

LISTS OF SPECIES

Fish, Passa Cinco stream, Corumbataí river basin, state of São Paulo, Brazil

Alberto Luciano Carmassi
Giulianna Rodrigues Rondineli
Francisco Manoel de Souza Braga

*Instituto de Biociências, Universidade Estadual Paulista Júlio de Mesquita Filho, Departamento de Zoologia.
Caixa Postal 199. CEP 13506-900. Rio Claro, São Paulo, Brazil. E-mail: carmassi@rc.unesp.br*

Abstract: The fishes of the present study were collected in Passa Cinco stream, a main river of Corumbataí river basin, Tietê drainage. Five sites were selected in that stream, downstream from headwater to its mouth, and six samplings were performed using the following fishery equipment: a sieve, electric fishery equipment, gill nets and fish-traps. 5082 individuals, 62 species, 18 families and 6 orders were captured. The orders Characiformes and Siluriformes were the most representative and the families Characidae and Loricariidae presented the largest in number of species.

Introduction

The neotropical area presents a great diversity of species of fresh water fish (Lowe-McConnell 1999). South America harbors, approximately, 60 families and about 5.000 species (Vari and Weitzman 1990). Thirty-eight families and 310 fish species were recorded for the upper Paraná river basin in São Paulo state (Langeani et al. 2007).

The Passa Cinco stream is a main river of Corumbataí River basin and also one of the most preserved. Its name is a toponymy for being the fifth river the travelers of the 19th century found in the way from Rio Claro to Ipeúna: Ribeirão Claro, Servidão, Corumbataí, Cabeça and, finally, the Passa Cinco stream.

Material and Methods

This work was accomplished in Passa Cinco stream, a main river of Corumbataí river basin. It presents 525 km² of drainage area and its course covers about 60 km, from its headwater in *Serra da Cachoeira*, a component of *Serra de Itaqueri*, located in the city of Itirapina, with altitude of 1000 m; to its mouth in Corumbataí river, with altitude of 480 m. Nowadays, 51.72 % of its surface is occupied by implanted pasture area, 14.13 % by sugarcane plantation, 15.67 % by native forest and 0.74% by scrubland (Valente and Vettorazzi 2002).

Five sites were selected according to the stream orders, using a hydrological map with scale 1:50.000, from the headwater, at order 2, to its mouth, at order 6, with the following geographical coordinates: site 1 (order 2) - 22°23'36" S, 47°53'08" W, site 2 (order 3) - 22°22'10" S, 47°51'22" W, site 3 (order 4) - 22°21'63" S, 47°48'48" W, site 4 (order 5) - 22°24'74" S, 47°43'34" W and site 5 (order 6) - 22°30'97" S, 47°39'49" W.

In May, July, September and November of 2005, January and March of 2006, six samplings were accomplished in each sample site (proc. IBAMA nº 02027.000234/2005-05).

The following fishery equipment were used: a sieve (used on bank vegetation for ten times in each site, except in site 1 due to vegetation absence and low volume of water), electric fishery equipment (used in the sites of smaller order - sites 1, 2 and 3 - in these places, passages of 50 m were determined, and the equipment was placed for a single time without a contention net), gill nets with meshes varying from 3 to 9 cm measured between adjacent knots (which were used in the sites of larger order - sites 3, 4 and 5 - used from afternoon to morning of the following day) and fish-traps (diameter = 20 cm and length = 50 cm; with bate, used in all sites).

LISTS OF SPECIES

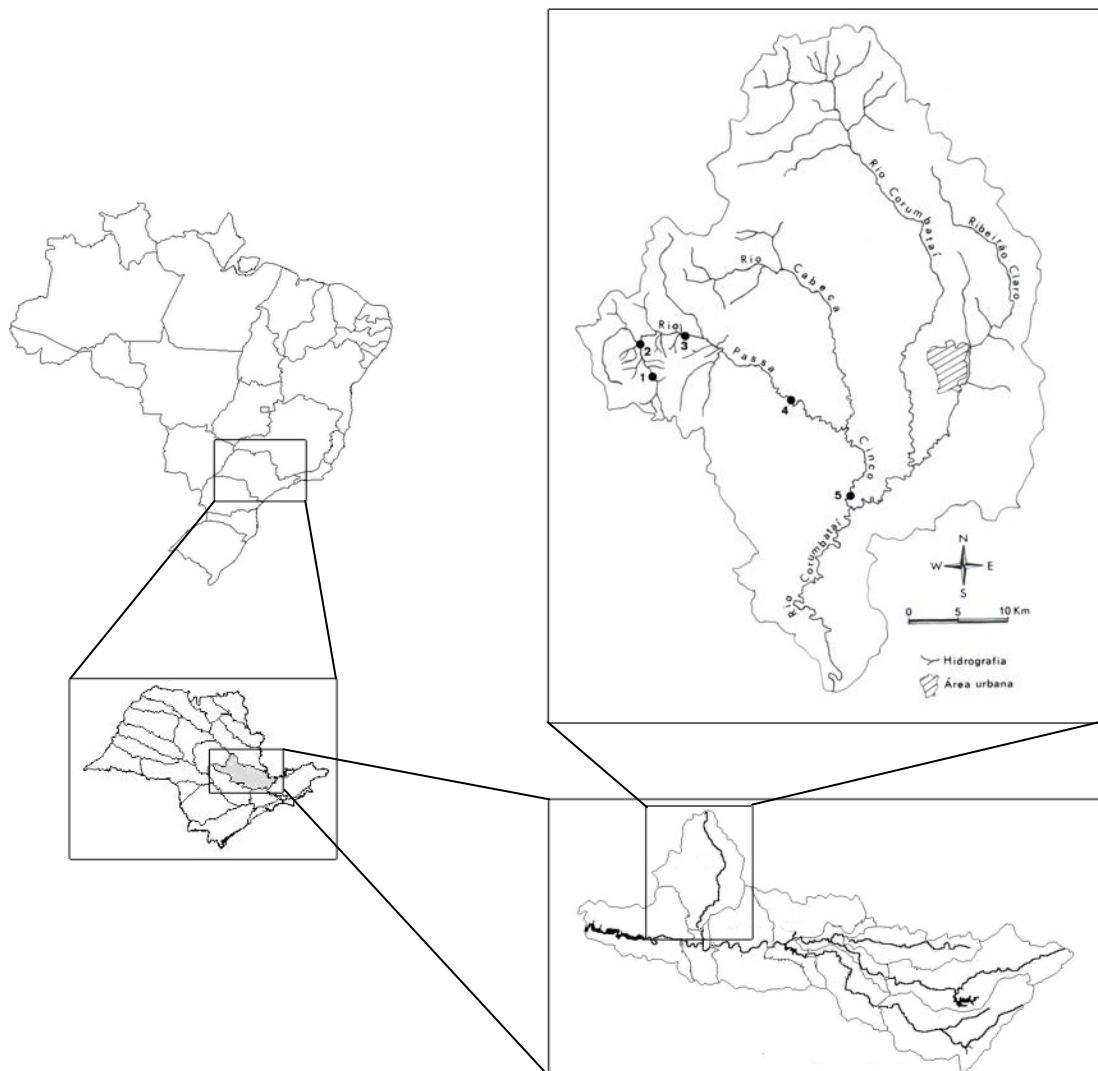


Figure 1. Study area indicating the Corumbataí River basin, showing the sampled sites (modified from Garcia et al., 2004). 1 - Sample site 1; 2 - Sample site 2; 3 - Sample site 3, 4 - Sample site 4; and 5 - Sample site 5.

All samplings were immediately stored in plastic bags with 10 % formaline and, after 48 hours, transferred to alcohol 70 % solution. The fish species were identified by experts on fish group.

Voucher specimens were deposited in the ichthyological collection of the ichthyology laboratory of *Universidade Estadual Paulista*, in Rio Claro. The taxonomic classification system used followed Reis et al. (2003).

Results and Discussion

We captured 5082 individuals, distributed into 62 species, 18 families and 6 orders (Table 1). The orders Characiformes and Siluriformes were the most representative ones, corresponding to 48 % and 41 % of the species, respectively, which reflects the pattern found for South American ichthyofauna (Schaefer 1998) and the upper Paraná River basin (Castro and Menezes 1998). Cyprinodontiformes, Gymnotiformes and

LISTS OF SPECIES

Perciformes contributed, each one, with 3% of the species and Synbranchiformes with 2 %.

The families Characidae and Loricariidae presented the largest number of species, contributing, together, with around 44 % of the captured species. The high contribution of species belonging to these families is common in several other studies (Garutti 1988; Uieda and Barreto 1999; Casatti et al. 2001; Castro et al. 2003; Suárez and Petrere 2005; Gomiero and Braga 2006a).

The captures of 61 species of fish in Passa Cinco stream reflect the richness of that system. Gerhard (unpublished data), sampling streams in Corumbataí river basin with electric fishery equipment, captured 51 species of fish from a total of 53.806 individuals. Fragoso (unpublished data), studying the Passa Cinco stream sub-basin, making uses of sieves, fishing-

net, fish-traps and nets, captured 52 species, 48 of them in the main course. Other studies in which nets and/or sieves and fish-traps have been used in Passa Cinco stream can also be mentioned: Gomiero and Braga (2006b) and Cetra and Petrere (2006) that captured 28 and 27 fish species respectively.

Only nine species of fish that were caught in previous studies were not sampled in this study: *Schizodon nasutus* (Cetra and Petrere 2006; Fragoso unpublished data), *Serrapinus notomelas* (Cetra and Petrere 2006), *Triporthus angulatus* (Cetra and Petrere 2006), *Steindachnerina insculpta* (Gomiero and Braga 2006; Fragoso, unpublished data), *Hypostomus albuginatus* (Gomiero and Braga 2006), *Hypostomus regani* (Gomiero and Braga 2006), *Serrapinus heterodon* (Gomiero and Braga 2006; Fragoso 2005), *Leporinus obtusidens* (Gomiero and Braga 2006), *Tilapia rendalli* (Fragoso, unpublished data).

Table 1. Taxonomic list of the species captured in the Passa Cinco stream, based on Reis et al. (2003), with distribution of species of fish in each sample site (1- Sample site 1; 2 - Sample site 2; 3 - Sample site 3, 4 - Sample site 4; and 5 - Sample site 5).

	Sample Sites				
	1	2	3	4	5
Superorder Ostariophysii					
Order Characiformes					
Family Parodontidae					
<i>Apareiodon affinis</i> (Steindachner, 1879)			X	X	X
<i>Apareiodon ibitiensis</i> Campos, 1944	X	X	X		
<i>Parodon nasus</i> Kner, 1859		X	X	X	X
Family Curimatidae					
<i>Cyphocarax modestus</i> (Fernández-Yépez, 1948)					X
<i>Cyphocarax vanderi</i> (Britski, 1980)	X				
<i>Steindachnerina insculpta</i> (Fernández-Yépez, 1948)			X	X	X
Family Prochilodontidae					
<i>Prochilodus lineatus</i> (Valenciennes, 1836)			X		
Family Anostomidae					
<i>Leporellus vittatus</i> (Valenciennes, 1850)			X		
<i>Leporinus friderici</i> (Bloch, 1794)			X		X
<i>Leporinus octofasciatus</i> Steindachner, 1915					X
<i>Leporinus striatus</i> Kner, 1858					X

LISTS OF SPECIES

	Sample Sites				
	1	2	3	4	5
Family Crenuchidae					
<i>Characidium gomesi</i> Travassos, 1956			X		
<i>Characidium</i> aff. <i>zebra</i> Eigenmann, 1909	X	X	X	X	X
Family Characidae					
Genera Incertae Sedis					
<i>Astyanax altiparanae</i> Garutti & Britskii, 2000	X	X	X	X	X
<i>Astyanax bockmanni</i> Vari & Castro 2007	X	X	X	X	X
<i>Astyanax fasciatus</i> (Cuvier, 1819)			X	X	
<i>Astyanax scabripinnis paranae</i> Eigenmann, 1914	X	X	X		
<i>Astyanax</i> sp.	X	X	X	X	X
<i>Bryconamericus stramineus</i> Eigenmann, 1908	X	X	X	X	X
<i>Bryconamericus turiuba</i> Langeani, Lucena, Pedrini & Tarelho-Pereira, 2005	X	X	X		
<i>Bryconamericus</i> sp.				X	X
<i>Hyphessobrycon eques</i> (Steindachner, 1882)			X		
<i>Hyphessobrycon</i> sp.					X
<i>Piabina argentea</i> Reinhardt, 1867		X	X		
Subfamily Serrassalminae					
<i>Serrassalmus maculatus</i> Kner, 1858					X
Subfamily Aphyocharacinae					
<i>Aphyocara dentatus</i> Eigenmann & Kennedy, 1903				X	
Subfamily Cheirodontinae					
<i>Odontostilbe</i> aff. <i>microcephala</i> Eigenmann, 1907	X	X	X	X	X
Subfamily Glandulocaudinae					
<i>Planaltina britski</i> Menezes, Weitzman & Burns, 2003					X
Family Erythrinidae					
<i>Hoplias</i> cf. <i>malabaricus</i> (Bloch, 1794)				X	X
Order Siluriformes					
Family Cetopsidae					
<i>Cetopsis gobioides</i> Kner, 1858		X	X		
Family Trichomycteridae					
<i>Trichomycterus</i> sp.1	X	X	X		
<i>Trichomycterus</i> sp.2					X
Family Callichthyidae					
<i>Corydoras aeneus</i> (Gill, 1858)			X		X
<i>Corydoras flaveolus</i> Ihering, 1911		X	X	X	X
<i>Hoplosternum littorale</i> (Hancock, 1828)					X
Family Loricariidae					
Subfamily Neoplecostominae					
<i>Neoplecostomus</i> sp.	X		X		
Subfamily Hypoptopomatinae					
<i>Corumbataia cuestae</i> Britski, 1997	X	X	X	X	
<i>Hisonotus insperatus</i> Britski & Garavello, 2003				X	
<i>Hisonotus</i> sp.			X	X	

LISTS OF SPECIES

	Sample Sites				
	1	2	3	4	5
Subfamily Loricariinae					
<i>Loricaria</i> cf. <i>piracicabae</i> Ihering, 1907					X
<i>Rineloricaria latirostis</i> (Boulenger, 1900)	X	X	X	X	X
Subfamily Hypostominae					
<i>Hypostomus ancistroides</i> (Ihering, 1911)	X	X	X	X	X
<i>Hypostomus</i> cf. <i>hermanni</i> (Ihering, 1905)			X		
<i>Hypostomus strigaticeps</i> (Regan, 1908)	X	X	X	X	X
<i>Hypostomus</i> sp.1	X	X	X	X	X
<i>Hypostomus</i> sp.2				X	X
<i>Hypostomus</i> sp.3			X		
Family Pseudopimelodidae					
<i>Microglanis</i> sp.			X		
Family Heptapteridae					
<i>Cetopsorhamdia iheringi</i> Schubart & Gomes, 1959	X	X	X	X	
<i>Imparfinis borodini</i> Mees & Cala, 1989	X	X	X		
<i>Imparfinis mirini</i> Hasemann, 1911	X	X	X	X	X
<i>Imparfinis schubarti</i> (Gomes, 1956)			X	X	
<i>Pimelodella</i> sp.			X		X
<i>Rhamdia quelen</i> (Quoy & Gaimard, 1824)	X	X	X	X	X
Order Gymnotiformes					
Family Gymnotidae					
<i>Gymnotus</i> cf. <i>carapo</i> Linnaeus, 1758			X		
Family Sternopygidae					
<i>Eigenmannia virescens</i> (Valenciennes, 1836)		X		X	
Order Cyprinodontiformes					
Family Poeciliidae					
<i>Phalloceros caudimaculatus</i> Hensel, 1868	X	X	X		X
<i>Poecilia reticulata</i> Peters, 1859			X	X	
Order Synbranchiformes					
Family Synbranchidae					
<i>Synbranchus marmoratus</i> Bloch, 1795					X
Order Perciformes					
Family Cichlidae					
<i>Crenicichla jaguarensis</i> Haseman, 1911					X
<i>Geophagus brasiliensis</i> (Quoy & Gaimard, 1824)	X	X	X	X	X

Acknowledgements

The authors wish to thank FAPESP (proc. n° 04/12669-3) and CNPq for financial support, Professors Julio C. Garavello, Francisco Langenai and Heraldo A. Britski that identified the fish species and the two anonymous reviewers for suggestions proposed.

LISTS OF SPECIES

Literature cited

- Casatti, L., F. Langeani, and R. M. C. Castro. 2001. Peixes de riacho do Parque Estadual Morro do Diabo, bacia do Alto rio Paraná, SP. *Biota Neotropica* 1:1-15.
- Castro, R. M. C. and N. A. Menezes. 1998. Estudo diagnóstico da diversidade de peixes do Estado de São Paulo; p. 1-13 in R.M.C. Castro (ed.), *Biodiversidade do Estado de São Paulo, Brasil: Síntese do conhecimento ao final do século XX*. Vol. 6. São Paulo. WinnerGraph.
- 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. Stopliglia, R. 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 do Brasil. *Biota Neotropica* 3(1): 1-31.
- Cetra, M. and M. Petrere. 2006. Fish-assemblage structure of the Corumbataí river basin, São Paulo state, Brazil: characterization and anthropogenic disturbances. *Brazilian Journal of Biology* 66(2A): 431-439.
- Garcia, G. J., H. D. Hebert, J. A. J. Perinotto, and J. F. M. Castro. 2004. Atlas ambiental da bacia do rio Corumbataí. Eletronic Database accessible at <http://ceapla.rc.unesp.br/atlas/>. Captured on 13 March 2004.
- Garutti, V. 1988. Distribuição longitudinal da ictiofauna em um córrego da região noroeste do estado de São Paulo, bacia do rio Paraná. *Revista Brasileira de Biologia* 48(4): 745-59.
- Gomiero, L. M. and F. M. S. Braga. 2006a. Diversity of the ichthyofauna in the Serra do Mar State Park – Núcleo Santa Virgínia, São Paulo state, Brazil. *Acta Scientiarum* 28(3): 213-218.
- Gomiero, L. M. and F. M. S. Braga. 2006b. Ichthyofauna diversity in a protected area in the state of São Paulo, southeastern Brazil. *Brazilian Journal of Biology* 66(1A): 75-83.
- Langeani, F., R. M. C. Castro, O. T. Oyakawa, O. A., Shibatta, C. S. Pavanelli, and L. Casatti. 2007. Diversidade da ictiofauna do Alto Rio Paraná: composição atual e perspectivas futuras. *Biota Neotropica* 7 (3): 181-197.
- Lowe-McConnell, R. H. 1999. Estudos ecológicos em comunidades de peixes tropicais. São Paulo. EDUSP. 534 p.
- Reis, R. E., S. O. Kullander, and C. J. Ferraris. 2003. Check List of the Freshwater Fishes of South and Central America. Porto Alegre. EDIPUCRS. 742p.
- Schaefer, S. A. 1998. Conflict and resolution: Impact of new taxa and phylogenetic studies of the neotropical cascudinhos (Siluroidei: Loricariidae); p. 375-400 In L. R. Malabaraba, R. E. Reis, R. P. Vari, Z. M. S. Lucena and C. A. S. Lucena (ed.), *Phylogeny and classification of neotropical fishes*. Porto Alegre. EDIPUCRS.
- Súarez, Y. R. and M. Petrere 2005. Organização das assembleias de peixes em riachos da bacia do rio Iguatemi, estado do Mato Grosso do Sul. *Acta Scientiarum* 27(2): 161-167.
- Uieda, V. S. and M. G. Barreto. 1999. Composição da ictiofauna de quatro trechos de diferentes ordens do rio capivara, Bacia do Tietê, Botucatu, São Paulo. *Revista Brasileira de Zootecias* 1(1): 55-67.
- Valente, R. O. A. and C. A. Vettorazzi. 2002. Análise da estrutura da paisagem na bacia do rio Corumbataí, SP. *Scientia Forestalis* 62: 114-129.
- Vari, R. P. and S. H. Weitzman. 1990. A review of the phylogenetic biogeography of the freshwater fishes of South America; p. 381-393 In G. Oeters and R. Hutter (ed.), *Vertebrates in the tropics*. Bonn, Alexander Koenig Zoological Research Institute and Zoological Museum.

Received December 2008

Accepted February 2009

Published online March 2009