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LISTS OF SPECIES

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Ichthyofauna from the Parque Nacional da Serra dos Órgãos and its surrounding areas, Rio de Janeiro state, Brazil

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Abstract: This study provides a list of freshwater fishes of the Parque Nacional da Serra dos Órgãos (PARNASO; Rio de Janeiro state, Brazil) and its surrounding areas. Fish samplings were performed by electrofishing during the dry season (2010 –2011) in three different areas: 1, inside of the PARNASO (2 sites); 2, in the buffer zone (4 sites); and 3, in adjacent areas (8 sites). A total of 47 fish species in 13 families and six orders were recorded. Fish composition within the limits of the PARNASO differed from that recorded in the adjacent area, with the latter having comparatively higher species richness. The buffer area had intermediate ichthyofauna composition between the two other areas. This study enhanced knowledge on the composition and structure of the fish assemblages in PARNASO, by recording the occurrence of six new species within the park that were not included in the Management Plan of this Conservation Unit.

Key words: fish, Serra do Mar, Atlantic Rain Forest streams, conservation unit

INTRODUCTION

The Atlantic Rain Forest, located mostly on the eastern Brazilian coast, presents high species richness but it is under heavy anthropogenic pressure that has devastated large forested areas (Ribeiro et al. 2009). This tropical forest was one of the largest biomes in the Americas, covering ca. 150 million ha (Ribeiro et al. 2009). The early exploitation of the forest dates from the beginning of the colonization of Brazil, 500 years ago. Nowadays, only 12.9% of its original cover remains forested (Tabarelli et al. 2010). The majority of remaining forest cover are small fragments (<100 ha) while the largest forested areas are located in cliffs and stepped areas that difficult access of humans (Ranta et al. 1998; Silva et al. 2007; Ribeiro et al. 2009). Because heavy vegetation losses and high endemism degree, the Atlantic Rain Forest is considered one the largest hotspots in the world (Myers et al. 2000; Miranda 2012). The Atlantic Rain Forest has a rich ichthyofauna, estimated about 270 species, belonging to 89 genera and 21 families (Abilhoa et al. 2011; Miranda 2012). However, there are several doubts on species descriptions and on the ecological processes such as heavy water turmoil and vegetation influences on fish assemblages (Guimarães et al. 2010). Despite the high biodiversity in the Atlantic Rain Forest, anthropogenic activities have jeopardized this system and there are few studies on streams fish composition and structure (Myers et al. 2000; Miranda 2012).

Conservation Units have been proposed to mitigate human impacts on biodiversity. The Parque Nacional da Serra dos Órgãos (hereafter PARNASO) (Figure 1), one of the oldest Brazilian conservation units, was created in 1939, and nowadays occupies an area of 20,024 ha, covering parts of four municipalities of the Rio de Janeiro state: Petrópolis, Teresópolis, Magé and Guapimirim (ICMBio 2014). This conservation unit is one of the most important areas of environmental preservation of the Atlantic Rain Forest biome, located in a strategic area of the Serra do Mar. However, knowledge on the ichthyofauna from PARNASO is scarce because of the difficulty to access streams and rivers in the area, where headwaters are located in cliffs and steep park areas, with numerous waterfalls.

This study provides a list of freshwater fish species occurring in the PARNASO and surrounding areas. The surrounding areas were divided into two zones: 1, buffer zone, which is subject to specific rules and restrictions to minimize anthropogenic impacts on the surrounding park area; and 2, adjacent area, which is the surrounding the buffer zone where the conservation unit rules do not reach. We also evaluated the role of the environment protection on the fish assemblage, as well as the

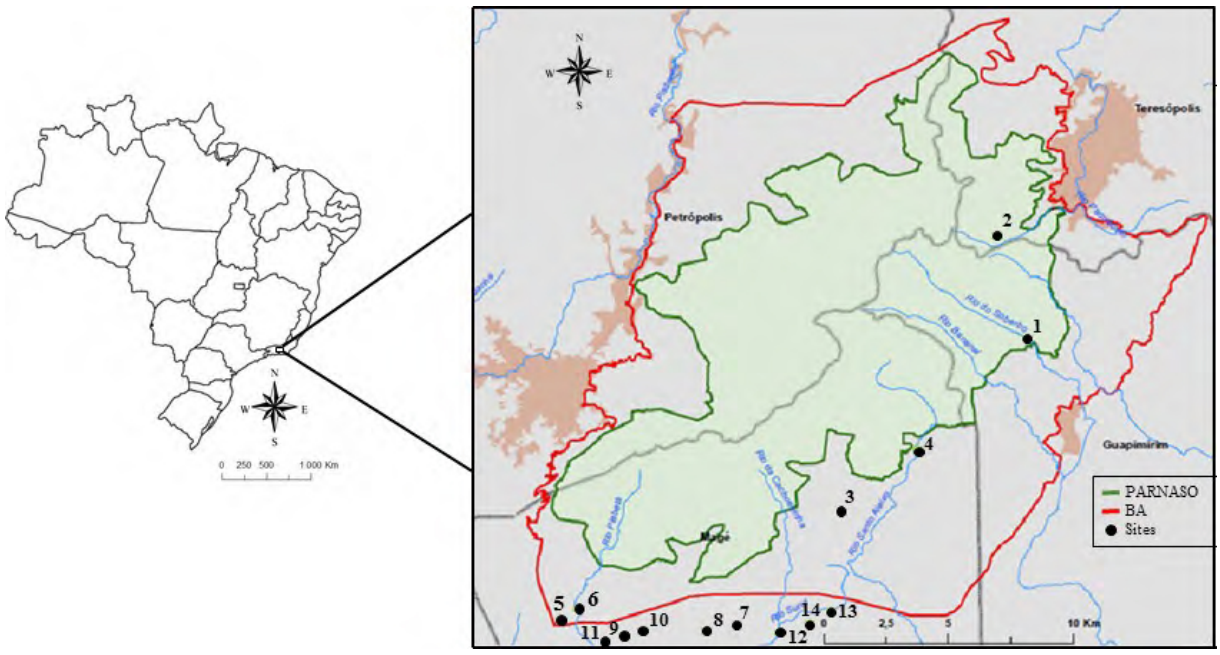

Figure 1. Map of the study area, indicating the 14 Atlantic Forest stream sites, in the Parque Nacional da Serra dos Órgãos (PARNASO) and its surrounding areas, southeastern Brazil. BA= Buffer area. Map given by Parque Nacional da Serra dos Órgãos (adapted). The altitude of the sites is given in Table 1.

consequences of impacts from non-protected areas on fish assemblage diversity. Although only the most accessible sites were searched, we also describe fish structure assemblage. We believe this study can contribute to an update of species composition in reference to the management plan estimates and reinforce the importance of conservation unit on fish diversity maintenance.

MATERIALS AND METHODS

Study Area

This study was carried out in the Parque Nacional da Serra dos Órgãos (PARNASO) and its surrounding areas, in Rio de Janeiro state, southeastern Brazil (latitudes 22°25′00″ –22°38′44″ S; longitudes 042°45′36″ – 043°26′57″ W) (Figure 1). This area is bounded by the Serra do Mar coastal range, with altitudes between 300 and 2,263 m above sea level (Bragagnolo and Pinto-da-Rocha 2003). The climate is tropical super humid, with the relative humidity remained between 80% and 90%, reaching 99% at higher altitudes (Drummond 1997; Bragagnolo and Pinto-da-Rocha 2003). Average annual temperature is 18°C and rainfall ca. 2,300 mm (Guimarães et al. 2009). The wet season peaks during the summer (December to March) and dry season in the winter (June to August).

Sampling design

The streams sampling sites included in this study were distributed inside of the PARNASO area, in its buffer area, and in the adjacent area. The buffer area is defined according to the Brazilian law (n° 9.985/2000) as the area in which human activities are subject to specific rules and restrictions to minimize anthropogenic impacts on the surrounding park area and to reduce damage on the conservation unit. The adjacent area is located near to the park but is not subject to conservation rules.

Fish and habitat surveys were conducted at 14 sites, which drain to Guanabara Bay in the Atlantic Rain Forest biome (Permit n° 17632-2/ICMBio), distributed within the PARNASO limits (2 sites), in the buffer area (4), and in the adjacent area (8) (Figures 1 and 2). The sites were chosen on the basis of accessibility, and they are first to third streams order, with mean stream width ranging from 0.5 to 15 m (Table 1). Fish samplings were carried out during the dry season (May to October) in 2010 (12 sites) and 2011 (2 sites) to standardize the seasonal context. As descripted in Terra et al. (2013), a site was extended upstream for 40 times the mean wetted channel width, or a minimum of 100 m and a maximum of 500 m.

Each site was surveyed by electrofishing, with alternating current generator (3000 W, 110/220 V) provided by two hoop-shaped (440 mm × 300 mm) anodes supporting a net (3 mm mesh). Two people, each with an anode, fished from one edge to the other removing all fishes detected in the electric field. All collected fish were fixed in 10% formalin and, after 48 hours, preserved in 70% ethanol. All individuals were identified to species, counted and weighed (g). Vouchers were deposited in the fish collection of the Laboratory of Fish Ecology, Universidade Federal Rural do Rio de Janeiro and in the Special Teleost an Fish Collection of the Universidade Federal do Rio de Janeiro (Appendix 1).

Statistical test

We calculated abundance (N), biomass (B) and frequency of occurrence (FO%) to each species for a

fish assemblage description (Table 2). The frequency of occurrence was calculated from the number of samples in which each species was observed in relation to the total number of sampling sites. The abundance and biomass were calculated based on the total of individuals and weights for each species, respectively.

With the objective of identify differences in fish assemblages composition among areas (PARNASO, buffer zone, and adjacent area), we performed a Non-Metric Multidimensional Scaling (MDS). The resemblance matrix was based on Bray Curtis similarity and this analysis was performed in PRIMER 6 with PERMANOVA+ software (Clarke and Gorley 2006).

RESULTS

We collected a total of 4,617 individuals belonging to 47 species, 13 families and six orders (Table 2). Siluriformes represented 42.6% (20 species) of the total number of species, followed by Characiformes with 32% (15 species). Cyprinodontiformes were represented by six species, Perciformes by three, Gymnotiformes by two and Synbranchiformes by only one species.

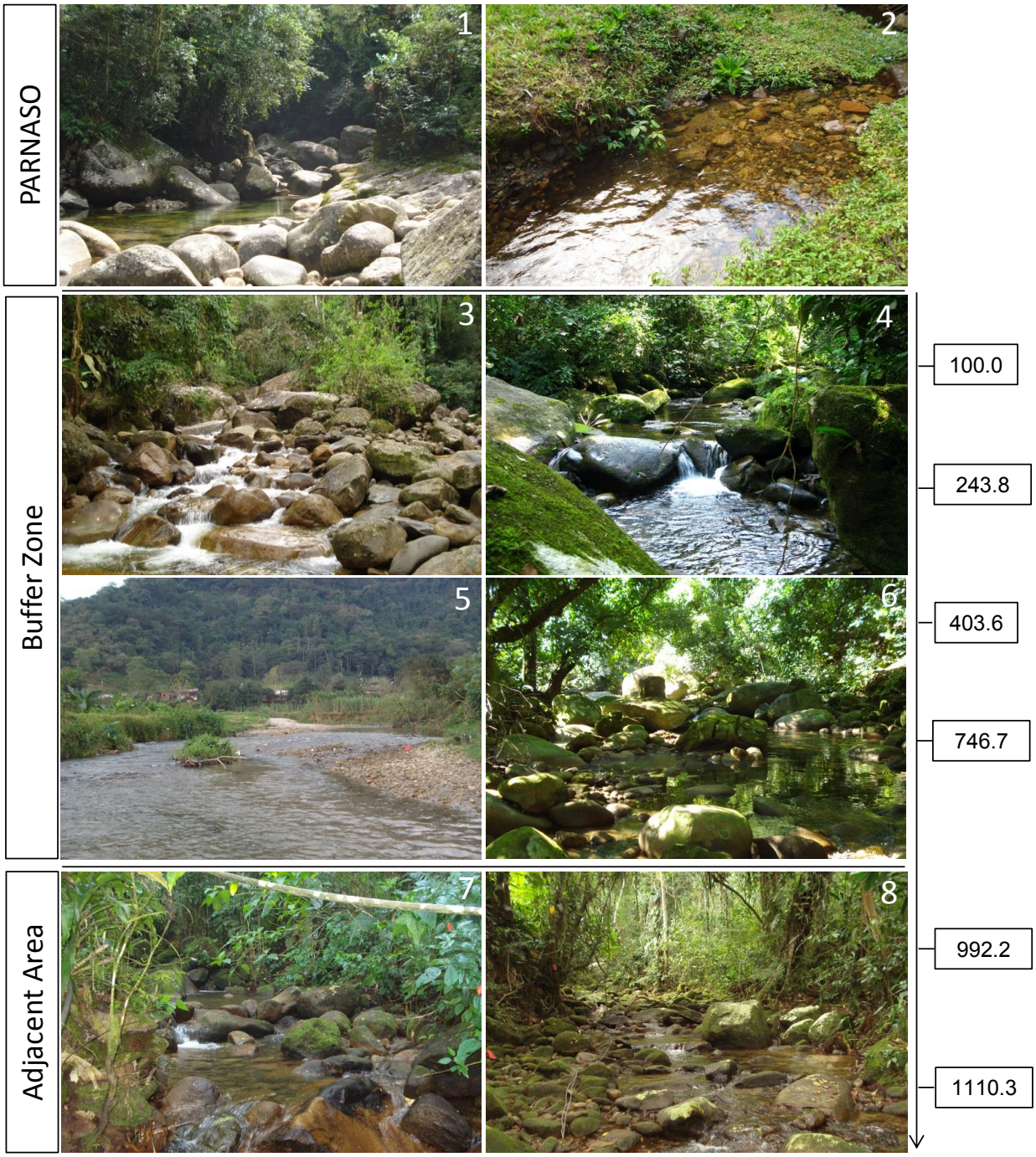

Figure 2. Stream pictures indicating the 14 Atlantic Rain Forest stream sites arranged according to their position in relation to Parque Nacional da Serra dos Órgãos. Numbers in each picture indicates their code. Odd numbers correspond to first distance from top to bottom. The arrow with numbers indicates the distance in meters from the park boarder.

Table 1. Physical characteristics of the 14 Atlantic Forest stream sites sampled in the Parque Nacional da Serra dos Órgãos and its surrounding areas, southeastern Brazil.

Position relative to PARNASO	River/stream	Code	Latitude (geo/WGS84)	Longitude (geo/WGS84)	Mean width (m)	Channel length sampled (m)	Altitude (m a.s.l.)
PARNASO	Soberbo	1	22°29′39″	043°59′53″	4	160	340
PARNASO	Santinha*	2	22°27′59″	043°00′09″	15	160	862
Buffer zone	Santo Aleixo	3	22°31′30″	043°01′53″	5	200	261
Buffer zone	Pedras Negras	4	22°32′34″	043°03′59″	7	280	207
Buffer zone	Caioba	5	22°35′12″	043°11′03″	8	320	20
Buffer zone	Rio Piabetá	6	22°35′02″	043°09′57″	8	320	35
Adjacent area	Rio dos Cavalheiros	7	22°35′36″	043°07′19″	4	160	12
Adjacent area	Rio do Ouro	8	22 °35′32″	043°06′44″	4	160	43
Adjacent area	Valinha	9	22°35′49″	043°08′34″	0.5	100	43
Adjacent area	Lava Prato	10	22°35′56″	043°08′47″	1.5	100	14
Adjacent area	Cachoeirinha	11	22°35′28″	043°05′26″	4	160	33
Adjacent area	Rio da Rainha	12	22°36′11″	043°09′10″	1.5	100	18
Adjacent area	Roncador I	13 (14)	22°35′27″	043°04′37″	2	100	12
Adjacent area	Roncador II	14 (13)	22°35′09″	043°04′90″	2	100	12

* No fish species was found.

Characidae was the family with the highest number of species (13 species), followed by Loricariidae (11 species). The Characidae family also had the highest number of individuals (40% of the total number of individuals), followed by Poeciliidae (15% of individuals).

Astyanax taeniatus (Jenyns, 1842) represented 19.2% of the total number of individuals and 22% of total biomass, occurring mainly in streams in the buffer area. *Poecilia reticulata* Peters, 1859 was the second most abundant species (12% of the total number of individuals); however the second highest biomass was recorded for *Rhamdia quelen* (Quoy & Gaimard, 1824) (15%). *Phalloceros harpagos* Lucinda, 2008 was the most frequent species, occurring in 10 of the 14 streams. *Poecilia reticulata* and *Xiphophorus* sp. (only one individual in the adjacent area) were the only recorded non-native species.

A total of 12 species was recorded within the PARNASO limiting area (Table 2), therefore doubles the number of species originally recorded in the management plan for the conservation unit. One of the six species previously recorded in the park management plan (*Trichomycterus goeldii* Boulenger, 1896) was not recorded in this study. We collected *Characidium vidali* Travassos, 1967 and the management plan listed *Characidium* sp. n., although we cannot ensure they are the same species. Fish assemblage composition within the PARNASO limits differed from those recorded in streams from the adjacent area (Figure 3). Moreover, streams in the buffer area have intermediary ichthyofauna composition between the PARNASO and the adjacent area. Two species were found only in the sites within the PARNASO limits (*Crenicichla lacustris* (Castelnau, 1855) and *Trichomycterus* cf. *paquequerense* (Miranda Ribeiro, 1943)). *Poecilia vivipara* Bloch & Schneider, 1801, *Rhamdioglanis transfasciatus* Miranda Ribeiro, 1908, *Astyanax intermedius* Eigenmann, 1908, *Rineloricaria* sp. 2, *Hypostomus* sp., *Astyanax* sp., *Callichthys callichthys* (Linnaeus, 1758), and *Kronichthys heylandi* (Boulenger, 1900) were collected only in the buffer area, whereas other 11 species were found only in the adjacent area.

DISCUSSION

The predominance of Siluriformes and Characiformes as main components of the ichthyofauna of the Atlantic Rain Forest streams was expected because they are the dominant orders in Neotropical freshwater systems (Lowe-McConnell 1999; Abilhoa et al. 2011) and were also observed in Atlantic Rain Forest streams (Casatti et al. 2001; Sarmento-Soares et al. 2007; Ferreira and Petrere 2009).

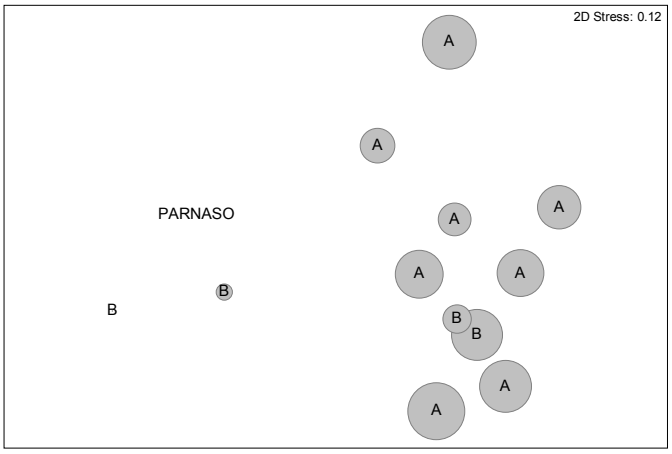

Figure 3. MDS plots of fish assemblages at each of the 14 Atlantic Rain Forest sites based on Bray–Curtis similarity measures. The species associated with the sites were shown in the bottom of the figure. The distance from each site sample to the PARNASO is shown using scaled bubbles. Scale of bubbles 0 - 4000 meters. A= adjacent area and B= buffer zone.

Table 2. List of species collected in the 14 Atlantic Rain Forest stream sites sampled in the Parque Nacional da Serra dos Órgãos, buffer zone and its adjacent areas. N = Number of individuals. B = Biomass in grams. FO% = Frequency of occurrence. X = Species recorded in the PARNASO Management Plan. Gray color indicates species sampled in within the area.

Species	N	B(g)	FO%	PARNASO	Buffer	Adjacent
CHARACIFORMES						
Crenuchidae						
Characidium vidali Travassos, 1967	383	816.25	50.0	X		
Characidae						
Astyanax giton Eigenmann, 1908	147	796.95	42.9			
Astyanax hastatus Myers, 1928	187	199.06	42.9			
Astyanax intermedius Eigenmann, 1908	59	329.6	14.3			
Astyanax janeiroensis Eigenmann, 1908	159	1456.75	42.9			
Astyanax parahybae Eigenmann, 1908	25	19.31	7.1			
Astyanax sp. 1	2	24.43	7.1			
Astyanax sp. 2	1	4.6	7.1			
Astyanax taeniatus (Jenyns, 1842)	886	5362.39	42.9			
Bryconamericus ornaticeps Bizerril & Perez-Neto, 1995	134	346.75	21.4			
Deuterodon sp. 1	16	184.7	14.3			
Deuterodon sp.2	30	31.33	14.3			
Hyphessobrycon reticulatus Ellis, 1911	66	42.07	7.1			
Mimagoniates microlepis (Steindachner, 1877)	133	59.7	21.4			
Erythrinidae						
Hoplias malabaricus (Bloch, 1794)	12	1144.75	21.4			
CYPRINODONTIFORMES						
Rivulidae						
Kryptolebias brasiliensis (Valenciennes, 1821)	3	1.25	21.4			
Poeciliidae						
Phalloceros aff. *anisophallos* Lucinda, 2008	6	0.99	7.1			
Phalloceros harpagos Lucinda, 2008	95	17.36	71.4			
*Poecilia reticulata** Peters, 1859	568	106.62	57.1			
Poecilia vivipara Bloch & Schneider, 1801	6	1.21	14.3			
Xiphophorus sp.*	1	1.12	7.1			
GYMNOTIFORMES						
Gymnotidae						
Gymnotus carapo Linnaeus, 1758	2	29.62	7.1			
Gymnotus pantherinus (Steindachner, 1908)	29	387.69	28.6			
PERCIFORMES						
Cichlidae						
Crenicichla lacustris (Castelnau, 1855)	1	36.17	7.1			
Geophagus brasiliensis (Quoy&Gaimard, 1824)	141	1647.94	42.9			
Gobiidae						
Awaous tajasica (Lichtenstein, 1822)	3	24.3	14.3			
SILURIFORMES						
Callichthyidae						
Callichthys callichthys (Linnaeus, 1758)	2	58.04	7.1			
Corydoras nattereri Steindachner, 1876	30	73.75	28.6			
Scleromystax barbatus (Quoy & Gaimard, 1824)	252	793.54	57.1			
Heptapteridae						
Acentronichthys leptos Eigenmann & Eigenmann, 1889	185	416.2	57.1			
Pimelodella lateristriga (Lichtenstein, 1823)	222	1296.09	50.0			
Rhamdia quelen (Quoy & Gaimard, 1824)	139	3641.34	57.1			
Rhamdioglanis transfasciatus Miranda Ribeiro, 1908	92	908.7	14.3			
Loricariidae						
Ancistrus multispinis (Regan, 1912)	31	177.07	42.9			
Hypostomus affinis (Steindachner, 1877)	8	224.78	28.6			
Hypostomus sp.	3	26.43	7.1			
Kronichthys heylandi (Boulenger, 1900)	1	0.18	7.1			
Neoplecostomus microps (Steindachner, 1877)	34	122.87	21.4			
Pareiorhaphis garbei (Ihering, 1911)	189	1053.86	28.6	X		
Parotocinclus maculicauda (Steindachner, 1877)	35	13.04	21.4			
Pseudotothyris obtusa (Miranda Ribeiro, 1911)	21	6.64	21.4			
Rineloricaria sp.1	24	98.61	28.6			
Rineloricaria sp.2	37	123.89	7.1			
Schizolecis guntheri (Miranda Ribeiro, 1918)	72	32.25	50.0			
Trichomycteridae						
Trichomycterus cf. *paquequerense* (Miranda Ribeiro, 1943)	2	8.67	7.1	X		
Trichomycterus zonatus (Eigenmann, 1918)	117	191.89	28.6	X		
SYNBRANCHIFORMES						
Synbranchidae						
Synbranchus marmoratus Bloch, 1795	26	1991.88	57.1			
Total	**4,617**	**24,332.63**				

* Non-native species.

The opportunist species *Astyanax taeniatus* and *Poecilia reticulata* that had the highest total number of individuals colonized several types of habitats. Characins inhabit several aquatic habitats such as streams, rivers, lagoons and reservoirs in different levels of environmental quality, whereas the poecilids are known for their capacity to colonize a wide range of degraded habitats tolerating low water quality where other species cannot tolerate (Araújo et al. 2009; Teixeira et al. 2005).

From species that were exclusively collected within PARNASO limits, *Crenicichla lacustris* is a widely distributed species over coastal drainages of the Southeastern and Eastern Brazil (FishBase 26/11/2014). However, *T.* cf. *paquequerense* that was considered endemic for the Paquequer River basin (also located within the PARNASO limiting area) was recorded for the first time in this study for the Soberbo River. This species is typical of cold and turbulent waters with special habitat requirements.

In the buffer zone, we found both, species more sensible to environmental disturbance (e.g., sewage discharges, channelization, lack of riparian cover) such as *R. transfasciatus*, and more tolerant species to environmental degradation such as the non-native *P. reticulata*, the characins of *Astyanax* genera and the siluriformes *Rineloricaria* sp. 2. In the adjacent area where human interference such as residences near the stream margins, small dams for recreation, poultry activities, small plantation, among others we recorded species typical of lowland areas that inhabit sites with comparatively high temperature and with high pool availability.

Altitude has been reported as an important environmental variable determining fish assemblage structure in streams (Ferreira and Petrere 2009). However, fish responses to altitudinal gradient can be confounding with anthropogenic impacts that are more common in low altitudes. Streams within the PARNASO limits and in its buffer area have comparatively higher altitude and have comparatively lower species richness that are associated with fast waters (rapids and runs), higher dissolved oxygen and comparatively lower temperature (River Continuum Concept, Vannote et al. 1980). Species of *Trichomycterus* and the *Characidium vidali* are typical representative of such areas. On the other hand, decreasing slope, increasing temperature and high availability of pools contribute to changes in the substrate type of downstream sites favoring the occupation of the stream habitat by other species adapted to these conditions as we found in the adjacent area of the PARNASO.

This study contributed to enhanced knowledge on the fish assemblage composition and structure in the PARNASO streams, recording six new species for the area that were not included in the management plan of this conservation unit. Knowledge on the community's composition and distribution is a main concern considering the high pressure of human activities on several of the world aquatic ecosystems (Duncan and Lockwood 2001; Aquino et al. 2009). This is a main step to elaborate and to establish management plans aiming conservation and recovery of aquatic ecosystems.

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Appendix 1

Table A1. Voucher numbers and geographic coordinates of the specimen deposited in fish collection of the Laboratory of Fish Ecology, Universidade Federal Rural do Rio de Janeiro and in the Special Teleost at Fish Collection of the Universidade Federal do Rio de Janeiro.

Vouchers numbers	Species	Streams	Geographic coordinates
UFRRJ-LEP866	*Characidium vidali*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP798	*Astyanax giton*	Cachoeirinha	22°35′28″ S, 043°05′26″ W
UFRRJ-LEP846	*Astyanax hastatus*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP793	*Astyanax intermedius*	Piabetá	22°35′02″ S, 043°09′57″ W
UFRRJ-LEP825	*Astyanax janeiroensis*	Roncador II	22°35′09″ S, 043°04′90″ W
UFRRJ-LEP871	*Astyanax parahybae*	Roncador II	22°35′09″ S, 043°04′90″ W
UFRRJ-LEP1525	*Astyanax sp. 1*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP1526	*Astyanax sp. 2*	Cachoeirinha	22°35′28″ S, 043°05′26″ W
UFRRJ-LEP794	*Astyanax taeniatus*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP836	*Bryconamericus ornaticeps*	Cachoeirinha	22°35′28″ S, 043°05′26″ W
UFRRJ-LEP1527	*Deuterodon sp. 1*	Cachoeirinha	22°35′28″ S, 043°05′26″ W
UFRRJ-LEP1528	*Deuterodon sp.2*	Roncador II	22°35′09″ S, 043°04′90″ W
UFRRJ-LEP1529	*Hyphessobrycon reticulatus*	Roncador II	22°35′09″ S, 043°04′90″ W
UFRRJ-LEP839	*Mimagoniates microlepis*	Rainha	22°36′11″ S, 043°09′10″ W
UFRRJ-LEP844	*Hoplias malabaricus*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP1136	*Kryptolebias brasiliensis*	Imbariê	22°35′04″ S, 043°11′46″ W
UFRRJ-LEP1531	*Phalloceros aff. anisophallos*	Rainha	22°36′11″ S, 043°09′10″ W
UFRRJ-LEP957	*Phalloceros harpagos*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP952	*Poecilia reticulata*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP1532	*Poecilia vivipara*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP982	*Xiphophorus sp.*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP1534	*Gymnotus carapo*	Rainha	22°36′11″ S, 043°09′10″ W
UFRJ8523	*Gymnotus pantherinus*	Rio do Ouro	22 °35′32″ S, 043°06′44″ W
UFRRJ-LEP1535	*Crenicichla lacustris*	Soberbo	22°29′39″ S, 042°59′53″ W
UFRRJ-LEP965	*Geophagus brasiliensis*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP972	*Awaous tajasica*	Rainha	22°36′11″ S, 043°09′10″ W

Continued

Table A1. *Continued.*

Vouchers numbers	Species	Streams	Geographic coordinates
UFRRJ-LEP1536	*Callichthys callichthys*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP931	*Corydoras nattereri*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP891	*Scleromystax barbatus*	Cachoeirinha	22°35′28″ S, 043°05′26″ W
UFRRJ-LEP916	*Acentronichthys leptos*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP919	*Pimelodella lateristriga*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP937	*Rhamdia quelen*	Roncador I	22°35′27″ S, 043°04′37″ W
UFRRJ-LEP927	*Rhamdioglanis transfasciatus*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP880	*Ancistrus multispinis*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP1538	*Hypostomus affinis*	Rainha	22°36′11″ S, 043°09′10″ W
UFRRJ-LEP1539	*Hypostomus sp.*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP1540	*Kronichthys heylandi*	Santo Aleixo	22°31′30″ S, 043°01′53″ W
UFRRJ-LEP929	*Neoplecostomus microps*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP1537	*Pareiorhaphis garbei*	Santo Aleixo	22°31′30″ S, 043°01′53″ W
UFRRJ-LEP1541	*Parotocinclus maculicauda*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP901	*Pseudotothyris obtusa*	Rainha	22°36′11″ S, 043°09′10″ W
UFRRJ-LEP1542	*Rineloricaria sp.1*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP1543	*Rineloricaria sp.2*	Caioba	22°35′12″ S, 043°11′03″ W
UFRRJ-LEP911	*Schizolecis guntheri*	Cavalheiros	22°35′36″ S, 043°07′19″ W
UFRJ8468	*Trichomycterus cf. paquequerense*	Soberbo	22°29′39″ S, 042°59′53″ W
UFRJ8481	*Trichomycterus zonatus*	Pedras Negras	22°32′34″ S, 043°03′59″ W
UFRRJ-LEP977	*Synbranchus marmoratus*	Roncador I	22°35′27″ S, 043°04′37″ W