

ANURANS FROM BARRA DE LA LAGUNA DE ROCHA (ROCHA, URUGUAY)

ANUROS DE BARRA DE LA LAGUNA DE ROCHA (ROCHA, URUGUAY)

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Resumen.— En este estudio presentamos una lista de especies de anfibios del Área Protegida Barra de la Laguna de Rocha (BLR), Uruguay. Se realizaron 15 salidas de campo de tres días de duración entre setiembre 2011 y marzo 2013. Durante cada salida de campo, se realizó búsqueda activa de individuos y muestreos auditivos en cada uno de los siete sitios seleccionados. Registramos 19 especies de anuros, distribuidas en seis familias: Bufonidae (4 especies), Hylidae (5), Leptodactylidae (7), Microhylidae (1) y Odontophrynidae (2). A partir de la comparación de estos datos con los registros históricos (obtenidos de colecciones científicas y literatura), identificamos ocho especies nuevas para el sitio de estudio. La riqueza de especies en el área representa un 39.6% de la riqueza total registrada para Uruguay y se destaca la presencia de *Melanophryniscus montevidensis* (Philippi, 1902), una especie en Peligro Crítico (CR) a nivel nacional, y globalmente Vulnerable (VU). La información de la composición de especies de anfibios en la BLR, pretende contribuir en la implementación del plan de manejo de esta unidad de conservación, así como estimular la realización de futuros estudios en el área.

Palabras clave.— Amphibia, conservación, lista de especies, área protegida.

Abstract.— We present a list of amphibian species from the protected area Barra de la Laguna de Rocha (BLR), Uruguay. Fifteen monthly three-day field trips were conducted between September 2011 and March 2013. During each field trip, active searches of individuals and auditive samplings were performed at seven selected sites. We recorded 19 species of amphibians belonging to five families: Bufonidae (4 species), Hylidae (5), Leptodactylidae (7), Microhylidae (1) and Odontophrynidae (2). Comparing these data with historical records (obtained from scientific collections and literature), eight species represented new records for the study site. The species richness in the area represents 39.6% of the total richness recorded for Uruguay. We highlight the presence of *Melanophryniscus montevidensis* (Philippi, 1902), a Critically Endangered (CR) species at national level, and globally Vulnerable (V). Information on BLR's amphibian species composition could help in the implementation of the management plan for this conservation unit, as well as to stimulate future studies in the area.

Keywords.— Amphibia, conservation, lists of species, protected area.

INTRODUCTION

Inventory and wildlife monitoring studies are basic and essential for planning conservation strategies in natural areas (Heyer et al., 1994; Maneyro & Carreira, 2006). Information on species richness is useful for directing conservation efforts, as it allows to define the current status of local populations through comparison with historical records (Bardier & Maneyro, 2015). Additionally, an inventory of species can be employed to establish conservation priorities within a specific area (Heyer et al., 1994).

Amphibian populations have suffered widespread declines and extinctions in recent decades. Currently, amphibians are the most threatened vertebrate group worldwide (Stuart et al., 2004, 2008; Collins & Crump, 2009; IUCN, 2018). Due to their biological and physiological characteristics (e.g., ectotherm condition, permeable skin, biphasic life cycles; Wells, 2007), these animals are particularly vulnerable to habitat loss, changes in water and soil quality, and to potential impacts of climate change (Stuart et al., 2004, 2008; Collins & Crump, 2009).

Paisaje Protegido Laguna de Rocha is a protected area located in Southern Uruguay, being Barra de la Laguna de Rocha one of its conservation focal objects. Currently, there is no official inventory of the amphibian species from this area based on systematic samples. Previous reports (e.g., Maneyro et al., 1995; Núñez et al., 2004), mention records of some species for this locality and nearby areas. However, these data are scarce and do not come from systematized studies. Long-term field samplings become essential, in order to provide a complete and updated characterization of the amphibian fauna composition.

The aims of this study were to obtain the inventory of amphibian species occurring in the southern sector of this conservation unit (Rocha, Uruguay); to compare this inventory with the historical records available in scientific collections and

literature; and to suggest which species may be priorities for conservation in the area. This study aims to contribute to the implementation of the management plan for this protected area, as well as to stimulate further studies in the BLR.

MATERIALS AND METHODS

The study was carried out at sites surrounding the southern coast of Laguna de Rocha, locally known as Barra de la Laguna de Rocha (BLR) (Rocha, Uruguay) ($34^{\circ}40'02''S$; $54^{\circ}14'00''W$) (Fig. 1). Since 1976, this area is part of the biosphere reserve Bañados del Este, included in the UNESCO Man and Biosphere Program (MAB), due to its great biodiversity (Pezzani, 2007). The lagoon has a great touristic activity and its sandy environments represent really important habitats for amphibians (Maneyro

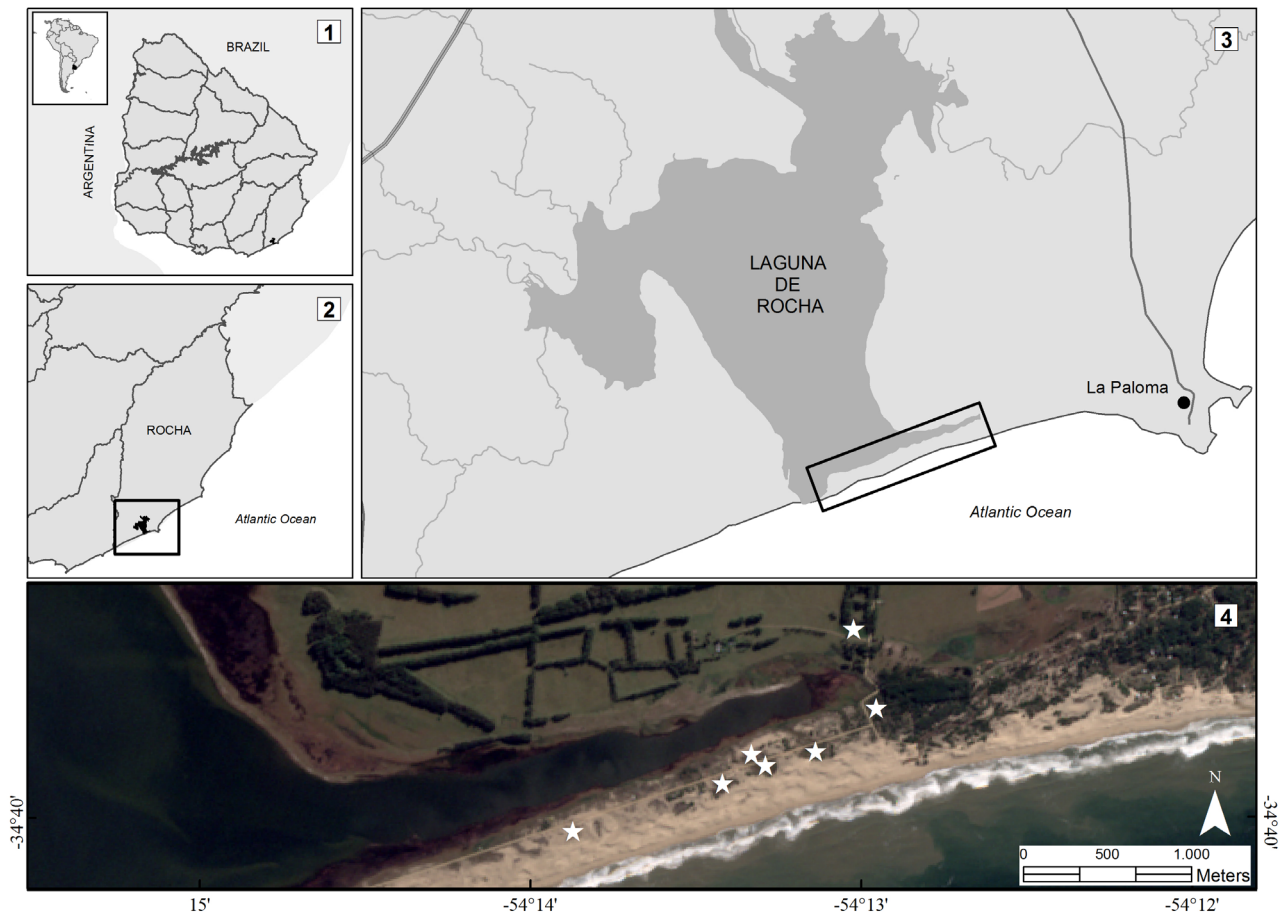


Figura 1. Área de estudio. 1) Mapa de Uruguay. 2) Departamento de Rocha. El recuadrado negro indica la Laguna de Rocha. 3) Laguna de Rocha. El rectángulo indica la zona Barra de la Laguna de Rocha (BLR). 4) Sitios de muestreo seleccionados en BLR (Imagen de satélite Sentinel II; fecha: 20 de julio de 2017).

Figure 1. Study area. 1) Map of Uruguay. 2) Rocha department. The black square indicates the Laguna de Rocha. 3) Laguna de Rocha. The rectangle indicates the Barra de la Laguna de Rocha (BLR) zone. 4) Selected sampling sites in BLR (Sentinel II satellite image; date: July 20, 2017).

et al., 1995). At moment, this area is part of Paisaje Protegido Laguna de Rocha (34°37'59"S, 54°17'40"W), an area that belongs to the National System of Protected Areas (SNAP) (DINAMA, 2010). It exhibits a coastal sand dune system, located at the southern portion of the lagoon, these areas are the most critically endangered within the protected area, and require strict conservation measures. The dunes have associated flood prone meadows, with shallow temporary ponds (<30 cm deep) of variable sizes and sandy substrata. Amphibians use these ponds during the breeding activity. The high concentration of salt in the environment determines a halophyte vegetation cover (Trimble et al., 2003). The climate is subtropical, with an average annual temperature of 16.4 °C and an average annual accumulated rainfall of 1058.7 mm (Tutiempo Network, 2019).

In order to obtain the list of species in BLR, fifteen monthly three-day field trips were performed in September 2011, November 2011 and between March 2012 and February 2013. Seven sampling sites were selected (Fig. 1). These sites comprise the breeding water bodies and their surroundings. Individuals were sought at the selected sites through active visual search (Heyer et al., 1994), with a sampling effort of at least 3 hours per day. In addition, fifteen-minute acoustic samplings (Heyer et al., 1994) were performed at all sites throughout three monitoring shifts (morning: 08:00-13:00 h, afternoon: 14:00-19:00 h, evening: 20:00-24:00 h). Additionally, historical records of species for the study site were obtained from the literature (Maneyro et al., 1995; Núñez et al., 2004), and were complemented with those obtained from the review of the Colección Científica de la Facultad de Ciencias of the Universidad de la República (ZVCB). For taxonomical determination of observed specimens were used local field guides (Maneyro & Carreira, 2012), and acoustic records of known species were employed for comparisons.

Finally, the list of species obtained was compared with the historical records. The conservation status of the species was determined using as a main reference the national Red List (Carreira & Maneyro, 2015). Some specimens were photographed, and the photo vouchers were deposited at the Colección Fotográfica de la Facultad de Ciencias - Anfíbios (CF-B). Also, some voucher specimens were collected and stored at Colección Científica de la Facultad de Ciencias of the Universidad de la República, for which, a collection license was issued by the national authority (División Fauna de la Dirección de Recursos Naturales Renovables of the Ministerio de Ganadería, Agricultura y Pesca). The specimens were euthanized in the field following the protocols approved by the Comisión Honoraria de Experimentación Animal associated with the project ANII FCE 2514.

RESULTS

Nineteen anuran species were identified from BLR. These species are distributed in 11 genera belonging to five families: Bufonidae (4 species), Hylidae (5), Leptodactylidae (7), Microhylidae (1) and Odontophrynidae (2) (Table 1, Figs. 2 and 3). Considering the historical records of species for the study area, the presence of 11 species in the BLR was confirmed, and 8 new species were recorded: *Dendropsophus sanborni* (Schmidt, 1944); *Scinax granulatus* (Peters, 1871); *Leptodactylus latinasus* (Jiménez de la Espada, 1875); *Leptodactylus mystacinus* (Burmeister, 1861); *Physalaemus gracilis* (Boulenger, 1883); *Pseudopaludicola falcipes* (Hensel, 1867); *Elachistocleis bicolor* (Guérin-Méneville, 1838) and *Odontophrynus maisuma* (Rosset, 2008).

Within the total recorded species, only *Melanophryniscus montevidensis* (Philippi, 1902) is threatened in Uruguay (Carreira and Maneyro, 2015). This species is cataloged as Vulnerable (VU) at global scale (Langone, 2004), whereas at the national level it is considered Critically Endangered (CR) (Carreira & Maneyro, 2015). It was observed in the study area during the diurnal and nocturnal samplings, associated with temporary ponds during different breeding events. Another species, *Odontophrynus maisuma*, is locally Near Threatened (NT) (Carreira & Maneyro, 2015), but due to its recent description, its conservation status has not been globally evaluated (IUCN, 2018). The remaining 17 species are considered as Least Concern (LC) for their conservation status, both locally and globally (IUCN, 2018, Carreira and Maneyro, 2015) (Table 1).

DISCUSSION

Currently there are 49 amphibian species inhabiting Uruguay (Maneyro & Carreira, 2012); and a large number are distributed throughout the coastal areas of the country (Maneyro and Carreira, 2006). The Rocha Department is known for its high diversity of amphibians (Maneyro et al., 1995), and it has the highest species richness in Uruguay (26 species) (Núñez et al., 2004). The amphibian richness found during this study (19 species) was similar in comparison to some localities within the Rocha Department. In the coastal locality of Aguas Dulces 20 species were recorded (González & Gambarotta, 2001), while from La Coronilla, Núñez et al. (2004) reported 16 species, and more recently, Bardier and Maneyro (2015) enlisted 23 species in Cerro Verde (historical records of the area were included). Moreover, the number of species in the BLR exceeded the species richness found in Cabo Polonio (11 species) (López, 2006), and Laguna de Castillos (13 species) (Gambarotta et al., 1999). The amphibian species richness in BLR represents 39.6% of the total

Tabla 1. Lista de especies de anuros de Barra de la Laguna de Rocha, Uruguay. A: registro auditivo; V: registro visual; Estatus en la UICN: estado de conservación de la UICN (UICN, 2018); Estado de NC: estado de conservación nacional (Carreira & Maneyro, 2015); CR: en peligro crítico; LC: Menor preocupación; NE: no evaluado; NT: Casi amenazado; VU: Vulnerable. * La especie no se puede distinguir de otros taxones simpátricos a través del registro auditivo. ** Los asteriscos indican posibles especies prioritarias para la conservación en Barra de la Laguna de Rocha.

Table 1. Species list of anurans from Barra de la Laguna de Rocha, Uruguay. A: auditive record; V: visual record; IUCN status: IUCN conservation status (IUCN, 2018); NC status: National conservation status (Carreira & Maneyro, 2015); CR: Critically endangered; LC: Least concern; NE: Not evaluated; NT: Near threatened; VU: Vulnerable. * The species cannot be distinguished from other sympatric taxa through the auditive record. ** Asterisks indicate potential priority species for conservation in Barra de la Laguna de Rocha.

Family/Species	Voucher number	Recording method	IUCN status	NC status
Family Bufonidae				
<i>Melanophryniscus montevidensis</i> (Philippi, 1902)	ZVCB 23422; 23423 and 23424	A/V	VU	CR **
<i>Rhinella arenarum</i> (Hensel, 1867)	ZVCB 4900 and 22670.	A/V	LC	LC
<i>Rhinella dorbignyi</i> (Duméril & Bibron, 1841)	CF-B 039	*/V	LC	LC
<i>Rhinella fernandezae</i> (Gallardo, 1957)	ZVCB 22592.	*/V	LC	LC
Family Hylidae				
<i>Dendropsophus sanborni</i> (Schmidt, 1944)	CF-B 040, 041 and 046.	A/V	LC	LC
<i>Baona pulchella</i> (Duméril & Bibron, 1841)	ZVCB 22769; 22920 and 22921.	A/V	LC	LC
<i>Pseudis minuta</i> Günther, 1858	ZVCB 22547; 22548 and 22607; CF-B 049.	A/V	LC	LC
<i>Scinax granulatus</i> (Peters, 1871)	ZVCB 22850.	A/V	LC	LC
<i>Scinax squalirostris</i> (Lutz, 1925)	ZVCB 16145 and 22609; CF-B 050.	A/V	LC	LC
Family Leptodactylidae				
<i>Leptodactylus gracilis</i> (Duméril & Bibron, 1841)	ZVCB 22604; 22605 and 22737.	A/V	LC	LC
<i>Leptodactylus latinasus</i> (Jiménez de la Espada, 1875)	ZVCB 23403	A/V	LC	LC
<i>Leptodactylus latrans</i> (Steffen, 1815)	ZVCB 22622 and 22625; CF-B 045 and 047.	A/V	LC	LC
<i>Leptodactylus mystacinus</i> (Burmeister, 1861)	ZVCB 23398.	A/V	LC	LC
<i>Physalaemus biligonigerus</i> (Cope, 1861)	CF-B 048.	*/V	LC	LC
<i>Physalaemus gracilis</i> (Boulenger, 1883)	CF-B 042	*/V	LC	LC
<i>Pseudopaludicola falcipes</i> (Hensel, 1867)	CF-B 043 and 044.	A/V	LC	LC
Family Microhylidae				
<i>Elachistocleis bicolor</i> (Guérin-Méneville, 1838)	ZVCB 23399; 23400 and 23401.	A/V	LC	LC
Family Odontophrynidae				
<i>Odontophrynus americanus</i> (Duméril & Bibron, 1841)	ZVCB 16142	*/V	LC	LC
<i>Odontophrynus maisuma</i> (Rosset, 2008)	ZVCB 22736; 22743 and 22841.	*/V	NE	NT**

richness recorded for Uruguay, and 73.1% of the total species richness recorded for Rocha. Consequently, the study site could be considered as an area with a high diversity of amphibian species.

This study allows to expand the historical record of species for the area, since eight new species were found during the sampling period. These new records reflect an optimal sampling effort, since in this study the monitoring was carried out in the



Figura 2. Especies encontradas durante el periodo de muestreo en Barra de la Laguna de Rocha: 1) *Melanophryniscus montevidensis*, 2) *Rhinella arenarum*, 3) *Rhinella dorbignyi*, 4) *Rhinella fernandezae*, 5) *Dendropsophus sanborni*, 6) *Boana pulchella*, 7) *Pseudis minuta*, 8) *Scinax granulosus*, 9) *Scinax squalirostris*. Todas las fotos de Raúl Maneyro excepto por la 1 tomada por Ernesto Elgue.

Figure 2. Species found during the sampling period in Barra de la Laguna de Rocha: 1) *Melanophryniscus montevidensis*, 2) *Rhinella arenarum*, 3) *Rhinella dorbignyi*, 4) *Rhinella fernandezae*, 5) *Dendropsophus sanborni*, 6) *Boana pulchella*, 7) *Pseudis minuta*, 8) *Scinax granulosus*, 9) *Scinax squalirostris*. All photos by Raúl Maneyro except for 1, by Ernesto Elgue.

long-term, covering all the seasons of the year, as well as the different times of the day, and combining acoustic and visual sampling. These two sampling methods were complementary and contributed to make the data collection more precise. This permitted us to differentiate between species that are often confused using only the auditory record, as is the case of *Rhinella dorbignyi* (Duméril & Bibron, 1841) and *R. fernandezae* (Gallardo, 1957); *Physalaemus biligonigerus* (Cope, 1861) and *P. gracilis*; *Odontophrynus americanus* (Duméril & Bibron, 1841) and *O. maisuma*.

Another aspect to be highlighted is that some samplings included periods with high levels of rainfall, which allowed us to register the presence of explosive-breeder species, whose reproductive activity is brief and occurs after heavy rainfalls (Wells, 2007). Some species with these characteristics in the study area are: *Melanophryniscus montevidensis*, *Elachistocleis bicolor* and *Odontophrynus americanus*. During the sampling period *Pleurodema bibroni* (Tschudi, 1838) was not recorded in BLR. This draws our attention as within the study area there are well preserved sites and geographically close records for this species (Kolenc et al., 2009, 2012). *Pleurodema bibroni* is nationally



Figura 3. Especies encontradas durante el período de muestreo en Barra de la Laguna de Rocha: 10) *Leptodactylus gracilis*, 11) *Leptodactylus latinasus*, 12) *Leptodactylus latrans*, 13) *Leptodactylus mystacinus*, 14) *Physalaemus biligonigerus*, 15) *Physalaemus gracilis*, 16) *Pseudopaludicola falcipes*, 17) *Elachistocleis bicolor*, 18) *Odontophrynus americanus*, 19) *Odontophrynus maisuma*. Todas las fotos de Raúl Maneyro excepto por la 12), tomada por Ernesto Elgue.

Figure 3. Species found during the sampling period in Barra de la Laguna de Rocha: 10) *Leptodactylus gracilis*, 11) *Leptodactylus latinasus*, 12) *Leptodactylus latrans*, 13) *Leptodactylus mystacinus*, 14) *Physalaemus biligonigerus*, 15) *Physalaemus gracilis*, 16) *Pseudopaludicola falcipes*, 17) *Elachistocleis bicolor*, 18) *Odontophrynus americanus*, 19) *Odontophrynus maisuma*. All photos by Raúl Maneyro except for 12), by Ernesto Elgue.

listed as near threatened (NT) (Carreira & Maneyro, 2015), and its populations have declined in recent years (Kolenč et al., 2009,

2012), which leads us to think they may have disappeared from the study site. *Melanophryniscus montevidensis* should be considered

as a priority species for conservation in BLR. This species is restricted to the Uruguayan coasts and Brazil (Bernardo-Silva et al., 2012). It is critically endangered in Uruguay (Carreira & Maneyro, 2015), due to its drastic population decline, small extension of occurrence (less than 10 km²), habitat deterioration and the growing urbanization of the coastal areas, among others (Langone, 2004; Arrieta et al., 2013).

Additionally, the species is threatened by the consequences of climate change (Toranza & Maneyro, 2013; Zank et al., 2014). In the BLR the breeding activity of *M. montevidensis* occurs in shallow temporary water bodies with abundant emergent hydrophilic vegetation (Pereira & Maneyro, 2016a). This species also presents high fidelity to both breeding and shelter sites (mainly rushes and caraguatales near the breeding ponds) (Pereira & Maneyro, 2016b). This information is essential and should be considered in the implementation of the management plan for the area, given that the increasing urbanization of the coastal area and the habitat fragmentation are two of the main causes considered for the decrease in their populations (Carreira & Maneyro, 2015).

This is the first inventory of amphibians from BLR and represents a new contribution for a better knowledge of the local herpetofauna. The study area proved to be of great potential importance for the preservation of amphibian populations because it has a great diversity, comparable with other localities of greater area within the Rocha department. It also highlights the presence of a threatened species at local and global scale. Paisaje Protegido Laguna de Rocha belongs to SNAP since 2010, and the management plan is being recently implemented. Considering this aspect, the information about the richness and species distribution is fundamental to propose long-term conservation measures with the aim of protecting the amphibian biodiversity in BLR.

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APPENDIX I

Boana pulchella:

ZVCB 22769 - January 23, 2013, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: F. Achaval-Coppes, G. Pereira y E. Elgue.

ZVCB 22920 - February 23, 2013, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue, F. Achaval-Coppes & G. Pereira.

ZVCB 22921 - February 24, 2013, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue, F. Achaval-Coppes & G. Pereira.

Dendropsophus sanborni:

CF-B 040 - April 23, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

CF-B 041 - March 26, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

CF-B 046 - November 20, 2011, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Gisela Pereira.

Elachistocleis bicolor:

ZVCB 23399 - October 31, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue; F. Achaval-Coppes; C. Bardier; G. Pereira.

ZVCB 23400 - October 31, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue; F. Achaval-Coppes; C. Bardier; G. Pereira.

ZVCB 23401 - October 31, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue; F. Achaval-Coppes; C. Bardier; G. Pereira.

Leptodactylus gracilis:

ZVCB 22604 - January 12, 1995, Laguna de Rocha, Rocha, Uruguay. Collectors: M. Santos & R. Maneyro.

ZVCB 22605 - January 12, 1995, Laguna de Rocha, Rocha, Uruguay. Collectors: M. Santos & R. Maneyro.

ZVCB 22737 - April 24, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: G. Pereira; E. Elgue; F. Achaval-Coppes & S. Cruces.

Leptodactylus latinasus:

ZVCB 23403 - October 31, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue; F. Achaval-Coppes; C. Bardier; G. Pereira.

Leptodactylus latrans:

ZVCB 22622 - April 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

ZVCB 22625 - April 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

CF-B 045 - February 23, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Gisela Pereira.

CF-B 047 - April 25, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

Leptodactylus mystacinus:

ZVCB 23398 - October 30, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue; F. Achaval-Coppes; C. Bardier; G. Pereira.

Melanophryniscus montevidensis:

ZVCB 23422 - October 30, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: F. Achaval-Coppes, G. Pereira, C. Bardier & E. Elgue.

ZVCB 23423 - October 30, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: F. Achaval-Coppes, G. Pereira, C. Bardier & E. Elgue.

ZVCB 23424 - October 30, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: F. Achaval-Coppes, G. Pereira, C. Bardier & E. Elgue.

Odontophrynus americanus:

ZVCB 16142 - August 7, 2006, Laguna de Rocha, Rocha,

Uruguay. Collectors: C. Borteiro, F. Kolenc.

Odontophrynus maisuma:

ZVCB 22736 - May 23, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: G. Pereira; E. Elgue; V. Valdez; F. Achaval-Coppes & S. Cruces.

ZVCB 22743 - August 22, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: G. Pereira; E. Elgue; F. Achaval-Coppes & S. Cruces.

ZVCB 22841 - August 22, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: S. Cruces, F. Achaval-Coppes, E. Elgue & G. Pereira.

Physalaemus biligonigerus:

CF-B 048 - November 27, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

Physalaemus gracilis:

CF-B 042 - November 13, 2011, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Raúl Maneyro.

Pseudis minuta:

ZVCB 22547 - April, 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

ZVCB 22548 - April, 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

ZVCB 22607 - April, 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

CF-B 049 - March 25, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

Pseudopaludicola falcipes:

CF-B 043 - August 22, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

CF-B 044 - February 23, 2012, Barra de la Laguna de Rocha,

Rocha, Uruguay. Photo by Gisela Pereira.

Rhinella arenarum:

ZVCB 4900 - February 10, 2001, Barra de la Laguna de Rocha, Rocha, Uruguay. Collector: M. Clara.

ZVCB 22670 - January 12, 1995, Laguna de Rocha, Rocha, Uruguay. Collectors: M. Santos & R. Maneyro.

Rhinella dorbignyi:

CF-B 039 - December 19, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

Rhinella fernandezae:

ZVCB 22592 - January, 1995, Laguna de Rocha, Rocha, Uruguay. Collectors: M. Santos & R. Maneyro.

Scinax granulatus:

ZVCB 22850 - December 18, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Collectors: E. Elgue, F. Achaval-Coppes, C. Fernandez & G. Pereira.

Scinax squalirostris:

ZVCB 16145 - August 7, 2006, Laguna de Rocha, Rocha, Uruguay. Collectors: C. Borteiro, F. Kolenc.

ZVCB 22609 - April 16, 1994, Laguna de Rocha, Rocha, Uruguay. Collectors: R. Maneyro, D. Queirolo, S. Umpierrez & R. Rodriguez.

CF-B 050 - March 24, 2012, Barra de la Laguna de Rocha, Rocha, Uruguay. Photo by Ernesto Elgue.

