

Department of Botany, University of Rajasthan — Jaipur 302004, India

## RESPONSE OF CHILLI CULTIVARS TO *MELOIDOGYNE INCOGNITA* AND ITS EFFECT ON MORPHOMETRICS OF FEMALE

by  
R. PANDEY and P.C. TRIVEDI

**Summary.** Ten cultivars of chilli, *Capsicum annum*, were screened for resistance to the root-knot nematode *Meloidogyne incognita*. The cultivar Pusa Jwala was assessed as resistant, Mandore local-1 and 2 as moderately resistant. Morphometrics of females in the tested cultivars showed a linear decrease of body size from susceptible to resistant cultivars, the smallest females being observed in cv. Pusa Jwala.

Considerable losses to chilli (*Capsicum annum* L.) are caused by nematode pathogens in India (Pandey and Trivedi, 1989). Sandy soil and high temperature favour root-knot populations and in the tropics, resistant cultivars are usually the only remedy.

The relative resistance to *Meloidogyne incognita* (Kofoid et White) Chitw. among a range of cultivars was evaluated so that promising cultivar could be selected for use by growers and by breeders in crop improvement programmes.

### Materials and methods

Nine locally grown cultivars of *C. annum* L. and one of *C. frutescens* L. (Table I) were selected. Seeds were surface sterilised in 0.1% HgCl<sub>2</sub> solution and sown in 15 cm pots containing steam sterilised local soil. Three weeks old seedlings were transplanted one per pot. Each cultivar was replicated four times. Pure cultures of *M. incognita* were maintained and multiplied on brinjal plants raised in autoclaved soil. Quantities of clean *M. incognita* eggs were obtained by the method described by Mc Clure et al. (1973). These eggs were hatched in Baermann's funnel and 1000 freshly hatched second stage juveniles were used to inoculate the pots by pouring a suspension of approximately 1000 nematodes into three holes made around the root.

Sixty days after inoculation, plants were uprooted and washed in running water. The effect of nematode infection of the plant was evaluated by counting the number of galls formed on the root system. Final soil populations of the pathogen in the pot soil were determined after extraction by Cobb's sieving and decantation and further passing the

suspension through Baermann's funnel and counting the nematodes thus obtained.

For morphometric studies of the female nematodes, roots of each cultivar were stained in acid-fuchsin for two minutes and destained for forty eight hours in lactophenol. The darkly stained females were then measured with the help of a micrometric lens.

### Results

Each of the ten cultivars showed some degree of galling (Table I). Jaipur local-2 was the most susceptible with maximum number of galls per plant. The only resistant cultivar was Pusa Jwala with minimum number of galls 1-50 per plant. Final soil populations of *M. incognita* per kg of soil expressed a linear trend, which varied from 1053 in resistant Pusa Jwala to 4028 in the highly susceptible Jaipur local-2.

Morphometric studies of adult females in the cultivars showed a linear trend of increasing size with the susceptibility of the cultivar. Thus, the smallest females were observed in resistant Pusa Jwala and largest females in highly susceptible cultivars (Table I). Females were generally pear shaped but were almost rotund in the highly susceptible Jaipur local-1 and NP-46-A.

The authors thank the Council of Scientific and Industrial Research for financial assistance and Head Department of Botany for providing facilities during the course of the study.

TABLE I - *Varietal screening in Capsicum spp. against Meloidogyne incognita.*

Cultivars	Resistance Rating a)	Final soil Population/kg	Morphometrics of adult females ( $\mu\text{m}$ ) length $\times$ width
<i>(C. annuum)</i>			
Jaipur local-1	HS	3700	480-580 $\times$ 500-560
Jaipur local-2	HS	4028	508-640 $\times$ 410-494
Jaipur local-3	S	3084	460-502 $\times$ 402-421
Mandore local-1	MR	2424	416-450 $\times$ 312-492
Mandore local-2	MR	2842	425-516 $\times$ 382-424
Mandore local-3	S	3118	472-498 $\times$ 424-454
NP-46-A	HS	3824	510-543 $\times$ 496-499
Mathania local	MS	3512	475-501 $\times$ 380-483
Pusa Jwala	R	1053	392-463 $\times$ 384-403
<i>(C. frutescens)</i>			
Pusa Sadabahar	MS	2948	454-476 $\times$ 379-463

a) No. of Gall	—	Rating
0	I	Immune
1-50	R	Resistant
51-100	MR	Moderately resistant
101-120	MS	Moderately susceptible
121-200	S	Susceptible
201-and above	HS	Highly susceptible

#### Literature cited

McCLURE M.A., TRUK T.H. and MISAGHI I., 1973 - A method for obtaining quantities of clean *Meloidogyne* eggs. *J. Nematol.*, 5: 230.

PANDEY R. and TRIVEDI P.C., 1989 - Statistical appraisal of plant parasitic nematodes associated with chilli in Jaipur district, Rajasthan, India. *The Indian Zoologist*, 13: 125-129.