



## Scientific Note

### Distribution extension of *Cyphocharax spilotos* (Vari, 1987) (Characiformes: Curimatidae), at Patos-Mirim lagoon system, Rio Grande do Sul State, Brazil

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**Abstract.** This paper describes a new area of occurrence and the first record of the species *Cyphocharax spilotos* (Vari, 1987), in Chasqueiro hydrographic basin, Patos-Mirim system, State of Rio Grande do Sul, Brazil.

**Key words:** Neotropical region, conservation, freshwater fish, Ostariophysi

**Resumo.** Ampliação da distribuição de *Cyphocharax spilotos* (Vari 1987), (Characiformes: Curimatidae), no sistema lagunar Patos-Mirim, estado do Rio Grande do Sul, Brasil. O presente trabalho descreve nova área de ocorrência, e o primeiro registro da espécie *Cyphocharax spilotos* (Vari, 1987), na bacia hidrográfica do Chasqueiro, sistema Patos-Mirim, estado do Rio Grande do Sul, Brasil.

**Palavras chave:** Região neotropical, conservação, peixes de água doce, Ostariophysi

The Patos-Mirim system is located in the State of Rio Grande do Sul (RS), Brazil, and comprises a complex of aquatic ecosystems that includes lagoons, lakes, rivers, streams, wetlands and estuaries, and this complex offers refuge to a great diversity of organisms (Seeliger & Odebrecht 2010). Patos and Mirim lagoons are connected by São Gonçalo channel. A dam was built in it during the 1970's to prevent the entry of saline water from Patos Lagoon into Mirim Lagoon (Burns *et al.* 2006). It should be noted that Mirim Lagoon is the main water source for the maintenance of agriculture (e.g. rice culture) in the far south of RS, as well as an important environment for artisanal fisheries.

This area is located in the Neotropical region, where an estimated 7000 fish species occur (Albert & Reis 2011). However, it should be emphasized that the number of species is continuously increasing due to descriptions of new species. With 18 families, 270 genera and

approximately 1700 valid species (Lévêque *et al.* 2008), the order Characiformes is one of the most species-rich. The Curimatidae family consists of 8 genera and 100 valid species, and 37 of these species belong to genus *Cyphocharax*, which is distributed in South and Central America (Vari *et al.* 2010, Eschmeyer 2013) including the Uruguay River, low Paraná River and Paraguay River basins (Buckup 2007). The diet of *Cyphocharax* species is based mainly on inorganic particulate matter, and because of their feeding habits, they play a relevant role in nutrient cycling and food webs in Neotropical ecosystems (Garcia *et al.* 2007, Corrêa & Piedras 2008). Reproduction occurs over a long period, usually between winter and late spring, with external fertilization (Hartz & Barbieri 1994). The fecundity of the species of this genus is considered high, with the total length of the first gonadal maturation being 121 mm for males and 128 mm for females (Schifino *et al.* 1998).

*Cyphocharax spilotos* (Vari, 1987) is a Curimatidae species, identified primarily by the following characters: absence of maxillary teeth, pigmentation in the lateral line pores, presence of a dark spot on the side of the body, beginning at the caudal peduncle and often extending to the opercle, ii +10 to 12 dorsal fin rays and 29-33 lateral line scales (Vari 1992). This study documents the first record of *C. spilotos* in the hydrographic basin of the Chasqueiro Stream, in Patos-Mirim system, State of Rio Grande do Sul, Brazil. So far few studies (Buckup & Reis 1997) describing the genus Characidium in southern Brazil have been conducted in this basin, which reinforces the importance of this study for the increase of the knowledge about fish fauna in this region. The species was previously recorded in the Jacuí delta, about 250 km away (Sacol-Pereira & Fialho 2010). It was also recorded in mid Uruguay River basin, about 600 km away (Pessano *et al.* 2004) and in low Arroio das Antas stream, about 500 km away (Luz-Agostinho *et al.* 2010). It is noteworthy that no study has been conducted in Chasqueiro stream watershed, and little is known about the bioecology of this species, for instance, aspects of reproductive (Quagio-Grassiotto

*et al.* 2003), circadian and seasonal variation (Sacol-Pereira & Fialho 2010). This highlights the importance of studies for the region.

We collected 434 specimens of *C. spilotos* (Figure 1) in the hydrographic basin of Chasqueiro stream (31°6'51" S/ 50°51'16,71" W) (Figure 2) (Table I), between August 2012 and February 2013. Nineteen specimens were sorted out for morphometric measurements. Samples were taken by the project “Feeding ecology and ecomorphological patterns of the fish assemblage in the Chasqueiro stream hydrographic basin, municipality of Arroio Grande, state of Rio Grande do Sul, Brazil”, run by the Ichthyology Laboratory of Universidade Federal de Pelotas. Fish were caught using: a) gill-net, 5 m long, 2.25 m high and 5 mm mesh between adjacent knots; five trawling were performed, b) hand net (5 mm mesh size) with a 35 cm wide and 50 cm long opening, used for up to 30 minutes, c) sieve, with 5 mm mesh, 80 cm wide and 160 cm long, used for up to 15 minutes. Four physicochemical descriptors of water were measured in each collection: dissolved oxygen, alkalinity, pH, and water temperature.



**Figure 1.** *Cyphocharax spilotos* collected in the hydrographic basin of Chasqueiro stream, State of Rio Grande do Sul, Brazil. (Picture by Fabiano Corrêa).

The collected fish were kept in plastic bags and fixed in 10% formalin. After 24 hours they were transferred to 70% ethanol for later identification of the 19 specimens. In laboratory, their total mass (g) was determined and the following morphometric measurements (mm) were taken according to Vari (1992): total length, standard length, head height, body height, caudal peduncle height, head length, anal fin length, dorsal fin length, caudal fin length, pectoral fin length, pelvic fin length, caudal peduncle length, pre-anal distance, pre-dorsal

distance, pre-pectoral distance, pre-pelvic distance, snout length, orbital diameter, interorbital distance, pre-nasal distance and snout width (Table II). Voucher specimens were deposited in the Ichthyological Collection of Universidade Federal do Rio Grande (ICFURG # 0044).

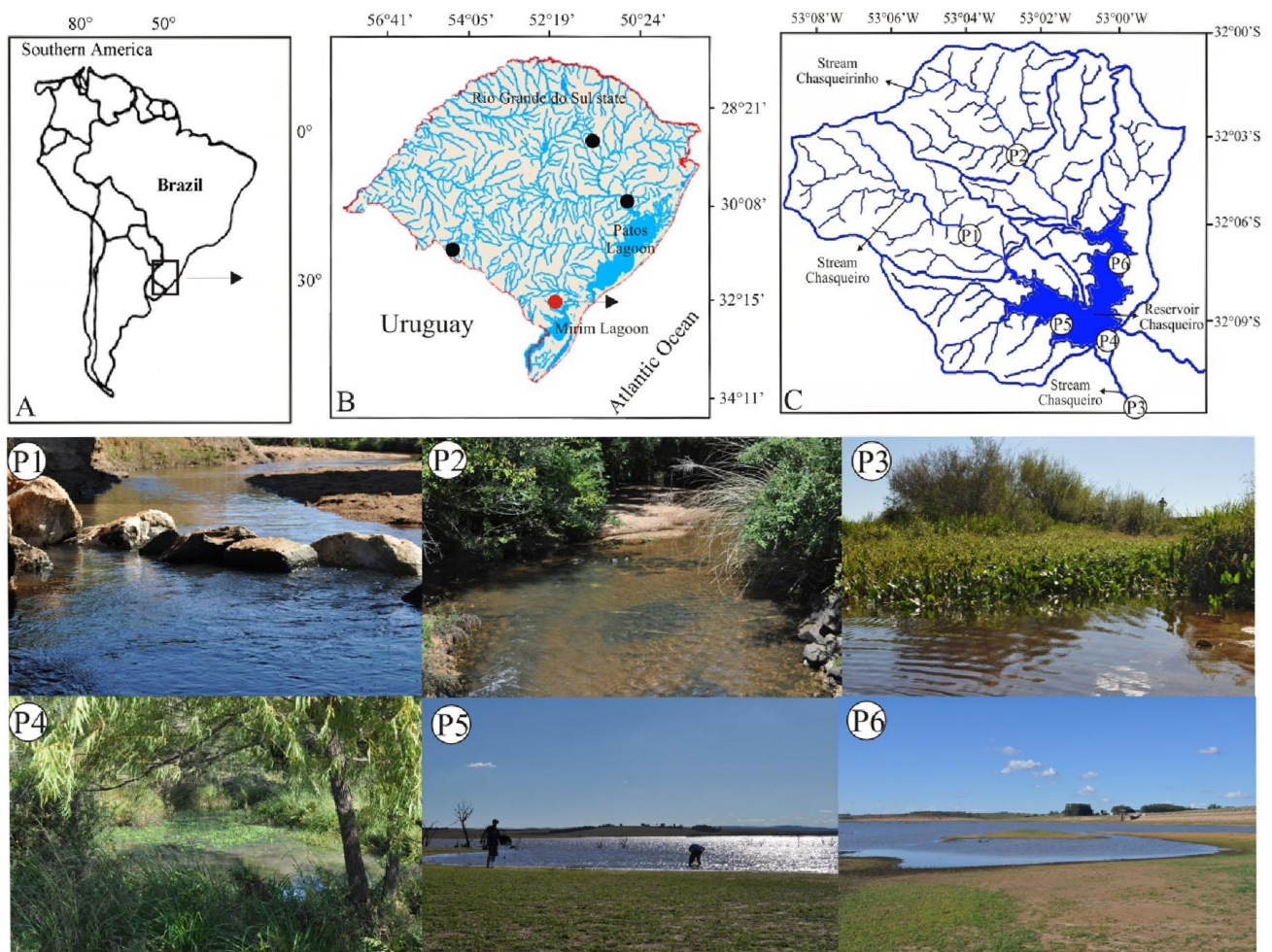
Studies that report new areas of occurrence, as well as species lists, are important as they generate information that can support management processes for conservation of biodiversity and aquatic ecosystems (Cionek *et al.* 2012, Corrêa *et al.*

2009). The first record of the species for the region reinforces the relevance of ichthyological studies in this hydrographic system, as there is a shortage of

studies on fish in this important area of southern Brazil. This is the first step for future research and for the conservation of the area.

**Table I.** Geographical coordinates and environmental descriptors of the sampling points located in the hydrographic basin of Chasqueiro stream, State of Rio Grande do Sul, Brazil.

Sampling points	Geographical coordinates	Dissolved oxygen (mg.L <sup>-1</sup> )	Alkalinity	pH	Water temperature (°C)
1	32° 07' 43.97"S / 53° 03' 48.03"W	9.5±1.1	42.6±1.5	8.2±0.7	16.6±3.6
2	32° 06' 05.89"S / 53° 03' 50.94"W	9.2±1.2	41.6±2.3	7.8±0.8	17.1±3.2
3	32° 12' 11.08"S / 52° 58' 29.70"W	3.6±1.6	40.0±2.7	7.5±1.0	18.8±3.7
4	32° 09' 55.73"S / 53° 00' 39.46"W	6.3±1.4	45.3±1.4	6.6±1.5	20.6±4.3
5	32° 10' 05.09"S / 53° 01' 26.53"W	8.6±1.2	41.4±1.7	7.2±0.9	20.9±5.3
6	32° 08' 59.69"S / 53° 00' 31.16"W	8.5±1.2	38.6±0.4	7.5±0.8	20.4±4.8



**Figure 2.** Distribution of *Cyphocharax spilotus*, where (A) shows South America, (B) State of Rio Grande do Sul; the black dots represent (Pessano *et al.* 2004, Luz-Agostinho *et al.* 2010 and Saccol-Pereira & Fialho 2010) the records of the species while the red dot indicate the new area of occurrence and (C) the sampling points (P1 -P6).

**Table II.** Morphometric data of *Cyphocharax spilotus* captured in the hydrographic basin of Chasqueiro stream, State of Rio Grande do Sul, Brazil. SD = Standard deviation, by 19 specimens.

	Low	Hight	Mean	SD
Total weigth	0.58	33.94	18.2	12.4
Total length (mm)	32.0	123.0	83.4	33.6
Standart length (mm)	22.0	97.0	65.6	27.5
	Percent of standard length			
Head height	25.0	32.3	27.3	1.9
Body height	32.7	44.5	36.8	2.7
Caudal peduncle height	11.3	14.9	13.0	0.9
Head length	24.7	36.8	28.3	3.3
Anal fin length	14.3	22.3	16.6	1.7
Dorsal fin length	22.5	36.8	28.2	3.0
Pectoral fin length	13.1	24.1	18.0	2.6
Pelvic fin length	17.8	27.7	20.1	2.1
Caudal fin length	7.1	14.1	10.6	1.7
Pre-anal distance	75.0	95.9	79.0	4.4
Pre-dorsal distance	45.0	61.6	48.2	3.5
Pre-pectoral distance	25.8	45.3	30.1	5.4
Pre-pelvic distance	40.9	57.0	52.5	3.4
	Percent of head length			
Snout length	25.2	40.8	32.2	4.6
Snout width	13.7	22.3	18.4	2.4
Orbital diameter	18.8	45.1	32.2	6.9
Interorbital distance	35.8	45.2	39.9	2.4
Pre-nasal distance	13.7	29.1	18.5	3.8

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