parasitic nematode from Kolhapur district. During this study eight genera belonging to genus Meloidogyne, heterodera, pratylenchus, dorylaimus, xiphinema, monhystra, hoploaimus and Tylenchus etc. meloidogyne, prathlenchus, dorylaimus shows high frequency than other genera.

Conclusion:

Kolhapur district is high cultivation of sugarcane fields. The plant parasite nematodes are damaging the sugarcane crops in Shahuwadi taluka of Kolhapur District. The 8 genera of plant parasitic nematodes are identified in soil samples. The parasitic nematodes is reducing the productivity and percentage of sugar content in sugar cane. Present study may give guideline to the researchers, students, farmers, and nematologists etc

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