# *Lernaeenicus* sp. parasite of Atlantic bumper fish on the coast of Santa Catarina state, Brazil

## *Ocorrência de penelídeo* Lernaeenicus *sp. parasitando palombeta no litoral de Santa Catarina, Brasil*

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### Abstract

This study describes the Penellidae copepod parasite in the Atlantic bumper, *Chloroscombrus chrysurus,* a marine fish of commercial importance in Southern Brazil. This is the first description of *Lernaeenicus* parasitizing Atlantic bumper on the Brazilian coast. A total of 1,500 specimens measuring 19 - 27 cm in length and 102 - 361 g weight were examined in August 2021. Analysis showed the parasites belonged to the *Lernaeenicus* genus. The importance of this mesoparasite in marine fish for consumption is also discussed.

**Keywords:** Copepod parasite. Mesoparasitism. Penellidae.

### *Resumo*

*Este estudo registra a presença de parasito copépode Penellidae do peixe marinho palombeta,* Chloroscombrus chrysurus, *de importância comercial no sul do Brasil. Esta é a primeira descrição de* Lernaeenicus *parasitando palombetas na costa brasileira. Um total de 1.500 espécimes de palombeta, medindo de 19 - 27 cm de comprimento e 102 - 361 g de peso, foram examinados em agosto de 2021. A análise dos parasitos mostrou que estes pertenceiam ao gênero* Lernaeenicus*. Discute-se, também, a importância deste mesoparasito em peixes marinhos para consumo.*

***Palavras-chave:*** *Copépode parasito. Mesoperasitismo. Penellidae.*

### Introduction

The Atlantic bumper (*Chloroscombrus chrysurus*) is found along the Atlantic coast of the Americas, from the United States of America to Argentina, inhabiting both bays and estuaries. It is more prevalent in the Northeast region of Brazil from June to August, with lower occurrences in January and February.

Its habits include both planktonic and benthic behaviors across all length classes, with younger fish being more affected by trawl fishing. The species has a silvery body with a blue-green dorsal region and a stained spot on the upper portion of the caudal peduncle. It has an oval shape with a more convex ventral profile compared to the dorsal, and a vertically positioned buccal slit (Cunha et al., 2000; Silva and Lopes, 2002; Costa et al., 2005; Fischer et al., 2011).

Crustaceans are a diverse group with numerous morphophysiological variations. Its parasitic action in fish can be either direct, by mechanical action, or as vectors. Crustaceans are often marine fish parasites and are relatively common and can infect fish species at various depths. Several groups of these invertebrates may include fish parasites, with copepods being the most significant. Copepods feed mainly on host mucus, tissues, and blood, with a monoxenic life cycle, though a few species require more than one host to complete their cycle (Lima et al., 2013b; Raja et al., 2016; Eiras and Castro, 2017).

Some copepods function as mesoparasites, with the cephalosome inserted deep into the host's fins, lateral musculature, head musculature, eyes, gill chamber, and other anatomical structures, while the body and abdomen of the parasite are kept outside the host in contact with the water. This is characteristic of the Penellidae family (Eiras and Castro, 2017). *Lernaeenicus* specimens has been recorded in fish of global commercial importance. As an example, three unidentified species in India parasitizing *Mugil cephalus* Linnaeus, in 1758 (Raja et al., 2016).

In Brazil, isopod and monogenean ectoparasites have been reported in *C. chrysurus* (Carvalho-Souza et al., 2009; Costa et al., 2010; Costa and Chellappa, 2010; Lima et al., 2013a; Costa and Chellappa, 2016). The genus *Lernaeenicus* has been described across various locations, with Kirtisinghe (1934) detailing its morphological characteristics: a long, slender body with three distinctly separate regions, a cylindrical cephalothorax, and slightly longer egg strings containing disk-shaped ovules in a single series.

Given the importance of pennelids as fish parasitic agents, this study aims to describe the occurrence of *Lernaeenicus* parasitizing *C. chrysurus*. The fish in this study were identified as *C. chrysurus* by Lessa and Nóbrega (2000) and Fisher et al. (2011), and the parasitic crustaceans as *Lernaeenicus* by Raja et al. (2016) and Luque et al. (2013).

## Case report

A screening was done in a frigorific of 1,500 Atlantic bumper specimens in August of 2021, measuring 19 to 27 cm of length and weighing 102 to 361 g. Prospecting for parasites was carried out by visual inspection of the captured fish. The parasites were carefully removed from the fish integument and fixed and preserved in 70°GL alcohol for later identification. The parasites were identified in the Parasitology Laboratory at the Instituto Federal Catarinense Campus Araquari, according to Knoff and Boeger (1994) and Fonsêca et al. (2000). The parasite average length was 3 cm, with one to four copepods found in 90% of the fish. The fish originated from Itajaí Coast, SC, Brazil (Latitude 26° 54' 30'' South, Longitude 48° 39' 45'' West) (Figure 1).

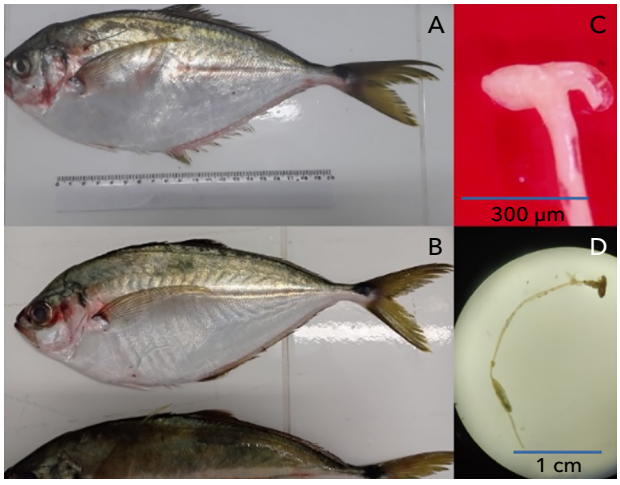


**Figure 1** - *Lernaeenicus* parasiting *Chloroscombrus chrysurus*. (A, B) Atlantic bumpers. (C) *Lernaeenicus* sp. (D) Head of a *Lernaeenicus* sp. specimen highlighting the anchor shape.

## Results and discussion

Kirtisinghe (1934) described *Lernaeenicus seeri* parasitizing the second dorsal fin of *Cybium* sp., confirming the parasitic action and morphology of *Lernaeenicus* in the Atlantic bumper. The copepod *Lernaeenicus sprattae*, found on Hemiramphus far, has been reported to cause pressure necrosis, swelling, hyperplasia, and fibroblast proliferation at the attachment site (Rameshkumar and Ravichandran, 2012). Similar lesions were observed in the Atlantic

bumpers of this study, although histopathological examinations were not performed to confirm the lesions in the inspected fish specimens.

Lewis (1959) described the *Lernaeenicus multilobatus*, a new parasitic copepod specie from the Lernaeidae family, parasitizing *Gigantactis* sp. in USA Florida's deep water. While species identification was not possible in this study, the genus was confirmed as *Lernaeenicus* through morphological comparison.

*Lernaeenicus radiatus* in black sea bass causes substantial gill infection lesions, related to the unique and invasive fixing process of the parasite, which struck through the gill and bound selectively to the brachial filament cartilage (Lovy and Friend, 2020).

It is important to note that the presence of large parasitic crustaceans can lead to consumers rejecting the purchase of the fish due to visible marks (Lima et al., 2013b), as seen in the parasitized Atlantic bumper specimens used in this study.

## Conclusion

To the authors' knowledge, this is the first description of L*ernaeenicus* parasitizing *C. chrysurus* on the Brazilian coast. Additional studies are needed to elucidate the parasitism patterns of these copepods in Atlantic bumper fish, particularly to assess their potential economic impact.

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