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First record of predation by *Hoplias malabaricus* (Characiformes: Erythrynidae) on *Leptodactylus paranaru* (Anura: Leptodactylidae) in the Atlantic Forest of southeastern Brazil

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Resumo

Hoplias malabaricus (Bloch, 1794) é um peixe predador neotropical conhecido por sua dieta generalista, que inclui o consumo oportunista de anfíbios. *Leptodactylus paranaru* é um anuro recentemente descrito, com distribuição restrita à Mata Atlântica. Este estudo documenta o primeiro registro de predação de *H. malabaricus* sobre *L. paranaru*, observado em um riacho eutrofizado em Praia Grande, estado de São Paulo. Descrevemos a interação e discutimos como as características ambientais do local podem ter facilitado o registro do evento. Este relato contribui para o conhecimento da história natural de ambas as espécies e reforça o comportamento oportunista de *H. malabaricus*.

Palavras-chave

Comportamento; Dieta; Eutrofização; História Natural; Interação predador-presa; Observação

Abstract

Hoplias malabaricus (Bloch, 1794) is a Neotropical predatory fish known for its generalist diet, which includes the opportunistic consumption of amphibians. *Leptodactylus paranaru* is a recently described anuran with a restricted distribution in the Atlantic Forest. This study documents the first record of predation by *H. malabaricus* on *L. paranaru*, observed in a eutrophic stream in Praia Grande, state of São Paulo. We describe the interaction and discuss how the environmental characteristics of the site may have facilitated the event's record. This report contributes to the knowledge of the natural history of both species and reinforces the opportunistic behavior of *H. malabaricus*.

Keywords

Behavior; Diet; Eutrophication; Natural History; Observation; Predator-Prey Interaction

Hoplias malabaricus (Bloch, 1794) is a freshwater predatory fish widely distributed across South America (Fowler, 1950; Oyakawa, 2003), known for its ambush-hunting strategy and dietary plasticity. Although adults are predominantly piscivorous (Knöppel, 1970; Carvalho et al., 2002), opportunistic predation on amphibians, including anurans and caecilians, has been reported (Silva et al., 2007; Torres, 2018). In Paraná state, Brazil, *H. malabaricus* was recorded preying upon the aquatic caecilian *Chthonerpeton viviparum* Parker & Wettstein, 1929 (Silva et al., 2007), and in Argentina, an individual was observed attempting to ingest a juvenile rattlesnake, *Crotalus durissus terrificus* (Laurenti, 1768), as reported by Torres (2018). These records highlight the opportunistic behavior of the species and its ecological relevance as a predator of diverse vertebrates in freshwater environments.

Among the potential targets of such predation is *Leptodactylus paranaru*, an anuran recently described by Magalhães et al. (2020). This species is a potential prey, as its distribution and habitat use (Magalhães et al., 2020) is shared with *H. malabaricus* (Fowler, 1950; Oyakawa, 2003). This predator is known to occupy the same lentic environments that *Leptodactylus* species use for reproduction (Andrade et al., 2012), and the increased exposure during calling activity is a known predation risk for anurans (Moura et al., 2022).

On 20 July 2025, at approximately 19:10h, we observed a predation event in a slow-flowing, eutrophic stream running parallel to a road (Fig. 1) in the municipality of Praia Grande, state of São Paulo, Brazil (-24.069°,-46.576°; datum WGS84). In this environment, an individual of *Hoplias malabaricus* was preying on an individual of *Leptodactylus paranaru* (Fig. 2). When we first detected the interaction, the fish was already grasping the posterior region of the anuran and beginning the ingestion. The frog actively resisted, attempting to swim towards the surface, while the fish pulled it downward. The struggle lasted approximately 10 minutes, after which the fish descended into deeper water with the frog still in its mouth, and neither was seen again. We remained at the site for an additional 12 minutes to check whether *L. paranaru* would resurface, but it did not. We therefore infer that the predation event was successful.

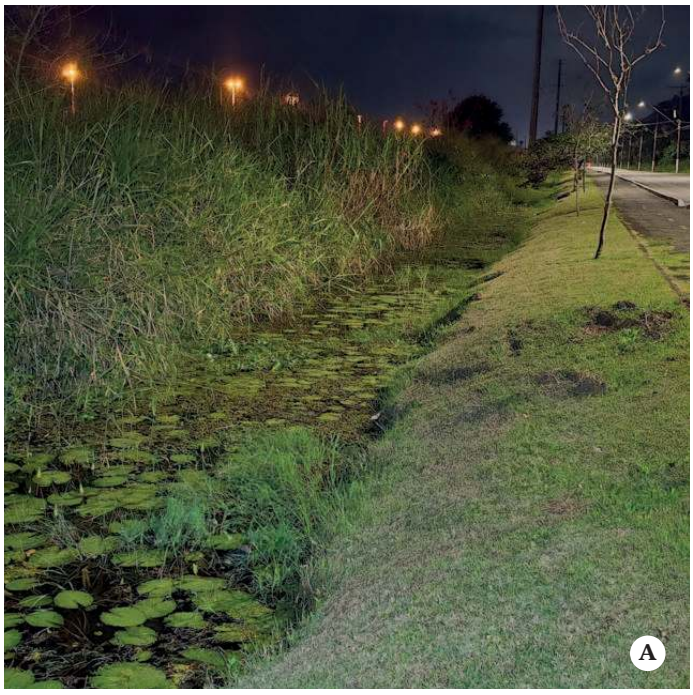



Figure 1. Predation event recorded in Praia Grande, São Paulo, Brazil. **(A)** Lentic and eutrophic environment parallel to the road where the event was recorded. **(B)** *Hoplias malabaricus* preying on an individual of *Leptodactylus paranaru*.

The environmental context may have facilitated our detection of the interaction. The observed location was an anthropized urban area, where the linear flow of the stream alongside the road formed a narrow, visible habitat. Direct visual observations of predation on amphibians are known to be rare and largely opportunistic (Rocha-Santos et al., 2022), indicating that most events go unnoticed in complex or extensive habitats. The environment where we witnessed the event fits the type of linear habitats that increase detectability (Langley et al., 2018). This record therefore contributes to the growing documentation of amphibian predation by *H. malabaricus*, particularly in interactions rarely observed in the field.

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