

Metazoan parasites of brown meagre (*Sciaena umbra* L. 1758) caught near Gökçeada, Turkey

Ahmet AKMIRZA*

Department of Aquaculture, Faculty of Fisheries, İstanbul University, İstanbul, Turkey

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Abstract: This study was conducted between July 2011 and January 2012 in Gökçeada, Turkey, to determine the metazoan parasite fauna of brown meagre (*Sciaena umbra*). The metazoan parasite fauna of 53 brown meagre samples was investigated and a total of 7 parasite species [*Anoiktostoma coronatum*, *Paracryptogonimus aloysiae* (Digenea), *Longicollum pagrosomi* (Acanthocephala), *Contracaecum fabri* (Nematoda), *Trachelobdella lubrica* (Hirudinea), *Nerocila bivittata*, and pranzia larvae (Isopoda)] were identified. It was determined that *Paracryptogonimus aloysiae* was the dominant parasite species of brown meagre with the prevalence of 66.04% in this region. *Anoiktostoma coronatum* and *Paracryptogonimus aloysiae* were reported for the first time in Turkey.

Key words: Digenea, Nematoda, brown meagre, *Sciaena umbra*, Gökçeada, Turkey

1. Introduction

The brown meagre, *Sciaena umbra* L. (Sciaenidae), is a benthic marine species living on rocky substrate, usually in caves and holes in inshore waters at a depth of 5–40 m, and feeding on benthic fish and crustaceans (1). This species is considered commercially important and is also very popular among sport fishermen. Brown meagre is cultured on a small scale in some Mediterranean countries such as Greece, and it may be a good alternative to gilthead sea bream and European sea bass (2). It shows a wide geographical distribution through the Mediterranean and Black Sea and along the Eastern Atlantic coast, from the English Channel to Senegal (1,3). Various studies were performed for the determination of the parasite fauna of brown meagre in different regions such as the western Mediterranean, Greece, and the Black Sea (2–6). Strona et al. (7) reported a total of 6 monogenean species (*Benedenia sciaenae*, *Calceostoma calceostoma*, *Calceostoma inermis*, *Diplectanum sciaenae*, *Diplectanum aculeatum*, and *Diplectanum simile*) from brown meagre in a checklist of the monogenoids infecting marine fish in Italy. Bartoli et al. (5) reported 5 digenean species (*Anoiktostoma coronatum*, *Paracryptogonimus aloysiae*, *Pleorchis polyorchis*, *Metadena pauli*, and *Stephanostomum bicoranatum*) in the Mediterranean region. Bartoli et al. also reported a redescription of *Pleorchis polyorchis* (Digenea), which is a specific and rarely seen parasite of brown meagre from the

western Mediterranean Sea. Some parasite species such as *Contracaecum fabri*, *Nerocila bivittata*, and *Pranzia larvae* are the most common parasite species and are found in various host fish including brown meagre. Previously, no parasitological studies were performed on the parasite fauna of brown meagre in Turkey; only *Stephanostomum bicoranatum* was reported in a previous study (8) in 1 of 3 brown meagre.

The aim of this study is to determine the parasite fauna of brown meagre and their infection rates, and to give a short description about the parasites found near Gökçeada, Turkey.

2. Materials and methods

The fish samples were caught with gill nets near Gökçeada, in the northeastern Aegean Sea, in Turkey, from July 2011 to January 2012. The sampling area is shown in Figure 1. After sampling, live fish samples were transported to the laboratory and kept in aerated tanks until parasitological investigation. For the parasitological investigation, fish samples were dissected; gills, intestines, and stomachs were removed and placed on separate petri dishes and then they were examined for parasites with a stereomicroscope under incident light. Live parasites were slightly compressed between a slide and a coverslip and examined under light microscope, and their photographs were taken. Some parasites were immediately mounted

* Correspondence: hakmirza@istanbul.edu.tr



Figure 1. Sampling area near Gökçeada coast, L: laboratory.

in glycerin jelly or placed in 70% alcohol solution, and slides were prepared after fixation. Measurements were taken with an ocular micrometer and BEL VIEW camera programs. Parasite samples recovered from fish samples were identified according to Petter and Radujkovic (9), Charfi-Cheikhrouha et al. (10), Bray et al. (11), Sağlam (12), Utevsky (13), and Anderson et al. (14). Infection rates of parasites were calculated according to Bush et al. (15).

3. Results and discussion

In this study, a total of 53 brown meagre samples were investigated parasitologically and 3 ectoparasite and 4 endoparasite species were detected. These parasite species, their sites of infections in the fish hosts, and their infection rates are shown in the Table.

3.1. *Anoiktostoma coronatum* (Wagner, 1852) Stossich, 1899 (Figure 2)

Body small (600–800 μm), oval to fusiform, oral sucker (100 \times 120 μm) terminal, funnel-shaped, surrounded by



Figure 2. Total view of *Anoiktostoma coronatum*.

a crown of large, sharp spines (number of spines 18–20). Ventral sucker (50 \times 55 μm) is small, circular, situated close to middle of body. Prepharynx is very short, pharynx large, ovoid, esophagus long. Ceca terminated close to posterior extremity. Testes 2, large and ovoid (100 \times 150

Table. Parasite species from brown meagre (*Sciaena umbra*) near Gökçeada and their infection rates.

Parasite species	Site	NEF	NIF	P (%)	NP	MI	Min–max
Digenea	<i>Anoiktostoma coronatum</i>	53	16	30.19	179	11.19	3–25
	<i>Paracryptogonimus aloysiae</i>	53	35	66.04	510	14.57	3–30
Acanthocephala	<i>Longicollum pagrosomi</i>	53	17	32.08	109	6.41	2–14
Nematoda	<i>Contraecaecum fabri</i>	53	5	9.43	17	3.4	1–5
Hirudinea	<i>Trachelobdella lubrica</i>	53	1	1.89	1	1	1
Isopoda	Praniza larvae	53	9	16.98	56	6.22	1–9
	<i>Nerocila bivittata</i>	53	1	1.89	1	1	1

NEF: Number of examined fish, NIF: number of infested fish, NP: number of parasites, P: prevalence, MI: mean intensity, Min–max: minimum–maximum intensity.

μm), in hind body, slightly elongated. Ovary intracecal, in hind body, slightly lobed ($80 \times 85 \mu\text{m}$). Uterus coiled from level of pharynx to close to posterior extremity in fore body and hind body. Vitellarium is follicular in its 2 lateral areas. Eggs small, ovoid, numerous ($20 \times 8 \mu\text{m}$).

Anoiktostoma coronatum is host-specific to *Sciaena umbra* and is a rare and little-known cryptogonimid species. This species was found by Brooks in the Adriatic Sea (3) and by Bartoli et al. in Corsica (5). This is the first detection of *Anoiktostoma coronatum* in the Turkish coasts of Gökçeada, Aegean Sea.

3.2. *Paracryptogonimus aloysiae* (Stossich, 1885) (Figure 3)

Body small, long (600–1200 μm) wide (600–900 μm), rounded to oval. Oral sucker ($110 \times 120 \mu\text{m}$) ventral-terminal; aperture surrounded by a row of numerous small spines (number of spines 75–80). Ventral sucker circular (90 μm in diameter), embedded in a sac. Prepharynx and esophagus short, pharynx ovoid, stout. Intestinal bifurcation lies between pharynx and ventral sucker. Cecae end close to posterior extremity. Testes 2, ovoid and intracecal. Ovary is in middle of body, intertesticular; multilobed. Uterus in hind body, extending close to posterior extremity. Vitellarium is follicular in its 2 lateral areas.

Paracryptogonimus aloysiae is the first species of this genus to be found in the Mediterranean region and is host-specific to *Sciaena umbra* (3,5). This is the first detection of this species from Turkish coasts.



Figure 3. Total view of *Paracryptogonimus aloysiae*.

3.3. *Longicollum pagrosomi* (Yamaguti, 1935) (Figure 4)

Longicollum pagrosomi (total length 8–12 mm, width 1.5–3 mm) is divided into presoma and trunk. Presoma (4–8 mm long) is also divided into proboscis and neck.



Figure 4. *Longicollum pagrosomi*: a) total view of female, b) trunk of male, c) proboscis.

Proboscis has arranged hooks, with 11–12 rows of hooks comprising 11–13 hooks each. Male has 2 spherical testes (2–2.5 mm in diameter). This species is orange-colored.

This acanthocephalan, with a Far Eastern origin, was first described in *Trachurus trachurus* from the Sea of Marmara by Oğuz and Kvach (16,17).

3.4. *Trachelobdella lubrica* (Grube, 1840) (Figure 5)

Small leeches (length 12 mm, width 0.3 mm). There are no tubercles on the body. The body is distinctly divided into the urosome and the trachelosome. Trachelosome is slender. Urosome looks inflated. Anterior and posterior suckers are small and inseparable parts of the body.

Trachelobdella lubrica occurs in warm temperate and tropical seas around the world, such as the Mediterranean, the Arabian Sea, West Africa, South Africa, and Australia (16). This species is parasitic on many fish species and has been reported from various fish species of the families Serranidae, Sciaenidae, Scorpaenidae, etc. (18,19). *Trachelobdella lubrica* was recorded from *Scorpaena* spp. in the Aegean Sea by Sağlam et al. (18), and from *Labrus bergylta* in the Sea of Marmara and *Epinephelus aeneus* and *Diplodus vulgaris* in the Aegean Sea by Ökter and Utevsky (19).

3.5. *Contracecum fabri* (Rud., 1819) (Figure 6)

This species, in the larval phase, is 10–30 mm long. Mouth with 3 lips, interlabially present. Esophagus 0.5–1 mm.



Figure 5. Total view of *Trachelobdella lubrica*.

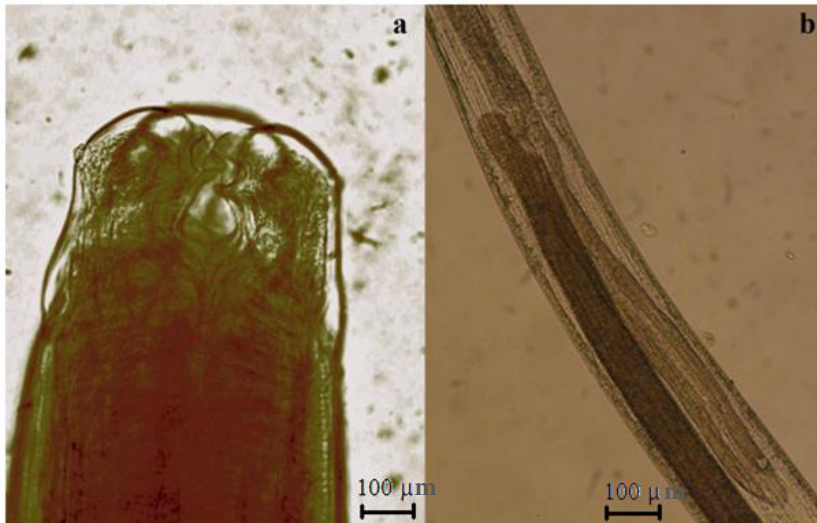


Figure 6. *Contracaecum fabri*: a) view of anterior extremity, b) view of intestinal and esophageal cecum.

long. The intestinal cecum short (0.05–0.07 mm) and the esophageal cecum long (0.6–1.2 mm.).

Contracaecum fabri is not host-specific and is found in many species of fish. This parasitic species was found in 23 fish species around the Adriatic Sea (9). Observed in many fish species from the Marmara Sea, Aegean Sea, and Black Sea, it was also located in some species such as *Trachinus draco*, *Diplodus annularis*, *Pagellus erythrinus*, and *Mullus surmuletus* near Gökçeada (8,20).

3.6. *Nerocila bivittata* (Risso, 1816) (Figure 7)

This species, a well-known parasite on fishes, shows a wide distribution from the British coasts to the French coasts and from the Aegean Sea to the Sea of Marmara, and it is found on various parts of the body of many fish species, such as *Labrus merula*, *Dentex macrophthalmus*, *Scieana umbra*, and *Gobius niger* (21).

3.7. *Praniza larvae* (Figure 8)

Gnathiidae isopods live free in the adult phase; they are only parasitic during their larval phase and they are

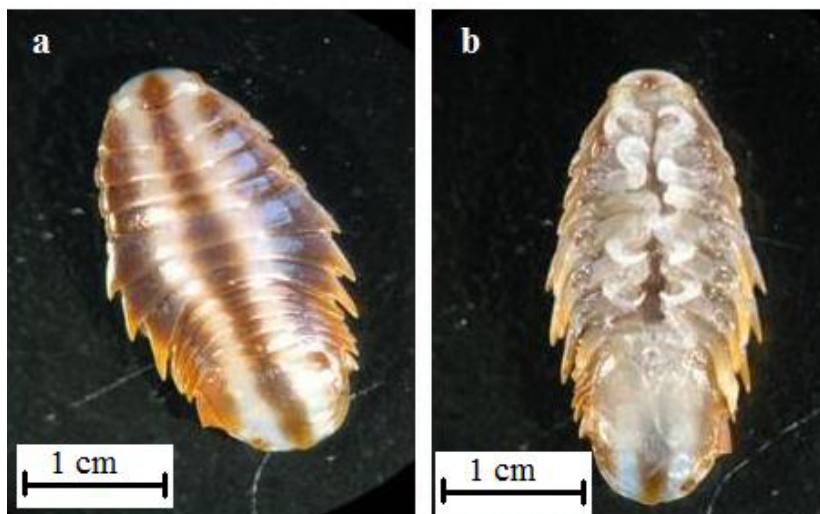


Figure 7. *Nerocila bivittata*: a) dorsal view, b) ventral view.



Figure 8. Total view of praniza larva.

called praniza larvae. Their length is 10–25 mm. Praniza larvae are found as ectoparasites on body surfaces and buccal cavities of fish. They were reported from various fish species, such as *Serranus cabrilla*, *Mullus surmuletus*, *Sarpa salpa*, *Sciaena umbra*, *Diplodus annularis*, *Scorpaena scrofa*, and *Crenilabrus tinca*, in the Mediterranean Sea, Aegean Sea, Sea of Marmara, and Black Sea (8,22).

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References

- Golani D, Öztürk B, Başusta N. The Fishes of the Eastern Mediterranean. İstanbul, Turkey: TÜDAV; 2006.
- Vatsos IN, Yiagnisi M, Karakostas I. *Ceratomyxa* spp. (myxospores) infection in cultured shi drum (*Umbrina cirrosa*) and cultured brown meagre (*Sciaena umbra*) from Greece. B Eur Assoc Fish Pat 2006; 26: 93–95.
- Bartoli P, Gibson DI. Three rare and little known cryptogonimid digeneans from the sciaenid fish *Sciaena umbra* (L.) in the Western Mediterranean. Syst Parasitol 1995; 30: 121–139.
- Paradiznik V, Radujkovic B. Digenean trematodes in fish of the North Adriatic Sea. Acta Adriat 2007; 48: 115–129.
- Bartoli P, Gibson DI, Bray RA. Digenean species diversity in teleost fish from a nature reserve off Corsica, France (Western Mediterranean), and a comparison with other Mediterranean regions. J Nat Hist 2005; 39: 47–70.
- Petter AJ, Radujkovic BM. Parasites des poissons marine du Montenegro: Nematodes. Acta Adriat 1989; 30: 195–236 (in French).
- Strona G, Stefani F, Galli P. Monogenoidean parasites of Italian marine fish: an updated checklist. Ital J Zool 2010; 77: 419–437.
- Akmirza A. The samples from metazoan parasites detected in fish around Gökçeada. In: Öztürk B, Aysel V, editors. Ulusal Ege Adaları 2001 Toplantısı Bildiriler Kitabı. İstanbul, Turkey: TÜDAV; 2001. pp. 85–96 (in Turkish with an abstract in English).
- Petter A, Radujkovic BM. Ascarides de poissons de Mediterranee occidentale. Bull Mus Natn Hist Nat Paris 1989; 9: 773–798 (in French).
- Charfi-Cheikhrouha F, Zghidi W, Ould-Yarba L, Trilles JP. Les Cymothoidae (isopodes parasites de poissons) des cotes Tunisiennes. Syst Parasitol 2000; 46: 143–150 (in French).
- Bray RA, Gibson DI, Jones A. Keys to the Trematoda. Nat Hist Museum London 2001; 3: 72–110.
- Sağlam N. Keys to the Freshwater and Marine Leeches. Elazığ, Turkey: Fırat Üniversitesi Su Ürünleri Fakültesi; 2004 (in Turkish).
- Utevsky AY. An identification key to Antarctic fish leeches (Hirudinea: Piscicolidae). Vestn Zool 2005; 3: 135–144.
- Anderson RC, Chabaud AG, Willmott S. Keys to the Nematode Parasites of Vertebrates. Wallingford, UK: CAB International; 2009.
- Bush AO, Lafferty KD, Lotz JM, Shostak AW. Parasitology meets ecology on its terms: Margolis et al. revisited. J Parasitol 1997; 83: 575–583.
- Oğuz MC, Kvach Y. Occurrence of Acanthocephalans in teleost fishes of Gemlik Bay, Sea of Marmara, Turkey. Helminthologia 2006; 43: 103–108.
- Kim S, Lee JS, Kim J. Fine structure of *Longicollum pagrosomi* (Acanthocephala: Pomphorhynchidae) and intestinal histopathology of the red sea bream, *Pagrus major*, infected with Acanthocephalans. Parasitol Res 2011; 109: 175–184.
- Sağlam N, Oğuz MC, Çelik ES, Doyuk SA, Usta A. *Pontobdella muricata* and *Trachelobdella lubrica* (Hirudinea: Piscicolidae) on some marine fish in the Dardanelles, Turkey. J Nat Biol Assoc UK 2003; 83: 315–316.
- Öktener A, Utevsky SY. New information on the hosts and distribution of the marine fish leeches *Trachelobdella lubrica* and *Pontobdella muricata* (Clitellata, Hirudinida). Vestn Zool 2010; 44: 33–36.
- Akmirza A. Parasite fauna of Greater Weever (*Trachinus draco* Linnaeus, 1758). Acta Adriat 2004; 45: 35–41.
- Kırıkım F, Kocataş A, Kaya T, Sezgin M. A report on parasitic isopods (Crustacea) from marine fishes and decapods collected from the Aegean Sea (Turkey). Turk J Parasitol 2008; 32: 382–385.
- Alaş A, Öktener A, Yılmaz M. *Gnathia* sp. (Gnathiidae) infestations on marine fish species from Turkey. Kafkas Univ Vet Med J 2009; 15: 201–204.