

LISTS OF SPECIES

Fish, Taquara river basin, northern of the state of Paraná, Brazil.

Wanner Galves^{1,2}
Oscar Akio Shibatta²
Fernando Camargo Jerep³

¹*Programa de Pós-Graduação em Ciências Biológicas - Zoologia, Universidade Estadual de Londrina. Caixa Postal 6001, 86051-990, Londrina, PR, Brazil. E-mail: wanner_galves@yahoo.com.br*

²*Museu de Zoologia, Universidade Estadual de Londrina. Caixa Postal 6001, 86051-990, Londrina, PR, Brazil.*

³*Laboratório de Ictiologia, Museu de Ciências e Tecnologia, Pontifícia Universidade Católica do Rio Grande do Sul. Caixa Postal 1429, 90619-900, Porto Alegre, RS, Brazil.*

Abstract: Taquara River is situated in an agriculturist region, on the northern portion of the Tibagi river basin, state of Paraná. Fish fauna was collected in five stretches of the Taquara River and in nine headwaters of its tributaries, in the period of May to December 2006. Six orders, 22 families, and 74 species were collected, in a sum of 2,389 individuals. The orders Characiformes and Siluriformes were dominant.

Introduction

According to Lowe-McConnell (1999), the Neotropical region has the richest and the most diversified freshwater fish fauna of the planet, with a richness of 6,025 species (Reis et al. 2003). However this value probably increases, once that the number of studies in environments of streams and headwaters has raised in not yet inventoried hydrographic basins (Vari and Malabarba 1998). Castro (1999) cited that these environments must receive priority in studies, before many of the information are lost with the human deleterious influence. These environments are mainly composed by small size species, dependent of allochthonous organic matter to survival (Lowe-McConnell 1999), and generally presenting high degree of endemism (Castro et al. 2003). This work purposed to carry through a survey of the fish species on Taquara river basin, once studies of fish fauna were inexistent in that basin.

Materials and methods

The study was developed in the Taquara river basin, one of the main tributaries of the low portion of Tibagi River (Figure 1). Surveys were done in five stretches of Taquara River: headwaters (23°40'04.1" S, 51°19'12.1" W), high-middle (23°37'11.2" S, 51°13'55.6" W), middle portion (23°34'39.7" S, 51°09'57.2" W), lower middle (23°33'47.2" S, 51°04'18.5" W), and low

portion (23°30'51" S, 50°57'18" W), and in the headwater of its nine main tributaries: Califórnia (23°39'36.7" S, 51°18'27.1" W), Clementino (23°42'26.7" S, 51°13'47.2" W), Clementino Primeiro (23°35'29.7" S, 51°17'37.7" W), Saltinho (23°41'41.0" S, 51°16'30.8" W), Jacucaca (23°38'17.3" S, 51°20'48.2" W), Cerne (23°34'38.2" S, 51°22'17.6" W), Lajeado (23°32'06.3" S, 51°12'02.1" W), Taquarina (23°32'31.9" S, 51°02'12.1" W), and Gabriel da Cunha (23°38'17.3" S, 51°20'48.2" W) (Figure 1).

The sampled sites presented scarce or absent riparian vegetation, and agricultural activity in their edges. The substratum was basically composed of stones, rocks and flagstones, although there were depositions of red latosol (*terra roxa*) in some stretches. The stretches present riffles, shaft and areas of calm waters. The samples were made among May to December 2006. The fishes were collected in 50 meters blocked stretches, with its extremities enclosed by a slender nest (5.0 x 1.2 m, mesh sizes 2 mm between adjacent knots) whenever possible, to avoid organisms escape. In the capture we used sieves, drag nets (identical meshes of blockade), and casting nets (mesh sizes 2 to 5 cm). In the middle portion, lower middle and low portion stretches we still used gill nets (mesh sizes 2 to 10 cm on opposite knots).

LISTS OF SPECIES

Adequate literature were used in the identification (Albert and Crampton 2003; Castro et al. 2003; 2004; Jerep 2006; Jerep et al. 2006; Graça and Pavanelli 2007) and classification of species (Reis et al. 2003). Voucher specimens are deposited in the collection of Museu de Zoologia at the

Universidade Estadual de Londrina (MZUEL), under the numbers 4376 to 4507 (except 4412, 4416, 4454, 4455, and 4459), 4539 to 4704, 4706, 4707, and 4712. Some collection details of all species can be found in the website http://splink.cria.br/sample_search.

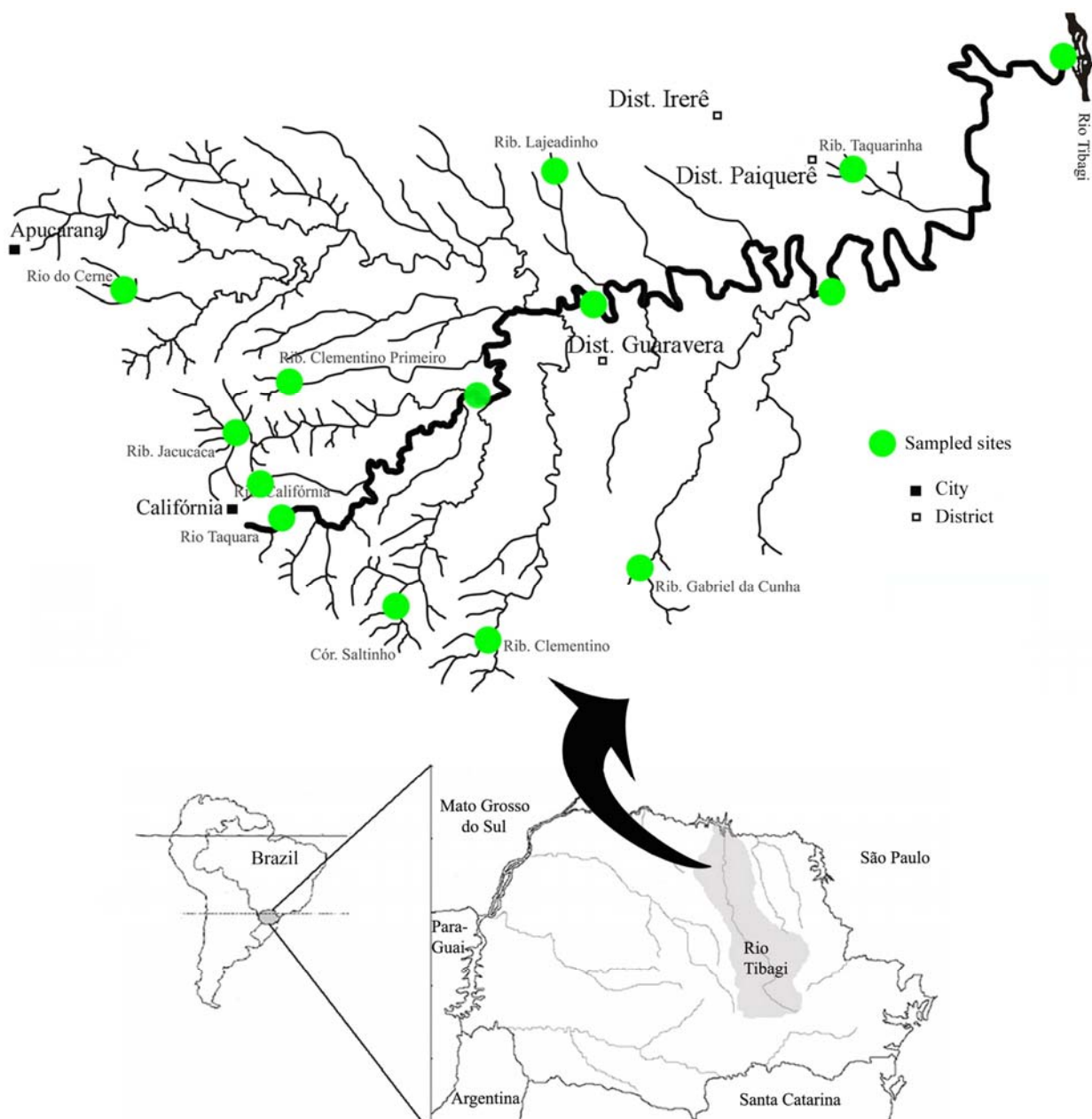


Figure 1. Sampling sites in the Taquara river basin, low portion of Tibagi river basin

LISTS OF SPECIES

Results and discussion

Two thousand three hundred and eighth-nine specimens of fish were collected, belonging to six orders, 22 families and 74 species (Table 1). The bigger dominance of species were represented by Characiformes and Siluriformes, respectively 36.49 % and 45.95 %, followed by Gymnotiformes, Perciformes, Cyprinodontiformes, and Synbranchiformes (Table 2). This pattern seems to be a trend in Neotropicals rivers, according to Lowe-McConnell (1999). This bigger ratio of Characiformes and Siluriformes was also observed on studies in the Tibagi river basin (Shibatta et al. 2002; 2006), and on studies in the high Paraná basin (Lemes and Garutti 2002; Casatti et al. 2001).

Amongst the Characiformes the predominance in richness was of Characidae and Anostomidae species, with eleven and six species respectively,

with prominence for the genera *Astyanax* and *Leporinus*. Already in the Siluriformes dominance in richness pertained to Loricariidae species, of which eleven species belonged to the genus *Hypostomus*. The distinguished bigger richness of Loricariidae can be explained by the higher numbers of environments with riffles and rocks, habitats preferential of these species, in addition to many stretches sufficiently illuminated that propitiates growth of Algae, the preferential species' food. Gymnotiformes presented just two families and three species, and the order Perciformes, with only the Cichlidae family, presented five species, being *Oreochromis niloticus* introduced. Already in Cyprinodontiformes two species were collected, both from the same family, being *Poecilia reticulata* introduced. Finally, Synbranchiformes had one family and one species.

Table 1. Fish species collected in the Taquara river basin, between May to December 2006.

Order / Family / Species
Order Characiformes
Family Acestrorhynchidae
<i>Acestrorhynchus lacustris</i> (Lütken, 1875)
Family Anostomidae
<i>Leporellus vittatus</i> (Valenciennes, 1859)
<i>Leporinus amblyrhynchus</i> Garavello & Britski, 1987
<i>Leporinus elongatus</i> Valenciennes, 1849
<i>Leporinus friderici</i> (Bloch, 1794)
<i>Leporinus octofaciatus</i> Steindachner, 1817
<i>Schizodon nasutus</i> Kner, 1859
Family Characidae
<i>Astyanax</i> aff. <i>eigenmanniorum</i> (Cope, 1894)
<i>Astyanax altiparanae</i> Garutti & Britski, 2000
<i>Astyanax fasciatus</i> (Cuvier, 1819)
<i>Astyanax paranae</i> Eigenmann, 1914
<i>Astyanax</i> sp.
<i>Bryconamericus iheringii</i> Boulenger, 1887
<i>Bryconamericus stramineus</i> Eigenmann, 1908
<i>Galeocharax knerii</i> (Steindachner, 1879)
<i>Oligosarcus paranensis</i> Menezes & Géry, 1983
<i>Piabina argentea</i> Reinhardt, 1866
<i>Serrapinnus notomelas</i> (Eigenmann, 1915)

LISTS OF SPECIES

Table 1. Continuation.

Order / Family / Species
Order Characiformes (continuation)
Family Serrasalminidae
<i>Myleus tiete</i> (Eigenmann & Norris, 1900)
<i>Serrasalmus maculatus</i> Kner, 1858
Family Crenuchidae
<i>Characidium zebra</i> Eigenmann, 1909
Family Curimatidae
<i>Cyphocharax modestus</i> (Fernandez-Yepez, 1948)
<i>Steindachnerina insculpta</i> (Fernandez-Yepez, 1948)
Family Erythrinidae
<i>Hoplias malabaricus</i> (Bloch, 1794)
Family Paradontidae
<i>Apareiodon affinis</i> (Steindachner, 1879)
<i>Apareidon ibitiensis</i> Campos, 1944
Family Prochilodontidae
<i>Prochilodus lineatus</i> (Valenciennes, 1836)
Order Siluriformes
Family Auchenipteridae
<i>Tatia neivai</i> (Ihering, 1930)
Family Callichthyidae
<i>Corydoras paleatus</i> (Jenyns, 1842)
Family Cetopsidae
<i>Cetopsis gobioides</i> Kner, 1857
Family Heptapteridae
<i>Cetopsorhamdia iheringi</i> Schubart & Gomes, 1959
<i>Imparfinis borodini</i> Mees & Cala, 1989
<i>Imparfinis mirini</i> Haseman, 1911
<i>Imparfinis schubarti</i> (Gomes, 1956)
<i>Phenacorhamdia tenebrosa</i> (Schultz, 1964)
<i>Pimelodella meeki</i> Eigenmann, 1910
<i>Rhamdia quelen</i> (Quoy & Gaimard, 1824)
Family Loricariidae
<i>Hisonotus insperatus</i> Britski & Garavello, 2003
<i>Hisonotus</i> sp.
<i>Hypostomus ancistroides</i> (Ihering, 1911)
<i>Hypostomus</i> cf. <i>topavae</i> (Godoy, 1969)
<i>Hypostomus hermanni</i> (Ihering, 1905)
<i>Hypostomus iheringii</i> (Regan, 1908)
<i>Hypostomus margaritifer</i> (Regan, 1908)
<i>Hypostomus nigromaculatus</i> (Schubart, 1964)
<i>Hypostomus paulinus</i> (Ihering, 1905)
<i>Hypostomus regani</i> (Ihering, 1905)

LISTS OF SPECIES

Table 1. Continuation.

Order / Family / Species
Family Loricariidae (continuation)
<i>Hypostomus</i> sp.
<i>Hypostomus</i> sp. I
<i>Hypostomus strigaticeps</i> (Regan, 1908)
<i>Isbrueckerichthys calvus</i> Jerep, Shibatta, Pereira & Oyakawa, 2006
<i>Loricaria prolixa</i> Isbrücker & Nijssen, 1978
<i>Megalancistrus parananus</i> (Peters, 1881)
<i>Neoplecostomus</i> sp.
<i>Rineloricaria pentamaculata</i> Langeani & Araújo, 1994
Family Pimelodidae
<i>Iheringichthys labrosus</i> (Kröyer, 1874)
<i>Pimelodus heraldoi</i> Azpelicueta, 2001
<i>Pimelodus maculatus</i> Lacépède, 1803
Family Trichomycteridae
<i>Trichomycterus diabolus</i> Bockmann, Casatti & de Pinna, 2004
<i>Trichomycterus</i> sp. A
<i>Trichomycterus</i> sp. B
Order Gymnotiformes
Family Apterontidae
<i>Apterontus ellisi</i> (Alonso de Arámburu, 1957)
<i>Apterontus</i> sp.
Family Gymnotidae
<i>Gymnotus carapo</i> Linnaeus, 1758
<i>Gymnotus inaequilabiatus</i> (Valenciennes, 1842)
Family Sternopygidae
<i>Eigenmannia virescens</i> (Valenciennes, 1847)
Order Perciformes
Family Cichlidae
<i>Cichlasoma paranaense</i> Kullander, 1983
<i>Crenicichla niederleini</i> (Holmberg, 1891)
<i>Crenicichla</i> sp.
<i>Geophagus brasiliensis</i> (Quoy & Gaimard, 1824)
<i>Oreochromis niloticus</i> (Hasselquist, 1757)
Order Cyprinodontiformes
Family Poeciliidae
<i>Phalloceros caudimaculatus</i> (Hensel, 1868)
<i>Poecilia reticulata</i> Peters, 1859
Order Synbranchiformes
Family Synbranchidae
<i>Synbranchus marmoratus</i> Bloch, 1795

LISTS OF SPECIES

Table 2. Number of species and its proportions per Order of species collected in the Taquara river basin.

Order	Number of species	Percentual of species
Characiformes	27	36.49
Siluriformes	34	45.95
Gymnotiformes	5	6.76
Perciformes	5	6.76
Cyprinodontiformes	2	2.70
Synbranchiformes	1	1.35

This study contributes with the knowledge of the fish diversity of Tibagi river basin low portion, once the studies in this region are still scarce. The number of species presented by this work is highest than previous works carried through in that basin (Shibatta and Cheida 2003; Shibatta et al. 2006; Vieira and Shibatta 2007). It also shows that, from those 74 species here presented, 44 did not occurred in the studies made by Castro et al. (2003) in upper Paranapanema river basin in headstreams freshwater, where were registered 52 species. Our data stand its high ichthyofauna richness, once that Taquara River is a tributary of the Paranapanema. Considering only the upper portions of surveyed Taquara river streams, 12 species were not registered in the Paranapanema River.

Literature cited

- Albert, J. S. and W. G. R. Crampton. 2003. Seven new species of the Neotropical electric fish *Gymnotus* (Teleostei, Gymnotiformes) with a redescription of *G. carapo* (Linnaeus). *Zootaxa* 287: 1-54.
- Casatti, L., F. Langeani, and R. M. Castro. 2001. Peixes de riacho do Parque Estadual Morro do Diabo, bacia do alto rio Paraná, SP. *Biota Neotropica* 1(2): 1-15.
- Castro, R. M. C. 1999. Evolução da ictiofauna de riachos sul-americanos: padrões gerais e possíveis processos, p. 139-155 in: E. P. Caramaschi, R. Mazzoni, and P. R. Peres-Neto (ed.). *Ecologia de peixes de riachos. Série Oecologia Brasiliensis VI*. Rio de Janeiro, PPGE-UFRJ.
- Castro, R. M. C., L. Casatti, H. F. Santos, K. M. Ferreira, A. C. Ribeiro, R. C. Benine, G. Z. P. Dardis, A. L. A. Melo, R. Stopiglia, T. X. Abreu, F. A. Bockmann, M. Carvalho, F. Z. Gibran, and F. C. T. Lima. 2003. Estrutura e composição da ictiofauna de riachos do rio Paranapanema, Sudeste e Sul do Brasil. *Biota Neotropica* 3(1): 1-31.
- Castro, R. M. C., L. Casatti, H. F. Santos, H. A. L. A. Melo, L. S. F. Martins, K. M. Ferreira, F. Z. Gibran, R. C. Benine, M. Carvalho, A. C. Ribeiro, T. X. Abreu, F. A. Bockmann, G. Z. Pelição, R. Stopiglia, and F. Langeani. 2004. Estrutura e composição da ictiofauna de riachos da bacia do rio Grande no estado de São Paulo, sudeste do Brasil. *Biota Neotropica* 4(1): 1-39.
- Graça, W. J. and C. S. Pavanelli. 2007. Peixes da planície de inundação do alto rio Paraná e áreas adjacentes. Maringá, EDUEM. 308 p.
- Jerep, F. C. 2006. Cascudos (Loricariidae: Siluriformes) da bacia do médio e baixo rio Paranapanema, alto rio Paraná, Brasil. Dissertação de Mestrado. Universidade Estadual de Londrina, Paraná. 254 p.
- Jerep, F. C., O. A. Shibatta, E. H. L. Pereira, and O. T., Oyakawa. 2006. Two new species of *Isbrueckerichthys* Derijst, 1996 (Siluriformes: Loricariidae) from the rio Paranapanema basin, Brazil. *Zootaxa* 1372: 53-68.

From the collected specimens, at least nine species were not yet described in the literature, and this material is already being analyzed.

Acknowledgements

We are grateful to the ichthyological team of the Museu de Zoologia from the Universidade Estadual de Londrina for their help and dedication on fieldwork. We thank Mariana B. A. Pereira by the handling with images. This article had support of the Programa de Pós-Graduação da Universidade Estadual de Londrina. Licence for fish collection was granted IBAMA (licence # 083/2003). The authors are participants of the Taxonline Project, with financial support of Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq.

LISTS OF SPECIES

- Lemes, E. M. and V. Garutti. 2002. Ictiofauna de poção e rápido em um córrego de cabeceira da bacia do Alto rio Paraná. *Comunicações do Museu de Ciência e Tecnologia* 15(2): 175-199.
- Lowe-McConnell, R. H. 1999. Estudos ecológicos de comunidades de peixes tropicais. São Paulo, Edusp. 534 p.
- Reis, R. E., S. O. Kullander, and C. J. Ferraris, Jr. (org.) 2003. Check list of the freshwater fishes of South and Central America. Porto Alegre, EDIPUCRS. 729 p.
- Shibatta, O. A., M. L. Orsi, S. T. Bennemann, and A. T. Silva-Souza. 2002. Diversidade e distribuição de peixes na bacia do rio Tibagi, p. 403-424 in: M. E. Medri, E. Bianchini, O. A. Shibatta, and J. A. Pimenta (ed.). *A Bacia do rio Tibagi*. Londrina: UEL.
- Shibatta, O. A. and C. C. Cheida. 2003. Composição em tamanho dos peixes (Actinopterygii, Teleostei) de ribeirões da bacia do rio Tibagi, Paraná, Brasil. *Revista Brasileira de Zoologia* 20(3): 469-473.
- Shibatta, O. A., M. L. Orsi, M. L. and S. T. Bennemann. 2006. Os peixes do Parque Estadual Mata dos Godoy, p. 156-167 in: J. M. Torezan (org). *Ecologia do Parque Estadual Mata do Godoy*. Londrina, Ed. Itedes.
- Vari, R. P. and L. R. Malabarba. 1998. Neotropical Ichthyology: an overview, p. 1-11 in: L. R. Malabarba and R. P. Reis (ed.). *Phylogeny and classification of Neotropical fishes*. Porto Alegre, EDIPUCRS.
- Vieira, D. B. and O. A. Shibatta. 2007. Peixes como indicadores da qualidade ambiental do ribeirão Esperança, município de Londrina, Paraná, Brasil. *Biota Neotropica* 7(1): 57-66.

Received July 2007

Accepted August 2007

Published online September 2007