

## PREVALENCE OF *CITRUS* NEMATODES IN DIFFERENT LOCALITIES AROUND AURANGABAD CITY, DISTRICT AURANGABAD (M.S.), INDIA.

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### ABSTRACT

The present study is based on the survey accompanied and assessment made by the frequencies of occurrence of economically important plant nematodes in different region of Aurangabad district. Samples were collected from roots and soil from six places of Aurangabad district. The frequency of occurrence and populations varied from place to place which is simply indicative of the fact that the studied area is highly infested with different varieties of nematode genus i.e. *Helicotylenchulus*, *Xiphinema*, *Pratylenchus*, *Tylenchulus*, *Eudorylaimus*, *Dorylaimus*, *Criconemoides*, *Mylonchulus*.

**KEYWORDS:** Aurangabad, *Citrus*, Nematode, Prevalence.

### INTRODUCTION

Soil nematodes respond rapidly to environmental disturbances, since they are present in high diversity and abundance in the soil and survive differentially according to habitat conditions. One of the major pests of high valued agricultural crops are the phytonematodes which are highly diversified organisms exhibiting variations in distribution patterns. The degree of damage depends upon pathogenic potential and population growth of nematodes which are greatly influenced by soil texture, crop cycle and anthropogenic factors. Thus community analysis of plant nematodes is important not only to assess the pathogenic potential of the nematodes in a particular region but also important to know the hot spot of nematode attack. Community analysis of plant parasitic nematodes have been studied by Ansari and Ahmed (2000), Nath *et al.*, (2009), Dama *et al.*, (1999, 2002), Dama (2002), Patel *et al.*, (2007), Roy *et al.*, (2007), Zalpuri (2010), Cohn and Milne (1972), and Srinivasan *et al.*, (2011).

### MATERIALS AND METHODS

#### Sample collection

The present investigation was carried out on the occurrence of important plant parasitic nematodes associated with citrus crops during 2013-2014. Nematode samples from 6 localities of around Aurangabad city were collected from around the roots of citrus and soil up to the depth of 0-15 cm. The samples were mixed to make a composite sample. From the composite soil sample 250 gm of soil was taken for further processing.

#### Parasite collection

Extracting the nematodes by Cobb's sieving and decanting method (1918) followed by Bearmann's funnel technique (Schindler, 1961). Extracted sample was observed under stereoscopic binocular microscope for collection and Syracuse counting disc. Isolated nematodes were killed in hot water and fixed in FAA (Formal acetic acid) solution and mounted on permanent slide in dehydrated glycerin for further anatomical studies. Based on morphological characteristics of adult and juvenile forms the nematodes were identified up to generic level. (Mai and Lyon, 1975).

#### Calculation

The absolute frequency, absolute density, relative frequency and prominence value were calculated by following Norton's formulae (Norton, 1978)

$$\text{Absolute density} = \frac{\text{no. of individual of a species}}{\text{Volume of the sample}} \times 100$$

$$\text{Absolute frequency} = \frac{\text{no. of samples containing species}}{\text{no. of samples collected}} \times 100$$

$$\text{Relative frequency} = \frac{\text{Absolute frequency of a species}}{\text{Sum of absolute frequency of all species}} \times 100$$

$$\text{Prominence value (PV)} = \text{Density} \sqrt{\text{absolute frequency}} / 100$$

## RESULTS AND DISCUSSION

The results are shown in Table 1, 2 and graph 1.

**Table 1.** Study of plant parasitic nematode collected from different localities around Aurangabad city, District Aurangabad (M.S.) India

Plant parasitic nematode	Localities						
	Himayat Bagh	Chikalhana	Vaijapur	Gangapur	Sillod	Karmad	Total
<i>Helicotylenchus</i>	+	+	-	-	-	-	2
<i>Xiphinema</i>	+	+	+	+	-	+	5
<i>Pratylenchus</i>	-	-	+	-	-	+	2
<i>Tylenchulus</i>	+	+	-	-	-	+	3
<i>Eudorylaimus</i>	+	+	-	+	+	-	4
<i>Dorylaimus</i>	+	-	+	+	-	+	4
<i>Criconemoids</i>	-	-	+	-	+	-	2
<i>Mylonchulus</i>	-	-	+	-	+	+	3

(+ = Present and - = Absent)

**Table 2.** Plant parasitic nematode associated with *Citrus* plant around Aurangabad city, District Aurangabad (M.S.) India.

Nematode	Absolute Frequency (%)	Relative Frequency (%)	Absolute Density (%)	Prominence Value (%)
<i>Helicotylenchus</i>	33.33	7.97	0.8	0.04
<i>Xiphinema</i>	83.33	20.04	2.0	0.18
<i>Pratylenchus</i>	33.33	7.97	0.8	0.04
<i>Tylenchulus</i>	50.00	12.07	1.2	0.08
<i>Eudorylaimus</i>	66.67	15.94	1.6	0.12
<i>Dorylaimus</i>	66.67	15.94	1.6	0.12
<i>Criconemoides</i>	33.33	7.97	0.8	0.04
<i>Mylonchulus</i>	50.00	12.07	1.2	0.08

**Graph 1.** Graph showing the occurrence of plant nematode in studied localities around Aurangabad city.

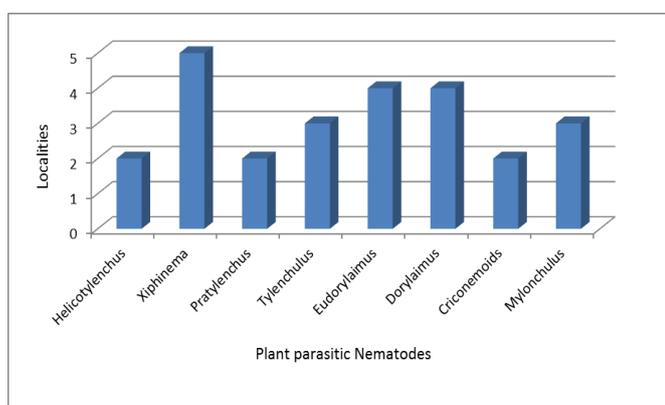


Table 1 show the population of *Xiphinema* was prevalent and were m found to retard the growth of the plants and leads to various deformities. *Xiphinema* were reported from all localities except Sillod. *Eudorylaimus* reported from Himayat

bagh, Chikalhana, Gangapur, Sillod. *Dorylaimus* reported from Himayat bagh, Gangapur, Vaijapur, Karmad. *Mylonchulus* reported from Vaijapur Sillod, Karmad. *Tylenchulus* were reported from Himayat Bagh, Chikalhana, Karmad. *Criconemoides*, *Pratylenchus*, *Helicotylenchus* reported from only two localities. Variation of soil moisture, soil temperature, sub soil water level throughout the different season was followed by the fluctuation of nematode population, significant positive co-relation among these factors and nematode numbers has been observed. (Hassan 1998).

In this study the soil nematodes are found from all the sites of study areas. The nematodes collected were belonging to different genera and occurrence varies with the sampling sites. These not only degrade the quality but also cause various morphological anomalies like premature wilting, stunted growth and dieback of twigs and chlorosis. Perusal of data in table depicted the variation in the frequency distribution of *Helicotylenchus*, *Pratylenchus*, *Eudorylaimus*, *Tylenchulus*, *Xiphinema*, *Dorylaimus*, *Criconemoides*, *Mylonchulus*. were reported from himayat bagh, Chikalhana, Vaijapur, Gangapur, sillod, karmad. Among the different farming system the incidence and the intensity may be found to be very high under irrigated while under rain feed farm it was very poor (Hiraha, 1971, Keerwan Leepsart, 1975, Todia, 1984, Teotia *et al.*, 1992, Govindaian *et al.* 1994, Pilip *et al.*, 1997, Sharma and Sarkar, 1998).

Study revealed that nematodes are abundant. They live in the soil and are widely distributed or spread and persist as a soil plant pest for indefinite period (Caveness, 1967; Whiting *et al.*, 2007). The work regarding the effect of nematodes on citrus plantation has been done earlier by only few workers Nehru *et al.*, (2005), Singh (2009), Zalpuri (2010). Thus the nematodes which found in the present study have adverse effect of climatic factors. It is directly related to their population number. Here the maximum number of nematodes may be found from fully irrigated localities and minimum from less humidity in soil and also less availability of water. This finding supports the result of the previous workers from different part of the world. As depicted from tables 1 and 2 the *Xiphinema* have highest prominence value, absolute and relative frequency followed by *Eudorylaimus*, *Dorylaimus*, *Tylenchulus*, *Mylonchulus*, *Pratylenchus*, *Helicotylenchus*, *Criconemoides*. Which is simply indicative of the fact that to what extent these nematodes become the causative of infection in the citrus plantations.

## CONCLUSION

From the above mention results it is concluded that the various villages of Aurangabad have heavy infection of various species of plant nematode. Their occurrence may cause serious threat to affected citrus plant species. As India is agricultural country so, there is need to check and control the growth of nematodes, because nematodes destroy the *Citrus* plantations which finally affect agriculture as well as economy of farmers and also economy of state.

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