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OBSERVATIONS ON INFECTIONS OF *PRATYLENCHUS SCRIBNERI* IN MAIZE ROOTS¹

by
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Summary. Maize root-rot caused by *Pratylenchus scribneri* is widespread in the northern provinces of China. Inoculation of the nematode on excised maize roots in aseptic conditions caused extensive destruction of cortex and epidermis.

Maize-root-rot disease caused by *Pratylenchus scribneri* Steiner has been identified in China and is widespread in the northern provinces (Gao, Cheng and Fang, unpublished information). There is a little published information on *P. scribneri* infestation of crop plants and therefore a study has been made of the infestation of maize (*Zea mays* L.) by the nematode under aseptic conditions, which is reported here.

Materials and methods

P. scribneri were recovered from a maize field at Zhengding county, Heibei province and were increased on "Lingdan 9" maize in the glasshouse. They were then extracted. The infection process of *P. scribneri* in excised roots was evaluated in "Lingdan 9" maize on sterile cultures. 0.75% water agar (Mountain, 1955) and White's (1943) media were prepared and autoclaved for 20 min. Maize seeds were surface sterilized by rinsing in 70% aqueous HgCl₂ for 15 min. After 10 rinses in sterile distilled water, individual seeds were placed on 0.75% water agar in petri dishes which were then stored until the seeds had sprouted and the root had elongated sufficiently. Roots 3-4 cm long were excised and 1-5 placed on White's agar medium in petri dishes.

Nematodes for inoculation were surface sterilized by incubating in a solution containing streptomycin sulfate (1000 units/ml), penicillin (800 units/ml) and actidion (15

µg/ml) for 20 min., followed by five rinses in sterile distilled water. Twenty petri dishes containing excised maize roots were each inoculated with a suspension of 400 nematodes of mixed life stages. Uninoculated ones were used as controls. After inoculation, the dishes were sealed with parafilm and stored in darkness at 28 °C for 60 days. *P. scribneri* infection of the roots was observed under a Nikon stereomicroscope at 1 day intervals for the first week after inoculation and at 7 day intervals thereafter. Roots were removed at the same time intervals, stained with acid fuchsin (Hopper, 1986) and examined with Olympus microscope.

Results

Both females and juveniles migrated to the root after inoculation. On reaching the surface of the roots, the nematodes spread along the roots. Before penetrating the roots, females usually laid some eggs in the medium beside the roots. Eggs hatched in 7 to 9 days. The nematodes frequently aggregated on the root tips and at the junction of the main and young lateral roots. Both female and juveniles directly penetrated into the roots through the epidermis. Females laid eggs mainly inside the roots. Females and juveniles were located solely within the cortex and generally were oriented longitudinally to the vascular cylinder. About one month after inoculation, numerous *P. scribneri* left the roots, and reinfected other roots. Nematode feeding and migration in the roots caused extensive destruction of

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cortex and epidermis. Maize roots infected by *P. scribneri* showed discrete small yellowish necrotic lesions which extended and combined to form large brown necrotic lesions.

Discussion

These observations confirmed that direct penetrations and infections of *P. scribneri* in maize roots resulted in destruction of the cortex and necrosis of the roots (Waudou and Norton, 1986), thus further verifying the pathogenicity of *P. scribneri* on maize. The aggregation of *P. scribneri* at the root tips and the junction of the main and young lateral roots is a possible explanation of the extensively pruned root systems observed on maize (Waudou and Norton, 1986). In addition, numerous specimens of *P. scribneri*

from monoxenic culture were observed. No males were ever found throughout the study.

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