LARGE PHASMIDS IN THE FEMALE OF *MELOIDOGYNE ETHIOPICA* WHITEHEAD

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The root-knot nematode, *Meloidogyne ethiopica* Whitehead, 1968, was described from a single egg mass culture on tomato (type host) from the Mlalo region, Lushoto District, Tanga Province, Tanzania (type locality); cowpea was also given as a host. In doing so, Whitehead (1968) at the same time studied specimens of this species from a single egg mass culture on tomato sent from Southern Rhodesia (now Zimbabwe) and slides from South Africa; both of these populations had been previously identified by the senders as *M. arenaria* (Neal, 1889) Chitwood, 1949. In the original description, the perineal patterns of *M. ethiopica* were characterized as varying from *M. arenaria* type to " *acrita* " type of *M. incognita* (Kofoid & White, 1919) Chitwood, 1949, this being the case even with specimens from single egg mass cultures. It seems possible that the nature of the perineal pattern of *M. ethiopica* might sometimes have made its accurate identification difficult or impossible, especially in the absence of other highly distinctive features of the female. *M. ethiopica* was collected and reported again by Whitehead (1969) from the Mlalo region of Tanzania on bean *(Vicia faba),* black wattle *(Acacia mearnsii),* cabbage, pepper *(Capsicum frutescens),* potato, pumpkin and tobacco. Jepson (1987) discussed this species but had no further information on its distribution and hosts. However, O'Bannon (1975) found *M. ethiopica* in two locations in Ethiopia; on Awasa Road, specimens were collected from lettuce, soybean, sisal and three weeds *(Ageratum conyzoides, Datura stramonium, Solanum nigrum);* and at the Tendaho-Dubte Estate only very few specimens were recovered from a cotton sample.

In studying an unidentified *Meloidogyne* species on strawberry having perineal patterns with some similarities to *M. arenaria* and *M. incognita* (1989), I obtained for comparison a type slide of *M. ethiopica* containing about ten perineal patterns. [Photomicrographs of the patterns were made with an automatic 35 mm camera attached to a compound microscope with differential interference contrast.] Upon examination, it was obvious that the phasmids were large and distinct and with a conspicuous phasmidial canal (Fig. 1). They averaged 24 µm apart based on these few patterns. Size of the phasmids of this species was not mentioned in the original description or by Jepson (1987). Thus, the female phasmids in *M. ethiopica* offer a good diagnostic character for differentiating this species from *M. arenaria* and *M. incognita* both of which have small, indistinct phasmids and phasmidial canals difficult to observe. This was further confirmed by examination of females from several populations of *M. incognita* on hand from various sources, and races 1 and 2 of *M. arenaria.* Following are ten other root-knot species reported either by the original authors and/or by Jepson (1987) to have large phasmids in the female : *M. californiensis* Abdel-Rahman & Maggenti, 1987; *M. kikuyensis* De Grisse, 1960; *M. kongi* Yang *et al.*, 1988; *M. mali* Itoh *et al.*, 1969; *M. naasi* Franklin, 1965; *M. nataliei* Golden *et al.*, 1981; *M. oteifae* Elmiligy, 1968; *M. ottersoni* (Thorne, 1969) Franklin, 1971; *M. propora* Spaull, 1977; *M. sewelli* Mulvey & Anderson, 1980. Specimens of these species (except *M. kikuyensis* and *M. kongi)* from the USDA Nematode Collection were examined and showed large, distinct phasmid.

Recently Way (1990) raised a question about the presence of *M. ethiopica* in Zimbabwe and suggested the possibility that this species might in fact be race 2 of *M. arenaria.* This does not seem at all likely in view of the difference in size and prominence of female phasmids in these two species; and also the body and tail lengths of the juveniles in *M. arenaria* are much greater than those of *M. ethiopica,* among other characters.

It seems that the nature of the female phasmids in *M. ethiopica* will be useful as a diagnostic character in separating this species from *M. arenaria* and *M. incognita;* and furthermore, this prominent structure in the other ten species noted above can be utilized to good advantage in identifying these species also.

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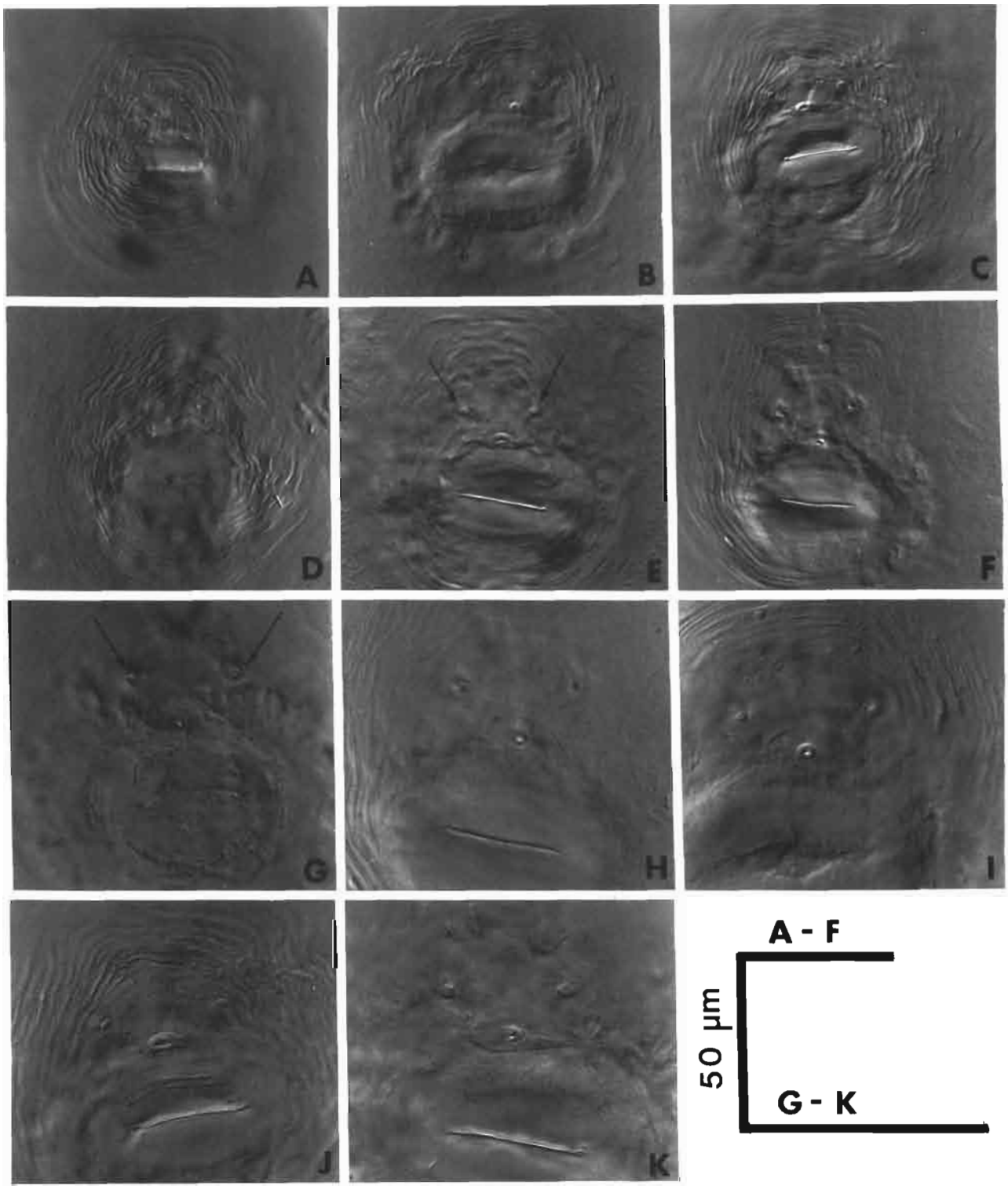

Fig. 1. *Meloidogyne ethiopica* Whitehead, 1968. Photomicrographs of perineal patterns of type specimens. A-F : Patterns of five different females, with focus on patterns in some and more on phasmids in others; G-K : Higher magnification of five perineal patterns, with focus primarily on phasmids (H and J are the same patterns as F and C, respectively). Arrows denote phasmids.

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