Neotropical Ichthyology

Original article

https://doi.org/10.1590/1982-0224-2021-0159

Freshwater fishes of the Río de la Plata: current assemblage structure

Correspondence:
Tomás Maiztegui
maiztegui@ilpla.edu.ar

Tomás Maiztegui[1,2], Ariel Hernán Paracampo[2], Jorge Liotta[3], Eva Cabanellas[2], Carlos Bonetto[2] and Darío César Colautti[2]

Few studies have addressed the composition of fish assemblages of the freshwater Río de la Plata (RdlP) and have only been limited to species lists gathered over the last two centuries. As such inventories have never been reviewed or validated by fish sampling, the richness and structure of RdlP fish assemblage are poorly known. Hence, we conducted an exhaustive literature review and a fieldwork in six coastal points of Argentina to update the species composition and determine the hierarchical structure of the fish assemblage. From the 206 species registered in the literature, 48 were not confirmed, 13 were absent, five were taken as synonymized species, 29 were supported by literature and 107 were confirmed; one was an established exotic species, and three were a non-established exotic species. The findings reported here suggest that the fish assemblage currently comprises 141 species, including four new records. Analysis of fieldwork data in number and weight of fish captured resulted in an assemblage hierarchical structure of five dominant, 22 frequent, and 45 rare species; 16 dominant, 11 frequent, and 45 rare taxa, respectively. These results could be used as baseline to monitor, manage, and preserve neotropical fish species in their southern distribution boundary.

Keywords: Biodiversity, Conservation, Ichthyofauna, Neotropics, Richness.

Submitted November 11, 2021
Accepted July 12, 2022
by Franco Teixeira de Mello
Epub October 14, 2022

Online version ISSN 1982-0224
Print version ISSN 1679-6225

Neotrop. Ichthyol.
vol. 20, no. 3, Maringá 2022

1 Comisión de Investigaciones Científicas de la provincia de Buenos Aires (CIC), La Plata, Buenos Aires, Argentina. (TM) maiztegui@ilpla.edu.ar (corresponding author).

2 Instituto de Limnología Dr. R. Ringuelet, CONICET, Universidad Nacional de La Plata (ILPLA), Boulevard 120 y 62, CP 1900 – CC712, La Plata, Buenos Aires, Argentina. (AHP) arielp@ilpla.edu.ar, (EC) evacabanellas.89@gmail.com, (CB) bonetto@ilpla.edu.ar, (DC) colautti@ilpla.edu.ar.

3 Museo de Ciencias Naturales "P. A. Scasso", San Nicolás, Buenos Aires. Dirección de Pesca Continental, Ministerio de Agroindustria, C1107AQA Ciudad Autónoma de Buenos Aires, Buenos Aires, Argentina. (JL) jorgerliotta@gmail.com.

El conocimiento de los ensambles de peces del sector dulceacuícola del Río de la Plata (RdlP) es escaso y limitado a listas de especies de compilaciones realizadas en los últimos dos siglos. Como esos inventarios nunca han sido revisados o validados mediante muestreos de peces, el conocimiento respecto de la riqueza y la estructura de los ensambles del RdlP resulta deficiente. Para ordenar y mejorar la información acerca de la riqueza y estructura de los ensambles de peces del área se realizó una revisión bibliográfica y un muestreo de campo para actualizar la composición de especies y determinar la estructura jerárquica del ensamble de peces. De las 206 especies colectadas de acuerdo a la bibliografía 48 se categorizaron como no reconfirmadas, 13 como ausentes, cinco como especies sinonimizadas, 29 como soportadas por la literatura, 107 como confirmadas, una exótica establecida y tres exóticas no establecidas. Los resultados sugieren que el ensamble de peces actualmente está compuesto por 141 especies, incluyendo cuatro nuevos registros. El análisis de los datos en número y en peso de los peces colectados mostró 5 especies dominantes, 22 frecuentes y 45 raras; y 16 dominantes, 11 frecuentes y 45 raras, respectivamente. Los resultados de este trabajo pueden ser usados como línea de base para el monitoreo, manejo y conservación de las especies de peces neotropicales en su límite de distribución sur.

Palabras clave: Biodiversidad, Conservación, Ictiofauna, Neotrópico, Riqueza.

INTRODUCTION

Freshwater ecosystems such as rivers, ponds, lakes, and streams are essential for human survival. Yet, they are among the most degraded habitats of the world (Dudgeon *et al*., 2006), making freshwater species the most threatened on Earth. Alarmingly, loss of freshwater biodiversity is mounting fast (Kumar, 2000; Sala *et al*., 2000) due to anthropogenic activity such as habitat alteration, water pollution, introduction of exotic species, and overexploitation of natural resources (Dudgeon *et al*., 2006; Arthington *et al*., 2010; Liermann *et al*., 2012; Pelicice *et al*., 2021).

Vitule *et al.* (2016) stated that loss of freshwater fish biodiversity cannot be measured simply by the number of threatened species or of species that became extinct, arguing that a decrease in freshwater fish populations, threatened or not, may drastically alter the ecosystem functioning. Moreover, research into the biological diversity of freshwater ecosystems is yet limited (Stiassny, 2002). As inventories allow assessing the presence of species or infer their absence within an area (Morrison *et al*., 2008), greater insights are required to develop the basis for measuring the biodiversity of species. Green *et al*. (2009) claimed that inventories made from compendiums of information previously collected from an area show all the inherent limitations associated with non-quantitative methodologies. From studies of the vulnerability of freshwater fish diversity (Tedesco *et al*., 2017) derived the need to generate updated quali-quantitative ichthyological research used as a basis to evaluate species conservation and extinction risk, particularly in South America (Baigún *et al*., 2012). For instance, Jaureguizar *et al*. (2015) on the

basis of the abundance and relative frequency of each species, typified the components of fish assemblage on the Argentinean estuarine-marine coast. Such approach had led to a thorough understanding to improve or develop integral conservation policies, strategic management decisions, and/or accurate environmental impact assessments.

The Río de la Plata (RdlP) is the collector of the La Plata River basin, the second largest watershed in South America, draining a surface of almost three million km^2 (Pasquini, Depetris, 2007) and representing the third most diverse basin of the continent with more than 900 fish taxa (Reis *et al*., 2016). Although ichthyological studies have been conducted on freshwater RdlP and neighboring streams scattered on the space and time scales, most are related to governmental reports centered on the relevant species for local fisheries (CARP-INIDEP-INAPE, 1990; CARU, 1992; CARU-CARP, 2012; 2016); hence, fish assemblages are still being poorly understood (Llompart *et al*., 2012). According to Baigún *et al*. (2012), 26% of the fish found in the lower La Plata River basin are classified as Data Deficient (IUCN), due to lack of information on their population and distribution. RdlP is the meridional edge of the Lower Paraná Ecoregion (Abell *et al*., 2008), which constitutes the distribution boundary for the most representatives of freshwater Neotropical fish (Ringuelet, 1975).

Bibliographic compilations describing the composition of the freshwater fish of RdlP were provided by Nion (1998), López *et al*. (2003), and Volpedo *et al*. (2010), recording approximately 170 species in the area. However, one of the main issues arising from these inventories is that compilers used the exhaustive work of Ringuelet *et al*. (1967) as a reference. This pioneer study represents the first Argentinean fish species list based on specimens collected in field samplings and on bibliographic compilations. Over the last twenty years, extensive reviews have been made for the freshwater ichthyofauna of Argentina and Uruguay, and several species have been synonymized or disregarded as part of the fish fauna of those countries (Litz, Koerber, 2014; Koerber *et al*., 2016a,b; 2020; Mirande, Koerber, 2020). However, the validity of fish records, the actual number of species, their frequency of occurrence, and abundance in the area have not been reviewed nor have they been contrasted with current surveys. This indicates a need to review and updated lists of current freshwater fish living in the RdlP, based on a quantitative approach.

In addition, freshwater RdlP is subject to environmental pollution due to the large urban and industrial centers located on its coast (AA-AGOSBA-OSN-SHN, 1992; FREPLATA, 2004), threatening the fish biodiversity inhabiting this ecosystem. Thus, the revision and characterization of the composition, distribution and community of fish species present in this area and their hierarchical structure within the assemblage will provide the foundation for assessing the conservation status of species, assemblages, and fisheries.

MATERIAL AND METHODS

Study area. The RdlP system is located on the western South American Atlantic coast (35°S 58°W) and can be defined as a funnel coastal plain tidal river with a semi-closed shelf at the mouth (Baigún *et al*., 2016). This extensive environment is divided into two main areas by the submersed shoal known as Barra del Indio that crosses the

river transversally (Fig. 1): the riverine zone (< 5 Practical Salinity Units: PSU) and the estuarine zone (> 5 PSU) (Guerrero *et al*., 1997; Baigún *et al*., 2016). The riverine zone is a shallow area not exceeding 5 m deep, characterized by a silty sand bottom that gradually turns to silt into the estuarine zone (Wells, Daborn, 1998). The main tributaries of the riverine RdlP are the Paraná and Uruguay rivers, providing 97% of the freshwater inflow (Guerrero *et al*., 1997), together with several streams draining its coasts. Despite its main fluvial regime, this area also exhibits tidal influence (Balay, 1961), allowing a dynamic interaction between freshwater-brackish waters that can be highly affected by the wind action (Simionato *et al*., 2007).

From an ichthyogeographical approach, Ringuelet (1975) argued that La Plata city (Fig. 1), and its surroundings, should be considered as the boundary where most freshwater fish fauna of La Plata River basin lives, due to a pauperization of taxa related to the saline gradient towards the estuary. However, López *et al*. (2002, 2008) extended the area of freshwater fish downstream, closer to the estuarine zone. For the present work, the study area comprised the Río de la Plata stretch from the mouth of Paraná (downstream the "Delta") and Uruguay rivers (downstream the locality of "Punta Gorda") to the imaginary line from La Balandra (Argentina) to Juan Lacaze (Uruguay) in opposite banks, hereinafter referred to as "freshwater RdlP" (Fig. 1). Such places were defined as limit because the last two stable freshwater fisheries of RdlP are placed in their banks, in the middle of the limits proposed by Ringuelet (1975) and López *et al*. (2002; 2008).

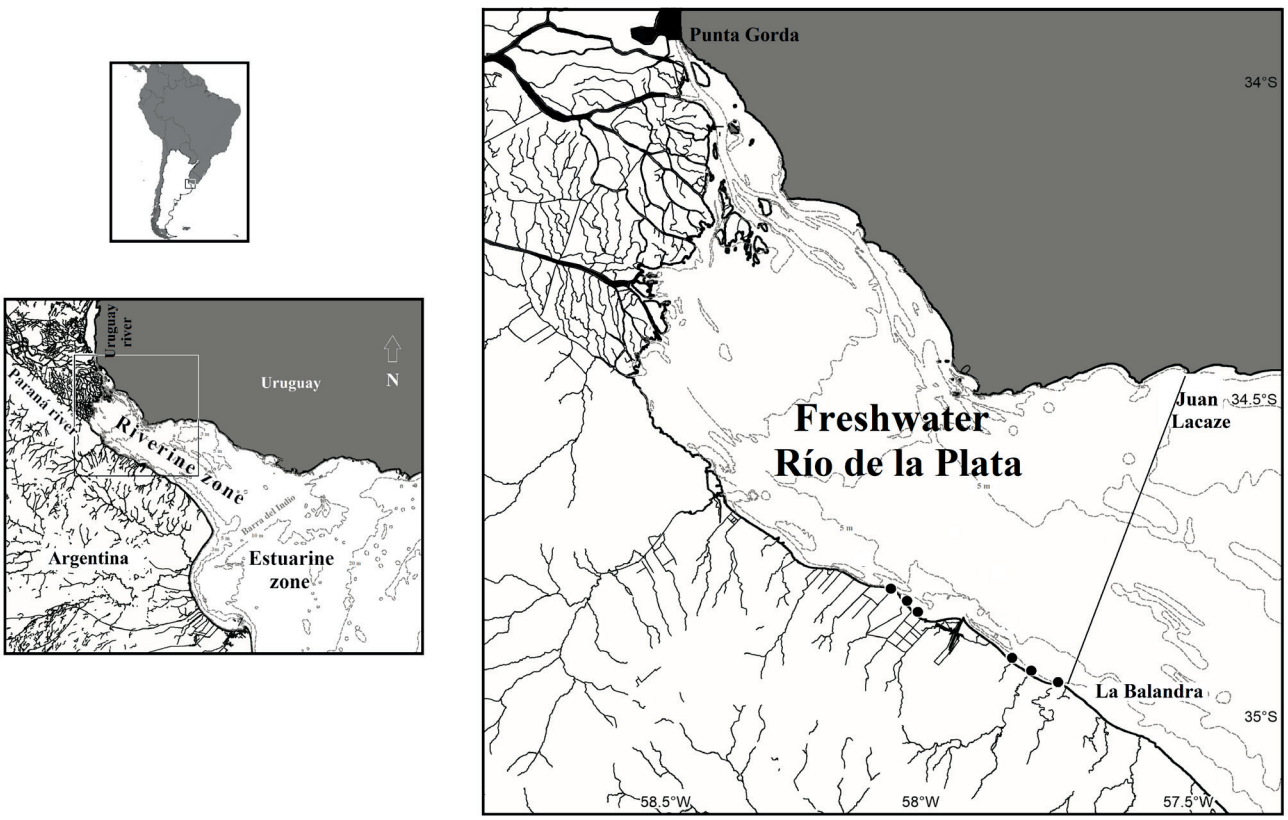

FIGURE 1 | Division of the Río de la Plata (RdlP) by the Barra del Indio shoal, in a riverine zone and an estuarine zone (FREPLATA, 2005), showing the sampled sites (black circles) and the limits of the area of freshwater RdlP considered for this study.

Literature review. Based on the list of freshwater fishes performed by López *et al*. (2003), species mentioned for the area in scientific literature, and our own fieldwork, a review of the species recorded for the freshwater RdlP was performed. The mention of each species was revised through the geographical distribution database of freshwater fishes from Argentina (Liotta, 2020). This online data source compile georeferenced information published in around 690 scientific publications on the distribution of inland fishes of the country. Furthermore, we conducted a systematic search in the Web of Science (WOS – in all fields) and Google Scholar database on Jan-2022, using the keywords: "scientific name" of each species and "rio de la Plata" (*i.e*., *Prochilodus lineatus* Río de la Plata). After these searches, around 1000 ichthyologycal documents were obtained including journal papers, governmental technical reports, books, conference presentations, and PhD theses. Then, we reviewed titles, abstracts and in many cases the full text of each document retaining only the surveys with actual fieldwork and capture location inside the delineated study area, obtaining 119 documents. The species were sorted in a list of fish species mentioned for the freshwater RdlP, following the classification of Nelson *et al*. (2016) and changes in taxonomy were reviewed and updated following Fricke *et al*. (2022). Each species was analyzed to confirm the number of records, defined as the number of times that the species were registered in field studies in the literature. Also, to this figure we added the species registered in our fieldwork as one more record. To solve old metadata replication from Ringuelet *et al*. (1967), species registered once with collection date before this work or older, and taxa without first record traceable were considered as "not confirmed". Such timeframe in the history of ichthyological studies of RdlP was defined considering the publication date of the study of the distribution of fish species in Argentina conducted by Ringuelet *et al*. (1967). The review of the list also included the analysis of species included in the last lists of freshwater fish species from Argentina (Mirande, Koerber, 2015; Koerber *et al*., 2016a, 2020) and Uruguay (Teixeira de Mello *et al*., 2011; Litz, Koerber, 2014; Koerber, Litz, 2016b; Koerber *et al*., 2020, 2021). The species previously mentioned for the study area, but not included in these lists, were categorized as "absent" for the freshwater RdlP and excluded from further analysis. In addition, species currently considered junior synonyms of other species those documented in the study area were referred to as "synonymized species". The remaining taxa, cited for Argentina and Uruguay within the study area, were categorized based on the absence or existence of specimens in ichthyological collections as "supported by literature" or "confirmed", respectively. The non-native species were grouped as "established exotic species" and "non-established exotic species", following Maiztegui *et al*. (2016), García Romero *et al*. (1998), and Liotta, Giacosa (2017).

Fieldwork. A fish sampling was carried out in freshwater RdlP at six sampling sites, along 35 km of the coastline between 34°46'56.0"S 58°00'39.9"W and 34°55'43.2"S 57°42'45.6"W (Fig. 1). Four seasonal fish samplings were performed from April 2016 to May 2017, using two fyke net with a rectangular mesh 10 x 5 mm (Colautti, 1998) and two trammel nets at each site, 25 m length and 1.9 m height each, with an inner mesh of 19 mm and 21 mm bar for one net, and 27 mm and 30 mm bar for the other net. The external mesh was 130 mm bar for both trammel nets. Fishing gears were arranged for one night, with a standardized effort at each site (16h). Fish were identified, counted,

and weighed (g). During fieldwork, some fish were identified and released alive; others were euthanized with an overdose of benzocaine solution, fixed in 10% formaldehyde, and stored in 70% ethanol for laboratory identification. Fish were identified following Azpelicueta, Braga (1991), López, Miquelarena (1991), Braga (1993, 1994), Aquino (1997), Casciotta *et al*. (2005), Miquelarena, Menni (2005), Miquelarena *et al.* (2008), and Rosso *et al.* (2018). Changes in taxonomy were reviewed and updated following Fricke *et al*. (2022). Voucher species were deposited in the ichthyology collection of the Fundación de Historia Natural Félix de Azara, Buenos Aires, Argentina (CFA-IC). In addition, species collected for the first time in the area were indicated as "new records".

Taking into account the categories supported by literature, confirmed, established exotic species, and new records showed in the list of fish species mentioned for the freshwater RdlP, we obtained the current fish assemblage of the freshwater RdlP with their respective number of records. Meanwhile, the taxa categorized as not confirmed, absent, and synonymized species were considered as not current components.

Literature and fieldwork. Comparison and representativeness. The relative distribution of species richness within each taxonomic order was compared between the current fish assemblage from the literature and that from our fieldwork using the test of goodness fit of *Kolmogorov-Smirnov* ($p < 0.05$). In turn, we calculated the frequency distribution of species and ratio between number of species captured in our fieldwork and number of species mentioned in the literature as function of number of records.

Hierarchical structure of fish assemblage. To describe the hierarchical structure of fish species, an Olmstead-Tukey (OT) diagram (Sokal, Rohlf, 1981) was drawn from the fieldwork sampled area, categorizing each species as "dominant", "frequent", "occasional" or "rare". Such classification was made according to the arrangement of species in a two-dimensional space defined by the percentage frequency of occurrence of species (occurrence %) and their catch per unit effort in fish number (CPUEn) and in fish weight (CPUEw). In both cases, values were standardized to 16h of fishing and, log transformed (ln X+1). The category obtained for each species was indicated in the list of fish species mentioned for the freshwater RdlP.

RESULTS

From the literature, 206 native and four exotic fish species were mentioned in freshwater RdlP (Tab. 1). From the analysis of each species, the following number by categories were defined: 48 not confirmed, 13 absent, five synonymized species, 29 supported by literature, 107 confirmed, one established exotic species, and three non-established exotic species.

A total of 28,147 individuals that weighted 912,723 g, encompassing 72 species distributed in 11 orders and 28 families were captured during fieldwork (Tab. 1). This figure represents half of the fish assemblage species reported in the literature, including four new records. These taxa, together with supported by literature, confirmed, and established exotic species categories found in the literature, define a list of 141 species that should be considered as current fish assemblage of the freshwater RdlP (Tab. 1). The

remaining categories: not confirmed, absent, synonymized species, and non-established exotic species, accounted 66 taxa and were considered as not current components.

The comparison between literature and sampling taxa composition showed no differences in the relative number distribution of species by order (*Kolmogorov Smirnov*, $D = 0.38$; $p = 0.29$). It also showed that Siluriformes and Characiformes were equally prevalent, representing around 80% of the taxa (Fig. 2), followed by Gymnotiformes, Atheriniformes, and Clupeiformes with 4–3%. Cichliformes, Acanthuriformes,

TABLE 1 | List of fish species mentioned for the freshwater Río de la Plata (RdlP) with their taxonomic position, discriminating between species categorized as current and not current component of the fish assemblage. Number of records (N°Rec), references, and category provided after literature review (Cat.: NC, not confirmed; Ab, absent; SS, synonymized species; SL: supported by literature; Co, confirmed; NR, new records; EEx, established exotic species; NEx, non-established exotic species). The species captured in the sampling were classified according to Olmstead-Tukey (OT CPUEn and CPUEw: D, dominant; F, frequent; R, rare; O, occasional) and their voucher number (VN) in ichthyology collections. Museo de La Plata, Instituto de Limnologia, La Plata (MLP); Museo Argenino de Ciencias Naturales "Bernardino Rivadavia", Buenos Aires (MACN); Laboratorio de Evolución of Facultad de Ciencias, Universidad de la República Uruguay, Montevideo (EVP); Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul, Porto Alegre (MCP); Museo Nacional de Historia Natural y Antropologia, Zoologia, Montevideo (MHNM).

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Current components of the fish assemblage						
CHONDRICHTHYES						
MYLIOBATIFORMES						
Potamotrygonidae						
Potamotrygon brachyura (Günther, 1880)	3	CARU (2012); Llompart *et al.* (2012); Lucifora *et al.* (2015).	SL			
OSTEICHTHYES						
Sciaenidae						
Pachyurus bonariensis Steindachner, 1879	8	Almirón (1989); Almirón *et al.* (2000); Llompart *et al.* (2012); CARU (2012, 2016); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	F		CFA8064
Plagioscion ternetzi Boulenger, 1895	8	Almirón (1989); Almirón *et al.* (2000); CARU (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	R		CFA8049
ATHERINIFORMES						
Atherinopsidae						
Odontesthes argentinensis (Valenciennes, 1835)	1	D´Anatro *et al.* (2020)	Co			EVP150
Odontesthes humensis de Buen, 1953	1	Bogan *et al.* (2015).	Co			CFA4800
Odontesthes retropinnis (de Buen, 1953)	1	Cuello (2020).	Co			MLP9670

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Odontesthes bonariensis (Valenciennes, 1835)	14	Almirón (1989); Almirón *et al.* (2000); CARU-CARP (2012, 2016); Paracampo (2013); Avigliano, Volpedo (2013a,b); Avigliano *et al.* (2015a); Valdés *et al.* (2015); Valencia *et al.* (2017); Villanova *et al.* (2018); Colautti *et al.* (2019); Scarabotti *et al.* (2021), This study.	Co	F		
Odontesthes perugiae Evermann & Kendall, 1906	1	This study.	NR	R		CFA8087
CICHLIFORMES						
Cichlidae						
Australoheros facetus (Jenyns, 1842)	8	Ringuelet *et al.* (1967); Ringuelet *et al.* (1978); Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			MLP12-XII-32-18
Cichlasoma dimerus (Heckel, 1840)	1	CARU-CARP (2016).	SL			
Crenicichla lepidota Heckel, 1840	1	Llompart *et al.* (2012).	SL			
Crenicichla scottii (Eigenmann, 1907)	2	Llamazares Vegh *et al.* (2012); Paracampo (2013).	Co			CFA2191
Gymnogeophagus meridionalis Reis & Malabarba, 1988	8	Escalante (1984); Almirón, García (1992); Almirón *et al.* (2000); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Yorojo Moreno *et al.* (2017); This study.	Co	R		CFA8038
CLUPEIFORMES						
Pristigasteridae						
Pellona flavipinnis (Valenciennes, 1837)	4	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016).	Co			MLP2-VII-54-11
Engraulidae						
Lycengraulis grossidens (Spix & Agassiz, 1829)	7	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP(2012, 2016); Llompart *et al.* (2012); Scarabotti *et al.* (2021); This study.	Co	R		CFA8089
Platanichthys platana (Regan, 1917)	1	CARU-CARP (2012).	SL			
Ramnogaster melanostoma (Eigenmann, 1907)	5	Ringuelet *et al.* (1967); Almirón (1989); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	F		CFA8088
CYPRINIFORMES						
Cyprinidae						
Cyprinus carpio Linnaeus, 1758	13	Mac Donagh (1945); Candia (1989); Fabiano *et al.* (1992); Colautti (1997); Colombo *et al.* (2000); CARU-CARP (2012, 2016); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Guerrero *et al.* (2017); Paracampo *et al.* (2020); This study.	EEx	F	D	CFA8096

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
CYPRINODONTIFORMES						
Anablepidae						
Jenynsia lineata (Fowler, 1940)	10	Ringuelet *et al.* (1967); Ringuelet *et al.* (1978); Escalante (1983); Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			
Poeciliidae						
Cnesterodon decemmaculatus (Jenyns, 1842)	9	Escalante (1983); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			CFA2163
Phalloceros caudimaculatus (Hensel, 1868)	4	Almirón (1989); Almirón *et al.* (2000); Callicó Fortunato *et al.* (2010); Llompart *et al.* (2012).	SL			
Rivulidae						
Austrolebias bellottii (Steindachner, 1881)	6	Escalante (1984); Almirón, García (1992); Almirón *et al.* (2000); Calviño (2007); Llompart *et al.* (2012); Calviño (2016).	Co			MLP6847
Austrolebias elongatus (Steindachner, 1881)	2	Ringuelet *et al.* (1967); Calviño (2016).	Co			MLP6408
Austrolebias nigripinnis (Regan, 1912)	4	Ringuelet *et al.* (1967); Calviño (2007); Calviño (2016) Llompart *et al.* (2012).	Co			MLP7889
CHARACIFORMES						
Acestrorhynchidae						
Acestrorhynchus pantaneiro Menezes, 1992	7	Almirón, García (1992); Almirón (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016) ; This study.	Co	R		CFA8060
Anostomidae						
Abramites hypselonotus (Günther, 1868)	1	Braga (1993).	Co			MLP17-XII-32-12
Leporinus acutidens (Valenciennes, 1837)	1	Almirón (1989)	SL			
Megaleporinus obtusidens (Valenciennes, 1837)	11	Candia (1989); Almirón (1989); Braga (1993); Penchaszadeh *et al.* (2000); Remes Lenicov, Colautti (2000); García, Protogino (2005); CARU-CARP (2012, 2016); Paracampo (2013); Rojo *et al.* (2021); This study.	Co	F	D	CFA8082
Pseudanos trimaculatus (Kner, 1858)	1	Braga (1993).	Co			MACN6207
Schizodon borellii (Boulenger, 1900)	2	CARU-CARP (2012, 2016).	SL			
Schizodon platae (Garman, 1890)	6	Almirón (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	F		CFA8086

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Characidae						
Aphyocharax dentatus Eigenmann & Kennedy, 1903	1	López *et al.* (1984).	SL			
Astyanax abramis (Jenyns, 1842)	5	Almirón (1989); CARU-CARP (2012, 2016); Paracampo (2013); This study.	Co	R		CFA8099
Astyanax alleni (Eigenmann & McAtee, 1907)	3	Almirón (1984); Llompart *et al.* (2012); Paracampo (2013).	SL			
Astyanax lacustris (Lütken, 1875)	4	Remes Lenicov, Colautti (2000); Llompart *et al.* (2012); CARU-CARP (2016); This study.	Co	F		CFA8072
Brycon orbignyanus (Valenciennes, 1850)	5	Ringuelet *et al.* (1967); CARU-CARP (2012, 2016); Guerrero *et al.* (2017); This study.	Co	R		MLP30-V-33-43
Bryconamericus exodon Eigenmann, 1907	1	Llompart *et al.* (2012).	SL			
Bryconamericus iheringii (Boulenger, 1887)	7	Almirón (1989); Almirón *et al.* (2000); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	R		CFA8044
Bryconamericus rubropictus (Berg, 1901)	1	Almirón *et al.* (2000).	SL			
Charax stenopterus (Cope, 1894)	7	Escalante (1984); Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			CFA2168
Cheirodon interruptus (Jenyns, 1842)	11	Ringuelet *et al.* (1967); Miquelarena *et al.* (1981); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	R		CFA8043
Cynopotamus argenteus (Valenciennes, 1837)	7	Almirón (1989); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	F		CFA8062
Cynopotamus kincaidi (Schultz, 1950)	1	This study.	NR	R		
Deuterodon luetkenii (Boulenger, 1887)	1	Paracampo (2013).	SL			
Diapoma terofali (Géry, 1964)	3	Miquelarena *et al.* (1981); Almirón *et al.* (2000); Paracampo (2013).	Co			MLP19-XII-79-1
Galeocharax humeralis (Valenciennes, 1834)	3	CARU-CARP (2012); Llompart *et al.* (2012); This study.	Co	R		
Heterocheirodon yatai (Casciotta, Miquelarena & Protogino, 1992)	1	Almirón *et al.* (2000).	SL			
Hyphessobrycon meridionalis Ringuelet, Miquelarena & Menni, 1978	5	Ringuelet *et al.* (1978); Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); Paracampo (2013).	Co			CFA2181

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Hyphessobrycon togoi Miquelarena & López, 2006	1	Miquelarena, López (2006).	Co			CFA1246
Moenkhausia intermedia Eigenmann, 1908	1	This study.	NR	R		CFA8052
Odontostilbe pequira (Steindachner, 1882)	2	Almirón (1984); This study.	Co	R		CFA8069
Oligosarcus jenynsii (Günther, 1864)	8	Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); CARU-CARP (2012); Llamazares Vegh *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	R		CFA8090
Oligosarcus oligolepis (Steindachner, 1867)	7	Escalante (1984); Almirón *et al.* (2000); Llompart *et al.* (2012); Paracampo (2013); CARU-CARP (2016); Paracampo *et al.* (2020); This study.	Co	F		CFA8055
Piabarchus stramineus (Eigenmann, 1908)	1	Azpelicueta, Braga (1980).	SL			
Psalidodon anisitsi (Eigenmann, 1907)	3	Ringuelet *et al.* (1978); Almirón (1989); Paracampo (2013).	Co			CFA2186
Psalidodon eigenmanniorum (Cope, 1894)	7	Escalante (1982); Almirón, García (1992); Almirón *et al.* (2000); López *et al.* (2009); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			CFA2175
Psalidodon erythropterus (Holmberg, 1891)	2	Llompart *et al.* (2012); This study.	Co	R		CFA8066
Psalidodon rutilus (Jenyns, 1842)	13	Ringuelet *et al.* (1967); Escalante (1984); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	D	F	CFA8070
Pseudocorynopoma doriae Perugia, 1891	7	Ringuelet *et al.* (1967); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Paracampo (2013); Paracampo *et al.* (2020).	Co			MLP22-XI-34-9
Roeboides descalvadensis Fowler, 1932	1	Lucena (2007).	Co			MCP10148
Roeboides microlepis (Reinhardt, 1851)	6	Ringuelet *et al.* (1967); Almirón (1989); Remes Lenicov, Colautti 2000; Llompart *et al.* (2012); CARU-CARP (2016); This study.	Co	R		CFA8050
Salminus brasiliensis (Cuvier, 1816)	14	Ringuelet *et al.* (1967); Bonetto *et al.* (1971); Escalante (1984); Sverlij, Espinach Ros (1986); Candia (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); Paracampo (2013); Guerrero *et al.* (2017); Rojo *et al.* (2021); Scarabotti *et al.* (2021); This study.	Co	F	D	CFA8085
Crenuchidae						
Characidium rachovii Regan, 1913	6	Ringuelet *et al.* (1978); López *et al.* (1980); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Paracampo (2013).	Co			MLP24-IV-79-2
Curimatidae						

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Cyphocharax platanus (Günther, 1880)	7	Almirón (1989); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	D	F	CFA8053
Cyphocharax saladensis (Meinken, 1933)	3	Almirón (1990); Llompart *et al.* (2012); This study.	Co	R		
Cyphocharax spilotus (Vari, 1987)	5	Almirón (1989); Azpelicueta, Almirón (1991); Llompart *et al.* (2012); CARU-CARP (2016); This study.	Co	R		
Cyphocharax voga (Hensel, 1870)	9	Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Llompart *et al.* (2012); Paracampo (2013); CARU-CARP (2016); Paracampo *et al.* (2020); This study.	Co	D		CFA8054
Potamorhina squamoralevis (Braga & Azpelicueta, 1983)	2	CARU-CARP (2016); This study.	Co	R		
Psectrogaster curviventris Eigenmann & Kennedy, 1903	2	CARU-CARP (2016); This study.	Co	R		
Steindachnerina biornata (Braga & Azpelicueta, 1987)	5	Braga, Azpelicueta (1987); Almirón *et al.* (2000); López *et al.* (2009); Paracampo (2013); This study.	Co	R		CFA8078
Cynodontidae						
Rhaphiodon vulpinus Spix & Agassiz, 1829	7	Ringuelet *et al.* (1967); Almirón (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	R		CFA8057
Erythrinidae						
Hoplias argentinensis Rosso, González-Castro, Bogan, Cardoso, Mabragaña, Delpiani & Díaz de Astarloa, 2018	12	Ringuelet *et al.* (1967); Escalante (1984); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); CARU-CARP (2012, 2016); Llamazares Vegh *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	F	D	CFA8042
Parodontidae						
Apareiodon affinis (Steindachner, 1879)	3	Almirón (1989); Paracampo (2013); This study.	Co	R		CFA8068
Prochilodontidae						
Prochilodus lineatus (Valenciennes, 1837)	32	Ringuelet *et al.* (1967); Almirón (1989); Candia (1989); Almirón, García (1992); Almirón *et al.* (2000); Colombo *et al.* (2000, 2011); Remes Lenicov, Colautti (2000); Villar *et al.* (2001); Remes Lenicov *et al.* (2005); Colombo *et al.* (2007); Speranza, Colombo (2009); Lombardi *et al.* (2010a,b); CARU-CARP (2012, 2016); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Speranza *et al.* (2012, 2013, 2016, 2020); Paracampo (2013); Cappelletti *et al.* (2015); Avigliano *et al.* (2017b, 2019b,c, 2020); Paracampo *et al.* (2020); Rojo *et al.* (2021); Scarabotti *et al.* (2021); This study.	Co	F	D	CFA8063
Serrasalmidae						
Metynnis otuquensis Ahl, 1923	1	Braga (1994).	Co			MACN5700

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Mylossoma duriventre (Cuvier, 1818)	3	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP (2016).	Co			MLP7-XII-32-40
Pygocentrus nattereri Kner, 1858	4	Almirón (1989); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016).	SL			
Serrasalmus maculatus Kner, 1858	5	Almirón (1989); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); Llompart *et al.* (2012).	SL			
Serrasalmus marginatus Valenciennes, 1837	1	Remes Lenicov, Colautti (2000).	SL			
Triportheidae						
Triportheus nematurus (Kner, 1858)	3	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP (2016).	Co			MLP5-VI-35-15
GYMNOTIFORMES						
Apteronotidae						
Apteronotus albifrons (Linnaeus, 1766)	2	Ringuelet *et al.* (1967); CARU-CARP (2016).	Co			MLP20-X-32-32
Gymnotidae						
Gymnotus inaequilabiatus (Valenciennes, 1839)	1	Ringuelet *et al.* (1967).	Co			MLP4-IV-61-48
Rhamphichthyidae						
Rhamphichthys hahni (Meinken, 1937)	3	Ringuelet *et al.* (1967); CARU-CARP (2016); This study.	Co	R		
Sternopygidae						
Eigenmannia trilineata López & Castello, 1966	4	López, Castello (1966); Llompart *et al.* (2012); CARU-CARP (2016); This study.	Co	F		CFA8056
Eigenmannia virescens (Valenciennes, 1836)	5	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); This study.	Co	R		
MUGILIFORMES						
Mugilidae						
Mugil liza Valenciennes, 1836	7	Ringuelet *et al.* (1967); Almirón (1989); Almirón *et al.* (2000); Colombo *et al.* (2000); Paracampo (2013); CARU-CARP (2016); This study.	Co	R		CFA8059
SILURIFORMES						
Ariidae						
Genidens barbus (Lacepède, 1803)	5	CARU-CARP (2012); Avigliano *et al.* (2015b, 2017a, 2019a); Maciel *et al.* (2021).	SL			
Aspredinidae						
Bunocephalus doriae Boulenger, 1902	1	Paracampo (2013).	Co			CFA2162
Pseudobunocephalus iheringii (Boulenger, 1891)	2	Almirón *et al.* (2000); This study.	Co	R		CFA8079

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Auchenipteridae						
Ageneiosus inermis (Linnaeus, 1766)	3	Ringuelet *et al.* (1967); Volpedo, Fuchs (2010); CARU-CARP (2012).	Co			MLP1-III-60-1
Ageneiosus militaris Valenciennes, 1835	8	Ringuelet *et al.* (1967); Almirón *et al.* (2000); Llompart *et al.* (2012); CARU-CARP (2012, 2016); Paracampo (2013); Guerrero *et al.* (2017); This study.	Co	R		CFA8041
Auchenipterus osteomystax (Miranda Ribeiro, 1918)	5	Ringuelet *et al.* (1967); Almirón *et al.* (2000); CARU-CARP (2012, 2016); Llompart *et al.* (2012).	Co			MLP1-V-41-19
Trachelyopterus albicrux (Berg, 1901)	1	Remes Lenicov, Colautti (2000).	SL			
Trachelyopterus cf. *galeatus* (Linnaeus, 1766)	5	Ringuelet *et al.* (1967); Almirón *et al.* (2000); Llompart *et al.* (2012); Guerrero *et al.* (2017); This study.	Co	F		CFA8058
Trachelyopterus lucenai Bertoletti, da Silva & Pereira, 1995	1	CARU-CARP (2016).	SL			
Callichthydae						
Callichthys callichthys (Linnaeus, 1758)	3	Ringuelet *et al.* (1967) Remes Lenicov *et al.* (2005); Llompart *et al.* (2012).	Co			MLP2-III-59-4
Corydoras paleatus (Jenyns, 1842)	9	Ringuelet *et al.* (1967); Escalante (1983); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	F		CFA8039
Doraridae						
Oxydoras kneri Bleeker, 1862	3	Ringuelet *et al.* (1967); Llompart *et al.* (2012); Scarabotti *et al.* (2021).	Co			MLP30-V-33-2
Pterodoras granulosus (Valenciennes, 1821)	12	Candia (1989); Amestoy, Fabiano (1992); Remes Lenicov, Colautti (2000); Ferriz *et al.* (2000); Villar *et al.* (2001); Cataldo (2002); Garcia, Protogino (2005); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Scarabotti *et al.* (2021); This study.	Co	R		CFA8076
Rhinodoras dorbignyi (Kner, 1855)	6	Ringuelet *et al.* (1967); Garcia, Protogino (2005); CARU-CARP (2012, 2016); Llompart *et al.* (2012); This study.	Co	R		CFA8074
Heptapteridae						
Heptapterus mustelinus (Valenciennes, 1835)	2	Ringuelet *et al.* (1967); Fuster (2017).	Co			MLP10-VIII-32-24
Pimelodella gracilis (Valenciennes, 1835)	6	Almirón (1989); Almirón, García (1992); Almirón *et al.* (2000); CARU-CARP (2012, 2016); This study.	Co	R		CFA8075
Pimelodella laticeps Eigenmann, 1917	8	Almirón *et al.* (2000); Almirón, García (1992); Llompart *et al.* (2012); López *et al.* (2009); Paracampo (2013); García *et al.* (2017); Paracampo *et al.* (2020); This study.	Co	R		CFA8081
Rhamdia aff. *quelen* (Quoy & Gaimard, 1824)	8	Almirón, García (1992); Almirón *et al.* (2000); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); CARU-CARP (2012); Paracampo *et al.* (2020); This study.	Co	R		CFA8067
Loricariidae						

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Ancistrus cirrhosus (Valenciennes, 1836)	3	Ringuelet *et al.* (1967); Almirón *et al.* (2000); This study.	Co	R		CFA8061
Brochiloricaria chauliodon Isbrücker, 1979	2	Almirón *et al.* (2000); Garcia, Protogino (2005).	SL			
Hisonotus maculipinnis (Regan, 1912)	1	Almirón *et al.* (2000).	SL			
Hoplosternum littorale (Hancock, 1828)	3	Ringuelet *et al.* (1967); Llompart *et al.* (2012); This study.	Co	R		CFA8091
Hypostomus aspilogaster (Cope, 1894)	3	Cardoso *et al.* (2011); CARU-CARP (2016); This study.	Co	R		CFA8093
Hypostomus borellii (Boulenger, 1897)	1	CARU-CARP (2012).	SL			
Hypostomus commersoni Valenciennes, 1836	12	Ringuelet *et al.* (1967); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); Volpedo, Fuchs (2010); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); CARU-CARP (2012, 2016); Paracampo *et al.* (2020); This study.	Co	F	D	CFA8040
Hypostomus laplatae (Eigenmann, 1907)	3	Ringuelet *et al.* (1967); Cardoso *et al.* (2019); This study.	Co	R		CFA8097
Hypostomus microstomus Weber, 1987	1	López, Miquelarena (1991).	Co			MHNM1524
Hypostomus roseopunctatus Reis, Weber & Malabarba, 1990	1	CARU-CARP (2016).	SL			
Hypostomus uruguayensis Reis, Weber & Malabarba, 1990	1	This study.	NR	R		CFA8094
Loricaria simillima Regan, 1904	1	CARU-CARP (2016).	Co			
Loricaria apeltogaster Boulenger, 1895	2	López (1970); CARU-CARP (2016).	SL			
Loricariichthys anus (Valenciennes, 1835)	10	López (1970); Almirón, García (1992); Almirón *et al.* (2000); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	F	D	CFA8083
Loricariichthys melanocheilus Reis & Pereira, 2000	2	Rodríguez (2003); CARU-CARP (2012).	Co			MLP755
Otocinclus arnoldi Regan, 1909	7	Almirón, García (1992); Schaefer (1997); Almirón *et al.* (2000); López *et al.* (2009); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020).	Co			CFA2170
Otocinclus vittatus Regan, 1904	1	Almirón *et al.* (2000).	SL			
Paraloricaria vetula (Valenciennes, 1835)	7	López (1970); Rodríguez (2003); Garcia, Protogino (2005); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); This study.	Co	R		CFA8077
Pterygoplichthys ambrosettii (Holmberg 1893)	2	CARU-CARP (2016); This study.	Co	R		CFA8036

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Rhinelepis strigosa Valenciennes, 1840	3	CARU-CARP (2012, 2016); This study.	Co	F		CFA8095
Ricola macrops (Regan, 1904)	5	Ringuelet *et al.* (1967); López (1970); Rodríguez (2003); Garcia, Protogino (2005); CARU-CARP (2016).	Co			
Rineloricaria catamarcensis (Berg, 1895)	1	Rodríguez (2003).	Co			CFA1680
Rineloricaria lima (Kner, 1853)	2	López (1970); Almirón, García (1992).	SL			
Pimelodidae						
Hypophthalmus oremaculatus Nani & Fuster de Plaza, 1947	1	López *et al.* (1980).	Co			MLP2-VIII-73-13
Iheringichthys labrosus (Lütken, 1874)	7	Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); This study.	Co	F		CFA8073
Luciopimelodus pati (Valenciennes, 1835)	11	Ringuelet *et al.* (1967), Sverlij, Espinach Ros (1986); Candia (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Scarabotti *et al.* (2021); This study.	Co	F		CFA8084
Pinirampus argentina (MacDonagh, 1938)	1	Ringuelet *et al.* (1967).	Co			MLP30-V-33-3
Pimelodus maculatus Lacepède, 1803	17	Ringuelet *et al.* (1967); Candia (1989); Almirón, García (1992); Gutiérrez, Martorelli (1999); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Garcia, Protogino (2005); Remes Lenicov *et al.* (2005); López *et al.* (2009); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); Rojo *et al.* (2021); This study.	Co	D		CFA8071
Parapimelodus valenciennis (Lütken, 1874)	13	Ringuelet *et al.* (1967); Almirón (1989); Almirón *et al.* (2000); Remes Lenicov, Colautti (2000); Remes Lenicov *et al.* (2005); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llompart *et al.* (2012); Paracampo (2013); Paracampo *et al.* (2020); Scarabotti *et al.* (2021); This study.	Co	D		CFA8047
Pimelodus albicans (Valenciennes, 1840)	13	Ringuelet *et al.* (1967); Almirón (1989); Candia (1989); Remes Lenicov, Colautti (2000); Gutiérrez, 2001; Remes Lenicov *et al.* (2005); Vergara *et al.* (2008); Volpedo, Fuchs (2010); CARU-CARP (2012, 2016); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo, 2013; This study.	Co	F	D	CFA8098
Pimelodus argenteus Perugia, 1891	3	Volpedo, Fuchs (2010); Llompart *et al.* (2012); This study.	Co	R		CFA8048
Pseudoplatystoma corruscans (Spix & Agassiz, 1829)	6	Ringuelet *et al.* (1967); Remes Lenicov, Colautti (2000); CARU-CARP (2012, 2016); Paracampo (2013); This study.	Co	F		CFA8035
Sorubim lima (Bloch & Schneider, 1801)	5	Almirón (1989); Remes Lenicov, Colautti (2000); Volpedo, Fuchs (2010); Llompart *et al.* (2012); This study.	Co	R		CFA8092
Zungaro jahu (Ihering, 1898)	3	Llompart *et al.* (2012); CARU-CARP (2016); Guerrero *et al.* (2017).	SL			
Pseudopimelodidae						

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Microglanis malabarbai Bertaco & Cardoso, 2005	5	Castello (1971); Almirón *et al.* (2000); Llompart *et al.* (2012); Paracampo (2013); This study.	Co	R		CFA8080
SYNBRANCHIFORMES						
Synbranchidae						
Synbranchus marmoratus Bloch, 1795	11	Ringuelet *et al.* (1967); Almirón, García (1992); Almirón *et al.* (2000); Remes Lenicov *et al.* (2005); López *et al.* (2009); Llamazares Vegh *et al.* (2012); Llompart *et al.* (2012); Paracampo (2013); Guerrero *et al.* (2017); Paracampo *et al.* (2020); This study.	Co	R		CFA8046
PLEURONECTIFORMES						
Achiridae						
Catathyridium jenynsii (Günther, 1862)	4	Candia (1989); Lunaschi (2003); Llompart *et al.* (2012); This study.	Co	R		CFA8065
Not current components of the fish assemblage						
PETROMYZONTIDA						
PETROMYZONTIFORMES						
Geotriidae						
Geotria macrostoma (Burmeister, 1868)	1	Burmeister (1868).	NC			
CHONDRICHTHYES						
MYLIOBATIFORMES						
Potamotrygonidae						
Potamotrygon histrix (Müller & Henle, 1839)	1	Pozzi (1945).	NC			
Potamotrygon motoro (Müller & Henle, 1841)	1	Pozzi (1945).	NC			
OSTEICHTHYES						
ACIPENSERIFORMES						
Acipenseridae						
Acipenser baerii Brandt, 1869	2	Azpelicueta, Almirón (1999); Liotta, Giacosa (2017).	NEx			
Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833	1	Demonte *et al.* (2017).	NEx			
ANGUILLIFORMES						
Muraenidae						
Gymnothorax ocellatus Agassiz, 1831	1	Marelli (1924).	NC			
ACANTHURIFORMES						

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Sciaenidae						
Plagioscion macdonaghi Daneri, 1954		Junior synonim of *Plagioscion ternetzi* Boulenger, 1895 by Casatti (2003).	SS			
CLUPEIFORMES						
Clupeidae						
Brevoortia aurea (Spix & Agassiz, 1829)	1	Lahille (1895).	NC			
Brevoortia pectinata (Jenyns, 1842)	1	Berg (1895).	NC			
Ramnogaster arcuata (Jenyns, 1842)	1	De Buen (1950) collected outside the study area (Montevideo, Uruguay)	NC			
CHARACIFORMES						
Anostomidae						
Leporinus striatus Kner, 1858	1	Devincenzi, Teague (1942) collected outside the study area (middle Uruguay River).	NC			
Characidae						
Aphyocharax pusillus Günther, 1868	1	Pozzi (1945).	NC			
Astyanax orbignyanus (Valenciennes, 1850)	1	Cuvier, Valenciennes (1850).	NC			
Diapoma speculiferum Cope, 1894	1	Myers (1942) collected outside the study area (Río Cebollatí, Uruguay).	NC			
Hyphessobrycon bifasciatus Ellis, 1911	1	Messner (1962).	NC			
Markiana nigripinnis (Perugia, 1891)	1	Perugia (1891).	NC			
Odontostilbe microcephala Eigenmann, 1907	1	Ringuelet (1975) without traceable record.	NC			
Poptella paraguayensis (Eigenmann, 1907)	1	Günther (1880).	NC			
Roeboides affinis (Günther, 1868)	1	Ringuelet, Arámburu (1957).	NC			
Serrapinnus piaba (Lütken, 1875)	1	Nion (1998) without traceable record.	NC			
Tetragonopterus argenteus Cuvier, 1816	1	Lahille (1895).	NC			
Curimatidae						
Steindachnerina brevipinna (Eigenmann & Eigenmann, 1889)	1	Berg (1897).	NC			

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Gasteropelecidae						
Thoracocharax stellatus (Kner, 1858)	1	Pozzi, Bordalé (1936).	NC			
Lesbiasinidae						
Pyrrhulina australis Eigenmann & Kennedy, 1903	1	Pozzi (1945).	NC			
Parodontidae						
Parodon suborbitalis Valenciennes, 1850	1	De Buen (1950).	NC			
Serrasalmidae						
Mylossoma paraguayensis Norman, 1929		Junior synonim of *Mylossoma duriventre* (Cuvier, 1818) Jégu (2003)	SS			
Piaractus mesopotamicus (Holmberg, 1887)	1	Pozzi (1945).	NC			
Serrasalmus spilopleura Kner, 1858	1	Norman (1929).	Ab			
Trichomycteridae						
Pseudostegophilus maculatus (Steindachner, 1879)	1	Stigchel (1947).	NC			
Scleronema minutum (Boulenger, 1891)	1	Devincenzi, Teague (1942) collected outside the study area (middle Uruguay River).	NC			
CICHLIFORMES						
Cichlidae						
Crenicichla lacustris (Castelnau, 1855)	1	Marelli (1924).	Ab			
Gymnogeophagus australis (Eigenmann, 1907)	1	Pozzi (1945).	NC			
Gymnogeophagus labiatus (Hensel, 1870)	1	Pereyra, García (2008) without traceable record.	NC			
Gymnogeophagus rhabdotus (Hensel, 1870)	1	Nion (1998) without traceable record.	NC			
CYPRINIFORMES						
Cyprinidae						
Hypophthalmichthys molitrix (Valenciennes, 1844)	1	García Romero *et al.* (1998).	NEx			
CYPRINODONTIFORMES						
Poeciliidae						
Phalloptychus januarius (Hensel, 1868)	1	Lahille (1923).	Ab			

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Poecilia vivipara Bloch & Schneider, 1801	1	Ihering (1931).	Ab			
GYMNOTIFORMES						
Rhamphichthydae						
Rhamphichthys rostratus (Linnaeus, 1766)	1	Lahille (1910).	Ab			
Hypopomidae						
Hypopomus artedi (Kaup, 1856)	1	Lahille (1921).	Ab			
MUGILIFORMES						
Mugilidae						
Mugil platanus Günther, 1880		Junior synonim of *Mugil liza* Valenciennes, 1836 by Menezes *et al.* (2010).	SS			
SILURIFORMES						
Ageneiosidae						
Ageneiosus dentatus Kner, 1858	1	Marelli (1924).	NC			
Auchenipteridae						
Trachelyopterus ceratophysus (Kner, 1858)	1	Perugia (1891).	NC			
Trachelyopterus striatulus (Steindachner, 1877)	1	Mac Donagh, Cabrera (1937).	NC			
Callichthydae						
Corydoras undulatus Regan, 1912	1	Nijssen, Isbrücker (1980) collected by Wolterstorff in 1912.	NC			
Corydoras aeneus (Gill, 1858)	1	Pozzi (1945).	NC			
Doraridae						
Megalodoras laevigatulus (Berg, 1901)		Junior synonim of *Pterodoras granulosus* (Valenciennes, 1821) by Sabaj (2003).	SS			
Loricariidae						
Ancistrus gymnorhynchus Kner, 1854	1	Stigchel (1947) misidentified this species which is distributed in Venezuela (Fricke *et al.*, 2022).	Ab			
Farlowella hahni Meinken, 1937	1	Almirón *et al.* (1992) without traceable record.	NC			
Hypostomus punctatus Valenciennes, 1840	1	Angelescu, Gneri (1949).	NC			
Hypostomus robinii Valenciennes, 1840	1	Lopez *et al.* (1987) misidentified this species which is distributed in Colombia (Fricke *et al.*, 2022).	Ab			

TABLE 1 | (Continued)

Classification	N°Rec	References	Cat.	OT		VN
				CPUEn	CPUEw	
Loricariichthys platymetopon Isbrücker & Nijssen, 1979	1	Roule (1826).	NC			
Otocinclus affinis Steindachner, 1877	1	Schaefer (1997).	Ab			
Paraloricaria commersonoides (Devincenzi, 1943)	1	De Vincenzi (1943) collected outside the study area (middle Uruguay River).	NC			
Rineloricaria felipponei (Fowler, 1943)	1	Fowler (1943).	NC			
Rineloricaria pareiacantha (Fowler, 1943)	1	Fowler (1943).	NC			
Rineloricaria thrissoceps (Fowler, 1943)	1	Fowler (1943).	NC			
Spatuloricaria nudiventris (Valenciennes, 1840)	1	Devincenzi, Teague (1942) collected outside the study area (middle Uruguay River).	NC			
Heptapteridae						
Myoglanis colletti (Steindachner, 1881)	1	Steindachner (1881).	NC			
Rhamdella jenynsii (Günther, 1864)	1	Günther (1880).	NC			
Pimelodidae						
Bergiaria platana (Steindachner, 1908)	1	Steindachner (1908).	NC			
Bergiaria westermanni (Lütken, 1874)	1	Lütken (1874).	NC			
Megalonema platanum (Günther, 1880)	1	Günther (1880).	NC			
Hemisorubim platyrhynchos (Valenciennes, 1840)	1	Nion (1998) without traceable record.	NC			
Hypophthalmus edentatus Spix & Agassiz, 1829	1	Lopez *et al.* (1980) erroneous record.	Ab			
Pimelodus brevis Marini, Nichols & LaMonte, 1933	1	Junior synonim of *Pimelodus argenteus* Perugia, 1891 by Mirande, Koerber (2015).	SS			
Paulicea luetkeni (Steindachner, 1876)	1	Haseman (1911).	Ab			
Pseudopimelodus mangurus (Valenciennes, 1835)	1	Marelli (1924).	Ab			
Pseudoplatystoma reticulatum Eigenmann & Eigenmann, 1889	1	De Buen (1950) without traceable record.	NC			
PLEURONECTIFORMES						
Achiridae						
Achirus lineatus (Linnaeus, 1758)	1	Pozzi (1945) misidentified this tropical species which is distributed up to northern Argentina (Fricke *et al.*, 2022).	Ab			

Cypriniformes, Mugiliformes, Pleuronectiformes, and Synbranchiformes ranged between 4–1%. Cyprinodontiformes and Myliobatiformes were found only in the literature, with 4% or less. Considering families, comparison evidenced that Characidae, Loricariidae, and Pimelodidae, in descending order, were the richest taxa.

The category supported by literature, reached the highest value for taxa with a single record, followed by confirmed taxa and new records. Based on the 141 taxa that should be considered as current fish assemblage, the number of species by number of records value (Tab.1) showed that half of these species showed three records or less in the study area, and that the remaining half were recorded up to 32 (Fig. 3). As records increased, the ratio between number of species caught in fieldwork and number of species mentioned in the literature increased, suggesting that the species most frequently cited were also those most commonly captured in the study area.

The Olmstead-Tukey quadrants for occurrence % - CPUEn (Fig. 4A) were limited by a mean frequency of occurrence of 30.67% and an average CPUE of 8 ind./16 h. Five species were dominant (6.94%), 22 frequent (30.6%) and 45 rare (62.5%) (Tab.1). Dominant species exhibited an occurrence higher than 88%, representing 90% of the total specimens collected (n = 25,311). Frequent species accounted for 8.5% of the total captured fish and rare species, representing 1.5% of the total captured specimens. While for occurrence % - CPUEw an average 264 g/16h was obtained, with 11 dominant (11.2%), 16 frequent (22.2%), and 45 rare species (62.5%) (Fig. 4B). Summed up, the group of five dominant species exhibited a CPUEw higher than 90% of the total weight

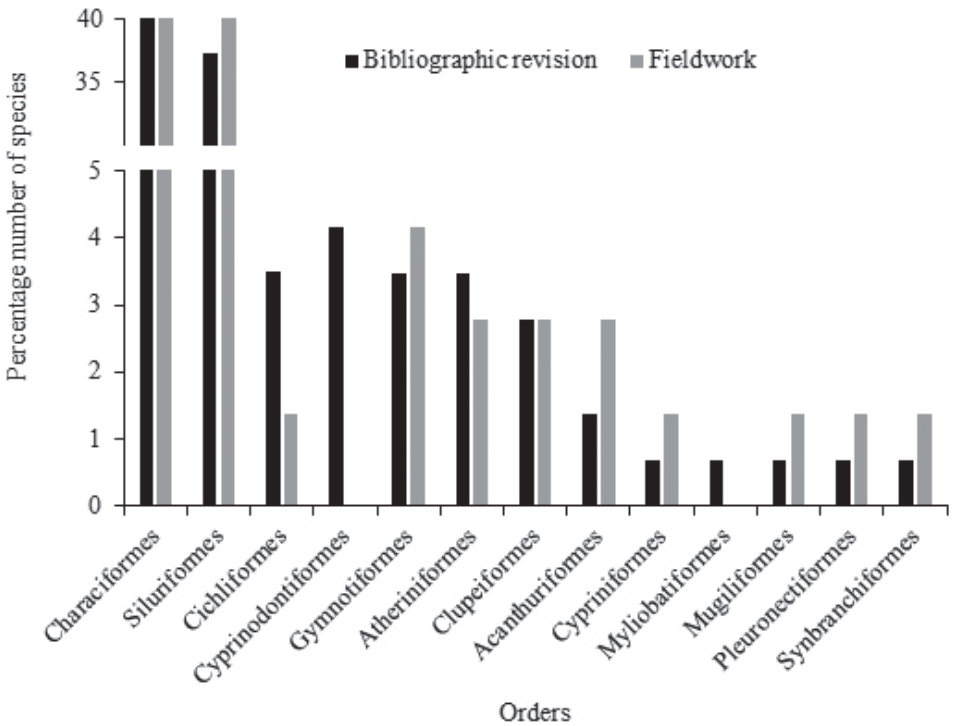

FIGURE 2 | Percentage number of species by order, literature review (black bar) differing from fieldwork (grey bar) in the freshwater Río de la Plata (RdlP).

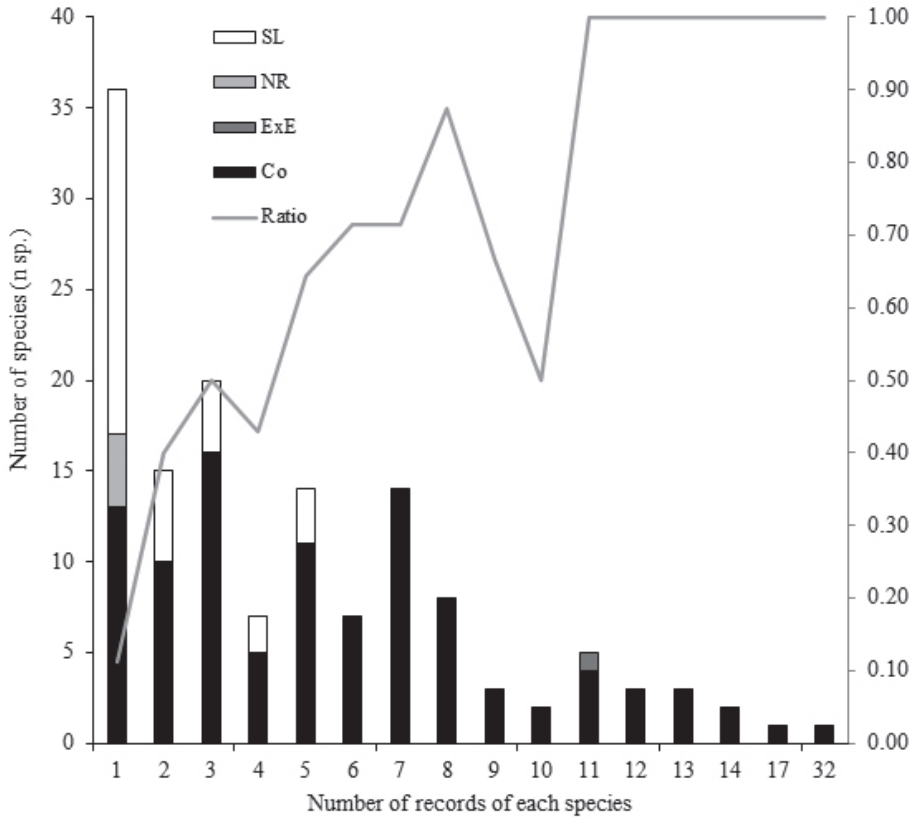

FIGURE 3 | Number of records of each species of the current fish assemblage of the freshwater Río de la Plata (RdlP) (SL, supported by literature; NR, new records; EEx, established exotic species; Co, confirmed) with their respective number of species and ratio between number of species captured in fieldwork and number of species mentioned in the literature.

collected (g = 828,531). Frequent species accounted for 6% and rare species 3.2% of the total captured biomass. Occurrence % - CPUEn and occurrence % - CPUEw analyses evidenced that *Parapimelodus valenciennis* (Lütken, 1874) and *Pimelodus maculatus* Lacepède, 1803 were dominant taxa, that no occasional species were found, and that the rare species were the same.

In turn, main differences between CPUEn and CPUEw were the hierarchy change from dominant to frequent of *Psalidodon rutilus* (Jenyns, 1842) and *Cyphocharax platanus* (Günther, 1880); and the category change from frequent to dominant of *Prochilodus lineatus* (Valenciennes, 1837), *Salminus brasiliensis* (Cuvier, 1816), *Megaleporinus obtusidens* (Valenciennes 1837), *Cyprinus carpio* Linnaeus, 1758, *Hoplias argentinensis* Rosso, González-Castro, Bogan, Cardoso, Mabragaña, Delpiani & Díaz de Astarloa, 2018, *Loricariichthys anus* (Valenciennes, 1835), *Hypostomus commersoni* Valenciennes, 1836, and *Pimelodus albicans* (Valenciennes, 1840).

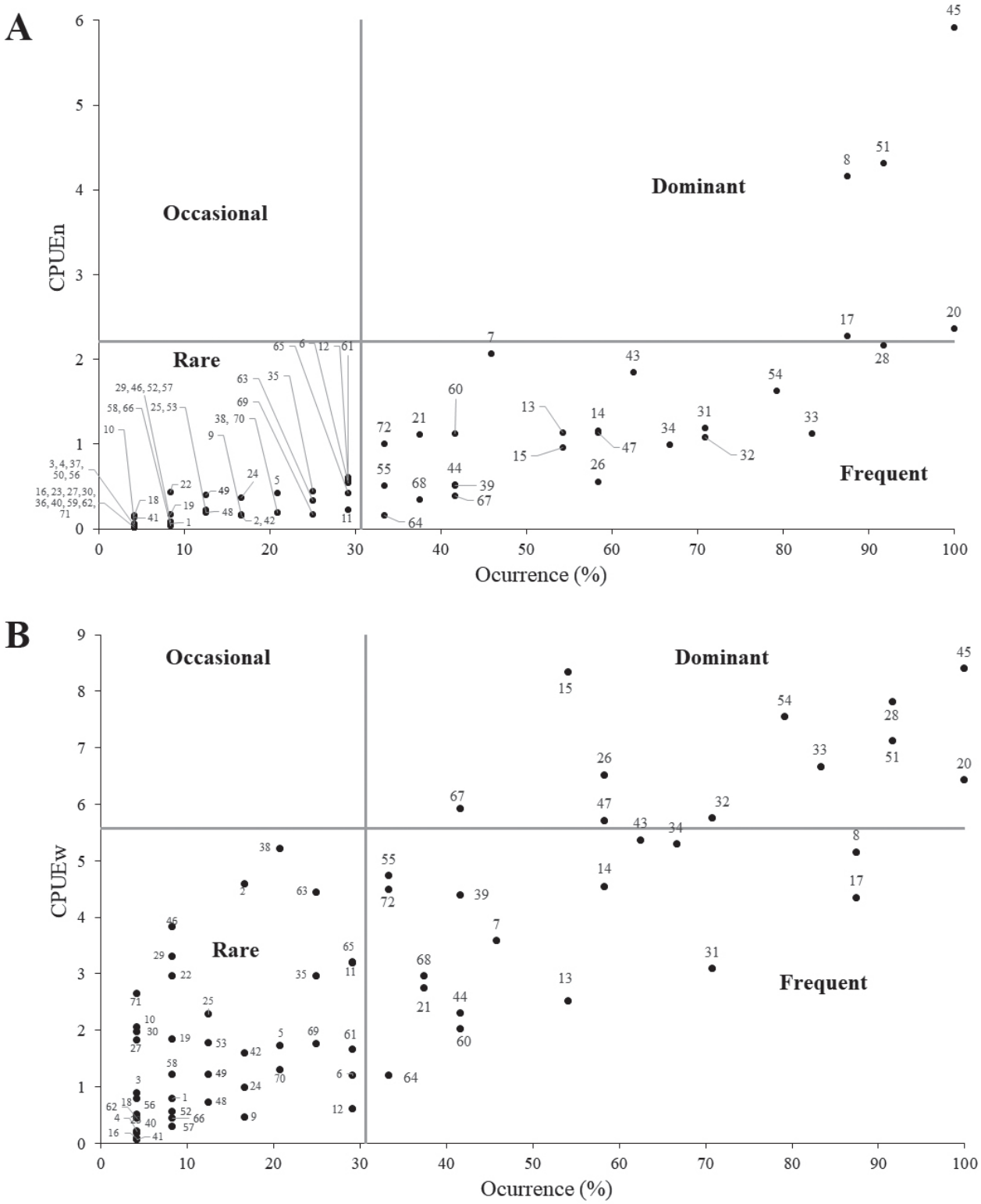

FIGURE 4 | Figure caption on next page.

FIGURE 4 | Olmstead-Tukey diagram showing the relationship between percentage frequency of occurrence of species (occurrence %) and log transformed (ln X+1) fish number and weight captured and standardized to 16h of fishing **A.** CPUEn and **B.** CPUEw in the freshwater Río de la Plata (RdlP), respectively. Grey lines correspond to the mean frequency of occurrence % (vertical) and average CPUEn and CPUEw (horizontal); they are used to define dominant, frequent, occasional, and rare species (categories are defined in Tab. 1). 1. *Acestrorhynchus pantaneiro*; 2. *Ageneiosus militaris*; 3. *Ancistrus cirrhosis*; 4. *Apareiodon affinis*; 5. *Astyanax abramis*; 6. *Psalidodon erythropterus*; 7. *Astyanax lacustris*; 8. *Psalidodon rutilus*; 9. *Bryconamericus iheringii*; 10. *Brycon orbignyanus*; 11. *Catathyridium jenynsii*; 12. *Cheirodon interruptus*; 13. *Corydoras paleatus*; 14. *Cynopotamus argenteus*; 15. *Cyprinus carpio*; 16. *Cynopotamus kincaidi*; 17. *Cyphocharax platanus*; 18. *Cyphocharax saladensis*; 19. *Cyphocharax spilotus*; 20. *Cyhocharax voga*; 21. *Eigenmannia trilineata*; 22. *Eigenmannia virescens*; 23. *Galeocharax humeralis*; 24. *Gymnogeophagus meridionalis*; 25. *Hoplosternum littorale*; 26. *Hoplias argentinensis*; 27. *Hypostomus aspilogaster*; 28. *Hypostomus commersoni*; 29. *Hypostomus laplatae*; 30. *Hypostomus uruguayensis*; 31. *Iheringichthys labrosus*; 32. *Megaleporinus obtusidens*; 33. *Loricariichthys anus*; 34. *Luciopimelodus pati*; 35. *Lycengraulis grossidens*; 36. *Microglanis malabarbai*; 37. *Moenkhausia intermedia*; 38. *Mugil liza*; 39. *Odontesthes bonariensis*; 40. *Odontesthes perugiae*; 41. *Odontostilbe pequira*; 42. *Oligosarcus jenynsii*; 43. *Oligosarcus oligolepis*; 44. *Pachyurus bonariensis*; 45. *Parapimelodus valenciennis*; 46. *Paraloricaria vetula*; 47. *Pimelodus albicans*; 48. *Pimelodus argenteus*; 49. *Pimelodella gracilis*; 50. *Pimelodella laticeps*; 51. *Pimelodus maculatus*; 52. *Plagioscion ternetzi*; 53. *Potamorhina squamoralaevis*; 54. *Prochilodus lineatus*; 55. *Pseudoplatystoma corruscans*; 56. *Psectrogaster curviventris*; 57. *Pseudobunocephalus iheringii*; 58. *Pterygoplichthys ambrosettii*; 59. *Pterodoras granulosus*; 60. *Ramnogaster melanostoma*; 61. *Rhinodoras dorbigyi*; 62. *Rhamphichthys hahni*; 63. *Rhamdia* aff. *quelen*; 64. *Rhinelepis strigosa*; 65. *Rhaphiodon vulpinus*; 66. *Roeboides microlepis*; 67. *Salminus brasiliensis*; 68. *Schizodon platae*; 69. *Sorubim lima*; 70. *Steindachnerina biornata*; 71. *Synbranchus marmoratus*; 72. *Trachelyopterus galeatus*.

DISCUSSION

The present study puts forward an updated list of fish species that inhabit the freshwater RdlP; this is also the first proposal of the hierarchical composition of its Argentinean coastal fish assemblage. From the 206 native fish mentioned in the freshwater RdlP, literature showed 66 taxa categorized as not confirmed, absent, or synonymized species. The absence of not confirmed species in fish samplings for at least five decades, when most samplings in the area were developed, does not allow confirming their current inclusion in the fish assemblage under study. Further studies on this topic are therefore needed, whose results can potentially reduce the number of species in this group. However, it is highly probable that the poor water quality and habitat conditions evidenced in freshwater RdlP due to anthropogenic activities (Topalián *et al*., 1990; Kurucz *et al*., 1998; Natale, 2005; FREPLATA, 2005; Cirelli, Ojeda, 2008) have been impacting negatively on the richness of the fish assemblage of the area for the last five decades or so. Indeed, the disappearance of certain species in the freshwater coastal surrounding areas of La Plata city has already been correlated with local human pollution in the 70s decade (Ringuelet, 1975). As example, the nonappearance of a relevant species for fisheries in the basin, like *Piaractus mesopotamicus* (Holmberg, 1887) might be associated with this situation, as suggested by Quirós (1990) who linked its abundance declination with human pollution. The species included in the absent and synonymized species categories, based on current taxonomic studies (Litz, Koerber, 2014; Koerber, Litz, 2014; Koerber *et al*., 2016a,b; 2020), must be excluded from the list of fish species for the area as some correspond to confirmed taxonomic misidentifications (*i.e*., *Hypostomus robinii* Valenciennes, 1840, *Ancistrus gymnorhynchus* Kner, 1854, and *Achirus lineatus* (Linnaeus, 1758)) or outdated labelling.

The 140 native species that should be considered as current fish fauna of the study area were grouped into supported by literature, confirmed, and new records, reducing

the number of autochthonous species previously compiled (Nion, 1998; López *et al*., 2003; Volpedo *et al*., 2010). Despite the historical relevance of previous compilations, our study suggests that the richness of species in freshwater RdlP is overestimated due to outdated old metadata replication. The supported by literature category refers to species that might represent misidentifications or taxa that migrate exceptionally from upper portions of the basin but do not become stablished. Either way, the lacking voucher number, making impossible to confirm their presence. This assumption is reinforced by the fact that the species in the supported by literature category were restricted to taxa recorded in five or less events, being maximum for species recorded once. Meanwhile, the confirmed group reflects species that undoubtedly are currently present in the study area. Such conclusion was based not only on the fact that these taxa were recently captured with voucher number deposit, but also on the fact that most were collected more than once. Indeed, it is highly probable that the taxa obtained two or more times, in independent fish samplings, represent usual fish fauna of the study area. However, species recently found once, as in the new records category, if not re-captured, could be re-categorized as not confirmed in subsequent research. In general, species recently captured once in the freshwater RdlP are commonly found in the upper parts of the La Plata River basin (Ringuelet, 1975), possibly extending their distribution. Volpedo *et al*., (2010) reported an increase in the number of taxa of RdlP over the last two decades owing to climate change. The referred mechanism could function as a counterpart of the effects caused by pollution and habitat modification, influencing fish assemblage composition and structure.

In the established exotic species category, the establishment and expansion of *Cyprinus carpio* are common in environments connected with the Río de la Plata system in Argentina and Uruguay (Teixeira de Melo *et al*., 2011; Maiztegui *et al*., 2016). This is reinforced by the Olmstead-Tukey analysis outcomes, indicating that this fish is frequently found in the study area. In contrast, non-established exotic species can occasionally appear in freshwater RdlP; yet, their presence is mostly due to their escape from aquaculture facilities within the basin (*i.e*., *Acipenser baerii* Brandt, 1869, *Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833, and *Hypophthalmichthys molitrix* (Valenciennes, 1844)).

The fish fauna of La Plata River basin is mostly characterized by Siluriformes and Characiformes (Reis, 2013; Reis *et al*., 2016), and by a decreasing gradient of species richness from the north to the south (Ringuelet, 1975; Cussac *et al*., 2009). Such ichthygeographical attributes agree with the results obtained in the study area, when the number of species proposed contrasts with environments located in the northern areas of the basin (Teixeira de Melo *et al*., 2011; Almirón *et al*., 2015; Bertaco *et al*., 2016).

Although no statistical differences were found when comparing reported data with samplings, lack of Cyprinodontiformes could result from the small body size (<5 cm) of some taxa of this group common for the area, namely *Jenynsia lineata* (Fowler, 1940), *Cnesterodon decemmaculatus* (Jenyns, 1842), and *Phalloceros caudimaculatus* (Hensel, 1868), not captured with the fishing nets employed. The taxa of Rivulidae family includes species that inhabit coastal temporary ponds (Alonso *et al*., 2018), environments not sampled in this study. The absence of Myliobatiformes in samplings can be linked to selectivity of fishing gears (Lucifora *et al*., 2016).

Knowledge of richness and abundance of fish species in a particular area is associated with collecting effort (Bertaco *et al*., 2016); freshwater RdlP has been sampled for more than five decades by several fishing procedures. Comparison of number of records results with captured/not captured species ratio, clearly evidenced that the more the species were cited in the literature the more they were found in the samplings. Indeed, species with higher values of records, such as *P. lineatus* (32), *S. brasiliensis* (14), and *Odontesthes bonariensis* (Valenciennes, 1835) (14), were linked not only to their occurrence and abundance in the freshwater RdlP, but also due to their importance to local and regional fisheries of the RdlP basin (Baigún *et al*., 2003; Colautti *et al*., 2009). Accordingly, these findings provide valuable insights into which species are, historically and at present, usual or unusual fish components of the study area.

The Olmstead-Tukey analysis evidenced, in agreement with the literature for the southern bank of the study area (Llompart *et al*., 2012; Paracampo *et al*., 2015, 2020), a predominance of *P. valenciennis* and *P. maculatus*. These findings were documented not only in coastal environments and the neighboring streams of RdlP, but also in deeper environments of the riverine sector of the RdlP (García *et al*., 2010; CARU-CARP, 2012; 2016). It is important to note that, the target of coastal local artisanal and sport fisheries, *P. lineatus*, *S. brasiliensis*, *M. obtusidens*, *Luciopimelodus pati* (Valenciennes, 1835), and *Pseudoplatystoma corruscans* (Spix & Agassiz, 1829) (Baigún *et al*., 2003; Colautti *et al*., 2009) were frequent or dominant in the Olmstead-Tukey analyses. Previous research into these species showed that they displayed a seasonal migration circuit between the freshwater RdlP up to the upper main rivers of La Plata basin during southern warm and colder seasons, respectively (Baigún *et al*., 2003; Espinach Ros *et al*., 2011; Avigliano, *et al*., 2020). However, our results would support the hypothesis that certain individuals of these species do not migrate and remain in the area throughout the entire year cycle.

In the Rio de la Plata, detritus is the most important component in the food web of the system (Lercari *et al*., 2015) and detritivorous species *P. lineatus* plays a key role in the cycling of nutrients, organic matter, and transferring energy to higher levels (Baigún *et al*., 2003; Speranza *et al*., 2013). The CPUEw dominance of *P. lineatus*, in addition the presence of *L. anus* and *H. commersoni* which are strictly detritivorous-alguivorous taxa (Lujan *et al*., 2012), reinforce the major role of detritus and the mentioned species in the system functioning.

Among the rare species, we can mention *Rhaphiodon vulpinus* Spix & Agassiz, 1829 and *Rhamphichthys hahni* (Meinken, 1937) considered, according to Baigún *et al*., (2012), as "data deficiency" based on information of their population status. In this category, *Cynopotamus kincaidi* (Schultz, 1950), *Hypostomus uruguayensis* Reis, Weber & Malabarba, 1990, *Hypostomus aspilogaster* (Cope, 1894), *Galeocharax humeralis* (Valenciennes, 1834), and *Pterodoras granulosus* (Valenciennes, 1821) species were not even considered by those authors as species found in the RdlP.

In view of ecological features of the estuary might generate dissimilarities between the fish assemblage of the southern bank (Argentina) respect to the northern one (Uruguay) (Bessonart *et al*., 2021), the hierarchy structure proposed could exhibit geographical restrictions. Despite such restrains, significant gaps in freshwater species knowledge (Abell *et al*., 2008) and data deficiency for neotropical fishes (Baigún *et al*., 2012), the fish structure reported here represent a base line for future research.

Considering the negative impact experienced by South American basins as a result of the rapid anthropogenic changes introduced during the 21st century (Allan *et al*., 2005; Barletta *et al*., 2010; Baigún *et al*., 2012; Reis *et al*., 2013), the insights into the composition and structure of the fish assemblages of the freshwater RdlP provided in this study could be used as starting point to monitor and develop criteria for the management and conservation of neotropical fish species in their southernmost distribution boundary.

ACKNOWLEGMENTS

The authors would like to thank Roberto Jensen (ILPLA) for his assistance in data collection and field operations. The research was partially financed by PIP (CONICET, process number 0652), P-UE (22920160100049CO), and PICT 1251. This paper is a Scientific Contribution number 1196, Institute of Limnology "Dr. Raúl A. Ringuelet" (ILPLA, CCT-La Plata CONICET, UNLP).

REFERENCES

- **Abell R, Thieme ML, Revenga C, Bryer M, Kottelat M, Bogutskaya N *et al*.** Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation. Bioscience. 2008; 58(5):403–14. https://doi.org/10.1641/B580507
- **Aguas Argentinas-Administración General de Obras Sanitarias de la Provincia de Buenos Aires-Servicio de Hidrografía Naval de la Armada Argentina (AA-AGOSBA-OSN-SHN).** Río de La Plata. Calidad de las aguas de la franja costera sur (San Isidro - Magdalena). Buenos Aires: Servicio de Hidrografía Naval de la Armada Argentina. 1992.
- **Allan JD, Abell R, Hogan Z, Revenga C, Taylor BW, Welcomme RL *et al*.** Overfishing in inland waters. Bioscience. 2005; 55(12):1041–51. https://doi.org/10.1641/0006-3568(2005)055[1041:OOIW]2.0.CO;2
- **Almirón AE.** Estudio ictiológicos en ambientes leníticos de los alrededores de La Plata. [PhD Thesis] Facultad de Ciencias Naturales y Museo (UNLP); 1989.
- **Almirón AE.** Presencia de *Cyphocharax saladensis* (Meinken, 1933) (Pisces, Curimatidae) en ambientes cercanos al Río de la Plata. Neotropica. 1990; 36(95):44.
- **Almirón AE, García ML.** Ictiofauna del arroyo El Pescado. Neotropica. 1992; 38(100):103–04.
- **Almirón AE, Casciotta JR, Ciotek L, Giorgis P.** Guía de los peces del Parque Nacional Pre-Delta. Buenos Aires: Administración de Parque Nacionales; 2015.
- **Almirón AE, Garcia ML, Menni RC, Protogino LC, Solari LC.** Fish ecology of a seasonal lowland stream in temperate South America. Mar Freshw Res. 2000; 51(3):265–74. https://doi.org/10.1071/MF98040
- **Almirón AE, Gómez SE, Toresani NI.** Peces de agua dulce de la provincia de Buenos Aires, Argentina. In: López HL, Tonni EP, editors. Situación ambiental de la Provincia de Buenos Aires. Recursos y Rasgos Naturales en la Evaluación Ambiental. 1992; 2(12):1–29. Available from: https://digital.cic.gba.gob.ar/handle/11746/2302
- **Alonso F, Terán GE, Calviño P, García I, Cardoso Y, García G.** An endangered new species of seasonal killifish of the genus *Austrolebias* (Cyprinodontiformes: Aplocheiloidei) from the Bermejo River basin in the Western Chacoan Region. PLoS ONE. 2018; 13(5):e0196261. https://doi.org/10.1371/journal.pone.0196261
- **Amestoy F, Fabiano C. 1992.** Distribución espacio-temporal, estructura poblacional y reproducción del armado común, *Pterodoras granulosus* (Pisces, Doradidae), en el Rio de la Plata médio e interior y en

el rio Uruguay inferior. Publ Com Adm Rio Uruguay, Sér Téc-Cient. 1(1):1–12.

- **Angelescu V, Gneri FS.** Adaptaciones del aparato digestivo al régimen alimenticio en algunos peces del río Uruguay y del Río de la Plata. I. Tipo omnívoro e iliófago en representantes de las familias Loricariidae y Anostomidae. Rev Mus Argent Cienc Nat. 1949; 1(6):161–272.
- **Aquino AE.** Las especies de Hypoptomatinae (Pisces, Siluriformes, Loricariidae) en la Argentina. Rev Ictiol. 1997; 5:5–21.
- **Arthington AH, Naiman RJ, Mcclain ME, Nilsson C.** Preserving the biodiversity and ecological services of rivers: new challenges and research opportunities. Freshw Biol. 2010; 55(1):1–16. https://doi.org/10.1111/j.1365-2427.2009.02340.x
- **Avigliano E, Pouilly M, Bouchez J, Domanico A, Sánchez S, Vegh SL *et al*.** Strontium isotopes (87Sr/86Sr) reveal the life history of freshwater migratory fishes in the La Plata Basin. River Res Appl. 2020; 36(10):1985–2000. https://doi.org/10.1002/rra.3727
- **Avigliano E, Volpedo AV.** Actinopterygii, Atheriniformes, Atherinopsidae, *Odontesthes bonariensis* Valenciennes, 1835: new records for the Plata Basin, Argentina. Check List. 2013b; 9(3):640–41. https://doi.org/10.15560/9.3.640
- **Avigliano E, Volpedo AV.** Use of otolith strontium: calcium ratio as an indicator of seasonal displacements of the silverside (*Odontesthes bonariensis*) in a freshwater–marine environment. Mar Freshw Res. 2013a; 64(8):746–51. https://doi.org/10.1071/MF12165
- **Azpelicueta MM, Almirón AE.** *Cyphocharax spilotus* (Characiformes, Curimatidae) en el río Paraná y afluentes del Río de la Plata. Neotropica. 1991; 37:158–59.
- **Azpelicueta MM, Almirón AE.** A sturgeon (Acipenseridae) in temperate waters of the South Hemisphere, Río de la Plata, Argentina. Biogeographica. 1999; 75(3):129–30.
- **Azpelicueta MM, Braga L.** Los Curimátidos en Argentina. In: Castellanos ZA editor. Fauna de agua dulce de la República Argentina. La Plata: Profadu CONICET; 1991. p.1–55.
- **Baigún CRM, Sverlij SB, López HL.** Recursos pesqueros y pesquerías del Río de la Plata interior y medio (Margen argentina). FREPLATA, PROYECTO PNUD/GEF/RLA 99/G31 [Internet]. Montevideo; 2003. Available from: www.ecopuerto.com/Bicentenario/informes/RecPesqRiodelaPlata.pdf
- **Baigún CRM, Colautti D, López HL, Van Damme PA, Reis RE.** Application of extinction risk and conservation criteria for assessing fish species in the lower La Plata River basin, South America. Aquat Conserv. 2012; 22(2):181–97. https://doi.org/10.1002/aqc.2223
- **Balay MA.** El Río de la Plata entre la atmósfera y el mar. Buenos Aires: Secretaría de Marina - Servicio de Hidrografía Naval. 1961.
- **Barletta M, Jaureguizar AJ, Baigun C, Fontoura NF, Agostinho AA, Almeida-Val VMF *et al*.** Fish and aquatic habitat conservation in South America: a continental overview with emphasis on neotropical systems. J Fish Biol. 2010; 76(9):2118–76. https://doi.org/10.1111/j.1095-8649.2010.02684.x
- **Berg C.** Contribución al conocimiento de los peces sudamericanos, especialmente de los de la República Argentina. An Mus Nac Buenos Aires. 1897; 5:263–302.
- **Berg C.** Enumeración sistemática y sinonímica de los peces de las costas argentinas y uruguayas. An Mus Nac Buenos Aires. 1895; 4:1–120.
- **Bertaco VA, Ferrer J, Carvalho FR, Malabarba LR.** Inventory of the freshwater fishes from a densely collected area in South America - a case study of the current knowledge of Neotropical fish diversity. Zootaxa. 2016; 4138(3):401–40. https://doi.org/10.11646/zootaxa.4138.3.1
- **Bessonart J, Loureiro M, Guerrero JC, Szumik C.** Distribution of freshwater fish from the Southern Neotropics reveals three new areas of endemism and show diffuse limits among freshwater ecoregions. Neotrop Ichthyol. 2021; 19(4):e200153. https://doi.org/10.1590/1982-0224-2020-0153
- **Bogan S, Bauni V, Meluso JM, Carini E, Homberg M.** *Odontesthes humensis* de Buen, 1953 (Atheriniformes: Atherinopsidae: Sorgentinini) from the La Plata River, first record from Argentina. Ichthyol Contrib PecesCriollos. 2015; 38:1–05.

- **Bonetto AA, Pignalberi C, de Yuan EC, Oliveros O.** Informaciones complementarias sobre migraciones de peces en la cuenca del Plata. Physis. 1971; 30(81):509–20.
- **Braga L.** Los Anostomidae (Pisces, Characiformes) de Argentina. In: Castellanos ZA, editor. Fauna de agua dulce de la República Argentina. La Plata: Profadu CONICET; 1993. p.5–45.
- **Braga L.** Los Characidae de Argentina de las subfamilias Cynopotaminae y Ancestrorhynchinae. In: Castellanos ZA, editor. Fauna de Agua Dulce de la República Argentina. La Plata: Profadu CONICET; 1994. p.21–29.
- **Braga L, Azpelicueta MM.** *Curimata biornata*, a new curimatid fish (Characiformes, Curimatidae) from Argentine and southeastern Brazil. Rev Suisse Zool. 1987; 94(2):465–73.
- **Burmeister HC.** *Petromyzon macrostomus*, descripción de una nueva especie de pez. Actas Soc Paleontol Buenos Aires. 1868; 1:35–37.
- **Callicó Fortunato R, Tombari A, Volpedo A.** Nuevos datos sobre *Phalloceros caudimaculatus* (Hensel, 1868) (Cyprinodontiformes: Poeciliidae: Poeciliinae). Nótulas Faunísticas. 2010; 57:1-05.
- **Calviño P, Nadalin DO, Serio MJ, López HL.** Colección ictiológica del Museo de La Plata: la familia Rivulidae. ProBiota, Serie Técnica y Didáctica. 2016; 1–23.
- **Calviño PA.** Distribución geográfica de *Austrolebias nigripinnis* (Regan) (Cyprinodontiformes: Rivulidae) en Argentina, con comentários sobre su variabilidad en el patrón de color. Bol Killi Club Arg BIBKCA. 2007; 12:22–38.
- **Candia CR.** Trabajos de marcación de peces en el Río de la Plata [Internet]. Mar del Plata; 1989. Available from: www.aquadocs.org/handle/1834/19569
- **Cappelletti N, Speranza E, Tatone L, Astoviza M, Migoya MC, Colombo JC.** Bioaccumulation of dioxin-like PCBs and PBDEs by detritus-feeding fish in the Rio de la Plata estuary, Argentina. Environ Sci Pollut Res. 2015; 22(9):7093–100. https://doi.org/10.1007/s11356-014-3935-z
- **Cardoso YP, Brancolini F, Protogino L, Lizarralde M.** Actinopterygii, Siluriformes, Loricariidae, *Hypostomus aspilogaster* (Cope, 1894). Distribution extension and first record for Argentina. Check List. 2011; 7(5):596–98. https://doi.org/10.15560/7.5.596
- **Cardoso YP, Brancolini F, Protogino L, Paracampo A, Bogan S, Posadas P *et al*.** An integrated approach clarifies the cryptic diversity in *Hypostomus* Lacépède 1803 from the Lower La Plata Basin. An Acad Bras Ciênc. 2019; 91(2):e20180131. https://doi.org/10.1590/0001-3765201920180131
- **Casciotta JR, Almirón AE, Bechara J.** Peces del Ibera: Hábitat y Diversidad. Buenos Aires: Grafikar; 2005.
- **Castello HP.** *Pseudopimelodus raninus* (Valenciennes, 1840) (Pisces, Pimelodidae) una nueva cita para la fauna de peces de la República Argentina. Physis. 1971; 30(80):543–45.
- **Cataldo D, Boltovskoy D, Marini V, Correa N.** Limitantes de *Limnoperna fortunei* en la cuenca del Plata: la predación por peces [Internet]. Paysandú; 2002. Available from: www.researchgate.net/publication/237700923_Limitantes_de_Limnoperna_fortunei_en_la_cuenca_del_Plata_la_predacion_por_peces
- **Cirelli AF, Ojeda C.** Wastewater management in Greater Buenos Aires, Argentina. Desalination. 2008; 218(1–3):52–61.
- **Colautti DC.** 1997. Ecología de la carpa *Cyprinus carpio*, en la cuenca del Río Salado, Provincia de Buenos Aires. [PhD Thesis] Facultad de Ciencias Naturales y Museo (UNLP); 1997.
- **Colautti DC**. Sobre la utilización de trampas para peces en las lagunas pampásicas. Rev Ictiol. 1998; 6(1–2):17–23.
- **Colautti DC, López HL, Nadalin DO.** La pesca en el sector costero del Río de la Plata entre Punta Atalaya y Punta Piedras. In: Athor J, editor. Parque Costero del Sur. Buenos Aires: Fundación de Historia Natural Félix de Azara; 2003. p.370–83.
- **Colautti DC, Miranda L, Gonzalez-Castro M, Villanova V, Strüssmann CA, Mancini M.** Evidence of a landlocked reproducing population of the marine pejerrey *Odontesthes argentinensis* (Actinopterygii; Atherinopsidae). J Fish Biol. 2019; 96(1):202–16. https://doi.org/10.1111/jfb.14207

- **Colombo JC, Bilos C, Lenicov MR, Colautti D, Landoni P, Brochu C.** Detritivorous fish contamination in the Río de la Plata estuary: a critical accumulation pathway in the cycle of anthropogenic compounds. Can J Fish Aquat Sci. 2000; 57(6):1139–50. https://doi.org/10.1139/f00-031
- **Colombo JC, Cappelletti N, Migoya MC, Speranza E.** Bioaccumulation of anthropogenic contaminants by detritivorous fish in the Río de la Plata estuary: 2-Polychlorinated biphenyls. Chemosphere. 2007; 69(8):1253–60. https://doi.org/10.1016/j.chemosphere.2007.05.073
- **Colombo JC, Cappelletti N, Williamson M, Migoya MC, Speranza E, Sericano J *et al*.** Risk ranking of multiple-POPs in detritivorous fish from the Río de la Plata. Chemosphere. 2011; 83(6):882–89. https://doi.org/10.1016/j.chemosphere.2011.02.084
- **Comisión Administradora del Río de la Plata - Instituto Nacional de Investigación y Desarrollo Pesquero - Instituto Nacional de Pesca (CARP-INIDEP-INAPE).** Informe final del Proyecto de Evaluación de los Recursos Pesqueros del Río de la Plata (Parte I) [Internet]. Mar del Plata; 1990. Available from: aquadocs.org/bitstream/handle/1834/19572/Inf.Tec.AC12.pdf?sequence=1&isAllowed=y.
- **Comisión Administradora del Río Uruguay (CARU).** Publicaciones de la Comisión Administradora del Río Uruguay. [Internet]. Paysandú; 1992. Available from: sedici.unlp.edu.ar/bitstream/handle/10915/67241/Documento_completo__.pdf-PDFA.pdf?sequence=1&isAllowed=y.
- **Comisión Administradora del Río Uruguay - Comisión Administradora del Río de la Plata (CARU-CARP).** Proyecto de evaluación de los recursos ícticos del bajo río Uruguay y Río de la Plata interior. Informe de campañas de invierno 2011 y verano 2012 [Internet]. Paysandú; 2012. Available from: www.caru.org.uy/web/pdfs_publicaciones/INFORME%20FINAL%20%20CARU%20CARP%20DICIEMBRE%202012.pdf.
- **Comisión Administradora del Río Uruguay - Comisión Administradora del Río de la Plata (CARU-CARP).** Proyecto de evaluación de los recursos ícticos del bajo río Uruguay y el Río de la Plata interior. Informe de la campaña de invierno 2016. [Internet]. Paysandú; 2016. Available from: www.magyp.gob.ar/sitio/areas/pesca_continental/informes/proyectos_caru/index.php.
- **Cuello MV.** Análisis poblacional morfométrico y genético, áreas de solapamiento y distribución de los pejerreyes de la Provincia Parano-Platense (Atheriniformes, Atherinopsidae) [PhD Thesis] Facultad de Ciencias Naturales y Museo (UNLP); 2020.
- **Cussac VE, Fernández DA, Gómez SE, López HL.** Fishes of southern South America: a story driven by temperature. Fish Physiol Biochem. 2009; 35(1):29–42. https://doi.org/10.1007/s10695-008-9217-2
- **Cuvier G, Valenciennes A.** Histoire naturelle des poissons. Musée D'histoire Naturelle De Paris. 1850; 1–91.
- **D'anatro A, González-Bergonzoni I, Vidal N, Tesitore G, Teixeira de Mello F.** Confirmation of the occurrence of *Odontesthes argentinensis* (Valenciennes, 1835) (Atheriniformes, Atherinopsidae) in the Río Uruguay. PANAMJAS. 2020; 15(2):100–05. Available from: https://panamjas.org/pdf_artigos/PANAMJAS_15(2)_100-105.pdf
- **De Buen F.** El Mar de Solís y su fauna de peces (2ª. Parte). 1950. SOYP.
- **Demonte D, Liotta J, Rueda E, CivettiR, Rozzati JC.** First record of the Russian sturgeon *Acipenser gueldenstaedtii* Brandt & Ratzeburg, 1833 (Acipenseriformes: Acipenseridae) from Argentina. Ichthyol Contrib PecesCriollos. 2017; 58:1–05.
- **Devincenzi GJ.** El género *Loricaria* en la cuenca platense: descripción de una nueva especie *Loricaria commersonoides*. Com Zool Mus Montevideo. 1943; 1(1):1–06.
- **Devincenzi GJ, Teague GW.** Ictiofauna del río Uruguay medio. An Mus His Nac Montevideo (2ª ser.). 1942. 5(4):1–104.
- **Dudgeon D, Arthington AH, Gessner MO, Kawabata Z-I, Knowler DJ, Lévêque C *et al*.** Freshwater biodiversity: importance, threats, status and conservation challenges. Biol Rev. 2006; 81(2):163–82. https://doi.org/10.1017/S1464793105006950

- **Escalante AH.** Contribución al conocimiento de las relaciones tróficas de peces de agua dulce del área platense. I. *Astyanax eigenmanniorum* (Osteichthyes, Tetragonopteridae). Limnobios. 1982; 2(5):311–22.
- **Escalante AH.** Contribución al conocimiento de las relaciones tróficas de peces de agua dulce del área platense. III. Otras especies. Limnobios. 1983; 2(7):453–63.
- **Escalante AH.** Contribución al conocimiento de las relaciones tróficas de peces de agua dulce del área platense. IV. Dos especies de Cichlidae y miscelánea. Limnobios. 1984; 2(8):562–78.
- **Espinach Ros A, Spinetti M, Foti R, Dománico A, Sverlij S, Márquez A.** Evaluación del comportamiento migratorio mediante técnicas de marcación y recaptura (Informe Anual 2009). In: CARU-DINARA-SSPyA: Programa de Conservación de la Fauna Íctica y los Recursos Pesqueros del Río Uruguay. p.158–71
- **Fabiano G, Amestoy F, García C, Ares L.** Estudio de las variaciones en la abundancia, la estructura y la distribución espacio-temporal de los efectivos de carpa común, *Cyprinus carpio*, en el Río de la Plata medio e interior y en el Río Uruguay inferior. CARU, Sér Téc-Cient. 1992; 1:13–24
- **Ferriz R, Villar C, Colautti D, Bonetto C.** Alimentación de *Pterodoras granulosus* (Valenciennes) (Pisces, Doradidae) en la baja cuenca del Plata. Rev Mus Argent Cienc Nat. 2000; 2(2):151–56. Available from: http://revista.macn.gov.ar/ojs/index.php/RevMus/article/view/151/142
- **Fowler HW.** Notes and descriptions of new or little known fishes from Uruguay. Proc Acad Nat Sci. 1943; 95:311–34.
- **Fricke R, Eschmeyer WN, Van der Laan R.** Eschmeyer's catalog of fishes: genera, species, references [Internet]. San Francisco: California Academy of Science; 2022. Available from: http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatmain.asp.
- **Fuster DRF.** Revisão taxonômica de *Heptapterus mustelinus* (Valenciennes, 1835) (Siluriformes: Heptapteridae). [PhD Thesis]. Porto Alegre: Universidade Federal do Rio Grande do Sul; 2017. Available from: https://lume.ufrgs.br/handle/10183/170110
- **García ML, Jaureguizar AJ, Protogino LC.** From fresh water to the slope: fish community ecology in the Río de la Plata and the sea beyond. Lat Am J Aquat Res. 2010; 38(1):81–94. https://doi.org/10.3856/vol38-issue1-fulltext-8
- **García ML, Protogino LC.** Invasive freshwater molluscs are consumed by native fishes in South America. J Appl Ichthyol. 2005; 21(1):34–38. https://doi.org/10.1111/j.1439-0426.2004.00570.x
- **García ML, Solari LC, García de Souza JR.** Feeding ecology of the siluriform *Pimelodella laticeps* Eigenmann, 1917 in a Pampean stream from Argentina. Rev Mus Argent Cienc Nat. 2017; 19(2):211–223. Available from: http://sedici.unlp.edu.ar/bitstream/handle/10915/87588/Documento_completo.19.519.pdf?sequence=1&isAllowed=y
- **García Romero N, Azpelicueta M, Almirón A, Casciotta J.** *Hypophthalmichthys molitrix* (Cypriniformes: Cyprinidae). Other exotic cyprinid in the Río de la Plata. Biogeographica. 1998; 74(4):189–91.
- **Green MJB, How R, Padmalal UKGK, Dissanayake SRB.** The importance of monitoring biological diversity and its application in Sri Lanka. Trop Ecol. 2009; 50(1):41–56. Available from: https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.513.3914&rep=rep1&type=pdf
- **Guerrero EL, Agnolin FL, Grilli P, Suazo Lara FS, Boné E, Tenorio AB *et al*.** Inventario de la fauna transportada por balsas de vegetación flotante en el Sistema fluvial del Río de La Plata. Rev Mus Argent Cienc Nat. 2017; 19(2):177–83. Available from: http://www.scielo.org.ar/scielo.php?script=sci_arttext&pid=S1853-04002017000200007
- **Guerrero RA, Acha EM, Framiñan MB, Lasta CA.** Physical oceanography of the Río de la Plata Estuary, Argentina. Cont Shelf Res. 1997; 17(7):727–42.
- **Günther A.** A contribution to the knowledge of the fish fauna of the Rio de la Plata. Ann Mag Nat Hist. 1880; (5)6:7–13.
- **Gutiérrez PA, Martorelli SR.** The structure of the monogenean community on the gills of *Pimelodus maculatus* in Río de la Plata (Argentina). Parasitology. 1999; 119(2):177–82. https://doi.org/10.1017/S0031182099004606

- **Haseman JD.** Description of some new species of fishes and miscellaneous notes on others obtained during the expedition of the Carnegie Museum to central South America. An Carnegie Mus. 1911; 7(3–4):315–28.
- **Ihering RV.** Cyprinodontes brasileiros (Peixes – guarús). Systematica e morfologia biologica. Archvs Inst Biol. 1931; 4:243–80.
- **Jaureguizar AJ, Cortés F, Milessi AC, Cozzolino E, Allega L.** A trans-ecosystem fishery: environmental effects on the small-scale gillnet fishery along the Río de la Plata boundary. Estuarine, Coastal Shelf Sci. 2015; 166:92–104. https://doi.org/10.1016/j.ecss.2014.11.003
- **Jégu M.** Subfamily Serrasalminae. In: Reis RE, Kullander SO, Ferraris Jr. CJ, editors. Check list of the freshwater of South and Central America. Porto Alegre: Edipucrs. 2003. p.182–96.
- **Koerber S, Litz TO.** On the erroneous records of *Poecilia vivipara* from Argentina. Ichthyol Contrib PecesCriollos. 2014; 33:1–04.
- **Koerber S, Litz TO, Mirande JM.** CLOFFAR-update 3-supplement to Checklist of the Freshwater Fishes of Argentina. Ichthyol Contrib PecesCriollos. 2016a; 28:1–10.
- **Koerber S, Litz TO, Serra WS.** CLOFFUY-update 2- supplement to Checklist of the Freshwater Fishes of Uruguay. Ichthyol Contrib PecesCriollos. 2016b; 41:1–8.
- **Koerber S, Litz TO, Serra WS.** CLOFFUY-update 3- supplement to Checklist of the Freshwater Fishes of Uruguay. Ichthyol Contrib PecesCriollos. 2020; 68:1–10.
- **Koerber S, Litz TO, Serra WS.** CLOFFUY-update 4- supplement to Checklist of the Freshwater Fishes of Uruguay. Ichthyol Contrib PecesCriollos. 2021; 78:1–11.
- **Kumar AB.** Exotic fishes and freshwater fish diversity. Zoos Print J. 2000; 15(11):363–67.
- **Kurucz A, Masello A, Méndez S, Cranston R, Wells PG.** Calidad ambiental del Río de la Plata. In: Wells PG, Daborn GR, editors. El Río de la Plata. Una Revisión Ambiental. Un informe de Antecedentes del Proyecto EcoPlata. Halifax: Dalhoousie University; 1998. p.71–86.
- **Lahille F.** Enumeración de los peces cartilaginosos (Plectognatos y Gymnótidos) encontrados en las aguas argentinas. Minist Agric Ganad. 1921; 1–41.
- **Lahille F.** Faunas locales argentinas. I. Lista de los pescados recogidos en los alrededores de La Plata (Prov. de Buenos Aires) durante el año 1894, y conservados en las colecciones del Museo de La Plata. Rev Mus La Plata. 1895; 6:265–74.
- **Lahille F.** Los peces argentinos del grupo de los Esociformes. Rev Fac Agr Vet. 1923; 4:161–95.
- **Lahille F.** Morenitas y ratonas. Rev Jard Zool. 1910; 6(22):3.
- **Lercari D, Horta S, Martínez G, Calliari D, Bergamino L.** A food web analysis of the Río de la Plata estuary and adjacent shelf ecosystem: trophic structure, biomass flows, and the role of fisheries. Hydrobiologia. 2015; 742:39–58. https://doi.org/10.1007/s10750-014-1964-8
- **Liermann CR, Nilsson C, Robertson J, Ng RY.** Implications of dam obstruction for global freshwater fish diversity. BioScience. 2012; 62(6):539–48. https://doi.org/10.1525/bio.2012.62.6.5
- **Liotta J.** Geographical distribution database of freshwater fishes from Argentina. Freshw Metadat J. 2020; 47:1–05. https://doi.org/10.15504/fmj.2020.47
- **Liotta J, Giacosa B.** Esturiones en la cuenca del Plata. Registros del periodo 1998-2016. [Internet]. Corrientes: Libro de resúmenes del V Simposio Argentino de Ictiología; 2017. Available from: www.researchgate.net/publication/320705857_Esturiones_en_la_cuenca_del_Plata_Registros_del_periodo_1998-2016.
- **Litz TO, Koerber S.** Check list of the freshwater fishes of Uruguay (CLOFF-UY). Ichthyol Contrib PecesCriollos. 2014; 28:1–40.
- **Llamazares Vegh S, Villatarco Vázquez AP, Kunert MC, Tombari AD.** Diversidad de vertebrados acuáticos de tres humedales urbanos de la ciudad de Buenos Aires. Biol Acuática. 2012; 27:149–61. Available from: https://revistas.unlp.edu.ar/bacuatica/article/view/6637/6362
- **Llompart F, Paracampo A, Solimano P, García I.** Peces de la Reserva Natural Punta Lara. In: Roesler I, Agostini MG, editors. Inventario de los Vertebrados de la Reserva Natural Punta Lara, provincia de Buenos Aires, Argentina. Buenos Aires: Aves Argentinas; 2012. 57–70.

- **Lombardi PE, Peri SI, Guerrero NRV.** Trace metal levels in *Prochilodus lineatus* collected from the La Plata River, Argentina. Environ Monit Assess. 2010a; 160(1):47–59. https://doi.org/10.1007/s10661-008-0656-0
- **Lombardi PE, Peri SI, Guerrero NRV.** ALA-D and ALA-D reactivated as biomarkers of lead contamination in the fish *Prochilodus lineatus*. Ecotoxicol Environ Saf. 2010b; 73(7):1704–11. https://doi.org/10.1016/j.ecoenv.2010.06.005
- **López HL, Arámburu RH, Miquelarena AM, Menni RC.** Nuevas localidades para peces de agua dulce de la República Argentina. I. Limnobios. 1980; 1(10):437–46.
- **López HL, Menni RC, Donato M, Miquelarena AM.** Biogeographical revision of Argentina (Andean and Neotropical Regions): an analysis using freshwater fishes. J Biogeogr. 2008; 35(9):1564–79. https://doi.org/10.1111/j.1365-2699.2008.01904.x
- **López HL, Menni RC, Miquelarena AM.** Lista de los peces de agua dulce de la Argentina. Biol Acuática. 1987; 12:1–50. Available from: https://revistas.unlp.edu.ar/bacuatica/article/view/6603/5616
- **López HL, Miquelarena AM.** Peces loricáridos de la cuenca del Plata, Argentina. I: El género *Cochliodon* Heckel, 1854 (Pisces: Siluriformes). Gayana Zoo. 1991; 55:3–11.
- **López HL, Miquelarena AM.** Los Hypostominae (Pisces: Loricariidae) de Argentina. Fauna de Agua Dulce de la República Argentina. 1991; 40(2):1–64.
- **López HL, Miquelarena AM, Menni RC, Casciotta JR.** Nuevas localidades para peces de agua dulce de la República Argentina. V. Rev Mus La Plata. 1984; 4(9):81–90. Available from: www.digital.cic.gba.gob.ar/handle/11746/3886
- **López HL, Miquelarena AM, Menni RC.** Lista comentada de los peces continentales de la Argentina. La Plata: ProBiota, Serie Técnica y Didáctica. 2003; 5:1–86. Available from: http://sedici.unlp.edu.ar/bitstream/handle/10915/15875/Revista_completa.pdf?sequence=1&isAllowed=y
- **López HL, Morgan CC, Montenegro MJ.** Ichthyological ecoregions of Argentina. Probiota, Sér Docs. 2002; (1):1–68.
- **López HL, Protogino LC, Mantinian JE.** Ictiofauna de los arroyos de la Reserva de Biosfera Parque Costero del Sur. In: Athor J, editor. Parque Costero del Sur - Naturaleza, conservación y patrimonio cultural. Buenos Aires: Fundación de Historia Natural Félix de Azara; 2009; p.262–73.
- **López RB.** Viejas del Río de la Plata (Pisces, Loricariinae). Rev Mus Argent Cienc Nat. 1970; 10:113–29.
- **López RB, Castello HP.** *Eigenmannia trilineata*, nueva especie hallada en el Río de la Plata. Com Mus Argent Cienc Nat. 1966; 4(2):7–12.
- **Lucena CAS.** Revisão taxonômica das espécies do gênero *Roeboides* grupo-*affinis* (Ostariophysi, Characiformes, Characidae). Iheringia, Sér Zool. 2007; 97(2):117–36. https://doi.org/10.1590/S0073-47212007000200001
- **Lucifora LO, Barbini SA, Vegh SL, Scarabotti PA, Vargas F, Solari A *et al*.** Geographic distribution of the short-tailed river stingray (*Potamotrygon brachyura*): assessing habitat loss and fishing as threats to the world's largest obligate freshwater elasmobranch. Mar Freshw Res. 2016; 67:1463–78. https://doi.org/10.1071/MF15003
- **Lujan NK, Winemiller KO, Armbruster JW.** Trophic diversity in the evolution and community assembly of loricariid catfishes. BMC Evol Biol. 2012; 12(124):1–13. https://doi.org/10.1186/1471-2148-12-124
- **Lunaschi LI.** *Prosorhynchoides rioplatensis* [Szidat, 1970] comb. nov.[Digenea, Bucephalidae] from *Catathyridium jenynsii* [Gunther, 1862][Pleuronectiformes, Achiridae] in Argentina. Acta Parasitol. 2003; 48(2):83–86.
- **Mac Donagh EJ.** Pesca de una "carpa de espejuelos. Not Mus La Plata. 1945; (82):11–16.
- **Mac Donagh EJ, Cabrera SE.** Estado de nuestros conocimientos sobre las especies del género *Trachycorystes* (Siluroideos) en la cuenca del Plata. Obra Cinc Mus La Plata. 1937; 2:573.
- **Maiztegui T, Baigún CRM, Garcia de Souza JR, Minotti P, Colautti DC.** Invasion status of the common carp *Cyprinus carpio* in inland waters of Argentina. J Fish Biol. 2016; 89(1):417–30. https://doi.org/10.1111/jfb.13014

- **Marelli CA.** Elenco sistemático de la fauna de la provincial de Buenos Aires (Procordados y Vertebrados). Mem Minist Obras Publ. 1922-1923. 1924; 536–682.
- **Menezes NA, Oliveira C, Nirchio C.** An old dilemma: the identity of the western south Atlantic lebranche mullet (Teleostei: Perciformes: Mugilidae). Zootaxa. 2010; 2519(1):59–68. https://doi.org/10.11646/zootaxa.2519.1.4
- **Messner E.** Lista de los peces Tetragonopterinae (fam. Characidae) del Uruguay. Bol Assoc Lat Amer Ictiol Herpetol. 1962; 2(1):4–05.
- **Miquelarena AM, Arámburu RH, Menni RC, López HL.** Nuevas localidades para peces de agua dulce de la República Argentina. II. Limnobios. 1981; 2(2):127–35.
- **Miquelarena AM, López HL.** *Hyphessobrycon togoi*, a new species from the La Plata basin (Teleostei: Characidae) and comments about the distribution of the genus in Argentina. Rev Suisse Zool. 2006; 113(4):817–28.
- **Miquelarena AM, Menni RC.** *Astyanax tumbayaensis*, a new species from northwestern Argentina highlands (Characiformes: Characidae) with a key to the Argentinean species of the genus and comments on their distribution. Rev Suisse Zool. 2005; 112:661–76.
- **Miquelarena AM, Mantinian JE, López HL.** Peces de la Mesopotamia Argentina (Characiformes: Characidae: Cheirodontinae). INSUGEO Miscelánea. 2008; 17:51–90.
- **Mirande JM, Koerber S.** Checklist of the Freshwater Fishes of Argentina (CLOFFAR). Ichthyol Contrib PecesCriollos. 2015; 36:1–68.
- **Mirande JM, Koerber S.** Checklist of the Freshwater Fishes of Argentina (CLOFFAR). Ichthyol Contrib Peces Criollos. 2020; 72:1–08.
- **Morrison ML, Block WM, Strickland MD, Collier BA, Peterson MJ.** Inventory and monitoring studies. In: Morrison ML, Block WM, Strickland MD, Collier BA, Peterson MJ, editors. Wildlife Study Design. New York: Springer-Verlag; 2008. p.267–312.
- **Myers GS.** 1942. Studies on South American fresh-water fishes. I. Stanford Ichthyol Bull. 1942; 2(4):89–114.
- **Natale OE.** Water quality indicators for the La Plata River basin. [Internet]. UNEP, FAO, EUROSTAT, OECD. Vienna: International Work Session on Water Statistics Umweltbundesamt; 2005. Available from: www.unstats. un. org/unsd/ENVIRONMENT/envpdf/pap_wasess5a3laplatariver. pdf.
- **Nelson JS, Grande TC, Wilson MV.** Fishes of the World. New Jersy: John Wiley & Sons; 2016.
- **Nijssen H, Isbrücker IJH.** A review of the genus *Corydoras* Lacépède, 1803 (Pisces, Siluriformes, Callichthydae). Bijdragen tot de Dierkunde. 1980; 50(1):190–220.
- **Nion H.** Peces del Río de la Plata y algunos aspectos de su ecología. In: Wells PG, Daborn GR, editors. El Río de la Plata. Una Revisión Ambiental. Un informe de Antecedentes del Proyecto EcoPlata. Halifax: Dalhoousie University; 1998. p.169–90.
- **Norman JR.** The South American Characid fishes of the subfamily Serrasalmoninae with a revision of the genus *Serrasalmus* Lácèpede. Proc Zool Soc London. 1929; 4:781–829.
- **Paracampo A.** Toxicidad de pesticidas, ensambles de peces y su relación con las características limnológicas en arroyos Pampeanos. [PhD Thesis]. La Plata: Facultad de Ciencias Naturales y Museo (UNLP); 2013. Available from: http://sedici.unlp.edu.ar/bitstream/handle/10915/31476/Documento_completo.pdf?sequence=5
- **Paracampo A, García I, Mugni H, Marrochi N, Carriquiriborde P, Bonetto C.** Fish assemblage of a Pampasic stream (Buenos Aires, Argentina): temporal variations and relationships with environmental variables. Stud Neotrop Fauna Environ. 2015; 50(3):145–53. https://doi.org/10.1080/01650521.2015.1065658
- **Paracampo A, Marrochi N, García I, Maiztegui T, Carriquiriborde P, Bonetto C *et al*.** Fish assemblages of Pampean streams (Buenos Aires, Argentina): relationships with abiotic and anthropogenic variables. An Acad Bras Ciênc. 2020; 92(2):e20190476. https://doi.org/10.1590/0001-3765202020190476
- **Pasquini AI, Depetris PJ.** Discharge trends and flow dynamics of South American rivers draining the southern Atlantic seaboard: an overview. J Hydrol. 2007; 333(2–4):385–99. https://doi.org/10.1016/j.jhydrol.2006.09.005

- **Pelicice FM, Bialetzki A, Camelier P, Carvalho FR, García-Berthou E, Pompeu PS *et al*.** Human impacts and the loss of Neotropical freshwater fish diversity. Neotrop Ichthyol. 2021; 19(3):e210134. https://doi.org/10.1590/1982-0224-2021-0134
- **Penchaszadeh PE, Darrigran G, Angulo C, Averbuj A, Brogger M, Dogliotti A *et al*.** Predation of the invasive freshwater mussel *Limnoperna fortunei* (Dunker, 1857) (Mytilidae) by the fish *Leporinus obtusidens* Valenciennes, 1846 (Anostomidae) in the Rio de la Plata, Argentina. J Shellfish Res. 2000; 19(1):229–32.
- **Pereyra S, García G.** Patterns of genetic differentiation in the *Gymnogeophagus gymnogenys* species complex, a neotropical cichlid from South American basins. Environ Biol Fish. 2008; 83:245–57. https://doi.org/10.1007/s10641-008-9329-7
- **Perugia A.** Appunti sopra alcuni pesci Sud – americani conservati nel Museo Civico di Storia Naturale di Genova. An Mus Civ Stor Nat Genova. 1891; 10:605–57.
- **Pozzi AJ.** Sistemática y distribución de los peces de agua dulce de la República Argentina. Gaea. 1945; 7:239–92.
- **Pozzi AJ, Bordalé LF.** Las especies argentinas de la subfamilia Gasteropelecinae. An Mus Argent Cienc Nat. 1936; 38:423–39.
- **Proyecto Protección Ambiental del Río de la Plata y su Frente Marítimo (FREPLATA) 2004.** Análisis Diagnóstico Transfronterizo del Río de la Plata y su Frente Marítimo" Proyecto PNUD/GEF/RLA/99/G31 [Internet]. Montevideo; 2005. Available from: www.gub.uy/ministerio-ambiente/politicas-y-gestion/proyecto-freplata
- **Quirós R.** The Parana River Basin development and the changes in the lower basin fisheries. Interciencia. 1990; 15(6):442–51.
- **Reis RE.** Conserving the freshwater fishes of South America. Int Zoo Yearb; 2013. 47(1):65–70. https://doi.org/10.1111/izy.12000
- **Reis RE, Albert JS, Di Dario F, Mincarone MM, Petry P, Rocha LA.** Fish biodiversity and conservation in South America. J F Biol. 2016; 89(1):12–47. https://doi.org/10.1111/jfb.13016
- **Remes Lenicov M, Colautti DC, López HL.** Ictiofauna de un ambiente lótico suburbano: el arroyo Rodríguez (Buenos Aires, Argentina). Biol Acuát. 2005. 22:231–37.
- **Remes Lenicov M, Colautti DC.** Estudio ictiológico del puerto de la Ciudad de Buenos Aires. En: Biodiversidad en la franja costera sur del Río de la Plata. Fitoplancton, zoobentos, peces de la zona portuaria de la Ciudad de Buenos Aires. Biol Acuát. 2000; 20:65–75.
- **Ringuelet RA.** Zoogeografía y ecología de los peces de aguas continentales de la Argentina y consideraciones sobre las áreas ictiológicas de América del Sur. Ecosur, 2; 1975. Available from: http://sedici.unlp.edu.ar/handle/10915/48003
- **Ringuelet RA, Arámburu R.** Enumeración sistemática de los vertebrados de la provincia de Buenos Aires. Minist Asunt Agrar. 1957; 119:1–94.
- **Ringuelet RA, Arámburu RH, Alonso de Arámburu AS.** Los peces argentinos de agua dulce. Buenos Aires: Comisión de Investigaciones Científicas. 1967.
- **Ringuelet RA, Miquelarena AM, Menni RC.** Presencia en los alrededores de La Plata de *Characidium* (*Jobertina*) *rachowi* y de *Hyphessobrycon meridionalis* (sp. nov.) (Osteichthyes, Tetragonopteridae). Limnobios. 1978; 1(7):242–57.
- **Rodríguez MS.** Sistemática y distribución geográfica de peces de la familia Loricariidae (Ostariophysi: Siluriformes) de la Argentina, con especial referencia a la tribu Loricariini. [PhD Thesis]. La Plata: Facultad de Ciencias Naturales y Museo (UNLP); 2003.
- **Rojo M, Cristos D, González P, López-Aca V, Dománico A, Carriquiriborde P.** Accumulation of human pharmaceuticals and activity of biotransformation enzymes in fish from two areas of the lower Rio de la Plata Basin. Chemosphere. 2021; 266:129012. https://doi.org/10.1016/j.chemosphere.2020.129012
- **Rosso JJ, Gonzalez-Castro M, Bogan S, Cardoso YP, Mabragana E, Delpiani M *et al*.** Integrative taxonomy reveals a new species of the *Hoplias malabaricus* species complex (Teleostei: Erythrinidae). Ichthyol Explor Freshw. 2018; 28:235–52.

- **Roule L.** Notice biographique sur Alcide Dessalines d'Orbigny. Commémoration du voyage d'Alcide d'Orbigny en Amérique du Sud. Publ Mus Nat Hist Paris. 1826; 7–13.
- **Sabaj MH.** Family Doradidae. In: Reis RE, Kullander SO, Ferraris Jr. CJ, editors. Check list of the freshwater of South and Central America. Porto Alegre: Edipucrs. 2003. p.456–69.
- **Sala OE, Chapin FS, Armesto JJ, Berlow E, Bloomfield J, Dirzo R *et al*.** Global biodiversity scenarios for the year 2100. Science. 2000; 287:1770–74. https://doi.org/10.1126/science.287.5459.1770
- **Scarabotti PA, Lucifora LO, Espínola LA, Rabuffetti AP, Liotta J, Mantinian JE *et al*.** Long-term trends of fishery landings and target fish populations in the lower La Plata basin. Neotrop Ichthyol. 2021; 19(3):e210013. https://doi.org/10.1590/1982-0224-2021-0013
- **Schaefer SA.** The neotropical cascudinhos: systematics and biogeography of the *Otocinclus* catfishes (Siluriformes, Loricariidae). Proc Acad Nat Sci. 1997; 148:1–120. https://www.jstor.org/stable/4065046
- **Simionato CG, Meccia VL, Guerrero RA, Dragani WC, Nuñez MN.** The Río de la Plata estuary response to wind variability in synoptic to intra-seasonal scales: 2. Currents' vertical structure y its implications for the salt wedge structure. J Geophys Res. 2007; 10. https://doi:10.1029/2006JC003815
- **Sokal RR, Rohlf FJ.** Taxonomic congruence in the Leptopodomorpha re-examined. Sys Zool. 1981; 30(3):309–25. https://doi.org/10.2307/2413252
- **Speranza ED, Cappelletti N, Migoya MC, Tatone LM, Colombo JC.** Migratory behaviour of a dominant detritivorous fish *Prochilodus lineatus* evaluated by multivariate biochemical and pollutant data. J Fish Biol. 2012; 81(2):848–65. https://doi.org/10.1111/j.1095-8649.2012.03358.x
- **Speranza ED, Colombo JC.** Biochemical composition of a dominant detritivorous fish *Prochilodus lineatus* along pollution gradients in the Paraná-Río de la Plata Basin. J Fish Biol. 2009; 74(6):1226–44. https://doi.org/10.1111/j.1095-8649.2009.02191.x
- **Speranza ED, Colombo M, Heguilor S, Tatone LM, Colombo JC.** Alterations in the sterol signature of detritivorous fish along pollution gradients in the Río de la Plata basin (Argentina): From plant to sewage-based diet. Environ Res. 2020; 184:109351. https://doi.org/10.1016/j.envres.2020.109351
- **Speranza ED, Colombo M, Tatone LM, Cappelletti N, Migoya MC, Colombo JC.** Fatty acid alterations in the detritivorous *Prochilodus lineatus* promoted by opportunistic feeding on sewage discharges in the Río de la Plata estuary. J Fish Biol. 2016; 89(4):2024–37. https://doi.org/10.1111/jfb.13104
- **Speranza ED, Tatone LM, Cappelletti N, Colombo JC.** Cost-benefit of feeding on anthropogenic organic matter: lipid changes in a detritivorous fish (2013). Ichthyol Res. 2013; 60:334–42. https://doi.org/10.1007/s10228-013-0355-x
- **Steindachner F.** Beiträge zur Kenntnis der Flussfische Südamerikas, III. Denks Akad Wiss Wien. 1881; 44(1):1–18.
- **Steindachner F.** Ueber eine noch unbekannte Art der Gattung *Bergiella* Eig. Aus dem La Plata. Anz Akad Wiss Wien. 1908; 45(8):110–13.
- **Stiassny MLJ.** Revision of *Sauvagella bertin* (Clupeidae; Pellonulinae; Ehiravini) with a description of a new species from the freshwaters of Madagascar and diagnosis of the Ehiravini. Copeia. 2002; 2002(1):67–76. https://www.jstor.org/stable/1447925
- **Stigchel JWB.** The South American Nematognathi of the Museums at Leyden and Ámsterdam. Zool Med. 1947; 27:1–204.
- **Sverlij SB, Espinach Ros A.** El dorado, *Salminus maxillosus* (Pisces, Characiformes) en el Río de la Plata y Río Uruguay inferior [Internet] Mar del Plata; 1986. Available from: www.marabierto.inidep.edu.ar/xmlui/handle/inidep/235
- **Tedesco PA, Beauchard O, Bigorne R, Blanchet S, Buisson L, Conti L *et al*.** A global database on freshwater fish species occurrence in drainage basins. Sci Data. 2017: 4:170141. https://doi.org/10.1038/sdata.2017.141
- **Teixeira de Mello F, González-Bergonzoni I, Loureiro M.** Peces de agua dulce del Uruguay. Uruguay: PPR-MGAP. 2011.

- **Topalián M, Loez CR, Salibian A.** Metales pesados en el río Reconquista (Buenos Aires): resultados preliminares. Acta bioquím clín latinoam. 1990; 24(2):171–76.
- **Valdés ME, Marino DJ, Wunderlin DA, Somoza GM, Ronco AE, Carriquiriborde P.** Screening concentration of E1, E2 and EE2 in sewage effluents and surface waters of the "Pampas" region and the "Río de la Plata" estuary (Argentina). Bull Environ Contam Toxicol. 2015; 94(1):29–33. https://doi.org/10.1007/s00128-014-1417-0
- **Valencia E, Veliz D, Tombari A, Vega-Retter C.** Genetic population structure and evidence of genetic homogeneity in populations of the Argentinian silverside *Odontesthes bonariensis* (Teleostei: Atherinopsidae) inhabiting central and northwestern Argentina. Lat Am J Aquat Res. 2017; 45(4):708–16. Available from: https://www.scielo.cl/scielo.php?pid=S0718-560X2017000400708&script=sci_arttext
- **Vergara J, Azpelicueta MM, Garcia G.** Phylogeography of the Neotropical catfish *Pimelodus albicans* (Siluriformes: Pimelodidae) from río de la Plata basin, South America, and conservation remarks. Neotrop Ichthyol. 2008; 6(1):75–85. https://doi.org/10.1590/S1679-62252008000100009
- **Villanova GV, Vera M, Brancolini F, Díaz J, Martinez P, Arranz SE.** Species assignment and population genetic studies of Gran Paraná pejerrey (*Odontesthes* sp., Atheriniformes, Atherinopsidae) from La Plata Basin in South America. Hydrobiologia. 2018; 819:243–57. https://doi.org/10.1007/s10750-018-3643-7
- **Villar C, Stripeikis J, Colautti D, D'huicque L, Tudino M, Bonetto C.** Metals contents in two fishes of different feeding behaviour in the Lower Paraná River and Río de la Plata Estuary. Hydrobiologia. 2001; 457:225–33. https://doi.org/10.1023/A:1012285820526
- **Vitule JRS, Costa APL, Frehse FA, Bezerra LAV, Occhi TVT, Daga VS *et al.*** Comment on 'Fish biodiversity and conservation in South America by Reis *et al.* (2016)'. J Fish Biol. 2016; 90(4):1182–90. https://doi.org/10.1111/jfb.13239
- **Volpedo AV, Fuchs DV.** Ecomorphological patterns of the lapilli of Paranoplatense Siluriforms (South America). Fish Res. 2010; 102(1–2):160–65. https://doi.org/10.1016/j.fishres.2009.11.007
- **Volpedo AV, Tombari AD, Cirelli AF.** La biodiversidad de peces del río de La Plata y su relación con los cambios ambientales en los últimos 40 años. In: Reyes LF, Volpedo AV, Carrera AP, editors. Estrategias integradas de mitigacion y adaptacion a cambios globales; 2010. p.243–48.
- **Wells PG, Daborn GR.** El Río de la Plata. Una revisión ambiental. Un informe de antecedentes del Proyecto EcoPlata. Nova Scotia: Halifax: Dalhoousie University; 1998.
- **Yorojo Moreno V, García I, Maroñas ME, Colautti DC.** Hábitos alimentarios de *Gymnogeophagus meridionalis* (Osteichthyes, Cichlidae) en un arroyo urbano. Rev Mus Argent Cienc Nat. 2017; 19(2):93–100.

AUTHORS' CONTRIBUTION

Tomás Maiztegui: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Writing-original draft, Writing-review and editing.

Ariel Hernán Paracampo: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing-original draft, Writing-review and editing.

Jorge Liotta: Data curation, Methodology, Supervision, Validation.

Eva Cabanellas: Methodology, Writing-original draft.

Carlos Bonetto: Writing-review and editing.

Darío César Colautti: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing-original draft, Writing-review and editing.

ETHICAL STATEMENT

Care during collection and handling of fish for this study complied with the Buenos Aires Province (Argentina) Wildlife and Fisheries Authority guidelines and policies (Law 11,477).

Neotropical Ichthyology

OPEN ACCESS

Official Journal of the
Sociedade Brasileira de Ictiologia

SBI

COMPETING INTERESTS

The authors declare no competing interests.

HOW TO CITE THIS ARTICLE

- **Maiztegui T, Paracampo AH, Liotta J, Cabanellas E, Bonetto C, Colautti DC.** Freshwater fishes of the Río de la Plata: current assemblage structure. Neotrop Ichthyol. 2022; 20(3):e210159. https://doi.org/10.1590/1982-0224-2021-0159