RESEARCH NOTES

Identification of Field Populations of *Meloidogyne* spp. by Chromosome Number[1]

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Identification of species of *Meloidogyne* Goeldi, 1887 is frequently accomplished by using perineal patterns and morphometrics, but intraspecific populations are not easily distinguished. Chromosome numbers have been determined for 10 (6) of the 36 species of *Meloidogyne* which are currently recognized (1, 5). Four of these species have a range of chromosome numbers. This chromosome range permits the identification of 19 chromosomal populations among *M. arenaria* (Neal, 1889) Chitwood, 1949; *M. hapla* Chitwood, 1949; *M. incognita* (Kofoid and White, 1919) Chitwood, 1949; and *M. javanica* (Treub, 1885) Chitwood, 1949.

The purpose of this study was to identify *Meloidogyne* spp. present in 0.2 ha of a 37-year-old vineyard of own-rooted grape vines (*Vitis vinifera* L., 'Thompson Seedless') on McCall Avenue, Selma, California. The use of perineal patterns alone to identify species of *Meloidogyne* was unsatisfactory for an analysis of nematode community structure (3, 4).

Soil samples were taken from the root zones of six vines chosen at random from 200 vines. Forty samples were taken from each vine site with a 7.5-cm diam auger (3). These 240 soil samples (Hanford sandy loam: 54.6% sand, 27.5% silt, 17.9% clay) were pooled. Eight tomato plants (*Lycopersicon esculentum* L., 'Pearson') were grown in subsamples of this vineyard soil. Sixty single egg-mass cultures were established on 'Pearson' tomato in the greenhouse. The females which produced these egg masses were dissected from root-gall tissue. Chromosome analyses were performed on these females according to the method of Triantaphyllou (7), and perineal patterns were cut from the empty cuticles. After 6 weeks, each culture was examined for chromosome number and perineal patterns.

Six chromosomal populations representing four species of *Meloidogyne* were detected. Chromosome numbers of 43, 47, 42, 37, 52, and 17 indicated, respectively, *M. javanica, M. javanica, M. incognita, M. arenaria* (2*n* form), *M. arenaria* (3*n* form), and *M. hapla* race A. Forty-three chromosomes indicated either *M. javanica* or *M. incognita,* but the perineal patterns of *M. javanica* were always typical.

These six populations of *Meloidogyne* represent a more complex mixture of populations than is usually recognized in an area of cultivated soil as small as 0.2 ha. In situations of this nature, the use of perineal patterns alone may result in identification of the species present. However, intraspecific variation may not be detected (2).

Cultural practices (such as crop rotation) or resistant cultivars are frequently designed to provide nonhosts or poor hosts for a rather narrow genetic base for virulence. It would be valuable, in future research, to determine whether different chromosome numbers within a species are correlated with different host ranges and pathogenicity. This information could be used in designing crop rotation systems or in evaluating plant resistance in breeding programs.

Received for publication 29 June 1976.
[1]Supported by USDA/CSRS grant no. 316-15-63.
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