

SHORT COMMUNICATION

The Presence of the Monogenean Helminth *Grubea cochlear* Diesing, 1858 from Chub Mackerel (*Scomber japonicus*) Caught in The Çanakkale Strait, Türkiye

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Abstract: In this study, 75 chub mackerels that were caught in the Canakkale Strait in Türkiye between October to December, 2019, were examined for the presence of parasites. The length and weight of all fish were measured and the external body area, oral cavity, nostrils, fins, and gills were examined. Gill samples were examined under a stereomicroscope and all suspicious findings were preserved in 99.99% ethanol. The mean length and weight of fish were 24.84±0.39cm and 146.01±7.16 gr, respectively. It was determined that the collected parasite is *Grubea cochlear*, a monogenic helminth belonging to the Mazocraeidea family. The chub mackerel, in which the specimen of *G. cochlear* was isolated among the gill filaments, was a female with a total length of 18.5 cm and a weight of 49.80 gr. This finding of *Grubea cochlear* isolated from the gills of chub mackerel is the first record of this species in this region.

Anahtar kelimeler:

Kolyoz balığı
Grubea cochlear
Mazocraeidea
Monogenea
Scomber japonicus

Çanakkale Boğazı'ndan Yakalanan Kolyoz Balığında (*Scomber japonicus*) Monogenean Helminth *Grubea cochlear* Diesing, 1858'in Varlığı

Öz: Bu çalışmada, Ekim-Aralık 2019 tarihleri arasında Çanakkale Boğazı'nda (Türkiye) avlanan 75 kolyoz (*Scomber japonicus*) Balığı incelenmiştir. Tüm balıkların boy ve ağırlıkları ölçülmüş, dış vücut bölgesi, ağız boşluğu, burun delikleri, yüzgeçler ve solungaçlar incelenmiştir. Solungaç örnekleri stereo mikroskopta incelenmiş ve tüm şüpheli buluntular %99,99'lük etanolde saklanmıştır. Balığın ortalama boyu ve ağırlığı sırasıyla 24.84±0.39cm ve 146.01±7.16 gr idi. Toplanan parazitin Mazocraeidea familyasına ait monogenik bir helminth olan *Grubea cochlear* olduğu belirlendi. Solungaç lamelleri arasından *G. cochlear* örneğinin izole edildiği kolyoz, toplam uzunluğu 18.5 cm ve ağırlığı 49.80 gr olan dişi bir bireydir. Kolyozun solungaçlarından izole edilen *Grubea cochlear* bulgusu, bu türün bölgedeki ilk kayıdır.

Introduction

Although the members of the Scombridae family are very common in the Atlantic, they are extensively fished in the Mediterranean (Costa et al., 2007; Costa et al., 2011). Members of the Scombridae family such as *Scomber japonicus* Houttuyn, 1782 and *Scomber colias* Gmelin, 1789, are mostly preferred in the Mediterranean cuisine. Chub mackerel is particularly important both in terms of food in human nutrition and fish feeding in aquaculture. The total catch of chub mackerels amounted to approximately 1.360 million tons (FAO, 2022).

Parasitic infections of wild fishes are very common (Feist and Longshaw, 2008). Parasites primarily use their hosts as a nutritional and reliable breeding ground. They increase the chances of mating and breeding when they meet the host and the host provides the necessary nutritional conditions (Rohde 1977, 1979, 1993; 1994;

Ramasamy et al. 1985; Koskivaara et al. 1992; Cavaleiro and Santos 2011). Ectoparasites of fish are observed in the body areas where the host contacts with the external environment and the gill lamellae that are in direct contact with the water are particularly a target for infestation (Koskivaara et al. 1992). Castro and Santos (2013) reported that many parasite species that were not previously observed in mackerels are observed in the gills.

Studies on monogenean parasites belonging to the family Mazocraeidea (Price, 1936) indicate that members of this family infest the gills of scombrids (family Scombridae). *Grubea cochlear* (Mazocraeidea) was first described by Karl Moriz Diesing in 1858. In 1968, it was found in the gills of *S. scombrus* from the coasts Tunisia and the former Yugoslavia (Rohde, 1986). In 1975, *G. cochlear* was isolated from *Sarda chilensis* of the coasts of

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Baha California. It was later isolated from *S. scombrus* and *S. japonicus* in the Mediterranean and the Western Atlantic (Rohde, 1986). *G. cochlear* was also isolated from chub mackerel from coasts of Italy and Spain in the Mediterranean (Mele, 2014). In this study, the occurrence of *G. cochlear* in the gills of chub mackerel (*S. japonicus*) caught from the Çanakkale Strait is reported.

Material and Methods

In this study, 75 chub mackerels that were caught in the Çanakkale Strait in November 2019 were examined for the presence of ectoparasites. Initially, the length and weight of all fish were measured. Then, the external body area, oral cavity, nostrils, fins, and the gills were examined. Samples taken from fish were examined in detail under a stereo zoom microscope (Zeiss Stemi 508-8:1) and photographs were taken using a digital camera. All suspicious findings were stored in absolute ethanol. For further examination, samples were removed from ethanol, softened in glycerin and examined under a binocular light microscope at different magnifications. Identification of the parasite was carried out according to Rohde and Watson (1985a, b), Rohde (1986, 1989), Xiao-Ming and Jian-Ying (2009), Lyndon and Vidal-Martinez (1994).

Results and Discussion

Only one specimen of *Grubea cochlear* was isolated from a total of 75 chub mackerels (*S. japonicus*) examined. The mean total length and weight of all fish examined were 24.84 ± 0.39 cm and 146.01 ± 7.16 gr, respectively (Figure 1). The chub mackerel in which *Grubea cochlear*

was found among the gill filaments was a female with a total length of 18.5 cm and weight of 49.80 gr.

The length of the *Grubea cochlear* specimen was 7.77 mm (Figure 2) and had 4 masochraid suction discs with different diameters (329.37 μ m, 380.038 μ m, 326.713 μ m, 283.018 μ m) (Figure 3, 4). The opisthaptor length of the specimen was 2.8 mm, which constituted about a third of the total body length (Figure 3).

Although rarely observed in the Scombridae family, the monogenean *Grubea cochlear* was reported earlier from Morocco, Portugal, Spain, Tunisia and the former Yugoslavia in the Mediterranean (Rohde, 1986; Bray, 2001; Kohn et al., 2006; Strona et al., 2010; Mendoza-Garfias et al., 2017; Derbel et al., 2022). It was also reported from scombrids caught from other parts of the world such as Brazil and the North Sea (Rohde, 1986). *G. cochlear* was also isolated from the Turkish waters. Tareen (1982) isolated *G. cochlear* from *S. scombrus* in the Aegean Sea and this was the first record for Turkey (Özer, 2021).

Two other closely related species, *G. australis* and *G. sinensis* were also reported from the gills of scombrids. *G. australis* was reported from the gills of *S. australis* in southeast Australia and *G. sinensis* was reported from the gills of *Pneumatophorus japonicus* in China (Xiao-Ming & Jian-Ying, 2009). *G. cochlear* has a relatively large opisthaptor that contains much more advanced suction discs than *G. australis* (Rohde, 1986) and *G. sinensis*. There are also differences in the number of small genital hooks, the shape of the opisthaptor and the direction of the opisthaptor (Xiao-Ming & Jian-Ying, 2009).



Figure 1. A group of the examined specimens of chub mackerels (Original)



Figure 2. The observed specimen of *Grubea cochlear* and its respective body measurements (Original, scale bar: 1 mm)

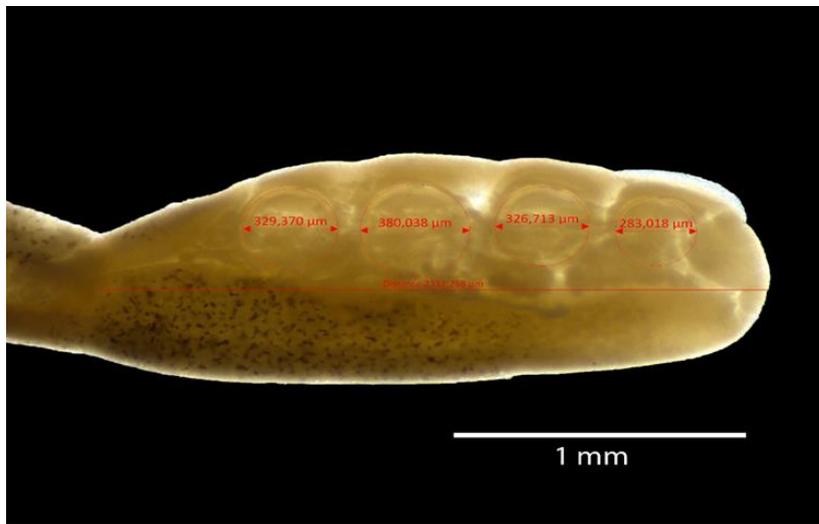


Figure 3. Suction organs and diameters of opisthaptors (Original, scale bar: 1 mm)



Figure 4. The suction disc of the observed specimen (Original)

The occurrence and prevalence of *G. cochlear* is very limited in wild scombrids. The prevalence of *G. cochlear* isolated from *S. scombrus* was only 2.5 %. Mele (2014) reported the prevalence of *G. cochlear* as 10%. Similar to other studies, the prevalence of this species in the present study was very low and only 1 specimen was found among 75 examined fish corresponding to a prevalence of 1.3%.

The Çanakkale Strait constitutes an important fishing area and aggregation zone where many species of pelagic species such as mackerels, bluefishes, chub mackerels and bonitos migrate annually between the Aegean Sea, the Sea of Marmara and the Black Sea (Rozakēs, 1987; Oğuz et al., 2000; Keser et al., 2007). Such periodic and temporary mass aggregations of different species of fishes in confined areas may also help facilitate spread of rare parasites such as *G. cochlear* in wild fish populations. This is the first report for the presence of ectoparasitic helminth *Grubea cochlear* isolated from the gills of chub mackerels in the region.

Conflict of Interest

The authors declare that there are no conflicts of interest.

Author Contributions

All authors contributed to the results and preparation of manuscript.

Ethics Approval

Ethics committee approval was not required since the article studied dead fish and parasites.

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