

LISTS OF SPECIES

Fish, Piquiri River, Upper Paraná River Basin, Paraná State, Brazil

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Abstract

The Piquiri River hydrographic basin includes a drainage area of 31,000 km². Headwaters are located in the São João Mountains, flowing 485 km until the Paraná River. The most important tributaries of the right margin are the rivers Goio-erê, Tricolor and Cantú, while in the left margin the rivers Sapucaí and Melissa stand out. Six samplings were done between October 2002 and September 2003, in three sampling sites (Campina, Apertado and Altônia) along the Piquiri River. Fish species were collected using gill nets with simple meshes and trammel nets, in addition to longlines. Considering the entire period, 1,667 individuals were collected, belonging to 62 species distributed among 21 families and 5 orders. A total of 25 species are new registers for this basin, while 6 were still not formally described, indicating that new species will be captured in future surveys.

Introduction

The Piquiri River hydrographic basin includes a drainage area of 31,000 km². The headwaters are located in the São João Mountains, and the river

goes through 485 km until discharge into the Paraná River. The most important tributaries of the right margin are the rivers Goio-erê, Tricolor and Cantú, while in the left margin the rivers Sapucaí and Melissa stand out (Paiva 1982). Several rapids, falls and narrow stretches characterize this river, with a gradient higher than 1,000 m from headwaters to mouth (Agostinho and Júlio Jr. 1999).

Multiple water uses are identified in the stretch located in the mid-northwest region of the Paraná State. Conama 020/86 resolution states that most rivers (including the Piquiri River), as a result of their main uses, should be classified in the Class 2, excepting those used for public water supply from headwaters and with basin area smaller than 50 km², which are classified in the Class 1: Arroio Barbosa (Alto Piquiri), Novaes (Braganey), Campo Bonito (Campo Bonito), Córrego Urutaí (Cruzeiro d'Oeste), Fivela (Guaraniaçu), Palmitalzinho (Palmital), Arroio Água Grande (Ubiratã). In the Piquiri basin the water is used by industries located in the region. Although the water supply is not importantly used for agriculture irrigation, several fish farms (aquaculture) are settled throughout the basin. The water is also used to raise cattle, and to remove and dilute domestic and industrial sewages (Paraná 1997).

Although studies concerning the fish fauna in the Piquiri River basin are scarce, Agostinho et al. (1997; 2004) registered 57 fish species. These authors stated that in addition to migratory species, there exist sedentary species with and without parental care, drawing attention to the presence of some endemic species, absent in other environments of the Upper Paraná River basin. Thus, this study present the updated list of fish species recorded in the Piquiri River, considering the studies mentioned above.

Material and Methods

A total of six fish samplings were conducted between October 2002 and September 2003, in three sampling sites (Campina, Apertado and Altônia) (Figure 1) along the Piquiri River. Campina site lies close to the mouth of the Cantú River, among the districts of Campina da Lagoa, Guaraniaçu and Altamira do Paraná (Figure 1).

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The margins are very steep and covered with riparian vegetation (trees and shrubs), and the channel is characterized as rocky, with moderate water flow. Apertado site is located downstream Apertado riffles, among the districts of Formosa do Oeste and Alto Piquiri (Figure 1). This site also presents steep shores, with margins covered by shrubs, grass and trees. Similarly, water velocity is

reduced and rocks predominantly cover the bottom. Altônia site is close to the district of Altônia and Terra Roxa. Its margins are very steep and covered by shrubs and grass vegetation, in addition to soybean and cotton cultures. The bottom is composed by gravel and sand, and currents present reduced velocity.

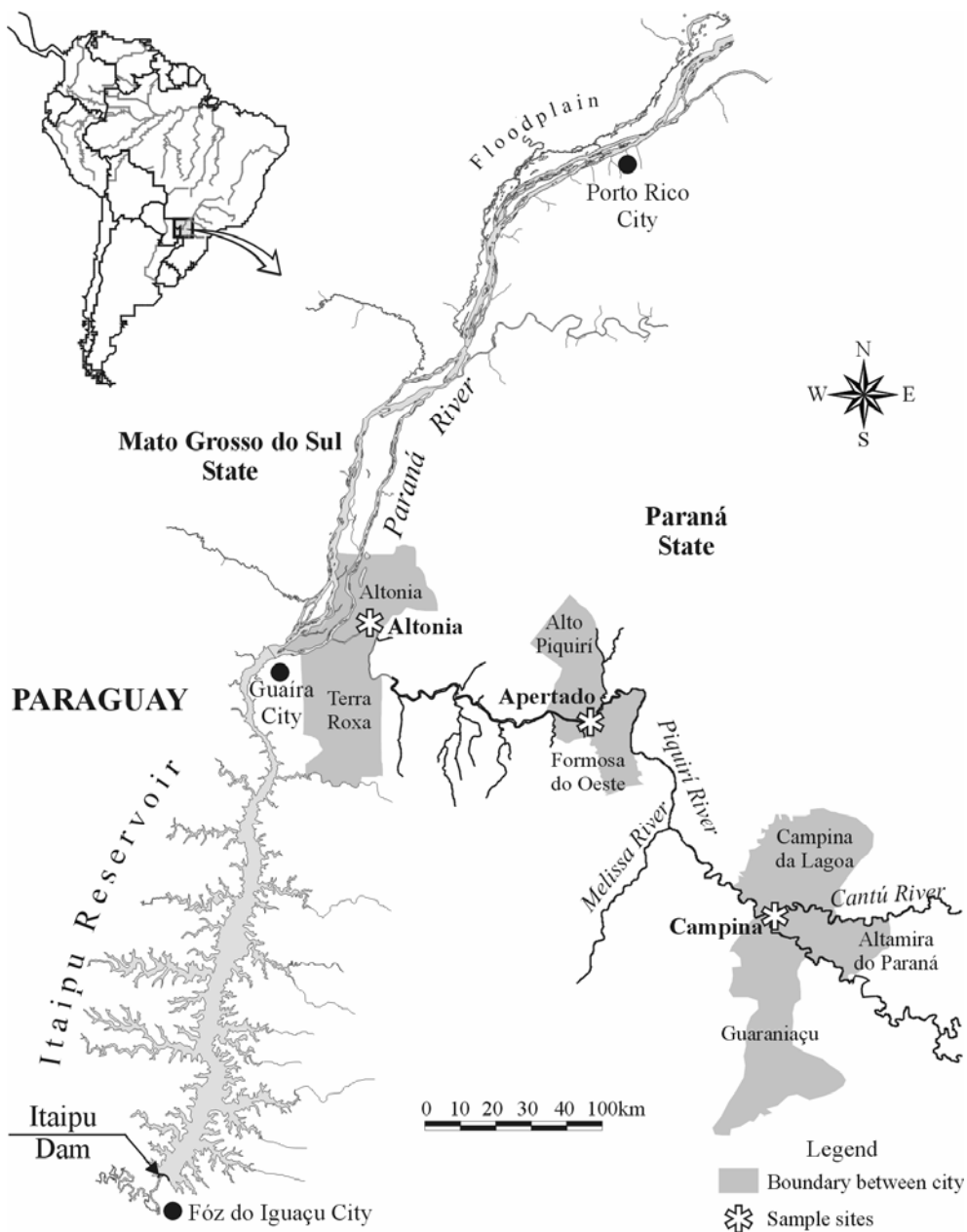


Figure 1. Sampling sites in the Piquiri River, Upper Paraná River basin.

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Fish species were collected using gill nets with simple (2.4, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14 and 16 cm between non-adjacent knots) and trammel nets (three layers; internal meshes of 6, 7 and 8 cm), all 20 m long. Gill nets were set for 24 hours, with checks in the morning (08:00 h), afternoon (16:00 h) and evening (22:00 h). We also used longlines with 50 hooks in each: 25 hooks of 3/0 and 25 of 7/0, all baited with live fish (tuvira and curimba). All fish species captured were identified accordingly to Graça & Pavanelli (in press). Voucher specimens of each species are deposited in the collection of Nupelia (Núcleo de Pesquisas

em Limnologia, Ictiologia e Aqüicultura, Universidade Estadual de Maringá).

Results and Discussion

Higher taxonomic categories follow Eschmeyer (1990), while families are presented according to Reis et al. (2003). A total of 1,667 individuals were collected in the whole period, belonging to 62 species, which are distributed in 21 families and 5 orders (Table 1). The orders registered were Myliobatiformes (one species), Characiformes (26 species), Siluriformes (29), Gymnotiformes (3) and Perciformes (3).

Table 1. Fish species collected in the Piquiri River, between October 2002 and September 2003. Higher categories follow Eschmeyer (1990) and families follow Reis et al. (2003). * Species captured by Agostinho et al. (1997) and also registered in this study; ** Species captured only in this study; # Species whose name was altered (earlier name).

ELASMOBRANCHII	
MYLIOBATIFORMES	
Potamotrygonidae	<i>Potamotrygon motoro</i> (Müller & Henle, 1841)**
ACTINOPTERYGII	
CHARACIFORMES	
Acestrorhynchidae	<i>Acestrorhynchus lacustris</i> (Lütken, 1875)*
Characidae	
Genera <i>Incertae Sedis</i>	<i>Astyanax altiparanae</i> Garutti & Britski, 2000*# (<i>Astyanax bimaculatus</i>) <i>Astyanax</i> sp. <i>Salminus brasiliensis</i> (Cuvier, 1816)* # (<i>Salminus maxillosus</i>)
Characinae	<i>Galeocharax knerii</i> (Steindachner, 1879)* <i>Roeboides paranensis</i> Pignalberi, 1975**
Serrasalminae	<i>Myleus tiete</i> (Eigenmann & Noris, 1900)* # (<i>Myloplus</i> sp.) <i>Serrasalmus maculatus</i> (Kner, 1858)* # (<i>Serrasalmus spilopleura</i>) <i>Serrasalmus marginatus</i> Valenciennes, 1837**
Anostomidae	<i>Leporellus vittatus</i> (Valenciennes, 1850)* <i>Leporinus friderici</i> (Bloch, 1794)* <i>Leporinus obtusidens</i> (Valenciennes, 1836)*

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	<i>Leporinus octofasciatus</i> Steindachner, 1915*
	<i>Leporinus striatus</i> Kner, 1858*
	<i>Schizodon altoparanae</i> Garavello & Britski, 1990**
	<i>Schizodon borellii</i> (Boulenger, 1900)*
Curimatidae	<i>Cyphocharax modestus</i> (Fernández-Yépez, 1948)* # (<i>Cyphocharax modesta</i>) <i>Cyphocharax nagelii</i> (Steindachner, 1881)** <i>Steindachnerina insculpta</i> (Fernández-Yépez, 1948)*
Prochilodontidae	<i>Prochilodus lineatus</i> (Valenciennes, 1836)*
Erythrinidae	<i>Hoplias</i> aff. <i>lacerdae</i> Miranda-Ribeiro, 1908* <i>Hoplias</i> aff. <i>malabaricus</i> (Bloch, 1794)*
Parodontidae	<i>Apareiodon affinis</i> (Steindachner, 1879)* <i>Apareiodon piracicabae</i> (Eigenmann, 1907)* <i>Parodon nasus</i> Kner, 1859*# (<i>Parodon tortuosus</i>)
Cynodontidae	<i>Rhaphiodon vulpinus</i> Spix & Agassiz, 1829**
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GYMNOTIFORMES	
Gymnotidae	<i>Gymnotus</i> aff. <i>inaequilabiatus</i> (Valenciennes, 1839)* # (<i>Gymnotus carapo</i>)
Sternopygidae	<i>Eigenmannia trilineata</i> López & Castello, 1966**
Apteronotidae	<i>Apteronotus</i> aff. <i>albifrons</i> (Linnaeus, 1766)*
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SILURIFORMES	
Auchenipteridae	<i>Ageneiosus inermis</i> (Linnaeus, 1766)** <i>Parauchenipterus galeatus</i> (Linnaeus, 1766)** <i>Tatia neivai</i> (Ihering, 1930)*
Callichthyidae	<i>Hoplosternum littorale</i> (Hancock, 1828)**
Cetopsidae	<i>Cetopsis gobioides</i> Kner, 1858**
Heptapteridae	<i>Pimelodella</i> sp. <i>Rhamdia quelen</i> (Quoy & Gaimard, 1824)* # (<i>Rhamdia</i> sp.)
Pimelodidae	<i>Hemisorubim platyrhynchos</i> (Valenciennes, 1840)** <i>Hypophthalmus edentatus</i> Spix & Agassiz, 1829** <i>Iheringichthys labrosus</i> (Lütken, 1874)*

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	<i>Pimelodus heraldoi</i> Azpelicueta, 2001*# (<i>Pimelodus fur</i>)
	<i>Pimelodus maculatus</i> La Cepède, 1803*
	<i>Pimelodus ornatus</i> Kner, 1858**
	<i>Pseudopimelodus mangurus</i> (Valenciennes, 1835)* #(<i>Pseudopimelodus zungaro</i>)
	<i>Pinirampus pirinampu</i> (Spix & Agassiz, 1829)**
	<i>Steindachneridion scriptum</i> (Miranda-Ribeiro, 1918)* # (<i>Steindachneridion</i> sp.)
Doradidae	<i>Pterodoras granulosus</i> (Valenciennes, 1840)** <i>Trachydoras paraguayensis</i> (Eigenmann & Ward, 1907)**
Loricariidae	
Ancistrinae	<i>Megalancistrus parananus</i> (Peters, 1881)* # (<i>Megalancistrus aculeatus</i>)
Hypostominae	<i>Hypostomus albopunctatus</i> (Regan, 1908)** <i>Hypostomus ancistroides</i> (Ihering, 1911)** <i>Hypostomus margaritifer</i> (Regan, 1908)** <i>Hypostomus regani</i> (Ihering, 1905)** <i>Hypostomus</i> spp. <i>Rhinelepis aspera</i> Spix & Agassiz, 1829**
Loricariinae	<i>Loricaria</i> sp. <i>Loricariichthys platymetopon</i> Isbrücker & Nijssen, 1979** <i>Loricariichthys rostratus</i> Reis & Pereira, 2000** <i>Hisonotus</i> sp.

PERCIFORMES

Sciaenidae	<i>Plagioscion squamosissimus</i> (Heckel, 1840)*
Cichlidae	<i>Crenicichla</i> sp. <i>Oreochromis niloticus</i> (Linnaeus, 1758)**

Compared to the surveys presented by Agostinho et al. (1997; 2004), which registered 57 fish species for the Piquiri River, a total of 31 were captured in both studies, and 12 of these had their names updated. It is possible to observe a clear substitution of species, since the present samplings caught 25 new species (not captured in previous surveys). In addition, the group *Hypostomus* and other five species still do not have a formal description, indicating a higher total number of species for this river. Since these

species were not considered for comparisons here, fish fauna substitution is probably underestimated.

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