

# Five Ectoparasites from Turkish Fish

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**SUMMARY:** Five ectoparasites were collected during the period of 2002-2005 from fish of Mediterranean Sea, Aegean Sea and inland waters of Turkey: Four crustaceans [*Ergasilus mosulensis* and *Pennella instructa* (Copepoda), *Ceratothoa steindachneri* (Isopoda) and *Argulus foliaceus* (Branchiura)] and one Annelida (*Piscicola geometra*) were found. The species, *E. mosulensis*, *P. instructa* and *C. steindachneri* have been reported for first time in Turkish waters, and *A. foliaceus* and *P. geometra* for the time from the Çavuşçu Lake.

**Key Words:** *Ergasilus*, *Pennella*, *Ceratothoa*, *Argulus*, *Piscicola*

## Türkiye Balıklarından Beş Ektoparazit

**ÖZET:** 2002-2005 yılları arasında Türkiye'nin içsularından, Akdeniz ve Ege Denizi Kıyıları balıklarından beş ektoparazit toplanmıştır: dördü crustacean [*Ergasilus mosulensis* ve *Pennella instructa* (Copepoda), *Ceratothoa steindachneri* (Isopoda) ve *Argulus foliaceus* (Branchiura)] biri Annelida (*Piscicola geometra*). *E. mosulensis*, *P. instructa* ve *C. steindachneri* Türkiye sularında ilk kez, *A. foliaceus* ve *P. geometra* Çavuşçu Gölü'nden ilk kez rapor edilmiştir.

**Anahtar Sözcükler:** *Ergasilus*, *Pennella*, *Ceratothoa*, *Argulus*, *Piscicola*

## GİRİŞ

There are over 150 described ergasilid (Crustacea, Copepoda, Ergasilidae) species. Most of them are found in freshwaters with only 23 species occurring in estuarine or coastal marine habitats. Nearly, all adult females are parasitic on teleost fishes, typically attaching to the gill filaments with their large subchelate antennae (5). The genus *Pennella* Oken, 1816 (Copepoda, Pennellidae) include the largest parasitic crustacea, and except for a single species infecting the blubber and musculature of cetaceans, adults are embedded in the flesh of marine teleosts (3).

Cymothoids (Crustacea, Isopoda, Cymothoidae) are ectoparasites of marine, freshwater or brackishwater teleost fishes. Numerous families and species of fishes, including many of commercial importance are infected. They settle on the skin, in the buccal cavity, the gill chambers or sometimes in a

pouch (29) and they are hematophagous feeding on their host blood and sometimes on tissues (13, 25).

Argulids (Crustacea, Branchiura, Argulidae) are excellent swimmers. Adults and larvae can easily migrate among many hosts. Branchiurans can induce morbidity and mortality in captive fish populations (4, 17, 32).

Leeches (Annelida, Hirudinea, Piscicolidae) are considered as ectoparasites and they are found virtually anywhere on the external body surface of fishes e.g., body surface, in mouth, branchial chamber or cloaca. They can induce tissue damage, osmoregulatory problems, and act as vectors of pathogens e.g., blood-born protozoa (6).

## MATERIAL AND METHOD

Samples were collected in Turkey during 2002-2005. Among host fishes, *Liza abu*, *Chlorophthalmus agassizi* and *Cyprinus carpio* were caught using gill nets; *Xiphias gladius* were obtained from a fishermen. Parasites were preserved and fixed in 70% alcohol. Specimens were dissected and cleared in lactic acid. Parasites were coded using micrometer.

Identifications and morphometric characteristics were performed according particularly to: Ho et al (15), Rahemo

Geliş tarihi/Submission date: 25 Ocak/25 January 2007  
Düzeltilme tarihi/Revision date: 27 Şubat/27 February 2007  
Kabul tarihi/Accepted date: 27 Şubat/27 February 2007  
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Makaledeki türlerin üçü 10. Uluslararası Yunanistan ve Yakın Böl-  
gelerin Zoocoğrafyası ve Ekoloji Kongresi'nde (26-30 Haziran  
2006, Patras) sunulmuştur.

Five ectoparasites

Table 1. Parasitological index for the five parasites collected.

	No. of fish investigated	No. of fish infested	Prevalence %	Intensity (min-max)	Mean Intensity	Total number of parasites
<i>E.mosulensis</i>	140 (La)	135	96.4	4-15	8.04	1085
<i>P.instructa</i>	5 (Xg)	5	100	1-3	1.6	8
<i>C.steindachneri</i>	56 (Ca)	13	23	1	1	13
<i>A.foliaceus</i>	24 (Cc)	11	45.8	1-5	2.64	29
<i>P.geometra</i>	24 (Cc)	2	8.3	1	1	2

La: *Liza abu*, Xg: *Xiphias gladius* Ca: *Chlorophthalmus agassizi*, Cc: *Cyprinus carpio*

(24) for *E. mosulensis*; Hogans (10), Kabata (16), Kabata (18), Yamaguti (32) for *P. instructa*; Horton (11), Trilles (28) for *C. steindachneri*; Bykhovskaya-Pavlovskaya (7), Rushton-Mellor (26) for *A. foliaceus*; Burreson (6) for *P. geometra*.

The parasites examined, their hosts, geographical range and parasitological index (Table 1) are given.

## RESULTS AND DISCUSSION

***Ergasilus mosulensis*** Rahemo, 1982 (Crustacea: Copepoda: Ergasilidae)

**Material examined:** Collected from the gill filaments of *Liza abu* Heckel, 1843 (Mugilidae; mullet) from Atatürk Dam Lake.

**Distribution:** Tigris River, Iraq (15, 24).

**Hosts:** *Liza abu* (15, 24).

**Size:** Total length, 704-994 µm.

**Remarks:** *E. mosulensis* is mainly characterized by a guitar-shaped cephalothorax with anterior lobe.

In Turkey, ergasilids were reported from both freshwater, marine and brackish water fishes. *E. sieboldi*, *E. briani* and *E. sp* were recently recorded from thirteen freshwater fish species (20). About marine and brackish ergasilids, there are two reports: *E. nanus* on mugilids (1, 21); *E. gibbus* on *Anguilla anguilla* (2).

*E. mosulensis* is reported for the first time in Turkey. This species was recently described (15, 24). Their material were from Iraq freshwaters (Tigris River) connected with Euphrates river system of Turkey.

***Pennella instructa*** Wilson, 1917 (Crustacea: Copepoda: Pennellidae);

**Material examined:** Removed from the base of the anal and pectoral fins and in the abdominal muscular tissue of *Xiphias gladius* Lin., 1758 (Xiphiidae; swordfish) from Muğla Province (the Aegean Sea).

**Distribution:** Mediterranean Sea, Pacific Ocean and Atlantic Ocean (9, 19, 27, 31, 32).

**Hosts:** *Xiphias gladius* and *Istiophorus platypterus* (9, 10, 19, 27, 31, 32).

**Size:** Total length, 210 -225mm.

**Remarks:** This species is mainly characterized by a long trunk, slightly thicker posteriorly, transversely striated third; abdominal brush similar to that of *Pennella filosa*; abdomen also subcylindrical, in line with trunk, provided with lateral rows of fine processes forming abdominal trunk.

One pennellid species (*Lernaolophus sultanus* from mouth base of *Diplodus vulgaris*.) was recently collected in Turkish waters (22). Adults *P. instructa* were found embedded in the flesh of marine teleosts especially big fish e.g. swordfish

This species is recorded for the first time in the Turkey.

***Ceratothoa steindachneri*** Koelbel, 1878 (Crustacea: Isopoda: Cymothoidae)

**Material examined:** collected from the mouth of *Chlorophthalmus agassizi* Bonaparte, 1840 (Chlorophthalmidae, shortnose greeneye ) from Samandağ, Hatay (Mediterranean Sea).

**Distribution:** Atlantic Ocean, Mediterranean Sea, Adriatic Sea (11, 30).

**Hosts:** *Serranus hepatus*, *S. scriba*, *S. cabrilla*, *S. atricauda* *Raja asterias*, *R. polystigma*, *R. alba*, *Diplodus vulgaris*, *Chlorophthalmus agassizi* *Echiichthys vipera* (8, 11, 12, 14, 30).

**Size:** Total length, 15-25 mm; width, 7.5-9.5 mm.

**Remarks:** Cephalon deeply curved towards rostrum at the level of the eyes; pereopods without prominent expansions on the merus.

Ökter and Trilles (23) recorded four *Ceratothoa* species e.g., *C. oestroides*, *C. parallela*, *C. italica*, *C. capri* from marine fishes of Turkey. For the first time, *C. steindachneri* is reported in Turkish waters.

***Argulus foliaceus*** Lin., 1758 (Crustacea: Branchiuran: Argulidae)

**Material examined:** Removed from the body surface and fins of *Cyprinus carpio* Lin., 1758 (Cyprinidae, carp) from Çavuşçu Lake (Konya).

**Distribution:** Europe, Central Asia, North America (7, 26).

**Hosts:** freshwater fishes, especially Cyprinidae (7, 26).

**Size:** Total length, 3-7 mm; width, 2.5-5 mm

**Remarks:** The most characteristics of this species are: urosome with rounded lobes covered marginally with small spines; posterior incisure of urosome not reach in center; anterior margin of cephalothorax forming broad protrusion delimited laterally by shallow grooves.

In Turkey, *A. foliaceus* Lin., 1758 was reported from 9 different hosts (including *Cyprinus carpio*) (20). This species is recorded for the first time in Çavuşçu Lake.

***Pisciola geometra*** Lin., 1761 (Annelida, Hirudinea, Piscicolidae)

**Material examined:** Removed from the body surface and fins of *Cyprinus carpio* Lin., 1758 (Cyprinidae, carp) from Çavuşçu Lake (Konya).

**Distribution:** Europe, Central Asia, North America (6, 7).

**Hosts:** freshwater fishes, especially Cyprinidae (6, 7).

**Size:** Total length, 25 mm; width, 3 mm

**Remarks:** Body about 10-11 times as long as wide, although in some specimens this ratio becomes 20-25; anterior part of the body only slightly less wide than posterior; caudal sucker approximately 1.5 times as large as body width.

*P. geometra* Lin., 1761 was previously reported from six host species (*Rutilus rutilus*, *Scardinius erythrophthalmus*, *Blicca bjoerkna*, *Tinca tinca*, *Esox lucius*, *Barbus rajanorum mystaceus*) (20). The species is recorded for the first time in Çavuşçu Lake; *C. carpio* is a new host for *P. geometra* in Turkey.

#### ACKNOWLEDGEMENT

The authors are very thankful to Prof. Dr. Ju-shey Ho from Department of Biological Sciences, California State University for the verification of *Ergasilus mosulensis* identification, Prof. Dr. Tangül Şan (Department Histology of Medical Faculty, Marmara University and Prof. Dr. Mustafa Urgan (Division of Materials, Istanbul Technical University), for preparing of and studying the SEM samples.

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