C, the soil temp balance was shifted in favor of the host rather than the nematode pest. The application of a nitrogen fertilizer at planting time or shortly thereafter, improved and extended the advantage of host over pest. Unfortunately, no host resistance appears to be available in the commercial varieties used in this region. Some of the new short-stemmed cultivars do show improved root vigor and many add host tolerance to the above practices. Additional screening of the wild wheats is being continued to seek host resistance or tolerance. There is also some information to indicate that certain crop rotations favor the nematode pest while others are unfavorable. A wheat-fallow-wheat rotation should be avoided on fields known to be infested with the nematode.

One key element which is missing at present from the pest management programs being conducted in Mexico, is a nematode survey, detection, and advisory service. At present there is no way for the grower to determine the level of nematodes in his fields and thereby make management decisions on crop rotation, planting date, fertilizer practices, and wheat cultivar to be planted.

LITERATURE CITED


A Description of Males of Hoplolaimus columbus

GEORGE FASSULIOTIS1

Abstract. The male of the Columbia lance nematode, Hoplolaimus columbus, is described and illustrated from a harvested soybean field in Holly Hill, South Carolina. It is morphologically similar to the female, except for reproductive structures. Key Words: lance nematode, males, soybean.

Males have been described from only five of the 15 recognized species in the genus Hoplolaimus (2, 5). The Columbia lance nematode, H. columbus Sher, 1963, is rapidly being recognized as a severe pathogen to soybean and cotton in the Coastal Plain of Georgia and South Carolina (1). Many soil samples from infested fields along the middle and upper Coastal Plain of South Carolina over the past five years failed to reveal males among thousands of specimens observed. However, samples from a harvested soybean field near Holly Hill, South Carolina, taken in January and February, 1973, revealed males in the ratio of one to 60 females. Females from the Holly Hill population were similar to the

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type population from Eastover, South Carolina, except for some minor variability.

Specimens extracted by the sugar-flotation method were killed in hot water, fixed in formalin-propionic acid 4:1, and processed in glycerine (3, 4).

_Stepholaimus columbus_ Sher, 1963, males

Fig. 1 A-D

**Measurements:** Length 1.31 mm (1.15-1.40, n = 8); a = 31.9 (25.9-39.2, n = 8); b = 10.9 (9.58-12.18, n = 8); c = 29.9 (26.8-33.1, n = 7); stylet = 42 μm (40.2-43.7, n = 8); o = 5.2 (4.8-5.2, n = 2); anterior phasmid = 38% (35.4-42.2, n = 5); posterior phasmid = 82% (79.7-83.2, n = 5); spicules = 46.8 (36.6-52.5, n = 8); gubernaculum = 21.3 (19.5-23.2, n = 6).

Body shape and general morphology similar to female, except for reproductive structures. When relaxed with heat, body assumed a slight ventral arc. Lip region with 3 or 4 annules. Often the constriction between the basal annule and the second annule of the lip region was indistinct and appeared as one. En face view of two specimens showed 7-8 longitudinal lines. Basal plate with 2 sub-dorsal, 2 sub-ventral and 2 lateral arms; lateral arms tripartite. Stylet knobs with two anterior projecting processes; spear opening ventral and subterminal. Esophageal glands with six nuclei, two of which were often indistinct. Excretory pore anterior or posterior to esophago-intestinal valve. Hemizonid two to eight annules posterior to excretory pore. Hemizonion 10 annules posterior to hemizonid. Anterior phasmid 38% from anterior end of body. No lateral lines present. Gubernaculum troughlike, with distinct titillae; spicules arcuate and with a very thin velum, seen when spicules were extended. Telamon distinct, and lying between the spicules. Bursa beginning at about the anterior end of the spicules and extending around the tip of the tail.

The females of _H. columbus_ from Holly Hill did not differ morphologically from the type species from Eastover, except for the stylet which averaged 43 μm (42-45) (Holly Hill) compared to 46 μm (40-48) (Eastover) and for the hemizonid which was separated from the excretory pore by 7-8 annules (Holly Hill), compared to 2-5 annules (Eastover).

Slides of the males and females from Holly Hill, South Carolina have been deposited at the United States Department of Agriculture Nematode Collection, Beltsville, Maryland and at the University of California Nematode Survey Collection, Davis.

**LITERATURE CITED**

1. FASSULIOTIS, G. J. RAU, and F. H. SMITH. 1968. Stepholaimus columbus: A nematode

Nematode Community Structure of Forest Woodlots: III. Ordinations of Taxonomic Groups and Biomass

S. R. JOHNSON, J. M. FERRIS and V. R. FERRIS

Abstract: Nematode communities of 18 Indiana mixed hardwood stands were comprised of an average of 23% tylenchid species, 31% dorylaimid species, and 46% species of six other orders. Based on total numbers of individuals present the stands averaged 42% tylenchids, 20% dorylaimids, and 38% individuals of other orders. Ordination of the sites using data only for tylenchid species gave an even distribution of sites, indicating little effect of site disturbances on tylenchid populations. By contrast an ordination using data for dorylaimid species showed a high degree of dissimilarity between reference sites indicating that disturbances at some sites had drastically affected the dorylaimid fauna. An ordination utilizing biomass of all species present was very similar to the ordination based on data for dorylaimid species only. Key Words: Indiana hardwood stands; Tylenchida; Dorylaimida; Rhabditida; Teratocephalida; Araeolaimida; Monhysterida; Chromadorida; Enoplida.

Within recent years interest has increased in the study of nematode faunas of natural habitats (8,9,14,16,17,18) because such knowledge is an essential step in the evaluation of the role of nematodes in the soil (5,18). Several techniques have been suggested for analysis of nematode faunas, including Yeates' (18) technique for indicating relative diversity and relative abundance of species; and the clustering techniques used by the present authors and by Schmitt and Norton (6,8,9,14).

Previous papers of this series (8,9) demonstrated by two different clustering techniques that nematode communities in mixed hardwood stands can be related to forest types, successional stages of the tree communities, and to major soil characteristics. Of the techniques used, community ordination gave the most information regarding the relationships. It was thought that a more meaningful interpretation of intersite relationships might be made if additional information regarding the taxonomic structure of the nematode communities were obtained, and if further ordinations were performed in which taxonomically related groups of nematodes were analyzed separately. Moreover, in view of an increasing emphasis on a consideration of biomass in decomposer processes (4,13,17), an additional ordination utilizing total biomass of each species in the community would provide information on relative species importance when biomass is a major consideration in an ecological study.

MATERIALS AND METHODS

Analysis of taxonomic structure and biomass: Details of the study area of 18 Indiana mixed hardwood stands of varying plant composition, soils, physiography, and past management practices has been given (9). Site characteristics are summarized in Table 1. Methods for sampling each site three times during each of 2 yr, for processing, identifying, and counting specimens, as well as a list of all species recovered, have been given elsewhere (8,9). In the present study, a Fortran IV computer program was written to sum the total numbers of species and individuals belonging to the Tylenchida, the Dorylaimida, and to a third group comprising the six remaining orders represented (Rhabditida, Teratocephalida, Araeolaimida, Monhysterida, Chromadorida, and Enoplida). A second computer program was