

**Supplementary material**

**Long-term study of reservoir cascade in south-eastern Brazil reveals spatio-temporal gradient in fish assemblages**

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**Table S1. Non-native species detected during monitoring-program sampling, 1993–2015, in Araguari cascade system**

Trophic guilds were determined on the basis of literature review to perform a distance-based linear model (DistLM)

Species	Herbivorous	Invertivorous	Omnivorous	Piscivorous	Reference
<i>Cichla kelberi</i>				X	Gomiero and Braga 2008
<i>Cichla piquiti</i>				X	Gomiero and Braga 2008
<i>Cichla</i> spp.				X	Gomiero and Braga 2008
<i>Coptodon rendalli</i>			X		Luz-Agostinho <i>et al.</i> 2006
<i>Cyprinus carpio</i>			X		Kloskowski 2011
<i>Leporinus macrocephalus</i>	X				Pavanelli <i>et al.</i> 2007
<i>Metynnis lippincottianus</i>	X				de Aquino Moreira <i>et al.</i> 2010
<i>Metynnis maculatus</i>	X				Rêgo 2008
<i>Micropterus salmoides</i>				X	Sanches and Rodrigues 2011
<i>Oreochromis niloticus</i>			X		Luz-Agostinho <i>et al.</i> 2006
<i>Pygocentrus nattereri</i>				X	Rêgo 2008
<i>Satanoperca pappaterra</i>		X			Hahn <i>et al.</i> 2004
<i>Serrasalmus marginatus</i>				X	Hahn <i>et al.</i> 2004
<i>Triportheus nematurus</i>		X			Vidotto-Magnoni and Carvalho 2009

**Table S2. Correlation results between the variables considered in distance-based linear model (DistLM) analysis**

Age, time after reservoir filling (years); area, reservoir area (km<sup>2</sup>); position, ordination of reservoirs in the cascade and trophic guilds of non-native fish species. *P*-values are displayed in the upper part of the matrix and correlation coefficients in the bottom part. Bold correlations are significant (*P* < 0.05)

Variable	Age	Area	Position	Piscivorous	Herbivorous	Omnivorous	Invertivorous
Age		<b>0.000</b>	<b>0.000</b>	0.327	0.967	0.908	<b>0.011</b>
Area	<b>0.640</b>		0.513	0.571	<b>0.029</b>	0.265	0.123
Position	<b>0.463</b>	0.063		<b>0.010</b>	0.086	0.056	<b>0.000</b>
Piscivorous	0.094	-0.054	<b>0.309</b>		<b>0.008</b>	0.525	<b>0.000</b>
Herbivorous	0.004	-0.207	0.164	<b>0.250</b>		0.289	0.413
Omnivorous	-0.011	0.107	-0.182	-0.061	-0.102		0.391
Invertivorous	<b>0.241</b>	0.147	<b>0.458</b>	<b>0.428</b>	0.079	-0.082	

**Table S3. Species recorded by long-term monitoring, from 1993 to 2015, in the Araguari reservoir cascade system**

Threatened-species categories were indicated for Brazil and Minas Gerais State (MG): VU, vulnerable; EN, endangered; CR, critically endangered

Number	Taxon	Common name	Origen	Threatened species	Migratory
	Cypriniformes				
1	<i>Cyprinus carpio</i> Linnaeus, 1758	Carpa	Non-native	No	No
	Characiformes				
	Acestrorhynchidae				
2	<i>Acestrorhynchus lacustris</i> (Lütken, 1875)	Peixe-cachorro	Native	No	No
	Anostomidae				
3	<i>Leporellus vittatus</i> (Valenciennes, 1850)	Solteira	Native	No	No
4	<i>Leporinus amblyrhynchus</i> Garavello & Britski, 1987	Piau, timburé	Native	No	No
5	<i>Leporinus friderici</i> (Bloch, 1794)	Piau-três-pintas	Native	No	Yes
6	<i>Leporinus octofasciatus</i> Steindachner, 1915	Ferreirinha, flamenguinho	Native	No	No
7	<i>Leporinus</i> sp.	Piau	–	–	–
8	<i>Leporinus striatus</i> Kner, 1858	Piau-listrado	Native	No	No
9	<i>Megaleporinus macrocephalus</i> Garavello & Britski, 1988	Piaussu, piavuçu	Non-native	No	Yes
10	<i>Megaleporinus obtusidens</i> (Valenciennes, 1836)	Piapara	Native	No	Yes
11	<i>Schizodon nasutus</i> kner, 1858	Taguara, ximboré	Native	No	No
	Characidae				
12	<i>Astyanax altiparanae</i> Garutti & Britski, 2000	Lambari-do-rabo-amarelo, tambiu	Native	No	No
13	<i>Astyanax bockmanni</i> Vari & Castro, 2007	Lambari	Native	No	No
14	<i>Astyanax fasciatus</i> (Cuvier, 1819)	Lambari-do-rabo-vermelho	Native	No	No
15	<i>Astyanax paranae</i> Eigenmann, 1914	Lambari	Native	No	No
16	<i>Brycon nattereri</i> Günther, 1864	Pirapitinga	Native	VU (Brazil) & EN (MG)	No
17	<i>Brycon orbignyanus</i> (Valenciennes, 1850)	Piracanjuba, piracanjuba	Native	EN (Brazil) & CR (MG)	Yes
18	<i>Galeocharax knerii</i> (Steindachner, 1879)	Peixe-cadela, peixe-cigarra	Native	No	No
19	<i>Metynnis lippincottianus</i> (Cope, 1870)	Pacu-marreca	Non-native	No	No
20	<i>Metynnis maculatus</i> (Kner, 1858)	Pacu-cd, pacu-peva	Non-native	No	No
21	<i>Myloplus tiete</i> (Eigenmann & Norris, 1900)	Pacu-prata, pacu-peva	Native	VU (Brazil) & EN (MG)	No
22	<i>Piabina argentea</i> Reinhardt, 1867	Lambari, piaba, piquira	Native	No	No
23	<i>Piaractus mesopotamicus</i> (Holmberg, 1887)	Pacu-caranha, pacu	Native	No	Yes
24	<i>Planaltina myersi</i> Böhlke, 1954		Native	No	No
25	<i>Pygocentrus nattereri</i> kner, 1858	Piranha	Non-native	No	No
26	<i>Salminus brasiliensis</i> (Cuvier, 1816)	Dourado	Native	No	Yes

Number	Taxon	Common name	Origen	Threatened species	Migratory
27	<i>Salminus hilarii</i> Valenciennes, 1850	Tabarana	Native	No	Yes
28	<i>Serrasalmus maculatus</i> kner, 1858	Piranha, pirambeba	Native	No	No
29	<i>Serrasalmus marginatus</i> Valenciennes, 1837	Piranha	Non-native	No	No
30	<i>Triportheus nematurus</i> (Spix & Agassiz, 1829)	Sardinha	Non-native	No	No
	Curimatidae				
31	<i>Cyphocharax modestus</i> (Fernández-Yépez, 1948)	Branquinha, saguiru	Native	No	No
32	<i>Cyphocharax nagelii</i> (Steindachner, 1881)	Branquinha, saguiru	Native	No	No
33	<i>Steindachnerina insculpta</i> (Fernández-Yépez, 1948)	Branquinha, saguiru	Native	No	No
	Erythrinidae				
34	<i>Hoplias intermedius</i> (Günther, 1864)	Lobó, traíra, trairão	Native	No	No
35	<i>Hoplias malabaricus</i> (Bloch, 1794)	Lobó, traíra	Native	No	No
	Parodontidae				
36	<i>Apareiodon piracicabae</i> (Eigenmann, 1907)	Canivete, charuto, durinho	Native	No	No
37	<i>Parodon nasus</i> Kner, 1859	Canivete, charuto, durinho	Native	No	No
	Prochilodontidae				
38	<i>Prochilodus lineatus</i> (Valenciennes, 1837)	Curimba, curimbatá	Native	No	Yes
	Gymnotiformes				
	Gymnotidae				
39	<i>Gymnotus sylvius</i> Albert & Fernandes-Matioli, 1999	Tuvira	Native	No	No
	Sternopygidae				
40	<i>Eigenmannia virescens</i> (Valenciennes, 1836)	Espadinha	Native	No	No
	Siluriformes				
	Auchenipteridae				
41	<i>Trachelyopterus galeatus</i> (Linnaeus, 1766)	Babão, cangati	Native	No	No
	Callichthyidae				
42	<i>Hoplosternum littorale</i> (Hancock, 1828)	Caborja, tamboatá, tamoatá	Native	No	No
	Doradidae				
43	<i>Rhinodoras dorbignyi</i> (Kner, 1855)	Abotoado, armado	Native	No	No
	Heptapteridae				
44	<i>Pimelodella</i>	–	Native	–	No
45	<i>Pimelodella gracilis</i> (Valenciennes, 1835)	Mandi-chorão	Native	No	No
46	<i>Rhamdia quelen</i> (Quoy & Gaimard, 1824)	Bagre, jundiá	Native	No	No
	Loricariidae				
47	<i>Hypostomus margaritifer</i> (Regan, 1908)	Cascudo, acari	Native	No	No
48	<i>Hypostomus regani</i> (Ihering, 1905)	Cascudo-chita, cascudo-chitão	Native	No	No

Number	Taxon	Common name	Origen	Threatened species	Migratory
49	<i>Hypostomus</i> spp.	Cascudo	Native	–	No
50	<i>Hypostomus strigaticeps</i> (Regan, 1908)	Cascudo	Native	No	No
51	<i>Megalancistrus parananus</i> (Peters, 1881)	Cascudo-abacaxi	Native	No	No
52	<i>Rineloricaria latirostris</i> (Boulenger, 1900)	Cascudo-chinelo	Native	No	No
	Pimelodidae				
53	<i>Iheringichthys labrosus</i> (Lütken, 1874)	Mandi-beiçudo, mandi-bicudo	Native	No	No
54	<i>Pimelodus maculatus</i> Lacepède, 1803	Mandi, mandi-amarelo	Native	No	Yes
55	<i>Pimelodus microstoma</i> Steindachner, 1877	Mandi	Native	No	No
56	<i>Pimelodus paranaensis</i> Britski & Langeani, 1988	Mandi	Native	No	No
57	<i>Pinirampus pirinampu</i> (Spix & Agassiz, 1829)	Barbado	Native	No	Yes
58	<i>Pseudoplatystoma corruscans</i> (Spix & Agassiz, 1829)	Pintado	Native	No	Yes
59	<i>Zungaro jahu</i> (Ihering, 1898)	Jaú	Native	CR (MG)	Yes
	Pseudopimelodidae				
60	<i>Pseudopimelodus mangurus</i> (Valenciennes, 1835)	Bagre-sapo, pacamã	Native	No	No
	Perciformes				
	Centrarchidae				
61	<i>Micropterus salmoides</i> (Lacepède, 1802)	Black bass	Non-native	No	No
	Cichlidae				
62	<i>Australoheros facetus</i> (Jenyns, 1842)	Acará	Native	No	No
63	<i>Cichla kelberi</i> Kullander & Ferreira, 2006	Tucunará-amarelo	Non-native	No	No
64	<i>Cichla piquiti</i> Kullander & Ferreira, 2006	Tucunará-azul	Non-native	No	No
65	<i>Cichla</i> spp.	Tucunará	Non-native	–	No
66	<i>Cichlasoma paranaense</i> Kullander, 1983	Acará, cará	Native	No	No
67	<i>Cichlasoma</i> spp.	Acará	–	–	No
68	<i>Coptodon rendalli</i> (Boulenger, 1897)	Tilápia	Non-native	No	No
69	<i>Crenicichla jaguarensis</i> Haseman, 1911	Joaninha	Native	No	No
70	<i>Geophagus brasiliensis</i> (Quoy & Gaimard, 1824)	Acará, cará	Native	No	No
71	<i>Oreochromis niloticus</i> (Linnaeus, 1758)	Tilápia	Non-native	No	No
72	<i>Satanoperca pappaterra</i> (Heckel, 1840)	Acará, cará, zoiúdo	Non-native	No	No

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