

Two new host records for *Pomphorhynchus laevis* (Müller, 1776) (Acanthocephala) recorded from Antalya, Turkey: Small bleak (*Alburnus baliki* Bogutskaya, Küçük & Ünlü, 2000) and Antalya barb (*Capoeta antalyensis* Battalgil, 1944)

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Abstract: Acanthocephalan *Pomphorhynchus laevis* specimens are reported in *Alburnus baliki* and *Capoeta antalyensis* caught between May and July of 2009 in streams discharging into Antalya Bay. The total prevalence rate for *P. laevis* was 78.5% and 60% in *A. baliki* and *C. antalyensis*, respectively. A total of 28 *A. baliki* were caught, and 74 *P. laevis* were recorded in 22 of the 28 fish examined. As for the occurrence of *P. laevis* in *C. antalyensis*, a total of 15 fish were caught, and a total of 25 individuals were found in 9 of the 15 fish examined. This finding constitutes the first record of this helminth parasite in either fish species, and the host fishes represent 2 new host records for *P. laevis*.

Key words: Acanthocephalan, *P. laevis*, *A. baliki*, *C. antalyensis*, new host record

Antalya'dan (Türkiye) *Pomphorhynchus laevis* (Müller, 1776) için iki yeni konak kaydı, *Alburnus baliki* Bogutskaya, Küçük and Ünlü, 2000 (İnci balığı) ve *Capoeta antalyensis* Battalgil, 1944 (Bıyıklı balık)

Özet: Mayıs - Temmuz 2009 tarihleri arasında Antalya Körfezine dökülen bazı akarsulardan yakalanan *A. baliki* (inci balığı) ve *C. antalyensis* (bıyıklı balık) Akantosefala'ya ait *P. laevis* türü kaydedilmiştir. *P. laevis*'in toplam prevalansı sırasıyla *A. baliki*'de % 78,5, *C. antalyensis*'de % 60'dır. Yakalanan toplam 28 adet *A. baliki*'nin 22'sinde 74 adet *P. laevis* kaydedilmiştir. Yakalanan 15 adet *C. antalyensis*'in 9'un da toplam 25 adet parazit bulunmuştur. Bulgularımız *P. laevis*'in her 2 balık türü için, konak balık kaydını oluşturmuştur.

Anahtar sözcükler: Akantosefala, *P. laevis*, *A. baliki*, *C. antalyensis*, yeni konak kaydı

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C. antalyensis is highly endemic and has a restricted distribution. There are 3 populations, from the Aksu, Köprüçay, and Boğaçay streams, found in the Antalya region of Turkey. The Antalya barb is abundant in Aksu Stream (Küçük and Güçlü, 2006). It prefers clear, cold, high-flowing water and lives in shallow streams with sandy and pebbly bottoms (Küçük and İkiz, 2004).

A. baliki, a species endemic to Antalya, was discovered in the Manavgat River by Bogutskaya et al. (2000). This species is found between the Alara and Boğaçay streams and has been observed to form small populations at the lower catchment of the littoral parts of rivers. Especially during the spring months, it lives in schools at a depth of between 0.5 and 3 m in the Oymapınar and Manavgat dam lakes. It grows to up to 8-9 cm in length and reproduces in May and June.

To the authors' knowledge, although the helminth parasites of several fish species in Turkey have been extensively studied, there are no records of ichthyoparasitological data for *A. baliki* and *C. antalyensis*. This study is the first on the helminth fauna present in the 2 endemic fish species in Turkey. We sought to determine the occurrence of acanthocephalan parasites in both fishes from streams discharging into Antalya Bay. More extensive sampling is needed in order to obtain a more detailed picture of the occurrence of helminth parasites in the 2 endemic host fishes. The phylum Acanthocephala contains parasitic worms that infect vertebrates. They are relatively large, conspicuous worms and are clearly visible in the dissected intestine of the definitive host. All acanthocephalans are internal parasites in all stages of development. Mature specimens inhabit the intestine and, rarely, the stomach of the vertebrate definitive host. They are not usually dispersed along the whole host intestine but rather prefer one part of it.

The fish samples were collected via electrofishing from streams discharging into Antalya Bay; all fish were caught between May and July of 2009 and were transported alive to the laboratory of the Mediterranean Fisheries Research, Production, and Training Institute in Antalya. They were kept in aquaria and examined within a few days.

Fish were killed by vertebral separation and dissected in order to examine the gastrointestinal tract. It was removed, placed into a petri dish, opened longitudinally, and, using a stereoscopic microscope, examined for helminths. All of the acanthocephalan specimens found in each individual fish were identified and counted. A few of the live worms were relaxed for 1 night in tap water in the refrigerator and were then fixed in 5% formalin; a few others that had been relaxed in chilled tap water were fixed in 70% ethanol and stained with iron-carmin. The parasite specimens were identified using descriptions provided by Markevich (1951) and Yamaguti (1963). The epidemiological parameters were described according to those of Bush et al. (1997). Voucher specimens of acanthocephalans were deposited in the Uludağ University Museum of Zoology in Bursa, Turkey. All measurements are given in micrometers, with the exception of those provided for body length, which are given in millimeters. We deposited the fish hosts in the laboratory of the Mediterranean Fisheries Research, Production, and Training Institute in Antalya, Turkey.

We examined 28 *A. baliki* and 15 *C. antalyensis* specimens between May and July of 2009. Acanthocephalan *P. laevis* specimens were identified in the host fishes. A total of 74 (52 males, 22 females) *P. laevis* were recorded in 22 of the 28 *A. baliki* fish examined. As for the occurrence of *P. laevis* in *C. antalyensis*, 15 fish were caught and a total of 25 (18 males, 7 females) parasites were found in 9 of the 15 fish examined. The overall prevalence of *P. laevis* was 78.5% and 60% in *A. baliki* and *C. antalyensis*, respectively. Data concerning the prevalence, abundance, and intensity of these *P. laevis* infestations are given in the Table.

Table. The details of *P. laevis* infection in *A. baliki* and *C. antalyensis* samples.

Host	n	P (%)	MA	MI	Range
<i>A. baliki</i>	22	78.5	2.6	3.3	1-8
<i>C. antalyensis</i>	9	60	1.6	2.7	1-7

n: number of infected fish; P: prevalence; MA: mean abundance; MI: mean intensity.

Pomphorhynchus laevis (Müller, 1758)

Host: *A. baliki* and *C. antalyensis*

Site of infection: Intestine

Locality: Antalya, Turkey

Male (10 specimens): Body length: 6.5 mm (range: 6-16), maximum width: 2200 (range: 850-4300). Proboscis length: 650-900, proboscis width: 300-365, bulb diameter: 500-1200, neck length: 1050-4100, neck width: 365-1221. Lemnisci 570-4430 long with a width of 247-1380. Testes oval, tandem, situated near the middle of the body; size of anterior testes: 380-2700 × 210-1830, posterior testes: 350-2680 × 245-1620. Cement glands oval-shaped and 6 in number.

Female (10 specimens): Body length: 8.5 mm (range: 4.5-18), maximum width: 2460 (range: 910-3980). Proboscis length: 590-910, proboscis width: 325-398, bulb diameter: 418-1295, neck length: 1210-4790, neck width: 385-1220. Lemnisci 620-3251 long with a width of 98-1210. Female genital opening terminal.

This is the first survey providing ichthyoparasitological data for *A. baliki* and *C. antalyensis* in Turkey. In this study, the occurrence of acanthocephalan parasites in 2 endemic fish species were investigated. The species were found in the intestines of both fishes. Our examination revealed a *P. laevis* prevalence of 78.5% in *A. baliki* and 60% in *C. antalyensis*. To our knowledge, *P. laevis* has been identified and reported by various authors in *Cyprinus*

carpio, *Silurus glanis*, *Esox lucius* (Öktener, 2003), *Carassius carassius*, *C. auratus*, *Leuciscus cephalus*, *Alburnus alburnus*, *Nemacheilus* sp. (Koyun, 2001), *Tinca tinca* (Yıldız, 2003), and *Alburnus nasreddini* (Buhurcu and Öztürk, 2007). This species was also recorded in *Rana ridibunda*, distributed throughout Turkey (Düşen and Oğuz, 2008). Buhurcu and Öztürk (2007) reported a 61.8% prevalence of this species in *A. nasreddini* from Lake Akşehir. In a similar study, Yıldız (2003) recorded this parasite in the tench (*T. tinca*) population of Kapulukaya Dam Lake with a prevalence of 26.1%. Another study (Koyun, 2001), in Enne Dam Lake, reported *P. laevis* in *C. carassius*, *C. auratus*, *A. alburnus*, *L. cephalus*, and *Nemacheilus* sp. with prevalence rates of 0.8%, 1.2%, 0.5%, 5%, and 20%, respectively. Our findings for the Antalya barb are similar to those of Buhurcu and Öztürk (2007).

The results of the present study contribute to our knowledge about the occurrence of acanthocephalan parasites in different localities. Both *C. antalyensis* and *A. baliki* are considered to be new host records for the parasite *P. laevis*. Although *C. antalyensis* has been included in the IUCN International Red List of threatened species, no specific legal protection or conservation actions have been taken thus far (Turan and Özcan, 2009). Their populations are threatened due to the destruction of shallow water habitats caused by hydroelectricity production. The populations are also threatened by helminth parasites. Further ichthyoparasitological investigations are obviously necessary for both host fishes before the full causes of the decline of their populations can be ascertained.

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