

# ***Lernanthropus chrysophrys* (Copepoda: Lernanthropidae) parasitic on a blackhead seabream, *Acanthopagrus schlegelii* (Sparidae), in Suruga Bay, central Japan, with a comment on the geographical distribution of the copepod in the Indo-West Pacific region**

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## ■ Abstract

An adult female of *Lernanthropus chrysophrys* Shishido, 1898 was collected from the gill filament of a blackhead seabream, *Acanthopagrus schlegelii* (Bleeker, 1854), in coastal waters of Suruga Bay (western North Pacific Ocean), Shizuoka Prefecture, central Japan. This represents the second record of *L. chrysophrys* from off the Pacific coast of Japan. Based on the previous and present papers, *L. chrysophrys* occurs in tropical to temperate waters of the Indo-West Pacific region and, in Japan, the species is found from waters affected by two warm currents, the Kuroshio and the Tsushima Current.

## ■ Introduction

Japanese sparids (Perciformes: Sparidae) are composed of 13 valid species in seven genera (Nakabo, 2013). Some of them are one of the important fishes in wild catch fisheries and aquaculture in coastal waters of Japan. Since the early 2000's, in view of their commercial importance, we have conducted parasitological surveys of wild and farmed sparids and reported some species of several parasite groups, including nematodes (Moravec et al., 2010, 2018), copepods (Madinabeitia and Nagasawa, 2011a–b; Nagasawa, 2017a; Nagasawa and Kan, 2018), and isopods (Nagasawa and Isozaki, 2016; Nagasawa, 2017b; Nagasawa and Tanaka, 2017; Nagasawa and Nitta, 2018; Nagasawa and Fukuda,

2018; Nagasawa and Kawai, 2019).

Recently, we collected the lernanthropid copepod *Lernanthropus chrysophrys* Shishido, 1898 from a blackhead seabream, *Acanthopagrus schlegelii* (Bleeker, 1854), in Suruga Bay (western North Pacific Ocean), Shizuoka Prefecture, central Japan. The copepod was originally described in 1898 using female specimens from blackhead seabream in Moroiso Cove off Misaki, Kanagawa Prefecture, central Japan (Shishido, 1898). The species has since been poorly studied for its occurrence on sparids and geographical distribution in Japan. This note reports on our collection of *L. chrysophrys* as its second record from the Pacific coast of Japan.

## ■ Materials and Methods

A blackhead seabream was caught using rod and line in coastal waters of Suruga Bay off Miho, Shimizu (34°59'54.77"N, 138°31'39.13"E), Shizuoka Prefecture, on 28 September 2019. The fish was transported on ice to the National Research Institute of Far Seas Fisheries, Shimizu, where it was measured for fork length (FL, mm) and examined for parasites on the gills, body surface, and fins. One copepod was found to attach to the gill filament, removed carefully, and fixed in 70% ethanol. Later, at the Aquaparasitology Laboratory, the copepod was examined for its morphology and identified as *L. chrysophrys*. The specimen preserved in 70% ethanol is deposited in the Crustacea (Cr) collection of the National Museum of Nature and Science, Tsukuba, Ibaraki Prefecture (NSMT-Cr 26732). The scientific and common names of fishes mentioned in this paper follow Froese and Pauly (2019).

## ■ Results

An adult female of *L. chrysophrys* was collected

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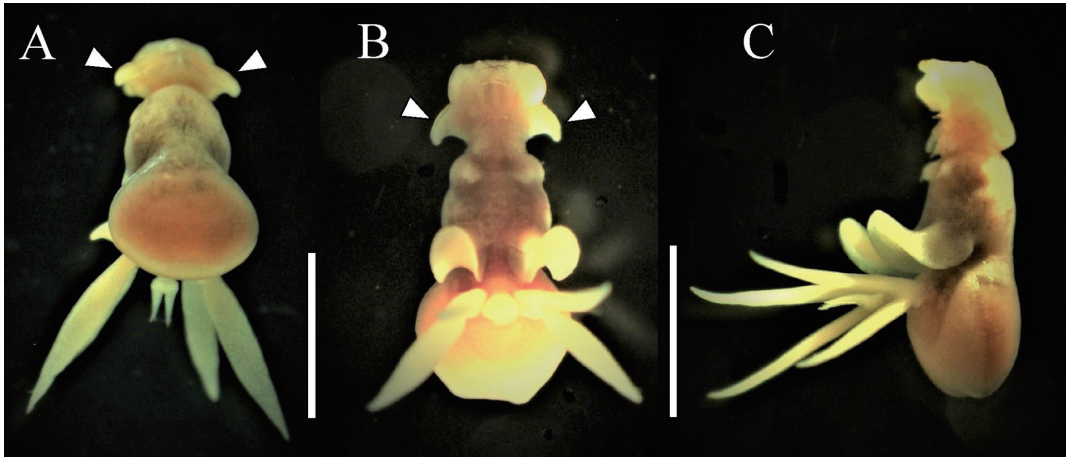


Fig. 1. *Lernanthropus chrysophrys*, adult female, NSMT-Cr 26732, from the gill filament of a blackhead seabream, *Acanthopagrus schlegelii*, in Suruga Bay off Miho, Shizuoka Prefecture, central Japan. A, posterodorsal view; B, ventral view; C, lateral view. The photographs were taken soon after the copepod was fixed in 70% ethanol. Scale bars: A, 2 mm; B–C, 2 mm.

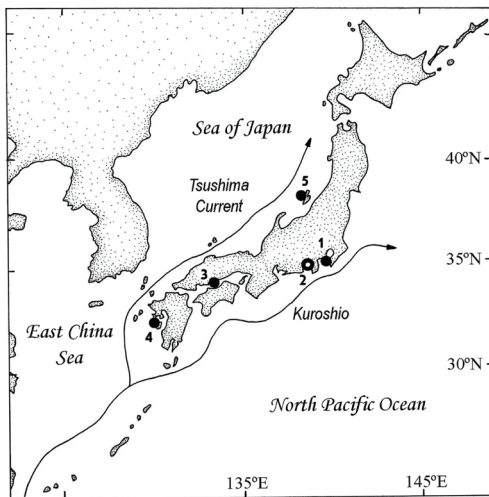


Fig. 2. Map of the Japanese Archipelago, showing the localities (1–5) where *Lernanthropus chrysophrys* was collected in the previous (closed circles) and present (open circle) studies. 1, Moroiso Cove, Kanagawa (Shishido, 1898); 2, Suruga Bay, Shizuoka (this paper); 3, Seto Inland Sea (Yamaguti, 1936); 4, Tomioka, Amakusa Island, Kumamoto (Shiino, 1955); 5, Sado Island, Niigata (Ho and Do, 1985). The routes of the Kuroshio and its branch, the Tsushima Current, are also shown.

from the gill filament of the blackhead seabream examined (315 mm FL). The female, measuring 4.0 mm in body length and 1.5 mm in dorsal plate width, is characterized by a trapezoid head with a pair of posterolateral protrusions (arrowheads in Fig. 1A–B), the trunk with its posterior part carrying a large, subcircular dorsal plate, a large, fleshy leg 3 protruding ventrally from the posterolateral corner of the trunk and curved

toward anteriorly, and leg 4 appearing as a pair of long, bilobate processes (Fig. 1).

#### Discussion

The morphological features of the female collected correspond to those of *L. chrysophrys* from Moroiso Cove, the type locality of the species (Shishido, 1898), the Seto Inland Sea (Yamaguti, 1936), Tomioka, Amakusa Island (Shiino, 1955), and Sado Island (Ho and Do, 1985) in Japan. All these authors stated that a pair of large protrusions at the posterolateral corners of the head is a major feature to characterize the species.

The host known from Japan is the blackhead seabream, which has been reported under different names: “kurodai” in Japanese (Shishido, 1898), *Sparus longispinis* [sic] (Yamaguti, 1936), *Sparus macrocephalus* (Shiino, 1955), and *Acanthopagrus schlegelii* [sic] (Ho and Do, 1985). Shiino (1955) regarded the “kudodai” as *S. macrocephalus*, which is currently a junior synonym of *A. schlegelii* (Froese and Pauly, 2019; WoRMS Editorial Board, 2019). “*Sparus longispinis*” (its correct specific name is *longispinnis*) is also not a valid name and has been treated as a junior synonym of goldsilk seabream, *Acanthopagrus berda* (Forsskål, 1775) (WoRMS Editorial Board, 2019). This species is not found in Japan, but “*Sparus longispinis*” was used for the blackhead seabream in ichthyological research during the 1930’s (e.g., Kinoshita, 1936). Thus, Nagasawa and Uyeno (2011) regarded the sparid reported as “*Sparus longispinis*” by Yamaguti (1936) as *A. schlegelii*.

In addition to *A. schlegelii*, four other species of

*Acanthopagrus* are found in Japanese waters (Nakabo, 2013): yellowfin seabream, *A. latus* (Houttuyn, 1782); Pacific seabream, *A. pacificus* Iwatsuki, Kume and Yoshino, 2010; Okinawa seabream, *A. sivicolus* Akazaki, 1962; and Okinawan yellow-fin seabream, *A. chinshira* Kume and Yoshino, 2008. While *L. chrysophrys* has been suggested to be specific to seabreams of *Acanthopagrus* (Ho and Do, 1985; Liu et al., 2009), no information is yet available on the species from these seabreams in Japan.

*Lernanthropus chrysophrys* is a parasite of *Acanthopagrus* spp. in the Indo-West Pacific region, as it has also been reported from Port Canning, India [Tripathi, 1962; Pillai, 1985: from *A. berda* (reported as *Chrysophrys berda*)], the northern and east coasts of Australia [Byrnes, 1988: from yellowfin bream, *A. asutralis* (Günther, 1859), *A. berda*, *A. latus*], Hainan Island, southern China [Song and Chen, 1976; Song and Kuang, 1980: from *A. schlegelii* (reported as *S. macrocephalus*)], and Taiwan (Liu et al., 2009; Ho et al., 2011: from *A. schlegelii*, *A. latus*, *A. berda*). There is no record of *L. chrysophrys* from Korea (e.g., Kim, 1998). Byrnes (1988) states that Markevich and Titar (1978) recorded the species in the Soviet Far East, but the latter authors actually did not do it. Based on the distribution records reported, *L. chrysophrys* occurs in tropical to temperate waters of the Indo-West Pacific region.

In Japan, *L. chrysophrys* has been found in the western North Pacific off central Honshu (localities 1–2 in Fig. 2), the Seto Inland Sea (locality 3), the East China Sea off western Kyushu (locality 4), and the Sea of Japan off central Honshu (locality 5). A warm current, the Kuroshio, and its branch, the Tsushima Current, flow off the coasts of western and central Japan (Fig. 2), and the distribution of *L. chrysophrys* in Japanese waters is likely to be affected by these two warm currents.

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