

Short Communication

First record of the genus *Hoplisoma* (Siluriformes: Callichthyidae) with an extension of its distribution to the Andean–Cuyan region, San Juan, Argentina

Agustina Daniela Valenzuela Gómez^{*1,2,3}, Fabricio Rubén Gómez^{1,2,3}, Rodrigo Gómez Alés^{1,2,3}, Héctor José Villavicencio³

¹Research Group on the Diversity and Biology of Arid-Land Vertebrates (DIBIOVA), Department of Biology, Faculty of Exact, Physical and Natural Sciences, National University of San Juan, Argentina.

²National Council of Scientific and Technical Research (CONICET), San Juan, Argentina.

³Department of Biology, Faculty of Exact, Physical, and Natural Sciences, National University of San Juan, San Juan, Argentina.

Abstract: Knowledge of the geographical distribution of the ichthyofauna is key, as it provides the information needed for inventory and monitoring studies that detect endemism and/or introduced exotic species. Within Siluriformes, the family Callichthyidae, which comprises the subfamilies Corydoradinae and Callichthyinae, is recognized as the third largest family within the order. The Callichthyidae family, especially the subfamily Corydoradinae, comprises more than 200 species distributed throughout South America, showing notable morphological diversity and a range of habitats, from fast-flowing piedmont streams with sandy or rocky bottoms to lowland pools with muddy bottoms. In this work, the presence of a Callichthyidae species is reported and confirmed for the first time, with a voucher specimen, in the province of San Juan, and the geographical distribution range of the genus *Hoplisoma* is expanded to the Andean–Cuyan region of Argentina. The collected specimens were captured at the outflow of the José Ignacio de la Roza dam in San Juan province for taxonomic identification. The methodology proposed by Díaz et al. (2024) was followed. It was determined that these specimens correspond to the genus *Hoplisoma*, with diagnostic features similar to those of species such as *H. osvaldoi* and *H. paleatus*.

Article history:

Received 3 February 2026

Accepted 14 March 2026

Available online 25 February 2026

Keywords:

Hoplisoma

Callichthyidae

Cuyan

San Juan

Argentina

Introduction

Siluriform fishes play a crucial role in aquatic food webs, serving as predators, scavengers, and detritivores (Duk Do et al., 2025). From an economic perspective, they are important for their role in aquaculture and their popularity in the ornamental fish industry (Teugels, 1996; Gisbert et al., 2022). Morphologically, they share several traits, including small eyes, the absence of scales, and circumoral barbels that serve as mechanosensory and chemosensory organs (Teugels, 1996). Within Siluriformes, the family Callichthyidae, comprising the subfamilies Corydoradinae and Callichthyinae, is recognized as the third-largest family in the order, with 227 valid species and new species being described every year (Fricke et al., 2025). Unlike most Siluriformes, the callichthyid catfishes are relatively small and are characterized by the presence of two

longitudinal series of dermal bony plates on the flanks, which form an armor that provides them with resistance against piercing attacks from predators without compromising their mobility (Reis, 2003; Lowe et al., 2021; Duk Do et al., 2025). These fishes can breathe atmospheric air thanks to the hypervascularization of the posterior portion of their intestine, allowing them to survive in environments with low oxygen concentrations (Podkowa et al., 2002).

The Corydoradinae subfamily comprises more than 200 species distributed throughout South America (Fricke et al., 2025) and exhibits notable morphological diversity, occupying a wide range of habitats (Alonso et al., 2024). The Corydoradinae species are small (standard length of around 90 mm) and are easily distinguished from other callichthyids by their deep bodies and short maxillary barbels

*Correspondence: Agustina Daniela Valenzuela Gómez
E-mail: agustinavalenzuela60@gmail.com

(Britto, 2003). The representatives of Corydoradinae are found in various freshwater environments, ranging from fast-flowing piedmont streams with sandy or rocky bottoms to lowland pools with muddy bottoms (Brito, 2003). The taxonomic classification of Corydoradinae has traditionally recognized the genera *Corydoras*, *Scleromystax*, and *Aspidoras* based on phenotypic characteristics, with osteological and morphological characters taken into account (Reis, 1998). Subsequently, based on DNA sequences, nine lineages were proposed, generating controversy by revealing greater diversity than previously recognized (Alexandrou et al., 2011). A recent classification (Díaz et al., 2024), based on ultraconserved elements (UCE), has redefined the taxonomy of Corydoradinae, recognizing seven genera: *Corydoras*, *Aspidoras*, *Scleromystax*, *Gastrodermus*, *Osteogaster*, *Brochis*, and *Hoplisoma*. However, the taxonomic classification remains under review to date. Recently, Alonso et al. (2024) described a new genus, *Urkumayu*, that groups endemic species from the upper basin of the Bermejo River (Salta Province) that had not previously been included in any genus.

According to the classification proposed by Díaz et al. (2024), the genus *Hoplisoma* is characterized by the absence of laminar expansions on the margins of the internal rays of the pectoral and dorsal fins. The dorsal fin spine presents most of its striae directed towards the tip. The oral commissure lacks a triangular or barb-like fleshy flap, as occurs in *Aspidoras*, *Brochis*, and *Corydoras*. The snout is short, and the eyes are located in the dorsolateral portion of the head. The body's background color varies from pale yellow to brownish yellow to grayish yellow, often with small dark spots in some regions. Finally, the osteological pattern shows that the second infraorbital region exhibits a posterior laminar expansion that can range from very reduced to relatively well developed.

In Argentina, the genus *Hoplisoma* is distributed in the northeast and central Argentina (Alonso et al., 2025), while Liotta (2016) documents records in different rivers of Buenos Aires, Formosa, Corrientes, Misiones, Entre Ríos, Santa Fe, Córdoba, Tucumán,

Salta, one record in Neuquén, and San Luis. Currently, representatives of the genus *Hoplisoma* have been found in the northwestern portion of the Plata basin, located on the Atlantic slope of the central region of the South American Andes, covering the headwaters of the Bermejo, Pilcomayo, Parapetí, Salado, and Dulce river basins (Knaack, 2007; Calviño and Alonso, 2009; Calviño and Alonso 2010; Alonso et al., 2018; Alonso et al., 2022).

In San Juan, a province in the Andean–Cuyan ichthyogeographic region, the San Juan River is located; it is the largest tributary of the Desaguadero River and part of the Colorado River basin (Secretariat of Water Resources, 2023). The Desaguadero basin is part of the Arid Diagonal of South America and originates in the Andes Mountains in the province of La Rioja (Cazenave, 2015). Upon entering San Juan, the river receives contributions from the Huaco River and, in the southeast of the province, from the San Juan River (Lupano, 2008). In its provincial course, it features important dams, including the Ullum dam (the province's main hydroelectric facility), the Ignacio de la Roza dam, and the Partidor San Emiliano. In the province, the distribution of the ichthyofauna has been documented for different ecoregions and water bodies (Acosta et al., 2016; García et al., 2018; Valenzuela et al., 2023; Valdez Ovallez et al., 2024), however, there are no confirmed records of species from the Callichthyidae family. In this work, we report the first voucher record and confirm the presence of a species from this family, belonging to the genus *Hoplisoma*, in the province of San Juan, thereby expanding the genus's geographical distribution into the Andean–Cuyan region of Argentina.

Materials and Methods

In 2023 and 2024, we conducted ichthyological monitoring across different sectors of San Juan, Argentina. Particularly, the specimens of *Hoplisoma* sp. were captured at the outflow of the José Ignacio de la Roza dam, located on the margin of the San Juan River, west of the homonymous city (31°30'11"S, 68°38'27"W, altitude: 706.93 m; Fig. 1). The river

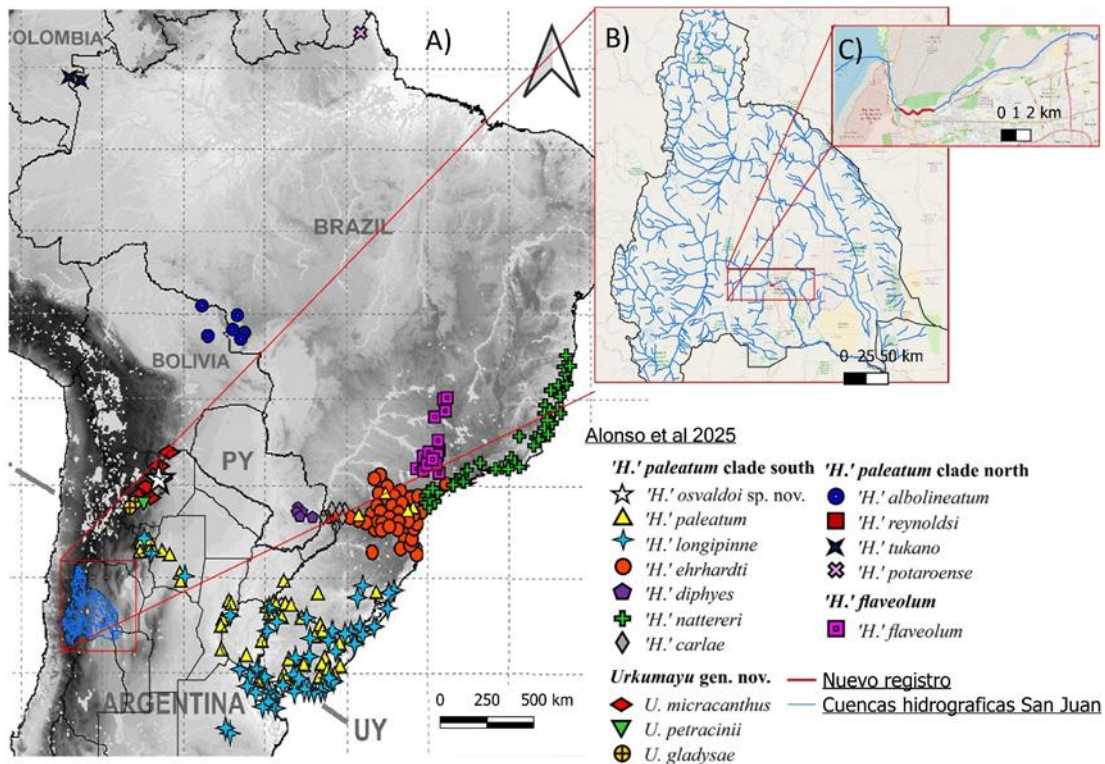


Figure 1. Map of the known distribution of two clades of *Hoplisoma* and *Urkumayu* (Alonso et al., 2025), (B) maps of the Province of San Juan, and (C) the section where the new specimens were found is detailed.



Figure 2. Lateral view of a live specimen of the genus *Hoplisoma* sp. (UNSJ-P1777).

sampling site is characterized by low water current velocity, where small pools with vegetation. At the same site, we observed them sharing microhabitats with species of *Jenynsia lineata*. We carried out the specimen captures using two methods: one passive, using a fyke net (Nasa-type net), and another active, using a **scoop net** measuring approximately 45 cm by 24 cm, which was dragged upriver against the current, removing the substrate and plant material, thus allowing the specimens to enter the net.

The collected specimens (n=10; Fig. 2) were transferred to the laboratory, where we performed standard morphometric measurements following the methods of Barriga and Battini (2009) (Fig. 3). For genus-level taxonomic identification, we followed Díaz et al. (2024). The capture of the specimens was authorized by the Secretariat of State for Environment and Sustainable Development of the province of San Juan (SEAyDS Exp. N° 1300-546-2022-FG), and the specimens were deposited in the Scientific Collection

Table 1. Morphometric measurements of *Hoplisoma* sp. (n = 10). Mean, median, range, and standard deviation are shown.

Morphometric Measurements	Mean	Median	Range		Standard Deviation
			Min	Max	
Total length (LT)	40.15	41.94	23.68	47.36	6.88
Standard length (LE)	31.5	31.77	21.53	36.77	4.85
Pre-dorsal length (LPD)	15.71	15.72	10.52	18.53	2.33
Head-Cloaca Length (LHC)	17.38	17.79	12.27	20.74	2.58
Body Depth (ALC)	10.08	10.29	6.95	11.98	1.6
Head Width (AC)	8.11	8.03	5.52	9.72	1.3
Pectoral fin length (LAp)	6.31	6.96	1.44	8.59	2.24
Anal fin length (LAA)	4.87	4.64	2.83	6.11	1
Adipose fin length (LAa)	3.47	3.54	2.33	4.17	0.49
Pelvic fin length (LAP)	4.69	4.38	2.43	6.45	1.27
Caudal peduncle depth (PPC)	4.29	4.3	3.04	5.03	0.56
Orbital length (LO)	2.32	2.36	1.63	2.74	0.33
Interorbital length (LIO)	4.72	4.74	3.61	5.61	0.62
Dorsal fin length (LAD)	7.2	7.61	5.18	9.21	1.3
Caudal fin length (LAC)	7.54	7.79	2.91	10	2.05
Barbel length 1 (LB1)	3.31	3.23	1.83	4.68	0.91
Barbel length 2 (LB2)	2.37	2.55	1.29	3.22	0.73

of Vertebrates, Ichthyology section, of the Department of Biology, Faculty of Exact, Physical and Natural Sciences, National University of San Juan (UNSJ - P1777 to UNSJ-P1786).

Results and Discussions

In Table 1, we present the descriptive morphometric analysis of *Hoplisoma* sp. specimens, which showed a total length of 40.15 mm and a standard length of 31.3 mm. From the detailed analysis of taxonomic characters following Díaz et al. (2024), we observed the absence of laminar expansions on the margins of the internal rays of the pectoral and dorsal fins; the dorsal fin spine possesses most of the striae directed towards the tip of the dorsal fin spine; the oral commissure is characterized by the absence of a fleshy flap and a short snout, which allows us to conclude that they are specimens of the genus *Hoplisoma*. Likewise, we hypothesize that it could be a species related to *H. osvaldoi* or *H. paleatus* given that the reviewed specimens present diagnostic characters and color pattern similar to these species.

The presence of this genus in the province of San Juan is of particular relevance, as it had not been recorded in previous ichthyological studies conducted in the region. This finding raises two non-exclusive hypotheses about its origin. On the one hand, the

species could be part of the native ichthyofauna, corresponding to small or cryptic populations that would have gone unnoticed in previous samplings (Acosta et al., 2016; García et al., 2018; Valenzuela et al., 2023), which would expand the known distribution range of the genus for biogeographic reasons (Díaz et al., 2024; Alonso et al., 2025). Recent results on the diversification of *Hoplisoma* in fragmented freshwater systems of the Neotropics (Fernández et al., 2025) show that natural and anthropic barriers can generate restricted populations that remain undetected in previous surveys, which supports this interpretation. On the other hand, an anthropic introduction cannot be ruled out, since specimens of this group are traded in the ornamental market (pers. obs.), often without strict controls on their origins, thereby increasing the risk of accidental or intentional releases. Introductions of this type can increase apparent richness, but frequently lead to the local extinction of native species, including endemic ones, and the loss of biodiversity (Allan, 1995; Vitousek et al., 1997; Garcia-Berthou et al., 2015).

These considerations underscore the importance of continuing systematic research that integrates morphological and genetic analyses, along with targeted new sampling, to clarify the origin and status of the detected population. The limited information on

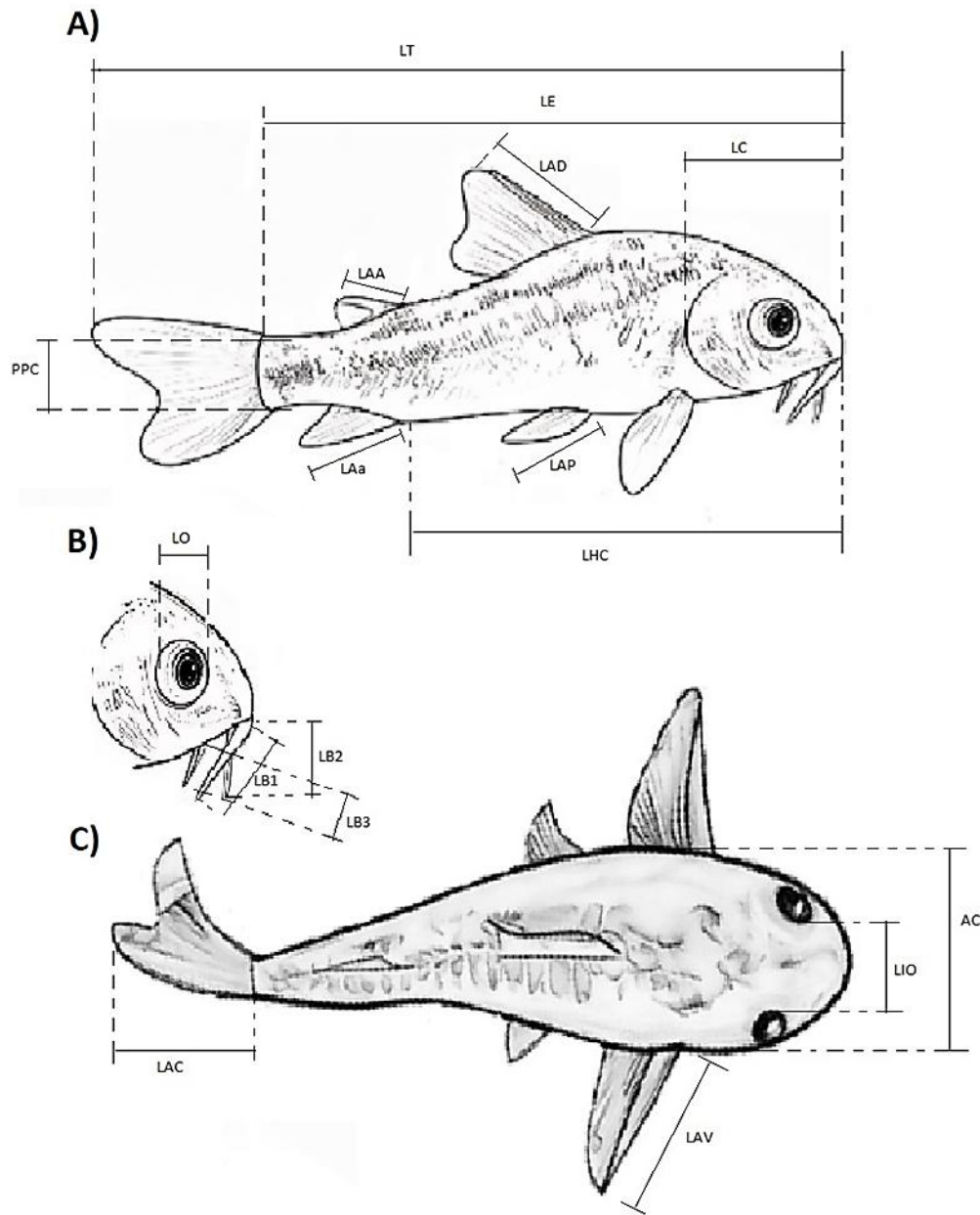


Figure 3. Morphometric measurements were recorded for each specimen. (A) Lateral view of the fish: Total Length (LT), Standard Length (LE), Dorsal Fin Length (LAD), Head Length (LC), Adipose Fin Length (LAA), Head Depth (ALC), Caudal Peduncle Body Depth (PPC), Anal Fin Length (LAa), Pelvic Fin Length (LAP), Snout-Cloaca Length (LHC); (B) Lateral view of the head: Orbital Length (LO), Barbel Length 1 (LB1), Barbel Length 2 (LB2); and (C) Dorsal view: Caudal Fin Length (LAC), Pectoral Fin Length (LAP), Head Width (AC), Interorbital Length (LIO). Scheme Author: Agustina Valenzuela.

the diversity, distribution, and biology of the fishes of San Juan, coupled with the stocking of exotic species such as salmonids and other anthropic pressures on wetlands, constitutes a challenge for the conservation of the provincial ichthyofauna (Valenzuela et al., 2023; Valdez Ovallez et al., 2024).

Reporting new record species provides valuable input for authorities to develop management strategies

to evaluate and mitigate potential impacts on native populations. With this record, the total number of species reported for the province increases to 28 (Acosta et al., 2016; Fernández et al., 2016, 2017; García et al., 2018), and the distribution of the genus *Hoplisoma* is expanded for the first time towards the Andean–Cuyan region of Argentina. Future studies that estimate its abundance and population dynamics

will be essential not only for basic research but also for designing management and conservation plans for the provincial ichthyofauna.

References

- Acosta J.C., Laspiur A., Blanco G. (2016). Ichthyofauna of San Juan: diversity and distribution (Spanish). In: Martínez Carretero E. (Ed.). San Juan Ambiental. San Juan, Editorial UNSJ. pp: 237-257.
- Alexandrou M.A., Oliveira C., Maillard M., McGill R.A.R., Newton J., Creer S., Taylor M.I. (2011). Competition and phylogeny determine community structure in Müllerian mimics. *Nature*, 469: 84-89.
- Alonso F., Terán G.E., Aguilera G., Montes M.M., Serra Alanís W.S., Calviño P., Vera-Alcaraz H.S., Cardoso Y., Koerber S., Mirande J.M. (2025). Integrative phylogeny of Corydoradinae (Siluriformes: Callichthyidae) with an emphasis on northwestern La Plata species, including descriptions of a new genus and species. *Zoologischer Anzeiger*. pp: 314: 10-23.
- Barriga J.P., Battini M.A. (2009). Ecological significances of ontogenetic shifts in the stream-welling catfish, *Hatcheria macraei* (Siluriformes, Trichomycteridae), in a Patagonian River. *Ecology Freshwater Fish*, 18(3): 395-405.
- Britto M.R. (2003). Phylogeny of the subfamily *Corydoradinae* Hoedeman, 1952 (Siluriformes: Callichthyidae), with a definition of its genera. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 153(1): 119-154.
- Calviño P.A., Alonso F. (2009). Two new species of the genus *Corydoras* (Ostariophysi: Siluriformes: Callichthyidae) from northwestern Argentina, and the redescription of *C. microcanthus* Regan, 1912 (Spanish). *Revista del Museo Argentino de Ciencias Naturales, Nueva Serie*, 11(2): 199-214.
- Cazenave H.W. (2015). The Desaguadero River Basin: A case of desertification due to anthropogenic action (Spanish). *Inte-rEspaço: Revista de Geografia e Interdisciplinaridade*, pp: 225-236.
- Diaz A.C., Tencatt L.F.C., Roxo F.F., Costa Silva G.S., Santos S.A., Britto M.R., Taylor M.I., Oliveira C. (2024). Phylogenomic analyses in the complex Neotropical subfamily Corydoradinae (Siluriformes: Callichthyidae) with a new classification based on morphological and molecular data. *Zoological Journal of the Linnean Society*, zlae053.
- Duk Do S., Rhee J.S. (2025). First Description of Intergenic Sequences in Corydoradinae and Introducing the Complete Mitogenome of *Hoplisoma concolor* (Siluriformes: Callichthyidae). *Genes*, 16(3): 282.
- Fernandez L.A., Liotta D.J. (2016). *Silvinichthys pachonensis*, a new catfish from high altitude, with a key to the species of the genus (Siluriformes: Trichomycteridae). *Ichthyological Exploration of Freshwaters*, 27: 375-383
- Fernandez L.A., Sanabria E.A., Quiroga L.B. (2017). Description of *Silvinichthys pedernalensis* n. sp. (Teleostei, Siluriformes) from the Andean Cordillera of southern South America. *Animal Biodiversity and Conservation*, 40.1: 41-47.
- Fernández M.Á., Briñoccoli Y.F., Bogan S., Eirin M., Cardoso Y.P. (2025). Distinct evolutionary lineages of *Hoplisoma* (Siluriformes: Callichthyidae) due to dispersal barriers. Available at SSRN 5348650.
- Fricke R., Eschmeyer W.N., Van der Laan R. (2025). Eschmeyer's catalog of fishes: genera, species, references. (<http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp>). Electronic version accessed 28/03/2025.
- García M.I., Acosta J.C., Blanco G.M., Acosta R. (2018). New records of introduced fishes in the Desaguadero River basin in central-western Argentina (Spanish). *Neotropical Biology and Conservation* 13(3): 268-273
- Gisbert E., Luz R.K., Fernández I., Pradhan P.K., Salhi M., Mozanzadeh M.T., Salhi M., Mozanzadeh M.T., Kumar A., Kotzamanis Y., Castro-Ruiz D., Bessonart M., Darias M.J. (2022). Development, nutrition, and rearing practices of relevant catfish species (Siluriformes) at early stages. *Reviews in Aquaculture*, 14(1): 73-105.
- Government of San Juan, Secretariat of Water Resources. (2023). Report on the San Juan River basin: Description and hydrological analysis (Spanish). Available from: https://www.argentina.gob.ar/sites/default/files/54_nueva.pdf
- Lowe T.M., Chan P.P. (2016). Integrating search and context for analysis of transfer RNA genes. *Nucleic Acids Research*, 44: W54-W57.
- Lupano C.F. (2008). San Juan River Basin - Basin No. 54. Available from: https://www.argentina.gob.ar/sites/default/files/54_nueva.pdf. Retrieved 28/03/2025
- Podkowa D., Goniakowska-Witalińska L. (2002). Adaptations to the air breathing in the posterior intestine of the catfish (*Corydoras aeneus*, Callichthyidae): A histological and ultrastructural study. *Folia Biologica*,

50(1-2): 69-82.

- Reis R.E. (2003). Family Callichthyidae (Armored catfishes). In: Reis R.E., Kullander S.O., Ferraris Jr. C.J., organizers. Checklist of the freshwater fishes of South and Central America. Porto Alegre: Edipucrs, 291-309.
- Teugels G.G. (1996). Taxonomy, phylogeny and biogeography of catfishes (Ostariophysi, Siluroidei): An overview. Aquatic Living Resources, 9: 9-34.
- Valdez Ovallez F.M., Acosta J.C., Acosta R., Fernández R., Corrales L. (2024). Range extension of *Synbranchus marmoratus* (Synbranchidae) towards Argentina's central Andes. Acta Biológica Colombiana, 29(1): 129-132.
- Valenzuela A.D., Fernández R.D., Gómez F.R., Acosta J.C., Corrales L.A., Acosta R., Valdez F.M. (2023). New records of *Pimelodella laticeps*, Eigenmann, 1917 (Siluriformes, Heptapteridae) and western distribution extension toward the Central Andes of Argentina (Spanish). Acta Zoológica Lilloana, 187-194.