A Study on Tetrahymena pyriformis (Holotrichous) and Epistyliis sp. (Peritrichous)
Found on Freshwater Leech, Nephelopsis obscura

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Abstract: Tetrahymena pyriformis and Epistyliis sp. found on the body surface, mouth and oesophagus of freshwater leech, Nephelopsis obscura were studied. Tetrahymena pyriformis was defined on the body surface, in the mouth and oesophagus of Nephelopsis obscura. But Epistyliis sp. was only determined on the body surface of leech. The mean length of Tetrahymena pyriformis was \(42 \pm 3.5 \mu m\) (X± SD, range 35-44 \(\mu m\), n=30) with a mean width of \(26 \pm 4.9 \mu m\) (X± SD, range 22-29 \(\mu m\), n=30). Epistyliis sp. length was \(48 \pm 3.8 \mu m\) (X± SD, range 45-52 \(\mu m\), n=30) a width of \(38 \pm 2.9 \mu m\) (X± SD, range 36-42 \(\mu m\), n=30).

Key words: Protozoa, Tetrahymena pyriformis, Epistyliis sp., leech, Nephelopsis obscura

Introduction
Protozoa are the most important group of animal parasites. However, some protozoologists consider them as commensals, but, they become pathogenic under certain conditions (Krier and Baker, 1987; Lom, 1995; Minioglu et al., 1968; Rogers and Gaines, 1975).

Tetrahymena pyriformis and Epistyliis 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; Krier 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 (Pomponielli et al., 2000).

Members of the genus Epistyliis may be extremely pathogenic under some circumstances. Epistyliis 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, 1993; Hoffman, 1967; Rogers and Gaines, 1975; Post, 1987).

Freshwater leech, Nephelopsis obscura has been recorded as parasite on the fish by Hoffman, (1967), and Saglam and Sarıyüpopoglu, (1988). 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, Fırat University, located 15 km north-west of Elazığ 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 Krier and Baker (1987), and Pritchard and Kruze (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 Epistyliis sp. was measured by microscope with micrometer. Photographs of the protozoan were taken and their figures were drawn.

Results
T. pyriformis and Epistyliis 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 \(\mu m\); c, 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 $42.0 \pm 3.6 \mu$ (range $39.0-44.0 \mu$, ± SD) and the mean width $26.9 \pm 4.9 \mu$ (range $22.0-28.0 \mu$, ± SD). This protozoan was defined in alive *N. obscura*, but it was not determined in dead leech. The protozoan was parasitic and killed the larvae of leech. Lesions and pale color 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 $48.0 \pm 3.6 \mu$ (range $45.0-52.0 \mu$, ± SD), with a mean width $38.0 \pm 2.9 \mu$ (range $36.0-42.0 \mu$, ± SD). The skin of leech 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 160-200 μ (Ekingen, 1953; Hoffman, 1967), in this study, it is smaller (40-3.6 μ) 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, 1953; Harliglu, 1999; Hoffman, 1967; Rogers and Gaines, 1975). *T. pyriformis* has been reported to cause important pathological disorders (Bykhovskaya-Pavlovskaya et al., 1962; Ekingen, 1953; 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 (Harliglu, 1999). In this study, it was determined that *Epistylis* was also attached to the leeches.

No previous 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.

**References**


