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**PJBS**

ISSN 1028-8880

# **Pakistan Journal of Biological Sciences**

**ANSI***net*

Asian Network for Scientific Information  
308 Lasani Town, Sargodha Road, Faisalabad - Pakistan

## A Study on *Tetrahymena pyriformis* (Holotrichous) and *Epistylis* sp. (Peritrichous) Found on Freshwater Leech, *Nepheleopsis obscura*

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**Abstract:** *Tetrahymena pyriformis* and *Epistylis* sp. found on the body surface, mouth and oesophagus of freshwater leech, *Nepheleopsis obscura* were studied. *Tetrahymena pyriformis* was defined on the body surface, in the mouth and oesophagus of *Nepheleopsis obscura*. But *Epistylis* sp. was only determined on the body surface of leech. The mean length of *Tetrahymena pyriformis* was  $42 \pm 3.5 \mu$  ( $X \pm SD$ , range 39-44  $\mu$ , n= 30) with a mean width of  $26 \pm 4.9 \mu$  ( $X \pm SD$ , range 22-29  $\mu$ , n= 30). *Epistylis* sp. length was  $48 \pm 3.8 \mu$  ( $X \pm SD$ , range 45-52  $\mu$ , n= 30) a width of  $38 \pm 2.9 \mu$  ( $X \pm SD$ , range 36-42  $\mu$ , n= 30).

**Key word:** Protozoa, *Tetrahymena pyriformis*, *Epistylis* sp., leech, *Nepheleopsis obscura*

### Introduction

Protozoans are the most important group of animal parasites. However, some protozoologists consider them as commensals, but, they became pathogenic under certain conditions (Kreier and Baker, 1987; Lom, 1995; Mimioglu *et al.*, 1968; Rogers and Gaines, 1975).

*Tetrahymena pyriformis* and *Epistylis* sp. are common ectocommensals found on the fish and other living organisms in water (Rogers and Gaines, 1975). Free-living species of *T. pyriformis* that are usually parasitic on the surface of internal organs of the fish (Bykhovskaya-Pavlovskaya *et al.*, 1962; Kreier and Baker, 1987; Lom, 1995). A holotrichous parasite *T. pyriformis* that has been reported from the gills, the surface of the body, and occasionally the internal organs of fish. This parasite may enter through the yolk sacs of fish larvae and other organs Bykhovskaya-Pavlovskaya *et al.*, 1962; Ekingen, 1983; Hoffman, 1967; Lom, 1995; Rogers and Gaines, 1975). *T. pyriformis* causes necrosis of muscular tissue and epithelial cells of some aquarium fish, oedema and haemorrhage of dermis and subcutaneous, and degeneration of skin (Ponpornpisit *et al.*, 2000).

Members of the genus *Epistylis* may be extremely pathogenic under some circumstances. *Epistylis* has been reported to attach on the body of fish, causing erosion of scales and hard-fin and sometimes bone, hyperplasia and haemorrhage of epithelial tissue, and inflammation on the body (Ekingen, 1983; Hoffman, 1967; Rogers and Gaines, 1975; Post, 1987).

Freshwater leech, *Nepheleopsis obscura* has been recorded as parasite on the fish by Hoffman, (1967), and Saglam and Sarieyyüoglu, (1998). Many species of flagellates and ciliophorans have been reported on the body of the leeches (Davies, 1991; Ekingen, 1983; Rogers and Gaines, 1975; Sawyer, 1986).

The aim of this study was to determine protozoans of freshwater leech, *N. obscura*.

### Materials and Methods

The study was carried out between March 1997 and March 1998. A total of 130 freshwater leech, *N. obscura*, were collected in the discharge channels of Fisheries Research Station of the Fisheries Faculty, Firat University, located 15 km north-west of Elazig in Eastern Turkey. The samples were brought alive to the Laboratory in the jar that filled with water. The leeches were examined for protozoa using the methods in Kreier and Baker (1987), and Pritchard and Kruse (1982). The samples were examined alive and then fixed. For fixation 1/4000 formalin and AFA was used. The specimens were identified with the aid of Bykhovskaya-Pavlovskaya *et al.* (1962) and Hoffman (1967). A total length and width of *T. pyriformis* and *Epistylis* sp. was measured by microscope with micrometer. Photographs of the protozoan were taken and their figures were drawn.

### Results

*T. pyriformis* and *Epistylis* sp. from class Ciliophora of Protozoa were found on the freshwater leech, *N. obscura*. *T. pyriformis* was defined on the body, in the mouth, oesophagus and digestive

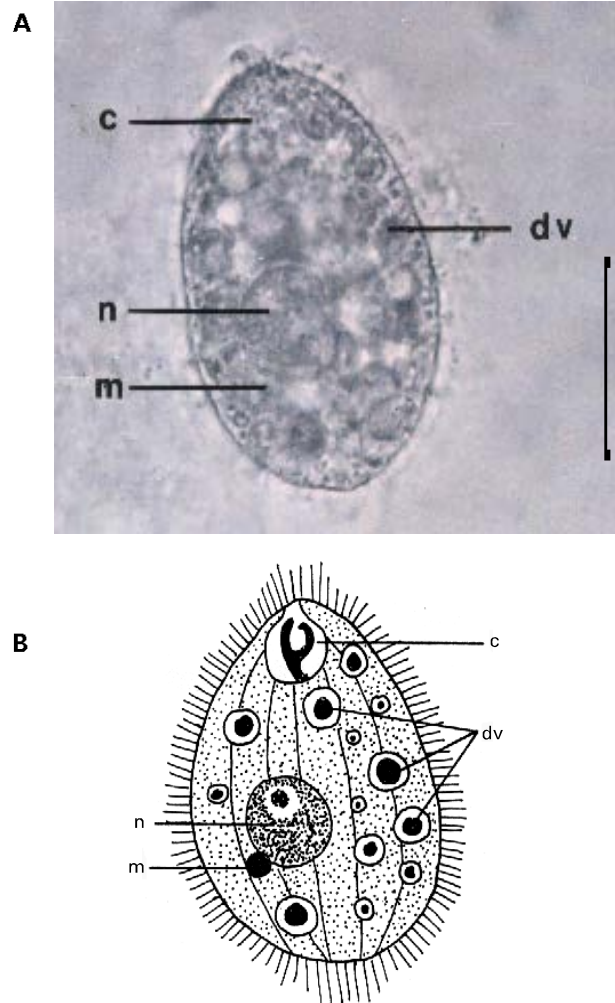


Fig. 1: The view of *Tetrahymena pyriformis* (A, B) (Scale bar= 15  $\mu$ ). cp. cytopharynx; m, micronucleus; n, nucleus; dv, digestive vacuole

tract of *N. obscura*. But, *Epistylis* sp. was only seen on the body surface of the leeches. *T. pyriformis* and *Epistylis* sp. were observed both alone and together on *N. obscura*. Two Ciliophorans, *T. pyriformis* and *Epistylis* sp. were firstly defined in the freshwater leech, *N. obscura*.

**Morphology of *Tetrahymena pyriformis*:** *T. pyriformis* (Fig. 1 A, B) was found by scraping the body surface and digestive system of *N. obscura*. *T. pyriformis* is oval shape. The mean total length of specimens preserved in formalin is  $42.0 \pm 3.5 \mu$  (range 39.0-44.0  $\mu$ ,  $\pm$  SD) and the mean width  $26.0 \pm 4.9 \mu$  (range 22.0-29.0  $\mu$ ,  $\pm$  SD). This protozoan was defined in alive *N. obscura*, but it

with *Epistylis* sp. was like velvety structure.

## Discussion

Morphological features of *T. pyriformis* showed a similarity with the findings of Bykhovskaya-Pavlovskaya *et al.* (1962). Although size of *Epistylis* sp. has been reported as 160-300  $\mu$  (Ekingen, 1983; Hoffman, 1967), in this study, it is smaller ( $48 \pm 3.8 \mu$ ) than that of previous studies. It was observed that *Epistylis* sp. attached colonies form on the leeches. These results are similar to the study of many researchers (Ekingen, 1983; Harlioglu, 1999; Hoffman, 1967; Rogers and Gaines, 1975). *T. pyriformis* has been reported to cause important pathological disorders (Bykhovskaya-Pavlovskaya *et al.*, 1962; Ekingen, 1983; Hoffman, 1967; Rogers and Gaines, 1975). But, in this study, *T. pyriformis* was observed on the body and digestive tract of freshwater leech, *N. obscura* which is a parasite in trout. Furthermore, *Epistylis* is also attached to fish (Hoffman, 1967; Margolis and Arthur, 1979; Rogers and Gaines, 1975) and crayfish (Harlioglu, 1999). In this study, it was determined that *Epistylis* was also attached to the leeches.

No pervious study was found about ciliophorans of *N. obscura*, as *T. pyriformis* and *Epistylis* sp. were firstly defined in the freshwater leech, *N. obscura* by this investigation.

So, *N. obscura* may be dangerous for trout. Because, it is parasite for trout and also it may transfer protozoans (*T. pyriformis*, *Epistylis* sp.) to fish.

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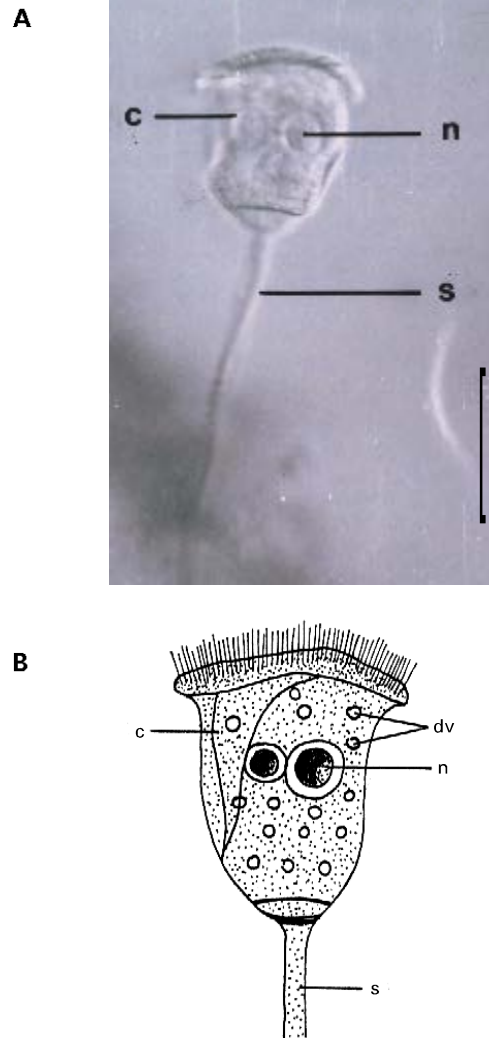


Fig. 2: The view of *Epistylis* sp. (A, B) (scale bar= 24  $\mu$ ). c, cytopharynx; s, stalk; n, nucleus; dv, digestive vacuole.

was not determined in dead leech. The protozoan was parasitic and killed the larvae of leech. Lesions and pale colour was defined on the skin of *N. obscura*.

**Morphology of *Epistylis* sp.:** *Epistylis* sp. (Fig. 2 A, B), was only determined on the body of *N. obscura* as ectocommensal. This protozoan is small and has a handle. In the colony, there were 2-5 bodies of *Epistylis* sp. in the handle. The total length of *Epistylis* sp. was  $48.0 \pm 3.8 \mu$  (range 45.0-52.0  $\mu$ ,  $\pm$  SD), with a mean width of  $38.0 \pm 2.9 \mu$  (range 36.0-42.0  $\mu$ ,  $\pm$  SD). The skin of leech