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## THE “CASCUDO AMARELLO” *Hypostomus luteus* (GODOY, 1980) IN ARGENTINA

*El “cascudo amarelo” Hypostomus luteus (Godoy, 1980) en Argentina*

Sergio Bogan<sup>1</sup>, Víctor Ezequiel Méttola<sup>2</sup>, Guillermo E. Terán<sup>3</sup>  
and Yamila P. Cardoso<sup>4</sup>

<sup>1</sup>Division Ictiología, Museo Argentino de Ciencias Naturales “Bernardino Rivadavia”, CONICET, Av. Ángel Gallardo 470, C1405DJR, Buenos Aires, Argentina. sergiobogan@yahoo.com.ar

<sup>2</sup>Facultad de Ciencias Naturales e Instituto Miguel Lillo. Miguel Lillo 205, (4000) San Miguel de Tucumán, Argentina. ezequielmettola@gmail.com

<sup>3</sup>Fundación Miguel Lillo – Unidad Ejecutora Lillo FML-UEL-CONICET, (4000) San Miguel de Tucumán, Argentina. guilloteran@gmail.com

<sup>4</sup>Laboratorio de Sistemática y Biología Evolutiva-CONICET, Facultad de Ciencias Naturales y Museo, Universidad Nacional de La Plata, La Plata, Argentina. yamilapcardoso@gmail.com

**AZARA**  
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**umai** Universidad  
Maimónides

**Abstract.** A batch of *Hypostomus luteus* collected in the Uruguay River basin in the province of Misiones is described. The specimens analyzed here allow this species to be safely incorporated into the lists of fish present in the Argentine Republic. In addition, descriptions are provided that we consider useful for the recognition of this species. After reviewing the lists containing *Hypostomus* for Argentina, we propose to eliminate four species that are actually not present in our waters or whose description makes their reliable geographic or taxonomic location impossible. By this we limit the list of *Hypostomus* species with a confirmed Argentinean distribution to 22 species.

**Key words.** Fishes; Loricariidae; *Hypostomus luteus*; Misiones

**Resumen.** Se describe un lote de *Hypostomus luteus* colectado en la cuenca del río Uruguay en la provincia de Misiones. Los especímenes aquí analizados permiten incorporar con seguridad esta especie a los listados de peces presentes de la República Argentina. Adicionalmente se proporcionan descripciones que consideramos útiles para el reconocimiento de esta especie. De la revisión de los listados de *Hypostomus* citados para Argentina proponemos la necesidad de apartar de la lista cuatro especies que no estarían efectivamente presentes en nuestras aguas o que su descripción hace imposible su confiable ubicación geográfica o taxonómica. De esta forma proponemos que el listado con distribución confirmada debe circunscribirse a 22 especies.

**Palabras clave.** Peces; Loricariidae; *Hypostomus luteus*; Misiones

## INTRODUCTION

South America boasts one of the most diverse ichthyofaunas on Earth. This remarkable diversity has captured the attention of taxonomists for years, making its study a significant and ongoing challenge (Takagui et al. 2023). Precisely, *Hypostomus* Lacépède 1803 stands out as one of the most diverse and widely distributed genera within Loricariidae (Queiroz et al. 2020; Zawazki and Penido 2021). Generally, members of this genus exhibit a benthic habit (Garavello and Garavello 2004), predominantly feeding by scraping and sucking organic material that accumulates on the surfaces of stems, logs, and rocks on the riverbed (Delariva

and Agostinho 2001). They are distributed across a wide variety of environments, with approximately 140 species inhabiting the neotropical region, particularly in the basins of lowlands in South America and Central America (Zawadzki et al. 2017).

From a conservation perspective, characterizing and establishing the species present in each basin within a country is crucial (Reis et al. 2003). This information is essential for understanding the structure and function of natural communities and the processes that impact them (Bauni et al. 2021). In this contribution, we aim to confirm the presence of the 'Cascudo amarelo' (*Hypostomus luteus*) in Argentina (Figure 1). Prior to this contribution, 26 species of



**Figure 1** - Map of Misiones indicating the location of Itacaruaré

*Hypostomus* had been reported in Argentina (see, for example, Cardoso et al. 2021; Terán et al. 2022). We also provide additional comments that will be valuable for strengthening an updated list, including suggestions for excluding some species.

## MATERIALS AND METHODS

From mid-2022 until October of the current year, we relocated the ichthyological collection (CFA-IC) from their previous location at Hidalgo 775, seventh floor of the Universidad Maimónides, to the current headquarters of the Fundación Azara at Valentín Virasoro 732 in the city of Buenos Aires. As a result of this, we carefully examined all collection materials and re-analyzed the specific identity of a group of *Hypostomus* from the province of Misiones, now identified as *Hypostomus luteus* (Godoy 1980)

The materials were received by the institution in 2013 as part of uncatalogued batches from the ILPA collection (Bogan and Giacchino 2016; Giacchino et al. 2023). The specimens are preserved in a 10% formaldehyde solution and stored in a 70% ethanol solution.

Abbreviations. **CFA-IC**: Colección ictiológica de la Fundación de Historia Natural Félix de Azara, CABA, Argentina; **MHNP**: Museo de Historia Natural de Pirassununga, São Paulo, Brazil.

## RESULTS

*Hypostomus luteus* (Godoy, 1980)

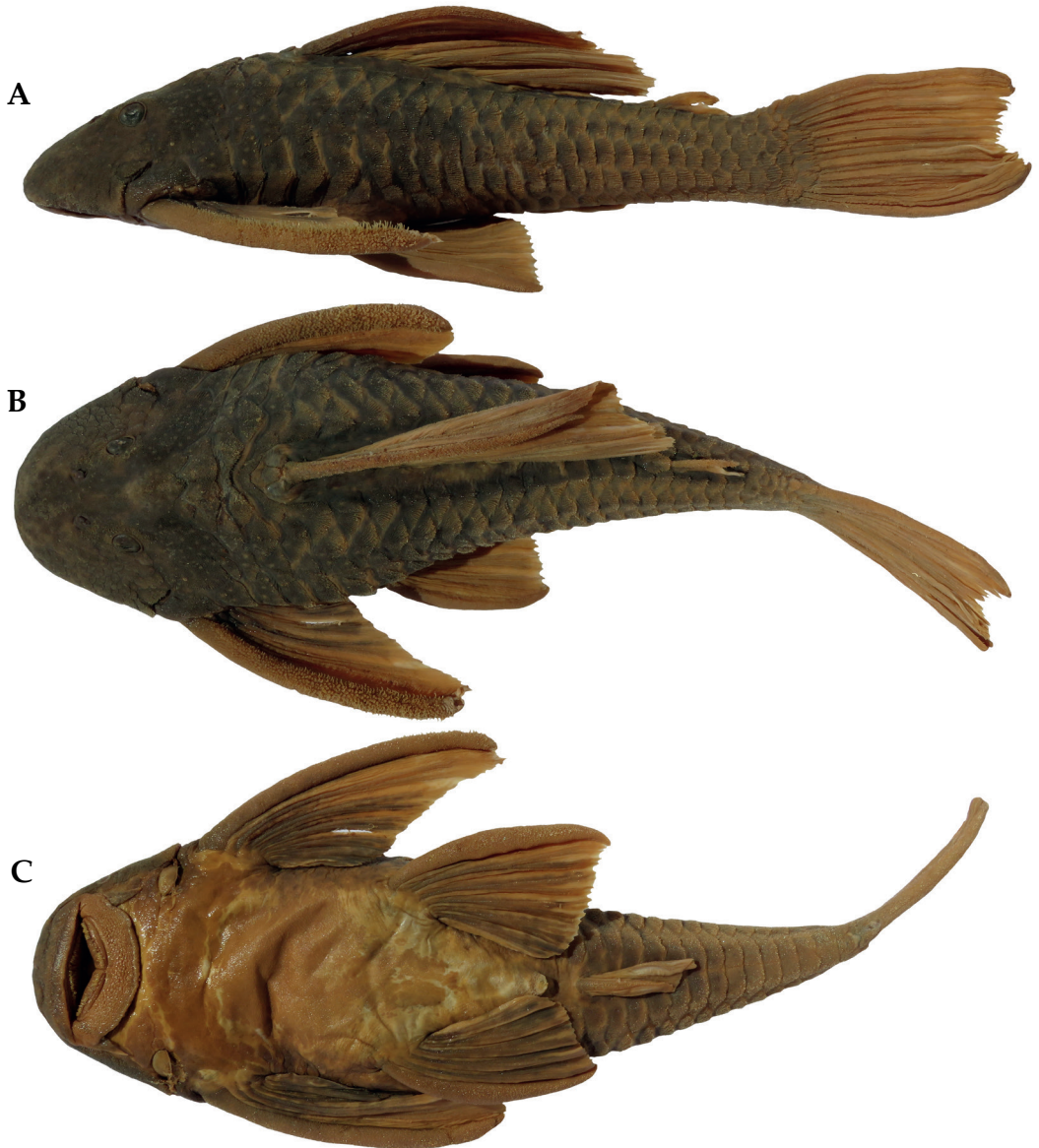
**Holotype.** MHNP 201, *Plecostomus luteus* Godoy, 1980

**Type locality.** Brazil, Rio Grande do Sul, Marcelino Ramos, Uruguay River (*sensu* Azevedo-Santos et al. 2023).

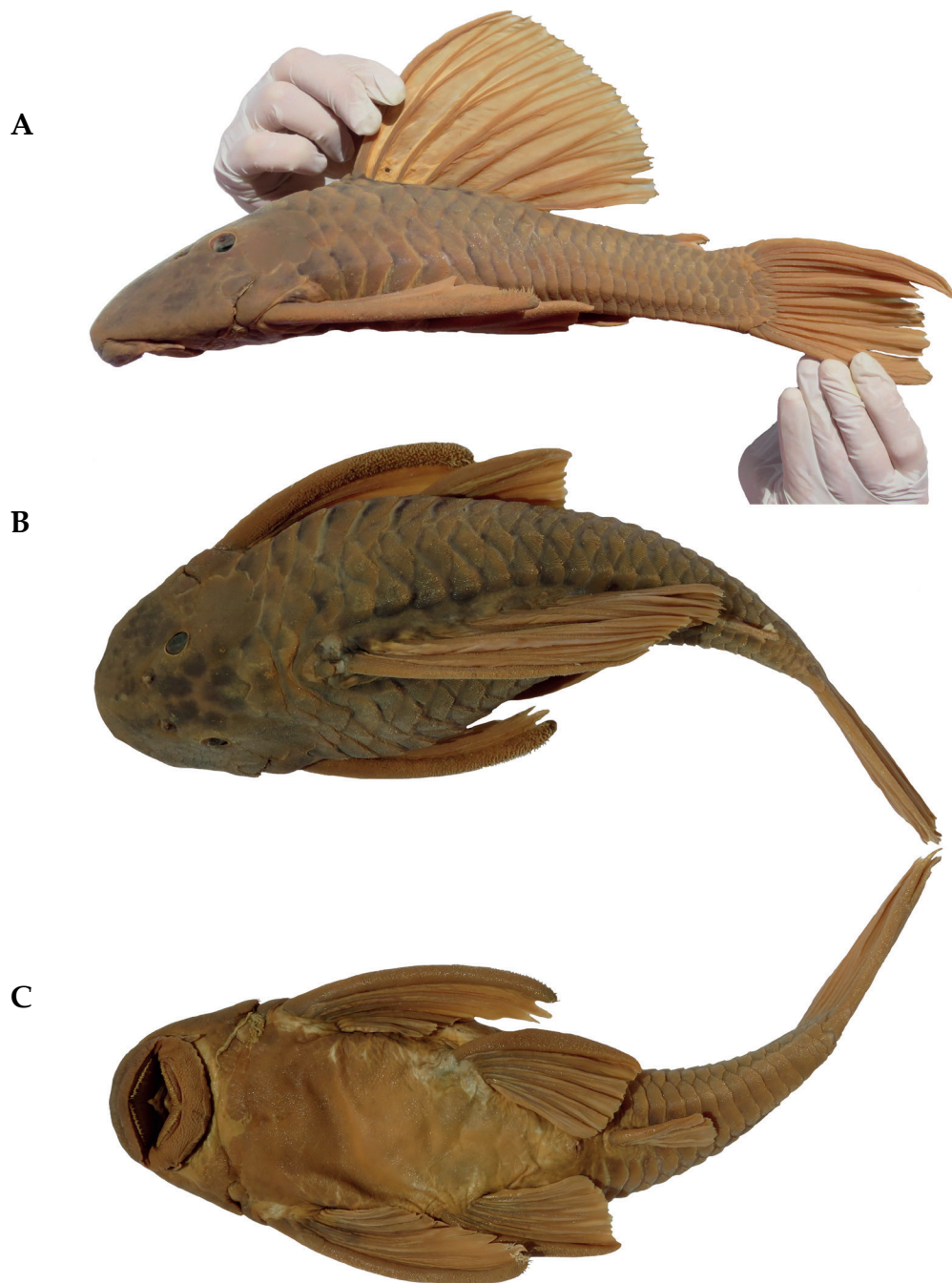
**Referred material.** CFA-IC-12768, 2 specimens, Uruguay River, Itacaruaré, Misiones 27°55'S 55°16'W. Collector J. O. García.

**Description.** These are two relatively large specimens, one measuring 48 cm TL (total length) and 36,5 cm SL (standard length), and the other 44,3 cm TL and 34,4 cm SL, respectively. High body, measuring 8,2 cm and the other 7,5 cm, covered with relatively large plates and practically without keels (only the first 5 plates of mid-ventral line have smooth keels), with 27-28 plates along to midline. The parieto-supraoccipital surrounded by three plates. Dorsal fin with I+7; pectoral fins with I+6; pelvic fins with I+5; anal fin with I+5; caudal fin with 2+16. A notable feature is the exposed skin area along the dorsal fin insertion. The mouth is positioned ventrally, characterized by its size and extensive premaxillae and dentaries. There are 22-26 teeth on the maxillary ramus and 22-25 on the mandibular ramus. The teeth are elongated and curved towards the mouth. The crown has a spatula-shaped structure with two cusps; typically, the one located on the commissural side is shorter and thinner. The caudal fin exhibits a margin that is slightly concave. The coloration is distinctive, with the body featuring a dark to brown background color that noticeably lightens in the posterior half. The caudal peduncle area displays a greater development of golden hues and more uniform brown tones. The head and the anterior part of the body bear light, circular, and small spots (less than the diameter of the pupil). The spot patterns become more diffuse and gradually disappear towards the posterior body. The ventral area is notably lighter than the dorsum and flanks, lacking spots. The fins display a uniform orange color without spots or bars, and all fins are lighter than the body's tone.

**Comments.** *Hypostomus luteus* was described by the ichthyologist Manuel Pereira de Godoy (1922-2003) from the state of Rio



**Figure 2** - *Hypostomus luteus* (CFA-IC-12768) specimen of 36,5 cm standard length. Uruguay River, Itacaruaré, Misiones. **A:** lateral view; **B:** dorsal view; and **C:** ventral view.



**Figure 3** - *Hypostomus luteus* (CFA-IC-12768) specimen of 34,4 cm standard length. Uruguay River, Itacaruaré, Misiones. **A:** lateral view; **B:** dorsal view; and **C:** ventral view.

Grande do Sul in Brazil. According to Godoy (1980: 32), the type specimen was collected in the 'Río Pelotas'. Nevertheless, a recent review of the collections assembled by Godoy provides arguments to narrow down the type locality to the Uruguay River basin in the vicinity of Marcelino Ramos, Grande do Sul River (Azevedo-Santos et al. 2023). The review conducted by Azevedo-Santos and collaborators also revealed that three localities mentioned in Godoy (1980) are direct tributaries of the Uruguay River, not the Pelotas River (Azevedo-Santos et al. 2023), thereby resolving any uncertainty about the sample's origin.

The materials we have described here (CFA-IC-12768) exhibit all the characteristics that allow their identification as *Hypostomus luteus*, particularly the presence of light spots (yellow/orangish) with rounded contours on a dark background, prominently featured on the head and the anterior part of the flanks. *H. luteus* is a relatively large species, notable for its intense yellowish-orange coloration, especially striking in the fins (Godoy 1980). In Brazil it is known by the name "Cascudo amarelo" from here the specific epithet *luteus*, the latin word for 'lime', in allusion to yellowish-orange mud color.

## DISCUSSION

*Hypostomus luteus* was re-studied by Reis et al. (1990), significantly expanding its distribution in the Uruguay River basin in the south of Brazil. Subsequently, this species was documented from Uruguay (Serra et al. 2014).

In Argentina, some specimens were referred to as *Hypostomus cf. luteus* by Almirón et al. (2015). These records are from the Vapor Viejo stream in the 'Parque Nacional Pre-Delta', Entre Ríos province (Almirón et al. 2015). Despite this mention, the assignment of this material to *H. luteus* was not

corroborated. Consequently, this species was not included in the systematic lists of the country's fish diversity (see Mirande and Koerber 2015, 2020; Bauni et al. 2021).

### Comments about the records of *Hypostomus cf. luteus* by Almirón et al., (2015).

The specimens from Pre-Delta could not be preserved by the authors; however, detailed photographs were taken at the time of capture, and these images were generously made available to us.

Through the comparison of the specimen illustrated by Almirón et al. 2015:189, as well as another from an unpublished photograph series provided to us (some of which can be seen in figure 4), we were able to better evaluate the characteristics of these records and propose a new taxonomic assignment for the specimens reported from Pre-Delta. Upon comparing these images with CFA-IC-12768, we reached to a conclusion that does not support their assignment to *H. luteus*.

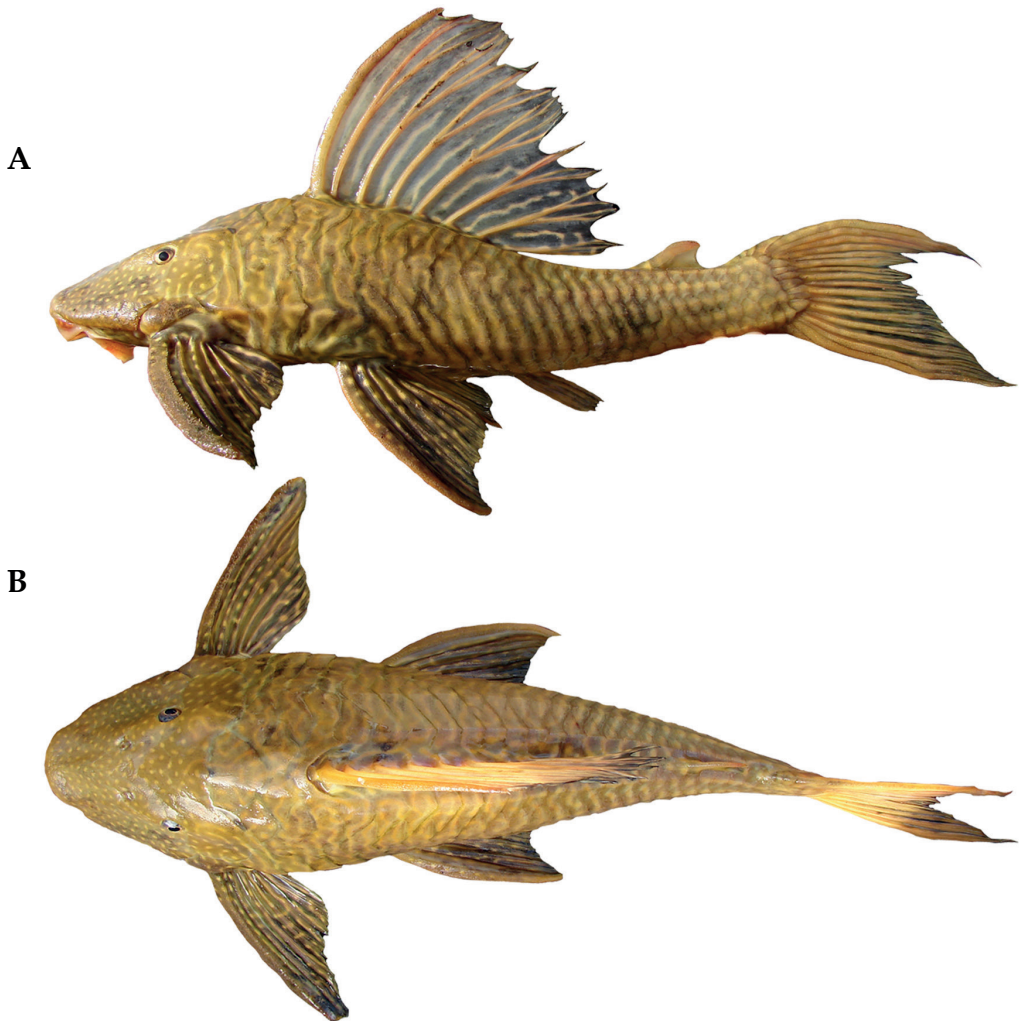
The specimens from Pre-Delta exhibit a higher and pointed snout, forming a right-angle profile between the snout point and the origin of the dorsal fin, in contrast to the rounded and slightly convex front between the snout and the dorsal fin in *H. luteus*. Additionally, there are more numerous spots across the body in the Pre-Delta material, whereas in *H. luteus*, the spots are more spaced and concentrated mainly in the anterior part of the body.

The Pre-Delta material also displays spots on the membranes of the dorsal fin, arranged in dot-shaped patterns (see Almirón et al. 2015:189) or forming lines of light color on the membrane (Figure 4). The presence of this type of spots is unusual in *H. luteus*, especially in adult specimens, and if present, they are limited to a few points that do not extend much in relation to the base of the dorsal fin. The caudal fin has the first upper and lower rays notably longer

than in *H. luteus*, with the ends forming the lower lobe longer than the upper lobe. In *H. luteus*, the caudal fin presents a margin ranging from truncated to slightly concave, with the outer rays of both lobes almost equal (Figures 2 and 3)

Devincenzi (1942), in the description of *H. luteomaculatus*, indicates a series of characters that are, to some extent, compatible

with the specimens of *Hypostomus cf. luteus* from Pre-Delta. For example, the parieto-supraoccipital is in contact with a single plate, as corroborated by the dorsal view image (Figure 4), in contrast to *H. luteus*, where three plates surround the parieto-supraoccipital (Godoy 1980; Figures 3 and 4); Additionally, in *H. luteomaculatus*, the posterior process of the parieto-supraoccipital gently



**Figura 4** - *Hypostomus cf. luteus*, Vapor Viejo stream, Parque Nacional Pre-Delta, Entre Ríos province. Here proposed as possible chromatic variation of *Hypostomus luteomaculatus*. **A**: lateral view; and **B**: dorsal view. Photos: Liliana Ciotek and Pablo Giorgis



connects with a wide predorsal plate. This is in contrast to *H. luteus*, where the parieto-supraoccipital process notably projects into a deep notch of the first predorsal plate. Devincenzi also mentions the presence of flank spots forming rows in the caudal peduncle. It is noteworthy that although the illustrated material from Pre-Delta has a very light background color blending in some areas with the spot patterns, rows of dots can still be observed on the peduncle (see Almirón et al. 2015:189 and Figure 4). In contrast to the specimens of *H. luteus*, where this coloration pattern is absent (Figure 2 and 3; see Godoy 1980). Although it can be somewhat diffuse, there is a dot pattern on the pelvic and caudal fins (Figure 4). Additionally, it can be noted that the abdomen presents light vermicular spots, similar to that observed in *H. luteomaculatus* (image provided by the authors), as opposed to the absence of spots on the pelvic fins, caudal fin, and abdomen in *H. luteus*.

On the other hand, according to Cardoso (2014), the records of *H. luteomaculatus* along the Paraná River are abundant. This species has been documented and molecularly verified from locations as Candelaria (Misiones), Ituzaingo (Corrientes), Antequera (Chaco), and Puerto Gaboto (Santa Fe). All these molecular-level records align with sequences from specimens of *H. luteomaculatus* collected very close to the type locality of this species. Specimens from Puerto Gaboto, as documented by Cardoso (2014), are deposited in the collection under the code CFA-IC-3361 and also have been compared with the images from Almirón et al. (2015). This comparison confirms the similarities between the specimens in the images and those deposited as *H. luteomaculatus*. In summary, the records of *Hypostomus cf. luteus* from the Parque Nacional Pre-Delta exhibit characters more closely related to *H. luteomaculatus* than to any other known species of *Hypostomus*.

**Some comments about the species list of *Hypostomus* inhabiting Argentine territory.** According to Mirande and Koerber (2015, 2020); Terán et al. (2020, 2022) and Bauni et al. (2021) there are 26 species of *Hypostomus* recorded from Argentina. Koerber and Weber (2014) stated that *H. alatus*, *H. itacua*, *H. hermanni* and *H. paulinus* have dubious or uncertain presence. We agree with this latter proposal and consider that these species should be eliminated from the species list confirmed for Argentina. Furthermore, we agree with the arguments presented by Cardoso et al. (2019), where *Hypostomus paranensis* (Weyenbergh, 1877) was proposed as a *species inquirenda*. Although arguments were presented regarding the lack of diagnostic characters, *H. paranensis* has remained on the fish lists at the same level as any other confirmed species in Argentine freshwaters (see, for example: Bauni et al. 2021; Mirande and Koerber 2015, 2020; Saravia et al. 2023). Currently, we have gathered more evidence supporting the consideration to remove *Hypostomus paranensis* from the species lists present in Argentine waters. The absence of type materials, along with an imprecise and ambiguous diagnosis, fails to meet the minimum requirements of the ICZN (1999). As a result, *Hypostomus paranensis* is impossible to distinguish from a wide number of species within the genus *Hypostomus*, making it inappropriate to attribute any current records to this species. Additionally, it is incorrect to include *Hypostomus paranensis* in the synonymous list of *Hypostomus cordovae*. Maintaining this species in the national lists only adds confusion.

If we consider the aforementioned proposals and the respective clarifications, the species number of *Hypostomus* confirmed to the Argentine fauna would be 22 species: *Hypostomus albopunctatus*, *H. arecuta*, *H. aspilogaster*, *H. borellii*, *H. boulengeri*, *H.*

*cochliodon*, *H. commersoni*, *H. derbyi*, *H. formosae*, *H. isbrueckeri*, *H. laplatae*, *H. latifrons*, *H. luteomaculatus*, *H. luteus*, *H. microstomus*, *H. myersi*, *H. piratatu*, *H. regani*, *H. roseopunctatus*, *H. spiniger*, *H. ternetzi*, and *H. uruguayensis*.

## CONCLUSIONS

The specimens analyzed here (CFA-IC-12768) confirm the presence of *Hypostomus luteus* for the first time in the province of Misiones, securely adding this armored catfish to the list of species present in Argentina.

Upon reviewing photographic material, both published and unpublished, of the records from the 'Parque Nacional Pre-Delta' referred to as *Hypostomus* cf. *luteus*, it is concluded that there is not enough evidence to confirm its final assignment to *H. luteus*. A meticulous comparison of the images reveals that the characters presented in these records are more compatible with *H. luteomaculatus*, probably correspond to a chromatic variation of the latter species.

From the analysis of the list of *Hypostomus* species cited for Argentina, we propose to strengthen some previous proposals and exclude four species from the list that are not effectively present in Argentina or whose description makes their location or identification not probable. Thus, the list with confirmed distribution in the country's continental waters should currently be restricted to 22 species.

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