A HOLOTRICHOUS CILIATE FROM THE COELOM OF CHAETOGNATHS

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A HOLOTRICHOUS ciliate was observed from the body cavity of Chaetognaths, *Sagitta enflata* Grassi and *Sagitta bedotti* Beraneck. In coastal waters of India *S. enflata* and *S. bedotti* are common species[1]. Although thousands of Chaetognaths were examined for parasites and associates only a few specimens were found to be infected with the ciliate *Metaphrya sagittae*.

So far no work on the parasites of Chaetognaths has been recorded from Indian waters and hence the present study was undertaken.

Zooplankton samples collected with Bongo net of 0.5 mm mesh width were used for this study. Plankton samples were preserved in formaldehyde solution in sea water. Chaetognaths were sorted out and examined for parasites. The infested host specimens were separated for detailed study.

This ciliate was obtained from *S. bedotti* from off Tuticorin, latitude 8°10′ north and longitude 78°56′ east at 75 m depth and it was found from *S. enflata* from off Cape Comorin, latitude 7°53.5′ north and 77°33′ east at 40 m depth and from off Dwaraka, latitude 21°47′ north and longitude 68°21′ at 80 m depth. From the host *S. enflata* a maximum of 33 individuals were noticed from a single specimen.

The body of *M. sagittae* is pear-shaped, measuring about 0.25 mm by 0.13 mm. It is almost transparent and quite colourless. The anterior end is distinctly narrower than the posterior end which is rather rounded (figure 1). The body appears to be symmetrical except the anterior end which is deflected towards one side. Body cilia are present in longitudinal rows. The organism is devoid of mouth or any other external structure. The cytoplasm is not sharply differentiated into ectoplasm and endoplasm. The meganucleus is large and reticular and the micronucleus is small rounded structure.

Figure 1. *Metaphrya sagittae* from the body cavity of *S. enflata*.

This ciliate was first observed by Ikeda in 1917 from *Sagitta* and described as a new genus and new species[2]. Since Chaetognaths are more or less transparent the associates or parasites were quantitatively recorded. The parasites reported in many papers have been summarised by Dolffus[3] and Alvarino[4]. Nagasawa and Marumo described this ciliate from Suruga Bay, Japan[5].

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ICHTHYOPHTHIRIASIS IN AQUARIUM FISHES—A NOTE ON THE PATHOGENICITY AND LIFE CYCLE OF THE PARASITE

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ICHTHYOPHTHIRIASIS or Ich disease, caused by *Ichthyophthirius multifilis* was observed in aquarium fishes in Mangalore. The disease caused heavy mortalities of aquarium fishes in two tanks. The introduction of new fishes to the tank without quarantaining was believed to be the possible source of infection.

Infected fishes showed the presence of characteristic small white spots on fins and skin. The spots containing the developing and matured parasites were easily seen with the naked eye. Positive diagnosis was done

by observing the skin smears and small pieces of fin under the microscope. The parasite was spherical and short cilia were present evenly over the whole surface with the result that characteristic rotating movement was observed. Horseshoe-shaped macronucleus was clearly observed in living and dead individuals (figure 1). The fully mature adult parasites, which drop off the infected fish, maintained in aquarium tanks measured upto 1150 μm in diameter, they were free swimming and white in colour.

Experimental infection studies were conducted to know the duration of the life cycle of the parasite, the influence of temperature on the development and susceptibility of *Catla catla* fingerlings to ich parasite, *I. multifilis*. Ten healthy fingerlings of catla measuring 5.2 cm (ave) were released along with a severely infected Gold fish (*Carassius auratus*) to a small tank, which was previously dried and disinfected. The water temperature of the experimental tank was $30 \pm 1°C$. On the third day of setting the experiment, there was infection on all the fingerlings, the intensity varying from mild to severe and more than 50% of the fishes died within 5 days. Cent per cent mortality of fishes occurred within 7 days. Matured adult parasites were observed on dead and moribund catla fingerlings. Reinfection was also observed on catla which survived upto 5 days from the start of the experiment.

Catla fingerlings were highly susceptible to ich parasites. The parasites took only 4 to 5 days to complete their life cycle.

The temperature dependency of this parasite with respect to development and attaining maturity is well documented in literature[1–3]. From the time of attachment of ciliospores (infective daughter elements) to the host till to the detachment of the matured adult parasite from the host it takes about 4 weeks at 10°C and only 4 or 5 days at 27°C[1]. This does not take into consideration the time from detachment of the adult parasite from the host to the production of ciliospores. But according to Meyer[2] the entire life cycle takes 2 weeks at 15°C, more than 5 weeks at 10°C and at lower temperatures the development may extend over several months. It is very interesting to note that in the present study, the entire life cycle has taken only 4 to 5 days.

Considerable reduction in the time required for the completion of the life cycle of *I. multifilis* at higher temperatures ($30 \pm 1°C$) and the pathogenicity of the parasite were the two important observations of this study.

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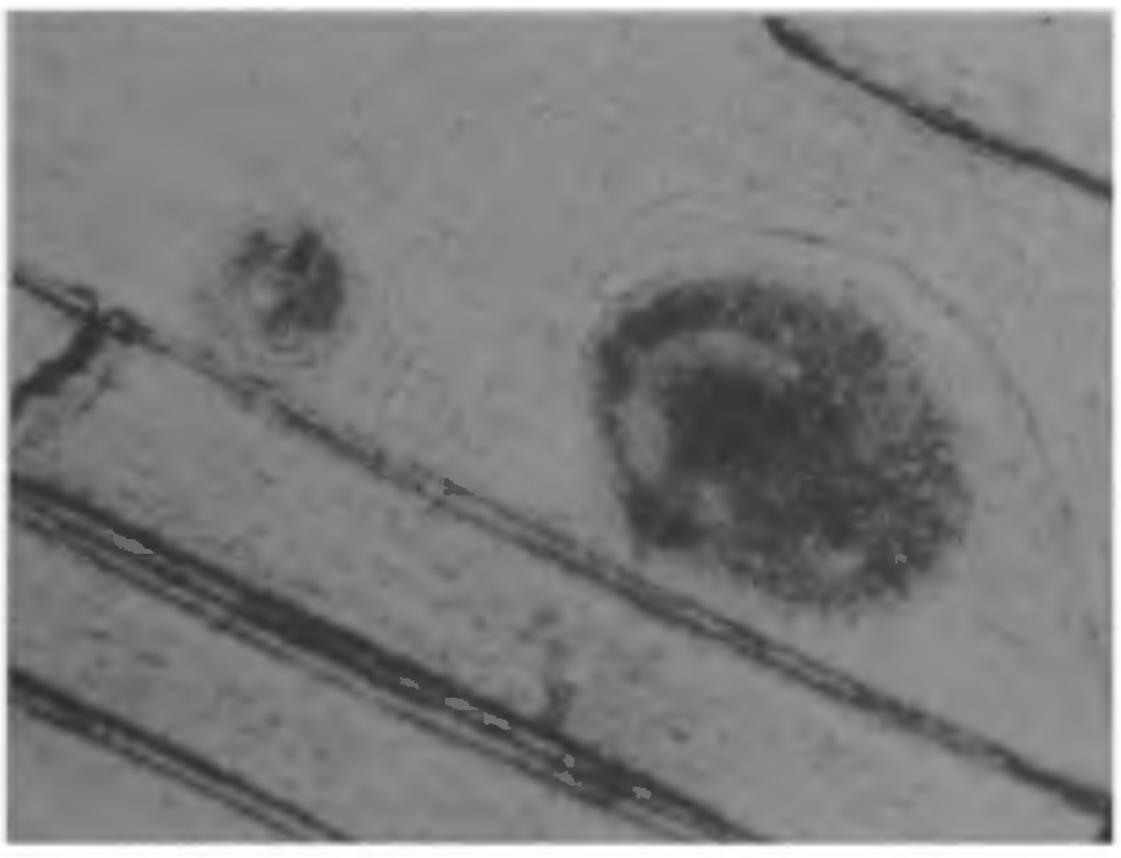

Figure 1. A view under low magnification of ich cells embedded in the fin.

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EFFECTS OF A FUNGICIDE METALAXYL ON THE ROOT MERISTEM OF *ZEA MAYS* L

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CHROMOSOME aberrations induced by pesticide treatment was first observed by the induction of heteroploids in *Nicotiana tabaccum* and *Solanum melangena* with Nicotin sulphate[1]. Since then a number of pesticides and fungicides have been reported to affect cell division and growth of vascular plants[2–9]. Metalaxyl is a versatile fungicide and is recommended for use against a wide range of air, soil and seed borne species