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**Shuddhodhan Ratnaparkhe**
Department of Zoology, Rajarshi Shau College of Arts, Commerce and Science, Pathardi, Tq. Phulambi, Dist. Chh. Sambhajinagar, Maharashtra, India

**Deepak Gaikwad**
Department of Zoology, Rajarshi Shau College of Arts, Commerce and Science, Pathardi, Tq. Phulambi, Dist. Chh. Sambhajinagar, Maharashtra, India

**Corresponding Author:**
**Shuddhodhan Ratnaparkhe**
Department of Zoology, Rajarshi Shau College of Arts, Commerce and Science, Pathardi, Tq. Phulambi, Dist. Chh. Sambhajinagar, Maharashtra, India

# Diversity of plant parasitic nematode from sugarcane plant in Khultabad dist. Aurangabad (MS) India

**Shuddhodhan Ratnaparkhe and Deepak Gaikwad**

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## Abstract
Nematodes have been known to cause crop losses in vegetables and many cash crop like sugarcane for many years. The nematodes were studied in Khultabad taluka. The main object of present study was to seek out soil nematodes related in sugarcane fields in Chhatrapti Sambhaji Nagar, (MS) India. Soil samples were collected from selected site in June 2022 to May 2023.seven genera of nematodes were meloidogyne, pratylenchus and dorylaimus population were extracted from sugarcane collected, counted and identified from soils. In this study, the total 7 genera was recorded. May present tolerance to meloidogyne, pratylenchus and dorylaimus.

**Keywords:** Sugarcane, plant parasitic nematodes, soil sample, root sample

## Introduction
The nematodes are generally found in all types of environment. We all know India is an agriculture country, and farmers are the backbone of Indian economy. Most of the population of India depends on agriculture sector. India holds the record for second largest agriculture land in the world, with around 60% rural Indian households making their living from agriculture.

The largest producer of sugarcane in India is the state of Uttar Pradesh. Maharashtra and together contribute to 80% of total sugarcane production in India. In Maharashtra Aurangabad district is also largest producer of the sugarcane after Kolhapur. Sugarcane is an important food crop in all over world. Basically in India it is very useful for food purpose, we use in all types of Mithai's. Also use it as a sweetener. So it play important role in Indian food culture. But nowadays farmers are facing lots of problems in their farms. Like droughts, bad weather, heavy rainfall, infections, and most negligible problems parasitic nematode. The nematode are basically aquatic animals but they have adopted terrestrial habits. Plant parasitic nematode are one of the biotic constraints in sugarcane to reduce production. It is due to nematode.

Nematodes is usually largest in sugarcane crop than any other crop. Worldwide the species pratylenchus and meloidogyne are the plant parasitic nematode which can be very infective, pathogenic unhealthful for the sugarcane plant. One of the earliest reports of observation of plant parasitic nematodein1743 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) [11] numerous nematode genera have been shown to be pathogenic to sugarcane with meloidogyne and pratylenchus being the most important worldwide (Birchfield, 1984; Spaull and Cadet, 1990) [12-13] the main object of this study is to provide updated data and information of plant parasitic nematode associate with sugarcane crop to next researcher, research fellow or to the farmers in Aurangabad region in Maharashtra state of India and to develop appropriate nematode Management strategies therefore reduce nematode population below their thresholds levels and will increase awareness for plant parasitic nematodes which will be beneficial for the farmers in the future.

## Materials and Methods
Nematodes can be extracted by the various techniques and methods. But most scientific technique is to extract nematode that is baermann funnel method which is invented by Dutch physician G. K. T. F Baermann in (1917)

**Soil sampling:** The sugarcane fields were randomly selected for sampling of soil from Khultabad taluka in Aurangabad region. The soil samples which are collected from various sites like Bazar sawangi, Bodkha, Verul, Tiagaon, Takli, Sultanpur, Sulibhanjan, Gadana, Galleborgaon, Daregaon, Chincholi, Indapur, Kagzipura etc. total 83 soil samples were collected from 17 sites. 19 cm diameter, and 16 cm depth soil was collected from sugarcane plant. Collected soil sealed in a polythene bag and kept away from sun. The samples were tagged properly and sent to the research lab of Maulana azad college Aurangabad. For further procedure that is extraction processing and nematode identification.

**Soil Collection Sites:** Bazar sawangi, Bodkha, Verul, Tiagaon, Takli, Sultanpur, Sulibhanjan, Gadana, Galleborgaon, Daregaon, Chincholi, Indapur, Kagzipura, Malkapur etc.

**Nematode Extraction from Soil**

200 gm soil samples were collected for nematode extraction by baermann funnel technique. 200 gm soil put into a beaker and closed the mouth of beaker by muslin cloth, then and add water into the beaker until up to deep muslin cloth within the water and soil become weighted and keep it for 24 hours. Then remove the beaker from funnel and take away the muslin cloth and soil to remove from beaker, and also the nematode suspension was poured into bottle. Wash bottle and allowed to settle. Once the suspension was removed and also remaining suspension that contain nematode was poured into the nematode investing dish for investigation and examined under the stereo and light microscope.

**Result**

During this study period from June 2022 to May 2023 it was observed that there is diversity of plant parasitic nematode associate with sugarcane crop in Khultabad taluka Aurangabad region. The highest diversity was recorded of genus Dorylaimus, Meloidogyne and Partylenchus from all visited fields of the sugarcane crops. As a result the population of nematodes in sugarcane fields causes decline in sugarcane productivity.

**Table 1:** Population of nematodes from Khultabad taluka of Aurangabad district during May2022-April 2023

| Name of the Nematode Genera | Months | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | May | June | July | Aug | Sept | Oct | Nov | Dec | Jan | Feb | Mar | Apr |
| *Xiphinema* | + | - | - | - | - | - | - | + | - | - | - | - |
| *Eudorylaimus* | - | - | - | - | - | - | - | - | + | - | - | - |
| *Longidorus* | - | - | - | + | - | - | - | - | - | + | + | - |
| *Dorylaimus* | - | - | - | - | - | + | + | - | - | - | - | + |
| *Monhystera* | - | - | + | - | - | - | - | - | - | - | - | - |
| *Dorylaimoides* | - | + | - | - | - | - | - | - | - | - | - | - |
| *Hemicycliophora* | - | - | - | - | + | - | - | - | - | - | - | - |

**Discussion**

The current study disclose some new facts about plant parasitic nematode from Aurangabad region. around the sugarcane root zone i have identified seven genera which are belonging to genus Meloidogyne, heterodera, pratylenchus, dorylaimus, xiphinema, monhystera and hoploaimus etc. meloidogyne, prathlenchus and dorylaimus showed high frequency than other genera.

**Conclusion**

Nematodes are frequently damaging to the sugarcane crops in Khultabad taluka Aurangabad region.7 genera of plant parasitic nematodes are identified in soil samples and root samples. For identification of plant parasitic nematode some organs are very useful and helpful such as stylet, vulva, basal bulb, and tail nematode problems are increasing fast in Aurangabad region, and result is reducing the production and farmers are facing loss, the present study may be helpful to the researchers, students, farmers, and nematologists etc.

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