

NOTA

FIRST RECORD OF *Physalaemus cuvieri* FITZINGER, 1826 (ANURA, LEIUPERIDAE) IN URUGUAY, WITH COMMENTS ON THE ANURAN FAUNA ALONG THE BORDERLINE URUGUAY-BRAZIL.

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The leiuperid frog *Physalaemus cuvieri* Fitzinger, 1826 is reported for first time in Uruguay. Specimens were collected in the outskirts of Rivera city (Northern Uruguay) and their advertisement call was recorded. The similarity between groups of anuran species from Uruguay and Rio Grande do Sul (Brazil) is discussed.

Primer registro de *Physalaemus cuvieri* Fitzinger, 1826 (Anura, Leiuperidae) en Uruguay, con comentarios sobre la fauna de anuros de la frontera Uruguay – Brasil. Se reporta por primera vez para Uruguay al leiupérido *Physalaemus cuvieri*. Los especímenes fueron colectados en las afueras de la ciudad de Rivera (norte de Uruguay) y su vocalización nupcial fue grabada. Se discute la similitud entre grupos de especies de anuros uruguayos y de Rio Grande do Sul (Brasil).

Keywords: *Physalaemus cuvieri*, Uruguay, geographical distribution, advertisement call.

Palabras clave: *Physalaemus cuvieri*, Uruguay, distribución geográfica, canto nupcial.

The Neotropical anuran family Leiuperidae Bonaparte, 1850 includes almost 80 anuran species. Among the seven genera of Leiuperidae the genus *Physalaemus* Fitzinger 1826, is the most diverse. *Physalaemus* currently consists of 42 recognized species, which are distributed across South America and great part of Middle America (Nascimento *et al.*, 2005; Frost, 2007).

The genus *Physalaemus* was divided into seven phenetic groups (Nascimento *et al.*, 2005) mainly based on external morphology (development and disposition of the glands, dimensions of the fingers, distribution of the tubercles on hands and feet), but also on the anatomy of the skeleton (teeth, sternum, phalanges), skin texture and natural history (bioacoustics, habitat). At present, five species are reported from Uruguay (Langone, 2003), one in the *P. albifrons* group (*P. biligonigerus*), another in the *P. gracilis* group (*P. gracilis*) and the others in the *P. henselii* group (*P. fernandezae*, *P. henselii* and *P. riograndensis*).

The original description of the genus *Physalaemus* was based on *P. cuvieri* Fitzinger, 1826 and it is extremely poor, consisting in only a key, with two characteristics for the genus (placed in Bombinatoroidea): *Rictus amplus*, *Digiti graciles* (Fitzinger, 1826). Therefore, many mistakes and misinterpretations have occurred (i.e.: Parker, 1927; Milstead, 1960), but the validity of this

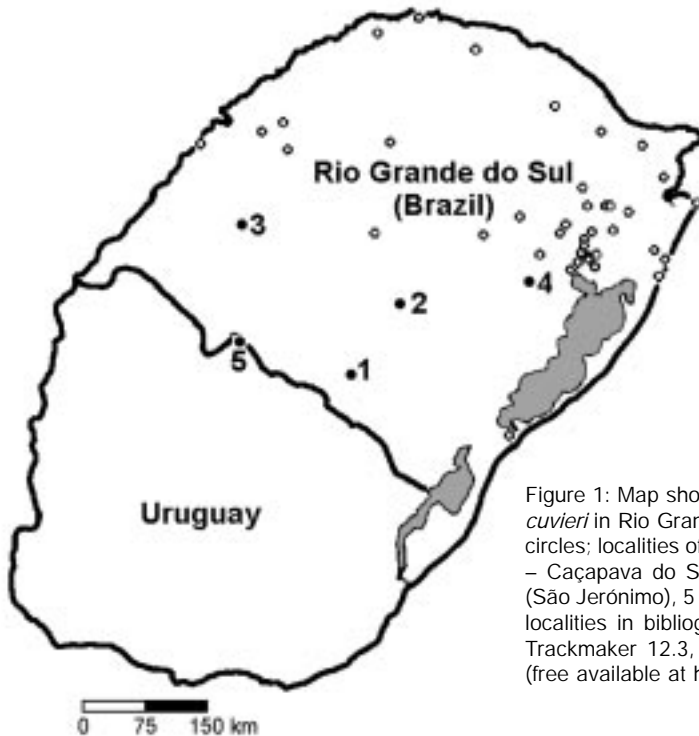


Figure 1: Map showing known localities of *Physalaemus cuvieri* in Rio Grande do Sul (Brazil) and Uruguay. Solid circles; localities of the examined specimens, 1 - Bagé, 2 - Caçapava do Sul, 3 - Manoel Viana, 4 - Morrinhos (São Jerónimo), 5 - Rivera city (Uruguay). Open circles: localities in bibliography. The map was built with GPS Trackmaker 12.3, developed by Odilon Ferreira Junior (free available at <http://www.gpstm.com.br>).

species is supported based on its advertisement call and geographical distribution (Barrio, 1965). Some authors had previously mentioned *P. cuvieri* among the Uruguayan species (Bokermann, 1962; Lynch, 1970), but these citations were based on erroneous interpretations of Parker (1927), who assumed that *P. neglecta* Ahl, 1927, is synonymous with *P. cuvieri*. As the type locality of *P. neglecta* was stated as "Santa Cruz, Uruguay?", Klappenbach and Langone (1992) discussed the species in the Uruguayan Amphibian list. However, neither Santa Cruz seems to be an Uruguayan locality (Klappenbach, 1974) nor *P. neglecta* is clearly a synonym of *P. cuvieri* (it may be placed in the synonymy of *P. cuvieri* and/or *P. billgonigerus*, as suggested by Cei, 1980 and Klappenbach and Langone, 1992). Finally, after an exhaustive analysis of collected specimens and literature, Klappenbach and Langone (1992) conclude that the presence of *P. cuvieri* is "not confirmed" for Uruguay. The aim of this work is to report for the first time the presence of *Physalaemus cuvieri* Fitzinger, 1826 as the sixth species of this genus for the Uruguayan fauna.

The advertisement call of the species was first heard during the night (between 21:00 and 23:00, local time) on January 23rd and 24th 2005 (air temperature 28°C and 26°C, respectively), in Campo del Abasto, besides Parque Gran Bretaña, outskirts of Rivera City, Rivera department, Uruguay (30° 52' 20" S; 55° 36' 00" W). On January 23rd, there was only one specimen calling, but in the second night two males were heard, and one of them was collected (ZVCB 11260). On January 25th the area was visited between 22:00 to 23:30, but no specimen was heard calling (air temperature 15°C).

During all months of 2005 the area was visited several times, and calls were heard again in December 3rd 2005. However in a neighbor area (Parque Gran Bretaña), a chorus of this

species was heard since October 9th 2005 and a specimen was collected (ZVCB 11554). In November 2nd 2005, a call was recorded (Fig. 2). The specimen was calling among gramineans in the border of a temporary pond (ZVCB 11613), between 19:00 to 20:00 local time (air temperature 14°C and water temperature 24.9°C).

In all cases, the calling activities took place in the margins of temporary ponds and the frogs called among the vegetation (mainly grass), with the body in contact with the water surface, as described in previous works (Bokermann, 1962; Barreto and Andrade, 1995; Kwet and Di-Bernardo, 1999).

Some behavioral observations were made in January 24th, 2004. The males seem to have a high fidelity to calling site (ZVCB 11260 was collected exactly in the same place where a male was heard in January 23th). Additionally the distance between the two calling males was five meters and they generally alternated their calls. Calling site fidelity and antiphonal calling could be interpreted as a signal of territoriality (Wells, 1977). The territorial behavior was reported in this species for populations of São Luiz, Maranhão, Brazil (Barreto and Andrade, 1995).

In the same ponds the following amphibian species were heard calling synchronously: *Elachistocleis bicolor*, *Dendropsophus sanborni*, *Leptodactylus gracilis*, *Leptodactylus latinasus*, *Leptodactylus ocellatus*, *Pseudis minuta*, *Pseudopaludicola falcipes*. At the study site, which was visited many times during 2003, 2004 and 2005, additional species were heard or collected (*Chaunus* gr. *granulosus*, *Melanophryniscus atroluteus*, *Hypsiboas pulchellus*, *Leptodactylus mystacinus*, *Odontophrynus americanus*, *Phyllomedusa iheringii*, *Scinax granulatus*, *Scinax fuscovarius*, *Scinax squalirostris*). The absence of congeners (like *P. biligonigerus*, *P. henselii* and *P. riograndensis*), that were reported for nearby localities (Nuñez *et al*, 2004), was remarkable.

For the taxonomic determination of the species, a morphological comparison with specimens from Rio Grande do Sul (Brazil) was made (see Appendix). The mean of the external measurements (in mm) of the Uruguayan specimens (n = 3) were (minimum and maximum between brackets): snout-vent length 27.33 (25.35 - 28.85), head length 8.85 (8.10 - 9.65), head width 8.67 (7.60 - 9.30), eye diameter 3.28 (3.10 - 3.50), interorbital distance 3.90 (2.85 - 4.75), eye-nostril distance 2.72 (2.30 - 3.30), internarial distance 2.35 (2.20 - 2.60), upper eyelid width 2.05 (1.60 - 2.65), upper eyelid length 4.07 (3.40 - 4.90), arm length 5.58 (5.40 - 5.80), thigh length 11.38 (10.25 - 13.30), tibial length 12.05 (11.60 - 12.60), foot length 20.03 (19.60 - 20.30).

Physalaemus cuvieri has a wide geographical distribution that includes the Argentinean Provinces of Misiones and Corrientes (Lavilla *et al*, 2000) and the major part of Brazil, Paraguay and Bolivia (IUCN *et al.*, 2004). Its presence in Venezuela needs to be confirmed (Frost, 2007). The closest known localities are in Brazil, where the species has been considered in general amphibian check lists for Rio Grande do Sul State (Braun and Braun, 1980; Kwet, 2001) and, as a "possible occurrence species", in an annotated check list for Candiota region near the Uruguayan border (Di-Bernardo *et al.*, 2004). The Uruguayan records are among the southernmost localities from which this species was reported (see Appendix and Fig. 1). The only exception is the specimen MCT 1970, from Bagé, in Rio Grande do Sul, Brazil, about 145 km NW airline from Rivera (calculated using the GPS Trackmaker 12.3, see Fig. 1). The citation from Rio Grande municipality (Braun and Braun, 1980) needs to be confirmed.

Based on patterns of geographical distribution, five groups of amphibian species in Uruguay were proposed, (Maneyro *et al.*, 1995). Most of these species groups were supported in an assessment of the known localities of Uruguayan amphibian species, based on a large collection record (Nuñez *et al*, 2004). On the other hand, several field studies were made in the borderline

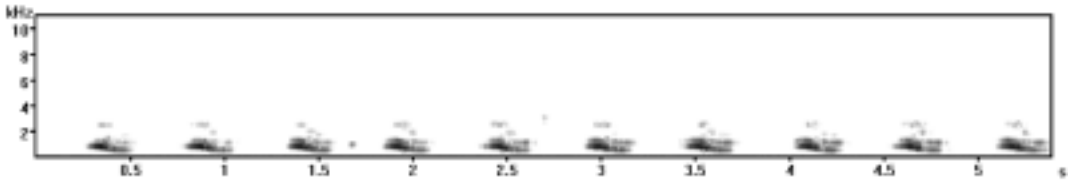


Figure 2: Sonogram of a 2.5 sec section of the advertisement call of *Physalaemus cuvieri* from outskirts of Rivera (Uruguay). This sonogram (based on five notes) was obtained from ZVCB 11260 (see details in text) on November 2nd 2005 (air temperature 14°C, water temperature 24.9°C).

region between Brazil and Uruguay during the last four years (mainly in the departments Cerro Largo and Rivera). These studies have resulted in new records of species so far unknown for Uruguay e.g., *Hypsiboas albopunctatus* (Kwet *et al*, 2002), *Leptodactylus furnarius* (Canavero *et al*, 2001), the recently described *Chaunus achavali* (Maneyro *et al*, 2004) and *Melanophryniscus pachyrhynchus* (Borteiro *et al.*, 2005).

In addition, the recent discovery of *Chaunus ictericus* (Canavero and Maneyro, *in prep.*) and the record of *P. cuvieri* presented here, both species very common in the hilly regions of Rio Grande do Sul State (Brazil) and Uruguay further support the existence of a geographical group named "Fauna Riograndense" in Uruguay (*sensu* Maneyro *et al.*, 1995). Some taxa are common in both Uruguay and Rio Grande do Sul, like *Limnomedusa macroglossa* or *Phyllomedusa iheringii* whereas other species are very common in Rio Grande do Sul but their records in Uruguay are scarce (e.g. *Dendropsophus minutus* and *Physalaemus cuvieri*), or unique, as in the case of *Hypsiboas albopunctatus*. The rarity of these species could be due to the fact that they reach their southern limit of geographical distribution at the Uruguayan border. Undoubtedly, efforts must be conducted in order to make more fieldwork, for inventory and monitoring amphibian populations in northern Uruguay, not only for thoroughly assessing the biological diversity of the Uruguayan amphibians but also for establishing geographical areas of conservation priority.

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APPENDIX: List of examined specimens (FZB = Fundação Zoobotânica de Rio Grande do Sul, Brazil; MCT = Museu de Ciências e Tecnologia da Pontifícia Universidade Católica de Rio Grande do Sul, Brazil; ZVCB = Vertebrate Zoology Collection, Facultad de Ciencias, Universidad de la República, Uruguay). All specimens belongs to *Physalaemus cuvieri*.

Brazil:

- FZB 9385, FZB 9386, FZB 9387, FZB 9388, FZB 9389, FZB 9390: Caçapava do Sul. Rio Grande do Sul. October 28th to November 1st, 1975. Collected by: P.C.Braun, C.A.S.Braun, M.L.Alves, S. Scherer, J.J. Rodrigues
- FZB 9432, FZB 9433, FZB 9434, FZB 9435, FZB 9436, FZB 9437, FZB 9438: Caçapava do Sul. Rio Grande do Sul. October 28th to November 1st, 1975. Collected by: P.C.Braun, C.A.S.Braun.
- MCT 1790: Bagé. Rio Grande do Sul. 1996. Collected by: G.F.Pontes.
- MCT 2527, MCT 2528: Caçapava do Sul. Rio Grande do Sul. 1997. Collected by: A. Kwet.
- MCT 3695: Guaritas, Caçapava do Sul. Rio Grande do Sul. 1999. Collected by: A. Kwet.
- ZUFMS 2407: Costa do Rio Ibicuy. Manoel Viana. Rio Grande do Sul. May 7th, 2000. Collected by: L. Giasson.
- ZUFMS 2768: Costa do Rio Ibicuy. Manoel Viana. Rio Grande do Sul. October 25th, 2000. Collected by: L. Giasson.
- ZVCB 11262: Morrinhos, Sao Jerónimo. Rio Grande do Sul. November 28th, 2004. Collected by: R. Maneyro, R. Ballestrin, M. di Bernardo.

Uruguay:

- ZVCB 11260: Male. Campos del Abasto, lindero al Parque Gran Bretaña. Rivera. January 24th, 2005. Collected by: M. Beheregaray, R. Maneyro.
- ZVCB 11554: Male. Parque Gran Bretaña. Rivera. October 9th, 2005. Collected by: M. Beheregaray, R. Maneyro, A. Pezzolano.
- ZVCB 11613: Male. Parque Gran Bretaña. Rivera. November 2nd, 2005. Collected by: R. Maneyro, A. Pezzolano.