

First record of *Serrapinnus kriegi* (Schindler, 1937) and confirmed presence of *S. calliurus* (Boulenger, 1900) for Uruguay (Characiformes: Characidae)

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Abstract

Specimens of the characid genus *Serrapinnus* housed in Uruguayan collections are reviewed to clarify their identities. *Serrapinnus kriegi* (Schindler, 1937) is recorded for the first time in the country while the presence of *Serrapinnus calliurus* (Boulenger, 1900), previously reported as *Serrapinnus piaba* (Lütken, 1875), is confirmed. Both were collected principally in the northern region of the country, in the Uruguay river basin. Fieldwork in other areas of the country suggests that these species are mainly restricted to the area herein reported, matching the distribution of other species. The historical presence of both species was confirmed from material deposited in collections since almost 50 years. This reinforces the relevance of scientific collections and the periodic conservation of large lots of specimens attributable to the same species that may eventually reveal to be species complexes.

Introduction

The family Characidae constitutes a largely heterogeneous assemblage of small to medium-sized fishes, with more than 1100 valid species (Van der Laan et al., 2017). The group is distributed in freshwater systems from Texas (U.S.A.) to the North Patagonian Region in Argentina (Nelson et al., 2016; Liotta, 2005). About 52 species are mentioned for Uruguay (Litz & Koerber, 2014; Koerber & Litz, 2014, 2016), but the presence of several of them is still unclear and some cited taxa have probably been misidentified.

Serrapinnus (subfamily Cheirodontinae) includes 16 species, distributed in the main Cis-Andean basins of South America (Zarske, 2012; Jerep & Malabarba, 2014; Jerep et al., 2016; Jerep et al., 2018). Representatives of the genus were mentioned from Uruguay since 1976, under *Serrapinnus* or *Cheirodon piaba*, *Serrapinnus calliurus* or *Serrapinnus* sp. (Carrera, 1976; Nión et al., 2002, 2016; Reichert, 2002; Malabarba, 2003; Miquelarena et al., 2008; Loureiro et al., 2013; Litz & Koerber, 2014), but none of these references provided detailed descriptions, photos or information about vouchers or distribution that could be useful for check their identities. The aim of the present contribution is to clarify the identity of the populations of *Serrapinnus* present in Uruguay.

Materials and methods

Analyzed specimens are housed in the collection of the Museo Nacional de Historia Natural de Montevideo (MHNM), and the Facultad de Ciencias (ZVC-P), Montevideo, Uruguay. Measurements (nearest mm) are straight-line distances taken with a digital caliper. Standard length (SL) is measured from tip of snout to hypural joint. Identifications were based on Almirón et al. (2015), Jerep & Malabarba (2014), Malabarba & Jerep (2014), Mantinian (2011), and Miquelarena et al. (2008). The literature that mentions each species for Uruguay is listed below the species name. Other references that we considered relevant are listed too and marked with asterisk (*).



fig. 1. (above left)
Serrapinnus calliurus. Top, male (MHNM 3783), Paso de la Cruz, Cuareim River, Artigas Department, Uruguay. Bottom, female (not preserved), Franquia, Bella Unión, Artigas Department, Uruguay. Specimens alive, upon capture.



fig. 2. (above right)
Serrapinnus kriegi. Top, male (MHNM 3794), Paso de la Cruz, Cuareim River, Artigas Department, Uruguay. Bottom, female (MHNM 3560), Paso de León, Cuareim River, Artigas Department, Uruguay. Specimens alive, upon capture.

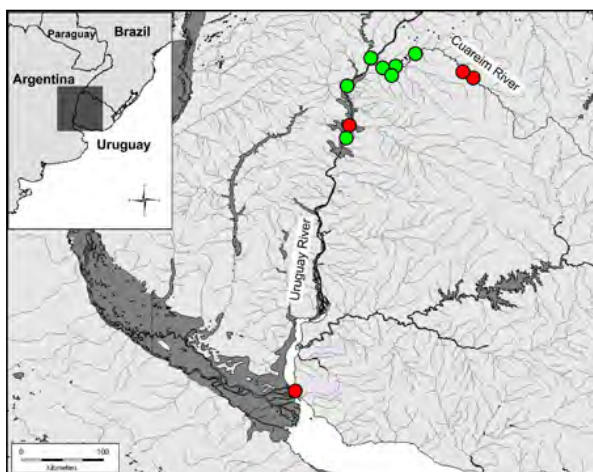


fig. 3. (right)
Geographic distribution of the genus *Serrapinnus* in Uruguay. Red dots corresponds to *S. calliurus* and green dots to sites with both, *S. kriegi* and *S. calliurus*.

Results and discussion

order	Characiformes Regan, 1911
family	Characidae Gill, 1893
subfamily	Cheirodontinae Eigenmann, 1915
tribe	Cheirodontini Malabarba 1998
genus	<i>Serrapinnus</i> Malabarba, 1998

***Serrapinnus calliurus* (Boulenger, 1900) (fig. 1)**

- o *Cheirodon calliurus* Boulenger, 1900*: 3 [description]
- o *Cheirodon piaba* (partim): Carrera, 1976: 37 [species list]. NON *Chirodon piaba* Lütken, 1875
- o *Serrapinnus piaba*: Reichert, 2002: 28, 114 [drawing and brief description of coloration]. NON *Chirodon piaba* Lütken, 1875
- o *Serrapinnus piaba* (partim): Nión *et al.*, 2002: 12 [species list]; Nión *et al.*, 2016: 29, 73, 132 [species list]. NON *Chirodon piaba* Lütken, 1875
- o *Serrapinnus calliurus*: Malabarba, 1998*: 215 [new combination]; Malabarba, 2003: 219 [catalog]; Miquelarena *et al.*, 2008: 73 [identification key, redescription and distribution]; Litz & Koerber, 2014: 12 [species list]; Mantinian, 2011*: 50, 93 [identification key, redescription, pictures and distribution]
- o *Serrapinnus* sp. (partim): Loureiro *et al.*, 2013: 104, 110 [species list and conservation]

Examined material (18 lots): MHNM 984, 3 ex., 30,2-33,0 mm SL, Laguna de las Lavanderas (30°24'52"S; 56°26'49"W), Artigas, Artigas Department, Uruguay, col.: E. Messner, 10/1/1962. MHNM 1207, 4 ex., 29,3-32,5 mm SL, Laguna de las Lavanderas (30°24'52"S; 56°26'49"W), Artigas, Artigas Department, Uruguay. MHNM 3783, 19 ex., 13,9-29,8 mm SL (1ex. 20,9 mm SL fixed in 95% Ethanol), Paso de la Cruz (30°16'19.50"S; 57°19'12.72"W), Cuareim River, Artigas Department, Uruguay, col.: W.S. Serra, M. Loureiro, F. Teixeira de Mello, S. Villars, D. Olsson, N. Zaldúa & F.

Stáble, 26-27/IX/2015. MHNM 3994, 2 ex., 24,4-28,6 mm SL, Paso de León (30°08'12,11"S; 57°06'14,73"W), Cuareim River, Artigas Department, Uruguay, col.: W.S. Serra, M. Zarucki, M. Loureiro & D. Arrieta, 22/III/2014. MHNM 4051, 2 ex., 13,3-19,9 mm SL, Arroyo Lemos (30°19'37,53"S; 56°34'31,08"W), Artigas Department, Uruguay, col.: M. Loureiro, F. Teixeira de Mello, I. González-Bergonzoni & F. Quintans, III/2007. MHNM 4067, 1 ex., 25,8 mm SL, pond near Uruguay River (31°04'19,98"S; 57°51'32,83"W), Villa Constitución, Salto Department, Uruguay, col.: W.S. Serra, 22/X/2016. ZVC-P 2674, 22 ex., 20,2-31,3 mm SL, Arrocería CONTI in front of Isla del Zapallo (30°30'00,03"S; 57°51'24,97"W), Uruguay River, Artigas Department, Uruguay, col.: C. Ríos & J. González, 01/VII/1979. ZVC-P 5224, 7 ex., 25,0-30,8 mm SL, Arrocería CONTI in front of Isla del Zapallo (30°30'00,03"S; 57°51'24,97"W), Uruguay River, Artigas Department, Uruguay, col.: C. Ríos & J. González, 01/VII/1979. ZVC-P 7971, 1 ex., 31,2 mm SL, A° Higueritas (33°52'50,92"S; 58°24'36,96"W), Nueva Palmira, Colonia Department, Uruguay, col.: R. Vaz-Ferreira, B. Sierra de Soriano & J. Soriano, 22/IX/1962. ZVC-P 8136, 1 ex., 27,5 mm SL (fixed in 95% Ethanol), Laguna Redonda, Rincón de Franquia (30°13'09,38"S; 57°37'20,32"W), Bella Unión, Artigas Department, Uruguay, col.: I. González-Bergonzoni & A. Duarte, 01/XI/2007. ZVC-P 8201, 20 ex., 14,7-25,8 mm SL, Estancia El Espinillar – ANCAP (30°57'50,61"S; 57°49'41,85"W), Salto Department, Uruguay, col.: R. Vaz-Ferreira & F. Achaval, 25/I/1980. ZVC-P 10867, 2 ex., 22,1-25,0 mm SL, Arroyo Yucutujá (30°20'49,42"S; 57°19'43,00"W), Artigas Department, Uruguay, II/2006. ZVC-P 12558, 2 ex., 26,9-29,5 mm SL, Paso de León (30°08'12,11"S; 57°06'14,03"W), Artigas Department, Uruguay, col.: A. Duarte, W.S. Serra & M. Loureiro, 4/XII/2012. ZVC-P 14190, 2 ex., 22,4-25,2 mm SL. (fixed in 95% Ethanol), Laguna Redonda (30°13'09,38"S; 57°37'20,32"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 17/VIII/2017. ZVC-P 14193, 8 ex., 17,6-30,5 mm SL., Laguna Redonda (30°13'09,38"S; 57°37'20,32"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 17/VIII/2017. ZVC-P 14195, 1 ex., 23,9 mm SL, Franquia (30°12'34,26"S; 57°37'29,76"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 18/VIII/2017. ZVC-P 14198, 1 ex., 24,0 mm SL, Arroyo del Cortado (30°08'56,34"S; 57°05'55,34"W), Artigas Department, Uruguay, col.: A. Duarte, W.S. Serra & M. Loureiro, 5/XII/2012. ZVC-P 14199, 5 ex., 18,0-23,6 mm SL, Cañada del Sauzal de la Divisa (30°19'54,09"S; 57°25'30,08"W), Artigas Department, Uruguay, col.: M. Loureiro, F. Teixeira de Mello, I. González-Bergonzoni & F. Quintans, III/2007.

This species differs from other congeners from the La Plata River basin by the following combination of characters: premaxillary teeth with 7-9 cusps, dorsal fin hyaline, incomplete lateral line, abdominal black spot absent and procurrent rays of the ventral profile of the caudal peduncle not anteriorly curved (Almirón et al., 2015; Jerep & Malabarba, 2014; Malabarba & Jerep, 2014; Mantinian, 2011; Miquelarena et al., 2008).

Uruguayan specimens present all the mentioned characters and come from Artigas, Salto and Colonia Departments, mainly associated to the Uruguay River and its affluent, the Cuareim River (fig. 3). These specimens were collected in shallow lagoons, canals and wetlands. The material (one specimen) from Colonia was collected in a stream that drains into the Río de la Plata just in front of the Paraná River. We suggest that the presence of *S. calliurus* in the southwestern Uruguay is related to the latter river, probably not forming established populations in Colonia. Previously reported distribution of *S. calliurus* extends through La Plata River basin and Patos Lagoon System, in Argentina, Bolivia, Brazil, Paraguay and Uruguay (Miquelarena et al., 2008; Mantinian, 2011; Malabarba, 2003; Sarmiento et al., 2014).

Reichert (2002) offers a drawing and a brief description of the coloration of "*Serrapinnus piaba*", both quite non diagnostic as presented. The author does not specify if the drawing effectively belongs to a specimen collected in Uruguay or not. We formally attribute this record to *S. calliurus* due to the lack of the abdominal spot in the illustration by Reichert. *Serrapinnus piaba* inhabits the São Francisco River basin and northeastern coastal Atlantic drainages in Brazil (Malabarba & Jerep, 2014) and previously to the revision of Malabarba (1998) it was widely recorded in South America through La Plata, Amazon and San Francisco river basins (Géry, 1977).

Carrera (1976) listed *Serrapinnus piaba* (under *Cheirodon*) for Uruguay, without providing a list of the examined material. In the Museo Nacional de Historia Natural (Montevideo), we located material from Uruguay that may correspond with the specimens examined by Carrera (1976). Four lots (of six listed in the catalog) were found; one actually belongs to *Serrapinnus calliurus* (MHNM 984) and other two (MHNM 1173 and MHNM 1123) are *Cheirodon ibicuihensis* Eigenmann, 1915. All were identified by E. Messner as "*Cheirodon piaba*". Messner, along with Carrera, worked in the MHNM. The fourth lot in the catalog (MHNM 1207) should be splitted, as it contains specimens with five different tattooed

numbers of the Messner's personal catalog: M768 and M979 are specimens of *Cheirodon interruptus*, M990 and M861 are *C. ibicuhiensis*, and M796 specimens of *S. calliurus*. We reassigned the number MHNM 1207 to the latter, and the other four lots were provided with new numbers from the catalog (M768 to MHNM 4066, M861 to MHNM 4064, M979 to MHNM 4065, and M990 to MHNM 4063). Nión *et al.* (2002) also listed *Serrapinnus piaba* for Uruguay without providing a list of examined material, apparently based on Carrera (1976), and therefore considering *C. ibicuhiensis* and *C. interruptus* under the concept.

Malabarba (2003) listed *Serrapinnus calliurus* for Uruguay, again without providing examined material or mentions of previous citations, probably based on Nión *et al.* (2002). Miquelarena *et al.* (2008) listed *S. calliurus* probably based on Malabarba (2003). Litz & Koerber (2014) listed *S. calliurus* based on Nión *et al.* (2002) taking in consideration Malabarba (2003) who restricted *S. piaba* to the São Francisco river basin (Brazil). Loureiro *et al.* (2013) listed *Serrapinnus* sp. from Uruguay, based on most of the material here reported (although not detailed or identified at species level at that moment) and therefore including both *S. calliurus* and *S. kriegi*. Finally, the mention of *Serrapinnus piaba* in Nión *et al.* (2016) probably was due to the omission of the data provided by Malabarba (2003), who also mentioned for the first time *C. ibicuhiensis* for Uruguay, and Litz & Koerber (2014). In the absence of any mention of examined material we assume that the specimens cited as *S. piaba* by them are actually *S. calliurus*.

***Serrapinnus kriegi* (Schindler, 1937) (fig. 2)**

- *Cheirodon kriegi* Schindler, 1937*: 106 [description]
- *Serrapinnus kriegi* (Schindler, 1937): Malabarba, 1998*: 215 [new combination]; Miquelarena *et al.*, 2008*: 74 [identification key, redescription and distribution]; Mantinian, 2011*: 50, 84 [identification key, redescription, pictures and distribution]
- *Serrapinnus* sp. (partim): Loureiro *et al.*, 2013: 104, 110 [species list and conservation]

Examined material (12 lots): MHNM 3560, 7 ex., 18,5-23,4 mm SL, Paso de León (30°08'12,11"S; 27°06'14,73"W), Cuareim River, Artigas Department, Uruguay, col.: W.S. Serra, M. Zarucki, M. Loureiro & D. Arrieta, 22/III/2014. MHNM 3794, 1 ex., 21,0 mm SL, Paso de la Cruz (30°16'19,50"S; 57°19'12,72"W), Cuareim River, Artigas Department, Uruguay, col.: W.S. Serra, M. Loureiro, F. Teixeira de Mello, S. Villars, D. Olsson, N. Zaldúa & F. Stabile, 26-27/IX/2015. MHNM 4004, 3 ex., 12,3-19,9 mm SL (fixed in 95% Ethanol), pond near Uruguay River (31°04'19,98"S; 57°51'32,83"W), Villa Constitución, Salto Department, Uruguay, col.: W.S. Serra & J. Chocca, 20/IV/2017. MHNM 4006, 7 ex., 11,4-21,1 mm SL (fixed in 95% Ethanol), Rincón de Franquia (30°11'45,75"S; 57°37'08,40"W), Bella Unión, Artigas Department, Uruguay, col.: W.S. Serra, R. Foti & J. Chocca, 22/IV/2017. ZVC-P 10398, 1 ex., 18,8 mm SL, Cañada del Sauzal de la Divisa (30°19'54,09"S; 57°25'30,08"W), Artigas Department, Uruguay, col.: M. Loureiro, F. Teixeira de Mello, I. González-Bergonzoni & F. Quintans, III/2007. ZVC-P 14042, 6 ex., 20,4-23,3 mm SL, Arrocería CONTI in front of Isla del Zapallo (30°30'00,03"S; 57°51'24,97"W), Uruguay River, Artigas Department, Uruguay, col.: C. Ríos & J. González, 01/VII/1979. ZVC-P 14188, 6 ex., 17,2-22,7 mm SL (fixed in 95% Ethanol), Franquia (30°12'34,26"S; 57°37'29,76"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 18/VIII/2017. ZVC-P 14189, 3 ex., 17,1-18,1 mm SL (fixed in 95% Ethanol), Laguna Redonda (30°13'09,38"S; 57°37'20,32"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 17/VIII/2017. ZVC-P 14192, 3 ex., 17,6-19,1 mm SL, Laguna Redonda (30°13'09,38"S; 57°37'20,32"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 17/VIII/2017. ZVC-P 14194, 2 ex., 17,9-23,9 mm SL, Franquia (30°12'34,26"S; 57°37'29,76"W), Bella Unión, Artigas Department, Uruguay, col.: M. Loureiro, J. Bessonart, M. Zarucki & S. Paullier, 18/VIII/2017. ZVC-P 14196, 1 ex., 21,9 mm SL, Arroyo Yucutujá (30°20'49,42"S; 57°19'43,00"W), Artigas Department, Uruguay, II/2006. ZVC-P 14197, 4 ex., 21,4-22,3 mm SL, Arroyo del Cortado (30°08'56,34"S; 57°05'55,34"W), Artigas Department, Uruguay, col.: A. Duarte, W.S. Serra & M. Loureiro, 5/XII/2012.

This species differs from other congeners from the La Plata River basin by the following combination of characters: premaxillary teeth with 7-9 cusps, dorsal fin hyaline, incomplete lateral line, abdominal black spot present and procurent rays of the ventral profile of the caudal peduncle anteriorly curved

(Almirón et al., 2015; Jerep & Malabarba, 2014; Malabarba & Jerep, 2014; Mantinian, 2011; Miquelarena et al., 2008).

Uruguayan specimens present all these characters and come from Artigas and Salto Departments, in northern Uruguay, associated to the Uruguay River and its affluent, the Cuareim River (fig. 3). They were collected in shallow lagoons, canals and wetlands, occasionally forming schools with *S. calliurus*. Previously known distribution of *S. kriegi* extended through Paraná, Paraguay and Middle Uruguay (Rio Grande do Sul) River basins, in Argentina, Bolivia, Brazil, and Paraguay (Bertaco et al., 2016; Mantinian, 2011; Malabarba, 2003; Miquelarena et al., 2008; Sarmiento et al., 2014).

On the basis of material analyzed we confirm the presence of *S. calliurus* in shallow lagoons, canals and wetlands mainly in the north of the country. Additionally we record for the first time for Uruguay the presence of *S. kriegi* in the same area and habitats of *S. calliurus*, occasionally even forming mixed schools. Fieldwork in other areas of the country suggests that these species are mainly restricted to the area herein reported, matching the distribution of other species as *Apistogramma borellii*, *Diapoma alegretense*, *Lepthoplosternum pectoralis*, *Leporinus lacustris*, *Tatia boemia*, and *Microglanis aff. eurystoma* (Zarucki et al., 2010). The historical presence of both species in Uruguay was confirmed through material deposited in collections since almost 50 years. This fact reinforces the relevance of scientific collections and the periodic conservation of large lots of "species", that may reveal to be species complexes only lately detected after new analyses.

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recommended form for reference:

Serra, W.S., F. Scarabino & S. Paullier (2018):

First record of *Serrapinnus kriegi* (Schindler, 1937) and confirmed presence of *S. calliurus* (Boulenger, 1900) for Uruguay (Characiformes: Characidae).

Ichthyological Contributions of PecesCriollos 59: 1-6

available as pdf-file at www.pecescrilloos.de since 22.Jul.2018