

Research Article

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## The distribution and density of stem nematodes in ornamental plants in Mazandaran province

<sup>1\*</sup>Seyed Esmaeil Mahdavian and <sup>2</sup>Farahnaz Jahanshahi

<sup>1</sup>Plant Protection Research Department, Mazandaran Agricultural and Natural Resources Research and Education Center, Agricultural Research, Education and Extension Organization (AREEO), Sari, Iran

<sup>2</sup>Plant Nematology Research Department, Iranian Research Institute of Plant Protection, Agricultural Research, Education and Extension Organization (AREEO), Tehran, Iran

\*Corresponding author E.mail: [ali2003\\_in@yahoo.com](mailto:ali2003_in@yahoo.com)

### Abstract

171 samples of soil and aerial parts of ornamental plants of Mazandaran province collected for identification, distribution and density of stem nematodes: Amol city (7 samples), Tonekaboon (23samples), Ramsar (21samples), Salmanshahr (9 samples), KelarAbad (24 samples), AbasAbad (34samples), Nashtarood (9samples), Nowshahr (34samples) and Hachirood ( 9samples). These samples during 91-94 collected from 74 ornamental plants which related to the 50 different families. Nematodes of leaves and aerial part collected from 5g of leaves by Mixing and centrifugation method. Worm shape nematodes fixed by deformation method and transfer into the pure glycerin and permanent slides prepared by them; therefore morphometric and morphology characteristics identified. Polluted area of nematodes identified after samples investigation, and their frequency determined according to the samples that have intended species.

Investigation of samples that collected from Mazandaran province showed that Salmanshahr (24samples), Abas-Abad (34samples), Nowshahr (34samples), Hachirood (9samples) are contaminated to the *D. dipsaci* nematode. These nematodes were not seen in samples of KelarAAbad, Ramsar, Tonekaboon, Nashtarood, Amol city. *D. dipsaci* nematodes allocated 14 percent of frequency to the samples of Salmanshahr (24 samples) and the most frequency of this nematodes related to the Syngonium and Fetonia flower which has 20 nematodes in 250 CM<sup>3</sup> of soil. *D. dipsaci* nematode has 23 frequency percent in AbasAbad (34 samples) and 190 nematodes in Begonia Rex; this nematodes has 33 frequency percent in Spaty Filum plant of Nowshahr and its maximum disperation was 30 nematodes. Hachirood (9 samples) have 10 nematodes in Cycas plant. 12 out of 74 ornamental plants were host of *D. dipsaci*. 14 samples were contaminated to these nematodes in these nine regions.

### Keywords

Ornamental Plant,  
Nematode,  
Ditylenchus.

### Introduction

Plant parasitic nematode is one of the limiting factors in ornamental plants. Ornamental plants grow in greenhouse and like other products, a lot of nematodes spectrum can damage them. Saser and Forkman (1987)

claimed that 11.1 percent of damage on ornamental plants due to plant parasitic nematodes. Prilliex (1881) was a first person who reported existence of plant parasitic nematodes on ornamental plants. He claimed

that *Ditylenchus dipsaci*, *Tylenchus hyacinthi*) nematodes can cause disease in Hyacinth. Ritzemabos (1880) identified *D. dipsaci* nematode on onions and ornamental flowers. Nypels (1898) collected *D. dipsaci* nematodes from Phlox plant. In 1909, Marcinowski tried to explain nematodes and host plant especially *D. dipsaci* that existed on Hyacinth and phlox. Van Slogteren in 1920s, studied *D. dipsaci* of onion that existed in India. Foxwilson studied existence of *D. dipsaci* on Phlox. *Ditylenchus* spp. Nematodes can be seen on 450 hosts. Ebrahimet. al (2002) identified *Ditylenchus* nematodes on ornamental plants, grass, shrubs and ornamental trees of Arabia country. *Meloidogyne arenaria*, *M. hapla*, *Meloidogyne javanica*, *Ditylenchus dipsaci*, *M. incognita*, *D. trifolii* as well as *Aphelenchoides ritzemabosi* identified on ornamental plants in Italy (Lamberti et al., 1987). Plant parasitic nematodes can cause damage in roots, aerial part of ornamental plants; therefore, their beauty and economic value decrease. Stem nematode reported in *Spathiphyllum* (Costa et al., 2003). 11 plant parasitic nematodes reported in relation to the vegetables, fruit trees and ornamental plant of Egypt (Korayem et al., 2014). Yugoslavia investigated occurrence and spread of parasitic nematodes in ornamental plant and following nematodes reported: *Eteroderfici*, *Meloidogyne* SPP, *Pratylenchus* SPP, *Ditylenchus dipsaci*, *Ritzemabosi* (Grujicic., 1987). Asian lily, clove, chrysanthemums, white gladiolus and tuberose of India country studied and *Meloidogyne*, *Aphelenchoides*, *Ditylenchus* nematodes identified (Borgohain, N. 2016).

## Materials and Methods

171 samples of soil and aerial parts of ornamental plants of Mazandaran province collected for identification, distribution and density of stem nematodes: Amol city (7 samples), Tonekaboon (23 samples), Ramsar (21 samples), Salmanshahr (9 samples), KelarAbad (24 samples), AbasAbad (34 samples), Nashtarood (9 samples), Nowshahr (34 samples) and Hachirood (9 samples). These samples during 91-94 collected from 74 ornamental plants which related to the 50 different families. Nematodes of leaves and aerial part collected from 5g of leaves by Mixing and centrifugation method (Cullen and Dhrd, 1972). Worm shape nematodes fixed by deformation method (1969) and transfer into the pure glycerin and permanent slides prepared by them; therefore morphometry and morphology characteristics identified. Polluted area of nematodes identified after samples investigation, and their

frequency determined according to the samples that have intended species.

## Results

Investigation of samples that collected from Mazandaran province showed that Salmanshahr (24 samples), Abas-Abad (34 samples), Nowshahr (34 samples), Hachirood (9 samples) are contaminated to the *D. dipsaci* nematode. These nematodes were not seen in samples of KelarAAbad, Ramsar, Tonekaboon, Nashtarood, Amol city. *D. dipsaci* nematodes allocated 14 percent of frequency to the samples of Salmanshahr (24 samples) and the most frequency of this nematodes related to the *Syngonium* and *Fetonia* flower which has 20 nematodes in 250 CM<sup>3</sup> of soil. *D. dipsaci* nematode has 23 frequency percent in AbasAbad (34 samples) and 190 nematodes in *Begonia Rex*; this nematodes has 33 frequency percent in *SpatyFilum* plant of Nowshahr and its maximum disperation was 30 nematodes. Hachirood (9 samples) have 10 nematodes in *Cycas* plant. 12 out of 74 ornamental plants were host of *D. dipsaci*. 14 samples were contaminated to these nematodes in these nine regions.

## Discussion

Liliaceae (*Aloe Vera*, grass, *Dracaena*, *Husna*, *Snsvrya*, wheat and *lepturus*) and Araceae (*fig leaf*, *Spathiphyllum*, *Aglaonema*, sweep, *Potosi*, *diphenhydramine Bakhya* and *syngonium*) each with seven plants have the most collected samples in the study. *D. dipsaci* nematode with 8 frequency percent reported in ornamental plant of Mazandaran province. The most population contaminated samples to *D. dipsaci* collected from Nowshahr, in which six samples reported. The most population of these nematodes was 190 that collected from *Begunia* plants of AbasAbad. The lowest amount of contaminated samples collected from Tonekaboon, Ramsar, and Nashtarood has not any contaminated sample. *D. dipsaci* with 22 frequency percent showed the most frequency in Salmanshahr. The capability of the *D. dipsaci* nematode for damaging ornamental plant must be investigated. It is necessary to prevent transportation of flowers pot, risome and flower Flower Bulbs to other sides of country. *Iris sibirica* and *Cycas revolute* increase with Flower Bulbs and they are good host for these species, so preventing transportation of bulbs to other greenhouse, city, and province is an important factor. Soil sterilization can decrease the amount of nematodes, but outdoor plants

Table 14.the host of the nematode, *D. dipsaci* population density, the average population on each host and the number of contaminated samples for each area

The number of sample	Name of the plant	Sampling location(number of samples) and The number of nematodes( <i>D. dipsaci</i> ) per 250 cubic centimeter of soil									
		Amol (7)	Tonek abon(23)	ramsar(21)	Salman Shar (9)	Kelar-Abad(24)	Abbas-abad (34)	Nashta Roud(9)	Noshahr(34)	Hachi Roud (9)	The average population for each plant
6	Peace Lily	×	×	×	×	0	0	×	30	×	30
1	Norfolk Island Pine	×	×	×	×	0	20	×	0	×	20
7	swiss-cheese plant	0	×	×	0	0	0	×	20	×	20
2	Begon	×	×	×	×	×	19 and 20	×	0	×	105
1	willow	×	×	×	×	×	0	×	10	×	10
4	Aluminium Plant	×	×	×	×	0	80 and 20	×	0	×	50
1	Chrysanthemum	×	×	×	×	×	×	×	10	×	10
1	Iris	×	×	×	×	×	×	×	10	×	10
4	Cycas	×	×	0	×	×	0	×	0	10	10
4	Arrowhead vin	×	×	×	20	×	0	×	0	×	20
1	verbena	×	×	×	0	×	×	×	20	×	20
3	Desert privet	×	×	×	20	×	×	×	×	×	20
Number of contaminated samples		0	0	0	2	0	5	0	6	1	Total infection samples 14

in the autumn and winter have low growth, and go to the sleep mode. Root rot and contamination reported and investigation offered, but it has not investigated on laboratory culture.

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