



Parasitic Isopod *Anilocra physodes* (Linnaeus, 1758) from Mersin Bay (Turkey) with a New Host Record

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Keywords

Parasitic Isopod,
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Abstract

Anilocra physodes (Linnaeus, 1758) (Isopoda, Cymothoidae) is reported for the first time on *Nemipterus randalli* Russell, 1986 (Pisces; Nemipteridae) from the northeastern Mediterranean coast of Turkey. The present study aims to report a new host species for *A. physodes* in the Turkish Mediterranean waters. Also, the host species for *A. physodes* and the host preferences with it, according to fish family distributions, are detailed in this study.

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1. Introduction

Randall's threadfin bream *N. randalli* Russell, 1986 has a wide distribution in the western Indian Ocean, including the east and west coasts of India, the Persian Gulf, the Red Sea to Madagascar (Russell, 1990), and also the Mediterranean Sea (Lelli et al., 2008). *N. randalli* is a Lessepsian migrant first recorded on the Mediterranean coast of Israel by Golani and Sonin (2006), erroneously identified as *N. japonicus*. In Turkish Mediterranean

waters, the Randall's threadfin bream has appeared in Turkish marine waters since 2007 and was first scientifically recorded on the Turkish coast by Bilecenoglu and Russel, (2008) and Gokoglu et al. (2008). This species is demersal and occurs mainly in muddy or sandy habitats (Sommer et al., 1996) at 20 to 450 m (Goldshmidt et al., 1996). It is carnivorous and feeds on small fish, crustaceans, molluscs, polychaetes and echinoderms.

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Isopods are a group of parasites within the family Cymothoidae that are known to infect numerous fish families, mostly in tropical and subtropical habitats (Innal et al., 2007). These isopod species are not host specific and have been described from many hosts worldwide (Ramdane et al., 2007; Trilles and Öktener, 2009; Innal and Kirkim, 2012).

The isopod *Anilocra physodes* (Linnaeus, 1758) belongs to the subclass Crustacea and is a widespread order whose members are distributed worldwide and constitute an important part of the global marine fauna (Williams and Williams, 1981). This species is a blood-feeding ectoparasite that requires only one host to complete its life cycle (Ramdane et al., 2007) and is typically attached to a specific site on the body of fish species, including the fin, or within the branchial or buccal cavities (Trilles and Öktener, 2009).

Marine isopods are poorly studied animals in Turkey, and the cymothoid fauna of Turkey is still poorly known (Innal et al., 2007). The present study aims to report a new host species for *A. physodes* in Turkish Mediterranean waters. Although *A. physodes* has been reported in many fish species along the Turkish coast, interestingly, in this study its presence was detected for the first time in *N. randalli*, a Lessepsian migratory fish species. It is also the first time that both male and female individuals of this isopod species have been observed together on the same host.

2. Material and Methods

The two parasites were observed on the body surface of the captured *N. randalli* individual (Figure 1). The *N. randalli* individual was collected from Mersin Bay (Tece) on 24.03.2024 (Figure 2). Parasitic isopods were fixed in 70% ethanol after removal from the host. The identity of the parasite species taken from the fish brought to the laboratory was determined after examination. Isopod specimens were identified and photographed using a laboratory dissecting microscope according to Trilles (1965) and Williams & Williams (1981). The total length of female and male parasitic isopod specimens was measured to the nearest mm.



Figure 1. The appearance of male and female isopod individuals on the host *N. randalli* collected from the coast of Mersin, Turkey.

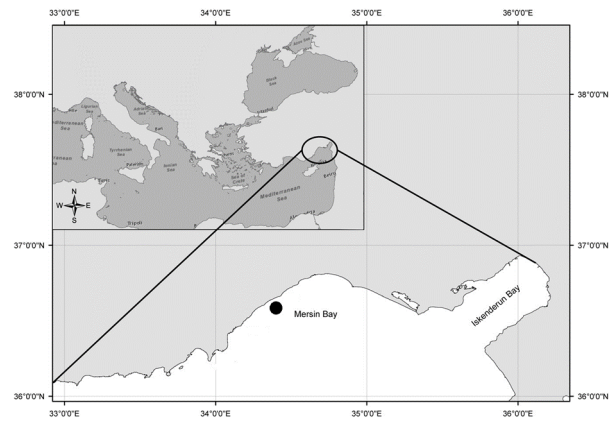


Figure 2. The area indicated by the black dot shows the area where the *N. randalli* individual was captured.

3. Results and Discussion

Two parasitic isopods were detected on an individual of *N. randalli* caught by hook and line in March 2024. The host individual (*N. randalli*) measured 15.1 cm in total length and weighed 42.2 g. The female individual of *A. physodes* measured 31 mm in total length and male 13 mm, and both isopod individuals were located near the tip of the dorsal fin of *N. randalli*.

Parasitic isopods are a very common crustacean infestation found in marine fish species along the Turkish coast (Öktener and Trilles, 2004). So far, *A. physodes* has been reported from the North Atlantic, the Mediterranean and the Adriatic Sea (Trilles, 1994). However, to date, two parasitic isopod species (*Anilocra physodes* and *Anilocra frontalis*) have been reported from Turkish waters (Kirkim, 1998; Öktener and Trilles, 2004), and these species have affected several fishes worldwide (Öktener et al., 2018).

In this study, two individuals of the marine parasitic isopod *A. physodes* (Linnaeus, 1758) were observed on *N. randalli*, belonging to the family Nemipteridae. In Turkish Mediterranean waters, the first records of *A. physodes* were reported from the coast of Antalya by Innal et al. (2007) and Innal and Kirkim (2012).

Although *A. physodes* and *A. frontalis* species previously known from the Mediterranean coast are similar, the anterior end of the head is truncate in *A. physodes* and rounded in *A. frontalis*. Also, the endopodites of the uropods slightly exceed the distal part of the pleotelson in *A. physodes*, but significantly in *A. frontalis* (Innal et al., 2007).

In Turkey, *A. physodes* has been found on several fish families, such as Sparidae, Centracanthidae, Scombridae, Serranidae, Sciaenidae, Moronidae, Physidae, Labridae, Sciaenidae, Carangidae, Mugilidae, Belonidae, Pomacentridae, Sphyraenidae, Congridae and Gobidae (Öktener et al., 2010). This species has so far been reported in many fish species along the Mediterranean coast of Turkey (Öktener and Trilles 2004; Innal et al., 2007; Trilles and Öktener, 2009; Öktener et al., 2010; Innal and Kirkim, 2012; Öktener et al., 2018). The prevalence of parasite species in host fish species in the previous studies and their distribution according to families are presented in Table 1. According to Öktener et al. (2018), *A. physodes* can select fish with carnivorous

and demersal characteristics. Similarly, in this study, this parasitic species preferred a carnivorous and demersal fish species *N. randalli* as a host.

In the present study, we report a new host fish species (*N. randalli*) for *A. physodes* in the northeastern Mediterranean (Mersin, Turkey). The present study will make a significant contribution to the literature in terms

of the occurrence of the parasitic isopod species *A. physodes*, which is found on the Mediterranean coast of Turkey, in a new host fish species. Another important contribution to the literature is that it is rare for both male and female individuals to coexist in the same location on the host.

Table 1. *Anilocra physodes* and hosts in the Turkish marine waters.

Host	Familya	Location	References
<i>Spicara smaris</i>	Sparidae	Sea of Marmara, Türkiye	Demir (1952)
<i>Spicara smaris</i>	Sparidae	Aegean Sea, Türkiye	Geldiay and Kocataş (1972)
<i>Pagellus sp.</i>			
<i>Scomber japonicus</i>	Scombridae	Aegean Sea, Türkiye	Akmirza (1997)
<i>Boops boops</i>	Sparidae	Aegean Sea, Türkiye	Akmirza (1998)
<i>Diplodus annularis</i>	Sparidae	Aegean Sea, Türkiye	Akmirza (2000)
<i>Diplodus vulgaris</i>			
<i>Diplodus sargus</i>			
<i>Pagellus erythrinus</i>			
<i>Oblada melanura</i>			
<i>Spondyliosoma cantharus</i>			
<i>Spicara maena</i>			Akmirza (2001)
<i>Diplodus annularis</i>	Sparidae	Antalya Gulf, Mediterranean, Sea Türkiye	İnnal et al. (2007)
<i>Lithognathus mormyrus</i>			
<i>Pagellus erythrinus</i>			
<i>Sphyræna ehrysoæna</i>	Sphyrænidae	Antalya Gulf, Mediterranean, Sea Türkiye	İnnal et al. (2007)
<i>Liza aurata</i>	Mugilidae	Antalya Gulf, Mediterranean, Sea Türkiye	İnnal et al. (2007)
<i>Sparus aurata</i>	Sparidae	Sea of Marmara, Türkiye	Oğuz and Öktener (2007)
<i>Trachurus trachurus</i>	Carangidae	Sea of Marmara, Türkiye	Oğuz and Öktener (2007)
<i>Pagellus erythrinus</i>			
<i>Spicara smaris</i>	Sparidae	Aegean Sea, Türkiye	Kırkım et al. (2008)
<i>Sparus aurata</i>			
<i>Dentex macroptalmus</i>			
<i>Labrus merula</i>	Labridae	Aegean Sea, Türkiye	Kırkım et al. (2008)
<i>Dicentrarchus labrax</i>	Moronidae	Aegean Sea, Türkiye	Kırkım et al. (2008)
<i>Sciaena umbra</i>	Sciaenidae	Aegean Sea, Türkiye	Kırkım et al. (2008)
<i>Serranus scriba</i>	Serranidae	Aegean Sea, Türkiye	Kırkım et al. (2008)
<i>Conger conger</i>	Congridae	Aegean Sea, Türkiye	Öktener et al. (2009)
<i>Belone belone</i>	Belonidae	Aegean Sea, Türkiye	Öktener et al. (2009)
<i>Serranus scriba</i>	Serranidae	Aegean Sea, Türkiye	Öktener et al. (2009)
<i>Chromis chromis</i>	Pomacentridae	Aegean Sea, Türkiye	Öktener et al. (2009)
<i>Dentex dentex</i>	Sparidae	Aegean Sea, Türkiye	Trilles and Öktener (2009)
<i>Diplodus vulgaris</i>			
<i>Oblada melanura</i>	Sparidae	Aegean and Mediterranean Sea, Türkiye	Öktener et al. (2010)
<i>Spicara maena</i>			
<i>Gobius bucchichi</i>	Gobidae	Mediterranean Sea, Türkiye	Öktener et al. (2010)
<i>Pempheris vanicolensis</i>	Pempheridae	Mediterranean Sea, Türkiye	Öktener et al. (2010)
<i>Boops boops</i>	Sparidae	Antalya Gulf, Mediterranean, Sea Türkiye	İnnal and Kırkım (2012)
<i>Phycis blennoides</i>	Phycidae	North Aegean Sea, Türkiye	Öktener et al. (2018)
<i>Nemipterus randalli</i>	Nemipteridae	Mersin Bay, Mediterranean, Sea Türkiye	Present study

4. Conclusion

Study results showed the presence of parasites *A. physodes* on the body surface of *N. randalli*, indicating the presence of a parasitic isopod infection affecting *N. randalli* in the northeastern Mediterranean the coast of Mersin Bay. In the present study, for the first time, a Lessepsian migratory fish species, *N. randalli*, was infected with the parasite *A. physodes*, which has been recorded in the eastern Mediterranean.

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Author contributions

The authors contributed equally.

Conflicts of interest

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

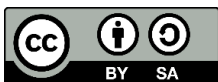
Statement of Research and Publication Ethics

For this type of study formal consent is not required.

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