CHAPTER I

Introduction
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The nematodes contribute one of the most significant group of medical, veterinary and agricultural importance. The most nematodes are free living, inhabit in the soil, fresh or marine water and others parasitic on animals and plants producing enormous diseases. These diseases are problems of considerable magnitude throughout the world particularly in the countries where domestic animals serves as the principal reservoir of infections. There are ample of reasons to believe that most of the infections and parasitic diseases of human race have originated directly or indirectly through animals though once considered to be diseases of rural and sylvatic environments, the nematode parasite occurs in dense and urban area, where these diseases are associated with pet or companion animals like dog, cat and also with exotic pets such as monkey, reptiles, aves and other animals.

The clinical and pathological characteristics of nematodes have many points in common in both man and animals although the localization of lesions, their incidence and their degree of gravity may vary considerably. These differences are mainly related to the species and immune status of the host and portal of
entry of pathogens as well as to the intensity and frequency of the exposure.

The study of morphology of pathogenic nematodes and attempts to establish correlations between these structures and their functions has long led us to the conclusion that nematodes must affect their hosts not only by depriving them of nutrients but particularly by disturbing their normal physiological functions even to the point of producing toxic effects and by causing the breakdown of their defense mechanism.

Extensive survey of animal parasitic nematodes in India has been done by Thapar (1924, 25, 38 & 50) in Fishes, Reptiles and Mammals of Lucknow; Karve (1927, 28, 30, 34, 38, 41 & 44) in Fishes, Amphibian, Reptiles and birds of Lucknow; Bhalerao (1931, 32, 33, 34, 35 & 41) Reptiles and Mammals; Chatterji (1933, 35 & 36) in Lizards; Mirza (1933, 34, 35 & 36) in Reptiles of Hyderabad; Singh (1934 & 48) in birds and Mammals of Hyderabad; Chakravarty (1936, 38, 39 & 42) in Reptiles, birds and Mammals of Kashmir; Agrawal (1938) in _Wallago attu_ of Allahabad; Sarwar (1944, 45, 46) in Mammals; Khera (1954) in Fishes, Amphibia, Reptiles and Mammals of Uttar Pradesh and Ali (1956) in Fishes and birds of Hyderabad.
Plant parasitic nematodes are recognised in the developed countries potentially serious constraints to crop productivity. There is rarely any crop free from nematode attack, whether in the fields, in the kitchen gardens or in greenhouses. These plants parasitic nematodes cause severe damage to cultivated crops. Till now the recognition of nematodes as serious deterrents to crop productivity did not occur in the developing countries like India because of less attention paid by the plant nematologists towards this side. If we are to make our proper contribution to world food problem during the coming years we must have sufficient number of trained nematologists.

In India survey of plant parasitic nematodes started at the beginning of 20th century when Barber (1901) recorded Tea-eelworm from Madras. In earlier survey, however, only the genera of plant parasitic nematodes have been taken into account without making any efforts for identifying the species.

The major genera damaging peanuts are Meloidogyne, Pratylenchus, Belonolaimus and Criconemoides spp. The rootknot nematodes known to damage peanuts are Meloidogyne arenaria, M. hapla, M. javanica. The more important nematode of sugarcane is
the endoparasitic lesion nematode *Pratylenchus*. Lance nematode *Hoplolaimus* is the next important genus widely distributed in the sugarcane belt of India. Presently 45 species of *Meloidogyne* causing root-knot have been described throughout the world of these nine species are reported to infest potatoes. The most important species on a world basis is *M. incognita* followed by *M. javanica*.

Wheat is a major crop throughout the world agriculture. The species like *Heterodera avenae*, *H. latipous*, *H. hordecalis* are known to be pests of wheat. Rice crop is an important food crop of our country. Several genera like *Aphelenchoides*, *Macroposthonia*, *Ditylenchus*, *Heterodera* and *Hirschmaniella* cause loss in the yield of rice in India. Many other important crops like Banana, Coffee, Tea, and vegetable, fruit and related crop, which are important crop of India are damaged by these poly-phagous phytonematodes.

The plant parasitic nematodes are not as host specific as animal parasitic. A single nematode has a wide host range and each parasite may infest almost all the host species. The pattern of life cycle is less variable in comparison to animal parasitic nematodes. The adults are either parasitic or free living but in
either case the infective stages are found living freely in the soil.

In India although the science of nematology is in infancy and our knowledge regarding the distribution of nematodes is very limited. Sen (1958) reported a loss of 70% in Chillies, brinjal, tomato and okra from Sabour. Srivastava and Upadhyay (1973) observed significant loss due to Meloidogyne javanica in the yield of brinjal. An assessment in Rajasthan recently indicated that Heterodera avenae alone causes an annual loss of ₹ 40,000,000.00 in wheat and ₹ 30,000,000.00 in barley due to the molya disease (Seshadria and Dasgupta, 1980). An annual loss of over ₹ 75,000,000.00 is suffered due to the ear-cockle disease caused by Anguina tritici. An annual estimated loss of ₹ 20,000,000.00 is being done to the coffeee industry in south India by the root-lesion nematode Pratylenchus coffeae. The survey of nematode fauna of Madhya Pradesh has completely neglected up till now. It is expected that large scale of surveys in future would provide sufficient information on host-parasite relationship and enable us to work out the quantum of damage and ensuring loss to our national economy.

The bio-ecological aspects of the nematodes help for a better understanding of the pest in planning
out effective control measures. Verma and Prasad (1969) pointed out that high temperature and low humidity appeared to be conductive and optimum for the multiplication of the nematode. Further rise in temperature and fall in relative humidity might have decreased their tolerance to desiccation and thus resulting in the fall of population. The seasonal fluctuation and vertical distribution of nematode populations are important tools for formulating control strategy of these pests.

Little is known about the animal and plant parasitic nematode fauna of Rewa district. Therefore, a thorough and extensive survey of host animals as Fishes, Amphibian, Reptiles, Mammals and plants of kitchen garden, gardens, nurseries and field crops was taken during 1993-1994 to ascertain the nematode pathogens associated with animals and plants in the district Rewa. Although, throughout the years these exceedingly interesting organisms have remained a little known group in the biological complex, principally because of the technical difficulties encountered in isolating and preparing them for detailed microscopic examination necessary in the process of identification.