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Ictiofauna da Bacia do Rio Mato Grosso, Estado do Rio de Janeiro

Fish fauna of Mato Grosso river basin, State of Rio de Janeiro, Brazil

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Resumo Os peixes do presente estudo foram coletados na bacia do rio Mato Grosso, Estado do Rio de Janeiro, entre abril de 2006 e abril de 2007, com o uso de pesca elétrica. Um total de 6813 exemplares, pertencentes a 24 espécies, 21 gêneros, 14 famílias e sete ordens foram capturados. Quatro espécies ameaçadas (*Spintherobolus broccae*, *Gymnotus pantherinus*, *Hyphessobrycon reticulatus* and *Trichomycterus* sp.) e três espécies exóticas (*Oreochromis niloticus*, *Cyprinus carpio* and *Poecilia reticulate*) foram registradas.

Palavras-chave: peixes, pesca elétrica, riachos, Mata Atlântica

Abstract The fishes of the present study were collected in the Mato Grosso river basin, State of Rio de Janeiro, between April 2006 and April 2007, using an electric fishing technique. A total of 6813 specimens, belonging to 24 species, 21 Genera, 14 Families and 7 Orders were captured. Four threatened species (*Spintherobolus broccae*, *Gymnotus pantherinus*, *Hyphessobrycon reticulatus* and *Trichomycterus* sp.) and three exotic species (*Oreochromis niloticus*, *Cyprinus carpio* and *Poecilia reticulate*) were recorded.

Key-words: fishes, electric fishing technique, stream, Atlantic rainforest

Introduction

South America has a highly diverse fish fauna (Lowe-McConnell 1999; Castro, 1999; Serra *et al*., 2015), estimated in about 6000 species (Reis *et al*. 2003). Furthermore, this number can reach 8000 species (Schaefer 1998), which represents 25% of global fish fauna diversity (Brito *et al*. 2007). Considering only Brazil, there are 2587 valid species (Buckup *et al*. 2007), but the knowledge about different aspects of fish biology (*e,g.* systematics, distribution and ecology) are scarce (Böhlke *et al*. 1978). According to Agostinho *et al*. (2005), around 30 to 40% of the freshwater fish fauna in Brazil has not been described. Despite the ascending number of investigations on the ecological aspects of fish communities in South America, the overall knowledge is still incipient (Reis *et al*. 2003).

The Atlantic Rainforest streams belong to the eastern Brazilian region and, within the context of South American freshwater fish fauna it is an important point of endemism (Menezes *et al*. 2007), due to its natural characteristics (*i.e.* geographic isolation) and comprises a large amount of fish species with many species of them yet undescribed (*e.g.* Ribeiro *et al*. 2011; Pereira *et al*. 2012). The increase in the number of species description in the last decade stimulated research to enhance conservation and control options for these unique environments (Mazzoni and Lobón-Cervià 2000).

The aim of this study is to describe the composition of the fish community from Mato Grosso river basin, State of Rio de Janeiro.

Materials and Methods

Study area

The Mato Grosso river microbasin (22º52' S, 42º38' W) (Figure 1) drains the northwest region of Saquarema municipality in the east watershed of Serra do Mar, State of Rio de Janeiro. Mato Grosso river microbasin is suffering major environmental problems as a result of deforestation of hillsides and the problems as a result of

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deforestation of hillsides and the occupation of its surrounding areas, especially for activities related to agriculture and cattle breeding (Miranda *et al*., 2010). Moreover, in the middle and lower reaches many areas of illegal extraction of sand and domestic sewage discharges have been recorded. Despite this situation, Mato Grosso stream waters are used to supply households, crop irrigation, watering livestock, recreation and leisure.

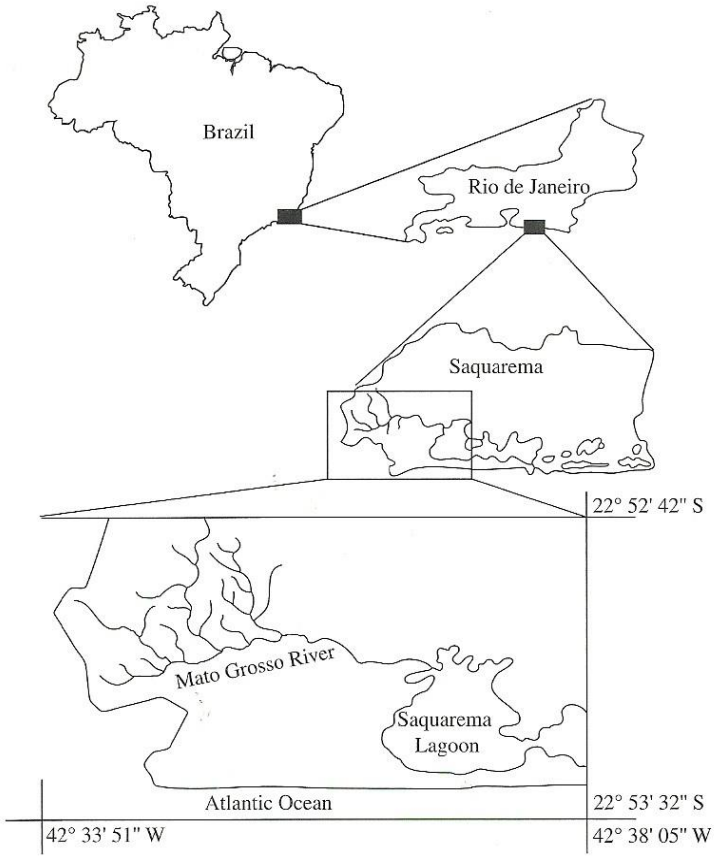

Figure 1 Mato Grosso river basin.

Fish sampling

Fishes were collected between April 2006 and April 2007, using an electric fishing technique (Mazzoni *et al*. 2000a) at 18 sampling sites. Sampled fish were identified to species following taxonomic keys (Géry 1977; Weitzman *et al*. 1988; Burgess 1989; Silfvergrip 1996; Melo 2001; Nelson 2006; Rican and Kullander 2006; Lucinda 2008; Ottoni and Costa 2008) and through queries to experts. Sample specimens were placed in the ichthyological collection of Laboratório de Ictiologia Sistemática of Universidade do Tocantins (UNT 6765 to UNT 6771) and at Museu Nacional – Universidade Federal do Rio de Janeiro (MNRJ 29949 to MNRJ 30027). Sampling license was granted by the Brazilian Institute of Environment (IBAMA) (Process IBAMA / MMA 02022.002475/2006-10, Authorization Nº 118/2006 - DIFAP / IBAMA).

Results and discussion

We collected 6813 specimens, belonging to 24 species, 21 Genera, fourteen Families and seven Orders (Table 1). Characiformes and Siluriformes were the Orders with the largest number of species and individuals. Characidae, was the most representative family, with five species, followed by Cichlidae with three species and Crenuchidae, Heptapteridae, Loricariidae and Poeciliidae with two species each one.

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Table 1 Fish species from the Mato Grosso river basin.

- Characiformes
  - Characidae
    - *Incertae Sedis*
    - *Astyanax taeniatus* (Jenyns, 1842)
    - *Hyphessobrycon bifasciatus* Ellis, 1911
    - *Hyphessobrycon reticulatus** Ellis, 1911
    - *Spintherobolus broccae** Myers, 1925
    - *Mimagoniates microlepis* (Steindachner, 1876)
  - Erythrinidae
    - *Hoplias malabaricus* (Bloch, 1794)
  - Crenuchidae
    - *Characidium interruptum* Pellegrin, 1909
    - *Characidium* sp.
- Siluriformes
  - Heptapteridae
    - *Pimelodella lateristriga* (Lichtenstein, 1823)
    - *Rhamdia quelen* (Quoy and Gaimard *in* Freycinet, 1824)
  - Callichthyidae
    - *Callichthys callichthys* (Linnaeus, 1758)
  - Trichomycteridae
    - *Trichomycterus* sp.
  - Loricariidae
    - *Parotocinclus maculicauda* (Steindachner, 1877)
    - *Hypostomus* aff. *H. punctatus* Valenciennes, 1840
- Gymnotiformes
  - Gymnotidae
    - *Gymnotus pantherinus* (Steindachner, 1908)
- Perciformes
  - Cichlidae
    - *Australoheros saquarema* Ottoni and Costa, 2008
    - *Geophagus brasiliensis* (Quoy and Gaimard, 1824)
    - *Oreochromis niloticus* (Linnaeus, 1758)
  - Gobiidae
    - *Awaous tajasica* (Lichtenstein, 1822)
- Cyprinodontiformes
  - Poeciliidae
    - *Phalloceros harpagos* Lucinda, 2008
    - *Poecilia reticulata* Peters, 1859
  - Rivulidae
    - *Kryptolebias gracilis Costa, 2007*
- Cypriniformes
  - Cyprinidae
    - *Cyprinus carpio** Linnaeus, 1758
- Synbranchiformes
  - Synbranchidae
    - *Synbranchus marmoratus* Bloch, 1795

* Species collected in additional sampling.

Mimagoniates microlepis was the most abundant species, followed by *Astyanax taeniatus*, *Pimelodella lateristriga*, *Poecilia reticulata* and *Phalloceros harpagos.* These species summed 67% of all sampled individuals. *Awaous tajasica* and *Callichthys callichthys* were represented by only one individual each.

The small species (*sensu* Castro 1999) that did not reach more than 15cm of standard length, represented about 62% of the total registered. Only eight species (*Australoheros saquarema*, *Awaous tajasica*, *Gymnotus pantherinus*, H. *malabaricus*, *Hypostomus* aff. *H. punctatus*, *Pimelodella lateristriga*, *Rhamdia quelen* and *Synbranchus marmoratus*) reached standard length greater than 15 cm (Table 2).

Table 2 Number of individuals captured (N), relative abundance (N%) and size range (Standard Length, minimum-maximum) of fish species in the Mato Grosso river basin from April 2006 to April 2007.

Species	N	N %	SL
Mimagoniates microlepis	1314	19.29	1.2 – 5.0
Astyanax taeniatus	1002	14.71	1.9 – 10.1
Pimelodella lateristriga	855	12.55	2.3 – 19.1
Poecilia reticulata	692	10.16	1.1 – 4.7
Phalloceros harpagos	666	9.78	1.1 – 3.9
Parotocinclus maculicauda	539	7.91	1.5 – 5.7
Characidium sp.	419	6.15	2.5 – 8.9
Hypostomus aff. *H. punctatus*	337	4.95	1.5 – 15.6
Geophagus brasiliensis	271	3.98	1.3 – 14.7
Characidium interruptum	261	3.83	2.1 – 4.7
Gymnotus pantherinus	182	2.67	2.3 – 23.3
Kryptolebias gracilis	77	1.13	1.4 – 4.9
Trichomycterus sp.	61	0.90	2.5 – 9.3
Hoplias malabaricus	37	0.54	2.3 – 32.5
Rhamdia quelen	31	0.46	7.6 – 24.6
Hyphessobrycon bifasciatus	28	0.41	1.8 – 4.1
Synbranchus marmoratus	18	0.26	9.5 – 57.0
Oreochromis niloticus	14	0.21	2.6 – 14.5
Australoheros saquarema	7	0.10	2.5 – 15.0
Awaous tajasica	1	0.01	17.8
Callichthys callichthys	1	0.01	8.7

According to Castro (1999) 85% of the fish fauna of Brazilian streams consists of Characiformes and Siluriformes, which is corroborated by Esteves and Lobón-Cervià (2001), Braga and Andrade (2005), Perez-Junior and Garavelo (2007), among others. In Mato Grosso river basin we recorded 58% of Characiformes and Siluriformes. In fact, these values are close to those reported by Sabino and Castro (1990) (62.5%), Juncos *et al*. (2006) (64.7%) and Mazzoni *et al*. (2006) (59%).

Species richness recorded for the Mato Grosso river microbasin is similar to other Brazilian streams. Teixeira (1989) recorded 25 species in a coastal stream in Rio Grande do Sul State, Esteves *et al.* (2008) recorded 21 species in the river Paraitinga, Tietê river basin. Aranha *et al*. (1998), Casatti *et al*. (2001) and Fogaça *et al*. (2003) recorded 26, 22 and 25 species, respectively,

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in streams of the upper Paraná river and Melo *et al*. (2006) recorded 23 species in Carangola river, a tributary of the Paraíba do Sul river. It's noteworthy that the number of species collected in this study is superior to that observed by Costa (1987) who recorded 17 species in a study conducted in the same area. This difference is possibly due to increased sampling efforts (*i.e*. greater number of sampled sites) and, especially, due to the use of electrofishing as a sampling technique.

We recorded three exotic species: *Oreochromis niloticus* (Linnaeus 1758), *Cyprinus carpio* Linnaeus, 1758 and *Poecilia reticulata* Peters, 1859. Among these, two (*Oreochromis niloticus* and *Poecilia reticulata*) are widely distributed in streams from Rio de Janeiro (Bizerril and Lima 2001). Probably the introduction of these exotic species occurred as a result of the leakage of fishing ponds, that is a consequence of fish farms that have been increasing in many regions of the country.

Three of the fish species that occur in the Mato Grosso river microbasin were classified as endangered, according to national and regional Red List: *Spintherobolus broccae* is classified as vulnerable (Malabarba 2007). Mazzoni *et al*. (2000b) and Menezes *et al*. (2007) classified *Gymnotus pantherinus* as presumably threatened. *Hyphessobrycon reticulatus* is at risk in areas where there are drastic changes in water chemistry (Menezes *et al*. 2007). Furthermore, following the criteria of the International Union for Conservation of Nature (2008), we can infer that *Trichomycterus* sp. is also an endangered species because of its restricted distribution to headwater areas, which are most likely to undergo anthropic action (sewage discharge and loss of riparian vegetation). Casatti (2003) highlights that the conservation of *Trichomycterus* species depends on the maintenance of the original features of the water bodies where they occur. The fish species *Kryptolebias gracilis* can be also considered threatened, once it is restricted to rivers of Saquarema lagoon system, which are under constant anthropogenic pressures.

Three of the 24 recorded species were recently described: *Kryptolebias gracilis*, *Phalloceros harpagos* and *Australoheros saquarema*. Other three species could not be identified and were presented at the Genus level (*Characidium*, *Hypostomus* and *Trychomycterus*). This situation confirms the need of taxonomic studies mentioned by several authors (*e.g.* Buckup 1999; Reis *et al*. 2003). According to Menezes (1996), one of the aspects that hinder an adequate evaluation about the distribution and diversity of the ichthyofauna from the Atlantic and other regions of South America, is the lack of knowledge about the taxonomic composition of many fish groups. The occurrence of newly described species emphasizes the limited knowledge about the diversity of fish fauna from streams of eastern Brazil.

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