On the presence of the migratory freshwater fish *Megaleporinus macrocephalus* (Garavello & Britski, 1988) (Characiformes: Anostomidae) in the Río Santiago, Río de la Plata basin, Buenos Aires, Argentina.

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Abstract

A specimen recently captured in the Río Santiago, within the Río de la Plata basin in Buenos Aires, was examined and identified as *Megaleporinus macrocephalus* (Garavello & Britski, 1988), a migratory freshwater fish native to the Paraguay basin in Brazil. Currently, this species is considered introduced in the Río Paraná basin. This record represents the first occurrence of *M. macrocephalus* in this sector of the Río de la Plata, marking its southernmost known report and extending its distribution range in Argentina by approximately 1.100 km south of the previously documented location from the Río He Hé, Formosa. This finding appears to be part of an ongoing geographical expansion process, in which the species continues to establish non-native populations across the Río de la Plata basin.

Resumen

Un ejemplar recientemente capturado en el río Santiago, dentro de la cuenca del río de la Plata en Buenos Aires, fue examinado e identificado como *Megaleporinus macrocephalus* (Garavello & Britski, 1988), un pez migratorio de agua dulce originario de la cuenca del río Paraguay en Brasil. Actualmente, esta especie es considerada introducida en la cuenca del río Paraná. Este registro representa la primera aparición de *M. macrocephalus* en este sector del río de la Plata, constituyendo su reporte más austral conocido y extendiendo su rango de distribución en Argentina aproximadamente 1.100 km al sur de la localidad previamente documentado en el río He Hé, Formosa. Este hallazgo parece ser parte un proceso de expansión geográfico en curso, en el que la especie continúa estableciendo poblaciones no nativas a través del río de la Plata.

keywords: Neotropical fish, human-mediated introduction, freshwater, morphology

Introduction

The Neotropical family Anostomidae is a freshwater group comprising 16 valid genera and 150 valid species, making it the fourth most diverse family within Characiformes (Toledo-Piza et al. 2024; Fricke et al. 2025). The family is considered monophyletic, supported by both morphological (Sidlauskas & Vari 2008) and molecular (Burns & Sidlauskas 2019; Mirande 2019; Sidlauskas et al. 2025) evidence. Anostomid fishes are typically distinguished by the presence of three or four large, multicuspid, serrate or incisiform teeth arranged in a single row on each side of the upper and lower jaws, as well as the absence of maxillary teeth (Garavello & Britski 2003; Birindelli et al. 2022). Several anostomid species hold commercial importance as food sources in fisheries and aquaculture (Campos & Rojas 2010; García-Dávila et al. 2018; Reynalte-Tataje & Zaniboni-Filho 2020; Birindelli et al. 2022), while others are popular in the aquarium trade (Biocomercio-Sostenible 2002; Birindelli et al. 2022).
In Argentina, the family Anostomidae comprises seven genera (*Abramites, Brevidens, Leporellus, Leporinus, Megaleporinus, Pseudanos,* and *Schizodon*), representing 15 valid species, three of which belong to the genus *Megaleporinus* (Mirande & Koerber 2015; Benitez & Aichino 2020; Mirande & Koerber

2020; Benitez et al. 2024): *M. macrocephalus, M. obtusidens* (Valenciennes, 1837), and *M. piavussu* (Britski, Birindelli & Garavello, 2012). Both *M. obtusidens* and *M. piavussu* are considered the most common species in the Paraná and Uruguay basins, as confirmed by barcoding methods (Coronel et al. 2025). *Megaleporinus macrocephalus,* commonly known as “boga-toro”, “boguita”, “piava”, or “piavuçu” is a migratory species originally described from the Río Paraguay basin in Brazil. Since then, its range has expanded to include the Paraná, Uruguay, and Laguna dos Patos systems, as well as the Doce, Paraíba do Sul, São Francisco, Tocantins, Itapecuru, and Mearim rivers in Brazil. This expansion is likely due to human-mediated introductions associated with aquaculture (Bertaco et al. 2016; Froehlich et al. 2017; Ota et al. 2018; Reynalte-Tataje & Zaniboni-Filho 2020; Almeida et al. 2022; Brandão et al. 2022; Bertaco et al. 2023). Taxonomic records of *M. macrocephalus* in Argentina are limited to a few individuals from the Río Paraguay basin in Formosa (Braga 1993), and the species has remained largely undocumented in subsequent years.

A fish specimen recently collected from the Río Santiago, in the Río de la Plata basin near Ensenada, Buenos Aires, was examined taxonomically. Upon comparison with anostomid species known to occur in the Río de la Plata basin, the specimen was identified as *M. macrocephalus*. The aim of this contribution is to report the presence of this species in the Río Santiago, within the Río de la Plata basin, based on morphological data. This finding represents the southernmost known record of the species to date and appears to be part of an ongoing process of geographical expansion, likely associated with its artificial introduction into the basin.

fig. 1 *Megaleporinus macrocephalus*, MLP-Ict 11935, 1, 191,3 mm SL. A. Coloration in life (right side, horizontally flipped). B. Coloration in alcohol (left side).

Materials and methods

A fish specimen was captured with a cast net (Permission # RESO-2424-3GDEBA-SSAGYPMDAGP), then anesthetized with benzocaine and fixed in 10% formalin. After washing, the specimen was preserved in 70% alcohol. The studied specimens are deposited in the ichthyology collection at the Museo de La Plata, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, La Plata, Buenos Aires, Argentina (MLP-Ict). Counts and measurements were taken on the left side of the specimens when

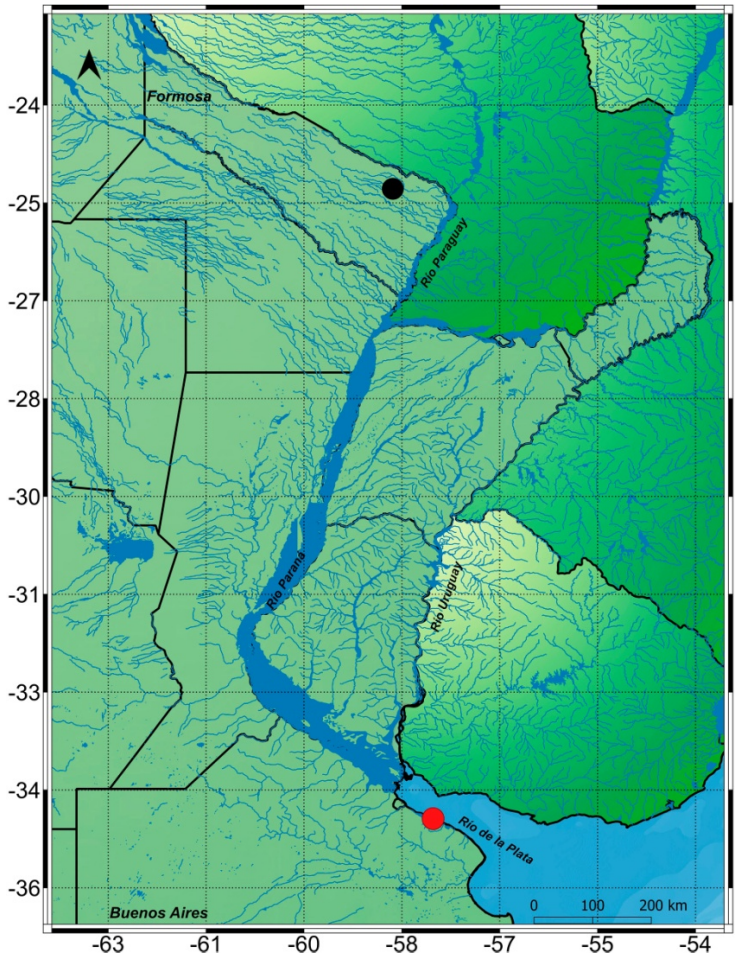

fig. 2 Distributional map of the geographic records known of *Megaleporinus macrocephalus* in Argentina. black circle: Río He Hé, red circle: Río Santiago

standard length (mm)	191.3
Percentages of SL:	
body depth	31.6
body width	14.3
lower jaw to anal-fin origin	83.7
lower jaw to adipose-fin origin	83.9
lower jaw to dorsal-fin origin	49.6
lower jaw to pelvic-fin origin	51.9
dorsal-fin origin to caudal-fin origin	54.6
dorsal-fin origin to adipose-fin origin	37.1
caudal-peduncle length	12.7
caudal-peduncle depth	12.3
anal-fin lobe length	12.3
first anal-fin length	12.1
last anal-fin length	6.2
head length	29.7
Percentages of HL:	
preopercle length	74.9
snout length	45.0
head depth	89.6
preopercle depth	77.7
snout depth	55.4
eye diameter	14.9
bony interorbital	55.4
Counts:	
dorsal-fin rays	ii,11
anal-fin rays	ii,8
pectoral-fin rays	i,17
pelvic-fin rays	i,8
number of lateral-line scales	42
number of scale rows between dorsal-fin origin and lateral line	6
number of scale rows between lateral line and pelvic-fin origin	6
number of scale rows between lateral line and anal-fin origin	5
predorsal scales	13

table 1. Morphometric and meristic data of specimen MLP-Ict 11935 from the Río Santiago, Río de la Plata basin, Argentina.

possible, according to the procedures outlined by Britski & Garavello (1978), Winterbottom (1980), and Britski et al. (2012). Measurements were taken point to point with a digital caliper and are expressed as percentages of standard length (SL) or head length (HL) for units of the head.

Results & Discussion

Megaleporinus macrocephalus (Garavello & Britski, 1988), figs. 1-2, table 1

Material examined: MLP-Ict 11935, 1, 191.3 mm SL, Argentina, Buenos Aires, Ensenada, bank of Río Santiago, between marinas 1 and 2, near Chiringo restaurant at Club de Regatas La Plata, 34°50'24"S 57°55'12"W, May 2024, N. Tizio.

The morphometric and meristic data for the specimen are provided in Table 1. This individual is characterized by a terminal mouth (Fig. 1), aligned with the ventral margin of the orbit; a rounded, short snout; 3/3 teeth on the premaxillae and dentary; 42 lateral line scales; six horizontal rows of scales between the dorsal-fin origin and the lateral line, as well as between the lateral line and the pelvic-fin origin; 17 scale rows around the caudal peduncle; a body without discernible dark blotches on the flanks and peduncle; a somewhat rounded distal portion of the caudal-fin lobes; and a largest simple anal-fin ray that is twice as long as the last branched anal-fin ray. Additionally, the preserved specimen exhibits a dusky appearance on the head and body, especially dorsally. The ventral body region is paler, somewhat yellowish. The dorsal, pectoral, anal, adipose, and caudal fins are dark grey, while the pelvic fin is slightly paler yellow. Subtle longitudinal lines are present between scales rows on the flanks.
According to Garavello & Britski (1988), *M. macrocephalus* is diagnosed by the following characters: a terminal mouth aligned with the lower region of the orbit; 3/3 teeth in the jaws; a short, rounded snout; 42-43 lateral-line scales; 5.5-6 scale rows above the lateral line and 5-5.5 scale rows below it; 16 scale rows

around the caudal peduncle; and a last anal-fin ray less than twice the length of the largest anterior anal-fin ray. This last characteristic, along with the presence of dark longitudinal lines between rows of scales along the body flanks (more conspicuous in adults), has been used in subsequent literature to identify the species (Ota et al. 2018; Birindelli et al. 2022; Bertaco et al. 2023). The studied specimen from the Río Santiago possesses these distinguishing characters (falling within the expected range of variation) and is therefore confirmed to be *M. macrocephalus* (Fig. 2).

The presence of *M. macrocephalus* in this area near the mouth of the Río de la Plata represents a remarkable distributional expansion for the species, marking its southernmost known record. To date, the species has not been previously reported in this sector of the Rio de la Plata basin (Braga 1993; Rosso & Liotta 2021; Maiztegui et al. 2022). In her review of Argentinean anostomids, Braga (1993) examined two uncatalogued specimens from the Río “Eh Eh” [sic] (He Hé) in the Paraguay basin. However, these specimens were unavailable for analysis in the present study, as they have not yet been located in the ichthyology collections where Braga (1993) conducted her research (MLP-Ict and the Museo de Ciencias Naturales in Buenos Aires, MACN).

According to N. Tizio, coauthor of this study, local fishermen also observed several specimens resembling *M. macrocephalus* during the summer of 2024, suggesting that the collection of single individual is not an isolated or rare occurrence. The presence of *M. macrocephalus* in this region of the Río de la Plata, potentially due to human-mediated introduction or the expansion of non-native populations, may make the species attractive for sport fishing, aquaculture, and/or human consumption, as it is widely utilized by local communities in other countries and regions (García-Dávila et al. 2018; Reynalte-Tataje & Zaniboni-Filho 2020; Bertaco et al. 2023). This record also highlights the species’ expansion throughout the entire Río de la Plata basin, where it could potentially compete with native species for resources such as niche scape, food, and habitat (Ota et al. 2018; Birindelli et al. 2022; Bertaco et al. 2023). It is important to note that the accidental escape or release of non-native fish used in aquaculture can negatively impact local fish communities, underscoring the need for careful management and monitoring (Ruesink 2005; Éder et al. 2018; Forneck et al. 2019). We hope this contribution will raise awareness among the general public, as well as environmental, governmental, and conservation organizations, encouraging further research into the ecological and geographical dynamics of *M. macrocephalus* and its impact on native fish populations in Argentina.

Comparative examined material

Abramites hypselonotus (Günther, 1868)	MLP-Ict 8252, 6, 40.8-53.7 mm SL.
Brevidens striatus (Kner, 1858)	MLP-Ict 9354, 11, 96.6-108.6 mm SL
Leporellus pictus (Kner, 1858)	MLP-Ict 9096, 1, 82.4 mm SL
Leporinus amae Godoy 1980	MLP-Ict 11392, 8, 86.1-136.5 mm SL
Leporinus friderici (Bloch, 1794)	MLP-Ict 1049, 1, 181.6 mm SL
Leporinus lacustris Amaral Campos, 1945	MLP-Ict 9217, 1, 101.4 mm SL
Leporinus octofasciatus Steindachner, 1915	MLP-Ict 6851, 1, 156.9 mm SL
Megaleporinus obtusidens (Valenciennes, 1837)	MLP-Ict 6807, 1, 133.2 mm SL
Schizodon platae (Garman 1890)	MLP-Ict 9265, 3, 74.1-103.7 mm SL
Schizodon borelli (Boulenger 1900)	MLP-Ict 8022, 1, 115.4 mm SL.

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