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The Presence of Pontobdella Muricata (Hirudinea: Piscicolidae), on the New Host Gymnura Altavela (Linnaeus, 1758) in the Eastern Mediterranean, Turkey

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Abstract

Two specimens of Pontobdella muricata were observed on the dorsal surface of a female spiny butterfly ray, Gymnura altavela (Linnaeus, 1758), that was recorded in 2018 in the Akcay coast (Iskenderun Bay), Turkey. The spiny butterfly ray, G. altavela, was observed to be the new host for P. muricata in the eastern Mediterranean coast of Turkey. Besides, the present study is given comprehensive documents of the previous records of constitutes of different host records for P. muricata in different geographical areas.

1. Introduction

The marine leech Pontobdella muricata (Linnaeus, 1758) belongs to the Piscicolidae family (Sket and Trontelj 2008). This parasitic species is a predominantly parasite of freshwater or marine fishes and is known to native distribution in the northeastern Atlantic Ocean, the Baltic Sea, the North Sea, and the Mediterranean Sea (Palomares and Pauly 2023).

The marine leech P. muricata in the Mediterranean is most commonly known as parasitic on fish. The marine leech species are found virtually anywhere on the external body parts of cartilaginous and teleost fish (Burreson 1995; Arslan and Öktener 2012). The parasitic marine leech P. muricata several reported from some elasmobranchs and teleost fishes host in the Mediterranean and Adriatic waters (Sağlam et al. 2003; Bottari et al. 2007; Bakopoulos and Ksida, 2014; Başusta et al. 2016; Bolognini et al. 2016; Ben Ahmed et al. 2015).

P. muricata has been recorded from some fish in the marine waters of Turkey (Saglam et al. 2003; Çınar et al. 2014), and it has also been reported from different cartilaginous fish hosts in the Black Sea (Öktener and Utevsky 2010), the Sea of Marmara (Ergüven and Candan 1992), the Aegean Sea (Saglam et al. 2003) and the Mediterranean Sea (Bulguroğlu et al. 2015; Başusta et al. 2016; Yanar et al. 2019). However, up to date, no marine leech specimen of P. muricata was reported on the spiny butterfly ray.

In the present study, two P. muricata specimens were reported from the dorsal surface of a female spiny

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butterfly ray, Gymnura altavela (Linnaeus, 1758). This is the first record of G. altavela as being a host to P. muricata, and it is also the second occurrence of P. muricata in the eastern Mediterranean coast of Turkey (Iskenderun Bay).

2. Method

Two specimens of the marine leech, P. muricata, were observed on February 2018 from the dorsal parts of a female spiny butterfly ray, Gymnura altavela (Linnaeus, 1758), and then it was once recorded by video camera from depths of 9-10 meters from Akçay coast, Iskenderun Bay (Coordinate: 36º 13' N, 35º 50' E) in the eastern Mediterranean coast of Turkey (Fig. 1 and Fig. 2). The sea water temperature was measured as 19 ºC.

After the Scuba survey, these parasites were recovered from the spiny butterfly ray for examination and preserved in 70% ethanol for long-term storage. The two collected marine leech specimens were transferred to the laboratory in the Faculty of Fisheries and Marine Sciences and Technology of the Iskenderun Technical University. They were examined and photographed under an Olympus SZX-7 stereo microscope equipped with a digital camera. Length, width, and diameters of the oral and caudal suckers of the leeches were measured for two leech specimens to the nearest 0.1 mm with a digital caliper. According to Llewellyn (1966) and Sawyer (1986), the marine leeches were identified as P. muricata.

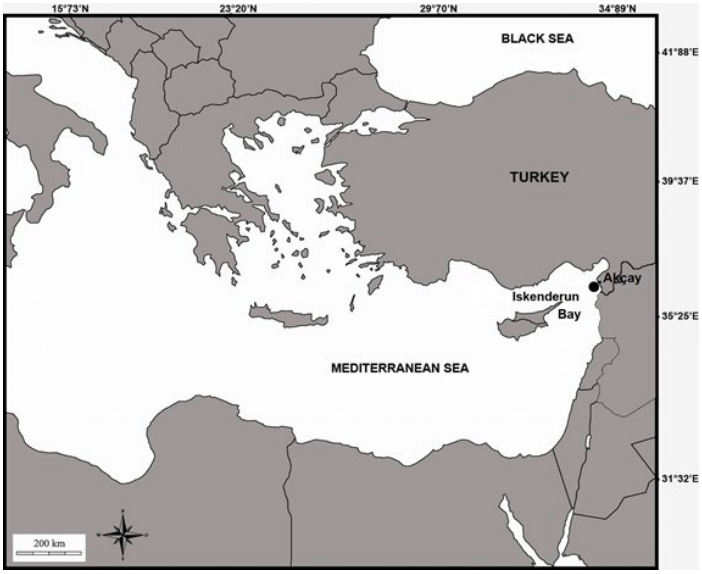

Figure 1. The map showing the capture record (●) of Pontobdella muricata from Akçay (Iskenderun Bay, Turkey)

Figure 2. The marine leechs Pontobdella muricata on the left and right disk of a female Gymnura altavela (Photo: Necdet Uyğur)

3. Results

The parasitic Hirudinea: The length (total length, TL) and width measurements of two specimens of P. muricata were 95.0 mm to 27.4 mm and 33.0 mm to 9.2 mm, respectively (Fig. 3). The diameters of the oral and the caudal sucker of them were 2.5 to 5.2 mm and 0.87 to 1.8 mm, respectively. The skin is rough and covered with small warts. The body is a long, cylindrical, somewhat flattened leech, narrowing at both ends. It has some annulations; the annulation of P. muricata between segments XI and XXVII is similar to the findings of the study by Sawyer (1986). Besides, this species has papillae and tubercles on the trachelosome and urosome and numerous photoreceptive cells on the oral sucker. However, there are no true eyes, and the oral sucker was

wider than the trachelosome. All morphological characteristics of P. muricata are consistent with the descriptions of Sawyer (1986).

Color: The color is olive-green with tiny speckles.

Figure 3. The marine leech Pontobdella muricata (95 mm, TL), OS (oral sucker) and CS (caudal sucker), Scale bar=10 mm

Stingray: The host spiny butterfly ray, G. altavela observed at depths between 9 to 10 m, was 460 mm in total length and 650 mm in disk width in Iskenderun Bay (Akçay coast) (Fig. 4). The spiny butterfly, G. altavela of the disk is very broad, and the tail is short armed with the spine.

Color: The disk is dark brown to grayish, the lower surface of the disc and the pelvic fins are white and brownish, and the tail is whitish. The morphological descriptions of the spiny butterfly ray agree with previous descriptions (Bauchot 1987).

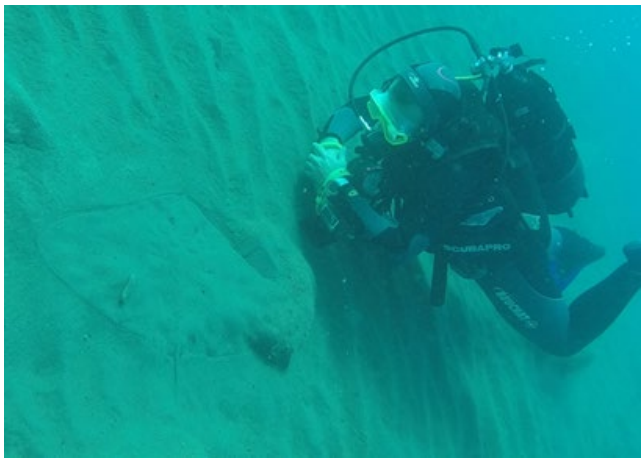

Figure 4. Underwater view of Gymnura altavela (Linnaeus, 1758) from Akçay coast (Photo: Necdet Uyğur)

4. Discussion

The marine leech, P. muricata is found on the seabed at depths down to about 100 m, and they are generally attached to the abdomen, ventral region, fin-bases of large elasmobranches and pectoral and pelvic fins, and gills of fishes where they feed by sucking blood (Rohde 2005; Palomares and Pauly 2023).

To date, marine leeches have been reported on several cartilaginous fishes (in Marbled electric ray Torpedo marmorata, Ray Raja sp., Thornback ray Raja clavata, Brown ray Raja miraletus, Spotted ray Raja montagui, Long-nosed skate Dipturus oxyrinchus and Common stingray Dasyatis pastinaca, Blacktip reef shark Carcharhinus melanopterus and Common eagle ray Myliobatis aquila) (Ergüven and Candan 1992; Sağlam et al. 2003; Öktener and Utevsky 2010; Bakopoulos and Ksidia 2014; Bulguroğlu et al. 2015; Bolognini et al. 2016; Yanar et al. 2019) and some ray-finned fish (in European plaice Pleuronectes platessa, Cape horse mackerel, Trachurus trachurus capensis) (Piasecki 1982; Sawyer 1986; Hayward and Ryland 2000). The previous records for the host list of marine leech P. muricata from different geographical areas are given in Table 1.

The spiny butterfly ray, G. altavela prefers sandy or muddy bottoms of brackish and coastal areas. It is disguised in the sand and feeds on crustaceans, mollusks, and small fish (McEachran and Capapé 1984).

In the Mediterranean, G. altavela is not targeted but is caught as bycatch with multiple fishing gears, including demersal trawl, gillnet, longline, and handline. Besides, coastal development, pollution, and anthropogenic effects through tourism activities are also an important threat to the species in shallow coastal habitats in the Mediterranean Sea. Thus, this species has been assessed as "Endangered, (EN)" under criteria A2d for The IUCN Red List of Threatened Species since 2019 (Dulvy et al. 2021) in the Mediterranean basin.

P. muricata is a hermaphrodite species, and fertilisation is internal. It feeds by sucking blood from fish as a parasite (Burreson 1995; Yamauchi et al. 2008). According to Palomares and Pauly (2023), the parasitic leech species is quiescent during the daytime, holding itself motionless and partially coiled, attached by its posterior sucker; however, it becomes active at night to feed. P. muricata can separate from its host and swim by flattening its body and then a new search for a suitable host fish (Rohde 2005; Palomares and Pauly 2023).

The present study is reported a new host record, G. altavela, for P. muricata in the eastern Mediterranean coast of Turkey. In addition, this study will shed light on scientists working in this field.

Table 1. Historical records host of *P. muricata* from different regions in Adriatic and Mediterranean waters

References	Location/ Country	No. of Infected Host	Year	Gear	Depth (m)	Family	Common Name	Species
Ergüven & Candan (1992)	Marmara Sea/Turkey	1	1992	-	-	Rajidae	Ray	*Raja* spp.
Sağlam et al. (2003)	Aegean Sea/Turkey	1	2000-2001	Bottom Trawl	-	Rajidae	Thornback ray	*Raja clavata* L.
		5				Torpenidae	Marbled electric ray	*Torpedo marmorata* Risso
Öktener & Utevsky (2010)	Black Sea/Turkey	3	2006	Gill net	-	Rajidae	Thornback ray	*Raja clavata* L.
Bakopoulos & Ksidia (2014)	Aegean Sea/Greece	3	2010-2012	Bottom Trawl	-	Rajidae	Thornback ray	*Raja clavata* L.
		2				Dasyatidae	Common stingray	*Dasyatis pastinaca* L.
Ben Ahmed et al. (2015)	Mediterranean Sea/	2	2008-2010	-	-	Rajidae	Ray	*Raja* spp.
Bulguroğlu et al. (2015)	Mediterranean Sea/Turkey	1	2013	Bottom Trawl	70	Rajidae	Thornback ray	*Raja clavata* L.
Başusta et al. (2016)	Mediterranean Sea/Turkey	2	2015	Bottom Trawl	75	Dasyatidae	Common stingray	*Dasyatis pastinaca* L.
Bolognini et al. (2016)	Northern and Central Adriatic Sea	33	2010-2014	Bottom Trawl	-	Rajidae	Thornback ray	*Raja clavata* L.
		21				Dasyatidae	Marbled electric ray	Torpedo marmorata *Risso*
								Myliobatis aquila L.
		3				Myliobatidae	Common eagle ray	
Bottari et al. (2017)	Thyrrhenian Sea/Italy	8	2014	Bottom Trawl	-	Rajidae	Brown ray	*Raja miraletus* L.
		2					Spotted ray	*Raja montagui* Fowler
Yanar et al. (2019)	Mediterranean Sea/Turkey	1	2016	Bottom Trawl	150-300	Rajidae	Long-nosed skate	*Dipturus oxyrinchus* L.
This study	Mediterranean Sea/Turkey	2	2018	Underwater survey	9-10	Gymnuridae	Spiny butterfly ray	*Gymnura altavela* L.

5. Conclusion

Although the marine leeches of Turkey are not well studied, there are limited studies on parasitic annelids and their hosts in Turkey. Our present study is provide a new essential data in this field. Therefore, further research and monitoring studies are required for parasite studies in different zoogeographic areas.

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Author contributions

Deniz Ergüden (DE): Investigation, data analysis, writing, sample design, methodology and final editing. Necdet Uyğur (NU): Data collection, data curation. Deniz Ayas (DA): Validation, supervision and editing.

Conflicts of interest

The authors declare that for this article they have no actual, potential, or perceived conflict of interest.

Statement of Research and Publication Ethics

For this type of study formal consent is not required.

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