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Report of *Apiosoma* sp. on Cultured European Sea Bass (*Dicentrarchus labrax*) in Turkey [1]

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ABSTRACT

This study is part of a parasitological investigation conducted in sea bass (*Dicentrarchus labrax*) and sea bream (*Sparus aurata*) at farms located in the Aegean Sea coastal zone of Turkey between march-november 2010. The species of Apiosoma has been reported mostly in freshwater fish. However, in the present study, *Apiosoma* sp. (Peritrichia, Epistylididae) was detected in the gill of sea bass weighing 200 g in earth ponds (7 ‰ salinity and 20 ºC water temperature) in sampling at october. The prevalence of parasite was determined as 40 % in the fish. Sesil ectocommensal ciliates feed with bacteria and suspended organic waste. For this reason, they are common in nutrienth-rich waters or poor water quality conditions. Therefore, it is necessary to improve the water quality in order to prevent *Apiosoma* infestations in cultured fish.

Türkiye'de Yetiştiriciliği Yapılan Avrupa Deniz Levreklerinde (*Dicentrarchus labrax*) *Apiosoma* sp.'nin Bildirimi

MAKALE BİLGİSİ

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ÖZET

Bu çalışma, Türkiye'nin Ege Denizi kıyısında yer alan çiftliklerdeki levrek (*Dicentrarchus labrax*) ve çipura (*Sparus aurata*) balıklarında Mart-Kasım 2010 tarihleri arasında yürütülen parazitolojik bir araştırmanın parçasıdır. Apiosoma türleri, çoğunlukla tatlı su balıklarında rapor edilmiştir. Bununla birlikte, bu çalışmada *Apiosoma* sp. (Peritrichia, Epistylididae), ekim ayındaki örneklemelerde toprak havuzlarda (su sıcaklığı 20ºC, tuzluluk ‰ 7) tutulan 200 g ağırlığındaki levrek balıklarının solungaçlarında tespit edilmiştir. Parazitin balıklardaki prevalansı % 40 olarak hesaplanmıştır. Sesil ektokommensal siliatlar, bakteri ve suspanse organik atıklarla beslenirler. Bu nedenle, besleyici elementlerce zengin sularda ya da zayıf su kalitesinin olduğu ortamlarda yaygın olarak görülmektedirler. Bu nedenle, yetiştiriciliği yapılan balıklarda *Apiosoma* enfestasyonlarının önlenmesi için su kalitesinin iyileştirilmesi gereklidir.

1. Introduction

Global fish production has grown to 167.2 million tons in 2014, of which 44.14% was produced by aquaculture (FAO 2016). Turkey has a 25% share of the European market of sea bass and sea bream and is the 3rd fastest growing country in aquaculture in the world (Cavdar 2017). Sea bass production by aquaculture in Turkey has been obtained by 80 847 tonnes in 2016 (TUIK 2018). The Turkish fisheries industry continues to develop more efficient production technologies, and the industry sources has started to obtain positive results by the application of (pre) on-growing of sea bass until they reach to the weight of 15-20g in earthen ponds in land-based sites (FAO 2017). Although most of the sea bass farming companies still prefer transferring the sea bass juveniles to the floating net-cages for breeding purposes, some of them prefer breeding their fish in the earthen ponds until the commercial size ranging from 250 to 300g. However, diseases problems (e.g. viral, bacterial, parasitic etc.) are still one of the main obstacles during the production cycle of sea bass.

In particular, sessile ciliates such as the species belonging to the following three genera: *Apiosoma* Blanchard, 1885, *Ambiphrya* Raabe, 1952, and *Epistylis* Ehrenberg, 1830, are obligate parasites which utilize the gills and skin of the fish merely as a substrate for attachment, causing massive destruction. Even in a moderate infection, these parasites may lead to high mortalities, as the fish stops feeding (Abowei et al. 2011). In some case, *Apiosoma* spp. can badly endanger fish egg, fry and even adult fish and cause great losses to aquaculture (Li et al. 2016; Li et al. 2008 a,b). *Apiosoma* sp. do not cause direct lesions in the host, but at high intensities can reduce the respiratory surface of the host's gill epithelium (Martins et al. 2015; Meira-Filho et al., 2017) and affecting gas exchange (Abowei et al. 2011; Meira-Filho et al., 2017). However, Moyses et al. (2015) considered *Apiosoma* sp. as an obligatory parasite

[1] This study is part of the master's thesis.

and relate the infestation by this group to the massive destruction of fish gill epithelium.

The genus *Apiosoma* can be distinguished from the sessile ciliates genera in having a scopula, which is used as the substrate-attaching organ. The species of Apiosoma, mainly live on the gills and body surface of aquatic organisms, particularly freshwater fish (Li et al. 2016; Li et al. 2008 a,b). However, it has been reported in a few marine fish species: lebranche mullet, *Mugil liza* (Meira-Filho et al., 2017), sea bass and sea bream (Yavuzcan Yıldız and Otgucuoglu, 2018).

The aim of this study was to report *Apiosoma* sp. in cultured sea bass weighing 200g in earth ponds (water temperature, 20ºC and salinity, 7 ‰) at a farm in the Aegean Sea coast of Turkey.

2. Material and Method

This study is part of parasitological investigation conducted in sea bass (*Dicentrarchus labrax*) and sea bream (*Sparus aurata*) at farms located in the Aegean Sea coastal zone of Turkey between march-november 2010. In the sampling at october, sea bass (n=5) weighing approximately 200g were caught with a fishing hook from an earthen pond (320m^3) filled with ground water. The water temperature was 20°C and the salinity was measured as 7 ‰. Initially, the fish were euthanized and fixed in 10% formalin for parasitological examinations. Gill filaments of each fish collected, were examined and photographed under a light microscope equipped with a digital camera.

3. Results and Discussion

In this study, conical or cup-like numerous *Apiosoma* sp. were observed in the secondary lamellae of the gills of sea bass (Figure 1). The prevalence of parasite was determined as 40 % in the fish. Some characteristic features of *Apiosoma* sp. such as, peristomial cilia, transverse ciliary band surrounding the cylindrical trunk, scopula (attachment organ), and peristomial disc were observed during our examination, were also presented in Figure 2.

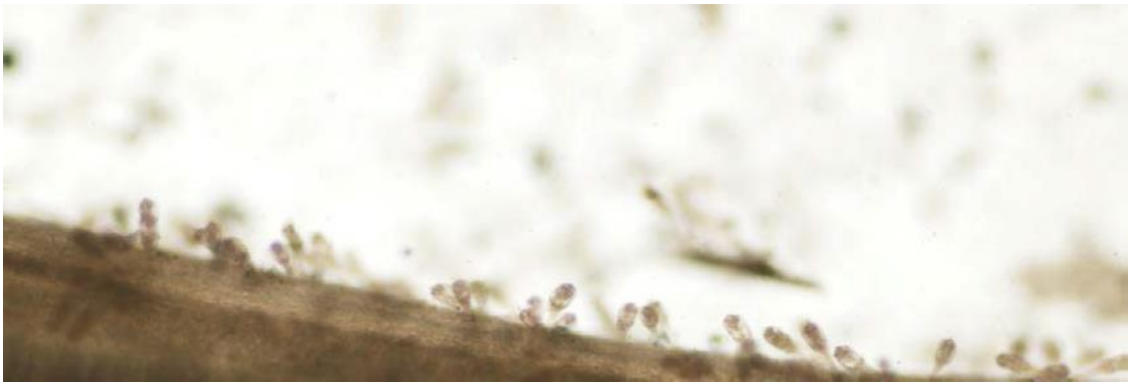

Figure 1. Numerous *Apiosoma* sp. attached to the secondary lamellae of the gills in sea bass(4x)

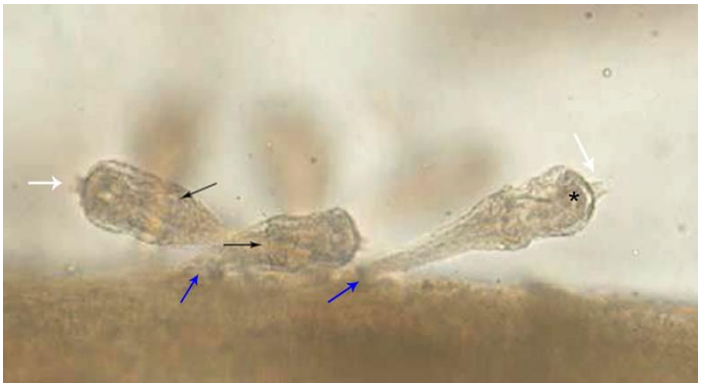

Figure 2. *Apiosoma* sp. in the secondary lamellae of the gills showing peristomial ciliae (white arrows), transverse ciliary bands surrounding the trunk (black arrows), scopula (blue arrows), and peristomial disc (asterisk) (x20).

Apiosoma species has been reported mostly in freshwater fish: rainbow trout (*Oncorhynchus mykiss*) (Öğüt et al., 2003; Altunay and Yavuzcan Yıldız, 2008; Özcelep, 2009), round goby (*Neogobius melanostomus*), tubenose goby (*Proterorhinus marmoratus*) (Pronin et.al., 1997) and common carp (*Cyprinus carpio*) (Özer and Erdem, 1998). However, in the present report, *Apiosoma* sp. were found in gill seconder filaments of the cultured sea bass weighing 200g in earth ponds (water temperature, 20ºC and salinity, 7 ‰) in the Aegean Sea coast of Turkey in october 2010. In the next studies, *Apiosoma* sp. was detected in lebranche mullet, *Mugil liza* (Meira-Filho et al., 2017); sea bass and sea bream from off-shore cage culture (Yavuzcan Yıldız and Otgucuoglu, 2018).

As a result of this study, *Apiosoma* sp. (Peritrichia, Epistylididae) was detected in the gill filaments of sea bass in earth ponds (water temperature, 20ºC and salinity, 7 ‰) at a farm in the Aegean Sea coast of Turkey. The prevalence of parasite was determined as 40 % in the fish.

The presence of Apiosoma is an indicator of organic pollution in water. Therefore, *Apiosoma* infestations in cultured fish can be prevented by improving the water quality.

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