

## **A Mermithid Parasite, an Occasional but Effective Natural Control Agent of Tea Tortrix**

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### **ABSTRACT**

A parasitic nematode attacking tea tortrix (*Homona coffearia* Nietner) in tea has been recorded many times in the past. Recently the same nematode was observed in Stellenberg Estate, Pupuressa in the mid country. As detail morphological studies on this nematode was not reported in the past, detail investigations on the morphology of the nematode was done and identified as the *Mermis nigrescens* [family: Mermithidae].

**Key words:** Tea tortrix, parasite, Mermithid worms

### **INTRODUCTION**

The tea tortrix (Lepidoptera: *Homona coffearia* Nietner) is an indigenous pest in Sri Lanka, first described as a pest of coffee (Nietner, 1861) and later as a serious pest of tea (Green, 1890). Twenty-six indigenous parasites of tea tortrix had been recorded prior to the records of King in 1933-39 (Austin, 1957). Three others were recorded later (Vitarana, 1992).

However, none of these indigenous parasites could bring about significant control of tea tortrix, as indicated by the fact that tea tortrix was the major pest of tea in Sri Lanka at that time. After the introduction in 1935 of a successful exotic parasite *Macrocentus homonae* Nixon from Java, some of the indigenous parasites have virtually gone into oblivion, presumably eliminated by *M. homonae* (Austin, 1957), although some of them do occasionally make brief appearances. Indigenous parasites are useful at times when hyper-parasites of *M. homonae* become active and lower the efficacy of the latter. One such latent parasite that made its appearance after several years in a few mid-elevation tea estates, in the years 2000 and 2001, was a parasitic nematode (Vitarana *et al.*, 2001).

It is believed that this parasitic nematode is the same species as the one Gadd (1939, 1941) referred to as a “mermith worm”, belonging to the family Mermithidae, some of which were parasitic on tea tortrix (Gadd, 1941). Sivapalan (1970) also reported that these mermithid nematodes were parasitic on tea tortrix.

Mermithid nematodes parasitize almost all groups of insects and are regarded as beneficial organisms (Barrett and Sanders, 1997).

## OCCURRENCE

The parasitic nematode was encountered for the 2nd year in succession in 2001, predominantly in Field No.14 of the Lower Division, and in two other fields of Stellenberg Estate, Pupuressa.

The field was planted with the clone TRI 2025, on which a heavy tea tortrix outbreak had been noticed in August. The tea tortrix population had declined abruptly a few weeks after the worms became noticeable, by about the end of September 2001, sitting on the foliage of tea in large numbers. Wet weather had prevailed at the time the tortrix outbreak was observed, indicating that natural control exerted by pathogenic agents had not been effective.

The worms had also been encountered about the same time, in 2001, in the Madulsima Division of Rangala Estate. The nematodes were encountered sitting on tea bushes, and also associated with damp litter on the ground in a water logged area. As dry weather set in, the nematodes declined in number, although the tea tortrix population remained below the outbreak level.

## CLASSIFICATION

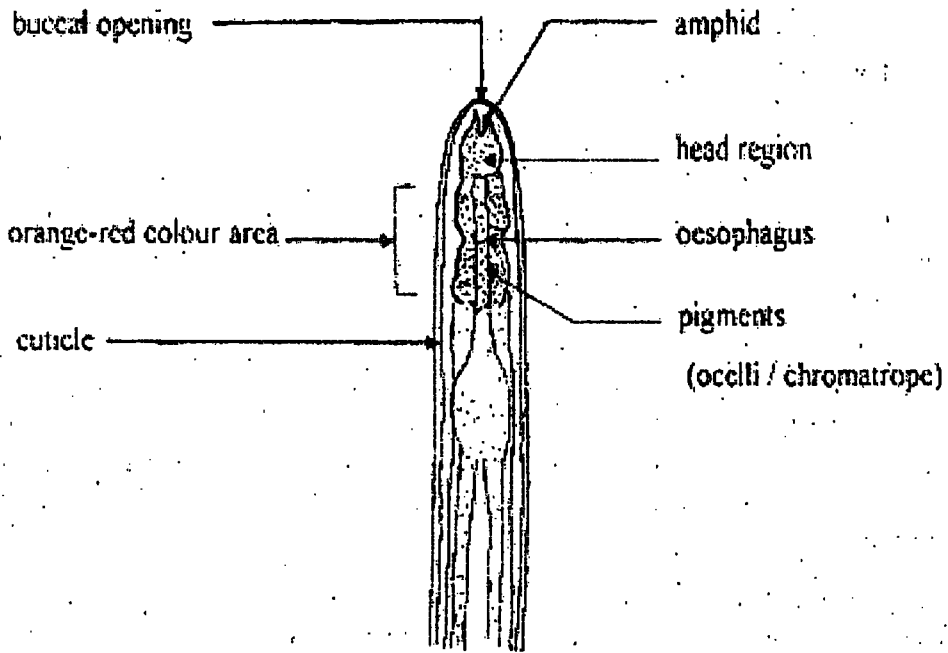
The nematode species was identified as *Mermis nigrescens* Dujardin, and classified as follows.

Phylum	Nematoda
Class	Adenophorea
Order	Dorylaimida
Family	Mermithidae
Genus	<i>Mermis</i>
Species	<i>nigrescens</i>

## MORPHOLOGY

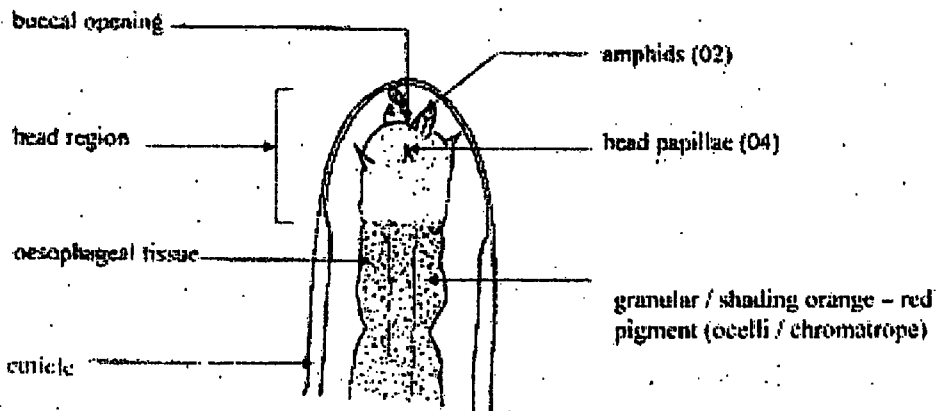
The worm is slender and thread-like, and can grow to a length of 10-20 cm (Barrett and Sanders, 1997). The mature adult may be identified by the pale, orange red-coloured area at the anterior end of the body, just below the head region (Fig. 1).

Spots of granular pigment are embedded in the oesophageal tissue. These spots are known as ocelli (Filipjev and Stekhoven, 1941), or chromatrope of Cobb (Goodey, 1963).



**Fig. 01: *Mermis nigrescens*, female. Cephalic end (10 x 40)**

The head is slightly offset and rounded in front. The terminal mouth, as seen under high magnification, is armed with two projections called lateral amphids, below which are found four head-papillae. The two laterally-placed amphids are larger than the head papillae: (Fig. 02).



**Fig. 02: *Mermis nigrescens*, female. Cephalic end, enlarged (10 x 60)**

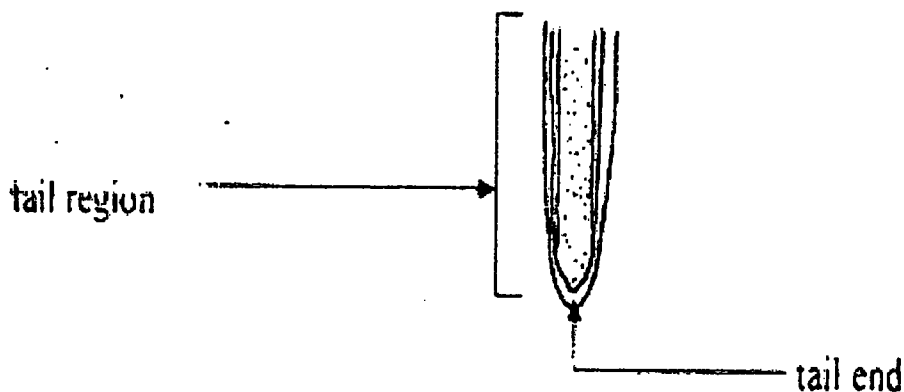


Fig. 03: *Mermis nigrescens*, female . Tail end (10 x 10)

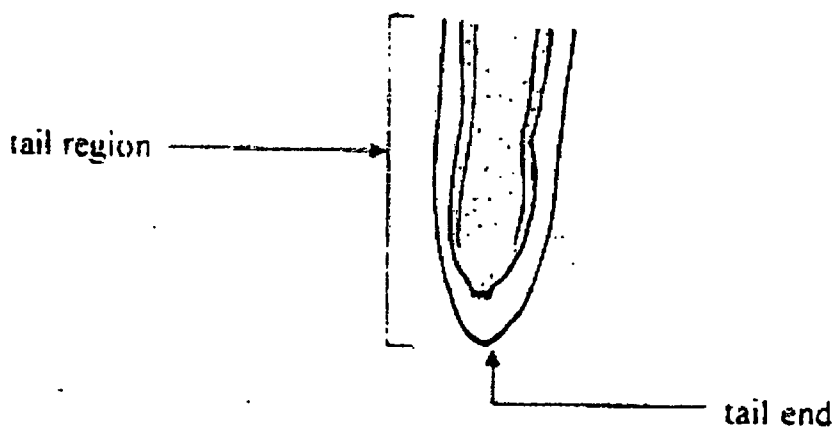


Fig. 04: *Mermis nigrescens*, female . Tail end, enlarged (10 x 40)

The tail is rounded to sub-conical. The body has no setae, and the cuticle is smooth and thickened.

The female has two ovaries and oviducts, and a tubular vagina. The gonads are paired in both sexes (Baylis and Daubney, 1926). The female is cream to brownish-black in colour, when seen above-ground during egg-laying. If the uterus is nearly empty, the worm will be cream or white in colour.

### FEEDING HABITS

*Mermis nigrescens* adults are free-living, whereas the larvae are endoparasitic within insects. The developing larvae take up large quantities of amino acids, lipids and carbohydrates from the host in which they live. Post-parasitic *M. nigrescens* do not eat (Sessine. 1995)

## IMPORTANCE AS A NATURAL CONTROL AGENT

*Mermis nigrescens* has been recorded as a parasite of annelids, molluscs, arthropods, and some vertebrates as well. The females climb out of the soil onto vegetation, where they deposit their eggs for ingestion by the hosts.

Egg-laying on vegetation above ground is a behavioural modification for parasitising insects. However, the polyphagous nature of *M. nigrescens*, and its dependence on wet weather for survival, become limiting factors with regard to its usefulness as a dependable natural control agent of tea tortrix. Nevertheless, on this recent occasion, the mermithid became the dominant parasite, although for a short period of two years, making chemical control unnecessary.

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