

**Interaction of root-knot nematode, *Meloidogyne incognita* (race 1),  
and wilt fungus, *Fusarium oxysporum* f. sp. *ciceri*,  
on chick-pea cultivars**

HOSSEINI NEJAD, S. A. and KHAN, M. W.

Plant Pests and Diseases Research Institute-Tehran

A.M.U. Aligarh- 202002 (U.P.) India

**ABSTRACT**

Interaction of *Meloidogyne incognita* (race 1) and *Fusarium oxysporum* f. sp. *ciceri* was studied on chick-pea cultivars Pusa-212 (resistant to wilt fungus) and Pusa-244 (relatively less susceptible to wilt fungus) under artificial inoculation. Pusa-212 did not exhibit any wilting symptoms even at termination of experiment when inoculated with fungus alone. Synergistic interaction occurred between the pathogens on these cultivars both in concomitant and sequential inoculations. Wilt symptoms appeared and greater wilting occurred in the presence of *M. incognita* (race 1). Synergistic interaction in sequential inoculations was greater than concomitant inoculation. Resistance of Pusa-212 recorded with the inoculation of the fungus alone was broken in the presence of the nematode.

**Key words:** Interaction, *Meloidogyne incognita*, *Fusarium oxysporum* and chick-pea.

**References**

- ALVAREZ, A. M. and Bringer, G.C. 1987. Root-rot of chick-pea caused by *Fusarium solani* (Mart.) Sacc. Agricultura Tecnica, 47: 78-79.

- BIRD, A. F., 1972. Quantitative studies on the growth of syncytia induced in plants by root-knot nematodes. *International Journal of Parasitology*, 2: 157-170.
- CARTER, R. W. 1978. The role of peroxidase and Polyphenoloxidase in the *Meloidogyne-Fusarium* disease complex of tomato. *Dissertation Abstract International*, 39B: 466-467.
- EISENBACK, J.D ; HIRSCHMANN, H. ; SASSER, J. N. and TRIANTAPHYLLOW, A. C. 1981. A more complete characterization of the four most common species of root-knot nematodes (*Meloidogyne* spp.) with a pictorial key. North Carolina State University Graphics, Raleigh 48 pp.
- HASSAN, A., 1993. The role of fungi in fungus-nematode interactions. In: *Nematode Interactions* (Ed. M. Wajid khan), Chapman and Hall Publication, pp. 273-288.
- KHAN, M. W. 1993. Mechanism of interaction between nematodes and other plant pathogens. In: *Nematode Interactions* (Ed. M. Wajid Khan) Chapman and Hall publication, pp. 55-79.
- KHAN, M. W. and HOSSEINI NEJAD, S. A. 1991. Interaction of *Meloidogyne javanica* and *Fusarium oxysporum* f. sp. *ciceri* on some chick-pea cultivars. *Nematologia Mediterranea* 19: 61-63.
- KOTASTHANE, S. R. ; AGRAWAL, P. S. ; JOSHI, L. K. and SINGH, L. 1980. Studies on wilt complex in Bengal gram (*Cicer arietinum*). *Review of Plant Pathology*, 59: 470.
- KUMAR, R. ; AHMAD, S. and SAXENA, S.K. 1988. disease complex in chick-pea involving *Meloidogyne incognita* and *Fusarium oxysporum*. *International Nematology Network Newsletter*, 5: 12-14.
- MAI, W. F. and ABAWI, G. S. 1987. Interaction among root-knot nematodes and *Fusarium* wilt fungi on host plant. *Annual Review of Phytopathology*, 25: 317-338.

- MANI, A. and SETHI, C. L. 1984. Plant growth of chick-pea as influenced by initial inoculum levels of *Meloidogyne incognita*. Indian Journal of Nematology, 14: 41-44.
- MANI, A. and SETHI, C. L. 1985. Reduced lamina, a typical symptom induced by *Fusarium solani* on chick-pea. Indian Phytopathology, 38: 542-543.
- MANI, A. and SETHI, C. L., 1987. Interaction of root-knot nematode, *Meloidogyne incognita* with *Fusarium oxysporum* f. sp. *ciceri* and *F. solani* on chick-pea. Indian Journal of Nematology, 17: 1-6.
- NATH, R. P ; A. K. ; HAIDER, M. G. and SINHA, B. K. 1979. Study of the nematodes of pulse crop in India. I-Pathogenicity of *Meloidogyne incognita* on gram. Indian Phytopathology, 32: 28-32.
- NOUGUERA, G. R. 1980. Growth and germination of spores of *Fusarium oxysporum* f. sp. *lycopersici* in the root extracts of tomato plants infected with *Meloidogyne incognita*. Agronomia Tropical, 30: 305-313.
- PATEL, H. R. ; THAKUR, N. A ; PATEL, B. K. and PATEL, C. C. 1987. Interaction between *Meloidogyne incognita* and *Fusarium oxysporum* f. sp. *ciceri* on chick-pea variety "Chaffa". Indian Journal of Nematology, 17: 124.
- POWELL, N. T. 1971. Interaction of plant parasitic nematodes with other disease causing agents. In: Plant Parasitic Nematodes Vol. II (Eds. Zuckerman, B. M. ; Mai, W. F. and Rohde, R. A.) Academic Press, London 119-136 pp.
- PROT, J. C. 1993. Biochemical and genetic basis of fungal-nematode interactions. In: Nematode Interactions (Ed. M. Wajid Khan), Chapman and Hall, London 288-302 pp.
- SIDHU, G. and WEBSTER, J. M. 1978. Predisposition of tomato to wilt fungus (*Fusarium oxysporum* f. sp. *lycopersici*) by root-knot nematode (*Meloidogyne incognita*). Nematologica, 23: 436-442.
- TAYLOR, A. L. and SASSER, J. N. 1978. Biology, Identification and Control of

- Root-knot Nematodes (*Meloidogyne* spp). North Carolina State University Graphics, Raleigh 111 pp.
- UPADHYAY, K. D. and DWIVEDI KUSUM, 1987. Effect of interaction between *Meloidogyne javanica* and *Fusarium oxysporum* f. sp. *ciceri* on chick-pea. Indian Journal of Nematology, 17: 145-146.
- VAN GUNDY, S. D. ; KIRKPATRICK, J. D. and GOLDEN, J. 1977. The nature and role of metabolic leakage from root-knot nematode galls and infection by *Rhizoctonia solani*. Journal of Nematology, 9: 113-121.
- WANG, L. H. 1973. Biochemical and physiological changes in root exudates, xylem sap and cell permeability of tomato plants infected with *Meloidogyne incognita*. PhD thesis, Purdue University, Indiana.
- Westerlund, F. A. ; Campbell, R. N. and Kimble, K. A. 1974. Fungal root-rot and wilt of chick-pea in California. Phytopathology, 64: 432-436.

---

Addresses of the Authors: Dr. S. A. Hosseini Nejad. Plant Pests and Diseases Research Institute, P. O. Box 1454, 19395 Tehran, Iran.