



Discovery of *Ectrepopterus uruguayensis* (Fowler 1943) (Teleostei, Characiformes, Characidae) in the Brazilian Pampa

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Abstract: We report the first record of *Ectrepopterus uruguayensis* from Rio Grande do Sul State, Brazil, based on specimens collected in the Quaraí River basin, lower Uruguay River basin, municipality of Santana do Livramento, border with Uruguay.

Key words: Lambari, *Hyphessobrycon uruguayensis*, Neotropical freshwater fish, Southern Brazil, Stethaprioninae.

Descoberta de *Ectrepopterus uruguayensis* (Fowler 1943) (Teleostei, Characiformes, Characidae) no Pampa brasileiro. Resumo: Relatamos aqui o primeiro registro de *Ectrepopterus uruguayensis* para o Estado do Rio Grande do Sul, Brasil, com base em espécimes coletados na bacia do rio Quaraí, baixo rio Uruguai, município de Santana do Livramento, limite com o Uruguai.

Palavras-chave: Lambari, *Hyphessobrycon uruguayensis*, Neotropical, Southern Brazil, Stethaprioninae.

Ectrepopterus Fowler is a monotypic genus of characid fish with a recognized distribution from Uruguayan drainages (Malabarba *et al.* 2012) and the Uruguay River basin in Argentina (Miquelarena & Carvalho 2013). The only known species of the genus, *Ectrepopterus uruguayensis* (Fowler 1943), was described based on a single specimen from Uruguay as *Megalampodus* (*Ectrepopterus*) *uruguayensis*, with no further locality data available (Weitzman & Palmer 1997). The species was also tentatively allocated to the genus *Hyphessobrycon* by Weitzman & Palmer (1997), but the same authors emphasized that this needed confirmation. The genus was recently revalidated and its type species redescribed based on the examination of the holotype and additional specimens from tributaries of the lower Uruguay River and Negro River, and from small rivers draining into the Rio de la Plata in

Uruguay (Malabarba *et al.* 2012). Based on a phylogenetic analysis, those authors proposed a new diagnosis for the monotypic genus with the following autapomorphies: foramen in posterior region of metapterygoid forms an incomplete arch, bordered posteriorly by the hyomandibula; pectoral-fin rays bearing hooks; posterior margin of second infraorbital posteroventrally oblique and second infraorbital ventrally bordering anterior region of third infraorbital; fourth infraorbital more developed longitudinally than dorsoventrally; ascending process of premaxilla reaching just anterior end of nasal; and lateral line interrupted (Malabarba *et al.* 2012).

Although river drainages of Rio Grande do Sul State have been extensively sampled for over 30 years (Bertaco *et al.* 2016), no previous records of *E. uruguayensis* have become available. We herein

report the first record of *Ectrepopterus uruguayensis* for Rio Grande do Sul State, Brazil.

The specimens were collected in the Quaraí River basin, lower Uruguay River basin, municipality of Santana do Livramento, Rio Grande do Sul State, Brazil, in September and November 2021 (Fig. 1). The sampled individuals were collected in the Passo da Lagoa stream drainage, and voucher specimens are cataloged in the fish collection of Museu de Ciências Naturais (MCN), Secretaria Estadual de Meio Ambiente e Infraestrutura do Rio Grande do Sul, Brazil: MCN 20245, 17 specimens, 21.2–39.6 mm standard length (SL), 30°45'44"S 55°47'56"W, altitude 249 m above sea level, 24 Nov 2021, M. V. Volcan & A. L. F. Pereira. The fish samples were taken with a dip-net (D-shaped hand net, 60 cm x 30 cm, 2-mm mesh size). Collected specimens were euthanized with clove oil, fixed *in situ* with 4% formaldehyde, and later transferred into 70% ethanol. Some fish were photographed in the field expedition and also in an

aquarium. The specimens were collected under authorization of Instituto Brasileiro de Meio Ambiente e dos Recursos Naturais Renováveis - IBAMA/ICMBio (AUTMFS No. 00087/2021, process number 5678-05.67/21.3).

The collected individuals were identified according to the diagnostic characters proposed by Malabarba *et al.* (2012), which include a large number of maxillary teeth (6 to 11; almost all tricuspidate), incomplete lateral line (5 to 9 perforated scales), one narrow vertically-elongate humeral spot, and the presence of longitudinal wavy stripes laterally on body in specimens larger than 35.0 mm SL. Also, mature males have small bony hooks on all rayed fins, which are absent in females, and a nearly straight anal-fin profile, smoothly concave in females (Malabarba *et al.* 2012) (Fig. 2). In addition, some specimens larger than 30.0 mm SL have the lower lobe of the caudal-fin slightly larger than the upper lobe. Six specimens were measured

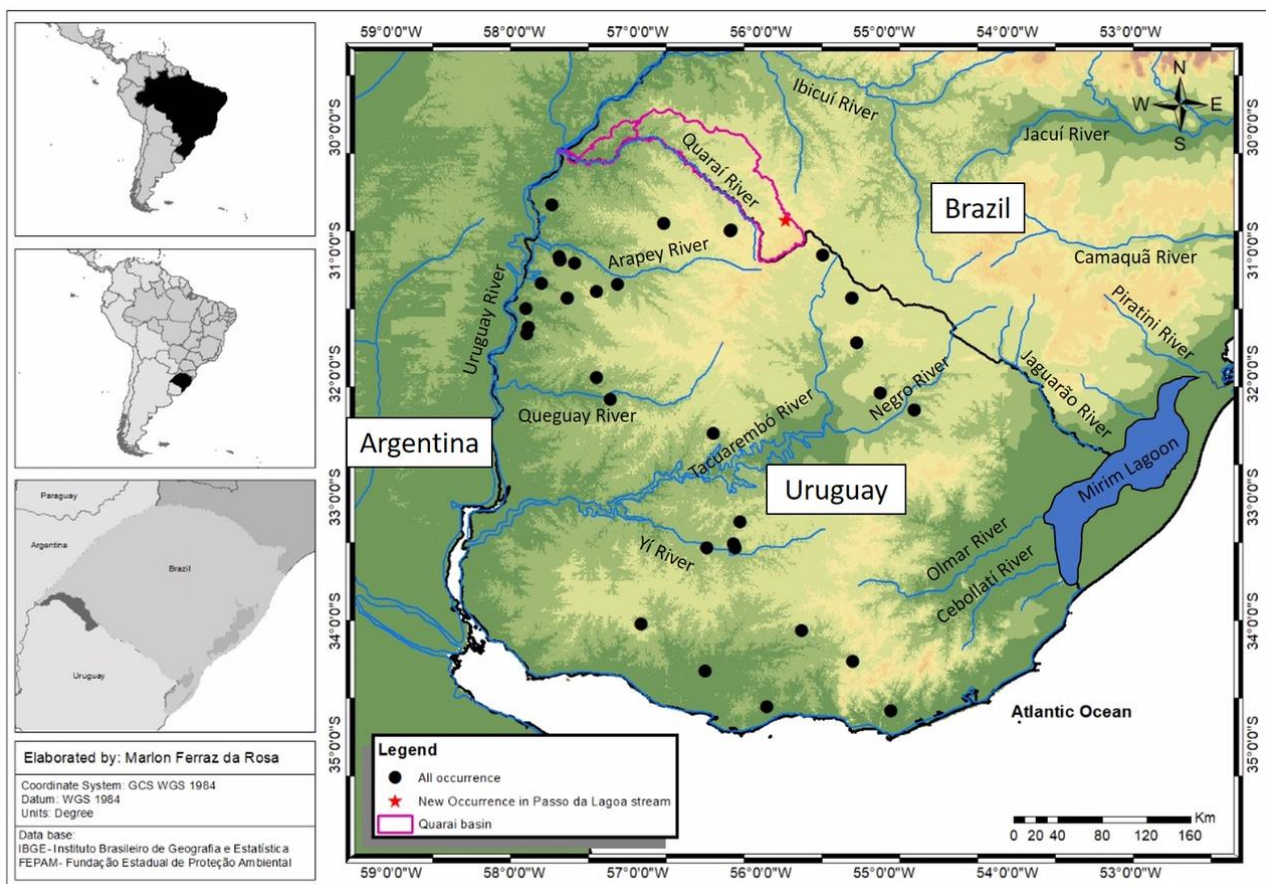


Figure 1. Records of *Ectrepopterus uruguayensis* in Uruguay of Malabarba *et al.* (2012) and Argentina of Miquelarena & Carvalho (2013) (black circle) and the new occurrence in the Quaraí River basin, lower Uruguay River basin, Rio Grande do Sul State, Brazil (red star).

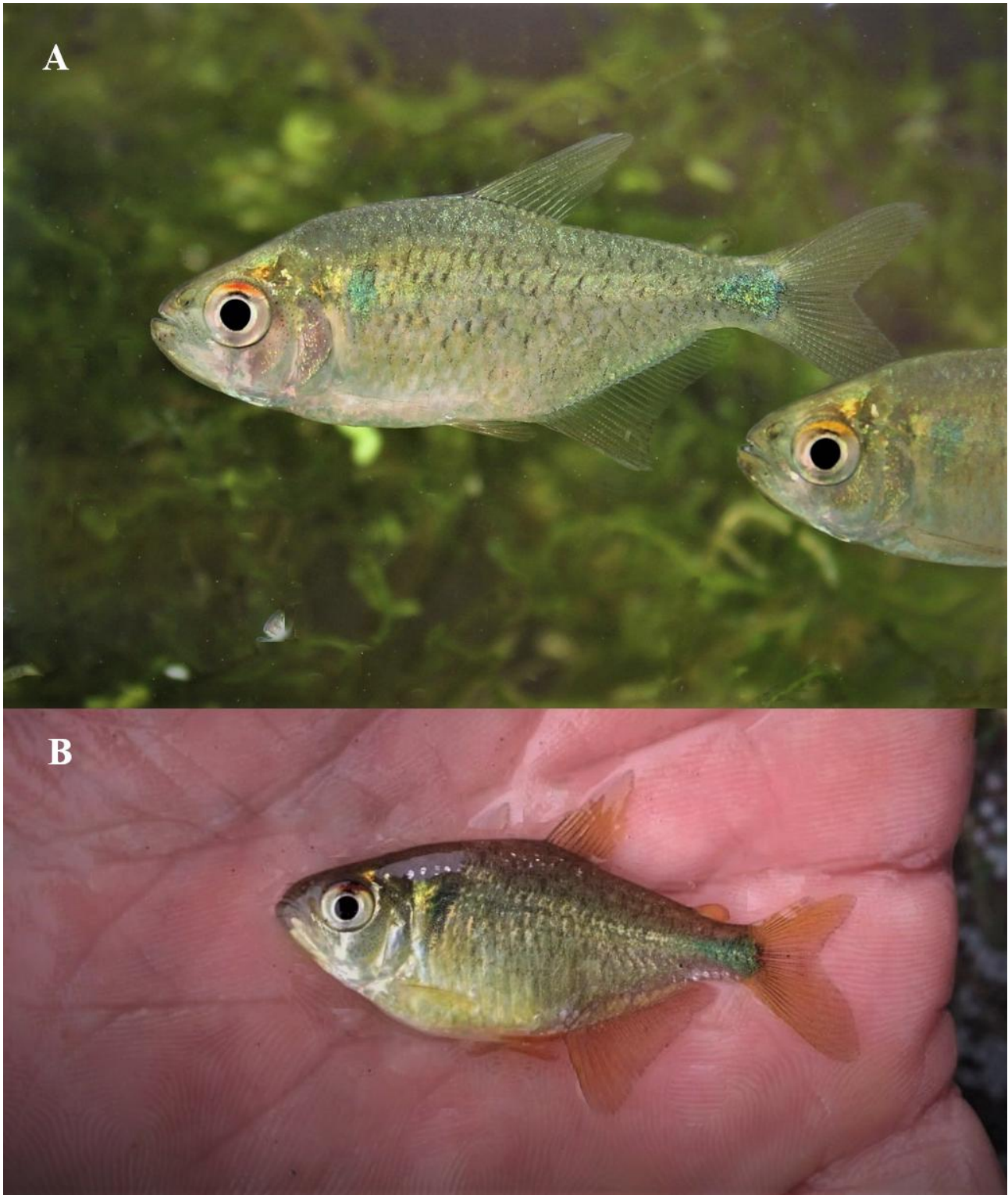


Figure 2. (A) Aquarium photography of *Ectrepopterus uruguayensis* individuals (33.5 mm SL, entire fish). (B) Specimen of *E. uruguayensis* photographed just after capture (32.5 mm SL), exhibiting natural coloration, Quarai River basin, lower Uruguay River basin, Rio Grande do Sul State, southern Brazil. Photos by M. V. Volcan.

according to the measures presented in Malabarba *et al.* (2012) (Table I), with measurements taken point to point with a caliper on the left side of specimens. Measurements are expressed as percentages of

standard length except for subunits of the head, which are recorded as percentages of head length.

Ectrepopterus uruguayensis inhabits streams and generally occurs in semi-lentic and lotic shallow

Table I. Morphometric data for six specimens of *Ectreopeterus uruguayensis*. SD = standard deviation.

	Range	Mean	SD
Standard length (mm)	31.7-39.6	34.9	-
Percents of standard length			
Predorsal distance	54.3-57.4	56.6	1.2
Prepelvic distance	48.5-52.1	50.6	1.4
Prepectoral distance	30.3-31.6	31.0	0.5
Preanal distance	61.4-66.8	64.5	2.4
Depth at dorsal-fin origin	36.9-41.8	39.6	1.9
Caudal peduncle depth	12.3-14.2	13.2	0.8
Caudal peduncle length	8.4-9.5	8.8	0.6
Anal-fin base length	29.6-31.9	30.7	0.9
Dorsal-fin length	28.5-33.4	32.0	1.9
Pelvic-fin length	16.9-20.0	18.9	1.0
Pectoral-fin length	19.5-20.8	20.1	0.6
Head length	27.5-30.9	29.6	1.3
Percents of head length			
Snout length	24.6-27.3	25.6	1.1
Maxillary length	49.9-56.0	51.2	2.1
Orbital diameter	35.7-39.1	38.0	1.2
Interorbital width	31.6-33.3	39.2	1.4

areas (less than 1 m depth) with aquatic submerged vegetation and riparian vegetation (Malabarba *et al.* 2012). The species was found in a typical Pampean stream located in a grassland landscape matrix with natural and cultivated pastures with disperse shrubs and scattered arboreal vegetation (Fig. 3). After an intense rainfall during the fieldtrip conducted in September 2021, the sampled stream presented turbid water and bottom substrate with mud, some stretches with sand or gravel, scarce aquatic vegetation and a depth of 70 cm (Fig. 3A). During the fieldtrip conducted in November 2021, when the period of highest temperature and drought begins in the region, the stream presents transparent water, abundant submerged aquatic vegetation and a depth of 30 to 60 cm (Figs. 3B, C).

The occurrence of *Ectreopeterus uruguayensis* in Rio Grande do Sul State, southern Brazil, was expected since populations were recorded in Uruguayan waters of the Quaraí River basin (Río Cuareim in Spanish), which is the border between Brazil and Uruguay (Fig. 1), and possibly also for the Negro River basin. The Quaraí River basin has high fish richness and diversity (Lanés *et al.* 2018), with recent records of endemic and endangered fish species (Volcan *et al.* 2010, Bertaco *et al.* 2016, Ferrer & Malabarba 2020). Furthermore, the Quaraí River basin was recently recognized as an important endemism area for freshwater fish species

in the southern Neotropical region (Bessonart *et al.* 2021). Ichthyological surveys performed in the Quaraí River basin are rare, and we found only one study carried out by Pessano *et al.* (2005) with no species record. However, the Brazilian side of this basin is still poorly sampled (Bertaco *et al.* 2016; Fig. 1), as demonstrated by the present study.

Due to the preference for streams with certain characteristics, *E. uruguayensis* is considered as a priority species for conservation in Uruguay (Soutullo *et al.* 2013, Serra *et al.* 2014). Despite the wide distribution in the country of Uruguay, the species is considered rare and commonly occurs in low densities. On the other hand, the main economic activity in the region where the species was recorded in Brazil is based on extensive livestock and irrigated rice cultivation, and more recently the natural grasslands were suppressed by soybean production, which continues to expand. Thus, this region is being mischaracterized, which may be influencing the occurrence of some species in the drainage basins of the Brazilian Pampa.

In this sense, intensification of ichthyological inventory efforts, even in areas of the Pampa Biome recognized as well sampled, including faunal surveys associated with environmental licensing processes, will provide a more complete understanding of Pampean biodiversity. Such information is essential for the establishment of proper environmental policies to ensure the protection of Pampa drainages, preserve the biome's natural grasslands and to maintain the biodiversity of its continental fishes.

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Ethical statement

Collection of fish and biological samples were conducted following all applicable ethical regulations regarding experimentation with animals.

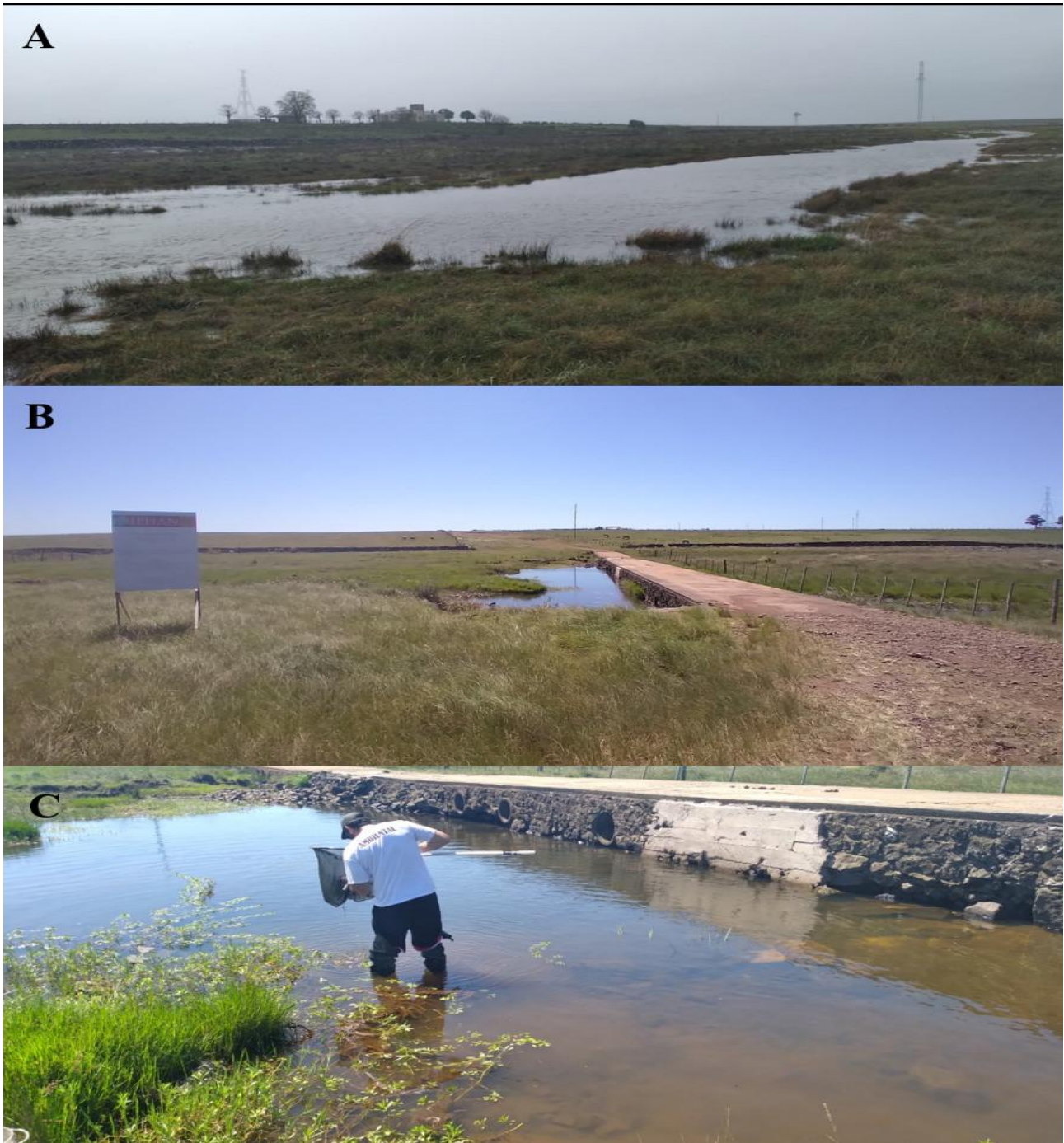


Figure 3. Habitat of *Ectrepopterus uruguayensis* in Passo da Lagoa stream (30°45'44"S 55°47'56"W, altitude 249 m above sea level), Quaraí River basin, lower Uruguay River basin, Rio Grande do Sul State, Brazil. (A) Passo da Lagoa stream where the species was found after intense rainfall during the first sampling (September, 2021). (B) Stretch of the sampled stream during the second sampling (November, 2021). (C) Hand net sampling in Passo da Lagoa stream.

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