

# Confirmed record of *Clavellotis fallax* (Heller) (Siphonostomatoida; Lernaepodidae) from *Dentex dentex* (Linnaeus) with morphological characters in Turkey

AHMET ÖKTENER<sup>1,✉</sup>, ALI ALAŞ<sup>2</sup>, DILEK TÜRKER<sup>3</sup>

<sup>1</sup>Department of Fisheries, Sheep Research Station. Çanakkele Street 7km., 10200, Bandırma, Balıkesir, Turkey. Tel.: +90-5072397983, ✉email: ahmetoktener@yahoo.com

<sup>2</sup>Department of Biology, Faculty of Education, Necmettin Erbakan University. B Block, 42090, Meram, Konya, Turkey

<sup>3</sup>Department of Biology, Faculty of Science, Balıkesir University. Cagis Campus, 10300, Balıkesir, Turkey

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**Abstract.** Öktener A, Alaş A, Türker D. 2017. Confirmed record of *Clavellotis fallax* (Heller) (Siphonostomatoida; Lernaepodidae) from *Dentex dentex* (Linnaeus) with morphological characters in Turkey. *Bonorowo Wetlands 1*: 4-7. *Clavellotis fallax* (Heller, 1865) (Copepoda, Siphonostomatoida; Lernaepodidae) was reported for the first time on *Dentex dentex* (Linnaeus, 1758) from the North Aegean Sea Coasts. This species was reported from different sparid species in Turkey, but not report from *Dentex dentex*. This paper aims to present some morphological characters with photographs and drawings of *Clavellotis fallax* from Turkey.

**Keywords:** *Clavellotis*, *Dentex*, *Copepoda*, Lernaepodidae, Turkey

## INTRODUCTION

Lernaepodidae is a diverse and large family of highly specialized parasitic copepods, currently comprising 48 genera (Boxshall and Halsey 2004). Lernaepodids are found everywhere the world's oceans on teleosts and chondrichthyans. As a group, they may infect all external surfaces of the host's body, including the gills, spiracles, and olfactory sacs (Benz 1993). The pathology associated with lernaepodid copepods depends on the tissue infected, the species of parasite, its size and the type of bulla (Lester and Hayward 2006). *Salmincola edwardsii* in brook trout caused severe diffuse exuberant proliferation of gill epithelium, resulting in severe lamellar fusion and aneurysms (Duston and Cusack 2002).

Fifteen species of Lernaepodidae family are reported from Turkish waters, namely *Clavellotis fallax* (Heller, 1865), *Clavellotis briani* Benmansour, Ben Hassine, Diebakate & Raibaut, 2001, *Clavellotis strumosa* (Brian, 1906), *Clavella alata* Brian, 1909, *Clavellisa scombri* (Kurz, 1877), *Lernaepoda galei* Krøyer, 1837, *Thysanote impudica* (Nordmann, 1832), *Parabrachiella bispinosa* (Nordmann, 1832), *Parabrachiella exigua* (Brian, 1906), *Parabrachiella insidiosa* (Heller, 1865), *Parabrachiella hostilis* (Heller, 1868), *Tracheliastes polycolpus* Nordmann, 1832, *Naobranchia cygniformis* Hesse, 1863, *Pseudotracheliastes stellifer* (Kollar, 1835) (Alaş et al. 2014).

The morphological characters in the study obtain a possibility to compare the findings of the other countries in next time. This study aims to confirm of the occurrence of *C. fallax* with the morphological characters especially including mouthparts from Turkey. It also aims to present

the host preferences according to family characteristics, habitat selections, feeding habits for *C. fallax*.

## MATERIAL AND METHODS

The host was obtained with the local fishing gears in North Aegean Sea in 2014. The collected parasites were fixed in 70% ethanol. Parasites were dissected using a Wild M5 stereo microscope. The dissected parts were mounted on slides in a glycerin-gelatine mounting medium. The appendages were drawn with the aid of a camera lucida (Olympus BH-DA). The photos were taken with the aid of Canon EOS 1100D camera attached to the microscope. The measurements were taken in millimeter (mm) with a micrometric program (Pro-way). The scientific names, synonyms of parasite and host were checked with the WoRMS Editorial Board (2015). The information of feeding habits, habitat characteristics of the host were prepared according to Froese and Pauly (2015). *C. fallax* (MNHN-IU-2013-18739) was deposited in the collections of the Muséum National d'Histoire Naturelle (MNHN), Paris, France.

## RESULTS AND DISCUSSION

*Clavellotis fallax* (Heller, 1865) (Figure 1, 2, 3)

**Host:** *D. dentex* (Linnaeus, 1758) (Pisces; Sparidae) (the common dentex); **Locality:** Babakale Port; **Total parasite:** 14; **Dissected parasite:** 10.

All parasites were firmly attached to the gill rakers of the host. The prevalence, mean intensity of parasite were 40%, 2.3 respectively.

**Description-female:** Body length varies from 4 to 5 mm. The cephalothorax longer than the trunk. The trunk is ovate or pyriform, with truncated posterior margin. Ovisacs stout, cylindrical, apically rounded. Second maxillae shorter than trunk and cephalothorax. Second maxillae short, about one-third of cephalothorax length, fused at tip; bulla small, mushroom-shaped. First antenna 4-segmented; basal segment unarmed; third segment armed with seta whip on anterior margin; the apical segment with terminal armature consisting of one tubercle, two short setae, three long. Second antenna typical biramous, bulbous exopod more prominent and longer than endopod, covered with robust spinules on the rounded tip. Endopod two-segmented, armed apically with two setae, one tubercle. Exopod with 6-9 spines and much more spinules. First maxilla biramous with small endopod and prominent tripartite exopod. Endopod composed of short digitiform process surmounted with one long, one short setae. Exopod tripartite with two big and one short setae. Mandible with dental formula P1, S1, P1, S1, P1, S1, B5. Maxilliped with a strong corpus, moderately elongated, with 1 with a strong terminal spine in its myxal area. subchela bearing a spine on its side. A sturdy barb reaches close to the middle of the claw.



Figure 1. *Clavellotis fallax* ♀ (Bar = 1 mm)

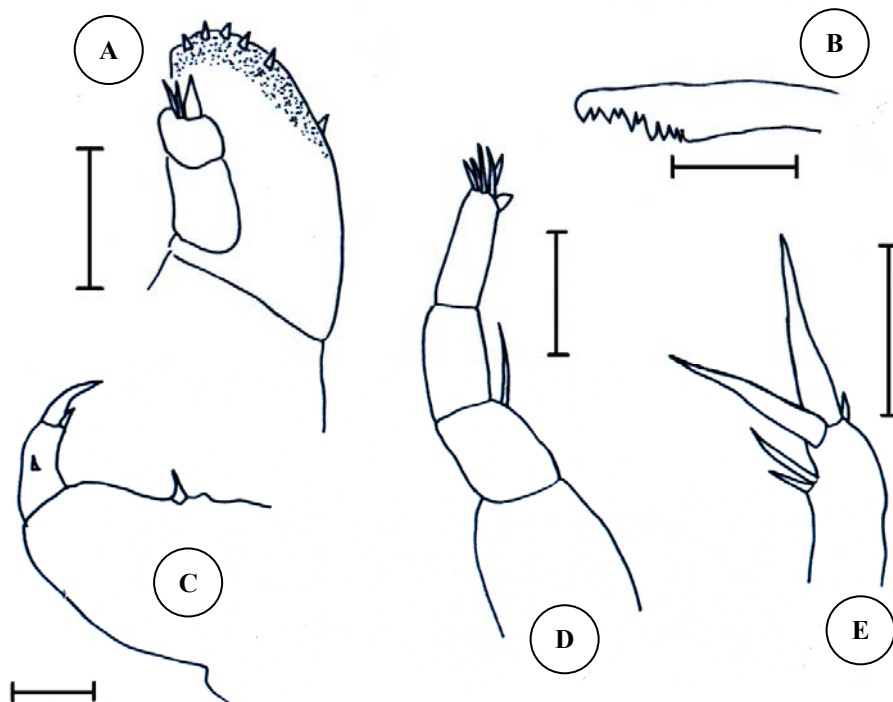
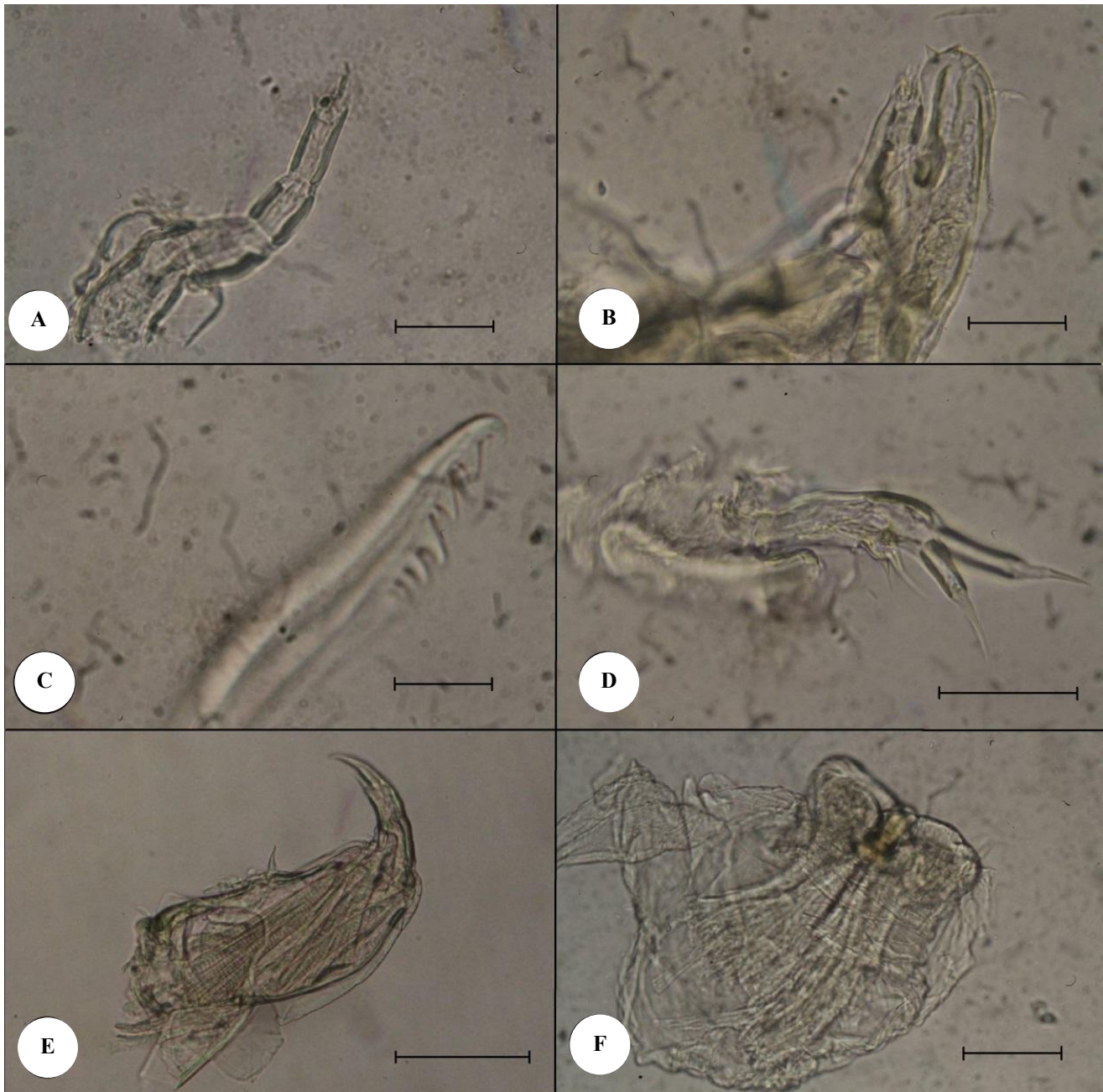


Figure 3. *Clavellotis fallax* ♀. A. Second antenna (Bar = 0.05mm), B. Mandible (Bar = 0.03mm), C. Maxilliped (Bar = 0.06mm), D. First antenna (Bar = 0.03mm), E. First maxilla (Bar = 0.05mm)



**Figure 2.** *Clavellotis fallax* ♀. A. First antenna (Bar = 0.03mm), B. Second antenna (Bar = 0.05mm), C. Mandible (Bar = 0.015mm), D. First maxilla (Bar = 0.05mm), E. Maxilliped (Bar = 0.06mm), F. Bulla (Bar = 0.15mm).

### Discussion

*Clavellotis fallax* has been reported from North Atlantic Ocean, Mediterranean Sea, Adriatic Sea (Radujkovic and Raibaut, 1989). It was reported on *D. dentex* (Brian 1906; Raibaut et al. 1971; Papoutsoglou 1976; Ben Hassine et al. 1978; Essafi et al. 1984; Radujkovic and Raibaut 1989; Benmansour and Ben Hassine 1997; Raibaut et al. 1998; Benkirane et al. 1999; Gonzalez et al. 2004; Martorell 2004), *Dentex gibbosus* (Brian 1924), *Lithognathus lithognathus*, *Cymatoceps nasutus* (Barnard 1955), *Lithognathus mormyrus* (Ben Hassine et al. 1978; Raibaut et al. 1998; Martorell 2004), *Sparus aurata* (Ben Hassine et

al. 1978; Essafi et al. 1984; Benmansour and Ben Hassine 1997; Raibaut et al. 1998; Martorell 2004; Souidenne 2010), *Spondyliosoma cantharus* (Ben Hassine et al. 1978; Essafi et al. 1984; Benmansour and Ben Hassine 1997; Raibaut et al. 1998; Martorell 2004; Boualleg et al. 2010), and *Pagellus erythrinus* (Essafi et al. 1984)

The host parasitism with *C. fallax* was examined according to family characteristics; all of 8 hosts belong to Sparidae family. The host parasitism with *C. fallax* was examined according to habitat selections of host fish; 5 of 8 host species are benthopelagic; 3 are demersal. The host parasitism with *C. fallax* according to feeding habits of host

fish; 6 of 8 host species are carnivorous, 2 are omnivorous. It may say that this parasite selects fishes with carnivorous and benthopelagic character. *D. dentex* examined in this study is carnivorous and benthopelagic character fish. It is fit as preferring host for *C. fallax*.

The cephalothorax, trunk, second maxilla proportions; the segment number on first antenna; the status exopod/endopod on second antenna, first maxilla; the myxal area, barb, spine on maxilliped of *C. fallax* agree with findings of Barnard (1955), Ben Hassine et al (1978), Brian (1924), Martorell (2004).

*C. fallax* was reported on the gill rakers of *Sarpa salpa*, *Diplodus sargus*, *Spondyliosoma cantharus*, *Pagellus erythrinus* from the Aegean Sea by Akmirza (2000). A parasitic copepod belonging *Clavellotis* at genus level was also reported on *D. dentex* by Çilli (2012). This study confirms the occurrence of *Clavellotis fallax* on *Dentex dentex* in Turkey.

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