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CONTENTS

INTRODUCTION

Nematodes constitute one of the largest and most ubiquitous groups of the multicellular organisms. They are found in almost all habitats, geographic regions, snowy mountains to deserts, in oceans and lakes. On the basis of their feeding habit, the nematodes have been divided under the following categories (Poinar, 1983)

i) Microbial feeders or microbivorous nematodes that feed on bacteria, diatoms etc.

ii) Predatory nematodes that feed on protozoa and small nematodes.

iii) Plant feeders or phytophagus nematodes which feed on living plants.

iv) Miscellaneous feeders – omnivorous or parasites of plants/animals.

It was N.A. Cobb in the early years of the 20th century who introduced the term 'Nematology' for the science exclusively dealing with nematodes. While nematology deals with all forms of nematodes, phytonematology deals with plant nematodes feeding on living plants, not only their structure and life cycle but also their pathological aspects, including host-parasite relationship, methods of their control, etc.

Plant parasitic nematodes attack all kind of plants and generally belong to Orders Tylenchida, Aphelenchida, Dorylaimida and Triplonchida. They are mainly found in the soil except the species of few genera like *Aphelenchoides, Ditylenchus* and *Anguina* etc. which attack above ground parts of plants (leaves, stem or flowers). Plant parasitic nematodes may be divided into two groups according to their parasitic habits, *i.e.*, ectoparasites and endoparasitic.

In 1743, Needham recorded the first nematode. (now known as *Anguina tritici*). The economic importance of plant parasitic nematode was first realized by Schact (1859) in Germany when he discovered a species of cyst nematode which was later named as *Heterodera schactii* by Schmidt (1871).

During nineteenth century, species of the genera. *Anguina, Meloidogyne, Heterodera, Ditylenchus, Tylenchulus semipenetrans, Rotylenchulus reniformis, Aphelenchoides, Halenchus, Hoplolaimus, Londigorus, Paratylenchus, Pratylenchus, Radopholus, Rotylenchus, Trichodours* and *Xiphinema* were mostly discovered in Europe.

OBJECTIVE

Baqri (2000) pointed out area-wise gaps of information regarding Phytophagous/plant parasitic nematode fauna from mainly south east Rajasthan, from where except a few stray reports, no significant information was available. Alwar, Bharatpur, Dholpur, Baran, Jhalawar and Dungarpur and Sawai Madhopur and Karauli districts of Rajasthan were mentioned as 'not surveyed districts' Keeping this point in view, the present study entitled "Qualitative and Quantitative study of plant and soil nematodes associated with crops of economic importance in Rajasthan" was initiated During the period under report (2005-07), the random surveys were conducted in Alwar, Bharatpur, Dholpur, Karauli, Jaipur, Dausa, Sawai Madhopur and Tonk districts of the State.

Quantitative study deals with the population of Phytophagous/Plant Parasitic/ Predatory nematode or in broader sense it gives information about nematode community per soil sample. As we know community is an assemblage of individuals, it may be large or small and may be composed of individuals of identical or different species. The organisms may be producers, consumers, predators, or decompsers. No matter what their nature, they all have one thing in common *i.e.,* they operate within the frame of their environment, and thus they help structure the 'community' in which they live.

The community study involves many factor such as 'Diversity', 'Structure' and 'stability' Mixed populations of nematode species can constitute a community.

The plant-parasitic nematodes are of the greatest interest to us because they inflict severe yield losses in agricultural and horticultural crops. Hence, the plant-parasitic nematodes are economically very important. In India, van Berkum and Seshadri (1970) have estimated crop losses of about 10 million dollars in wheat due to seedgall nematode (*Anguina tritici)* and about eight million dollars in barley and wheat due to 'molya disease' caused by cereal cyst nematode (*Heterodera avenae*) in Rajasthan State alone. Losses caused by root knot and cyst nematodes (*Meloidogyne* spp. and *Heterodera* spp.) have been estimated from 25 to 90% depending upon the degree of dominance of nematode population, cultivars, season and crops pattern.

From Rajasthan and Gujarat States, excellent information has already been gathered on distribution, ecology, pathogenecity and management of root knot and cyst nematodes. However, no significant information is available on the other plant parasitic nematodes like root-lesion, ring nematode, spiral nematode, longidorids dorylaims, *i.e. Xiphinema* sp. *Longidorus* sp. and *Paralongidorus* sp. and Triplonchids (Trichodorids).

REVIEW OF LITERATURE

The review of nematology literature reveals that in India the history of nematology starts from the survey report of root-knot nematode by Barber (1901) from the tea

gardens in south India. Prior 1959 only a few stray references are available in literature (Butler,1913,1919 Milne 1919; Ayyar,1926,1933; Dastur,1936; Luthra & Vasudeva, 1939; Goodey, 1951 Sanwal, 1951 and few others. Siddiqi (1959), Das (1960) and Jairajpuri (1962) were the first to initiate the work in a systematic way on the taxonony of plant and soil nematodes. Since then many nematologists have made significant contribution in taxonomy (Seshadri and coworkers, 1962-1966; Khan, 1963-1996; Khan, S.M. and Khan, E, 1964; Edward and Misra, 1963-1966; Sethi and Swarup, 1966; Baqri and Jairajpuri, 1966-1992; Sukul, 1967; Khera and his coworkers, 1966-1980; Baqri and his coworkers, 1975-2005; Bajaj and his coworkers, 1976-2005; Ahmad and Jairajpuri, 1976-2005; Ahmad, I. and Jairajpuri, 1979-2000; Sultan and his co-workers, 1982-2002; Luqman and his coworkers, 1985-2000; Dhanachand and his coworkers, 1992-2002; and a few others.

Dr. Q.H. Baqri and his coworkers (1980-1992) at ZSI, Kolkata have published a series of papers on taxonomy, ecology and population dynamics and intraspecific variation study from 'West Bengal' During this period, Zoological Survey of India was also recognized as one of the the leading centres for taxonomical work in Nematology. However, the Nematology Section of ZSI, Kolkata still continues to contribute in the field of nematode taxonomy under the leadership of Dr. A. Chatterjee.

From Rajasthan, Arya (1957) was the first to report root knot nematode species from Jodhpur. Prasad and Mathur and Sehgal (1959) identified a serious nematode pest (*Heterodera avenae*) which causes molya diseases in wheat and barley. Since then Khera and his co-workers, (1966); Yadav; B.S. (1966); Nama and his co-workers (1979-91); Lal and Mathur (1986); Lal, Mathur and Rajan (1990), Sharma and Trivedi (1996-98) and few others have made significant contribution describing nematode fauna of Rajasthan.

Baqri (1994-2005); Bohra and Baqri (1997); Baqri and Bohra (2005); Baqri and Bohra (2002) have published valuable papers on "Plant and Soil nematode from Fragile Ecosystem in entire Thar Desert. Baqri and Bohra (2001-2003) and Bohra and Baqri (2002-2005) have described many new species and a new genus of Order Dorylaimida from Rajasthan and Gujarat. Besides, they have also reported several species as new records from the Thar desert in Rajasthan and Gujarat States.

However, Bishnoi and Yadav (2002); Yadav and Siddiqi (2002); Yadav *et al.* (2004); Kaul and Chaudhary (2004); Siddiqi and *et al.* (2004) are mostly working on applied aspects of *Meloidogyne* and *Heterodera* spp in Rajasthan. A team of nematologists under the leadership of Dr. A.U. Siddiqui at the Rajasthan College of Agriculture at Udaipur is mainly working on Entomopathogenic Nematodes (EPN). The present project report has been divided into major two sub-heads, i.e. A. Quantitative and B. Qualitative.

In 2000, The All India Co-ordinated Project (AICOPTAX) was also sanctioned by the Ministry of Environment & Forests with Dr. Q.H. Baqri as its Principal Investigator and

DRS has now been recognized as one of the Centres of taxonomical work on Plant and Soil Nematodes.

A. Quantitative

Quantitative analysis of soil samples collected during the period under reports provides information about nematode population per sample i.e. occurrence of frequency or Absolute frequency, Relative frequency, Relative density, Prominence Value and dominance Index for plant-parasitic genera. Plant-parasitic nematodes associated with 'cereal crops', horticultural plants, ornamental plants and vegetables. These information furnished in Table Nos. 1-13 and bargraphs have also been incorporated accordingly.

The Quantitative study and Qualitative study are interdependent.

B. Qualitative Study

The Qualitative study provides information up to specific level.

The 84 species of Phytophaogus/Plant-parasitic nematodes have been identified belonging to 37 genera of 20 families of Orders Tylenchida (43 spp.), Aphelenchida (1 sp.), Dorylaimida (35 spp.), Triplonchida (1 sp.), Isolaimida (1 sp.) and Mononchida (3 spp.).

The diagnostic characters and information about habitat, localities and distribution of each species have been furnished.

MATERIAL AND METHODS

Soil samples were collected by Dr. P. Bohra while on survey to eight districts of Rajasthan, namely Alwar, Bharatpur, Dholpur, Karauli, Jaipur, Dausa, Sawai Madhopur and Tonk. About 407 soil samples were collected during the period i.e. 2005-2006 under report. Soil samples around roots of host plants were collected with the help of a showel from depth (5-15 cm) depending upon the moisture in the field. The soil collected in polythene bags and their open ends were properly closed with rubber bands, brought to laboratory and stored in a fridge to avoid evaporation. All relevant data regarding host, locality etc. were recorded at the time of collection.

Soil samples were processed in laboratory by Cobb's (1918) modified seiving and decantation technique (350 mesh seive or 53 µm pore size). Nematodes obtained by this method were fixed in hot F. a. or 4% formalin. Then nematodes were transferred to a solution of glycerine alcohol (95 parts 30% alcohol and 5 ml glycerine) in a cavity blocks by using fine brush. The cavity blocks containing nematodes were kept in desiccators for slow dehydration for at least for two weeks. For identification, permanent slides were prepared in anhydrous glycerine. The cover slip sealed either with glyceel or nail polish or wax.

All measurements were made on specimens mounted in anhydrous glycerine with the help of occular micrometer. de Man's (1884) formula for denoting body dimensions of nematodes was used.

QUANTITATIVE STUDY

Mathematical and statistical ecology are becoming more important in biological studies, but advanced techniques and even some simple ones, have been used in little in nematode ecology. The method of presenting data is to list the nematodes found in an area or crop, frequently within specified political boundaries. Such a list provides no information concerning frequency, abundance, or habitat relationships, except sometimes of associated plants. Thus a mere listing of species is of limited long term ecological use. Information about habitats, soils, frequency, density and other parameters add much more meaning.

Keeping in view the above facts, the Quantitative analysis of samples collected during 2005-06 from Alwar, Bharatpur, Dholpur, Karauli, Jaipur, Dausa, Sawai Madhopur and Tonk districts of Rajasthan State have been studied.

Material and methods

The sampling was made at random. For the quantitative estimation, the methodology described by Baqri *et al.* (1983) was followed. For the quantitative study, the bulk of a sample was thoroughly mixed with hand and 100 gm of soil was taken separately for processing. This 100 gm soil was processed for isolation of the nematodes through the modified Baermann funnel technique The nematode population per 200 ml (beaker) soil was counted from each sample under stereoscopic binocular microscope.

After 24 hours the counting was made thrice in a counting dish (syrcase dish) and the mean values were obtained. Only the commonly found nematodes were identified upto genera and counted separately under the stereoscopic binocular microscope. The remaining nematodes were counted under the following group: Other tylenchids, other dorylaims and saprophagous. For identification up to species level, at the time of counting some specimens were picked up and transferred in glycerine alcohol and kept into desiccator for slow dehydration and then mounted in anhydrous glycerine. After taking body measurements, species identification was confirmed.

Parameters used in quantitative estimation

According to Norton (1978), the following parameters could add some information over mere listing of species and in the community analysis.

Frequency : That is how often a species occurs among samples. Absolute frequency is expressed as percentage :

$$\text{Absolute frequency} = \frac{\text{Number of samples containing a species x100}}{\text{number of samples collected}}$$

$$\text{Relative frequency} = \frac{\text{frequency of species} \times 100}{\text{sum frequency of all species}}$$

Density : Density (abundance) is a quantitative measure of entities in a sample or a mean for a group of samples per unit of soil for example,

$$\text{Relative density} = \frac{\text{number of individuals of a species} \times 100}{\text{total of all individuals in a sample}}$$

Prominance Value :

Beals (1960) combined the density and frequency about population and suggested this formula for calculating prominence value.

PV= density frequency

Dominance Index :

$$\text{Dominance percentage} = \frac{\text{Total Nematode population in 10 ml}}{\text{500 gm}}$$

$$\text{Dominance index (di)} = \frac{(n_1 \times 100)}{N}$$

n_1 = number of individual of taxa

N = Total number of individuals of taxa.

ACHIEVEMENTS

In order to conduct the quantitative studies, soil samples were collected during surveys (2005-06) at above mentioned districts from around roots of various host plant, which are economically very important. The results obtained from quantitative analysis are furnished below according to districts and crops respectively.

The calculations were made by applying the Norton (1978) formula. The details of each district have been furnished in Table-1 to 13.

A. Quantitative Study

The results of the quantitative estimation of different genera and other nematodes from Alwar, Bharatpur, Dholpur, Karauli, Jaipur, Dausa, Sawai Madhopur and Tonk of Rajasthan have been furnished in Table Nos. 1-13.

Table-1 provides the comparative information from eight districts of Rajasthan regarding average percent frequency of occurrence and dominance of important pest in

soil from various host plants like, cereal crops, horticulture plants, ornamental plants, etc.

District Alwar

The amalgamated results of the quantitative estimation of 62 soil samples collected from 10 localities have been analysed in Table Nos. 1-3. The study reveals that the species of the genera *Hoplolaimus*; *Helicotylenchus*; *Tylenchorhynchus* and *Pratylenchus* are abundant. The results also confirm that *Hoplolaimus* and *Helicotylenchus* are most abundant. The results also confirm that *Hoplolaimus indicus*; *Helicotylenchus spp.* (*H. dihystera, H. erytheirnae, H. multicintus*; etc.) and *Tylenchorhynchus spp.* (*T. nordiensis, T. mashhoodi*) are the key pests in Alwar district because of their high degree of occurrence and dominance. The results also confirm that Criconematids and Trichodorids are also verry serious pests particularly in cereal crops and horticulture crops.

District Bharatpur

In all, 63 soil samples were collectd from 15 localities of district Bharatpur. Table Nos. 4-5 provide the frequency of occurrence and dominance of the important pests of district Bharatpur. The results reveal that *Hoplolaimus, Helicotylenchus, Tylenchorhynchus, Pratylenchus, Hirschmanniella, Paratylenchus,* Trichodorids and Criconematids are the key and potential pests of cereal crops and vegetable plants in district Bharatpur. Trichodorids and *Hirschmanniella* spp. are the dominant pest of economically important crops in district Bharatpur.

Surprisingly, not a single genus of predatory nematodes of order Mononchida has been found in Alwar and Bharatpur districts during study. It may be a reason of high population of plant parasitic nematodes in both the districts.

District Dholpur

Seventy one soil samples and root samples were collected from 13 localities of district Dholpur. The results of quantitative estimation reveal that *Helicotylenchus, Hoplolaimus, Pratylenchus, Tylenchorhynchus, Rotylenchulus reniformis,* Trichodorids, *Hirschmanniella, Xiphinema*, Criconematids, *Meloidogyne* sp. are most frequently occurring pests in cereal and ornamental plants in district Dholpur.

During the study the predatory nematodes mononchids have been found in very poor population.

District Karauli

In all 37 soil samples from 16 localities were collected. The results of quantitative estimation reveals that *Tylenchorhynchus, Helicotylenchus, Hoplolaimus, Pratylenchus,*

Trichodorids *Xiphinema*, Criconematids and *Hirschmanniella* spp. are among the most frequent and dominant pest of cereal crops in district Karauli.

District Dausa

In all, 69 soil samples from 15 localities were collected. The results of quantitative estimation reveal that *Helicotylenchus*, *Tylenchorhynchus, Rotylenchoides, Hoplolaimus, Pratylenchus*, *Hirschmanniella* are most frequent nematode pests. *Rotylenchulus reniformis*, *Aphelenchoides* sp; Trichodorids, *Xiphinema* are also found in significant number. *Pratylenchoides sp.* have been recorded for the first time from the State. Not a single predatory nematode was found during study.

District Sawaimadhopur

About 36 soil samples from 10 localities were collected. The overall results of quantitative estimation have been shown in Table No. 11. The study reveals that the species of the genera *Helicotylenchus*, *Tylenchorhynchus*, *Rotylenchulus reniformis* and *Hoplolaimus indicus* amongst the most frequent nematode pests. *Pratylenchoides sp.*, *Hirschmanniella* sp., Trichodorids, *Xiphinema* and other longidorids are also found during study.

The high frequency of *Rotylenchulus reniformis* particularly in district Sawai Madhopur may be due to the reason that the district is famous for its Guava production in Rajasthan. During the study mononchids were not found.

District Tonk
(Table-12)

About 44 oil samples from 6 localities were collected. The results of quantitative estimation of genera reveals that *Helicotylenchus*, *Tylenchorhynchus, Pratylenchus*, *Rotylenchoides*, *Hirschmanniella*, Longidorids, *Paratrichodorus* sp. and *Pratylenchoides sp.* are found to be frequent occurrence. During the study it was noticed that the overall nematode population in samples collected from district Tonk are very poor while the diversity is very significant. In district Tonk the predatory nematodes are also found. The main reason behind this may be due to low rainfall during, 2006.

District Jaipur
(Table-13)

In all, 25 soil samples from 14 localities were collected. The results of quantitative study reveals that *Helicotylenchus*, *Tylenchorhynchus, Pratylenchus, Hoplolaimus, Hirschmanniella,* Longidorids and Trichodorids were having high frequency of occurrence. The same species of genera are dominant pest of economically important plants in the district. Mononchids are found with very low frequency of occurrence.

Table-1 : District : ALWAR
(Cereal Crops)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	99.1	9.85	12.4	119.9	12.4
Helicotylenchus sp.	97.5	10.55	9.7	97.9	9.7
Tylenchorhynchus sp.	91.6	9.85	13.63	131.6	13.63
Pratylenchus sp.	95	9.85	11.39	110	11.39
Criconematids	40	4.22	8.6	54.8	8.6
Other tylenchids	93.33	9.85	15.5	3.5	15.5
Trichodorids	41.6	0.79	7.08	19.3	7.08
Xiphinema sp.	75	6.33	2.5	0	2.5
Saprophagous	100	4.2	9.3	0	9.3

Table-2 : District : ALWAR
(Horticulture)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	100	11.57	30.41	9.61	30.41
Helicotylenchus sp.	100	11.57	11.50	3.63	11.50
Tylenchorhynchus sp.	100	11.57	7.27	2.49	7.27
Pratylenchus sp.	00	00	00	00	00
Criconematids	100	11.57	6.44	2.03	6.44
Other tylenchids	100	11.57	17.37	5.49	17.37
Trichodorids	72.72	8.42	3.96	3.38	3.96
Longidorus sp.	72.72	8.42	0.41	0.35	0.41
Saprophagous	100	11.57	10.02	3.16	10.02
Xiphinema	18.18	2.10	1.82	7.76	1.82

Table-4 : District : ALWAR
(Ornamental Plants)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	100	12.40	12.20	122	12.20
Helicotylenchus sp.	100	12.40	26.64	266.4	26.64
Tylenchorhynchus sp.	87	10.79	8.73	81.4	8.73
Pratylenchus sp.	75	9.30	2.10	18.18	2.10
Criconematids	50	7.08	0.97	6.85	0.97
Other tylenchids	100	12.40	17.58	175.8	17.58
Trichodorids	25	3.10	0.21	1.05	0.21
Longidoris	12	1.48	0.05	0.17	0.05
Xiphinema sp.	37	9.59	1.02	6.2	1.02
Other dorylaimids	95	11.78	8.84	86.16	8.84
Mylonchulus sp.	12	1.55	0.05	0.17	0.05
Saprophagous	100	12.40	11.97	119.7	11.97

Table-4 : District : BHARATPUR
(Cereal Crops)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	66	80	19.40	1.9	19.4
Helicotylenchus sp.	80	9.79	12.25	77.4	12.2
Tylenchorhynchus sp.	63	7.71	8.03	35.9	8.0
Pratylenchus sp.	60	7.34	7.76	54.45	7.7
Hirschmanniella sp.	56	6.85	2.63	139.93	2.6
Rotylenchulus reniformi	40	4.89	0.52	23.40	0.52
Criconematids	23	28.15	0.57	19.66	0.5
Paratylenchus sp.	60	7.3	10.93	13.94	0.25
Other tylenchids	90	11.01	18.18	121.26	18.1
Trichodorids	83	10.15	6.06	392.21	6.0
Xiphinema sp.	40	4.89	0.75	34.02	0.75
Other dorylaims	93	11.38	12.43	84.48	12.4

Table-5 : District : BHARATPUR
(Vegetables)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoplolaimus indicus	81	12.32	3.70	30.34	37
Helicotylenchus sp.	72	10.95	6.77	5.68	6.7
Tylenchorhynchus sp.	81	12.32	3.82	3.45	3.8
Pratylenchus sp.	63	9.58	4.33	3.43	4.3
Hirschmanniella sp.	56	6.85	2.63	139.93	5.1
Rotylenchulus reniformis	9	1.36	1.01	0.95	1.0
Criconematids	18	2.73	13.59	5.76	13.5
Other tylenchids	81	12.32	48.08	43.53	12.4
Trichodorids	63	9.58	4.14	2.60	4.1
Other dorylaimids	100	15.07	5.43	1.71	5.4
Saprophagous	90	13.69	11.38	5.76	11.3

Table-6 : District : DHOLPUR
(Cereal Crops)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	55	7.8	6.94	91.96	6.9
Helicotylenchus sp.	60	8.5	4.59	63.51	9.2
Tylenchorhynchus sp.	40	5.6	6.49	73.36	6.4
Pratylenchus sp.	80	11.3	9.13	145.79	9.1
Hemicriconemoides	20	2.8	0.89	7.15	0.8
Hirschmanniella sp.n	30	4.2	0.50	4.92	0.5
Rotylenchoides sp.	50	7.6	3.30	4.24	3.3
Other tylenchids	90	12.7	19.60	332.63	19.6
Trichodorids	35	4.9	3.13	33.13	3.1
Longidorids	30	4.25	1.84	18.07	1.8
Xiphinema sp.	45	6.30	4.03	42.51	4.0
Saprophagous	95	13.4	14.45	251.46	14.4
Other dorylaimids	80	11.34	14.90	237.91	14.9

Table-7 : District : DHOLPUR
(Ornamental Plants)

Name of Nematode species	A.F. %	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	83	10.63	10.82	9.85	10.8
Helicotylenchus sp.	66	8.51	10.74	8.79	10.7
Tylenchorhynchus sp.	100	12.76	3.40	1.07	3.4
Meloidogyne sp. (Juvenile)	16	2.12	5.06	2.08	5.0
Pratylenchus sp.	66	8.51	6.28	5.14	6.2
Rotylenchulus reniformis	50	6.38	5.50	3.88	5.5
Criconematids	33	4.25	1.31	0.75	1.3
Hirschmanniella sp.n	50	6.38	1.74	1.23	1.7
Other tylenchids	100	12.76	18.95	5.99	18.9
Trichodorids	100	12.76	4.01	1.26	4.0
Xiphinema sp.	16	2.12	16.76	0.07	0.1
Other dorylaimids	100	12.76	16.76	5.29	16.7
Mononchids	16	2.12	0.08	0.03	0.08
Saprophagous	83	10.63	15.10	13.75	15.1

Table-8 : District : DHOLPUR
(Horticulture Plants)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	66	9.52	1.01	0.67	1.01
Helicotylenchus sp.	100	14.28	12.39	3.91	12.39
Tylenchorhynchus sp.	33	4.76	0.20	0.06	0.20
Meloidogyne sp. (Juvenile)	16	2.12	5.06	2.08	5.06
Pratylenchus sp.	33	4.76	6.70	3.84	6.7
Rotylenchulus reniformis	66	0.10	29.47	24.12	29.4
Other tylenchids	100	14.28	17.07	5.37	17.07
Trichodorids	33	4.76	6.91	3.96	6.91
Xiphinema sp.	66	0.10	0.60	0.48	0.60
Other dorylaimids	100	14.28	15.85	1.58	15.05
Saprophagous	100	14.28	9.75	3.08	9.75

Table-9 : District : KARAULI
(Cereal Crops)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	70	9.8	18.55	15.52	18.5
Helicotylenchus sp.	75	10.5	12.14	9.68	11.1
Tylenchorhynchus sp.	90	12.6	12.14	11.51	12.1
Pratylenchus sp.	65	9.1	4.22	10.42	4.2
Criconematids	20	2.81	0.88	0.39	0.8
Hirschmanniella sp.	20	2.81	2.18	0.97	2.1
Other tylenchids	80	11.26	11.66	10.42	11.6
Trichodorids	65	9.15	6.27	5.03	6.2
Xiphinema sp.	40	5.63	8.02	5.07	3.8
Other dorylaimids	90	12.67	24.08	21.67	11.06
Mononchids	5	0.70	0.06	0.04	0.06
Saprophagous	75	10.56	1575	13.63	15.7

Table-10 : District : DAUSA

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	46	6.5	3.49	2.39	3.4
Helicotylenchus	86	12.1	11.69	10.90	9.0
Tylenchorhynchus	86	12.14	12.04	11.23	12
Pratylenchus	33	4.6	2.09	1.20	2.0
Hirschmanniella	33	4.6	5.58	3.20	5.5
Rotylenchoides sp.	66	9.3	8.55	6.99	8.5
Rotylenchulus reniformis (Juvenile)	26	3.7	1.57	0.81	1.5
Pratylenchoides sp.n	6	0.93	0.17	0.14	0.1
Other tylenchids	100	14.0	4.67	15.35	15.3
Trichodorids	20	2.80	2.26	1.01	2.2
Xiphinema sp.	20	2.80	0.52	4.84	0.5
Other dorylaimids	53	7.47	13.43	9.77	13.4
Aphelenchus avenae	13	1.86	0.52	4.84	0.5
Aphelenchoides sp.	33	4.67	2.09	1.20	2.0
Saprophagous	80	11.21	20.4	18.25	20.4

Table-11 : District : SAWAIMADHOPUR
(Cereal Crops)

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	31	6.96	3.85	2.14	3.8
Helicotylenchus sp.	57	12.78	8.36	6.36	8.3
Tylenchorhynchus sp.	57	12.78	18.19	13.93	18.1
Pratylenchus sp.	31	6.97	6.37	3.60	6.3
Rotylenchulus reniformis	42.10	1.16	4.78	3.09	4.7
Pratylenchoides sp.	31	6.97	6.37	3.60	6.3
Hirschmanniella sp.	10	2.32	1.59	0.50	15.9
Other tylenchids	31	6.9	4.24	2.39	4.2
Trichodorids	36	8.14	4.11	2.50	4.1
Longidorids	10	2.32	1.85	0.61	1.85
Xiphinema sp.	16	2.12	16.76	0.07	0.5
Other dorylaimids	47	10.46	16.60	11.38	16.6
Saprophagous	57	12.78	17.79	13.54	17.7

Table-12 : District : TONK

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	7	2	1.7	5.03	1.7
Helicotylenchus dihystera	53	14	12.2	8.97	12.2
Tylenchorhynchus	53	14	13.4	9.95	13.4
Hirschmanniella sp.n	23	6.1	7.12	3.41	7.1
Pratylenchus	46	0.12	13.9	9.48	13.9
Rotylenchoides sp.n	15	4.08	3.56	1.37	3.5
Other tylenchids	15	0.24	1.0	0.39	1.0
Paratrichodorus	7	2.04	0.50	0.44	0.5
Longidorids	23	6.2	1.78	0.85	1.7
Other dorylaimids	69	18.3	0.24	0.19	24.1
Mylonchulus sp.	7	0.49	1.01	0.90	1.0
Pratylenchoides sp.n	7	2.04	2.54	2.27	2.5
Saprophagous	46	12.24	16.03	10.87	16

Table-13 : District : JAIPUR

Name of Nematode species	A.F.%	R.F.%	R.D.%	P.V.	D.I.
Hoploliamus indicus	75	10.7	13.51	11.70	13.5
Helicotylenchus sp.	90	12.85	14.84	14.87	14.8
Tylenchorhynchus sp.	80	11.4	18.84	14.07	18.8
Meloidogyne sp.	15	2.1	0.00	0.00	0.00
Pratylenchus sp.	85	12.1	4.50	3.33	4.9
Criconematids	20	2.8	2.91	1.30	2.9
Hirschmanniella sp.	55	7.85	4.50	3.33	4.5
Other tylenchids	60	8.5	4.63	3.58	4.6
Trichodorids	60	8.5	3.10	2.40	3.1
Longidorids	5	0.7	0.0	0.0	0.0
Xiphinema sp.	25	3.5	0.69	0.34	0.6
Other dorylaims	75	10.7	13.32	0.00	13.3
Mononchids	5	0.7	0.19	11.53	0.19
Pratylenchoides sp.	20	2.8	0.38	0.16	0.38

QUALITATIVE STUDY

The qualitative studies yielded the following 43 species of Tylenchida, one species of Aphelenchida, 35 species of Dorylaimida, three species of Mononchida, one species of Triplonchida and one species of Isolaimida.

Order TYLENCHIDA Thorne, 1949

Superfamily TYLENCHOIDEA Örley, 1880

Family TYLENCHIDAE Örley, 1880

Genus ***Tylenchus*** Bastian, 1865

1. *Tylenchus magnus* Khurna & Gupta, 1988

Genus ***Malenchus*** Andrássy, 1968

2. *Malenchus subtilis* Lal & Khan, 1988

Superfamily HOPLOLAMOIDEA Filipjev, 1934 (Paramonov, 1967)

Family HOPLOLAIMIDAE, Filipjev, 1934 (Wieser, 1953)

Genus ***Hoplolaimus*** von Daday,

3. *Hoplolaimus indicus* Sher, 1963

Genus ***Helicotylenchus*** Steiner, 1945

4. *Helicotylenchus erythrinae* (Zimmermann, 1904) Golden, 1956,
5. *Helicotylenchus leiocephalus* Sher, 1966
6. *Helicotylenchus exallus* Sher, 1966
7. *Helicotylenchus goodi,* Tikyani *et al.*, 1969
8. *Helicotylenchus conicephalus* Siddiqi, 1972
9. *Helicotylenchus labiatus* Roman, 1965
10. *Helicotylenchus crenacauda* Sher, 1966
11. *Helicotylenchus labiodiscinus Sher*, 1966
12. *Helicotylenchus microdorus* Prasad *et al.*, 1965
13. *Helicotylenchus multicinctus* (Cobb, 1893) Golden, 1956
14. *Helicotylenchus tropicus* Roman, 1965
15. *Helicotylenchus glissus* Thorne & Malek, 1968

Genus ***Rotylenchoides*** Whitehead, 1958

16. *Rotylenchoides* sp.n.

Family ROTYLENCHULIDAE Hussain & Khan, 1967 (Hussain, 1976)

Genus ***Rotylenchulus*** Linford & Oliveira, 1940

17. *Rotylenchulus reniformis* Linford & Oliveira, 1940

Family PRATYLENCHIDAE Thorne, 1949 (Siddiqi, 1963)

Genus ***Pratylenchus*** Filipjev, 1936

18. *Pratylenchus brachyurus* (Godfrey, 1929) Filipjev & Schuurmans Stekhoven, 1941
19. *Pratylenchus macrostylus* Wu, 1971

20. ***Pratylenchus uralensis*** (Romaniko, 1966) Loof, 1991

21. ***Pratylenchus neglectus*** (Rensch, 1924) Filipjev & Schuurmans Stekhoven, 1941

22. ***Pratylenchus thornei*** Sher & Allen, 1953

23. ***Pratylenchus zeae*** Graham, 1951

Genus ***Hirschmanniella*** Luc & Goodey, 1964

24. ***Hirschmanniella*** sp.n.

Genus ***Pratylenchoides*** Winslow, 1958

25. ***Pratylenchoides*** sp.n.

Superfamily DOLICHODOROIDEA Chitwood in Chitwood & Chitwood, 1950 (Siddiqi, 1986)

Family TELOTYLENCHIDAE Siddiqi, 1960

Genus ***Bitylenchus*** Filipjev, 1934 (Jairajpuri, 1982)

26. ***Bitylenchus goffarti*** (Sturhan, 1966) Jairajpuri, 1982

27. ***Bitylenchus dubius*** (Butschli, 1873) Filipjev, 1934

Genus ***Quinisulcius*** Siddiqi, 1971

28. ***Quinisulcius curvus*** (Williams, 1960) Siddiqi, 1971

Genus ***Tylenchorhynchus*** Cobb, 1913

29. ***Tylenchorhynchus clarus*** Allen, 1955

30. ***Tylenchorhynchus robustus*** Thorne & Malek, 1968

31. ***Tylenchorhynchus divittatus*** Siddiqi, 1961

32. ***Tylenchorhynchus phaseoli*** Sethi & Swarup, 1968

33. ***Tylenchorhynchus brassicae*** Siddiqi, 1961

34. ***Tylenchorhynchus brevidens*** Allen, 1955

35. ***Tylenchorhynchus brevilineatus*** Williams, 1960

36. ***Tylenchorhynchus madarpurensis*** Sultana, Singh & Sakhuja,1991

37. ***Tylenchorhynchus nordiensis*** Khan & Nanjappa, 1974

Genus ***Merlinius*** Siddiqi, 1970

38. *Merlinius nanus* (Allen, 1955) Siddiqi, 1970

Genus ***Neodolichorhynchus*** Jairajpuri & Hunt, 1984

39. *Neodolichorhynchus* (*Prodolichorhynchus)elegans* (Germani & Luc, 1984) Siddiqi, 2000

40. *Neodolichorhynchus (Mulkorhynchus) phaseoli* (Sethi & Swarup, 1968) Talavera & Tobar, 1997

Superfamily CRICONEMATOIDEA Taylor, 1936 (1914) (Geraert, 1966)

Family CRICONEMATIDAE Taylor, 1936 (1914) Thorne, 1949

Genus ***Hemicriconemoides*** Chitwood & Birchfield, 1957

41. *Hemicriconemoides brachyurus* (Loss, 1949), Chitwood & Brichfield, 1957

42. *Hemicriconemoides mangiferae* Siddiqi, 1961

Order APHLENCHIDA Siddiqi, 1980

Superfamily APHLENCHOIDEA Fuchs, 1937

Family APHLENCHIDAE Fuchs, 1937 (Steiner, 1949)

Genus ***Aphelenchus*** Bastian, 1865

43. *Aphelenchus avenae* Bastian, 1865

Order DORYLAIMIDA Pearse, 1942

Superfamily DORYLAIMOIDEA De Man, 1876

Family DORYLAIMIDAE De Man, 1876

Genus ***Dorylaimus*** Dujardin, 1845

44. *Dorylaimus* sp.n.

Genus ***Ischiodorylaimus*** Andrássy, 1969

45. *Ischiodorylaimus* sp.n.

Genus ***Mesodorylaimus*** Andrássy, 1959

46. *Mesodorylaimus kauli* Baqri & Bohra, 2001

Genus ***Prothornenema*** Baqri & Bohra, 2003

47. *Prothornenema capitatum* Baqri & Bohra, 2003

Family APORCELAIMIDAE Heyns, 1965

Genus ***Aporcelaimellus*** Heyns, 1965

48. ***Aporcelaimellus heynsi*** Baqri & Jairajpuri, 1968

Genus ***Tubixaba*** Monteiro and Lordello, 1980

49. ***Tubixaba parva*** Pretorius, Kruger & Heyns, 1987

Genus ***Torumanawa*** Yeates, 1967

50. ***Torumanawa*** sp.n.

Family QUDSIANEMATIDAE Jairajpuri, 1965

Genus ***Labronema*** Thorne, 1939

51. ***Labronema confusum*** (Baqri & Jana, 1983) Andrássy, 1991

Genus ***Latocephalus*** Patil & Khan, 1982

52. ***Latocephalus laetanus*** Siddiqi, 2003

53. ***Latocephalus lineatus*** Siddiqi, 2003

54. ***Latocephalus conicaudatus*** Baqri & Bohra, 2003

55. ***Latocephalus smithi*** (Heyns, 1963) Patil & Khan, 1982

Genus ***Moshajia*** Siddiqi, 1982

56. ***Moshajia cultristyla*** Siddiqi, 1982

Family NORDIDIIDAE Jairajpuri & Siddiqi, 1964

Genus ***Kochinema*** Heyns, 1963

57. ***Kochinema farodai*** Baqri & Bohra, 2001

Superfamily ACTINOLAIMOIDEA Thorne, 1939

Family CARCHAROLAIMIDAE Thorne, 1967

Genus ***Carcharolaimus*** Thorne, 1939

58. ***Carcharolaimus mashhoodi*** Jairajpuri, 1968

Genus ***Mylodiscoides*** Lordello, 1963

59. ***Mylodiscoides*** sp.n.

Superfamily BELONDOROIDEA Thorne, 1939

Family BELONDIRIDAE Thorne, 1939

Genus ***Belondira*** Thorne, 1939

60. *Belondira aquaticus* Ferris, Ferris & Goseco, 1983

Genus ***Dorylaimellus*** Cobb, 1913

61. *Dorylaimellus (A.) deviatus* Baqri & Jairajpuri, 1968

62. *Dorylaimellus (M.) jacobi* Baqri & Jairajpuri, 1968

63. *Dorylaimellus (B.) discocephalus*, Siddiqi, 1964

Superfamily TYLENCHOLAIMOIDEA Filipjev, 1934

Family TYLENCHOLAIMIDAEFilipjev, 1934

Genus ***Tylencholaimus*** De Man, 1876

64. *Tylencholaimus constrictus* Vinciguerra, 1986

65. *Tylencholaimus pakistanensis* Timm, 1964

66. *Tylencholaimus* sp.n.

67. *Tylencholaimus decens Andrássy,* 1991

68. *Tylencholaimus gertii* Kurger, 1965

69. *Tylencholaimus proximus* Thorne, 1939

70. *Tylencholaimus innebus* Ahmad & Jairajpuri, 1980

71. *Tylencholaimus obscurus* Jairajpuri, 1965

72. *Tylencholaimus minutus* Vinciguerra, 1986

73. *Tylencholaimus naguriensis* Baqri & Bohra, 2001

Superfamily NYGOLAIMOIDEA Thorne, 1935

Family NYGOLAIMIDAE Thorne, 1935

Genus *Nygolaimus* Cobb, 1913

74. *Nygolaimus harishi* Ahmad & Jairajpuri, 1980

75. ***Nygolaimus anneckei*** Heyns, 1968

76. ***Nygolaimus captivatus*** (Heyns, 1968) Khan & Jairajpuri, 1982

77. ***Nygolaimus hyans*** Thorne, 1974

78. ***Nygolaimus*** sp.n.

79. ***Nygolaimus*** sp.n.

Order MONONCHIDA Jairajpuri, 1969

Superfamily BATHYODONTOIDEA Clark, 1961

Family BATHYODONTOIDAE Clark, 1961

Genus ***Bathyodontus*** Fielding, 1950

80. ***Bathyodontus cylindricus*** Fielding, 1950

81. ***Bathyodontus*** sp.n.

Superfamily MONONCHULOIDEA De Coninck, 1965

Family MONONCHULIDAE De Coninck, 1965

Genus ***Oionchus*** Cobb, 1913

82. ***Oionchus obtusus*** 1913

Order TRIPLONCHIDA, Cobb, 1920

Superfamily TRICHODOROIDEA Thorne, 1935

Family TRICHODORIDAE Thorne, 1935

Genus ***Paratrichodorus*** Siddiqi, 1974

83. ***Paratrichodorus (Atlantadorus) porosus*** (Allen, 1957) Siddiqi, 1974

Order ISOLAIMIDA Cobb, 1920

Superfamily ISOLAIMOIDEA Timm, 1969

Family ISOLAIMIDAE Timm, 1969

Genus ***Isolaimium*** Cobb, 1920

84. ***Isolaimium***n sp.n.

LOCALITIES SURVEYED

District	No. of sample collected	No. of localities surveyed	Name of Localities
Alwar	62	10	Tijara, Chikani, Indok, Badola,Silised, Dhola ki piao, Bharatpur road, Bhala Road, Shabadi, Thanagachi.
Bharatpur	63	15	Bajaira, Khumbar, Bhurago, Nagar, Pairsal-Nadbai, Rarhar, Sawaimadhopur-Jaipur road, Pipal, Dholpur Road, Bachandi, Mahua, Ekran, Jatholi, Deeg, bharanga,.
Dholpur	71	13	Sijaroli, Kheda, Shivpura, Dungapura, Khegara, jatoli, Sarmathura, Bari-Road, Karimpura, Narpura, Umrao ki dhani, Gajarpura, Bari.
Karauli	37	16	Gudala, Kela Devi (lakudi), Khayuria-Kela devi, Karanpur, Laruki Kela Devi, Kela Devi Road, Gudala, Shri Mahavirji, Gangapur, Ritholi Dausa Road, LakodiKela Devi, Mandriad, Marmala Kela Devi, Nadoli, Kashrah, Karauli.
Jaipur	25	14	Kanote, Tidipur, Shivdaspura, Basichal, Chamu, Jaitpura, Parkheda, Rajarampura, Solgrampura, Pahladpura, Rajawash, Bilwa, Sitapura, Gathaihill.
Dausa	69	15	Kavat, Sikraj, Lawnamood, Sadalpur, Thikariya, Bhadoli, Naghal, Bhandraj, Khedaparpura, Basnkho, Mehandipura, Shikandra, Golaiya, Gajanko, Dausa city (P.W.D. geust house).
Sawai Madhopur	36	10	Malarnachauk, Ladhipura, Sherpura, Surwal, Sawai Madhopur city, Gwaliar Road, Madhosinghpura, Karmuda, Jetpur, Badal.
Tonk	44	6	Mehandrawas, Arniya, Banu, Pachala, Union, P.W.D guesthouse.

Sl. No.	Local Name of the plant	Botanical name of plant
1.	Rice	*Oryza sativa*
2.	Moong	*Vigna radiate*
3.	Wheat	*Triticum aestivum*
4.	Jowar (Millet)	
5.	Chawlla (cow pea)	*Phaseolus sinensis*
6.	Bajra (Pearl millet)	*Pennisetum typhoides*
7.	Maize	*Zea mays*
8.	Gawar (Cluster bean)	*Cyamopsis tetragonaloba*
9.	Loki (Bottle gourd)	*Lagenaria siceraria*
10.	Torii (Ridged gourd)	*Luffa acutangula*
11.	Ghiya Torii (Vegetable sponge)	*Luffa cylindrica*
12.	Tinda (Round ground)	*Citrullus vulgaris*
13.	Arhar (Pigeona pea)	*Cajanus cajan*
14.	Dhaniya (Coriander)	*Coriandrum sativum*
15.	Palak (Spinack)	*Spinacea oleracea*
16.	Barley	*Hordeum vulgare*
17.	Karela (Bitter gourd)	*Momordica charantia*
18.	Onion	*Allium cepa*
19.	Richka grass(Alfalfa plant)	*Medicago satina*
20.	Brinjal	*Solenum melongena*
21.	Kakadi (Snake cucumber)	*Cucumis sativum*
22.	Bhindi (Lady's finger)	
23.	Green Chillies	*Capsicum annuum*
24.	Tomato	*Lycopursicon esculantum*
25.	Pumpkin (Kaddu)	*Cucurbita moschata*
26.	Banana	*Musa paradisiaea*
27.	Sugarcane	*Saccharum officinarum*
28.	Lemon	*Citrus limon*
29.	Papaya	*Carica papaya*
30.	Orange	*Citrus reticulate*
31.	Sarson (Mustard)	*Brassica campestris*
32.	Til	*Sesamus indicum*
33.	Cauliflower	*Brassica oleracea*
34.	Chiku (Sapodilla)	*Achras sapota*

Sl. No.	Local Name of the plant	Botanical name of plant
35.	Jamun(Javaplum)	*Syzgium cumini*
36.	Anar(Pomegrante)	*Punica granatum*
37.	Khajur(date palm)	*Phoenix dactylifera*
38.	Ber	*Zizyphus mauritiana*
39.	Sitaphal	*Cucurbita maxima*
40.	Coconut	*Cocos nucifera*
41.	Kaurunda	*Carissa carissa*
42.	Juhi	*Avena sativa*
43.	Cotton	*Gossypium arboreum*
44.	Shisham (sisso)	*Dalbergia sissoo*
45.	Mango	*Mangifera indica*
46.	Belpatra	*Aegle marmelos*
47.	Mehandi (Henna)	*Lawsonia inermis*
48.	Guava (Amrood)	*Psidium guajava*
49.	Kaner	*Nerium indicum*
50.	Khejri	*Prospis cineraria*
51.	Tulsi	*Ocimum sanctum*
52.	Rye	*Secale cereale*
53.	Arandi (Castor)	*Ricinus communis*
54.	Aak	*Calotropis procera*
55.	Sonf (fennem)	*Foeniculum vulgare*
56.	Moth (Dewgram)	*Vigna aconitifolia*
57.	Sweet Potato	*Impomea batatas*
58.	Fenugreek	*Trigonella foenum-graecum*
59.	Neem(Margosa)	*Azadiracta indica*
60.	Eucalyptus	*Eucalyptus spp.*
61.	Emblic	*Emblica officinalis*
62.	Rose	*Rosa damascena*
63.	Jasmine	*Jasminum grandiflorum*
64.	Acacia babool	*Accacia nitotica*
65.	Teak	*Tectona grandis*
66.	Mausambhi	*Citrus sinensis*
67.	Ashoka	*Sarca indica*
68.	Isabgol	*Plantago ovata*

SYSTAMATIC ACCOUNT

Tylenchus magnus Khurana & Gupta, 1988

1988. *Tylenchus magnus* Khurana & Gupta. *Revue. Nematol.*, **11** : 35-37.

Material examined : 2 females, 1 male. Reg. No. IV/1863

Measurements : Females (2) : L= 0.73-0.92 mm; a= 25-29; b= 5.6-6.5; c= 7.4-8.7; c′= 5.0-7.0; V= 69-71. VAD/TL= 1.3-1.6. Male (1) : L= 0.73 mm; a= 25; b= 5.6; c= 7.4

Description : Female : Body strongly ventrally curved. Lateral fields each with four incisures, outer ones weakly crenate. Lip region continuous with four distinct striae. Excretory pore at level of basal bulb. Post-uterine sac 17-22 µm, vulva anus distance 1.4-1.6 of tail length. Tail 88-105µm long, strongly ventrally curved, ending in a hook. Male : Males comparatively slender and less curved. Bursa weak, 26-30µm long. Spicules 23-26 µm long. Gubernaculum 6-9µm long. Tail 82-95 µm long.

Host : Pearl millet.

Locality : Bhaurunga, district Bharatpur.

Distribution : Himachal Pradesh.

Remarks : This species is being reported for the first time from the State.

Malenchus subtilis Lal & Khan, 1988

1988. *Malenchus subtilis* Lal & Khan, *J. Mycol. Plant. Path.*, **18** : 43-46

Material examined : 2 females, 1 male. Reg. No. IV/1862.

Measurements : Females (2) : L= 0.38-0.44 mm; b= 3.2-3.3; c= 5.0-5.4; c′= 8-10; V= 64-66. Male (1) : L= 0.37 mm; b= 3.2; c= 4.9;

Description : Female : Cuticle coarsely striated. Lateral fields a single band with smooth borders. Lip region finely striated. Median oesophageal bulb oval, rather weak with small valve. Excretory pore near anterior end of basal bulb. Vulva open, lateral disc small. Post-uterine sac short. Body markedly narrowing behind vulva. Vulva-anus distance 53-56 µm, marked with 34-42 annules. Tail 70-76 µm or 1.3-1.4 times vulva anus distance, gradually narrowing with fine, thread-like tip. Male : Spicules 15-17µm long. Tail 4.3-4.5 anal body width long.

Host : Pearl millet.

Locality : Bharatpur-Dholpur Road

Distribution : Uttar Pradesh, Haryana, Punjab.

Remarks : First time reported from the State.

Hoplolaimus indicus Sher, 1963

1979. *Basirolaimus indicus* (Sher, 1963) Shamsi, *Nematol. Medit.*, **7** : 15-19.

1982. *Hoplolaimus arachidis* Maharaja & Das, *Proc. Indian Acad. Parasitol.*, **3** : 30-32.

1963. *Hoplolaimus indicus* Sher, *Nematologica,* **12** : 1-56.

Material examined : 10 females. Reg. No. IV/1974.

Measurement : Females (10) : L= 1.02-1.40 mm; a= 22-36; b= 7.5-9.7; c= 42-65; c= 0.60-0.68; V $^{10-11}$= 52-57$^{10-11}$; Males (10): L= 0.94-1.30 mm; a= 26-36; b= 7.9-10.1; c= 31-38; T= 50-55.

Description : Female : Lip region hemispheroid, marked by 3-4 annules. Stylet robust, 30-34 µm long; basal knobs tulip-shaped. Female reproductive system amphidelphic. Epiptygma single or double. Spermatheca filled with sperms. Tail with 8-13 annules. Male: Similar to female in general morphology. Spicules arcuate and cephalated, 37-48 µm long. Gubernaculum 12-20 µm long. Tail conoid. Bursa terminal.

Host : Pearl millet, Jowar, Brinjal.

Localities: Almost every localities of Alwar, Bharatpur, Dholpur, Karauli, Jaipur, Dausa, Sawai Madhopur and Tonk districts of the State.

Distribution : Rajasthan, West Bengal, Delhi, Himachal Pradesh, Bihar, Punjab, Haryana, U.P., Sikkim, etc.

Remarks : It is a widely distributed species in the State.

Helicotylenchus erytherinae (Zimmermann, 1904) Golden, 1956.

Helicotylenchus erytherinae Zimmermann, 1906. *Meded. Pl. tuin, Batavia,* **67** : 1-105.

Helicotylenchus erytherinae (Zimmermann, 1906) Golden, 1956. *Bull. Md. Agric. Exp. Stn.*, **A-85** : 1-28.

Material examined : 10 females. Reg. No. IV/1861 and IV/1877.

Measurements : Females (10) : L= 0.73-0.88 mm; a= 23-26; b= 6.6-7.5; c= 29-32; c′= 1.3-1.5; V=$^{14-15}$58-63$^{15-17}$

Description : Female : Lip region hemispherical, marked by 4-5 striae. Stylet 30-32µm long, basal knobs slightly anteriorly directed. Spermatheca functional. Tail 25-26

µm long, tapering into a pronounced ventral projection. Phasmids 1-3 annules anterior to anus. Male : Not found.

Host : Rose, mango and cotton.

Localities : Chikani district Alwar, Pairsal-Nadbai, district Bharatpur.

Distribution : West Bengal, Rajasthan, Gujarat and Tamil Nadu.

Elsewhere : Los Angeles, California, Nigeria.

Helicotylenchus multicinctus (Cobb, 1893) Golden, 1956

1893. *Tylenchus multicinctus* Cobb. *Macleay Mem. Vol. Linn. Soc. NSW* : 252-1308

1956. *Helicotylenchus multicinctus* (Cobb, 1893) Golden, *Maryland. Ag. Exp. Stn. Bull.*, **A-85** : 28 pp.

Material examined : 10 females. Reg. No. IV/1964.

Measurements : Females (10) : L= 0.73-0.87 mm; a= 30-36; b= 6.1-6.6; c= 44-50; c'= 0.60-1.00; V= $^{8-9}$60-66$^{8-9}$

Description : Female : Lip region hemispherical, marked by 3-5 striae. Stylet 25-29 µm long, with anteriorly indented basal knobs. Tail dorsally curved with hemispherical terminus, 16-18 µm long marked by 7-9 striae ventrally. Phasmids slightly anterior to anus. Male : Not found.

Host : Moong

Locality : Kela Devi road, district Karauli.

Distribution : Rajasthan, Gujarat, West Bengal, Orissa, North Andaman.

Elsewhere : Los Angeles, California, Colombia, Nigeria.

Helicotylenchus dihystera (Cobb, 1893) Sher, 1961.

1960. *Helicotylenchus crenatus* Das, *Z. Parasitenk,* **19** : 553-605.

1968. *Helicotylenchus puniceae* Swarup & Sethi. *Bull. Ent.*, **9** : 76-80.

1961. *Helicotylenchus dihystera* (Cobb, 1893) Sher. *Nematologica,* **12** : 1-56.

Material examined : 25 females. Reg. No. IV/1973.

Measurements : Females (25): L= 0.54-0.83 mm; a= 20-32; b= 4.5-6.4; c= 1.0-1.3; V= $^{13-15}$60-66$^{12-14}$

Description : Female : Lip region continuous with body, hemispherical, marked by 4-5 striae. Stylet 24-27 µm long, with concave or anteriorly indented basal knobs.

Spermatheca rounded, filled with sperms. Tail 13-18 µm long, dorsally convex-conoid, with slight ventral projection. Phasmids 6-8 striae anterior to anus. Male : Not found.

Host : Pearl millet, moong, jowar and mango etc.

Localities : Widely distributed in the State.

Distribution : Gujarat, Himachal Pradesh, West Bengal, Karnataka, Orissa, Sikkim, Haryana, Madhya Pradesh, Maharashtra and Andaman & Nicobar Islands.

Elsewhere : Australia, Malaysia, Senegal, Ivory Coast, Nigeria, South Africa, Moroccco, California, Suva, Fiji Islands, Mauritius.

Helicotylenchus labiatus Roman, 1965

1965. *Helicotylenchus labiatus* Roman. *Technical Paper 41*: 5-21

Material examined : 2 females. Reg. No. IV/1860-1861.

Measurements : Females (2) : L= 0.50-0.60 mm; a= 21-24; b= 4.4-5.4; c= 35-48; $V=^{25-30}61-64^{20-27}$

Description : Female : Lip region truncate, marked by 3-4 labial striae. Cephalic frame work conspicuous. Stylet 25 µm long, with cupped basal knobs. Lateral fields marked by four incisures, middle incisures fused near tail terminus. Spermatheca filled with sperms. Tail convex-conoid. Phasmids preanal, 22-29 µm from terminus. Male : Not found.

Host : Mango

Locality : Pairsal- Nadbai, district, Bharatput.

Elsewhere : San Sebastian

Remarks : This species is being reported for the first time from India.

Helicotylenchus tropicus Roman, 1965

1965. *Helicotylenchus tropicus* Roman. *Technical Paper,* **41** : 5-21.

Material examined : 5 females. Reg. No. IV/1915.

Measurements : Female (5) : L= 0.50-0.70 mm; a= 25-29; b= 4.6-5.7; c= 35-57; $V=^{24-29}59-64^{15-25}$

Description : Female : Lip region truncate, marked by 3-4 labial striae. Cephalic framework conspicuous. Stylet 24-25 µm long; with cupped shaped basal knobs.

Spermatheca filled with sperms. Tail with ventral projection. Phasmids preanal, 19-25 µm from tail terminus. Male : Not found.

Host : Mango

Locality : Pairsal-Nadbai, district Bharatpur.

Elsewhere : Puerto Rico

Remarks : Reported for the first time from India.

Helicotylenchus microdorus Prasad *et al.*, 1965

1965. *Helicotylenchus microdous* Prasad *et al. Indian J. Entom.*, **27** : 182-183.

Material examined : 4 females. Reg. No. IV/1877.

Measurements : Females (4) : L= 0.65-0.74 mm; a= 32-35; b= 5.0-7.0; c= 36-44; V= 60-66.

Description : Female : Body spiral in shape upon fixation. Lip region conoid rounded, marked by 3 striae. Labial framework moderately sclerotized. Stylet 18-21 µm long with anteriorly directed basal knobs. Reproductive system amphidelphic. Tail dorsally convex with bluntly rounded terminus with 9-12 tail annules. Male : Not found

Host : Cotton

Locality : Madhogarh, district Alwar.

Distribution : Delhi,

Remarks : First time reported from the State.

Helicotylenchus crenacauda Sher, 1966

1966. Helicotylenchus crenacauda Sher. Nematologica, **12** : 1-56

Material examined : 5 females. Reg. No. IV/1861.

Measurements : Females (5): L= 0.57-0.77 mm; a= 24-29; b= 4.7-6.2; c= 3.9-5.0; c′= 1.0-1.3; V= 59-64.

Description : Female : Body spiral in shape upon fixation. Lip region hemispherical with four distinct labial annules. Stylet 24-28 µm long with flattened anterior surface. Excretory pore anterior to level of oesophago-intestinal junction. Spermatheca inconspicuous, empty. Phasmids 4-6 annules anterior to anus. Tail indented terminally, pronounced ventral projection, 8 annules. Inner incisures fusing in posterior third of tail. Male : Not found.

Host : Mango

Locality : Pairsal-Nadbai, district Bharatpur.

Distribution : Rajasthan, West Bengal, Andaman and Nicobar Islands

Elsewhere : California, U.S.A.

Helicotylenchus labiodiscinus Sher, 1966

1966. *Helicotylenchus labiodiscinus* Sher. *Nematologica, 12* : 1-56

Material examined : 3 females. Reg. No. IV/1861.

Measurements : Females (3) : L= 0.48-0.66 mm ; a= 22-29; b= 4.9-6.5; c= 27-42; c′= 1.0-1.4; V= 58-63;

Description : Female : Body in loose spiral shape upon fixation. Lip region truncate without annulation, conspicuous labial disc. Stylet 23-27 µm long with flattened anteriorly basal knobs. Excretory pore anterior to oesophago-intestinal valve. Reproductive system amphidelphic. Phasmids near middle of tail 7-8 annules posterior to anus. Tail more curved dorsally, terminus irregularly hemispherical, terminal annulation coarse, 15 annules. Male : Not found.

Host : Mango

Locality : Pairsal-Nadbai, district Bharatpur.

Distribution : First time reported from India.

Elsewhere : California, U.S.A.

Helicotylenchus leiocephalus Sher, 1966

1966. *Helicotylenchus leiocephalus* Sher, Nematologica; **12**(1) : 1-56.

Material examined : 2 females. Reg. No. IV/1861 and IV/1864.

Measurements : Females (2) : L= 0.77-0.80 mm; a= 29-31; b= 5.9-6.2; c= 31-32; c′= 1.2; $V=^{17\text{-}18}60\text{-}61^{18\text{-}19}$

Description : Female : Body spiral in shape upon fixation. Lip region conoid, labial annules indistinct. Stylet 26-28 µm long with strong, slightly cupped basal knobs. Excretory pore at the end of oesophagus. Reproductive system amphidelphic. Spermatheca set off filled with sperms. Tail bluntly rounded, tail annules 12-15. Male : Not found.

Host : Pearl millet.

Localities : Jatoli, district Bharatpur.

Distribution : First time reported from India.

Elsewhere : South and North Dakota.

Helicotylenchus exallus Sher, 1966

1966. Helicotylenchus exallus Sher. *Nematologica,* **12**(1) : 1-56.

Material examined : 5 females. Reg. No. IV/1864.

Measurements : Females (5) : L= 0.61-0.65 mm; a= 26-28; b= 6.0-6.2; c= 40-45; c′= 0.7-1.2; $V=^{10-11}60\text{-}62^{8-10}$

Description : Female : Lip region hemispherical, marked by 4 annules. Stylet 25-27 µm long, with flattened anteriorly directed basal knobs. Spermatheca set off, filled with sperms. Phasmids 3-5 annules anterior to anus. Tail more curved dorsally with slight ventral projection, marked by 12 annules. Male : Not found.

Host : Pearl millet.

Locality : Bharatpur-Alwar road.

Distribution : Rajasthan, Gujarat and Sikkim.

Elsewhere : South Dakota, U.S.A.

Helicotylenchus glissus Thorne & Malek, 1968

1968. ***Helicotylenchus glissus*** Thorne & Malek. *Tech. Bull. S. Dak. Agric. Exp. Stn.,* **31** : 1-11.

Material examined : 3 females. Reg. No. IV/1966.

Measurements : Females (3) : L= 0.70-0.71 mm; a= 25-26; b= 6.5-6.6; c= 44.0-44.1; $V= {}^{19-20}61\text{-}62^{16-17}$

Description : Female : Lip region smooth or lip annules very fine, 5 in number. Stylet 24-25 µm long, with slightly cupped basal knobs. Isthmus as long as body width. Excretory pore slightly posterior to junction of oesophagus and intestine. Spermatheca setoff filled with sperms. Tail digitate with 5-7 ventral annules. Phasmids 3-6 annules anterior to anus. Male : Not found.

Host : Tomato

Locality : Rajdoli, district Alwar.

Distribution : First time reported from India.

Elsewhere : Stromberg, Nebr

Helicotylenchus goodi Tikyani *et al.*, 1969.

1969. *Helicotylnchus goodi* Tikyani *et al., Zool. Anz.,* **182** : 420-423.

Material examined : 2 females. Reg. No. IV/1860.

Measurements : Females (2) : L= 0.64-0.84 mm; a= 21-28; b= 5.0-6.4; c= 70-80; V= 58-62.

Description : Female : Lip region conoid-truncate, smooth. Stylet 23-25 µm long with flat cupped anteriorly indented basal knobs. Lateral fields fused at one third of tail. Phasmids 0-13 annules anterior to anus. Tail hemispherical, with 13-19 annules, tail terminus annulated. Male : Not found.

Host : Moong

Locality : Rajakheda, district Dholpur.

Distribution : Rajasthan

Helicotylenchus conicephalus Siddiqi, 1972.

1972. *Helicotylenchus conicephalus* Siddiqi. *Nematologica,* **18** : 74-91.

Material examined : 3 females. Reg. No. IV/1860.

Measurements : Females (3) : L= 0.46-0.64 mm; a= 28-32; b= 4.5-6.5; c= 36-47; c´= 0.7-1.4; V= 60-63.

Description : Female : Lip region conical, anteriorly truncate, with a distinct terminal disc and lacking annules; labial framework heavily sclerotized. Labial annules very fine. Stylet 21-24 µm long with flattened basal knobs. Reproductive system amphidelphic. Spermatheca axial, empty. Tail rounded the terminal annules finner than the rest, usually with a distinct ventral projection and with 7-9 annules ventrally. Phasmids anterior to anal level. Inner incisures on tail fusing distally. Male : Not found.

Host : Mango.

Locality : Pairsal-Nadbai, district Bharatpur.

Distribution : First time reported from India.

Elsewhere : Northern region, Malawi, Abunaama, Norther Fang Area, Central Sudan.

Rotylenchulus reniformis Linford & Oliveira, 1940

1940. *Rotylenchulus reniformis* Linford & Oliveira.

Material examined : 10 Juvenile females, 5 mature males. Reg. No. IV/1968.

Measurements (after Dasgupta *et al.*, 1968) : Females (immature): L= 0.34-0.42 mm; **a= 22-27**; b= 3.6-4.3; b^1= 2.4-3.5' c= 14-17; c= 2.6-3.4; V= 68-73; Spear = 16-18 µm; **Females** (mature) : L= 0.38-0.52 mm; a= 4-5; V= 68-73; Males : L= 0.38-0.43 mm; a= **24-29**; b^1= 2.8-4.8; c= 12-17; T= 35-45; stylet = 12-15 µm; spicules = 19-23 mm; **gubernaculums** = 7-9 µm; Juveniles : L= 0.35-0.41 mm; a= 20-24; b^1= 3.5-4.1; c= 12-**16**; stylet = 13-15 µm.

Description : Immature Female : Body slender, open c-shaped. Lip region elevated; **conoid**, continuous with body. Cephalic framework heavily sclerotized. Stylet knobs **rounded**, sloping posteriorly. Oesophageal glands overlapping intestine ventrally and **laterally**. Ovaries immature. Tail tapering to narrow, rounded terminus and distinct hyaline **portion**. Mature Female: Obese, kidney-shaped, neck contour irregular. Vulva raised. **Body** beyond anus hemispherical, with a 5-9 µm long slender terminal portion. Eggs laid **in** gelatinous matrix. Male : Anterior region degenerate, stylet and oesophagus degenerate. **Spicules** elongate slender, ventrally arcuate; gubernaculums linear; bursa reduced, **subterminal**.

Locality : Dungapura, Dholpur, India.

Remarks : *R. reniformis* is a sedentary and semi-endoparasite attacking several crops **and** fruit trees in India.

Pratylenchus negelectus (Rensch, 1924) Filipjev & Schuu. Stekh., 1941

1924. *Aphelenchus neglectus* Rensch. *Zool. Anzerger.*, **59** : 227-280.

1941. *Pratylenchus negelectus* (Rensch, 1924) Filipjev. & Schuu. Stekh. *A manual of agric. Helminthology. Brill, Leiden,* 878 pp.

Material examined : 7 females. Reg. No. IV/1978.

Measurements *:* Females (7): L= 0.54-0.56; a= 32.2-33.7; b= 4.1-4.4 ; c=11.4-12.4; **V= 86-87**.

Description : Female: Lip region composed of two annules. Lateral fields marked by **five** incisures. Stylet 15-16 µm long. Spermatheca empty. Tail 44-47 µm with broadly **rounded**, truncate terminus. Male : Not found.

Host : Mango.

Locality : Mandriad, district Karauli.

Distribution : Australia, Japan, South Africa, Northwest India

Elsewhere : Almost cosmopolitan : Northern temperate zone

Remarks : First time reported from the State.

Pratylenchus brachyurus (Godfrey, 1929) Filipjev & Schuu. Stekh., 1941

1929. *Tylenchus brachyurus* Godfrey. Phytopathology, **19** : 611-629.

1941. *Pratylenchus brachyurus* (Godfrey, 1929) Filipjev & Schuu.Stekh. *A manual of agricultural helminthology*. Brill. Leiden, 818 p.

Material examined : 3 females. Reg. No. IV/1879.

Measurements : Females (3) : L=0.50-0.52; a= 30.2-31.6; b= 4.4-4.8; c= 29.8-30.1; V= 87.1-88.7

Description : Lip annules two, outer margin of lip region angular. Stylet 21-22µm long. Spermatheca empty. Tail subcylindrical, terminus smooth, rounded to truncate. Male : Not found.

Host : Brinjal.

Locality : Madhogarh, district Alwar.

Elsewhere : Pantropical and subtropical countries.

Remarks : Reported for the first time from the State.

Pratylenchus zeae Graham, 1951

1951. *Pratylenchus zeae* Graham. *S.C. Agri., Exp., Stn. Bull.*, 350, 25pp.

Material examined : 5 females. Reg. No. IV/1978.

Measurements : Females (5) : L= 0.38-0.57 mm; a= 18-22; b= 6.0-6.5; c= 14-18; V= 69-74.

Description : Female : Body almost straight. Lip region marked by three annules. Stylet 15-16 µm long. Tail marked by 20-25 annules, tip bluntly pointed, smooth. Male : Not found.

Host : Shin.

Locality : Bharatpur-Alwar Road.

Distribution : Gujarat, Haryana, Maharashtra, Punjab.

Elsewhere : Germany

Remarks : First time reported from the State.

Pratylenchus thornei Sher & Allen, 1953

1953. ***Pratylenchus thornei*** Sher & Allen. *Univ. Calif. Publ. Zool.*, **57** : 441-470.

Material examined : 8 females. Reg. No. IV/1978

Measurements : Females (8) : L= 0.45-0.53 mm; a= 25-27; b= 4.6-4.9; c= 18-21; V= 77-78[17-18]

Description : Female : Lip region continuous, marked by three annules; labial sclerotization extending backwards on two or three body annules. Stylet 19-20 µm long. Spermatheca without sperms. Tail tip broadly rounded to truncate, smooth. Male : Not found.

Host : Jowar.

Locality : Pairsal-Nadbai, district Bharatpur.

Distribution : Gujarat, Haryana, Punjab.

Remarks : First time reported from the State.

Pratylenchus uralensis Romaniko, 1966

1966. ***Pratylenchus uralensis*** Romaniko. *Zool. Zhurmal.*, **45** : 929-931.

Material examined : 4 females. Reg. No. IV/1878.

Measurements : Females (4) : L= 0.50 mm; a=27.2-28.1; b= 4.0-4.2 ; c=30.1-31.6; V= 72-73.

Description : Females : Lip annules three. Stylet 12-13 µm long. Reproductive system prodelphic. Spermatheca empty. Males unknown. Tail terminus oblique-truncate, with two small protruberances. Male : Not found.

Host : Brinjal

Locality : Madhogarh, district Alwar.

Distribution : First time recorded from India.

Elsewhere : USSR.

Pratylenchus macrostylus Wu, 1971

1971. *Pratylenchus macrostylus* Wu *Can. J. Zool.*, **49** : 487-489.

Material examined : 5 females. Reg. No. IV/1879.

Measurements : Females (5) : L= 0.50-0.53 mm; a= 28.2-29.4; b= 4.2-4.5; c= 26.3-28.1; V= 84-85.

Description : Female : Lip annules two. Lip region high and rounded. Stylet 21-25 µm long. Spermatheca empty. Males rare. Tail conoid. Male: Not found.

Host : Brinjal.

Locality : Madhogarh, district Alwar.

Elsewhere : Canada.

Remarks : Reported for the first time from the State.

Bitylenchus dubius (Butschli, 1873) Filipjev, 1934

1873. *Tylenchus dubius* Butschli.

1934. *Bitylenchus dubius* (Butschli, 1873) Filipjev. *Smithson. Misc. Collect.*, **89** : 1-63.

Material examined : 1 female. Reg. No. IV/1858.

Measurements : Female (1) : L= 0.80 mm; a= 35; b= 5.2; c= 19; V= 53.

Description : Female : Cephalic region set off from body by depression. Stylet 14 µm long. Median oesophageal bulb oval. Vulva transverse slit. Spermatheca round axial. Post anal intestinal sac large, filling one quarter or more of tail cavity. Tail 42 µm long, sub-cylindrical, 2.4 anal body-width long. Male : Not found.

Host : Pearl millet.

Locality : Guadala, district Karauli.

Remarks : First time reported from the State.

Bitylenchus goffarti (Sturhan, 1966)

1966. *Tylenchorhynchus goffarti* Sturhan. *Appl. Nematol.*, **19** : 185-188.

1986 *Bitylenchus goffarti* (Sturhan,) Siddiqi. *CAB Agri. Bureax, Farnham royal, Slough*, UK, ix + 645 pp.

1982. *Bitylenchus goffarti* (Sturhan, 1966) Jairajpuri. *Meded. Fac.Landbou Wetem. Rijkusniv., Gent.*, **47** : 765-770.

Material examined : 3 females, 3 males. Reg. No. IV/1967.

Measurements : Females (3) : L= 0.53-0.74 mm; a= 24-41; b= 4.8-6.3; c= 11-15; V= 51-56. Males (3): L= 0.52-0.67 mm; a= 35-43; b= 5.0-5.8; c= 12-15; T= 41-51

Description : Female: Lip region set off from body by depression. Labial sclerotization moderate. Stylet 14-17 µm long. Median oesophageal bulb oval. Vulva transverse. Post anal intestinal sac present. Tail 35-42µm long conoid with smooth terminus. Male : Spicules 23-25 µm long. Gubernaculum 10-11 µm long. Bursa enveloping entire tail length. Tail tip pointed.

Host : Til

Locality : Narpura, district Dholpur.

Distribution : West Bengal, Rajasthan

Merlinius nanus (Allen, 1955) Siddiqi, 1970

1955. *Tylenchorhynchus nanus* Allen. *Univ. Calif. Publ. Zool.*, **61** : 129-165.

1970. *Merlinius nanus* (Allen, 1955) Siddiqi. *Proc. Helminth. Soc. Wash.*, **37** : 68-77.

Material examined : 1 female, 1 male. Reg. No. IV/1867.

Measurements : Female (1) : L= 0.54 mm; b= 5.0; c= 15.4; V= 56; Male (1) : L= 0.57 mm; b= 5.4; c= 14.4; T= 55.

Description : Female : Cephalic region continuous, perioral disc indistinct. Stylet 13 µm long. Oesophagus typical of the genus. Vulva pore like, epiptygma indistinct. Tail 35 µm, sub cylindrical, terminus smooth. Male: Spicules 20 µm long. Gubernaculum crescent shaped. Bursa 51µm, subterminal. Tail 40 µm arcuate with blunt tip and notched.

Host : Pearl millet, til etc.

Localities: Sapau-Bari road, district Dholpur and Jatoli, district Bharatpur.

Distribution : West Bengal, Uttar Pradesh.

Elsewhere : California, U.S.A.

Remarks : Reported for the first time from the State.

Merlinius brevidens (Allen, 1955) Siddiqi, 1970.

1955. *Tylenchorhynchus brevidens* Allen. *Publ. Zool.*, **61** : 129-165.

1970. Merlinius brevidens (Allen, 1955) Siddiqi. *Proc. Helminth. Soc. Wash.*, **37** : 68-77.

Material examined : 1 female, 1 male. Reg. No. IV/1968.

Measurements : Female (1) : L= 0.54-0.69 mm; a= 36-40; b= 4.2-5.2; c= 11-13; V= 53-57. Male (1): L= 0.53-0.59 mm; a= 34-35; b= 4.0-4.9; c= 9-10.

Description : Female: Cephalic region continuous, perioral disc indistinct. Lip annules 6. Lip region moderately sclerotized. Stylet 14 µm long. Basal knobs indented posteriorly. Median bulb slightly anterior to middle of oesophagus. Vulva slit like, epitygma indistinct. Tail 42-45 µm, bearing 42-49 tail annules; tail subcylindrical with hemispherical smooth terminus. Male : Spicules 15 µm long. Gubernaculum 10µm length. Tail 45-50 µm long; tail tip pointed. Bursa enveloping entire tail.

Host : Pearl millet.

Locality : Ser Mathura, district Dholpur

Distribution : Uttar Pradesh.

Elsewhere : California, U.S.A.

Remarks : This species is being reported for the first time from the State.

Quinisulcius curvus (Williams, 1960) Siddiqi, 1971

1960. *Quinisulcius curvus* Williams

1971. *Quinisulcius curvus* (Williams, 1960) Siddiqi*Indian J. Nematol.*, **1** : 25-43.

Material examined : 2 females. Reg. No. IV/1859.

Measurements : Females (2) : L= 0.49-0.63 mm; a=0.05-.07; b= 4.6-5.5; c= 15-18; V= 52-57.

Description : Female : Lip region set off, marked by 4-5 annules. Labial sclerotization indistinct. Stylet 16-17 µm. Basal knobs posteriorly sloping. Spermatheca round, axial or slightly set off. Tail 15-23 µm long, with smooth terminus. Tail annules 15-23. Male : Not found.

Host : Shin.

Locality : Tijara road district Alwar.

Distribution : Car Nicobar Island, Andaman.

Remarks : First time reported from the State.

Tylenchorhynchus clarus Allen, 1955

1955. *Tylenchorhynchus clarus* Allen. *Univ. Calif. Publ. Zool.*, **61** : 129-165.

Material examined : 2 females, 1 male. Reg. No. IV/1972.

Measurements : Females (2) : L= 0.56-0.57 mm; a= 24-25; c= 19; V= 61. Male (1) : L= 0.68 mm; a= 24; c= 18;

Description : Female : Lip region continuous, marked by 5 annules. Labial sclerotization inconspicuous. Stylet 15-16 µm long. Reproductive system amphidelphic. Spermatheca round, axial. Ovaries outstretched. Tail 34-35 µm long, bearing 10-15 striae and 2.7-2.8 anal body width long. Male: Spicules 23 µm long. Gubernaculum 15 µm long. Bursa 48 µm long, enveloping entire tail length, tail tip pointed.

Host : Pearl millet.

Locality : Sapau road, district Dholpur.

Distribution : First time reported from India.

Remarks : Reported as new record from India.

Tylenchorhynchus brevilineatus Williams, 1960

1960. *Tylenchorhynchus brevilineatus* Williams.

Material examined : 2 females, 2 males. Reg. No. IV/1969.

Measurements : Females (2) : L= 0.50-0.71 mm; a= 33-41; b= 4.4-6.1; c= 12-18; V= 51-57. Males (2) : L= 0.55-0.65 mm; a= 36-38; b= 4.5-6.0; c= 11-17;

Description : Lip region set off from body, annules 5-6. Labial sclerotization present. Cuticle marked with both longitudinal and transverse striae. Longitudinal lines only confined to oesophageal region. Stylet 13-18 µm long. Basal knobs indented posteriorly. Reproductive system amphidelphic. Tail 40-46 µm bearing 40-42 tail annules, hemispheroid tail terminus smooth; 2.5-2.9 anal body width long. Male : Spicules 20-26 µm long. Gubernaculum 10-14 µm long. Tail 43-45 µm long; tip pointed.

Host : Jowar.

Locality : Nadbai, district Bharatpur.

Distribution : Rajasthan, Uttar Pradesh, West Bengal

Tylenchorhynchus brassicae Siddiqi, 1961

1961. *Tylenchorhynchus brassicae* Siddiqi. *Z. Parasitkde.*, **21** : 46-64.

Material examined : 1 female, 1 male. Reg. No. IV/1857.

Measurements : Female (1) : L= 0.64 mm; a= 37; b= 4.8; c= 14; V= 55. Male (1) : L= 0.58 mm; a= 48; b= 4.1; c= 15; T= 49.

Description : Female : Cephalic region set off, sclerotization moderate. Labial annules 5. Stylet 17 µm long; with rounded basal knobs. Spermatheca filled with sperms. Tail 15 µm or 3.0 anal body width long, conoid with a large conoid obtuse terminus. Phasmids located a little anterior to middle of tail. Male : Spicules 21 µm long, ventrally arcuate cephalated. Gubernaculum 10 µm long. Bursa large with coarsely crenate margins, enveloping entire tail. Phasmids located at 1/3rd of tail length from cloaca.

Host : Til.

Locality : Kumhar, district Bharatpur.

Distribution : Delhi, Haryana, Maharashtra, Punjab, Uttar Pradesh.

Elsewhere : U.K.

Remarks : First time reported from the State.

Tylenchorhynchus divittatus Siddiqi, 1961

1961. *Tylenchorhynchus divittatus* Siddiqi, *Z. Parasitenk.*, **21** : 44-46

Material examined : 1 female, 1 male. Reg. No. IV/1971.

Measurements : Female (1) : L= 0.75 mm; a= 30; b= 4.3; c= 17; V= 52.Male (1) : L= 0.74 mm; a= 30; b= 4.5; c= 15;

Description : Female : Lip region set off. Stylet 17 µm long. Spermatheca. Spherical, filled with sperms. Tail cylindrical, 42 µm long; terminus striated. Phasmids posterior to anus. Male : Spicules 14 µm long. Gubernaculum 11µm long. Bursa 52 µm long, enveloping entire tail length. Tail terminus pointed.

Host : Rose.

Locality : Chikani, district Alwar.

Distribution : Gujarat.

Elsewhere : U.K.

Remarks : This species is being recorded for the first time from the State.

Tylenchorhynchus robustus Thorne & Malek, 1968

1968. *Tylenchorhynchus robustus* Thorne & Malek. *Tech. Bull. S. Dak. Agric. Exp. Stn.*, **31** : I-III.

Material examined : 4 females, 1 male. Reg. No. IV/1869.

Measurements : Females (4) : L= 1.0 mm; a= 31; b=7; c= 15; V= $^{22}52^{23}$

Male (1) : L= 0.85 mm; a= 28; b= 6.2; c= 15; T= 42

Description : Female : Body arcuate upon fixation, tapering anteriorly to bluntly conoid lip region. Labial annules indistinct. The outer incisures are crenate. Stylet 23 µm long , with slightly cupped knobs. Spermatheca about half as long as body width, filled with sperms. Intestine extending entire length of tail cavity. Tail 42-45 µm long, bearing 40-45 tail annules with hemispheroid smooth terminus. Male : Spicules 25 µm long. Gubernaculum 13 µm long. Bursa enveloping entire tail length; 52 µm long. Male tail terminus pointed.

Host : Amala.

Locality : Sermathura, district Dholpur.

Distribution : Andaman and Nicobar.

Elsewhere : South Dakota.

Tylenchorhynchus nordiensis Khan & Nanjappa, 1974.

1974. *Tylenchorhynchus nordiensis* Khan & Nanjappa. *I. J. Nematol.*, **12**(2) : 216.

Material examined : 5 females, 5 males. Reg. No. IV/1970.

Measurements : Females (5) : L= 0.55-0.65 mm; a=39.2-43.3; b= 5.0.-5.9; c= 14-17; V= 52-56. Males (5) : L= 0.54-0.60 mm; a= 41.5-42.8; b= 5.4-6.0; c= 12-16;

Description : Female : Cephalic region continuous with body; labial sclerotization prominent; Stylet 11-13µm long, median oesophageal bulb oval. Vulva equatorial, lip not modified. Spermatheca round, axial. Female tail 14-19 µm long conoid with smooth terminus. Male : Spicules 18-20 µm long. Gubernaculum 8-9 µm, well developed. Bursa enveloping entire tail. Tail tip bluntly pointed.

Host : Tomato.

Locality : Kishori-Thanagachi district Alwar.

Distribution : Uttar Pradesh.

Remarks : First time reported from the State.

Tylenchorhynchus murdharensis Lal, Mathur & Rajan, 1990.

1990. *Tylenchorhynchus murdharensis* Lal, Mathur & Rajan, *Indian J. Nematol.*, **19** : 51-54.

Material examined : 7 females, 3 males. Reg. No. IV/1969.

Measurements : Females (7) : L= 0.64-0.81; a= 37-38; b= 6.0-6.6; c= 14-19; V= 52-55; Males (3) : L=0.59-0.71; a= 34-37; b= 5.0-6.1

Description : Female : Cephalic region set off from body. Lip annules 7-8. Labial sclerotization moderate. Stylet 15-16 µm long, basal knobs indented posteriorly. Median oesophageal bulb rounded. Spermatheca small, rounded, axial, with sperms. Tail 35-42 µm long, bearing 35-42 annules, conoid with smooth terminus and 3.0-3.7 anal body-width long. Male : Spicules 23-25 µm long; Gubernaculum 11-13 µm long. Tail 45-52 µm; tail tip pointed. Bursa enveloping entire tail.

Host : Moong and Jowar.

Localities: Durgapura and Umarao ki dhani, district Dholpur.

Distribution : Punjab, Haryana, Rajasthan (Thar).

Neodolichorhynchus (Mulkorhynchus) phaseoli (Sethi & Swarup, 1968) Talavera & Tobar, 1997.

1974. *Dolichorhynchus phaseoli* (Sethi & Swarup 1968) Mulk & Jairajpuri, *Indian J. Zool.*, **2** : 15-18.

1997. *Neodolichorhynchus (Mulkorhynchus) phaseoli* (Sethi & Swarup, 1968) Talavera & Tobar, *International. J. Nematol.*, **7** : 35-40.

Material examined : 2 females, 2 males. Reg. No. IV/1856.

Measurements : Females (2) : L= 0.60-0.65 mm; a= 27-27.4; b= 5.2-5.3; c= 20-20.5; V= 56. Males (2) : L= 0.50-0.55 mm; a= 25-26; b= 5.0-5.1; c= 15.15.4

Description : Female : Lip region cap-like, set off from body. Lateral fields completely aerolated. Stylet 14-15 µm long. Stylet knobs 2-3 µm wide. Reproductive system amphidelphic. Spermatheca set off, rounded, filled with sperms. Tail 13-14 µm long, cylindrical. Tail terminus smooth. Male: Spicules 17-18 µm. Bursa enveloping entire tail and doubly notched at tail tip. Gubernaculum usually with projections at proximal end.

Host : Pearl millet.

Locality : Tijara Road, district Alwar.

Distribution : Punjab, Haryana.

Elsewhere : Senegal.

Neodolichorhynchus (Prodolichorhynchus) elegans (Germani & Luc, 1984) Siddiqi, 2000

1984. *Dolichorhynchus elegans* Germani & Luc, *Revue. De. Nematol.*, **7** : 49-56.

2000. *Neodolichorhynchus (Prodolichorhynchus) elegans* (Germani & Luc, 1984). Siddiqi, *Tylenchida Parasites of Plants and Insects, 2nd* Ed. : 1-805.

Material examined : 4 females, 4 males. Reg. No. IV/1888.

Measurements : Females (4) : L= 0.60-0.70 mm; a= 32-36; b= 4.6-5.4; c= 14-15; V= 55-56. Males (4) : L= 0.54-0.70; a= 36-37; b= 4.3-5.6; c= 12-20; T= 53-55.

Description : Female : Cephalic region set off from body. Lateral fields four, non aerolated. Tail 14-16 µm bearing 35-40 tail annules subcylindrical, tail terminus smooth or 2.3-2.8 anal body width long. Male : Spicules 19-22 µm long. Bursa 58-64 µm enveloping entire tail. Bursa with double depressions at tail tip.

Host : Pearl millet.

Locality : Tijara Road district Alwar.

Distribution : First time reported from India.

Elsewhere : Senegal.

Remarks : This species with its new taxonomic position is being recorded for the first time from India.

Hemicriconemoides mangiferae Siddiqi, 1961

1961. *Hemicriconemoides mangiferae* Siddiqi, *Proc. Helminth. Soc. Wash.*, **28** : 213-215.

Material examined : 10 females. Reg. No. IV/1977.

Measurements : Females (10) : L= 0.49-0.58 mm; a= 16-19; b= 4.2-5.0; c= 16-19; V= 91-92; V^1= 35-42; VL/VB = 1.3-1.6;

Description : Female : Cuticular sheath attached to body at anterior end and vulval opening sometimes on tail. Lip region slightly set off, with 2 annules; first annule smaller than second or about equal to second, angular, directed outward. Labial disc slightly elevated, rounded at top, inconspicuous in some specimens. Annules 3-4 µm wide in middle of body. Stylet 78-81 µm long. Stylet knobs 5-7 µm across. Excretory pore 34-38 annules from anterior end. Vulvar sheath lacking. Tail convex-conoid the last 3-4 annules narrow abruptly. Male : Not found.

Host : Mango

Locality : Pairsal-Nadbai, district Bharatpur.

Distribution : Andaman Nicobar, West Bengal, Uttar Pradesh

Elsewhere : Nigeria, Phillipines, California.

Remarks : This speices is being reported for the first time from the State.

Hemicriconemoides brachyurus (Loss, 1949) Chitwood & Birchfield, 1957

1963. *Hemicycliophora brachyurus* (Loss, 1949) Goodey,

1957. *Hemicriconemoides brachyurus* (Loss, 1949) Chitwood & Birchfield, *J. Zool. Soc. India,* **1** : 17-22

Material examined : 5 females. Reg. No. V/1975.

Measurements : Females (5) : L= 0.40-0.54 mm; a= 13-17; b= 4.3-5.2; c= 16-25; V= 93-95; V^1= 26-37; VL/VB= 1.0-1.4

Description : Female : Cuticular sheath attached to body at anterior end and well separated on tail. Lip region slightly set off from body, with 2 annules; first annule smaller than second. Labial disc slightly elevated, flattened at anterior. Annules 2-3 µm wide in mid body. Stylet 56-64 µm long. Stylet knobs 8-11 µm across. Vulvar sheath present. Tail acutely conoid. Male : Not found

Host : Moong

Locality : Rahar, district Bharatpur

Distribution : West Bengal.

Elsewhere : Ceylon

Remarks : This species is being reported for the first time from the State.

Aphelenchus avenae Bastian, 1865

1865. *Aphelenchus avenae* Bastian.

Material examined : 10 females, 10 males. Reg. No. IV/1842.

Measurements : Females (10) : L= 0.55-0.86 mm; a= 25-39; b= 4.9-6.9; c= 27-35; V= 74-78. Males (10) : L= 0.63-0.81 mm; a= 27-33; b= 5.5.-5.9; c= 24-29; T= 48-57.

Description : Female: Lip region bluntly rounded to flattened, continuous with adjoining body, with 3-4 very faint annules. Lateral fields marked by 10-14 incisures. Stylet 10-12 µm long; slightly thickened at base. Oesophagus typical of the genus. Post

uterine sac reaching about half way from vulva to anus. Tail bluntly rounded, 16-33 µm long; about 0.7-1.0 anal body width long. Male: Spicules slender, 28-30 µm long. Gubernaculum 14-16 µm long. Tail conical and enveloped by a bursa.

Host : Pearl millet, Cotton, Jowar, Moong etc.

Locality (ies) : Almost every localities surveyed.

Distribution : Throughout India, Consmopolitan in distribution.

Elsewhere : Cosmopolitan in distribution.

Mesodorylaimus kauli Baqri & Bohra, 2001.

2001. *Mesodorylaimus kauli* Baqri & Bohra, Nematology :

Material examined : 10 females, 10 males. Reg. No. IV/1847

Measurements : Females (10) : L= 1.00-1.4 mm; a= 25-32; b= 3.7-5.0; c= 27-30; V= $^{17-18}$52-54$^{18-19.}$ Males (10) : L= 1.10-1.33 mm; a= 31-32; b= 3.7-5.0; c= 60-65; T = 60-65.

Description : Female : Body tapering towards both extremities. Lip region slightly narrower than adjoining body, demarcated by a slight depression. Odontostyle 10-13 µm long. Guiding ring 7-8 µm from anterior end. Odontophore 19-20µm long. Basal expanded part of oesophagus occupies 34-40% of neck region. Prerectum 75-76 µm or 3.4-3.9 anal body width long. Rectum 22-24 µm or 1.1-1.2 anal body-width. Tail convex-conoid with a dorsally bent elongated tip, 1.8-1.9 anal body long. Male: Spicules 40-42 µm long. Lateral guiding ring pieces 8-10 µm long. One adanal pair, and 10-11 regularly spaced ventromedian supplements. Prerectum 95-100 µm long, begins from third or fourth ventromedian supplements. Tail 20-24 µm conoid rounded or one anal body width long.

Host : Chawla, moong, til etc.

Localities : Collected from ser Mathura, district Dholpur, Keola devi road district Karauli.

Distribution : Rajasthan, Gujarat.

Prothornenema capitatum Baqri & Bohra, 2003

2003. *Prothornenema capitatum* Baqri & Bohra, *International J. of Nematology,* **13**(2) : 185-194.

Material examined : 5 females, 3 males. Reg. No. IV/1838,1848, 1850.

Measurements : Females (5) : L= 1.00-1.34 mm; a= 28-37; b= 5.0-6.0; c= 9.1-14.6; V= $^{15-16}$46-47$^{15-16.}$ Males (3) : L= 1.03-1.11 mm; a= 5.7-5.8; c= 54-58; T= 56-60.

Description : Female : Lip region cap-like, set off from body by constriction, with moderate labial and post labial sclerotization. Odontostyle 10-11 µm long; its aperture 3-4 µm. Odontophore 11-13 µm long. Guiding ring 6-7 µm from anterior end. Basal expanded part of oesophagus occupies 32-34% of neck region. Reproductive system amphidelphic. Prerectum 50-52 µm or 2.6-3.0 anal body width long. Rectum 22-24 µm or 1.0-1.2 anal body width long. Tail 72-120 µm elongate-conoid to filiform, 3.7-8.1 anal body width long, with two caudal pores on each side. Male : Spicules 30 µm long. Lateral guiding pieces 6-7 µm long. Ventromedian supplements contiguous 15-17 in number. Prerectum 75-80 or 3.9-4.2 anal body width long. Tail 19 µm or one anal body width long, short conoid with broadly rounded terminus.

Host : Jowar

Localities: Nadabai, district Bharatpur and Keladevi Road, district Karauli.

Distribution : Gujarat.

Aporcelaimellus heynsi Baqri & Jairajpuri, 1968

1968. *Aporcelaimellus heynsi* Baqri & Jairajpuri.

Material examined : 15 females. Reg. No. IV/1849.

Measurements : Females (15) : L= 1.02-1.33 mm; a= 24-26; b= 3.0-4.6; c= 26-33; V= $^{10-11}50\text{-}53_{10-11.}$

Description : Female: Lip region set off from body by constriction. Lips separate, subangular. Odontostyle 13-15 µm long; its aperture 9-10µm. Odontophore 18-20 µm long. Guiding ring 6-7 µm from anterior end. Basal expanded portion of oesophagus occupies 50-53% of neck region. Tail conoid with rounded terminus, 38-40 µm long or 1.5-1.6 anal body-width long. Male : Not found.

Host : Pearl millet, Jowar, Gwar, brinjal etc.

Localities : Widely distributed in the state.

Distribution : Gujarat, West Bengal, Uttar Pradesh, Rajasthan.

Tubixiba parva Pretorius, Kruger & Heyns, 1987

1987. *Tubixiba parva* Kruger & Heyns. *Koedoe,* **30** : 41-47.

Material examined : 10 females. Reg. No. IV/1854, 1872.

Measurements : Females (10) : L= 3.12-3.78 mm; a = 45-52; b= 4.0-4.6; c= 89-96; V= $^{7-8}54\text{-}55^{7-8}$

Description : Female : Lip region distinctly set off by deep constriction. Lips twice as wide as high; separated. Odontostyle 15-17 µm long; its aperture 5-6 µm. Odontophore 26-30 µm long. Guiding ring 9-10µm from anterior end. Basal expanded part of oesophagus occupies 51-54% of neck region. Tail bluntly conoid; 32-34 µm or 0.7-1.1 anal body width long. Male: Not found

Host : Jowar, Til, Moong, Chawla etc.

Localities : This species is widely distributed in the state.

Distribution : Gujarat, Rajasthan.

Labronema confusum (Baqri & Jana, 1983) Andrassy, 1991.

1991. *Labronema confusum* Andrassy. *Opusc. Zool. Budapest*, **XXIV** : 3-55.

Material examined : 10 females. Reg. No. IV/1841.

Measurements : Females (10) : L= 0.94-1.18 mm; a= 29-37; b= 4.1-4.5; c= 43-54; V= $^{9-10}$48-54$^{9-10}$.

Description : Female : Lip region se off by constriction. Odontostyle 13-15 µm long; its aperture 5-6 µm. Odontophore 19-22 µm long. Guiding ring sclerotized 'double' Basal expanded part of oesophagus occupies 37-39% of neck region. Female reproductive system amphidelphic. Tail 23-24 µm long, obtusely rounded, about 0.8 anal body width long. Male : Not found.

Host : Pearl millet, brinjal, jowar, til, moong etc.

Localities : Abundantly found in all districts surveyed.

Distribution : Gujarat, West Bengal, Rajasthan

Elsewhere : Budapest.

Latocephalus smithi (Heyns, 1963) Patil & Khan, 1982

1963. *Latocephalus smithi* Heyns, *Proc. Helminth. Soc. Wash.*, **30**(1) : 1-6.

Material examined : 2 females. Reg. No. IV/1868.

Measurements : Females (2) : L= 0.81-1.14 mm; a = 43-51; b= 3.6-4.5; c= 32-40; V=$^{2-3}$47-50$^{6-10}$

Description : Female : Body slightly ventrally curved. Lip region expanded. Odontostyle 8-9 µm long; its aperture 2/5 of its length. Odontophore 16-17 µm long. Guidng ring 5-6 µm from anterior end. Basal expanded part of oesophagus occupies 45-

47% of neck region. Lateral hypodermal glandular organs 60-65 in number. Very distinct especially in tail region. Reproductive system opisthodelphic. Anterior uterine sac 9-10 µm long. Prerectum 35-40 µm or 2-2.5 anal body width long. Tail 25-27 µm long convex-conoid about 0.5-0.6 anal body width long. Male : Not found

Host : Sugarcane.

Locality : Thanagachi, district Alwar.

Distribution : Rajasthan.

Elsewhere : Rustenburg, South Africa.

Latocephalus lineatus Siddiqi, 2003

2003. *Latocephalus lineatus* Siddiqi, *Intern. J. of Nematology* **13**(2) : 177-184.

Material examined : 2 females. Reg. No. IV/1885

Measurements : Females (2) : L= 1.36-1.37 mm; a= 54.3-54.4; b= 4.2-4.3; c= 45-45.3; V= $^{0.6}52^{13}$

Description : Body ventrally arcuate upon fixation. Lip region set off by a constriction, wider than adjoining body. Odontostyle 7-8µm long; its aperture 5µm. Odontophore 17 µm long. Basal expanded part of oesophagus 42-43% of neck region. Vulva transverse. Reproductive system opisthodelphic. Anterior uterine sac about 2/5th of corresponding body width long. Prerectum 65-67µm or 4 anal body width long. Rectum 1.3 anal body width long. Tail 30-31 µm dorsally convex-conoid to small rounded terminus or one anal body width long. Male : Not found

Host : Moong

Locality : Tijara, district Alwar.

Distribution : Tripura

Elsewhere : Not known.

Remarks : First time reported from the State.

Latocephalus laetanus Siddiqi, 2003

2003. *Latocephalus laetanus* Siddiqi. *Intern. J. of Nematology,* **13**(2) : 177-184.

Material examined : 2 females. Reg. No. IV/1885.

Measurements : Females (2) : L= 1.15-1.27 mm; a= 42-55; b= 4.5-5.1; c= 41-42; V= $^{5-7}41-45^{9-10}$

Description : Female : Body ventrally arcuate to open C-shaped upon fixation. Lip region set-off by a depression, slightly wider than adjoining body. Odontostyle with wide lumen 8-9 µm long; its aperture 2/5 of odontostyle length. Odontophore 10-15 µm long. Guiding ring plicate 3-5 µm from anterior end. Basal expanded part of oesophagus occupies 37-44% of neck region. Vulva transverse. Reproductive system opisthodelphic. Anterior uterine sac absent. Prerectum 50-65 µm or about 2-3 anal body width long. Rectum 13-17 µm long or 1.1-1.2 anal body width long. Tail 27-31 µm long or 2.0-2.4 anal body width long; conoid to a small rounded terminus. Male : Not found

Host : Cotton

Locality : Tijara, district Alwar

Elsewhere : Colombia

Remarks : First time reported from India.

Latocephalus conicaudatus Baqri & Bohra, 2003

2003. *Latocephalus conicaudatus* Baqri & Bohra. *International. J. of Nematology,* **13**(2) : 185-194.

Material examined : 2 females. Reg. No. IV/1976.

Measurements : Females (2) : L= 1.85-2.01 mm; a= 61-62; b= 5.4-5.9; c= 38-39; V= $^{0.81\text{-}86}34\text{-}35^{13\text{-}14}$

Description : Female : Body slender, slightly curved ventrally in the posterior region upon fixation, Lateral hypodermal glands 63-68 in numbers. Lip region wider than adjoining body. Odontostyle 12 µm long; its aperture 5-6 µm. Odontophore 22-23 µm long; Guiding ring 5-6µm from anterior end. Basal expanded part of oesophagus occupies 52-54% of neck region. Reproductive system mono-opisthodelphic. Anterior uterine sac 15-16 µm long. Prerectum 35-36 or 1-5 anal body width long. Rectum 0.6 anal body width long. Tail 50-52 µm convex-conoid with rounded tip, about 2.2 anal body width long. Male : Not found.

Host : Chawla.

Locality : Kela Devi road, district Karauli.

Distribution : Rajasthan.

Moshajia cultristyla Siddiqi, 1982

1982. *Moshajia cultristyla* Siddiqi. *Nematol. Medit.,* **10** : 157-166.

Material examined : 5 females. Reg. No. IV/1885.

Measurements : Females (5) : L= 0.97-1.18 mm; a= 30-39; b=3.6-4.0; c= 37-43; c´= 1.3-1.6; V= $^{8-9}52\text{-}54^{8-9}$

Description : Female : Body ventrally arcuate. Cuticle irregular, finely striated. Lateral body pores prominent, widely spread, ventral body pores not spreading all over the body. Lip region aprocelaimid with raised lips and papillae. Odonttostyle 13-15 µm; its aperture 8-10 µm. Odontophore 15-22 µm long. Basal expanded part of oesophagus occupies 49-50% of neck region. Reproductive system amphidelphic. Prerectum 76-83 µm or about 2.5 anal body-width long. Rectum 1.5-1.7 anal body width long. Tail 20-22 µm long subdigitate, 1.3-1.6 body width long. Male : Not found

Host : Pearl millet.

Localities : Distributed in all the surveyed districts.

Distribution : Andaman & Nicobar.

Elsewhere : St. Albans, U.K.

Remarks : First time reported from the State.

Kochinema farodai Baqri & Bohra, 2001

2001. *Kochinema farodai* Baqri & Bohra*Nematology*, **3**(2) : 113-127.

Material examined : 5 females. Reg. No. IV/1849.

Measurements : Females (5) : L= 0.96-1.08 mm; a= 29-32; b= 4.1.-4.5; c= 30-33; V= $^{10-11}52\text{-}54^{10-11}$

Description : Female : Lip region distinctly set-off from body, wider than adjoining body. Odontostyle 17-19 µm long. Odontophore 19-22µm long, rod-like. Guiding ring 10-11 µm from anterior end. Basal expanded part of oesophagus occupies 41-44% of neck length. Female reproductive system amphidelphic. Tail 32-35 µm long; 1.4-1.6 anal body-width long, convex-conoid with rounded terminus. Male : Not found.

Host : Pearl millet, moong, chawla, bhindi etc.

Localities : Widely distributed in the surveyed districts.

Distribution : Rajasthan, Gujarat.

Carcharolaimus masoodi Jairajpuri, 1968

1968. *Carcharolaimus masoodi* Jairajpuri. *Proc. Helminth. Soc. Wahs.*, **35** : 96-102.

Material examined : 3 females. Reg. No. IV/1887.

Measurements : Females (3) : L= 1.49-1.65 mm; a= 46-55; b= 3.6-4.4; c= 71; V=$^{8-9}$49-52$^{8-9}$

Description : Female : Body straight upon fixation. Lateral hypodermal glandular organs very conspicuous, 100-125 which are very conspicuous towards tail end. Lip region wide about two-thirds as wide as body at base of oesophagus. Lips large angular, labial papillae visible. Odontostyle 11-13 µm, cylindrical, its aperture 6-7 µm. Odontophore 20-25 µm long. Post extension constriction of oesophagus present. Basal expanded part of oesophagus 56-64% of neck region. Oesophageal lumen sclerotized. Reproductive system amphidelphic. Prerectum 35-50 µm or 1-2 anal body width long. Tail 20-24 µm long, about one anal body width long with rounded terminus. Male : Not found

Host : Groundnut, moong.

Localities: Tijara, district Alwar, Dausa, Dholpur etc.

Distribution : Rajasthan, Uttar Pradesh.

Belondira aquatica Ferris, Ferris & Goseco, 1983

1983. *Belondira aquatica* Ferris, Ferris & Goseco. *Research Bulletin.*, **979** : 1-47.

Material examined : 3 females, 1 male. Reg. No. IV/1868.

Measurements : Females (3) : L= 1.26-1.36 mm; a= 43-46; b=3.7-4.2; c= 75-85; V= $^{3-4}$39-41$^{10-11}$. Male (1) : L= 1.39 mm; a= 44; b= 4.0; c=80.

Description : Female : Body straight. Lip region rounded. Cephalic frame-work distinctly sclerotized. Odontostyle 5-6 µm long, its aperture distinct. Odontophore 12-13 µm long. Basal expanded part of oesophagus occupies 57-60% of neck region. Anterior uterine sac 3-4 µm, posterior genital branch normal. Prerectum 112-128 µm long or about 5-6 anal body width long. Tail 16-17 µm long rounded 0.7-0.8 anal body width long. Male : Spicules 31 µm long, slightly arcuate, lateral guiding pieces 6-7 µm long. One adanal pair and one preanal ventro-submedian supplements. Tail similar to female.

Host : Sugarcane.

Locality : Thanagachi, district Alwar.

Elsewhere : U.S.A.

Remarks : First time reported from the state.

Dorylaimellus (Belondorylaimellus) discocephalus Siddiqi, 1964

1964. *Dorylaimellus discocephalus* Siddiqi. *Labdev. J. Sci. Tech.*, **2** : 37-41

Material examined : 10 females. Reg. No. IV/1874.

Measurements : Females (10) : L= 1.03-1.31 mm; a= 37-38; b= 4.2-4.5; c= 39-46; V=$^{7-8}$50-52$^{7-8}$

Description : Female : Lip region well set-off Lateral glandular organs conspicuous, 70-72 in number, variable in size and irregular in arrangements. Odontostyle 6-7 µm, its aperture 2-3 µm; odontophore 9-11 µm long; with typical flanges. Basal expanded part of oesophagus occupies 55-57% of neck region. Female reproductive system amphidelphic. Prerectum 50-60 µm or 2-3 anal body width long. Tail 26-28 µm, cylindrical with bluntly rounded terminus, about 1.4 anal body width long. Male : Not found

Host : Brinjal.

Locality : Thanagachi, district Alwar.

Distribution : Rajasthan, Gujarat, West Bengal, Uttar Pradesh etc.

Remarks : In Rajasthan this species is very commonly found.

Dorylaimellus (Axodorylaimellus) deviatus Baqri & Jairajpuri, 1969

1969. *Dorylaimellus deviatus* Baqri & Jairajpuri. *Nematologica,* **15** : 408-424.

Material examined : 2 females. Reg. No. IV/1963.

Measurements : Females (2) : L= 1.00-1.04 mm; a= 45-45.3; b= 6.3-6.4; c= 37-38; V= $^{7-8}$51-52$^{7-8}$

Description : Female : Lip region set off, with peri-oral disc. Perioral sclerotization distinct. Odontostyle 8-9 µm long; its aperture 3-4 µm. Odontophore 11-12 µm long with flanges. Basal expanded part of oesophagus occupies 45-46% of neck region. Female reproductive system amphidelphic. Prerectum 3-4 anal body width long. Tail 27-28 µm long short cylindroid, about 1.6-1.7 anal body -width long. Male : Not found

Host : Shin.

Locality : Tijara, district Alwar.

Remarks : This species is being reported for the first time from the state.

Dorylaimellus (Mesodorylaimellus) jacobi Jairajpuri & Ahmad, 1980

1980. *Dorylaimellus jacobi* Jairajpuri & Ahmad. *Indian J. Nematol.*, **10** : 9-22

Material examined : 2 females. Reg. No. IV/1870.

Measurements : Females (2) : L= 1.00-1.01 mm; a= 32.4; b= 6.0-6.1; c= 34.6; V= 57-58.

Description : Female : Lip region setoff, knob like. Peri-oral disc absent. Peri-oral sclerotization indistinct or absent. Odontostyle 9-10 µm long; its aperture 2-3 µm. Odontophore 8-9 µm long with flanges. Basal expanded part of oesophagus occupies 57-58% of neck region. Female reproductive system mono-prodelphic. Prerectum 28-29 µm or 1.8-1.9 anal body width long. Tail 28-29 µm short cylindroid-conoid-rounded. Male : Not found.

Host : Brinjal.

Locality : Thanagachi, district Alwar.

Distribution : Uttar Pradesh.

Remarks : First time reported from the state.

Tylencholaimus proximus Thorne, 1939

1939. *Tylencholaimus proximus* Thorne. *Capita Zool.*, **8** : 57.

Material examined : 2 females. Reg. No. IV/1984.

Measurements : Females (2) : L= 0.64-0.75 mm; a= 26-30; b= 4.0-4.1; c= 29-34; V= 66-68.

Description : Female : Lip region cap-like, set off from adjacent body by deep constriction. Odontostyle 7-8 µm long; its aperture one third of its length. Guiding ring 4-5 µm from anterior end. Odontophore 8-9 µm long, with basal knobs. Basal expanded part cylindrical occupies 30-40% of neck length. Reproductive system prodelphic. Posterior uterine sac absent or if present rudimentary, about less than one third of corresponding body width. Prerectum 2.2-4.0 anal body width long. Rectum 0.8-0.9 anal body width long. Tail 20-22 µm, convex-conoid with bluntly rounded terminus, about 1.1-1.2 anal body width long. Male : Not found

Host : Moong.

Locality : Ser Mathura, district Dholpur.

Elsewhere : Spain, America, Norway.

Remarks : First time reported from India.

Tylencholaimus pakistanensis Timm, 1963

1963. *Tylencholaimus pakistanensis*. Timm. *Proc. Helm. Soc. Wash.*, **31** : 51

Material examined : Females : 3. Reg. No. IV/1985.

Measurements : L= 0.71 mm; a = 29.7; b= 4.6; c= 39.7; V= 53.1. Female : Lip region expanded, set off from body. Odontostyle 7-8 µm long; its aperture 1-2 µm of its length. Odontophore 9-10 with basal knobs. Basal expanded part of oesophagus occupies 27-33% of neck length. Reproductive system opisthodelphic. Prerectum 2-3 anal body width long. Rectum 1.6-1.7 anal body width long. Tail 17-18 µm subconoid one anal body long. Male : Not found.

Host : Pearl millet.

Locality : Chikani, district Alwar.

Distribution : First time reported from the state.

Elsewhere : Pakistan, Bangladesh.

Tylencholaimus obscurus Jairajpuri, 1965

1965. *Tylencholaimus obscurus* Jairajpuri. *Nematologica,* **10** : 516-517.

Material examined : 5 females. Reg. No. IV/1882-84.

Measurements : Females (5) : L= 0.75-0.08 mm; a= 21-25; b= 3.9-4.0; c= 34-38; V=66-67.

Description : Female : Body slender. Lip region setoff by a deep constriction. Odontostyle 7-8 µm long; its aperture one fourth of its length. Guiding ring single 4-5 µm long. Odontophore 9-10 µm long; Basal expanded part of oesophagus occupies 40-44% of neck length. Reproductive system prodelphic. Posterior uterine sac 35% of corresponding body width. Prerectum 2-3 anal body width long. Rectum 0.6-0.7 anal body width long. Tail 19-20 µm convex-conoid.

Host : Moong, Cauliflower, Pearl millet.

Localities : Chikani, district Alwar and Bari, district Dholpur.

Distribution : Uttar Pradesh, Gujarat

Elsewhere : South Australia, Mexico, South Africa.

Remarks : First time reported from the state.

Tylencholaimus gertii Kruger, 1965

1965. *Tylencholaimus gertii* Kruger. *Proc. Helm. Soc. Wash.*, **32** : 1.

Material examined : 5 females. Reg.No. IV/1964.

Measurements : Females (5) : L= 0.61-0.62 mm; a= 17-21; b= 3.6; c= 22-24; V= 46^{16}

Description : Female : Lip region set off by a deep constriction. Odontostyle 7-8 µm long; its aperture one fourth of its length. Odontophore 9-10 µm long. Basal expanded part of oesophagus occupies 49-50% of neck length. Reproductive system opisthodelphic. Anterior uterine sac absent or if present very small. Prerectum 5-6 anal body width long. Rectum one anal body width long. Tail 16-18 µm bluntly convex-conoid with characteristic bowl shaped terminal core about less than one anal body width long. Male : Not found

Host : Chilli, Moog and Jamun.

Localities : Chikani, district Alwar, Ser Mathura, district Dholpur.

Distribution : Rajasthan, Gujarat.

Elsewhere : South Africa, Australia.

Tylencholaimus innebus Ahmad & Jairajpuri, 1980

1980. *Tylencholaimus innebus* Ahmad & Jairajpuri. *Indian J. of Nematology,* **9**(2) : 133-135.

Material examined : 4 females. Reg.No. IV/1986.

Measurements : Females (4) : L= 0.68-0.86 mm; a= 27-30; b= 3.7-4.5; c= 34-36; V= $^{13\text{-}15}62\text{-}64^{13\text{-}15}$

Description : Female : Lip region cap-like, set off from body contour, about twice as wide as high. Odontostyle 7-8 µm long; its aperture about one fourth of its length. Guiding ring single 4-5 µm from anterior end. Odontophore rod-like, with small basal thickenings, about 1.4 odontostyle length. Basal expanded part of oesophagus occupies about 36-37% of oesophageal length. Vulva transverse slit. Female reproductive system amphidelphic. Prerectum 2-3 anal body width long. Rectum one anal body width long. Tail 24-25 hemispherical, about one anal body width long. Male : Not found.

Host : Cotton and Pearlmillet.

Localities : Badola and Chikani, district Alwar.

Distribution : Uttar Pradesh, Uttarakhand.

Elsewhere : Nepal.

Tylencholaimus minutus Vinciguera, 1986

1986. *Tylencholaimus minutus* Vinciguera. *Nematol. Medit.*, **14** : 107-116.

Material examined : 3 females. Reg. No. IV/1846.

Measurements : Females (3) : L= 0.45-0.46 mm; a= 21-25; b= 3.1-3.6; c= 21-25; V= 71-72.

Description : Females : Lip region globose and set off by constriction, cap like. Odontostyle 5-6 µm long. Odontophore 8-10 µm long with distinct basal knobs. Oesophageal expansion abruptly expanded into basal part of oesophagus which occupies 41-44% of neck length. Reproductive system prodelphic. Post uterine sac absent. Prerectum 3-4 anal body width long. Rectum one anal body-width long. Tail 18-19 µm conoid, subdigitate about one anal body width long. Male : Not found

Host : Sugarcane.

Locality : Thanagachi, district Alwar.

Elsewhere : Italy, Hungary, Netherland, St. Albans U.K., U.S.A.

Remarks : First report from India.

Tylencholaimus constrictus Vinciguerra, 1986.

1986. *Tylencholaimus constrictus* Vinciguerra. *Nematol. Medit.*, **14** : 107-116.

Material examined : 3 females. Reg. No. IV/1840.

Measurements : Females (3) : L= 0.86-0.90 mm; a= 30-31; b= 4.2.-4.5; c= 34-36; V= 62-68

Description : Female : Lip region set off by a slight constriction, disc-like. Odontostyle 8-9 µm long. Odontophore 10-11 µm long. Basal expanded part of oesophagus occupies 47-50% of neck length. Vulva transverse. Reproductive system prodelphic. Posterior uterine sac 23-25 µm long. Prerectum 2-3 anal body- width long. Rectum one anal body-width long. Tail 24-25 µm, hemispherical, rounded, about one anal body- width long. Male : Not found

Host : Pearl millet.

Locality : Gudala, district Karauli.

Elsewhere : Italy, U.S.A., U.K.

Remarks : First time reported from India.

Tylencholaimus decens Andrassy, 1991

1991. *Tylencholaimus decens* Andrassy. *The Batorliget Nature Reserve – after forty years* : 189-192.

Material examined : 2 females. Reg. No. IV/1843-1845.

Measurements : Females (2) : L= 0.64-0.66 mm; a= 26.7-26.9' b= 3.7-4.0; c= 26-29; V= 66-68.

Description : Female : Lip region set off from body. Odontostyle 6-7 µm long; its aperture 2-3 µm. Odontophore 10-11 µm long. Basal expanded part of oesophagus occupies 45-47% of neck length. Reproductive system prodelphic posterior uterine sac 18-19µm, less than corresponding body- width. Prerectum 1-2 anal body-width long. Rectum 0.8-0.9 anal body-width long. Tail 20-21 µm, conoid 0.9-1.1 anal body-width long. Male : Not found.

Host : Pearl millet and brinjal.

Localities : Rahar, district Bharatpur and Thanagachi, district Alwar.

Elsewhere : Batorliget Nature Reserve, Hungary.

Remarks : First time reported from the state.

Tylencholaimus nagueriensis Baqri & Bohra, 2001

2001. *Tylencholaimus nagueriensis* Baqri & Bohra. *Nematology.*

Material examined : 4 females. Reg. No. IV/1965-1966.

Measurements : Females (4) : L= 0.64-0.74 mm; a = 19-22; b= 3.6-4.0; c= 32-33; V= $^{19-20}$64-67.

Description : Female : Lip region cap-like, set off from body by a constriction with perioral disc. Odontostyle 8-9µm long. Odontophore 10-11 µm, with small basal thickenings. Basal expanded part of oesophagus 37-39% of neck length. Female reproductive system prodelphic. Prerectum 40-42 µm or 2.2-2.5 anal body width long. Rectum 20-22 µm or one anal body width long. Tail convex conoid with rounded terminus, 20-22 µm or 1.0-1.2 anal body width long. Male : Not found.

Host : Jowar and Pearl millet.

Localities : Tijara, Thanagachi, district Alwar, Rahar, district Bharatpur, Ser Mathura district Dholpur, Bhadoli, district Dausa and Tidipura, district Jaipur.

Distribution : Rajasthan and Gujarat.

Nygolaimus anneckei Heyns, 1968

1967. *Nygolaimus (Nygolaimus) anneckei* Heyns. *Entomology Memoirs,* **19** : 1-144.

Material examined : 6 females. Reg. No. IV/1836.

Measurements : Females (6) : L= 1.25-1.34 mm; a= 43-44; b= 4.3-4.5; c= 67-69; V= $^{6-8}43\text{-}44^{6-8}$

Description : Female : Body almost straight upon fixation. Lip region set off by constriction. Tooth deltoid, 7-8 µm somewhat dorsally curved. Basal expanded part of oesophagus occupies 48-50% of neck length. Amphidelphic reproductive system, both genital branches equally developed. Prerectum 1.8-1.9 anal body width. Rectum 0.8-0.9 anal body- width long. Tail 18-19 µm, dorsally convex-conoid bluntly rounded. Male: Not found

Host : Jowar, Pearlmillet, Til, Rizka etc.

Locality : Umarao Ki Dhani, district Dholpur.

Distribution : Rajasthan, Gujarat, Andaman Nicobar.

Elsewhere : Germary, South Africa.

Nygolaimus hyans Thorne, 1974

1974. *Nygolaimus hyans* Thorne. *Technical Bulletin,* **41** : 1-119.

Material examined : 3 females. Reg. No. IV/1987.

Measurements : Females (3) : L= 1.23-1.35 mm; a = 40-41; b= 3.9-4.1; c= 60-61; V= $^{7-8}58\text{-}59^{7-8}$

Description : Female : Body almost straight upon fixation. Lip region rounded set off from body by distinct constriction. Tooth deltoid, 9µm long. Basal expanded part of oesophagus occupies 53-54% of neck length. Prerectum 4.0-4.2 anal body width. Rectum about one anal body width. Tail 18-19 µm convex conoid with rounded terminus, about 1-3 anal body-width long. Male : Not found

Host : Pearl millet.

Locality : Bhuragaon, district Bharatpur.

Distribution : First time reported from India from Bhuragaon village, district Bharatpur.

Nygolaimus captivitatis (Heyns, 1968) Ahmad & Jairajpuri, 1980

1962. *Nygolaimellus captivitatis* Andrassy, *Opusc. Zool. Budapest,* **4** : 21-33.

1968. *Nygolaimus (Nygolaimus) captivitatis* Heyns, *Entomology Memoirs,* **19** : 1-144.

Material examined : 4 females. Reg.No. IV/1983.

Measurements *:* Females (4) : L= 1.21-1.34 mm; a = 39-40; b= 4.0-4.2; c= 60-61; V= $^{7-8}47\text{-}48^{7-8}$

Description : Female : Body almost straight upon fixation. Lip region set off by constriction. Tooth deltoid, 7-8 µm long. Basal expanded part of oesophagus occupies 54-56% of neck length with somewhat constriction near its middle. Female reproductive system amphidelphic. Prerectum 1.3-1.4 anal body width long. Rectum about one anal body width long. Tail 17-18 µm, bluntly convex-conoid, about one anal body-width long. Male : Not found

Host : Jowar.

Locality : Bhuragaon, district Bharatpur.

Distribution : First time reported from India from Bhuragaon district Bharatpur.

Elsewhere : Hungary.

Nygolaimus harishi Ahmad and Jairajpuri, 1988

1980. *Nygolaimus harishi* Ahmad & Jairajpuri. *Revue Nematol.,* **3** : 41-50

Material examined : 5 females. Reg. No. IV/1837, 1840.

Measurements *:* Females (5) : L= 1.07-1.17 mm; a= 40-42; b= 3.7-3.9; c= 61-66; V = $^{7-8}41\text{-}43^{8-10}$

Description : Female : Body almost straight upon fixation. Cuticle transversely striated, 2-3 µm thick (thickest at tail). Lip region distinctly set off from body. Tooth deltoid, 6-7 µm long. Basal expanded part of oesophagus occupies 50-52% of neck length. Female reproductive stystem amphidelphic. Anterior genital branch reduced. Prerectum 1.5-1.6 anal body-width. Rectum about one anal body- width long. Tail 16-18 µm, straight-conoid with rounded terminus, about 1/3rd of anal body-width long. Male : Not found

Host : Pearl millet, Jowar, Brinjal, Moong.

Localities: Kumhar, Rahar, district Bharatpur.

Distribution : Rajasthan, Haryana, Punjab, Gujarat, Himachal Pradesh.

Oionchus obtusus Cobb, 1913

1913. *Oionchus obtusus* Cobb. *J. Wash. Acad. Sci.*, **3** : 432-444.

Material examined : 5 females. Reg. No. IV/1981-82.

Measurements : Females (5) : L= 0.67-1.2 mm; a= 19-33; b= 3.0-3.9; c= 41-55; V= 58-66.

Description : Female : Body almost straight upon fixation. Lip region 12-14 µm wide, 4-6 µm high. Anterior wider part of buccal cavity 11-13 µm long, 6-8 µm wide. Mural tooth large, sub ventral walls bearing two transverse rows of denticles. Reproductie system mono-prodelphic, post-uterine sac 6-8 µm. Sphincter not present at oviduct-uterus junction. Tail hemispherical, 18-22 µm or less than one anal body-width long. Spinneret subterminal dorsally. Male : Not found.

Host : Pearl millet.

Locality : Kela Devi Road, district Karauli.

Distribution : Punjab, Uttarakhand, Uttar Pradesh.

Elsewhere : Netherland.

Remarks : This species is being reported for the first time from Rajasthan.

Bathyodontus cylindricus Fielding, 1950

1950. *Bathyodontus cylindricus* Fielding. *J. Helminth,* **20** : 9-24.

Material examined : 3 females. Reg. No. IV/1979-80.

Measurements : Females (3) : L= 0.76-0.88mm; a= 13-20; c= 33-53; b= 2.5-3.0; V= $^{8-9}51\text{-}56^{8-9}$

Description : Female : Body almost straight upon fixation. Lip region 14-17 µm wide, 7-9 µm high, slightly set off, lips conoid with amalgamated bases. Anterior wide part of buccal cavity 16-19µm long, 5-6 µm wide. Vento-sublateral denticle small, but distinctly visible. Reporuductive system amphidelphic. Tail 15-16 µm, rounded, less than one anal body width long. Spinneret terminal. Male : Not found.

Host : Pearl millet.

Locality : Bharatpur and Dholpur.

Distribution : Uttarakhand.

Elsewhere : Netherland.

Remarks : This species is first time reported from the state.

Paratrichodorus porosus (Allen, 1957) Siddiqi, 1974.

1957. *Trichodorus porosus* Allen. *Nematologica,* **2** : 32-62.

1974. *Paratrichodorus porosus* (Allen, 1957) Siddiqi. *Nematologica,* **19** : 259-278.

Material examined : 5 females. Reg. No. IV/1873 and IV/1875.

Measurements : Females (5) : L= 0.42-0.80 mm; a= 13-25; b=3.1-6.0; V= 52-59. **Males** (5) : L= 0.53-0.76 mm; a= 15-25; b= 4-6; c= 60-85; spicules = 36-38 µm.

Description : Female : Body stout, almost straight upon fixation. Cuticle swelling upon fixation. Onichiostyles 39-58 µm, oesophagus typical to the genus. The intestine often overlapping the oesophageal bulb for some distance dorsally. Vulva equatorial, pore-like. Vagina weakly sclerotized. Anus subterminal. Male : Two ventromedian copulatory supplements present. One pair of post anal ventrosublateral papillae present. Spicules straight, transversely striated. Gubernaculum straight, orientated parallel to the spicules and with the distal end thickened. Bursa inconspicuous.

Host : Jowar and Mango.

Locality : Thanagachi, district Alwar; Kumhar, district Bharatpur.

Distribution : Tropical and subtropical regions.

Elsewhere : Africa, Asia, Australia, South and Central America.

Remarks : This genus and species is being reported for the first time from the state.

CONCLUSION

The results of quantitative estimation of soil samples collected from eight districts of Rajasthan State reveal that the wide variety of plant parasitic nematodes are found associated with crops of economic importance i.e. agricultural, horticultural and cash crops. In the Rajasthan State, many Scientists are involved in experimental and applied field, mainly Root-knot (*Meloidogyne* spp.) and cereal cyst nematodes (*Heterodera avenae*) because these inflict severe yield losses and in the quality of crops of economic importance. Most of these plant parasitic nematodes are ectoparasites and remained attached to the root-system of the plants and suck the juice by piercing their stylet, odontostyle or onchiostyle in roots, which results in the stunting of the growth of plants and yellowing of leaves.

During the present study, the following plant parasitic nematode species have been found as predominant pests of plants: *Hoplolaimus indicus*, *Helicotylenchus sp.*, *Rotylenchulus reniformis*, *Pratylenchus zeae*, *Pratylenchus thornei*, *Pratylenchus neglectus*, *Hirschmanniella gracilis*, *Tylenchorhynchus mashhoodi* (other species

mentioned in the list), *Pratylenchoides* sp. *Rotylenchoides* sp. *Hemicriconemoides mangiferi, Hemicriconemoides brachyurus, Paralongidorus citri, Longidorus* sp., *Xiphinema* sp. and Trichdorids (*Paratrichodorus porosus*).

Pratylenchoides sp., *Rotylenchoidoides* sp. and *Paratrichodorus porosus* and other trichodorids have been reported for the first time from Rajasthan.

In all 84 species have been identified belonging to 37 genera of 20 families of Orders Tylenchida (43 spp.), Aphelenchida (1 sp.), Dorylaimida (35 spp.), Mononchida (3 spp.), Triplonchida (1 sp.) and Isolaimida (1 sp.)

Out of 84 species identified during the study, 29 species have been recorded for the first time from the State while 14 species have been recorded for the first time from India. Besides, 12 species belonging to Order Tylenchida, Dorylaimida and Isolaimida have been found new to Science.

DISCUSSION

The results of quantitative estimation from all the eight districts surveyed during 2005-06 concludes that the key/potential pests of economically important crops in Rajasthan State follow pattern in the district surveyed. *Hoplolaimus indicus*; *Helicotylenchus dihystera, Helicotylenchus erytherinae*; *Helicotylenchus multicinctus*; *Helicotylenchus crenacauda, Helicotylenchus exallus* etc., *Pratylenchus zeae*; *Rotylenchoides* sp.; *Rotylenchulus reniformis; Pratylenchus thornei*; *Pratylenchus macrostylus*; *Meloidogyne* sp.; *Pratylenchus neglectus*; *Hirschmanniella* spp; *Pratylenchoides* sp.n; *Tylenchorhynchus mashhoodi; Tylenchorhynchus divittatus; Tylenchorhynchus robustus; Bitylenchus goffartii; Hemicriconemoides mangiferus; Hemicriconemoides brachyurus; Paratrichodorus porosus; Aphelnchoides* sp; *Paralongidorus* spp. *Xiphinema* spp. and so on.

The frequency occurrence of other tylenchids, other dorylaimids and saprophagous is significant. The predatory nematode population is found to be very low.

Some species of genera i.e. *Pratylenchoides* sp.n., *Paratrichodorus porosus* are being reported for the first time from the State.

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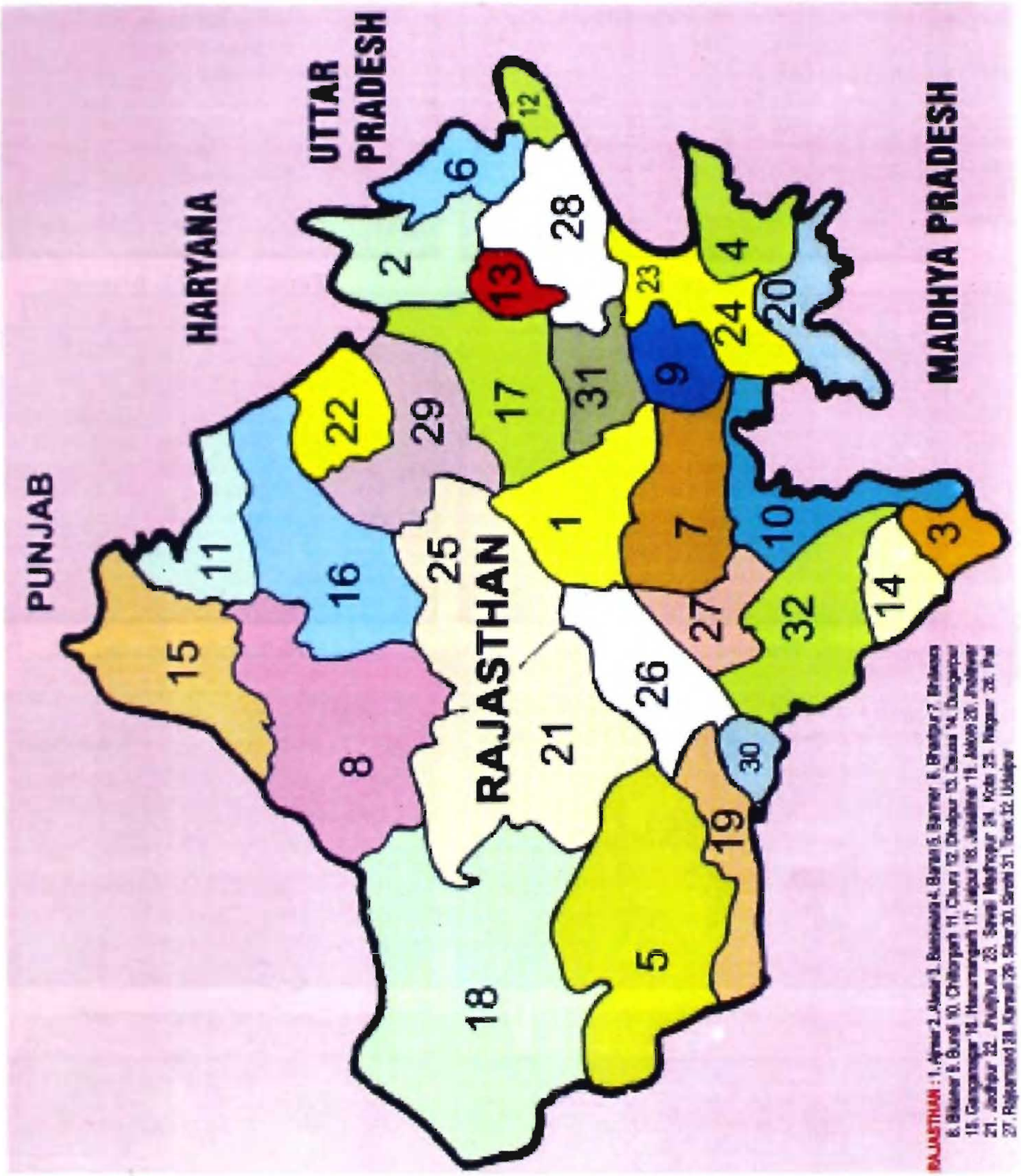
PLATES AND CHARTS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MADHYA PRADESH
RAJASTHAN
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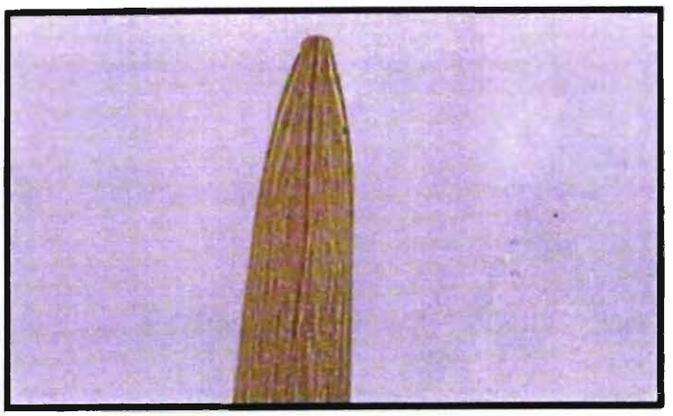

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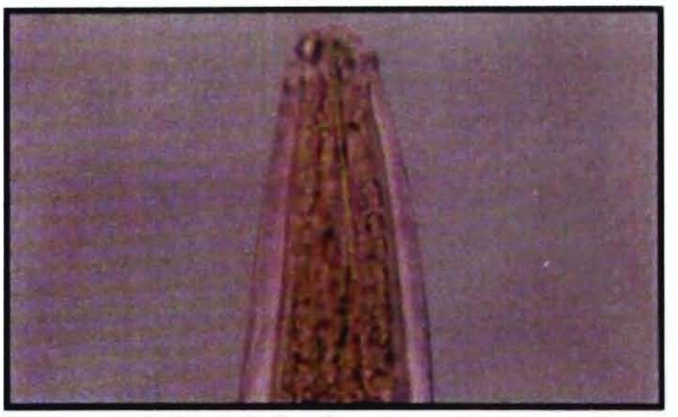

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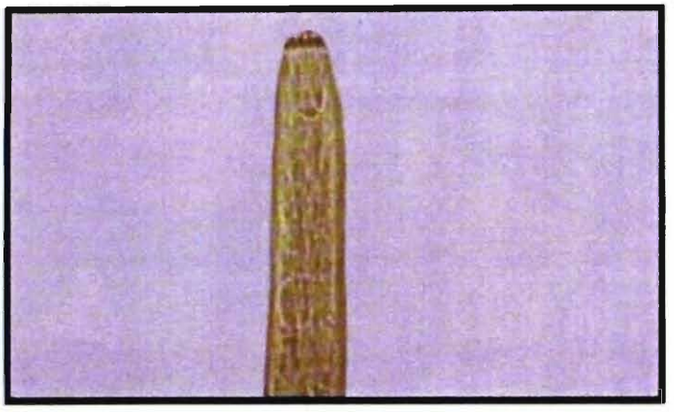

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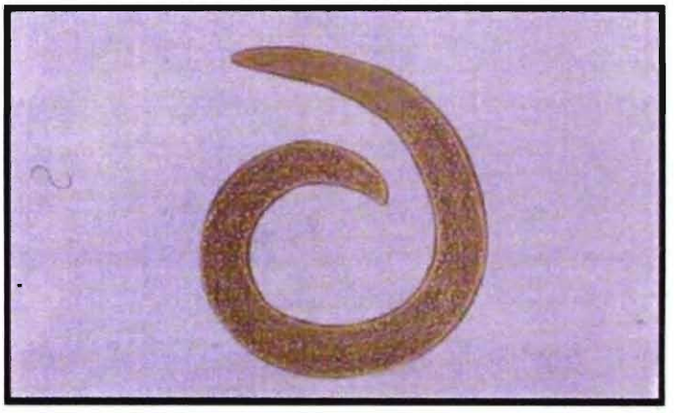

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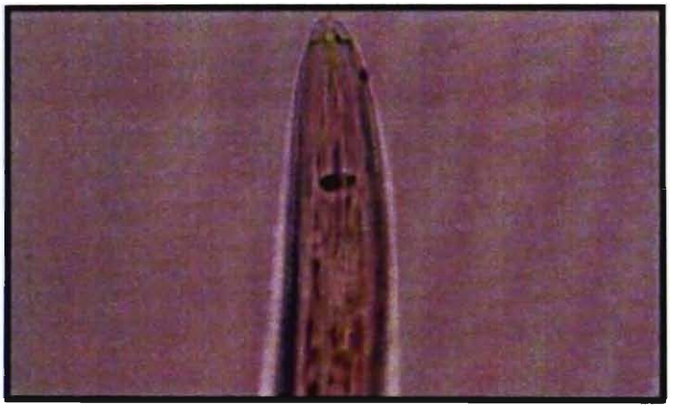
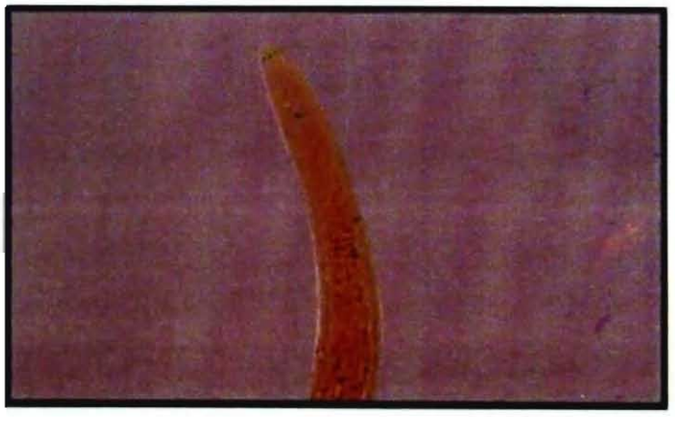


Helicotylenchus sp.

Carchsrolaimusmasoodi



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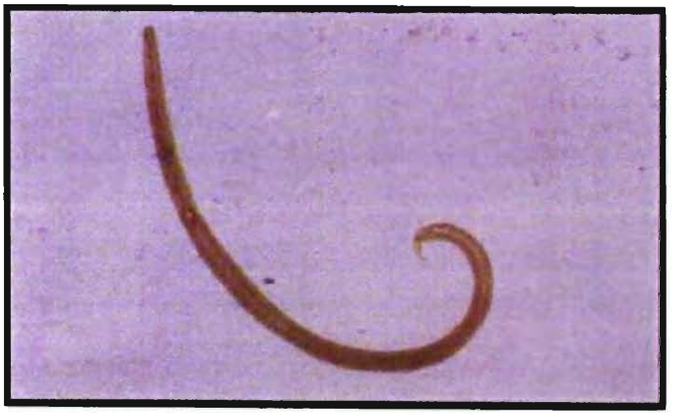
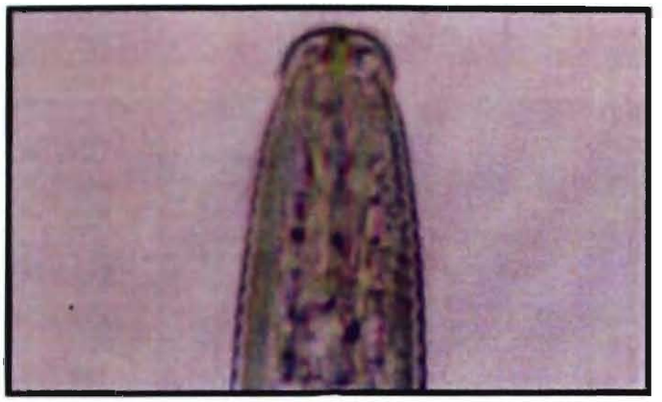


Mylonchulus sp.



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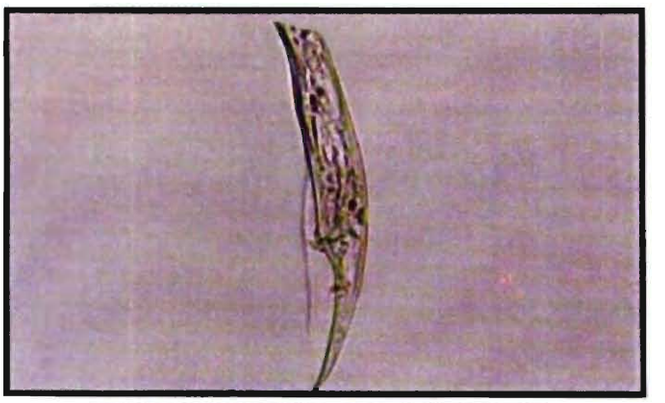

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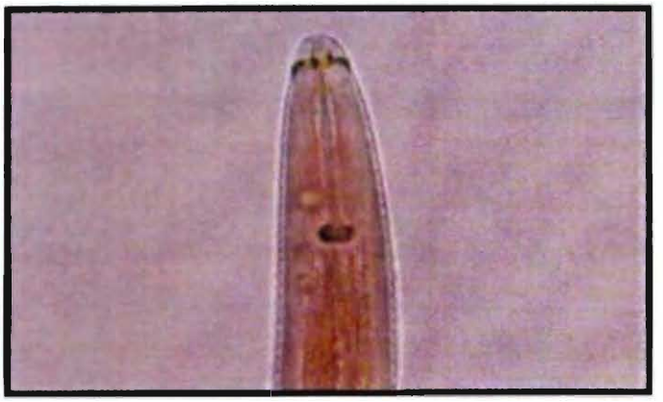

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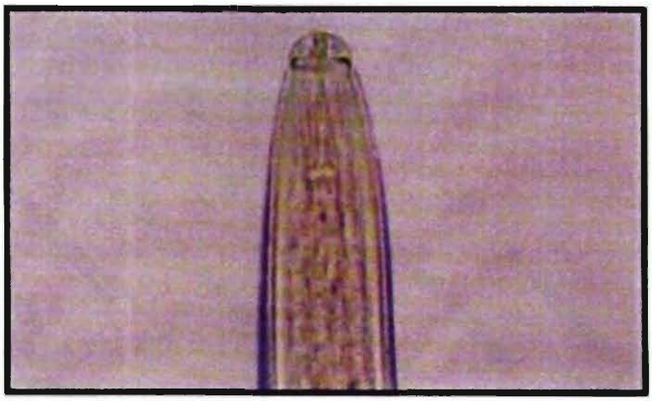

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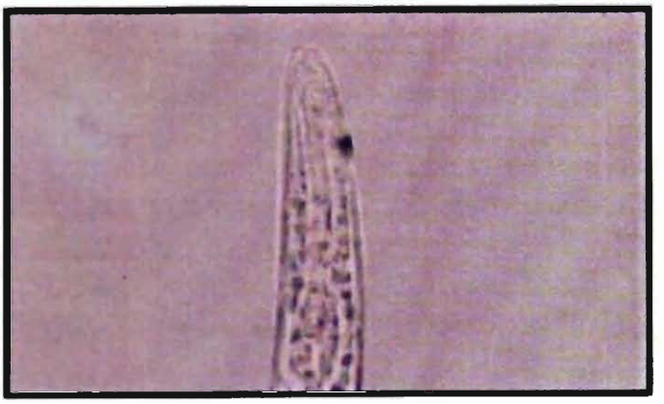

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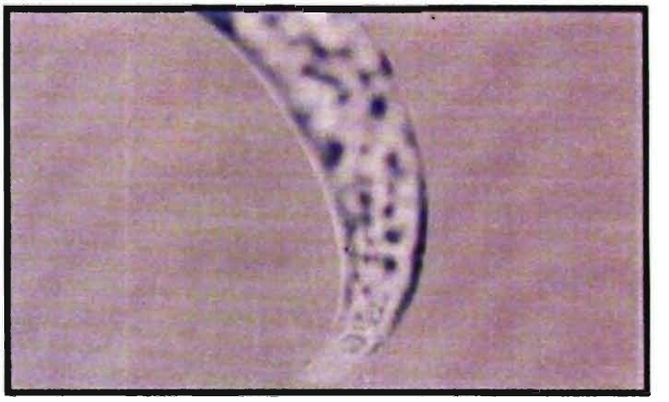

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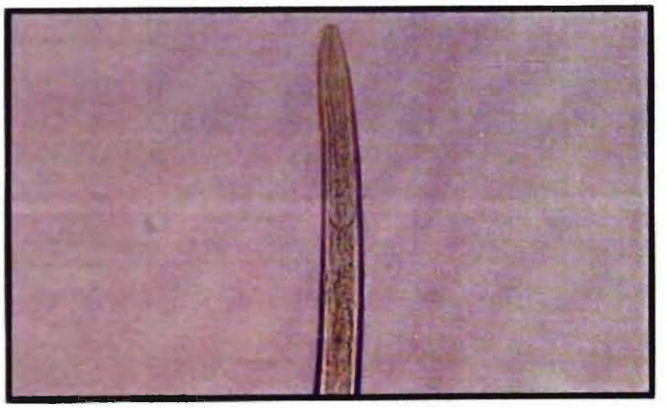
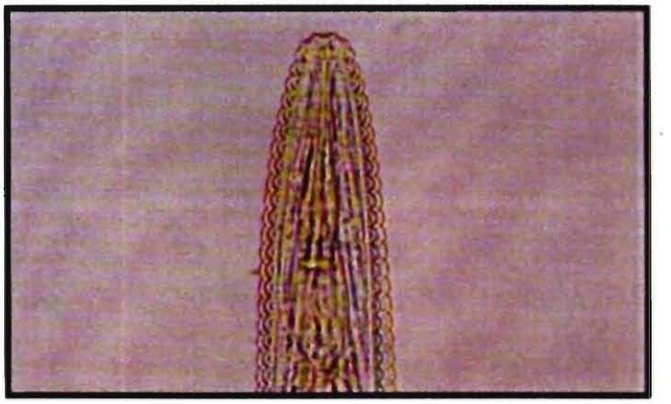


***Hirshamanniella* sp.n.**



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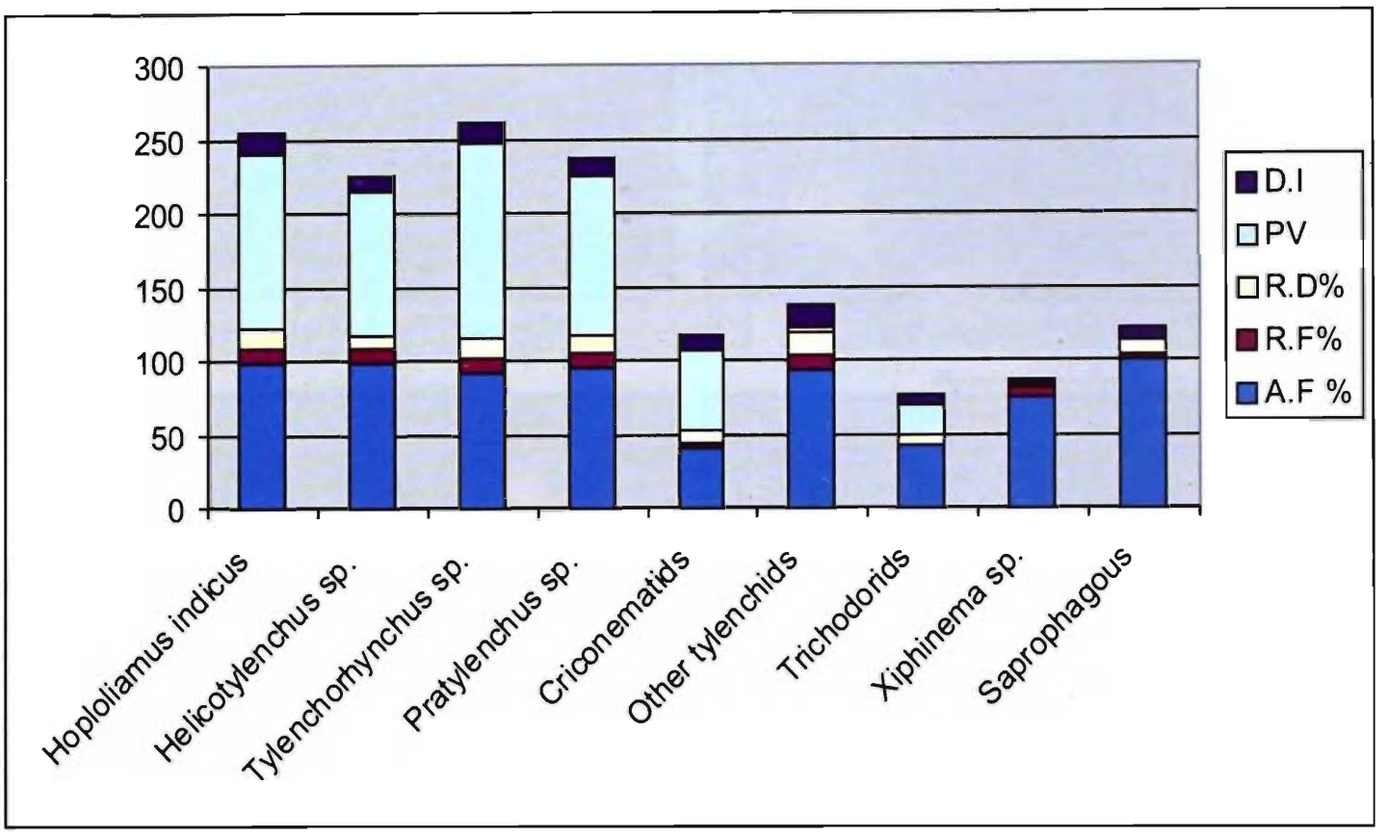


Chart-1 : District : ALWAR (Cereal Crops)

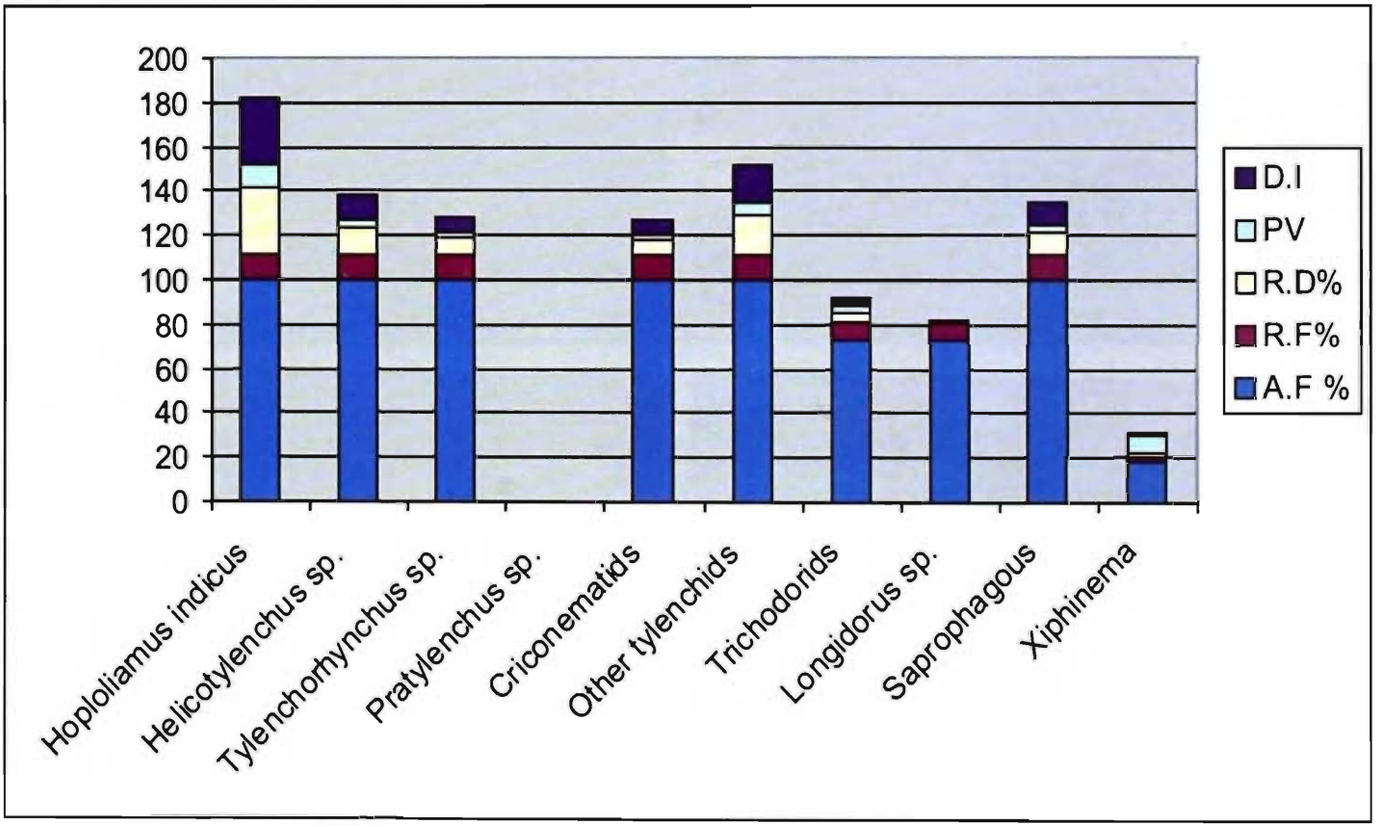


Chart-2 : District : ALWAR (Horticulture)

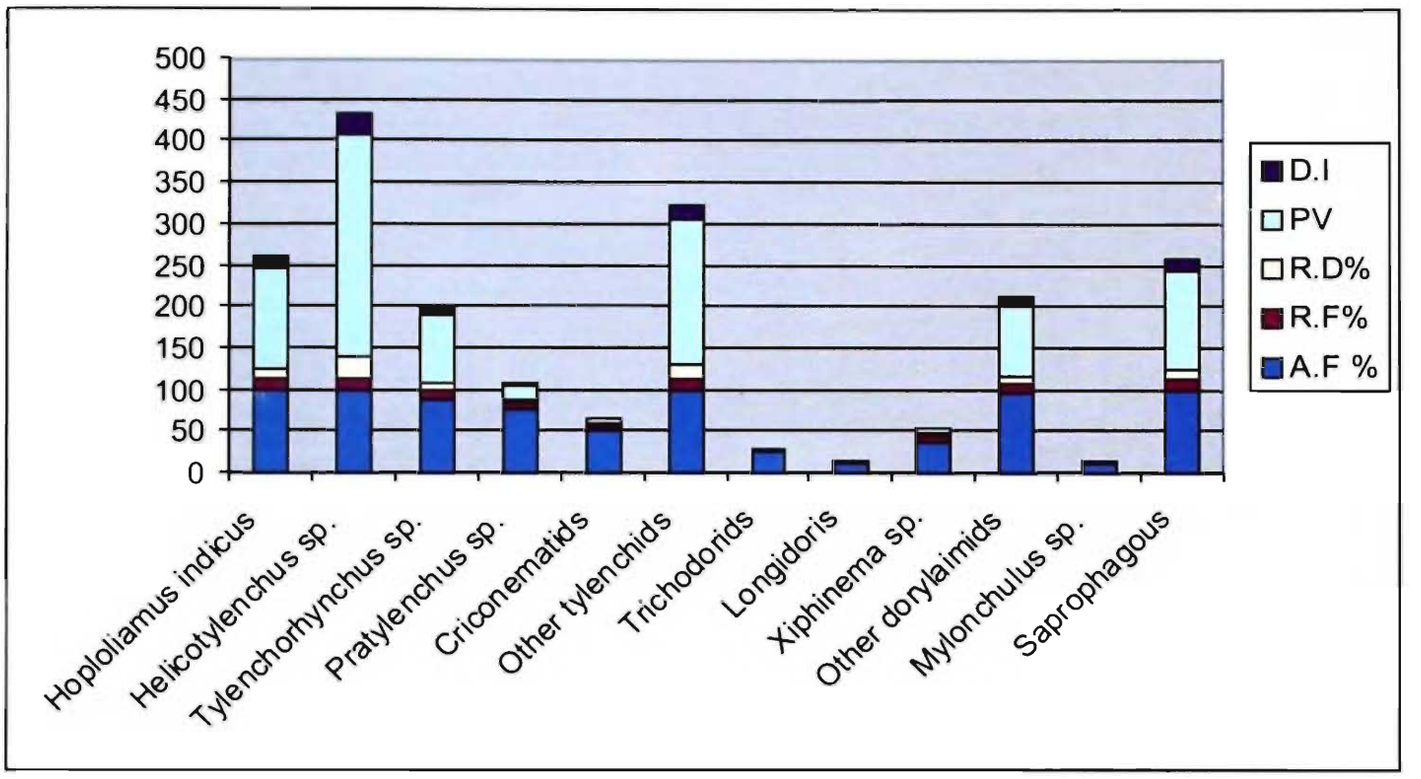


Chart-3 : District : ALWAR
(Ornamental Plants)

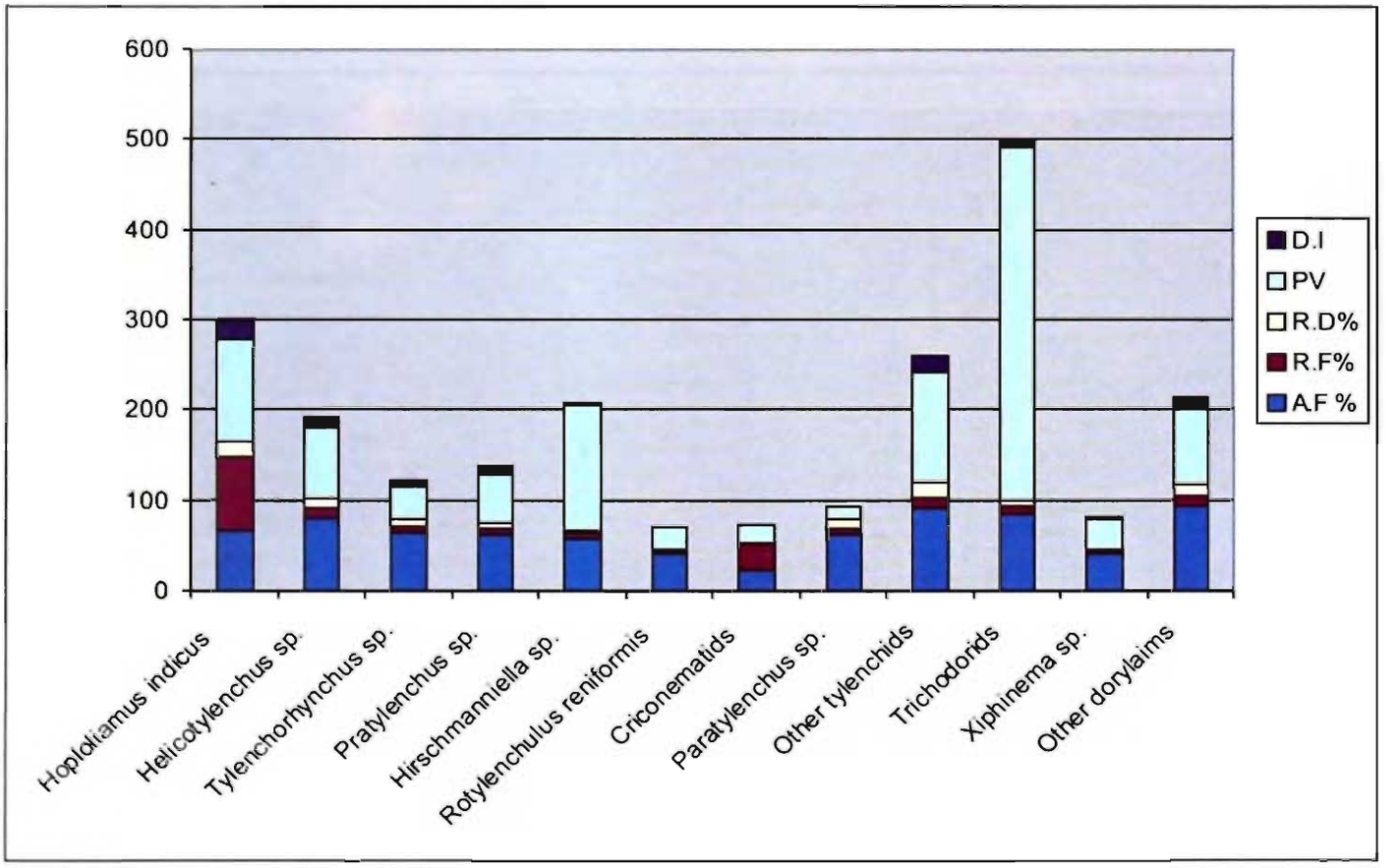


Chart-4 : District : BHARATPUR
(Cereal Crops)

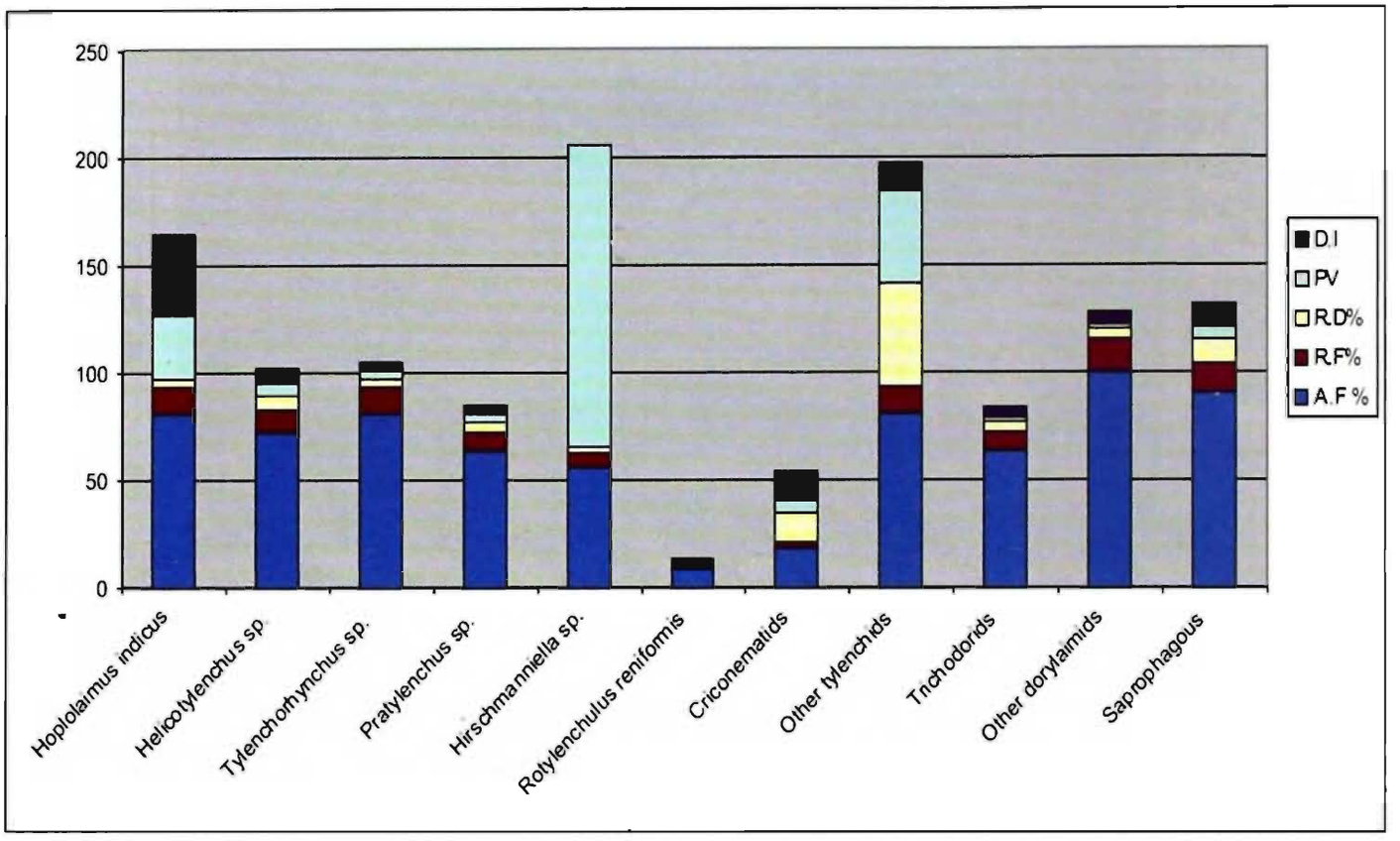


Chart-5 : District : BHARATPUR (Vegetables)

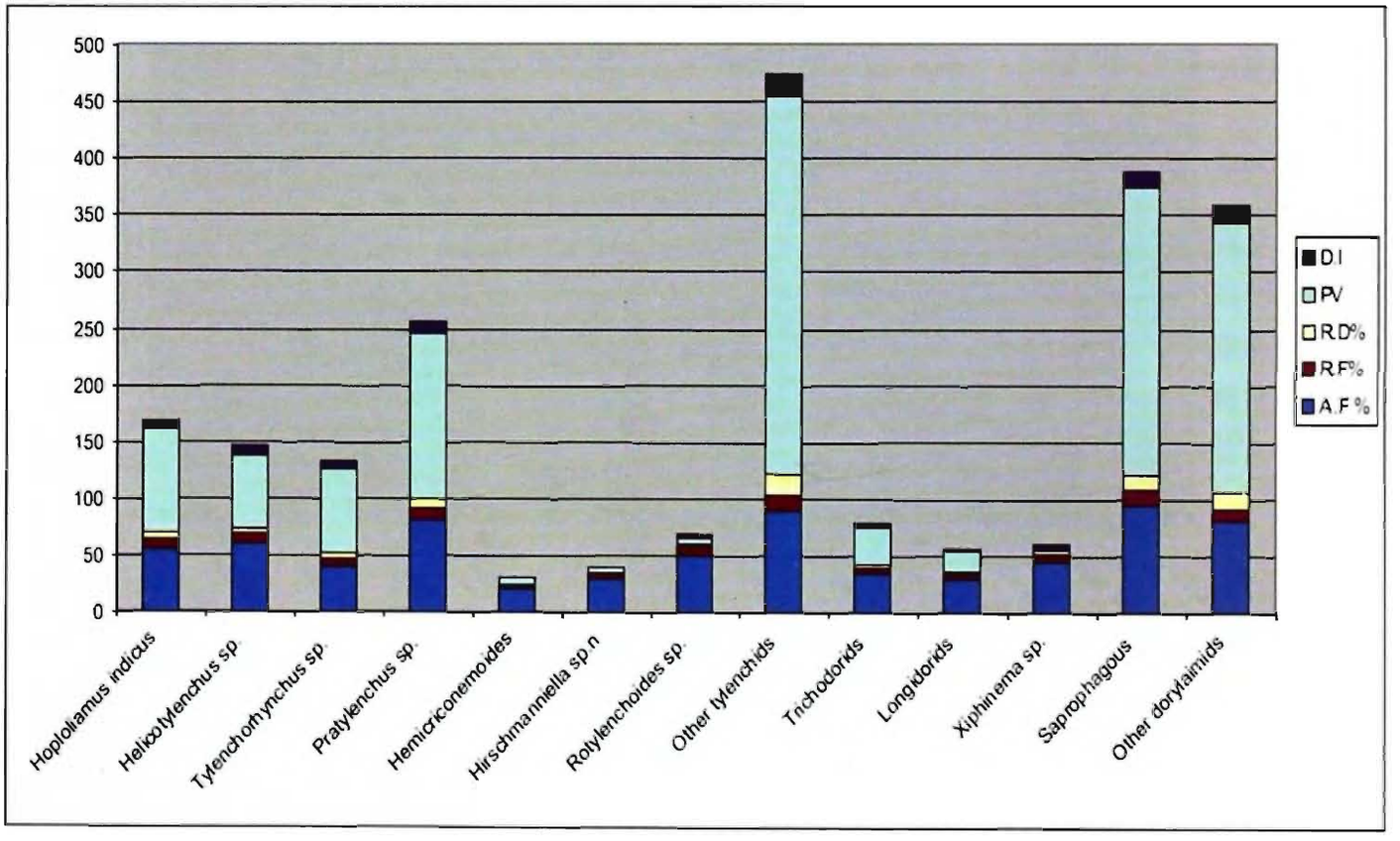


Chart-6 : District : DHOLPUR (Cereal Crops)

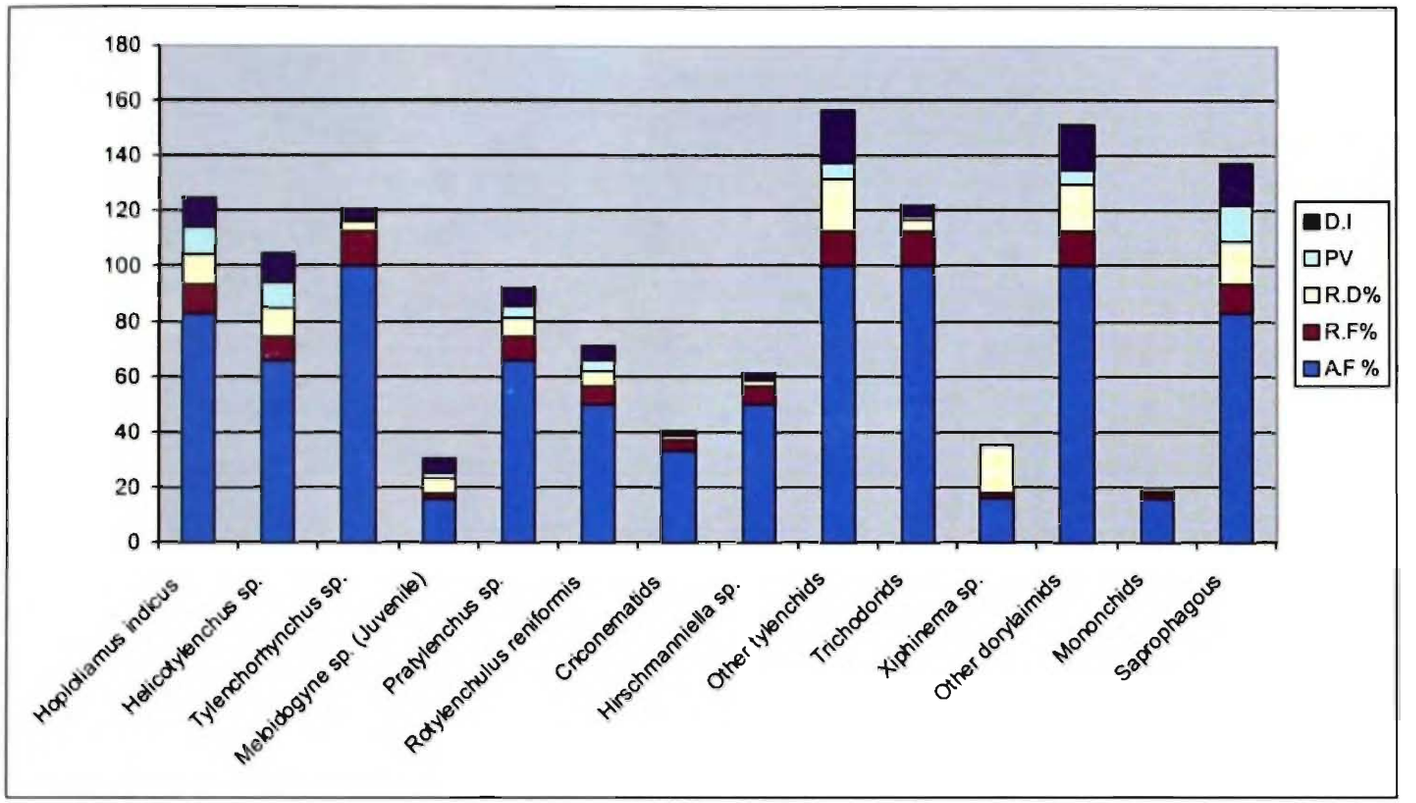


Chart-7 : District : DHOLPUR
(Ornamental Plants)

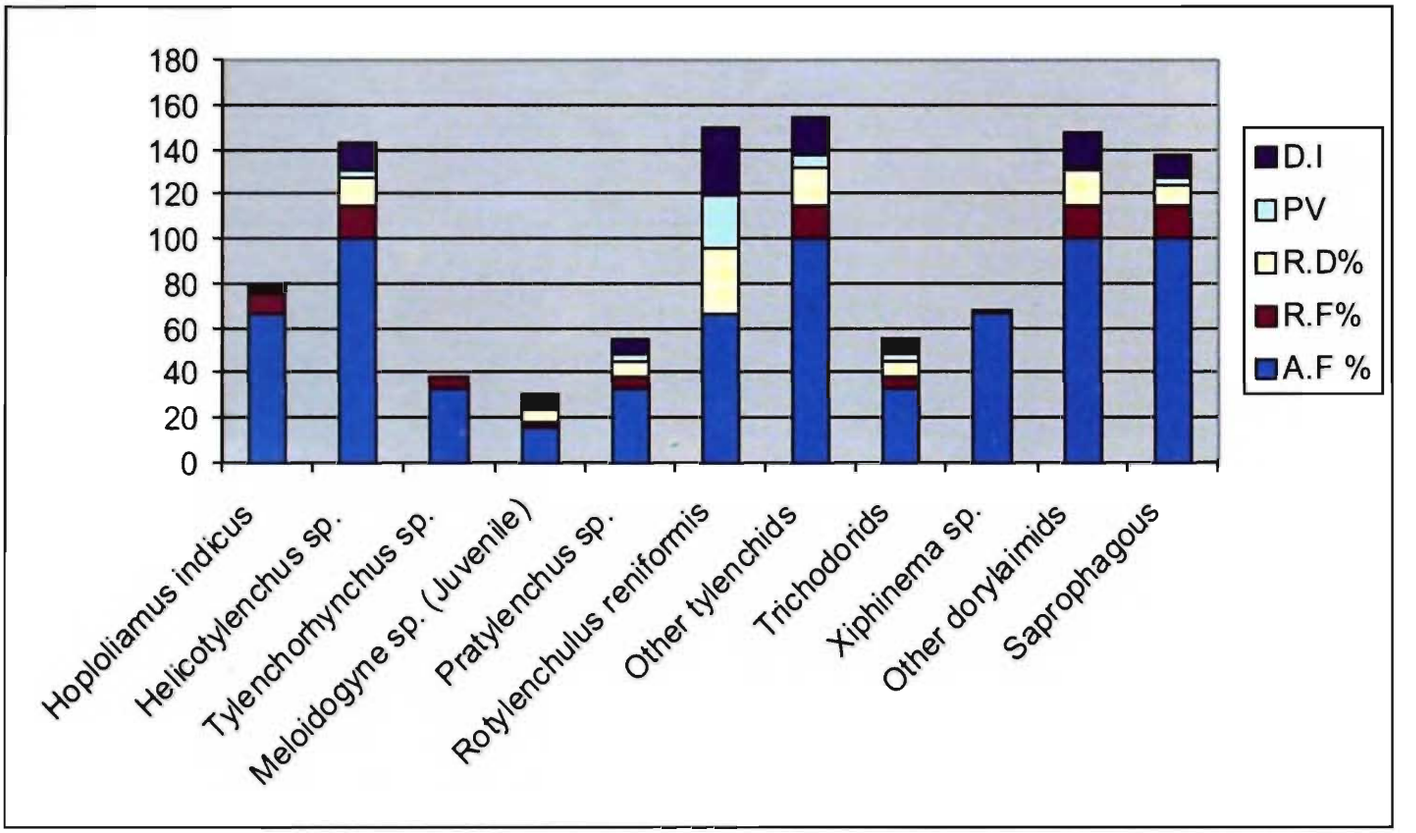


Chart-8 : District : DHOLPUR
(Horticulture Plants)

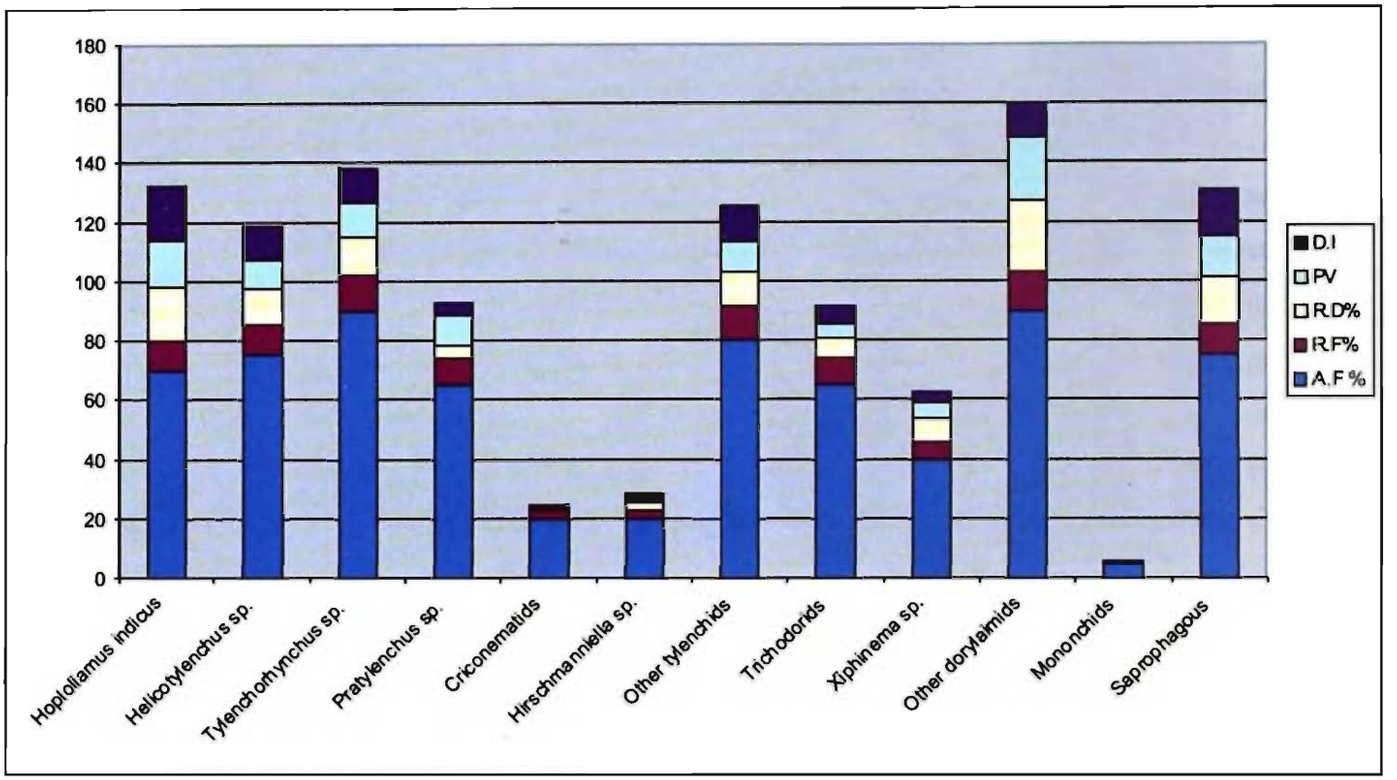
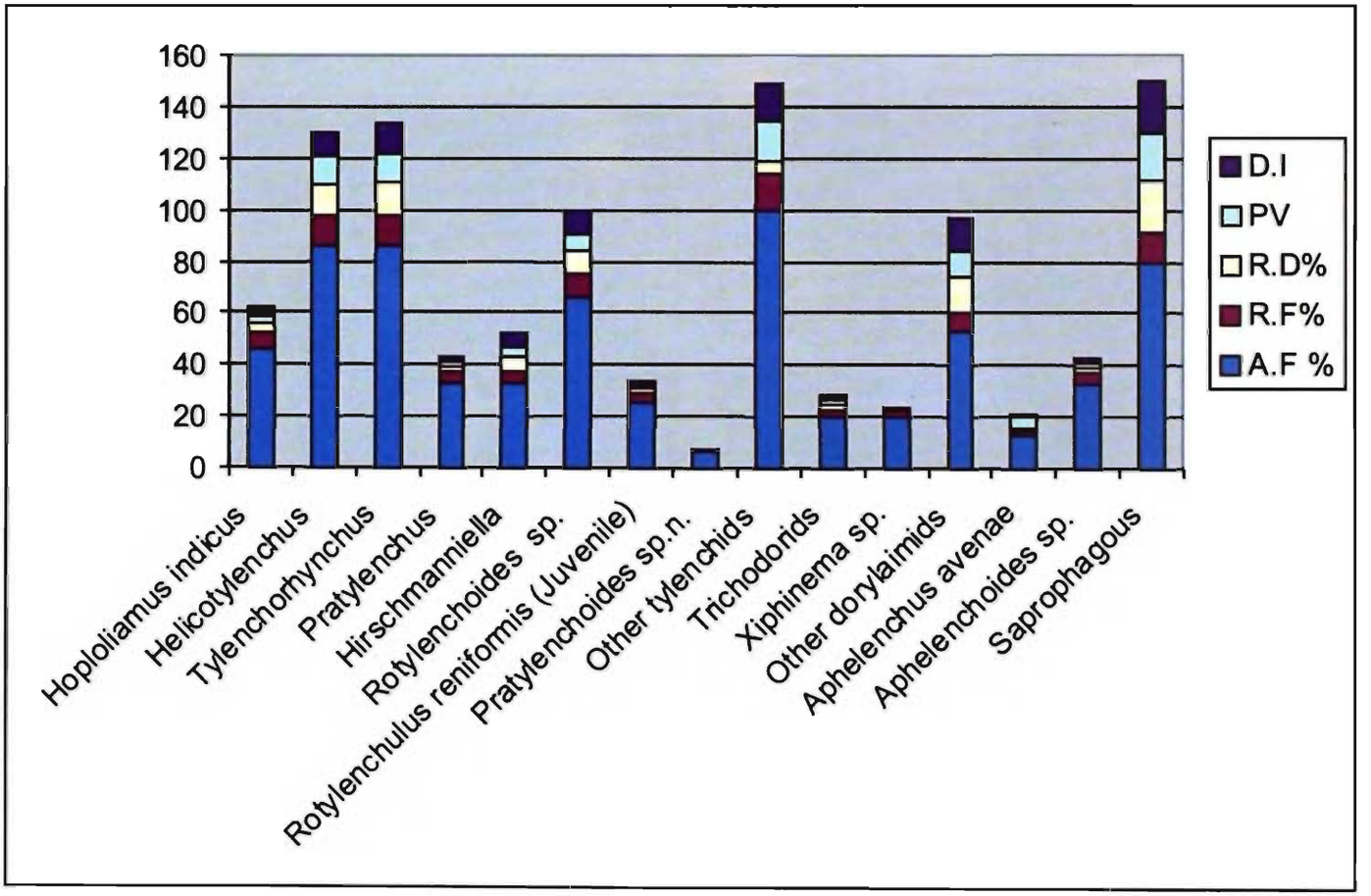


Chart-9 : District : KARAULI
(Cereal Crops)



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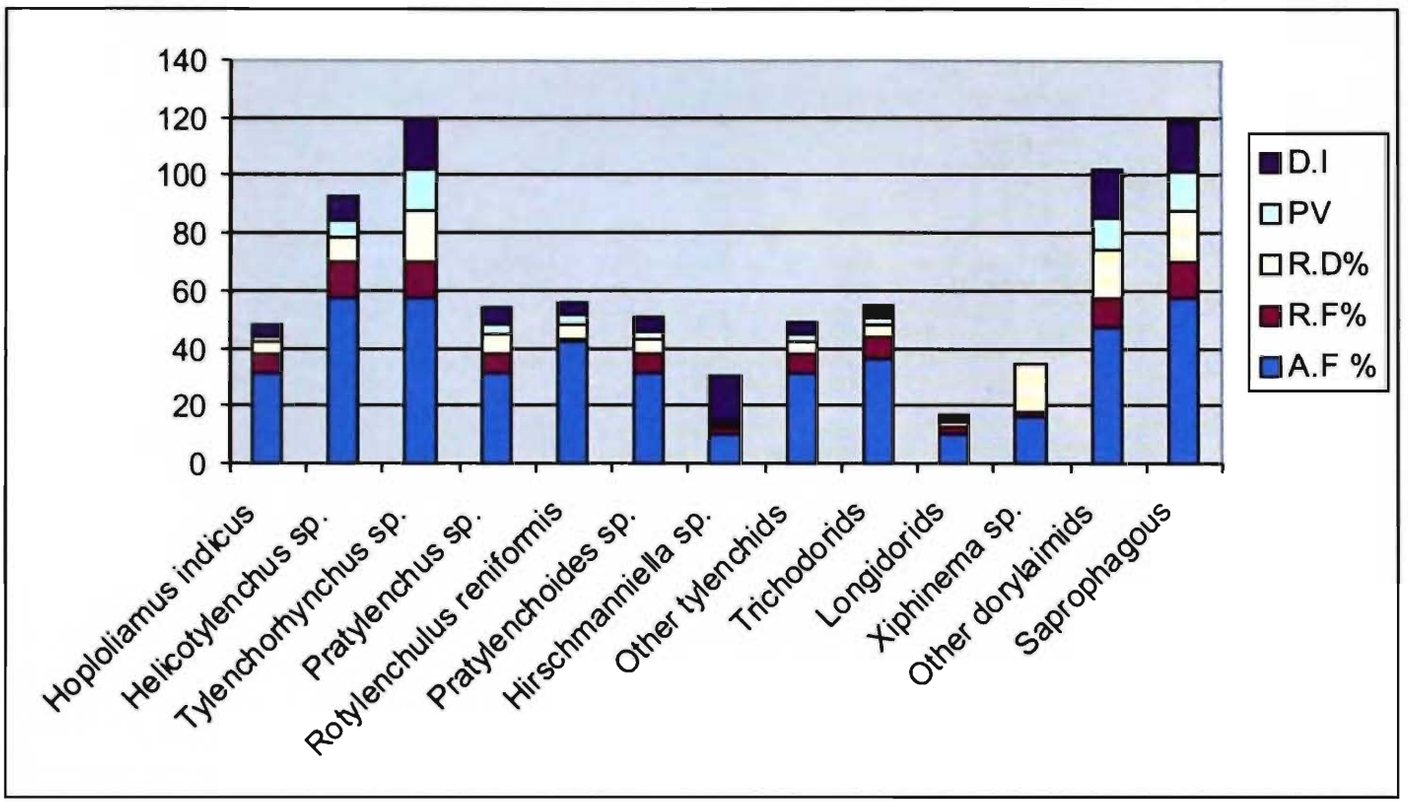

Chart-11 : District : SAWAIMADHOPUR
(Cereal Crops)

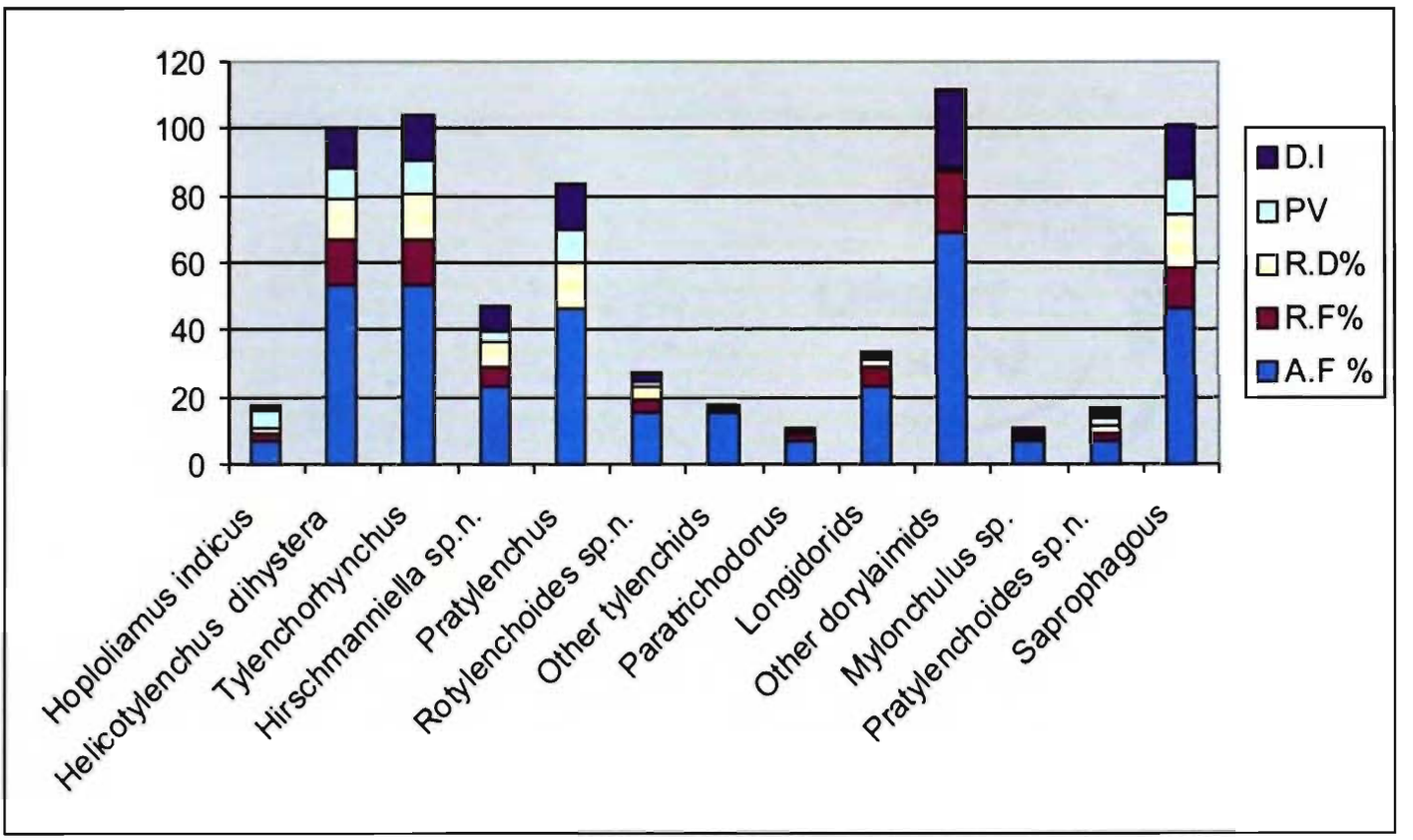

Chart-12 : District : TONK

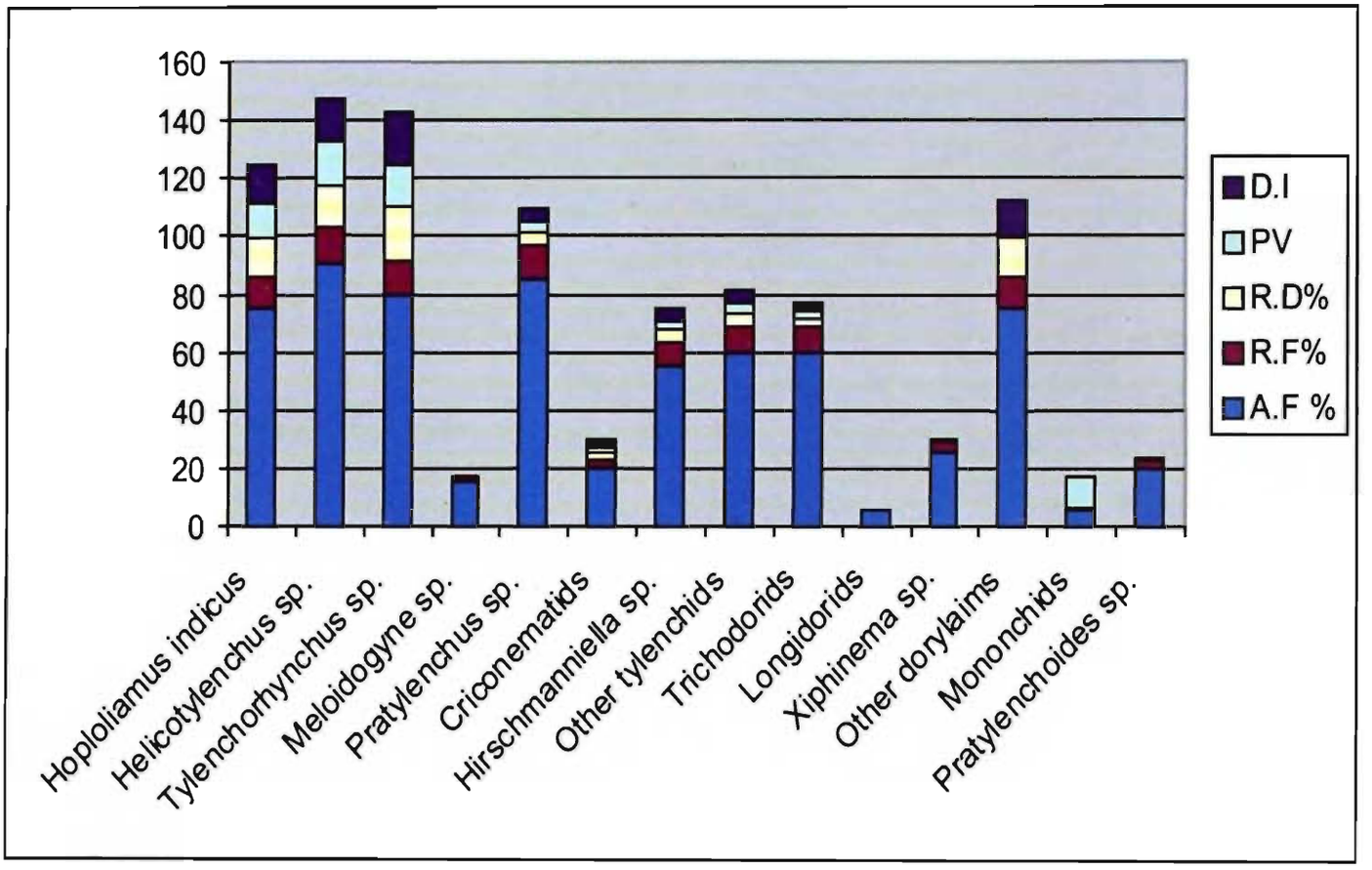

Chart-13 : District : JAIPUR