Root-Knot Nematodes on Indoor Cucumbers in Tripoli Region of Libyan Jamahiriya

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ABSTRACT

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A survey of indoor cucumbers in the Tripoli region conducted during February–March 1980 revealed that root-knot nematode (*Meloidogyne incognita*) was inflicting heavy losses in most areas. Most of the plastic tunnels were heavily infested. The disease ranged from mild to severe. In some tunnels this led to total crop failure. Glasshouses were free from infestation where soil was fumigated prior to cultivation.

Crops of high market value are often produced in glasshouses in cooler regions of areas having a temperate climate. Under these circumstances, species of root-knot nematodes that could not survive outdoors find ideal conditions for multiplication (1). In temperate climates, tomato, cucumber, lettuce, and many ornamentals are heavily attacked in glasshouses by *Meloidogyne incognita, M. javanica*, and *M. arenaria* (1). *M. incognita* is usually the causal organism in cucumbers under glass or plastic because of its preference for higher temperature (2). Lamberti (3) stated that crops of cucumber under glass are occasionally completely destroyed by root-knot nematodes in Italy.

Cucumber is important in Libyan Jamahiriya. It is grown in glasshouses and plastic tunnels by farmers and government establishments for domestic consumption. Despite its damage by root-knot nematodes, no attempt has been made exclusively to study root-knot of indoor cucumbers in Libya. Therefore, it was desirable to study this problem in the Tripoli region where cultivation is most concentrated. The information is presented in this paper.

MATERIALS AND METHODS

Cucumbers grown in plastic tunnels and glasshouses in the Tripoli region were surveyed during February–March 1980. Plant samples were collected at random from 40 plastic tunnels and 10 glasshouses in the cucumber cultivation area. The cropping history, chemicals used prior to sowing, and general condition of the crop were noted.

Roots brought to the laboratory were thoroughly washed and examined for galls. Numbers of galls per root system were counted. Root systems were immersed in an aqueous solution of phloxin B (0.15 g/liter of tap water) for 15 min to stain the egg masses. Root gall index and egg-mass rating were made according to the following scale: 0 = 0, 1 = 1–2, 2 = 3–10, 3 = 11–30, 4 = 31–100, and 5 = more than 100 galls or egg masses per root system (4). Mature females were dissected out from sizable galls, and perineal patterns were prepared for identification from each sample.

RESULTS AND DISCUSSION

Plastic tunnels, semipermanent structures built for growing cucumbers by farmers during winter, were almost invariably infested with root-knot nematode. In Ainzara, Khalat Farjan, and Swani areas where indoor cultivation of cucumber was more extensive, all but two plastic tunnel plantations were infected. Cucumbers in plastic tunnels at Qasre-Benghasir and Tajora were also infected. In some tunnels, seedlings or very young plants showed well-developed, recognizable galls (Fig. 1). The infection of plants varied from mild to severe. Cucumbers in two plastic tunnels at Airport Road, however, were free from infection (Table 1).

No nematicide was used in most of the plastic tunnels prior to cultivation. In some tunnels, cucumber was grown consecutively for 3–4 yr. Some had an infection history for the last 3–4 yr.

Cucumbers in glasshouses maintained by government establishments at Gharabuli and Tajora and some maintained privately by farmers were free from infection. The apparent reasons for infection-free glasshouses seemed to be the use of nematicides before cultivation, less chances of contamination from outside sources, and proper maintenance. Plastic tunnels were not so well maintained and had the chance of contamination, whereas no use of nematicides or use of less effective ones allowed more survival and multiplication of nematodes. In three plastic tunnels at Tajora, total crop failure from root-knot occurred. In other plastic tunnels, the damage was estimated between 25 and 80%.

Root-knot nematode reproduced well as indicated by egg-mass index, and well-developed galls were formed. The root-gall and egg-mass indexes were identical, varying from 2 to 5 (Table 1).

The perineal patterns of females from each location surveyed showed the characteristics of *M. incognita* (Kofoid & White) Chitwood. In other parts of the

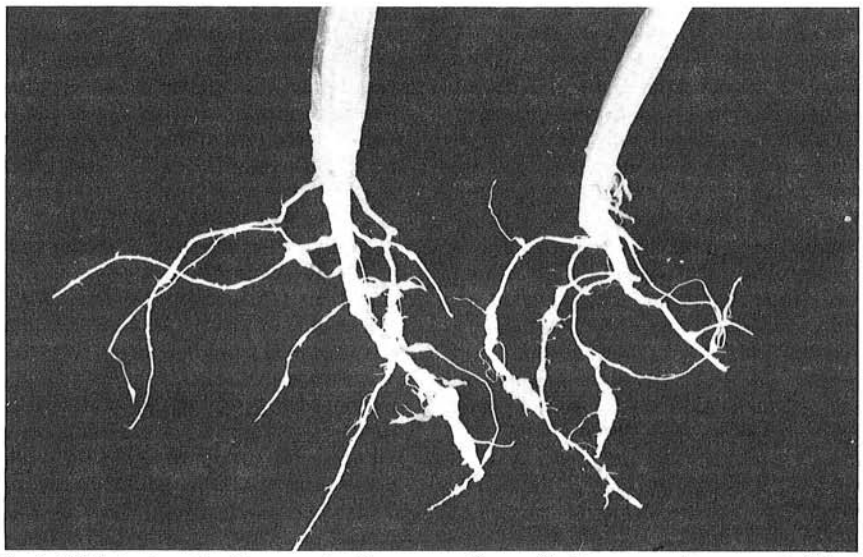

Fig. 1. Well-developed galls on roots of young seedlings of indoor cucumber grown in Tripoli region of Libya.

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Table 1. *Meloidogyne incognita* infection of indoor cucumbers in different localities of the Tripoli region

Locality	Units surveyed (no.)	Infestation (%)[a]	Root-gall or egg-mass index
Ainzara	17	87	2–5
Gharabuli	2	0	0
Qasre-Benghasir	1	100	2
Khalat-Farjan	10	50	3–5
Airport Road	1	0	0
Swani	15	100	3–5
Tajora	8	38	5

[a] Calculated on the basis of number of cultivation units surveyed in each locality.

world, *M. arenaria* and *M. javanica* also infect indoor cucumbers (1).

The environmental conditions available to *M. incognita* in plastic tunnels in this area were suitable for multiplication and survival on crops such as cucumber. Cucumbers succumb easily to the damage caused by *M. incognita*. The root-knot problem on indoor cucumbers in the Tripoli area is alarming, inflicting heavy losses to the growers.

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