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RELATIVE RATES OF EGG HATCH OF THE ROOT-KNOT NEMATODE OF MATURE TEA, *MELOIDOGYNE BREVICAUDA*, IN RELATION TO OTHER SPECIES OF THIS NEMATODE

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The mature females of the root-knot nematode of mature tea, *Meloidogyne brevicauda*, are extremely large, however, most of them are found devoid of eggs sacs or when present, with only a very few eggs. The results of the present investigation have shown that, in relation to the commoner species of root-knot nematodes, the rate of egg hatch of M. brevicauda is only 10.1 ± 11.3 larvae per egg mass, whilst the rate amongst the other species is very much higher, being in the order of 200 to 600 larvae per egg mass.

INTRODUCTION

Root-knot nematodes (*Meloidogyne* species) are amongst the most commonly encountered nematodes in tea growing areas and of these, *Meloidogyne brevicauda* is the only species that is known to attack mature tea. This species has so far been recorded only in Sri Lanka (Loos, 1953; Hutchinson & Vythilingam, 1963; Sivapalan, 1967, 1972). The mature females of this species of nematodes are extremely large (Fig. 1) and one expects to find large numbers of eggs. However, the spread of infestation is observed to be very slow and the attack is found confined to only the very old mature seedling fields.

Investigations were carried out to study the extent of egg-hatch in this species of nemotode as compared to that amongst the commoner species of root-knot nematodes, M. incognita, M. javanica and also amongst the relatively rarer species, M. arenaria & M. hapla.

MATERIALS AND METHODS

Twenty egg masses of *M. brevicauda* were removed from mature females dissected out of galled tea roots and each was kept separately in individual BPI dishes (Bureau of Plant Industry, USA) containing distilled water, to observe hatching. Twenty egg masses each of *M. incognita, M. javanica, M. arenaria* and *M. hapla* were also dissected out and kept individually in BPI dishes, as mentioned above. Daily observations of egg hatch were made for a period of five weeks in the laboratory maintained at 21° ± 2°C and at a mean R.H. of 60%, until hatching ceased completely.

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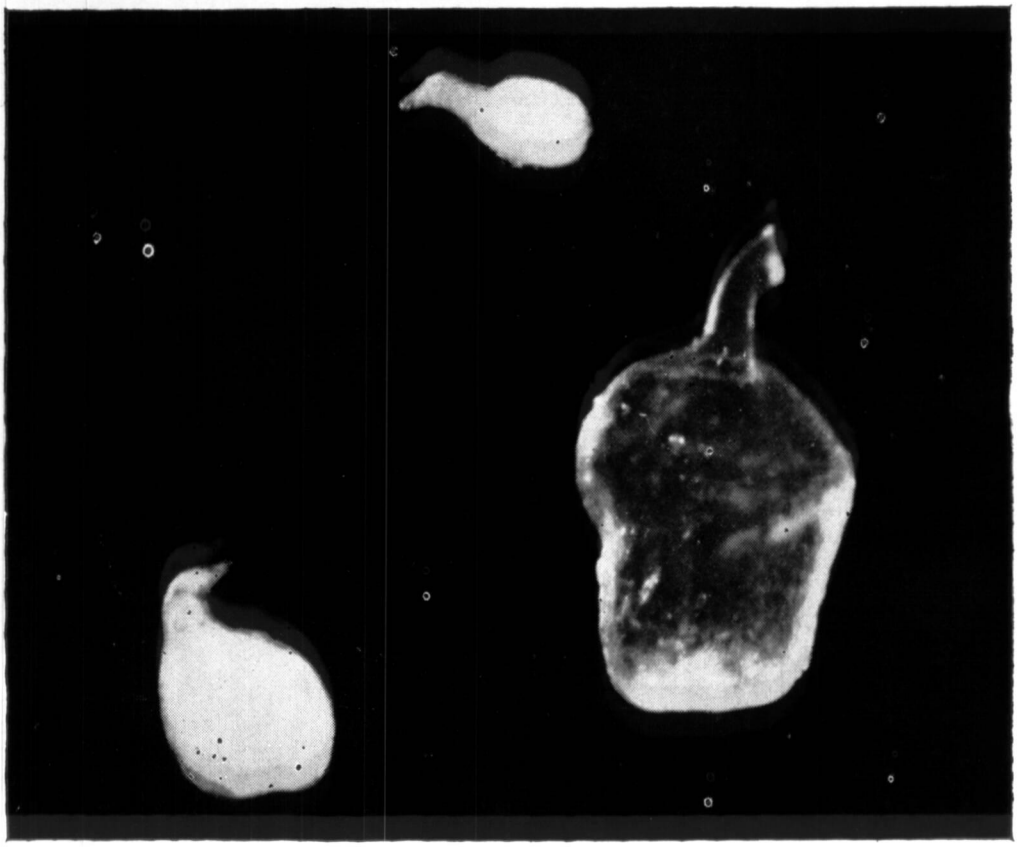

Fig. 1. — Relative size differences of mature females of Meloidogyne brevicauda (right) as compared with those of M. incognita (left)

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RESULTS

The results of the above experiment are presented in Table 1.

TABLE 1 — *Relative rates of egg hatch from egg masses of different species of root-knot nematodes (Meloidogyne spp.).*

Species	*No. of larvae/egg mass*
M. brevicauda (very rare species)	10.1 ± 11.3
M. arenaria (rare species)	214.5 ± 93.3
M. hapla (rare species)	357.5 ± 135.9
M. incognita (common species)	531.1 ± 181.6
M. javanica (common species)	570.3 ± 120.7

As seen from the above Table, the rate of egg hatch of *M. brevicauda* was found to be very significantly and extremely low when compared to the rest of the tested species. The largest number of larvae per egg mass was obtained from *M. javanica*, which number was not significantly different from that obtained from *M. incognita*. Although fair numbers of larvae hatched out from egg masses of *M. arenaria* and *M. hapla* these numbers were significantly lower than those obtained from the former two species.

DISCUSSION

As seen from the above results, the extremely low rate of hatch of eggs of *M. brevicauda* appears to support field observations of a very slow and prolonged infestation potential of this species of nematodes. Quite often one encounters these large-sized mature females empty and devoid of any eggs and it is only rarely that one comes across females with egg masses containing very few eggs. Males are extremely rare too and it is possible that eggs develop only following fertilization, which is likely to occur by chance and those unfertilized seem to fail to produce eggs. The enormous size of the females could be one that has evolved as an evolutionary trend to ensure fertilization by causing its large and bulky body to protrude out of galled roots to attract the extremely low numbers of males that may happen to pass them.

On the other hand, tea could be a very poor host and being hypersensitive to this species of nematodes, produces large galls at low levels of infestation. So far we have not been able to find any alternate hosts and as a measure of survival in the available poor host, this species is likely to have developed its big bulk for reasons stated above.

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