

Note

Mortality in protozoa and mysis of *Penaeus indicus* and *P. semisulcatus* by *Leptomonas* like parasite in the hatcheries

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ABSTRACT

A *Leptomonas* like parasite was found to be responsible for mortality of larvae of *Penaeus indicus* and *P. semisulcatus* in the hatcheries. The mortality occurred in protozoa and mysis stages but not in naupliar and postlarval stages of prawn. The parasite exhibited polymorphism and three different forms were observed. It occurred in the appendages, eyestalks, eyes and rostrum of the host. Histological sections showed the presence of this parasite in internal organs such as hepatopancreas, gut and abdominal muscle.

Prawns serve as the hosts of symbiotic, commensal, parasitic and pathogenic protozoans. A disease observed by Couch (1978) in protozoa and mysis stages of brown shrimp (*Penaeus aztecus*), is caused by an amoeboflagellate placed in the genus *Leptomonas*. In the present study, a parasite which resembled *Leptomonas* was found to be associated with mortalities in the larvae of *P. indicus* and *P. semisulcatus* in the hatcheries. An attempt has been made to describe this parasite briefly.

The infected larvae of *P. indicus* and *P. semisulcatus* were collected from the hatcheries located at Narakkal near Cochin and Mandapam Camp respectively. The dead, moribund and live larvae were fixed in neutral buffered formalin and Davidson's fixative. Specimens were processed, stained and

mounted in DPX for microscopical examination. Representative specimens were also processed and embedded in wax, cut at 5-7 μ m thickness and stained with haematoxylin and eosin (Preece, 1972).

The microscopical examination revealed the presence of large number of parasites inside the body of larvae. It was responsible for mortalities of protozoae and mysis of *P. indicus* and *P. semisulcatus*. The mortality of larvae ranged from 70 to 90% during the period of investigation (14 incidences in two years). It was not encountered in the naupliar and postlarval stages. This parasite was found to invade both the external and internal body parts and was also seen in the eyes, eyestalk, rostrum and appendages (Fig. 1). Three different forms namely pyriform, oval

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and spherical were observed inside the host (Fig. 2). A straight flagellum and a compact nucleus (4-7 μm) were observed in the pyriform (Fig. 3). The size of this form ranged from 18 to 28 μm in length and 16 μm in width at the broadest region. The flagellum and pointed projection were absent in the oval form (Fig. 4). Its size ranged from 15 to 23 μm lengthwise and 15 μm laterally at the widest region. A nucleus was present at the narrow end of the organism. The spherical form (cyst)

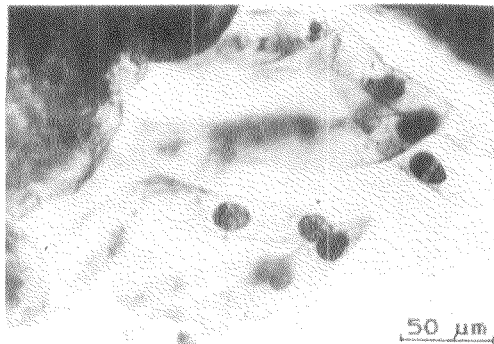


Fig. 1 Cephalothoracic region of mysis of *Penaeus semisulcatus* infected with *Leptomonas* like parasite. Note the parasite in the appendages. (wet mount).

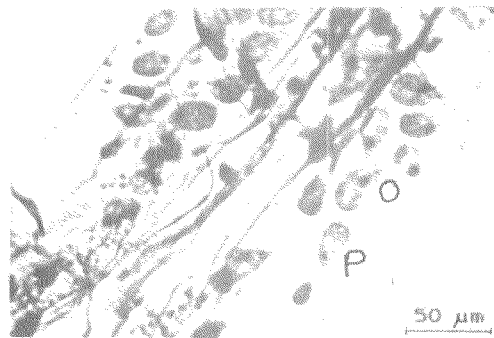


Fig. 2. Abdominal segment of mysis of *P. semisulcatus* showing different forms of the parasite. O - oval form, P - pyriform.

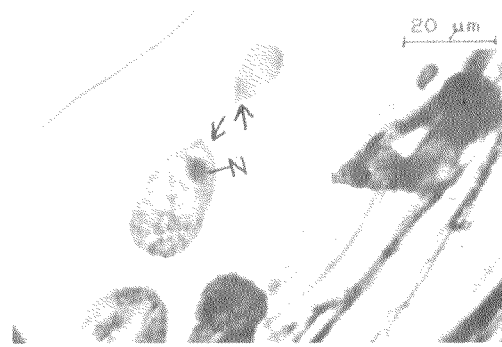


Fig. 3. Pyriform form of the parasite showing the nucleus (N) and base of flagellum (arrow).



Fig. 4. Oval form of *Leptomonas*. Note the absence of flagellar base. N - nucleus.

existed in two sizes ranging from 9 to 15 μm and 4 to 8 μm in diameter (Fig. 5). The cytoplasm of all forms ranged from clear to opaque and contained various inclusions.

Histopathological sections of infected mysis showed the presence of these parasite in hepatopancreas, gut and abdominal muscle (Figs. 6 & 7).

The parasite was tentatively assigned to the genus *Leptomonas* on the basis of description given by Couch (1978). Couch (1978, 1983) first reported on the occurrence of this parasite in protozoa and mysis of penaeid prawn (*P. aztecus*). The parasite resembled

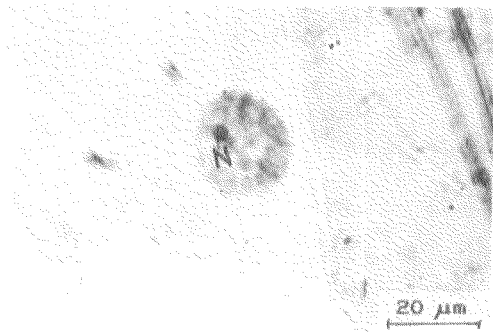


Fig. 5. Spherical form of *Leptomonas*. N-nucleus.

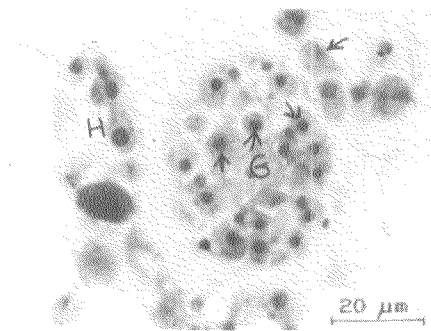


Fig. 6. Cross-section of mid region of infected mysis. Note the parasite in the gut (G) and hepatopancreas (H).

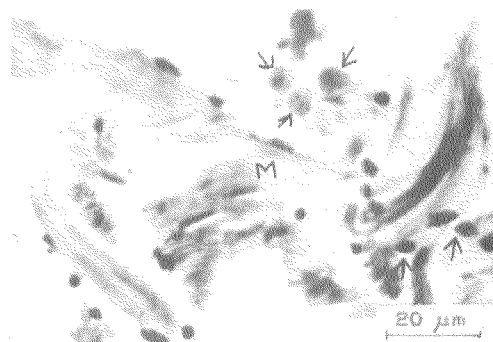


Fig. 7. Cross-section of abdominal region of infected larva showing the presence of parasites in the muscle (M) (arrow).

Leptomonas described by Couch (1978) in all respects such as presence of flagellum, polymorphism, tendency to infect protozoa and mysis stages alone, site of infection and cytoplasmic inclusions. The parasite seemed to affect only the weak larvae. Couch (1978) suggested that *Leptomonas* parasite is a secondary invader of a weak host, possibly from encysted forms which may exist in the hindgut of the host. The pathogenic mechanism of the parasite on the host is not clearly known except the mechanical damage to the host tissue. Although the parasite was seen in the histological sections of hepatopancreas, gut and abdominal muscle of infected mysis, no appreciable changes in the cellular structures of organ was observed. The direct causes of death in the infected larvae are not known. The presence of parasites in the vital organs suggest that loss of vital tissues may lead to loss of vital functions. However, further work is necessary to understand the mechanism of infection by this parasite on the host.

Acknowledgement

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