

NEW EVIDENCE OF THE PRESENCE OF *GLOSSOBIUS AURITUS* BOVALLIUS, 1885 (ISOPODA: CYMOTHOIDAE) IN THE EASTERN PACIFIC COAST

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Abstract: Five specimens of the cymothoid isopod *Glossobius auritus* were sampled from the stomach content of two Dolphinfinch (*Coryphaena hippurus*) captured off Mazatlán, Gulf of California, thus representing a second register of the species in the Eastern Pacific since the unique record, 36 years ago off the coast of Guerrero, Mexico. There is no evidence that *G. auritus* parasites the Dolphinfinch; however, it is known that the flying fish, previously recognized as hosts of *Glossobius* species, are essential components within their diet.

Keywords: *Coryphaena hippurus*, Crustacea, fish ectoparasite, Gulf of California.

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NUEVAS PRUEBAS DE LA PRESENCIA DE *GLOSSOBIUS AURITUS* BOVALLIUS, 1885 (ISOPODA: CYMOTHOIDAE) EN LA COSTA DEL PACÍFICO ORIENTAL

Resumen: Se obtuvieron cinco especímenes del isópodo cymotoido *Glossobius auritus* del contenido estomacal de dos peces dorado (*Coryphaena hippurus*) capturados frente a Mazatlán, en el Golfo de California, esto representa un segundo registro de la especie en el Pacífico Oriental desde el registro único, hace 36 años frente a las costas de Guerrero, México. No hay evidencia de que *G. auritus* sea parásito del pez dorado; sin embargo, se conoce que los peces voladores (reconocidos en la literatura como hospederos de las especies de *Glossobius*) son componentes importantes de su dieta.

Palabra clave: *Coryphaena hippurus*, Crustacea, ectoparásitos de peces, golfo de California.

INTRODUCTION

Isopods of the Cymothoidae family are obligate fish ectoparasites that affect a significant number of species in tropical and temperate marine, brackish, and freshwater environments, including fish that are captured and/or farmed for human consumption (Smit et al., 2014). Their presence is a threat because they can cause significant economic losses (Grano-Maldonado et al., in press).

In general, the cymothoid isopods are poorly known, with few specialists dedicated to their study (Martin et al., 2015b), and the genus *Glossobius* Schioedte & Meinert, 1883 is even less studied. Compared to other genera of

Cymothoidae (e.g., *Anilocra* Leach, 1818, *Cymothoa* Fabricius, 1793, or *Nerocila* Leach, 1818), whose species infest coastal fish, *Glossobius* infest pelagic species of little interest for fishing, and so are scarcely captured, such as the flying fish and halfbeaks. The species of *Glossobius* are recognized as buccal attaching parasites that infest fishes of the families Exocoetidae and Hemiramphidae (Beloniformes), with wide pelagic distribution across tropical and subtropical waters worldwide (Bruce & Bowman, 1989; Martin et al., 2015a; Nunomura, 1994; Panakkool-Thampan et al., 2018; Ravichandran et al., 2019; Smit et al., 2014).

According to the World Register of Marine

Species (Boyko et al., 2024), the genus *Glossobius* is currently composed of eight species: *G. albinae* Kononenko, 1986; *G. anctus* Bruce & Bowman, 1989; *G. auritus* Bovallius, 1885; *G. crassa* (Dana, 1853); *G. hemiramphi* Williams & B-Williams, 1985; *G. impressus* (Say, 1818); *G. linearis* (Dana, 1853) and *G. ogasawarensis* Nunomura, 1994.

The known distribution of *G. auritus* is restricted to the Atlantic Ocean and the Eastern Pacific coast (OBIS, 2024), and, in several cases, the host species is unknown. Previous records of *G. auritus* in other marine regions are attributed to misidentifications of the species or the species being synonymized, (i.e., *G. albinae* and *G. ogasawarensis* are currently recognized as valid. See Bruce & Bowman, 1989; Martin et al., 2015a).

In addition to its first record in the Atlantic Ocean by Bovallius (1985), the valid records of *G. auritus*, are limited to six and date back to collections made between 1956 and 1972 in the West Atlantic coasts and a single report of a female obtained from the stomach content of a dolphinfish (*Coryphaena hippurus* Linnaeus, 1758) captured off Guerrero, Pacific coast of Mexico, on March, 1957 and deposited

in the National Museum of Natural History, Smithsonian Institution, Washington, D.C., (USNM 104866) (Fig. 1). This unique register, among an extensive collection of specimens of *Ceratothoa* Dana, 1852 and *Glossobius parasitizing* flying fishes and halfbeaks of the world, was reported by Bruce & Bowman (1986) but remained unnoticed by subsequent authors who made compilations on the Eastern Pacific isopods (e.g., Espinosa-Pérez & Hendrickx, 2001, 2006; Aguilar-Perera, 2022).

In this study, we report the presence of three body parts and three complete specimens of *G. auritus* (one female and two males) in the stomach content of two dolphinfish (*C. hippurus*) captured off Mazatlán, Sinaloa, Mexico, as a new record, confirming its presence in the Eastern Pacific waters.

MATERIAL AND METHODS

Specimens of *G. auritus* were obtained from dolphinfish sampled in June 2023. Five specimens of *C. hippurus* were captured by artisanal fishing in coastal waters off Mazatlán, Sinaloa (Fig. 1). Fish were purchased post-mortem directly by the fishermen. Fish were stored in ice and transported to the Facultad de

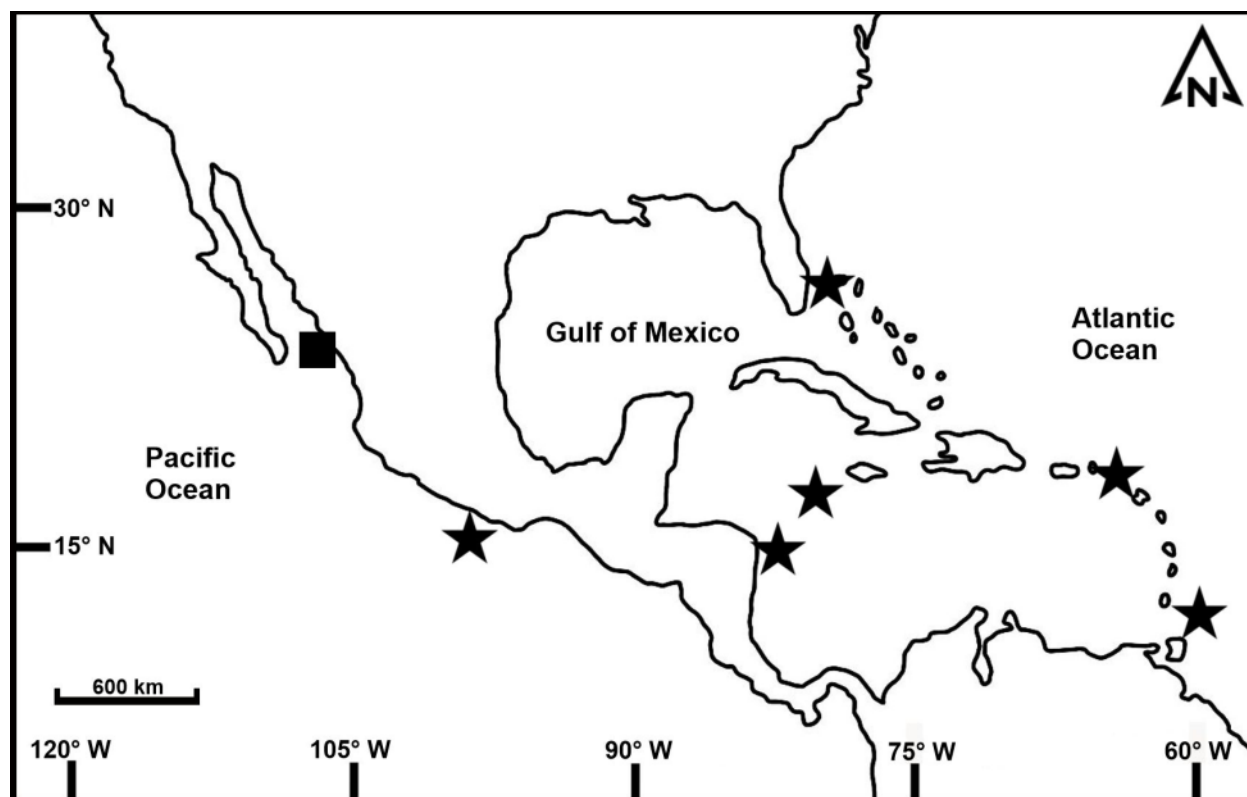


Fig. 1. *Glossobius auritus* collection records. ★ = Localities where *G. auritus* were recorded according to the Ocean Biodiversity Information System (OBIS 2024). ■ = Mazatlán, in this study.

Fig. 1. Registros de colecta de *Glossobius auritus*. ★ = corresponden a los puntos registrados por el Sistema de Información en Biodiversidad Oceánica (OBIS 2024). ■ = Mazatlán, en este estudio.

Ciencias del Mar, Universidad Autónoma de Sinaloa (FACIMAR), for a parasitological examination. The stomach content was carefully examined, and parasites were removed, relaxed in marine water, and fixed in 96% alcohol. The isopods were identified following Bruce & Bowman (1989) and Martin et al. (2015a). Total length (T.L.) of the isopods is expressed in millimeters.

The composite digital images of the specimens were made with a Canon Powershot S3 IS digital camera attached to a Stemi 2000 stereomicroscope. Between 5 and 15 photographs were taken at different focal planes and combined using Combine ZP-Free image stacking software for depth of field correction (Hadley, 2011). The specimens were deposited in the Regional Collection of Marine Invertebrates of the Instituto de Ciencias del Mar y Limnología, UNAM, in Mazatlán, Mexico. The accession numbers to the Regional Collection (ICML-EMU) are indicated in the "MATERIAL EXAMINED" section.

RESULTS

Order Isopoda Latreille, 1817
Suborder Cymothoida Wägele, 1815
Family Cymothoidae Leach, 1814
Glossobius auritus Bovallius, 1885
(Figs. 2 and 3)

Material examined: Off Mazatlán, Sinaloa (23°13' N, 106°32' W) (Fig. 1) Jun 20, 2023, one complete female (T.L. 25,7); one complete male (T.L. 8,2)(ICML-EMU 13770 A) in the stomach content of a male of *C. hippurus* (T.L. 560). Same collection data: one male (T.L. 8,3) and two anterior and one posterior adult female body sections (first pereonites plus cephalon and first pereopods and pleon plus pleotelson) (ICML-EMU 13770 B) in the stomach content of a male of *C. hippurus* (T.L. 420).

Distribution: Eastern and Western Atlantic, and the Pacific Coast of Mexico (Bruce & Bowman, 1989; Martin et al., 2015a; OBIS, 2024).

Host: According to Bruce & Bowman (1989), the specimens of *G. auritus* from the Atlantic coasts were obtained from specimens of the flyingfish *Cypselurus comatus* (Mitchill, 1815) (Exocoetidae) or an unknown host. On the other hand, the fish hosts of the specimens of *G. auritus* from the coasts of Guerrero, Mexico (Bruce & Bowman, 1989) and Mazatlán (this study) are unknown.

Due to the advanced digestion stage (Fig.3), the flying fish species were not identified in the stomach content because, according to Fishbase (2024a, b); 35 species and 6 genera of the family Exocoetidae (flying fish) and three genera and 11 species of Hemiramphidae (halfbeaks) are reported as

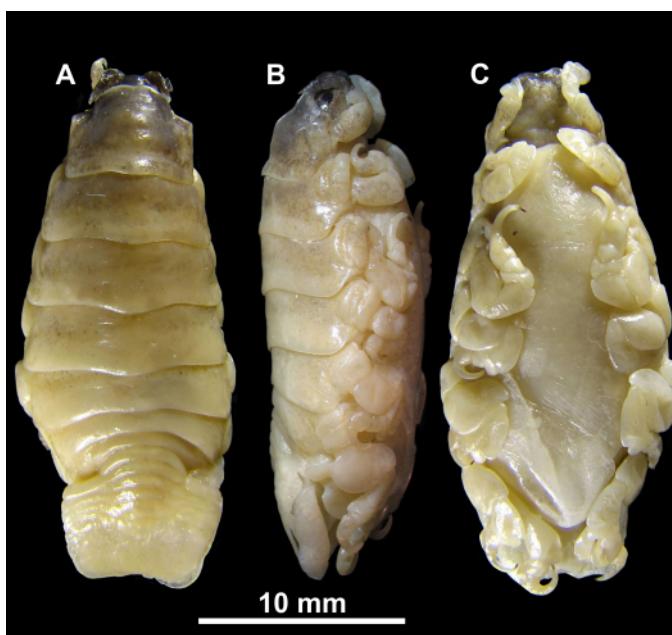


Fig. 2. *Glossobius auritus*, female obtained from the stomach content of a *C. hippurus* specimen collected off Mazatlán, Sinaloa, Mexico (ICML-EMU 13770 A). A)Dorsal view, B)Lateral view, C) Ventral view.

Fig. 2 Hembra de *Glossobius auritus* obtenida del contenido estomacal de un espécimen de *Coryphaena hippurus* colectado frente a Mazatlán, Sinaloa, México (ICML-EMU 13770 A). A)Vista dorsal, B)Vista lateral, C)Vista ventral.

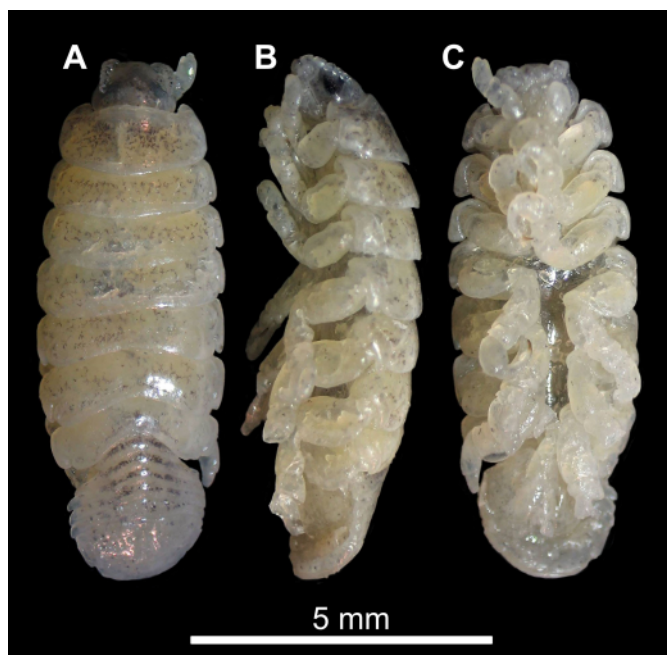


Fig. 3. *Glossobius auritus*, male obtained from the stomach content of a *C. hippurus* specimen collected off Mazatlán, Sinaloa, Mexico. (ICML-EMU 13770 B). A) Dorsal view, B) Lateral view, C) Ventral view.

Fig. 3. Macho de *Glossobius auritus* obtenido del contenido estomacal de un espécimen de *Coryphaena hippurus* colectado frente a Mazatlán, Sinaloa, México, (ICML-EMU 13770 B).

present in the Eastern Pacific coasts, which could be hosts of *G. auritus* (Froese & Pauly, 2024 a, b).

Remarks: The complete material (one female, two males, and the incomplete specimens) agrees well with the description and figures of *G. auritus* presented in Bruce & Bowman (1989) and Martin et al. (2015a).

The diagnostic characters of *G. auritus* contain: body sub-rhomboid, without scattered pigmentation but darker anterior pereonites and cephalon; rostrum rounded or blunt; pereonites 1 and 2 without bulbous lateral lobe; pereopod 3 dactylus no longer or no larger than other dactyli, less than twice or less as long as pereopod 3 propodus; pleopod 1 lateral margin strongly convex; uropod exopod similar or shorter than endopods Body; posterior margins of pereonites 3–5 without median point; posterior margin of pleotelson not rounded; pleon wider than pereonite 7 width and coxae 2–7 anteroventral margins similar size to posteroventral margins (Bruce & Bowman, 1989; Martin et al., 2015a).

Coryphaena hippurus is a pelagic fish distributed in tropical and subtropical waters of the Atlantic, Indian, and Pacific oceans (Palko et al., 1982). It is a highly migratory species characterized by large population sizes that support important coastal fisheries along the

Eastern Tropical Pacific communities (Díaz-Jaimes et al., 2010; Ortega-García et al., 2022). These authors studied the distribution patterns in Baja California Sur and the coast of Oaxaca, Mexico. Both populations have similar feeding habitats, and oceanic pelagic species (e.g., flying fish, halfbeaks) suggest that they are essentially non-selective foragers (Olson & Galván-Magaña, 2002). However, it is essential to recognize that these isopods may appear in the stomach content of another predatory pelagic fish diet.

DISCUSSION

At least five specimens of *G. auritus* were collected from the stomachs of two Dolphinfish captured off Mazatlán, representing the second record of the species in the Eastern Pacific since the first record dated 36 years ago (Bruce & Bowman, 1989).

There is no evidence that *G. auritus* parasites dolphinfish, but it is known that the latter includes flying fish (recognized as hosts of *Glossobius* species) as important components within their diet (Olson & Galván-Magaña, 2002).

It is still interesting that Dolphinfish constitute an indirect form of parasitic isopod capture, which, in turn, provides information about the distribution of *G. auritus* in the open sea.

FINAL CONSIDERATIONS

This study provides insight into the dolphinfish's feeding habits and mobility in tropical regions. These feeding habits offer indirect evidence of the dynamics of the oceanic food web in the Tropical Eastern Pacific, which can help improve stock assessments and management of regional species.

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Conflict of interest

The authors declare they have no conflict of interest.

Author Contributions

Conceptualization and Design: MIGM, JSB. Performed research: MIGM, JSB.

Acquisition of data: MIGM, JSB. Analysis and interpretation of data: JSB, MIGM. Preparation of figures/tables/maps: MIGM, JSB. Writing – original draft: MIGM, JSB. Writing – critical review & editing: MIGM, JSB. Fish identification: MIGM.

Data availability

All study data are included in the article and/or supplementary material.

Ethical approval

The study complied with all corresponding regulations (NOM-033-ZOO-1995) for the justified use of animals in research and their welfare.

Consent for publication

All authors declare they have reviewed the manuscript's content and consent to submit the document.

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