Ornamental fish of economic and biological importance to the Xingu River

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(With 1 figure)

The deployment of the Belo Monte's Hydroelectric Power Plant, in the state of Pará, influences and makes changes to the river flow and hydrological cycle in the area, which reflects in the decrease of fish populations (Eletrobras, 2008).

In the city of Altamira, over 200 species of fish are traded as ornamentals (Carvalho Junior et al., 2009). The increase of the market value leads to increased selective fishing and consecutively to overfishing. Furthermore, environmental changes imply major social changes, since a large part of the local population depends on ornamental fishery as a source of income. While Brazil does not develop protocols for the commercial production of ornamental fish, these populations live off extractive fishing. On the other hand in Asian countries, considered major importers, technological advances have been recorded in aquaculture for several Brazilian species of high commercial value, such as stingrays (Potamotrygonidae) and several species of plecos (Loricariidae), among them the zebra pleco (Chapman, 2000; Ribeiro et al., 2009). Hence, a loss in profits for Brazil can be observed.

Thus the choice of species for ornamental fish farming should consider biological characteristics such as reproductive and dietary habits, requirements for the creation of eggs and larvae.

This paper aims to select priority species for research to enable the development of species of ornamental interest from the Xingu region of cultivation technologies.

The indices of species selection were based on biological and zootechnical aspects. Furthermore, due to peculiar characteristics of ornamental fishes, characteristics described by Kodama et al. (2011) were also considered, such as market demand, value marketing, zootechnical aspects of species and the available production technology.

Thus the indexes were divided into 2 groups: Biological/zootechnical: abundance, distribution, reproductive potential, the rusticity of captive conditions, capacity to form groups and couples, reproductive and stocking density, and Economic/ecologic: market value and conservation status.

Ninety-four species of fish from the Xingu were used, distributed in twelve families occurring in the ornamental market, which were classified according to the index, bibliography and collected information of the actors in the productive chain of ornamental fish, followed by a Marketplace analysis. Each index received grades: high, medium and low. After this step, we constructed a feasibility matrix, a tool developed using Fuzzy logic, because of uncertainties in the dynamics of the ornamental market and the lack of biological information on the species of ornamental fish from the Xingu River (Shaw and Simões, 1999).

The selection of priority species for research was restricted to three main fish families, based on the interests of local fishermen and exporters: Loricariidae (Table 1), Potamotrygonidae and Cichlidae (Table 2).

Based on the array (Figure 1) of five species, one species of Potamotrygonidae (*Potamotrygon leopoldi*) and two species of Cichlidae (*Crenicichla regani* and *Teleocichla* spp) were chosen from the family loricariidae (*Hypancistrus zebra*, *Hypancistrus* sp2, *Baryancistrus xanthelus*, *Scobinancistrus* sp3 and *Ancistrus* sp4).

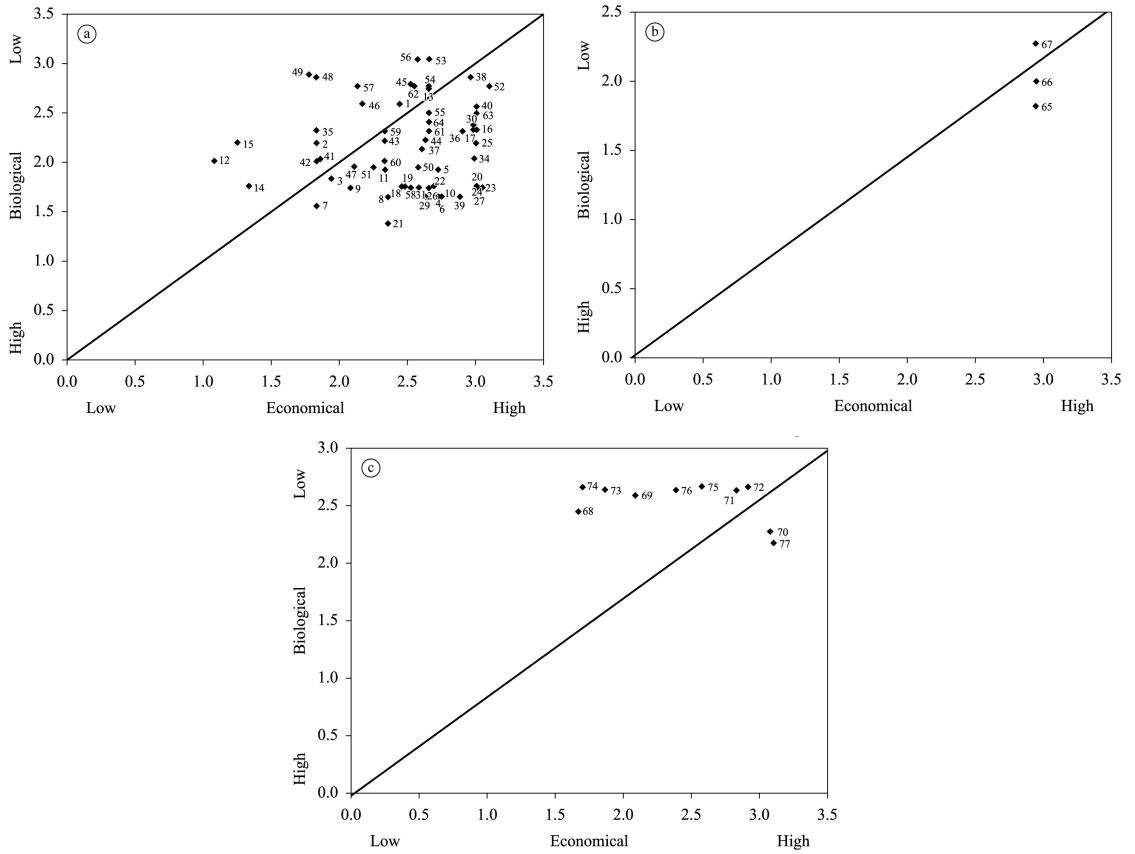

Figure 1. Ranking higher priority species for aquaculture research. Distributed family: Loricariidae (a); Potamotrygonidae (b) and Cichlid (c).

Table 1. List of the species assessed from the family Loricariidae.

Number	Species	L-Number	Number	Species	L-Number
1	*Acanthicus hystrix* (Spix and Agassiz, 1829)	L155	33	*Loricaria cataphracta* (Linnaeus 1758)	?
2	*Ancistrus ranuculus* (Müller, Rapp Py-Daniel and Zuanon 1994)	L034	34	New genus similar to Scobinancistrus	L082
3	*Ancistrus* sp1	L100	35	*Oligancistrus punctatissimus* (Steindachner 1882)	L016, L030
4	*Ancistrus* sp2	?	36	*Oligancistrus* sp1	L354
5	*Ancistrus* sp3	?	37	*Oligancistrus* sp2	L020
6	*Ancistrus* sp4	?	38	*Otocinclus hasemani* (Steindachner 1915)	?
7	Baryancistrus aff longipinnis	L019	39	*Panaque aff armbrusteri* (Lujan, Hidalgo and Stewart 2010)	L027
8	*Baryancistrus chrysolomus* (Rapp Py-Daniel, Oliveira and Zuanon 2011)	L047	40	Panaque aff. Nigrolineatus	?
9	*Baryancistrus niveatus* (Castelnau 1855)	L026	41	*Panaque* sp1	L002, L074
10	*Baryancistrus* sp	?	42	*Parancistrus aurantuacus* (Castelnau 1855)	L056
11	*Baryancistrus xanthelus* (Rapp Py-Daniel, Oliveira and Zuanon 2011)	L018, L081, L085, L177	43	*Parancistrus nudiventris* (Rapp Py-Daniel and Zuanon 2005)	L031, L176, L300, LDA 004

? No valid description. (L-Number) classification Aqualog company used by the hobbyist and trade.

Table 1. Continued...

Number	Species	L-Number	Number	Species	L-Number
12	*Farlowella smithi* (Fowler 1913)	?	44	*Parotocinclus* sp	?
13	*Hemiodontichthys acipenserinus* (Kner 1853)	?	45	Peckoltia compta	L134
14	*Hopliancistrus* sp1	L017	46	*Peckoltia sabaji* (Armbruster 2003)	L075, L124, L301
15	*Hopliancistrus tricornis* (Isbrücker and Nijssen 1989)	L212	47	*Peckoltia* sp1	L012, L013
16	*Hypancistrus* "complexo pão"	L236 iriri	48	*Peckoltia vittata* (Steindachner 1882)	L015
17	*Hypancistrus* "complexo pão"	L287 Xingu	49	*Pseudansitrus* sp	L067
18	*Hypancistrus* "complexo pão"	L173 Xingu	50	*Pseudacanthicus* sp1	L025
19	*Hypancistrus* "complexo pão"	L250 Iriri	51	*Pseudacanthicus* sp2	L185
20	*Hypancistrus* "complexo pão"	Baixo Xingu	52	Pseudancistrus barbatus	?
21	*Hypancistrus* sp1	L066	53	*Pseudoloricaria laeviuscula* (Valenciennes 1840)	?
22	*Hypancistrus* sp2	L174	54	*Pterygoplichthys lituratus* (Kner 1854)	L196
23	*Hypancistrus zebra* (Isbrücker and Nijssen 1989)	L046/L173	55	*Pterygoplichthys xinguensis* (Weber 1991)	
24	Hypoptopoma cf inexspectatum	?	56	*Reganella depressa* (Kner 1853)	?
25	Hypoptopoma gulares	?	57	*Rinoloricaria platyura* (Müller and Troschel 1849	L042
26	*Hypoptopoma incognitum* (Aquino and Shaefer 2010)	?	58	Scobinancistrus sp3	L48?
27	*Hypoptopoma* sp	?	59	*Scobinancistrus aureatus* (Burgess 1994)	L014
28	Hypostomus aff. Emarginatus	?	60	*Scobinancistrus pariolispos* (Isbrücker and Nijssen 1989)	L048
29	*Hypostomus* aff. *Plecostomus*	?	61	*Spatuloricaria* sp	?
30	*Hypostomus hemicochliodon* (Armbruster 2003)	?	62	*Spectracanthicus murinus* (Nijssen and Isbrücker 1987)	L254
31	*Leporacanthicus heterodon* (Isbrücker and Nijssen 1989)	L172	63	Spectracanthicus punctatissimus	?
32	*Limatulichthys griseus* (Eigenmann 1909)	L062	64	*Squaliforma emarginata* (Valenciennes 1840)	L011

? No valid description. (L-Number) classification Aqualog company used by the hobbyist and trade.

Table 2. List of the species assessed from the Potamotrygonidae and Cichlidae families.

Number	Species	Family	Number	Species	Family
65	*Potamotrygon leopoldi* (Castex e Castello, 1970)	Potamotrygonidae	72	*Heros severus* (Heckel, 1840)	Cichlidae
66	*Potamotrygon motoro* (Müller and Henle 1841)	Potamotrygonidae	73	*Pterophyllum scalares* (Lichenstein, 1840)	Cichlidae
67	*Potamotrygon orbgyni* (Castelnau 1855)	Potamotrygonidae	74	*Retroculus xinguenses* (Gosse, 1971)	Cichlidae
68	*Apistogramma* spp	Cichlidae	75	*Satanoperca jurupari* (Heckel, 1840)	Cichlidae
69	*Crenicichla alta* (Eigenmann, 1912)	Cichlidae	76	*Symphysodom aequifasciatus* (Pellegrin, 1904)	Cichlidae
70	*Crenicichla regani* (Ploeg, 1989)	Cichlidae	77	*Teleocichla* spp	Cichlidae
71	*Geophagus altifrons* (Heckel, 1840)	Cichlidae			

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