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RESEARCH ARTICLE

Gnathia sp. (Gnathiidae) Infestations on Marine Fish Species from Turkey

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Summary

This study was carried out between June and August 2006. Totally 150 samples out of ten different fish species caught from the Marmara Sea, the Black Sea and the Aegean Sea were examined. For this purpose, body surface, fins, gills and mouth cavity of each fish were examined with the aid of a dissecting microscope. After that, ectoparasite samples were preserved in 70% ethanol to be observed under the dissecting microscope for identification. *Gnathia* sp. was found out in the mouth cavity and gill flaments of these infected fishes. This is the first study reporting *Gnathia* sp. from *Serranus cabrilla; Mullus surmuletus; Mugil cephalus; Trachurus mediterraneus; Sarpa salpa; Sciaena umbra*.

Keywords: *Gnathia sp., Sea of Marmara, Black Sea, Aegean Sea*

Türkiye Deniz Balığı Türlerinde *Gnathia* sp. (Gnathiidae) İnfestasyonu

Özet

Bu çalışma Haziran-Ağustos 2006 periyodunda yapılmıştır. Marmara Denizi, Karadeniz ve Ege Denizi'nden yakalanan 10 farklı balık türünden toplam 150 balık incelenmiştir. Bu amaçla her bir balığın vücut yüzeyi, yüzgeçleri, solungaçları ve ağız boşluğu disseksiyon mikroskobu ile incelenmiştir. Bundan sonra ektoparazit örnekleri disseksiyon mikroskobu altında incelenmiş olup, toplanan balıkların teşhis edileceği zamana kadar %70'lik etanolde muhafaza edilmiştir. *Gnathia* sp. larvalarına enfekte balıkların solungaç flamentleri ve ağız boşluklarında rastlanmıştır. Bu çalışmayla Türkiye'de *Serranus cabrilla; Mullus surmuletus; Mugil cephalus; Trachurus mediterraneus; Sarpa salpa; Sciaena umbra* balık türlerinden *Gnathia* sp. ilk defa rapor edilmektedir.

Anahtar sözcükler: *Gnathia sp., Marmara Denizi, Karadeniz, Ege Denizi*

INTRODUCTION

Gnathiid isopods (Crustacea: Isopoda: Gnathiidae) have complex life cycles with free-living adults and three stages of parasitic juveniles that feed on the blood and tissue fluids of teleosts and elasmobranchs. Juveniles have piercing and serrated mouthparts, including paired toothed mandibles and maxillules (maxillae 1), grooved paragnaths (hypopharynx), robust maxillipeds and hooked gnathopods. Young gnathiids can thus attach and feed on the surfaces of fish, sometimes in large numbers. Whereas gnathiid isopods as larvae are external fish parasites, as adults they live in cavities and crevices on the sea floor, such as in sponges, sea anemones and tunicates, coral rubble, or sediment cavities [1-4]. Presently there are 182 identified species of gnathiids reported from the world oceans [5]. Larvae, adult females and males differ considerably in their shape and behaviour. Praniza which is parasitic larval form of *Gnathia*

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sp. [6]. Praniza feed on their hosts' blood. There is enormous expansion of the mid-gut to accomodate these blood meals. When the ectoparasitic phase is over, the praniza leave their host and moult into the adult male or female. The adults are cryptic, do not feed and lead secluded lives in sheltered places on the sea-bed [7,8]. Numerous species have been reported in fish culture including *Gnathia vorax* on Sparidae, Serranidae, Mugilidae from the Mediterranean coast of Israel (9); *Gnathia* sp. on salmon farm (10); Paragnathia sp. on Anguilla anguilla [11]; *Gnathia* sp. on atlantic salmon [12].

This study is specifically aimed to investigate the infestations and hosts distribution of *Gnathia* sp. from Turkey.

MATERIAL and METHODS

A total of 150 fish belonging to several family were caught from three sea as follows: *Scorpaena scrofa, Serranus cabrilla,* and *Pagellus erythrinus* from the Sea of Marmara; *Mullus surmuletus* from Black Sea; *Mugil cephalus, Gaidropsarus mediterraneus, Scorpaena scrofa, Trachurus mediterraneus, Sarpa salpa, Serranus cabrilla, Diplodus vulgaris,* and *Sciaena umbra* from Aegean Sea. They were examined for ectoparasites in July-August 2006. After capturing, the fishes were placed on ice for approximately 6 hr and the body surface, fins, gills, mouth of each fishes were examined. The gill arches were preserved in 70% ethanol and later examined with the aid of a dissecting microscope (American Optycal Microscope). The parasites were removed and preserved in 70% ethanol. The identification of parasites were completed according to various authors [6-8,13].

RESULTS

Infestation values: Number of fish examined, number of fish infested, prevalence (%), intensity (min-max), total number of parasites were given in *Table 1*.

Table 1. *Parasitological index of Gnathia sp. collected from the seas surrounding Turkey*
Tablo 1. *Türkiye'yi çevreleyen denizlerden toplanan Gnathia sp.'nın parazitolojik indexi*

Fish Species	NFE	NFI	P	MI (min-max)	NP
Mullus surmuletus	23	2	8.7	1.5(1-2)	3
Scorpaena scrofa	26	3	11.5	3.3(1-6)	10
Serranus cabrilla	34	5	14.7	2.6(1-3)	13
Mugil cephalus	2	2	100	10(5-15)	20
Gaidropsarus mediterraneus	8	4	50	3.5(2-6)	14
Trachurus mediterraneus	5	2	40	2.0(1-3)	4
Sarpa salpa	4	3	75	2.6(1-4)	8
Diplodus vulgaris	15	6	40	3.6(3-8)	22
Sciaena umbra	6	6	100	4.6(4-8)	28
Pagellus erythrinus	27	7	26	3.0(1-5)	21

NFE = Number of fish examined; **NFI** = Number of fish infested; **P** = Prevalence (%); **MI (min-max)**= Mean intensity (minimum-maximum); **NP**= Total number of parasites

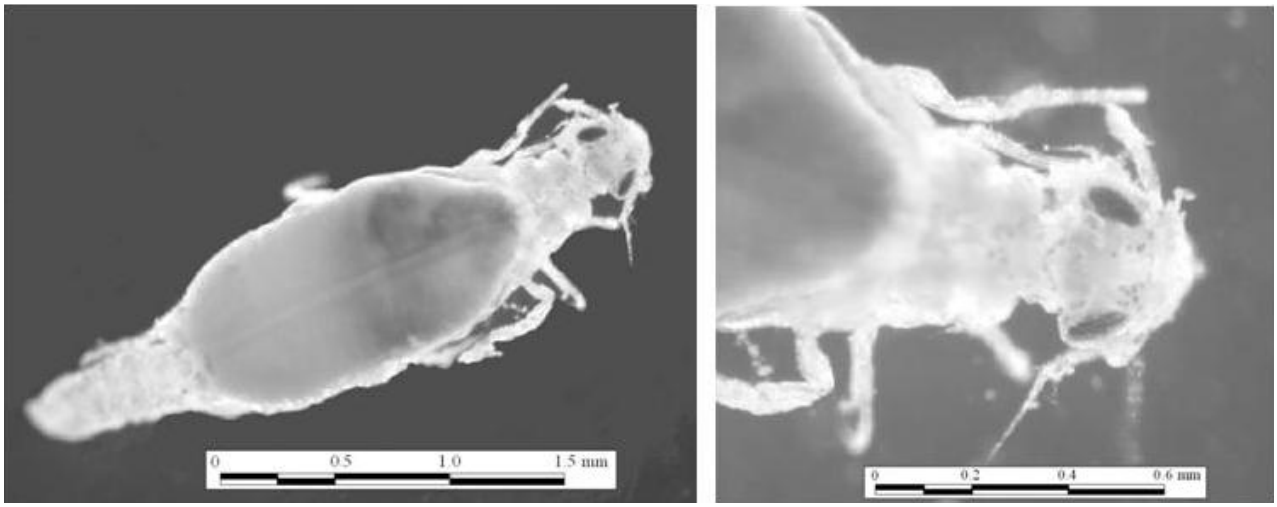

Fig 1. *Gnathia sp.*
Şekil 1. *Gnathia sp.*

DISCUSSION

There are various studies about *Gnathia* sp. in the Black Sea and Mediterranean Sea. *Gnathia* oxyure and *Gnathia* bacescoi species from the Black Sea were reported by Kononenko [14]. In addition, Gnathiids in the Mediterranean Sea were investigated by Monad [1].

In a research done by Papoutsoglou, *Gnathia maxillaris* was reported on several fishes from Greece: *Apogon imberbis, Boops salpa, Cantharus lineatus, Chromis chromis, Coris julis, Crenilabrus mediterraneus, C. quinquemaculatus, C. scina, C. tinca, Diplodus annularis, D. vulgaris, Gobius jozo, G. ophiocephalus, Labrus merula, Maena maena, Mullus barbatus, M. surmuletus, Onos tricirratus, Pagellus erythrinus, Phycis blennioides, Puntazzo puntazzo, Scorpaena porcus, Serranus scriba, Sphyraena sphyraena, Thalassoma pavo, Trachinus raco, Trigla lineata, Umbrina cirrosa, Uranoscopus scaber,* and *Zeus faber* [15]. At Adriatic Sea, *Gnathia* sp. *(vorax)* from *Merluccius merluccius, Pagellus erythrinus, Mullus barbatus, Trigla lyra,* and *Gnathia* sp. *(piscivora)* from *Chelon labrosus* were identified by Radujkovic [16].

In another study, *Gnathia* sp. was reported from *Uranoscopus scaber, Serranus scriba, Onos tricirrata, Acipenser stellatus, Ophidium barbatum, Trigla hirundo,* and *Crenilabrus pavo* from Black Sea [17].

The Gnathiids previously from Turkish sea are reported as both free and parasitic phase. *Gnathia vorax* was determined by some authors in holes and in wooden boards from Black Sea and Aegean Sea as a free form [18,19]. *Gnathia* sp. praniza larvae were reported from several fishes from Aegean Sea and Mediterranean Sea of Turkey [19-23]. *Gnathia* sp. was noted on *Diplodus annularis, D. vulgaris, Spondyliosoma cantharus, Lithognathus mormyrus, Diplodus sargus, Dentex dentex, Sparus pagrus, Crenilabrus tinca Scorpaena porcus, S. scrofa, Gaidropsarus mediterraneus,* and *Umbrina cirrosa* from Gökçeada by Akmirza [21,23], and *Gnathia* sp. on *Epinephelus aeneus* was found by Genç et al. [20].

Mugil cephalus usually in schools over sand or mud bottom, *Sciaena umbra* occurs in shallow coastal waters mainly on rocky and sandy bottoms, *Sarpa salpa* found over rocky substrates and sandy area with algal growth, *Gaidropsarus mediterraneus* lives generally at shallow depths near the shores on rocky bottom with aquatic vegetation [24]. Prevalance values of *Mugil cephalus, Sciaena umbra, Sarpa salpa and Gaidropsarus mediterraneus* were occurred over 50% *(Table 1)*. These high prevalance values is likely to be related to their habitat since adults and larvae of gnathiids are located on the sea bed, these fish are probably more easily infected than the others.

Gnathia spp. are *protandrous* hermaphrodites and to form male individuals, culture medium is necessary. We were not able to prepare culture medium. So, we could not culture pranizas. For this reason, we were able to make the identification of this species at genus level.

Gnathia species were found belonging to four different families which are recorded in Turkey for first time. In this sampling, two main body areas were infested by *Gnathia* sp. in Turkish fishes; the mouth base and the gill flaments. The study shows that five demersal, four benthopelagic and one pelagic fish were infested with *Gnathia* sp.

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