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New Hosts of Root-knot Nematode in Pakistan

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Abstract: Surveys of various crop fields and lawns of Karachi and its vicinity were conducted to record new hosts of root-knot nematode (*Meloidogyne* spp.). Five plant species were reported as new hosts of root-knot nematode *Meloidogyne incognita* and *M. javanica* for the first time from Pakistan.

Key words: Hosts, root-knot, nematode, *M. incognita*, *M. javanica*

Introduction

Root-knot nematode, *Meloidogyne* spp. is one of the most wide-spread nematode pests limiting agricultural productivity all over the world (Taylor and Sasser, 1978). In some developing countries like Pakistan, root-knot nematode infection is so common and wide spread that galled roots are considered "normal" (Saifullah *et al.*, 1990). They are economically important plant pathogens, obligate parasites and parasitize thousands of plant species. So far four species of root-knot nematodes (*Meloidogyne* spp.) have been reported from various hosts in Pakistan. Until now four species of root-knot nematode viz., *M. arenaria*, *M. hapla*, *M. incognita* and *M. javanica* have been recorded on several crops (Maqbool, 1981). The most common species are *M. incognita* and *M. javanica*.

The objective of this study was to record some new hosts of root-knot nematode (*Meloidogyne* spp.).

Materials and Methods

During a survey of plant parasitic nematodes moderate to severe root-knot galling was observed on the roots of some plants including *Amaranthus viridis* Linn., *Chloris barbata* Sw., *Euphorbia clarkeana* Hook. f., *Medicago polymorpha* Linn. and *Portulaca grandiflora* Hook. (CV. mexica) growing in the experimental microplots of the Greenhouse at National Nematological Research Centre, University of Karachi. From each site ten plants were collected. The galled roots were teased with a dissecting needle to release the mature females and other developmental stages of the nematode. The perennial patterns of mature females were prepared, mounted on glass slides (Southey, 1986) and identified on the basis of pictorial key (Eisenback *et al.*, 1981). In *M. incognita*, Kofoid and White (Chitwood, 1949) the perennial pattern showed distinct high dorsal arch composed of smooth and wavy striae, the male head with large and round labial disc centrally concave, generally marked with 2-3 annuls, second stage juveniles length 346-463 (405) μm, tail length 42-62 (52) μm, stylet 14-16(15) μm. In *M. javanica* (Treub) Chitwood 1949 the perennial patterns were rounded with flat and dorsal arch and distinct lateral lines, male head with dumb-bells shaped labial disc and medial lips, marked by one incomplete annule, second stage larvae length 402-560 (488) μm, tail 51-53(50) μm, stylet 14-16 (15) μm. Gall index (GI) was rated on a 0-5 scale (Taylor and Sasser, 1978) as follows: no gall =0; 1-2 gall = 1; 3-10=2; 11-30=3; 31-100=4; more than 100=5.

Results and Discussion

Mixed populations of *M. incognita* and *M. javanica* were recorded on *Amaranthus viridis*, *Portulaca grandiflora* (CV. mexica) and *Chloris barbata*, whereas, *M. incognita* alone was found on *Euphorbia clarkeana* and *M. javanica* on *Medicago polymorpha*, which are reported as hosts for the first time. Five host plants of root-knot nematode and their associated species along with the root-knot index are given in (Table 1). *M. incognita* on *A. viridis* has been previously reported by Soomro *et al.* (1993). Khan *et al.* (1999) have been reported *Hirschmanniella oryzae* and *Tylenchorhynchus annulatus* from *A. viridis*. A survey of the relevant literature (Kafi, 1963; Gul and Saeed, 1987; Maqbool, 1992; Zarina and Abid, 1995; Zarina,1996) suggests that the above mentioned plants are the new host records of root-knot nematodes from Pakistan.

Table 1: Host plants of *Meloidogyne incognita* and/ or *M. javanica* from various sites and their root-knot index (RKI). RKI are given for *Meloidogyne* spp.

Host	Species	Site	RKI
Amaranthus viridis	*M. incognita*	NNRC, Malir	4
	M. javanica	Karachi Univ.	
Chloris barbata	*M. incognita*	NNRC, Nursery	3
	M. javanica	Karachi Univ., CDRI	
Euphorbia clarkeana	*M. incognita*	NNRC, Nursery	3
Medicago polymorpha	*M. javanica*	Karachi Univ.	4
Portulaca grandiflora	*M. incognita*	NNRC,	5
(CV. mexica)	*M. javanica*	Botany Dept. Bhatti Park	

NNRC- National Nematological Research Centre.
CDRI- Cereal Disease Research Institute.
RKI - Root-knot index

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