of the sooty mould fungus, *Capnodium ramosum* Cooke, which imparts a blackish colour to leaves, and reduces the photosynthetic area.

The Spiralling Whitefly is highly polyphagous and thrives on 481 host plants belonging to 295 genera and 90 families (Srinivas 2000). Though the Andaman Islands are completely cut off and remote from the Indian mainland, they are well connected by both air and sea. In the South Andamans, during July 2003, severe infestation of this pest was recorded for the first time on guava.

A preliminary survey conducted between July 2003-November 2003 indicated that *A. dispersus* attacks the following crops in South Andamans (Table 1). This pest is multiplying rapidly due to conducive climatic conditions prevailing in the South Andamans. The possible route of entry of this pest into the South Andamans is through mainland India with planting material imported by various agencies, as in case of the Citrus Blackfly *Aleurocanthus woglumi* Ashby. The Citrus Blackfly was introduced into the Andamans in 1990 along with 2000 budlings of Mandarin oranges brought by the State Agriculture Department from South Arcot, Tamil Nadu for distribution to farmers (Bhumannavar *et al.* 1991). Stringent quarantine measures at the ports (points of entry) on the Indian mainland, as well at these Islands, can prevent such unintended introduction, which could become a menace.

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20. OCCURRENCE OF *LUMBRINERIS HARTMANI* (DAY 1953) (POLYCHAETA: LUMBRINERIDAE): A NEW RECORD FOR INDIAN WATERS[1]

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Members of the Lumbrineridae, a family of the Order Eunicemorpha, are very homogeneous in their general external morphology. All of them have a simple prostomium; a long body not clearly portioned into regions and subbiramous parapodia without ventral cirri. They commonly burrow in sandy mud and have lost their head appendages. On the other hand, the anterior end of the prostomium is richly supplied with nerves while the jaws are very powerful. A few species of *Lumbrineris* are found under stones and in algal tufts.

In earlier studies the occurrence of *Lumbrineris tetraura*, *L. notocirrata*, *L. polydesma*, *L. heteropoda*, *L. simplex*, *L. impatiens*, *L. bilabiata*, *L. latreilli* and *L. pseudobifilaris* has been recorded from diversified environments along the east and west coast of India (Fauvel 1953; Parulekar 1971; Hartman 1974; Antony and Kuttyamma 1983; Rao 1998; Misra *et al.* 1984; Srikrishnadhas *et al.* 1987; Misra 1995; Sunder Raj and Sanjeeva Raj 1987; Pillai 2001).

During the present study three specimens of *Lumbrineris hartmani* were collected from the sand beneath seagrass beds in the intertidal area of Krusadai Island (9° 14' N, 79° 12' E) in the Gulf of Mannar on August 12, 2001. This island has well-developed coral reefs and extensive seagrass beds. The sediment samples collected were sieved through a 0.5 mm sieve, and the animals retained were stored in 70% alcohol for further studies. All drawings were made using Camera Lucida.

All three specimens collected were incomplete, with a maximum length of 70 mm for 203 segments. Prostomium is depressed, conical (Fig. 1a); eyes and nuchal organ are absent. Peristomium is composed of two apodous segments; it is as

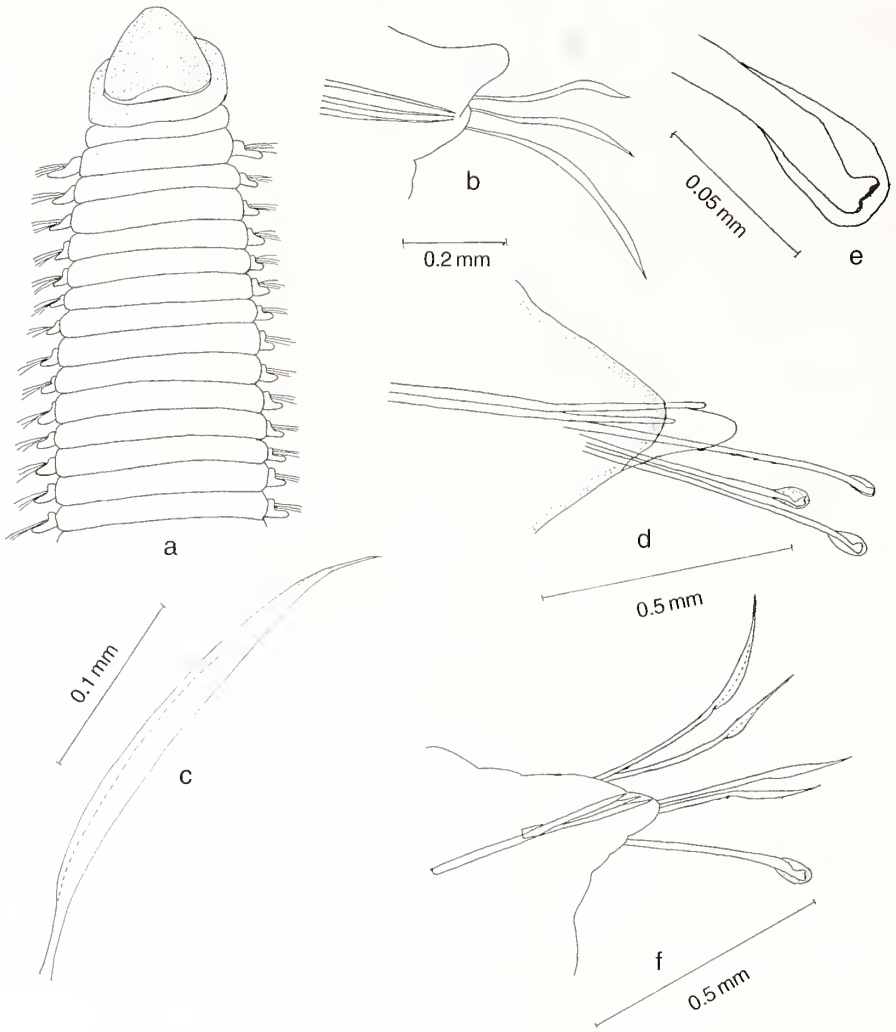

Fig 1. a-f: a. Anterior end, b. Anterior parapodia, c. Winged capillary, d. Posterior parapodia, e. Bidentate hooded hook, f. Middle parapodia

long as the first setigerous segment. Maxillary supports long and triangular. Maxillae I (forceps) is falcate; maxillae II has five teeth; maxillae III two teeth and maxillae IV one tooth. Some anterior parapodia are reduced. Anterior parapodia (Fig. 1b) with winged capillary setae (Fig. 1c), posterior (Fig. 1d) with bidentate hooded hooks (Fig. 1e), a few middle segments (Fig. 1f) with capillary setae and bidentate hooded hooks. Dorsal and ventral cirri are absent.

Setae and simple bidentate hooded hooks are present from 19th parapodial segment and continue to the end of body, blade is shorter after the middle of the body. Three acicula in each parapodium. Parapodia with unequal lobes, the anterior feet, having a low, rounded presetal lobe and a longer, conical, postsetal one. In posterior feet the postsetal lobe is longer but never exceeds the length of the setae.

This specimen has been deposited in the Marine Biology Museum, Parangipettai (Regn. No.: MBM-AN-005).

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21. MORPHOLOGY AND IDENTIFICATION OF CLADOCERAN FAUNA OCCURRING IN THE FISH SEED FARM, AAREY, MUMBAI, INDIA[1]

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Introduction

Aquaculture has to play an important role in providing rich proteinaceous food, needed constantly for the ever-increasing human population all over the world. Thus, for intensive production of protein-rich fishes and prawns, it is necessary to provide required zooplanktonic food organisms at an optimum density. Therefore, adoption of basic techniques has been an important consideration by which abundant and sustained production of forageable zooplanktonic food organisms can be produced in high density in a short period of time. The secondary productivity implying production of zooplankton in the water bodies has been always a slow process under natural conditions, and depends upon the pace of primary productivity. However, this natural process may not be obviously suitable for fish and prawn production under fish farm conditions, where quick returns from culture are the essential requirements for commercial viability. Among mass cultured zooplankton in fish nurseries, initial occurrence of Rotifers is essential to provide minute zooplankter to the fish spawn, which has just started feeding. As the spawn grow, they become capable of ingesting slightly larger zooplankter such as Cladocerans and Copepods. Cladocerans are fleshy in nature, highly nutritious and easy to digest; this plays an important role in fish seed production. Shirgur and Indulkar (1987) have emphasized the importance of Cladocerans, which play a significant role as forage organisms for the growing carp fry. It is, therefore, clear that there is a great scope to survey and study the Cladoceran fauna of fish farms so as to understand the species-wise profile among the zooplanktons in fish farm conditions and to assess them on the basis of their mass culture response. The present studies were carried out at a Government Fish Seed Farm, Aarey, Mumbai, on the morphology and identification characters of different Cladoceran species isolated from fortnightly collected zooplankton samples.

Zooplankton samples were collected from the reservoir and fish nursery ponds at the Aarey Fish Seed Farm, Mumbai, for two years at fortnightly intervals, using conical plankton net (120 µm mesh). The collected samples were preserved in isotonic solution (Shirgur 1984). All the samples were examined for qualitative analysis. From the preserved samples, Cladocerans were separated and identified on the basis of standard identification key for Cladocerans (Ward and Wipple 1966). Dr. R.G. Michael of North-Eastern Hill University, Shillong (Meghalaya) confirmed the identification. The distinguishing characters are depicted using Camera Lucida drawings.

From the zooplankton samples collected for two successive years from Government Fish Seed Farm, Aarey, Mumbai, twelve different species of Cladocerans, namely *Ceriodaphnia cornuta* Sars 1886 (Fig. 1), *Moina micrura* (I) Kurz 1874 (Fig. 2), *Moina micrura* (II) (Fig. 3), *Moina dubia* Guerne & Richard 1892 (Fig. 4), *Macrothrix laticornis* Jurine 1820 (Fig. 5), *Kurzia longirostris* Daday 1850 (Fig. 6), *Alona rectangula* Sars 1862 (Fig. 7), *Alona pulchella* King 1853 (Fig. 8), *Chydorus sphaericus* Muller (1785) (Fig. 9), *Bosminopsis deitersi* Richard 1895 (Fig. 10), *Diaphanosoma excisum* (I) Sars 1885 (Fig. 11) and *Diaphanosoma excisum* (II) Sars var Stingling Jenkin 1934 (Fig. 12) were identified. All these Cladocerans belonged to common taxa (Phylum: Arthropoda; Class: Crustacea; Superorder: Diplostraca; Order: Cladocera; Suborder: Eucladocera), as per the classification adopted from Biswas (1971). Ten species belong to one common Superfamily – Chydoridae and four different