



Population Dynamics of Plant Parasitic Nematodes Associated with Ornamentals in Agra regions

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Nematodes are a diverse group of worm-like animals. They are found in virtually every environment, both as parasites and as free-living organisms. They are generally minute, but some species can reach several meters in length. This guide focuses specifically on plant parasitic nematodes, which are very small or microscopic, can cause significant damage to crops, and are extremely widespread.

Because nematodes are difficult or impossible to see in the field, and their symptoms are often non-specific, the damage they inflict is often attributed to other, more visible causes. Farmers and researchers alike often underestimate their effects. A general assessment is that plant parasitic nematodes reduce agricultural production by approximately 11% globally [1], reducing production by millions of tonnes every year.

This present study carried out in fields of Agra regions was undertaken to ascertain the prevalence of plant parasitic nematodes genera associated with ornamentals plants.

An extensive survey was carried out during February 2011 – February 2012 for the isolation of plant parasitic nematodes associated with ornamentals and Vegetables plants of Agra regions. Over 200 soil and root samples were collected from 4 ornamentals plants growing in fields, nurseries, home gardens.

Soil samples were taken from the rhizosphere of plants by using a hand shovel from 5 different points on the field while moving in a zigzag pattern and a hole near the base of the roots 15- 30 Cm deep depending upon the plant size. Soil and root samples were collected randomly from plants showing retarded growth, with reduced leaf size and chlorosis of foliage or wilting of plants. One kg soil samples was taken from each plant and kept in polythene bags. Plant and root samples were placed in separate polythene bags, sealed tightly and labeled with details of host, locality and date of collection. Samples were stored at 5-10°C. Nematodes were processed by the following procedure given by [2-3].

For extraction of nematodes from the soil, modified Cobb's sieving and Baermann funnel technique [4] was followed by using a series of sieves (250, 45, 37 mm pore size). Each soil sample was thoroughly mixed and 200cc of Soil was drawn from the homogenous mixtures for processing.

Root samples were washed in cold tap water and blotted dry before being finely chopped with clean scissors. No attempt was made to standardise the amount of roots used. Nematodes were extracted by placing the chopped roots into a single-ply paper tissue supported by a plastic mesh in an open ended funnel suspended over a glass boiling tube. These were placed in a Seinhorst mistifier chamber (5 s on : 4 min 55 s off mist cycle) for 48-72 h [3].

Concentrated nematode suspensions were placed in a glass vial containing minimum quantity of water and the nematodes were killed by adding equal quantity of boiled 40 per cent formalin. After killing and fixing, the nematodes were carefully stored in screw-capped vials as wet collection with proper labels. 3.1.4 Preparation of permanent slides for identification of prevailing nematode. The nematodes got from Cobb's sieving and decanting method were taken in a beaker and were used for making the permanent slides for identification of prevailing nematode. The permanent slides were prepared by killing and fixing method.

On examination of soil and root samples collected during the survey, 6 genera plant parasitic nematodes isolated from ornamentals plants, 8 genera from vegetables and sugarcane were revealed (Table 1,2,3).

Eight genera of plant parasitic nematodes were encountered in soil and root samples collected from five regions of Agra respectively. In the soil and root, plant parasitic nematodes identified were *Pratylenchus* spp., *Meloidogyne* spp., *Rotylenchus* spp., *Radopholus* spp., *Tylenchorrhynchus* spp., *Rotylenchulus* spp., *Radopholus* spp., *Heterodera* spp., and *Helicotylenchus* spp.

The frequently occurring species which was followed by *Meloidogyne* species with (ornamentals plants), while *Pratylenchus* species had frequency rating of (ornamentals), and a population of *Tylenchorrhynchus* spp. *Radopholus* spp., *Rotylenchus* spp., *Heterodera* had the lowest frequency rating associated with ornamentals and vegetables, while significantly population rating higher of *Tylenchorrhynchus* spp., *Rotylenchus* spp., *Heterodera* in sugarcane field than ornamental and vegetable plants [Table - 1]. Some species were not recorded during collection periods such as *Heterodera* spp., *Radopholus* spp., associated with ornamentals..

Root Knot (*Meloidogyne* spp) and root lesion nematodes (*Pratylenchus* species) were the most frequently encountered genus indicated in data.

The results indicated a significant population of plant parasitic nematodes on the different soil texture. The highest population of nematodes was found in areas having sandy soil and lowest population was found in clay soils.

Table: 1- Distribution of Plant Parasitic Nematodes Associated with four Ornamentals Plants in AGRA

Host Association	Nematodes	Distribution
<i>Acalypha</i>	<i>Meloidogyne incognita</i> <i>M. javanica</i> <i>Pratylenchus thornei</i> <i>Rotylenchulus reniformis</i> <i>Tylenchorrhynchus annulatus</i>	ET, SA, JAL, LK JAL, SA FBD, SA, LK LK SA, LK, FBD
<i>Hibiscus rosa-sinensis</i>	<i>Meloidogyne incognita</i> <i>M. javanica</i> <i>Pratylenchus thornei</i> <i>P.roseus</i> <i>P.agilis</i> <i>Rotylenchulus reniformis</i> <i>Tylenchorrhynchus annulatus</i>	ET, SA, JAL FBD, SA LK, JAL, ET, SA, LK, ET, JAL SA ET, LK ET, SA
<i>Jatropha podagrica</i>	<i>Helicotylenchus dihystra</i> <i>Meloidogyne incognita</i> <i>M. javanica</i> <i>P.roseus</i> <i>Rotylenchulus reniformis</i>	ET LK, ET, JAL, FBD ET, LK, JAL, FBD ET, JAL LK
<i>Rosa indica</i>	<i>Meloidogyne incognita</i> <i>M. javanica</i> <i>Pratylenchus coffeae</i> <i>P.roseus</i> <i>P. throni</i> <i>P.agilis</i> <i>Rotylenchulus reniformis</i> <i>Tylenchorrhynchus annulatus</i>	ET, JAL, SA, FBD JAL, SA, LK ET, JAL, SA, LK ET, FBD, JAL JAL, FBD FBD FBD, LK ET, SA

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