CLOFFBR-MA – update 1 – supplement to Checklist of the freshwater fishes of Maranhão, Brazil.

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Remarks on this update

Not even two years have passed since the publication of the CLOFFBR-MA and the initial hope of the authors that this would establish a new zero-line from where to start and initiate a new era for Maranhão's freshwater ichthyology has been fulfilled. Now that researchers and authors have a complete reference for this Brazilian state, and not only for isolated river basins, several species inventories have increased our knowledge on the fishes of this area between the Catinga, Cerrado, and Amazon biomes. Other species have been recorded for Maranhão by being listed as either type specimens or comparative material in publications on systematics.

In this first update to CLOFFBR-MA we present 34 changes which in consequence increase the quantity of fish species known from the state's freshwaters by 26 to a new total of 287.

As for updating the CLOFFBR-MA only evidence-based records are being taken into account, the work of e.g. Monroe et al. (2023) has not been considered due to the lack of mentioning voucher numbers for their specimens.

But changes are not limited to species level only. By transferring the Lutjanidae, Gerreidae, Haemulidae, and Sciaenidae from "Perciformes" *incertae sedis* to Acanthuriformes, the high level structure has been modified following Fricke et al. (2023).

In the following second table special attention needs to be paid to the column entitled 'confirmation'. The species logged with '1' are those that have been listed in CLOFFBR-MA at the end of e.g. a family as in need of confirmation. These had not been included in the initial count, but are so now. Only *Moenkhausia dichroura* was included in the initial count as with 'need of verification' against termed specimens existing in collections and is treated here with a '0' to avoid a double counting.

	CLOFF BR-MA	update # 1	new total
Myliobatiformes	2		2
Elopiformes	2		2
Osteoglossiformes	1		1
Clupeiformes	7	1	8
Characiformes	109	10	119
Gymnotiformes	11	2	13
Siluriformes	64	11	75
Batrachoidiformes	1		1
Syngnathiformes	2		2
Gobiiformes	6		6
Synbranchiformes	1		1
Carangiformes	6		6
Cichliformes	19	1	20
Cyprinodontiformes	14		14
Beloniformes	3		3
Mugiliformes	3		3
Acanthuriformes	9	1	10
Tetraodontiformes	1		1
	261	26	**287**

Three species have been combined with a new genus, one has been synonymized, and thus, these do not influence the total count. The remaining columns should be self-explinatory.

	sp. nov.	first record	confir-mation	not MA	comb. nov.	new syn.	revali-dation	sums
Clupeiformes								**1**
Pellona castelnaeana			1					
Characiformes								**10**
Acestrorhynchus lacustris			1					
Acestrorhynchus microlepis		1						
Hemigrammus brevis		1						
Knodus guajajara	1							
Knodus savannensis		1						
Leporinus venerei		1						
Moenkhausia dichroura			0					
Moenkhausia loweae		1						
Mylossoma duriventre			1					
Serrasalmus eigenmanni			1					
Serrasalmus spilopleura		1						
Gymnotiformes								**2**
Eigenmannia bumba	1							
Eigenmannia cacuria	1							
Eigenmannia robsoni	1							
Eigenmannia virescens				-1				
Rhamphichthys pantherinus						0		
Siluriformes								**11**
Ageneiosus vittatus			1					
Brachyplatystoma vaillanti		1						
Hypoptopoma gulare		1						
Hypostomus krikati	1							
Hypostomus vaillanti		1						
Hypostomus velhomonge	1							
Peckoltia greedoi			1					
Pimelodus maculatus			1					
Pseudoplatystoma fasciatum			1					
Sciades couma			1					
Sturisoma rostratum		1						
Cichliformes								**1**
Geophagus sveni		1						
Lugubria marmorata					0			
Saxatilia brasiliensis					0			
Acanthuriformes								**1**
Pachypops fourcroi			1					
Tetraodontiformes								**0**
Sphoeroides psittacus					0			
	6	11	10	-1	0	0	0	

The aim of this list of species of freshwater fishes is to provide an updated supplement to the 'Checklist of the Freshwater Fishes of Maranhão, Brazil. (CLOFFBR-MA)' published by Koerber et al. (2022).
Only those species are listed here that have not been included in that paper or which have undergone systematical changes since then. Changes in this sense may be new species, synonymies, revalidations, new combinations, first records etc., every factor which might modify the data published at present. New evidence-based records refer to species listed in CLOFFBR-MA with 'listing' or 'locality', yet lacking any published specimens.
Information already provided in CLOFFBR-MA is not repeated herein.This list is not a publication in the sense of the 'Code' (ICZN) and expressions as 'sp.nov.' or 'comb.nov.' etc. are only used to highlight changes in comparison with the original CLOFFBR-MA.

class A C T I N O P T E R I

order **CLUPEIFORMES**

family **Pristigasteridae**

Pellona Valenciennes, 1847

P. castelnaeana Valenciennes, 1847
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

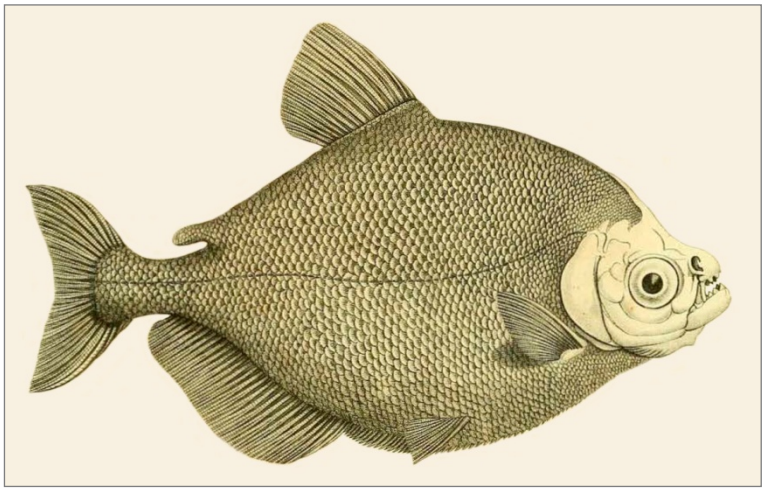
order **CHARACIFORMES**

family **Serrasalmidae**

subfamily Colossomatinae

Mylossoma Eigenmann & Kennedy, 1903

M. duriventre (Cuvier, 1818)
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)



Myletes duriventris Cuvier, 1818
Cuvier, pl. 22, fig. 2

subfamily Serrasalminae

Serrasalmus Lacepède, 1803

S. eigenmanni Norman, 1929
evidence-based confirmation for Maranhão from the Turiaçu basin
published in Limeira-Filho et al. (2023)

S. spilopleura Kner, 1858
first record for Maranhão from the Litoral Ocidental
published in Limeira-Filho et al. (2023)

family **Anostomidae**

Leporinus Agassiz, 1829

L. venerei Britski & Birindelli, 2008
first record for Maranhão from the Tocantins river basin
published in Nascimento et al. (2023)

family **Acestrorhynchidae**

subfamily Acestrorhynchinae

Acestrorhynchus Eigenmann & Kennedy, 1903

A. lacustris (Lütken, 1875)
evidence-based confirmation for Maranhão from the Mearim and Turiaçu river basins
published in Limeira-Filho et al. (2023)

A. microlepis (Jardine, 1841)
first record for Maranhão from the Turiaçu basin
published in Limeira-Filho et al. (2023)

family **Characidae**

subfamily Stethaprioninae

tribus Stethaprionini

Hemigrammus Gill, 1858

H. brevis Ellis, 1911
first record for Maranhão from the Parnaíba basin
published in Silva et al. (2023)

Moenkhausia Eigenmann, 1903

M. dichroura (Kner, 1858)
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

M. loweae Géry, 1992
first record for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

subfamily Stevardiinae

tribus Diapomini

Knodus Eigenmann, 1911

K. guajajara Aguiar, Brito, Ottoni & Guimarães, 2022
sp.nov. from the Mearim and Munim river basins in Maranhão
published in Aguiar et al. (2022)

K. savannensis Géry, 1961
first record for Maranhão from the Tocantins river basin
published in Aguiar et al. (2022)

order **GYMNOTIFORMES**

family **Sternopygidae**

Eigenmannia Jordan & Evermann, 1896

E. bumba Dutra, Ramos & Menezes, 2022
sp.nov. from the Mearim river basin in Maranhão
published in Dutra et al. (2022)

E. cacuria Dutra, Ramos & Menezes, 2022
sp.nov. from the Parnaíba river basin in Maranhão

published in Dutra et al. (2022)

E. robsoni Dutra, Ramos & Menezes, 2022
sp.nov. from the Parnaíba river basin in Maranhão
published in Dutra et al. (2022)

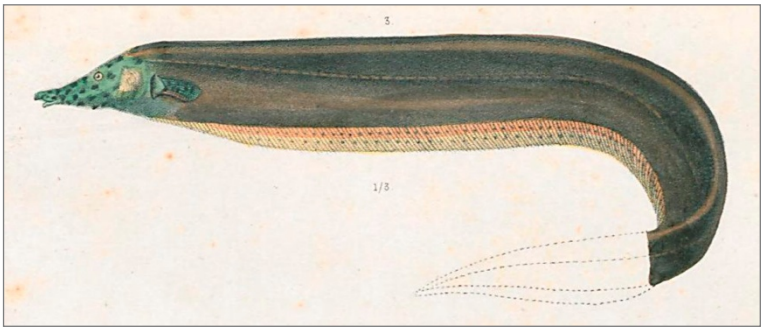
Sternopygidae - species considered not to be distributed in Maranhão

Sternarchus virescens Valenciennes, 1842 | in CLOFFBR-MA sub *Eigenmannia virescens* | Dutra et al. (2022)

family **Rhamphichthyidae**

Rhamphichthys Müller & Troschel, 1846

R. pantherinus Castelnau, 1855
Rhamphichthys atlanticus is a jr. synonym
published in Carvalho & Albert (2023)



Rhamphichthys pantherinus Castelnau, 1855
Castelnau, pl. 46, fig. 3

order **SILURIFORMES**

family **Loricariidae**

subfamily Loricariinae

tribus Farlowellini

Sturisoma Swainson, 1838

S. rostratum (Spix & Agassiz, 1829)
first record for Maranhão from the Mearim river basin
published in Londoño-Burbano & Britto (2022)

Loricaria rostrata Spix & Agassiz, 1829
Spix & Agassiz, pl. 3, fig. 1

subfamily Hypoptopomatinae

tribus Hypoptopomatini

Hypoptopoma Günther, 1868

H. gulare Cope, 1878
first record for Maranhão from the Itapecuru river basin
published in Reis & Lehmann (2022)

subfamily Hypostominae

tribus Hypostomini

Hypostomus Lacepède, 1803

H. krikati Oliveira, Guimarães, Brito & Ottoni, 2022
sp.nov. from the Mearim river basin in Maranhão
published in Oliveira et al. (2022)

H. vaillanti (Steindachner, 1877)
first record for Maranhão from the Parnaíba river basin
published in Lustosa-Costa et al. (2022)

H. velhomonge Lustosa-Costa, Ramos, Zawadzki & Lima, 2022
sp.nov. from the Parnaíba river basin in Maranhão
published in Lustosa-Costa et al. (2022)

tribus *Peckoltia* clade

Peckoltia Miranda Ribeiro, 1912

P. greedoi Armbruster, Werneke & Tan, 2015
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

family **Auchenipteridae**

subfamily Auchenipterinae

tribus Ageneiosini

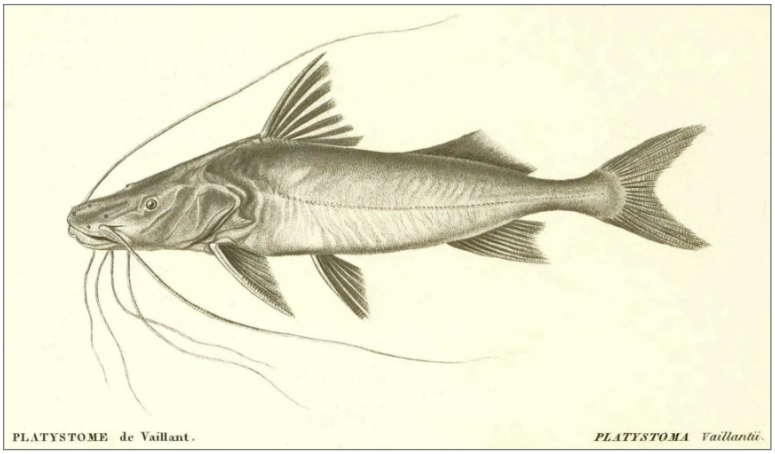
Ageneiosus Lacepède, 1803

A. vittatus Steindachner, 1908
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

family **Pimelodidae**

Brachyplatystoma Bleeker, 1862

B. vaillantii (Valenciennes, 1840)
first record for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)



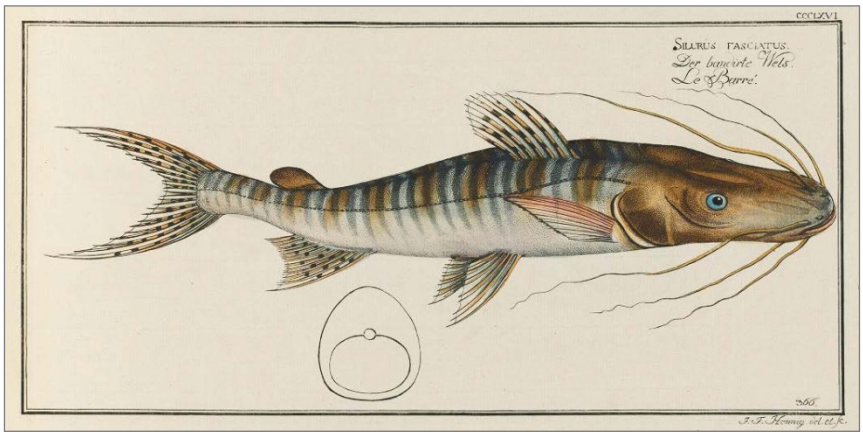
Platystoma vaillantii Valenciennes, 1840
Cuvier & Valenciennes, pl. 423

Pimelodus Lacepède, 1803

P. maculatus Lacepède, 1803
evidence-based confirmation for Maranhão from the Parnaíba basin
published in Silva et al. (2023)

Pseudoplatystoma Bleeker 1862

P. fasciatum (Linnaeus, 1766)
evidence-based confirmation for Maranhão from the Munim basin
published in Vieira et al. (2023)



Silurus fasciatus Linnaeus, 1766
Bloch, pl. 366

family **Ariidae**

subfamily Ariinae

Sciades Müller & Troschel, 1849

S. couma (Valenciennes, 1840)
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

order **CICHLIFORMES**

family **Cichlidae**

subfamily Cichlinae

tribus Geophagini

Geophagus Heckel, 1840

G. sveni Lucinda, Lucena & Assis, 2010
first record for Maranhão from the Tocantins river basin
published in Chuctaya et al. (2022)

Lugubria Varella, Kullander, Menezes, Oliveira & Lopez-Fernandez, 2023

L. marmorata (Pellegrin, 1904)
comb.nov. from *Crenicichla*
published in Varella et al. (2023)

Saxatilia Varella, Kullander, Menezes, Oliveira & Lopez-Fernandez, 2023

S. brasiliensis (Bloch, 1792)
comb.nov. from *Crenicichla*
published in Varella et al. (2023)

order **TETRAODONTIFORMES**

family **Tetraodontidae**

Sphoeroides Anonymous [Lacepède], 1798

S. psittacus (Bloch & Schneider, 1801)
comb.nov. from *Colomesus*
published in Araujo et al. (2023)

order **ACANTHURIFORMES**

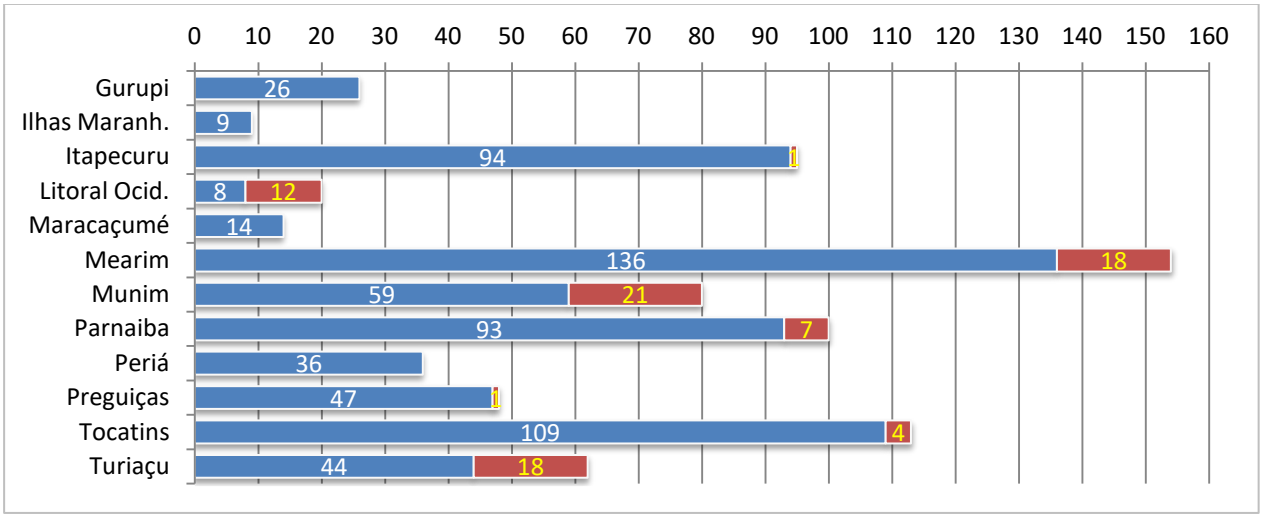
family **Sciaenidae**

Pachypops Gill, 1861

P. fourcroi (Lacepède, 1802)
evidence-based confirmation for Maranhão from the Mearim basin
published in Limeira-Filho et al. (2023)

Updates on Maranhão's ichthyofauna by river basin

As researchers investigate the ichthyofaunal composition of individual rivers basins, below we provide the changes for each river basin which above have been listed for the complete state. As in the first part, also here only unequivocal and reproducible reports, based on voucher specimens, have been included.
The concepts of 'new species' and 'first record' do not need to be explained, while the parameter of 'first evidence' requires a comment. Those are the species which in CLOFFBR-MA have been indicated for this river basin only based on mere listings or indicated localities, but no published specimens had been known from this very basin.



Development of species known from each of Maranhão's river basins. Numbers of species from the original CLOFFBR-MA in blue, additions from the present update in red.

The composition of the below list per basin was not as simple as it does appear on a first sight, as authors do not use the same standards, what in several cases caused confusion and additional work:
1. Limeira-Filho et al. (2023) in their list applied the abbreviation PER to the Pericumã river, despite the fact that in the map of Maranhão's hydrological systems published by the UEMA and used for CLOFFBR-MA (page 4), PER had been used for the Periá river. The Pericumã is located in the Litoral Ocidental and therefor enters in the area of LIT in that map and thus, also in CLOFFBR-MA and the present update.

2. In their study on the Parnaíba river Silva et al. (2023) erroneously indicated their locality 32 to be situated in the state of Piauí. As the Sussuapara Waterfall at the given geographical position is located well within the territory of Maranhão we have considered the species obtained at this locality for the present update.
3. If an editor of a journal allows authors to make reference to a supplementary document, then the editor should check if this file is in fact available in the moment of publication; either at the journal's web page or under a provided link as mentioned in the final version of a manuscript. The authors should be compliant with the readers, an editor must be.

GUR: Gurupi

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IMA: Ilhas Maranhenses

-

ITA: Itapecuru

Hypoptopoma gulare	first record	Reis & Lehmann (2022)
Leporinus piau	first evidence	Nascimento et al. (2023)

LIT: Pericumã

Aequidens tetramerus	first record	Limeira-Filho et al. (2023)
Astyanax bimaculatus	first evidence	Limeira-Filho et al. (2023)
Callichthys callichthys	first record	Limeira-Filho et al. (2023)
Cichlasoma zarskei	first record	Limeira-Filho et al. (2023)
Gymnotus carapo	first record	Limeira-Filho et al. (2023)
Hoplerythrinus unitaeniatus	first record	Limeira-Filho et al. (2023)
Hoplias malabaricus	first evidence	Limeira-Filho et al. (2023)
Leporinus friderici	first record	Limeira-Filho et al. (2023)
Leporinus piau	first record	Limeira-Filho et al. (2023)
Prochilodus lacustris	first record	Limeira-Filho et al. (2023)
Rhamdia quelen	first record	Limeira-Filho et al. (2023)
Serrasalmus spilopleura	first record	Limeira-Filho et al. (2023)
Steindachnerina notonota	first record	Limeira-Filho et al. (2023)
Sternopygus macrurus	first record	Limeira-Filho et al. (2023)
Trachelyopterus galeatus	first evidence	Limeira-Filho et al. (2023)

MAR: Maracaçumé

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MEA: Mearim (incl. Pindaré)

Acestrorhynchus lacustris	first record	Limeira-Filho et al. (2023)
Ageneiosus inermis	first evidence	Limeira-Filho et al. (2023)
Ageneiosus vittatus	first record	Limeira-Filho et al. (2023)
Apteronotus albifrons	first record	Limeira-Filho et al. (2023)
Brachyplatystoma vaillantii	first record	Limeira-Filho et al. (2023)
Colossoma macropomum	first record	Limeira-Filho et al. (2023)
Corydoras treitlii	first record	Limeira-Filho et al. (2023)
Eigenmannia bumba	new species	Dutra et al. (2022)
Hypostomus krikati	new species	Oliveira et al. (2022)
Knodus guajajara	new species	Aguiar et al. (2022)
Leporinus piau	first record	Nascimento et al. (2023)
Moenkhausia dichroura	first evidence	Limeira-Filho et al. (2023)
Moenkhausia loweae	first record	Limeira-Filho et al. (2023)

Mylossoma duriventre	first record	Limeira-Filho et al. (2023)
Pachypops fourcroi	first record	Limeira-Filho et al. (2023)
Peckoltia greedoi	first record	Limeira-Filho et al. (2023)
Pellona castelnaeana	first record	Limeira-Filho et al. (2023)
Pimelodella cristata	first evidence	Limeira-Filho et al. (2023)
Potamotrygon orbignyi	first record	Limeira-Filho et al. (2023)
Sciades couma	first record	Limeira-Filho et al. (2023)
Sturisoma rostratum	first record	Londoño-Burbano & Britto (2022)

MUN: Munim

Acestrorhynchus falcatus	first evidence	Vieira et al. (2023)
Aequidens tetramerus	first evidence	Vieira et al. (2023)
Anchovia surinamensis	first record	Vieira et al. (2023)
Apteronotus albifrons	first evidence	Vieira et al. (2023)
Auchenipterus menezesi	first record	Vieira et al. (2023)
Colossoma macropomum	first record	Vieira et al. (2023)
Copella arnoldi	first record	Vieira et al. (2023)
Corydoras julii	first record	Vieira et al. (2023)
Corydoras vittatus	first record	Vieira et al. (2023)
Cynodon gibbus	first evidence	Vieira et al. (2023)
Eigenmannia robsoni	first record	Vieira et al. (2023)
Geophagus parnaibae	first evidence	Vieira et al. (2023)
Hassar affinis	first evidence	Vieira et al. (2023)
Hemiodontichthys acipenserinus	first evidence	Vieira et al. (2023)
Hemiodus parnaguae	first evidence	Vieira et al. (2023)
Hemisorubim platyrhynchos	first evidence	Vieira et al. (2023)
Hoplosternum littorale	first record	Vieira et al. (2023)
Hypoptopoma incognitum	first record	Vieira et al. (2023)
Knodus guajajara	new species	Aguiar et al. (2022)
Leporinus friderici	first evidence	Vieira et al. (2023)
Loricariichthys derbyi	first record	Vieira et al. (2023)
Metynnis lippincottianus	first evidence	Vieira et al. (2023)
Myloplus rubripinnis	first record	Vieira et al. (2023)
Oreochromis niloticus	first record	Vieira et al. (2023)
Pimelodus blochii	first record	Vieira et al. (2023)
Pimelodus ornatus	first evidence	Vieira et al. (2023)
Platydoras brachylecis	first evidence	Vieira et al. (2023)
Poptella compressa	first evidence	Vieira et al. (2023)
Prochilodus lacustris	first evidence	Vieira et al. (2023)
Psectrogaster rhomboides	first evidence	Vieira et al. (2023)
Psellogrammus kennedyi	first record	Vieira et al. (2023)
Pseudobunocephalus timbira	first record	Vieira et al. (2023)
Pseudoplatystoma fasciatum	first record	Vieira et al. (2023)
Pygocentrus nattereri	first evidence	Vieira et al. (2023)
Rhamdia quelen	first record	Vieira et al. (2023)
Rhamphichthys pantherinus	first evidence	Vieira et al. (2023) sub *R. atlanticus*
Roeboides margareteae	first evidence	Vieira et al. (2023)
Roeboides sazimai	first evidence	Vieira et al. (2023)
Satanoperca jurupari	first evidence	Vieira et al. (2023)
Schizodon dissimilis	first evidence	Vieira et al. (2023)
Serrasalmus rhombeus	first record	Vieira et al. (2023)
Sorubim lima	first evidence	Vieira et al. (2023)
Tatia intermedia	first record	Vieira et al. (2023)
Tetragonopterus argenteus	first record	Vieira et al. (2023)
Trachelyopterus galeatus	first evidence	Vieira et al. (2023)

Triportheus signatus	first evidence	Vieira et al. (2023)

PAR: Parnaíba

Aequidens tetramerus	first record	Silva et al. (2023)
Bryconops melanurus	first evidence	Silva et al. (2023)
Caenotropus labyrinthicus	first evidence	Silva et al. (2023)
Characidium zebra	first evidence	Silva et al. (2023)
Cichlasoma sanctifranciscense	first evidence	Silva et al. (2023)
Eigenmannia cacuria	new species	Dutra et al. (2022)
Eigenmannia robsoni	new species	Dutra et al. (2022)
Hemigrammus brevis	first record	Silva et al. (2023)
Hemigrammus rodwayi	first evidence	Silva et al. (2023)
Hoplerythrinus unitaeniatus	first evidence	Silva et al. (2023)
Hypostomus vaillanti	first record	Lustosa-Costa et al. (2022)
Hypostomus velhomonge	new species	Lustosa-Costa et al. (2022)
Leporinus piau	first evidence	Nascimento et al. (2023)
Pimelodella parnahybae	first evidence	Silva et al. (2023)
Pimelodus maculatus	first record	Silva et al. (2023)
Triportheus signatus	first evidence	Silva et al. (2023)

PER: Periá

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PRE: Preguiças

Leporinus piau	first record	Nascimento et al. (2023)

TOC: Tocantins

Aspidoras raimundi	first record	Tencatt et al. (2022)
Geophagus sveni	first record	Chuctaya et al. (2022)
Knodus savannensis	first record	Aguiar et al. (2022)
Leporinus veneri	first record	Nascimento et al. (2023)

TUR: Turiaçu

Acestrorhynchus lacustris	first record	Limeira-Filho et al. (2023)
Acestrorhynchus microlepis	first record	Limeira-Filho et al. (2023)
Auchenipterus menezesi	first record	Limeira-Filho et al. (2023)
Cichlasoma zarskei	first record	Limeira-Filho et al. (2023)
Geophagus parnaibae	first evidence	Limeira-Filho et al. (2023)
Hemiodus parnaguae	first evidence	Limeira-Filho et al. (2023)
Hemisorubim platyrhynchos	first record	Limeira-Filho et al. (2023)
Hoplerythrinus unitaeniatus	first record	Limeira-Filho et al. (2023)
Hoplias malabaricus	first evidence	Limeira-Filho et al. (2023)
Hypostomus krikati	first record	Limeira-Filho et al. (2023)
Loricariichthys derbyi	first record	Limeira-Filho et al. (2023)
Megalops atlanticus	first record	Limeira-Filho et al. (2023)
Metynnis lippincottianus	first evidence	Limeira-Filho et al. (2023)
Pimelodella parnahybae	first record	Limeira-Filho et al. (2023)
Pimelodus blochii	first evidence	Limeira-Filho et al. (2023)
Pimelodus ornatus	first record	Limeira-Filho et al. (2023)
Platydoras brachylecis	first evidence	Limeira-Filho et al. (2023)
Poptella compresa	first record	Limeira-Filho et al. (2023)
Prochilodus lacustris	first evidence	Limeira-Filho et al. (2023)
Psectrogaster rhomboides	first record	Limeira-Filho et al. (2023)
Pseudoplatystoma punctifer	first evidence	Limeira-Filho et al. (2023)

Rhamdia quelen	first record	Limeira-Filho et al. (2023)
Rhamphichthys pantherinus	first record	Limeira-Filho et al. (2023)
Saxatilia brasiliensis	first record	Limeira-Filho et al. (2023)
Serrasalmus eigenmanni	first record	Limeira-Filho et al. (2023)
Serrasalmus rhombeus	first evidence	Limeira-Filho et al. (2023)
Tetragonopterus argenteus	first record	Limeira-Filho et al. (2023)
Trachelyopterus galeatus	first evidence	Limeira-Filho et al. (2023)
Triportheus signatus	first evidence	Limeira-Filho et al. (2023)

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