UNIVERSIDADE FEDERAL DE SÃO CARLOS

CENTRO DE CIÊNCIAS HUMANAS E BIOLÓGICAS

DEPARTAMENTO DE BIOLOGIA

CAROLINE BETTO FELÍCIO

GUIA ILUSTRATIVO DE GIRINOS COLETADOS EM 14 UNIDADES DE CONSERVAÇÃO

Sorocaba

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Trabalho de Conclusão de Curso apresentado ao Curso de Bacharelado em Ciências Biológicas, Centro de Ciências Humanas e Biológicas da Universidade Federal de São Carlos, como requisito para obtenção do título de Bacharel em Ciências Biológicas.

Orientação: Prof. Dr. Fernando Rodrigues da Silva

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Trabalho de Conclusão de Curso

Universidade Federal de São Carlos – Campus Sorocaba

Sorocaba, 25 de agosto de 2023.

Orientador _____
Prof. Dr. Fernando Rodrigues da Silva

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DEDICATÓRIA

A minha mãe, Rachel, que sempre me apoiou em todas as etapas da minha vida, sem seus conselhos e seu amor, eu não teria chegado até aqui.

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Á todos que citei, amo vocês e obrigada por tudo!

RESUMO

Embora o conhecimento sobre a diversidade de anuros tenha aumentado nas últimas décadas, estima-se que cerca de 40% das espécies de anuros em estágios larvais no Brasil não tenham seus girinos descritos. Uma das principais razões para esta discrepância é a dificuldade na identificação de girinos, especialmente em comunidades tropicais que apresentam alta riqueza de espécies. Aqui, apresentamos uma extensão de um guia ilustrado, publicado por Michelle Rezende, com espécies de girinos coletados em 14 unidades de conservação no estado de São Paulo, Brasil. Foram descritas as medidas da morfologia externa e da estrutura oral de 65 espécies de anuros pertencentes a 17 gêneros. Esperamos que este guia ilustrado ajude e incentive a inclusão do estágio larval em futuros estudos de avaliação da diversidade de anuros.

Palavras-chave: biodiversidade; catálogo; fase larval; morfologia.

RESUMO EM LÍNGUA ESTRANGEIRA

Despite the increased knowledge about anuran diversity in recent decades, it is estimated that approximately 40% of anuran species with larval stages in Brazil lack descriptions of their tadpoles. One of the main reasons for this discrepancy is the challenge of identifying tadpoles, particularly in tropical communities characterized by high species richness. Here, we present an expanded version of an illustrated guide initially published by Michelle Rezende, featuring tadpole species collected from 14 protected areas within the São Paulo state, Brazil. We described the measurements of external morphology and oral structure of 65 anuran species belonging to 17 genera. Our aspiration is that this illustrated guide will serve as a helpful resource and stimulate the incorporation of the larval stage in forthcoming studies assessing anuran diversity.

Key-words: biodiversity; catalogue; larval stage; morphology.

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SUMÁRIO

1. INTRODUCTION

Approximately 86% of Earth's species remain undiscovered (i.e., Linnean shortfall; Mora et al., 2011) and scant knowledge exists about the geographic distribution of already described species (i.e., Wallacean shortfall; Hortal et al. 2015). These shortfalls are concerning as current estimates of biodiversity loss rival or surpass those of past mass extinctions (McCallum, 2007; Barnosky *et al.*, 2011). Among vertebrate groups, amphibians exhibit the highest number of endangered species, with approximately one third of the species being at risk of extinction (Catenazzi, 2015). Furthermore, amphibians are characterized by the most rapid rate of new species descriptions (Catenazzi, 2015; AmphibiaWeb, 2017). Although information on all life stages is key to its effective conservation, many surveys have not included larval stages of anuran, mainly due to the difficulty in species identification.

The larval stage is a critical component to the understanding of the anuran life history (Wilbur 1997; McDiarmid & Altig 1999; Haddad & Prado 2005). For example, the use of larval characters in taxonomic studies can help solving phylogenetic issues at the species and genus level (Orton 1957; Roelants et al. 2011; Grosso 2015). They are appropriate models in a variety of ecological approaches, such as ecotoxicology, competition and predation interactions, food webs and community structure (Werner & Anholt, 1996; Relyea, 2004; Eterovick & Barata, 2006; Both et al, 2011a-b). Furthermore, surveys including tadpoles are complementary in determining species composition (Skelly & Richardson 2009), because they stay in breeding habitats longer than adults (Da Silva 2010).

Currently, Brazil is home to the greatest anuran diversity in the World (AmphibiaWeb 2021), with 1,144 species (Segalla *et al.* 2021). However, around 40% of anuran species with larval stages in Brazil do not have their tadpole described (Provete *et al.* 2012). Additionally, there are few regional identification keys to tadpoles available in Brazil (e.g., Hero 1990, Rossa-Feres and Nomura 2006; Machado and Maltchik 2007), even in relatively well sampled regions of the country. Here we present an expanded version of an illustrated guide initially published by Rezende (2017), featuring 68 tadpole species collected from 14 protected areas within the São Paulo state, Brazil. We provide descriptions of external morphology and compare them with descriptions available. Our aspiration is that this enhanced illustrated guide will serve as a helpful resource and stimulate the incorporation of the larval stage in forthcoming studies assessing anuran diversity.

2. MATERIAL AND METHODS

2.1 Study area and sampling methods

The tadpoles were collected in 14 protected areas in the São Paulo state, southeastern Brazil (Fig. 1). For each protected area we sampled tadpoles in two ponds, two streams and two trails inside forest fragments from December 2014 to February 2015, December 2015 to February 2016, and December 2016 to February 2017. We selected this period because it is the time of the year when most of the annual rainfall occurs and most anuran species are active. Tadpoles were collected using a hand dipnet (3 mm² mesh wire) along the margins of ponds and streams. We looked for eggs/tadpoles inside bromeliads along trails. All collected specimens were anaesthetized and euthanized, fixed and stored in 10% formaldehyde. All collected tadpoles are housed in the Laboratório de Ecologia Teórica: Integrando, Tempo, Espaço e Biologia (LET.IT.BE), Departamento de Ciências Ambientais, Universidade Ferderal de São Carlos, Sorocaba.

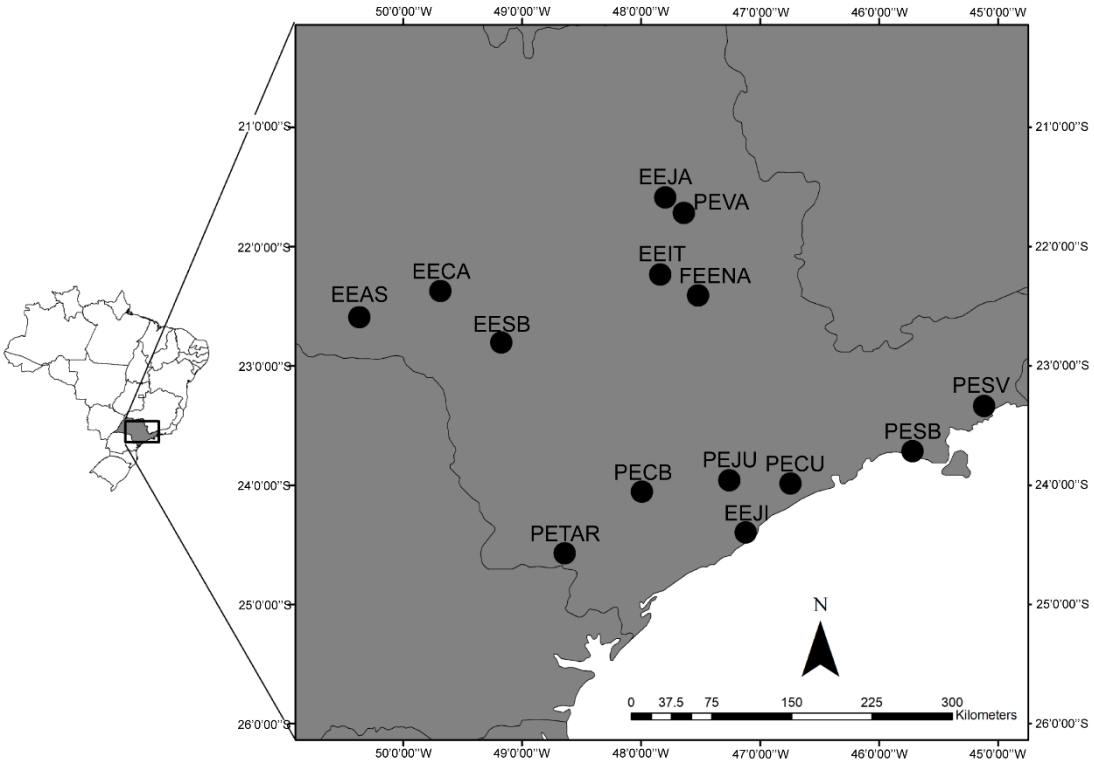

Figure 1. Map showing the state of São Paulo highlighted in Brazil (on the left), and indicating the 14 Protected Areas where field surveys were conducted (black dots). EEAS: Estação Ecológica de Assis; EECA: Estação Ecológica de Caetetus; EEIT: Estação Ecológica de Itirapina; EEJA: Estação Ecológica de Jataí; EEJI: Estação Ecológica de Juréia-Itatins; EESB: Estação Ecológica de Santa Bárbara; FEENA: Floresta Estadual Edmundo Navarro de Andrade; PECB: Parque Estadual Carlos Botelho; PEJU: Parque Estadual do Jurupará; PEVA: Parque Estadual Vassununga; PECU: Parque Estadual de Serra do Mar – Núcleo Curucutu; PESB: Parque Estadual da Serra do Mar – Núcleo São Sebastião; PESV: Parque Estadual da Serra do Mar – Núcleo Santa Virgínia; PETAR: Parque Estadual Turístico do Alto do Ribeira.

2.3 Morphological characters

All individuals collected were analyzed and morphologically identified in the laboratory with a Leica EZ4 HD stereomicroscope. We selected for morphological description only individuals between stage 33 to 38 (*sensu* Gosner 1960). We produced photographs of dorsal and lateral view of preserved tadpoles using a digital camera Canon PowerShot SX 50HS and oral structure using Leica EZ4 HD stereomicroscope. We used the *ImageJ* software (Schneider et al. 2012) for taking measurements following Altig & McDiarmid (1999), Altig (2007), and Rossa-Feres & Nomura (2006), namely: internasal (IND) and interorbital distance (IOD), tail muscle width (TMW), tail muscle height (TMH), body length (BL), tail length (TAL), maximum tail height (MTH), total length (TL), average of left and right eye diameter (AME), average of left and right nostril diameter (AND), dorsal fin height (DFH) and ventral fin height (VFH). We standardized the description of coloration and position of the oral disk following Schulze *et al.* (2015) and Pezzuti et al. (2021). We followed Rossa-Feres & Nomura (2006) and Pezzuti et al. (2021) for marginal and submarginal papillae, tooth formula, tooth rows, jaw sheaths width, spiracle, vent tube and position of the eyes and the nostrils (Fig. 2).

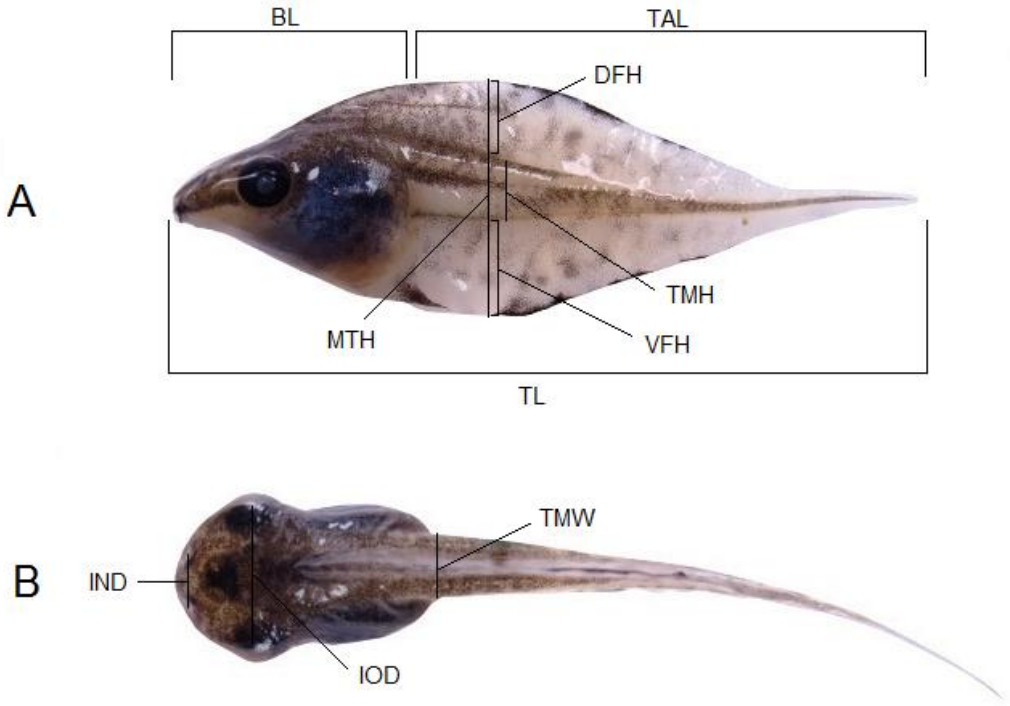

Figure 2. Morphological tadpole characters from lateral (A) and dorsal (B) views. Abbreviations: Internasal (IND) and interorbital distance (IOD), tail muscle width (TMW), tail muscle height (TMH), body length (BL), tail length (TAL), maximum tail height (MTH), total length (TL), dorsal fin height (DFH) and ventral fin height (VFH). Photo from an individual of *Dendropsophus minutus* (Source: Rezende 2017).

3. RESULTS

We analyzed 65 anuran species (Table S1). Most of these species belong to the family Hylidae (35 species), followed by Leptodactylidae (17), Bufonidae (3), Hylodidade (3), Microhylidae (3), Phyllomedusidae (3), Cycloramphidae (2), and Odontophrynidae (1). Details on morphological characterizations are provided below in alphabetical order.

Boana Gray, 1825

***Boana albomarginata* (Spix, 1824; Fig. 3a-d)**

Characterization

We collected 218 individuals of *B. albomarginata* in seven protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará, PETAR and PESM núcleos Curucutu, São Sebastião and Santa Virgínia. We analysed eleven individuals in the stages 33 to 38 for morphological characterization (Table S1).

Body: Total length: 39.7 ± 4.8 mm. Body length: 15.1 ± 1.7 mm. Body ovoid in dorsal view, and globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.2 ± 0.2 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.5 ± 0.1 mm of diameter, ovoid, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube median, and dextral. Tail length: 24.8 ± 3.4 mm, and 1.6 times the length of the body. Dorsal fin height: 2.6 ± 0.6 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.0 ± 0.3 mm, and convex margin.

Oral disc: Oral disc ventral. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae are sparse in the lateral. Jaw sheath finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/4(1), A1-2 of the same length, P2 longer than P1, and P3 and P4 shorter than the others.

Coloration in formalin: Body has light brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with brown blotches. Fins are transparent with brown blotches, and show a longitudinal median dark narrow stripe located at the first third of the tail.

Comments: The tadpoles described by Peixoto & Cruz (1983) from Itaguaí, Rio de Janeiro state, Brazil, differ from those studied herein by: i) one row of marginal papillae.

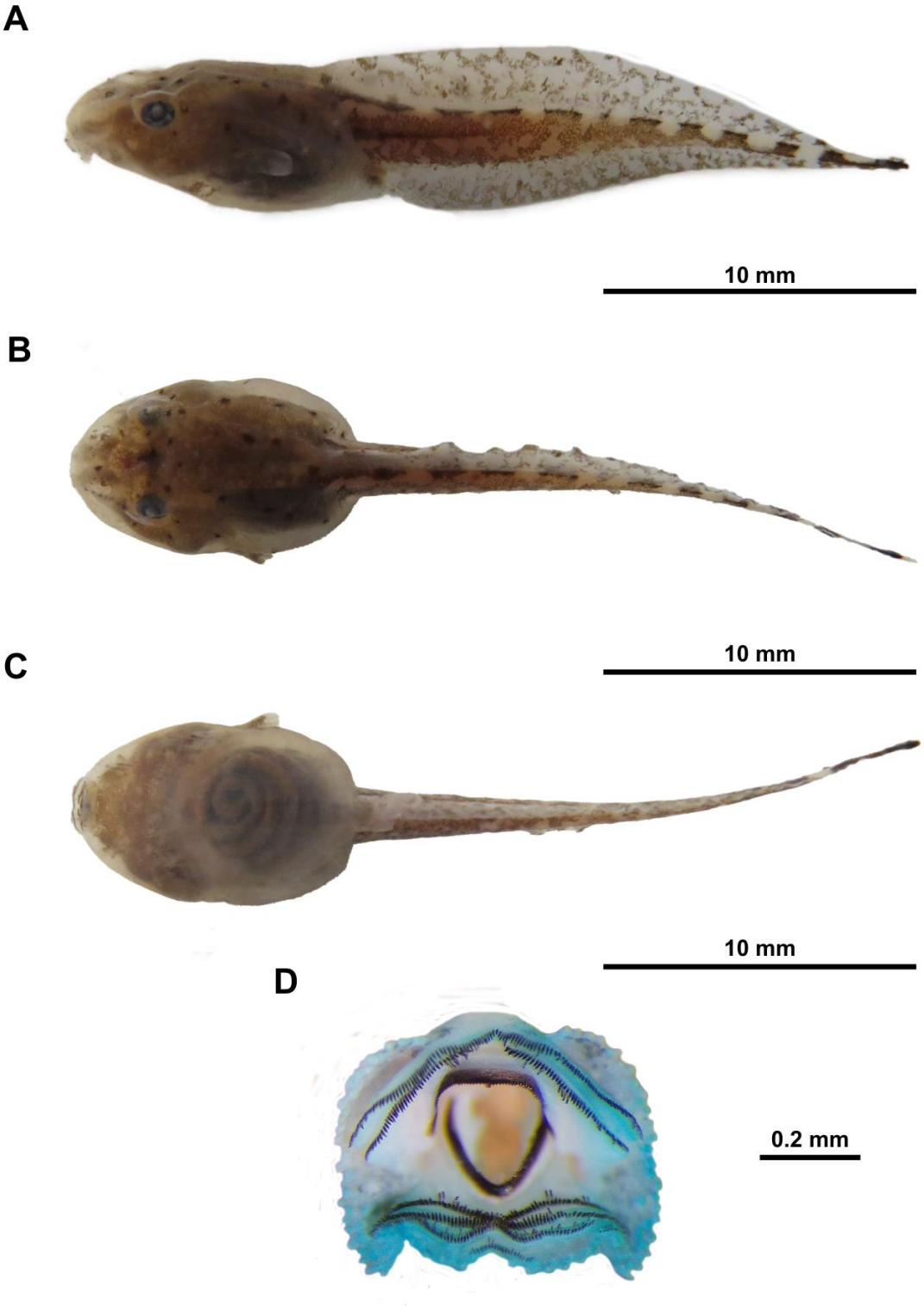

Figure 3. *Boana albomarginata.*

***Boana albopunctata* (Spix, 1824; Fig. 4a-d)**

Characterization

We collected 355 individuals of *B. albopunctata* in six protected areas: E.E. Jataí, E.E. Santa Bárbara, FEENA, P.E. Jurupará, P.E. Vassununga and PESM núcleo Curucutu. We analysed seventeen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 45.6 ± 6.9 mm. Body length: 16.85 ± 3.95 mm. Body oval in dorsal view, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.65 ± 0.2 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.5 ± 0.05 mm of diameter, reniform, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, long, dorsolateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube median, dextral, and fused to ventral fin. Tail length: 29.65 ± 6.45 mm, and 1.75 times the length of the body. Dorsal fin height: 3.35 ± 0.55 mm, slightly convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 2.25 ± 0.35 mm, and margin parallel to the longitudinal axis of the tail.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row, and narrow dorsal gap. Submarginal papillae present in the lateral. Jaw sheaths are finely serrated, and upper and lower ones' arc-shape. Tooth row formula 2(1,2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with small dark spots dorsally, light brown ventrally. Spiracle is transparent. Tail is beige with brown blotches. Fins are brown with blotches, and show a longitudinal median dark narrow stripe located at the first third of the tail.

Comments: The tadpoles described by de Sá (1995) differ from those studied herein by: i) body elliptical; and ii) nostril oval in de Sá (1995). The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) snout oval in dorsal view; ii) oral disc ventral; iii) submarginal papillae absent; and iv) lower jaw sheath V-shape. The tadpoles described by Heyer et al. (1990) are similar to those studied herein.

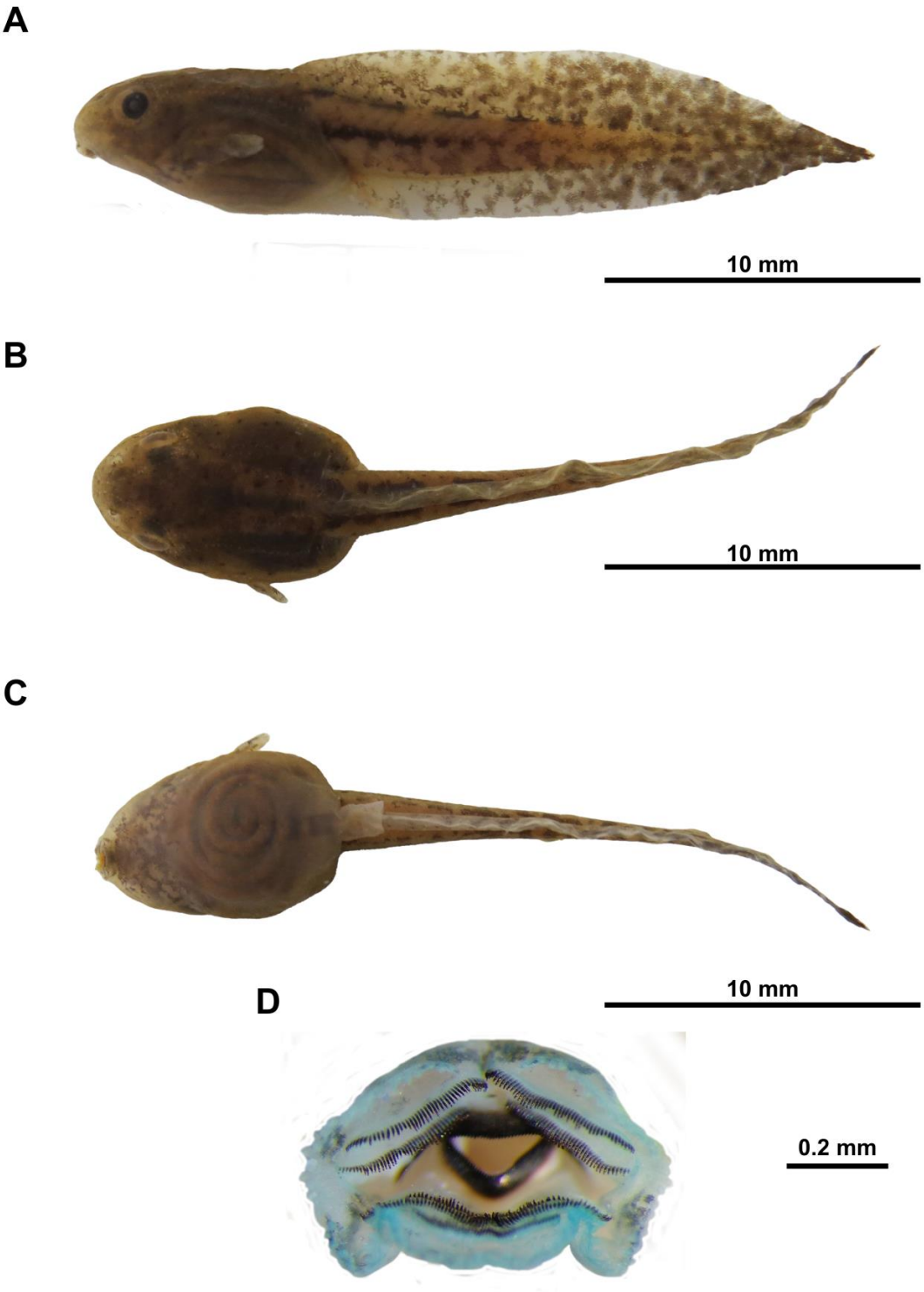

Figure 4. *Boana albopunctata.*

***Boana bandeirantes* Caramaschi & Cruz, 2013 (Fig. 5a-d)**

Characterization

We collected five individuals of *B. bandeirantes* at PESM núcleo Santa Virgínia. We analysed one individual in stage 36 for morphological characterization (Appendix Table S1).

Body: Total length: 45.9 mm. Body length: 16.5 mm. Body ovoid in dorsal view, and globular in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 1.35 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.45 mm of diameter, reniform, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube median, dextral, and fused to ventral fin. Tail length: 29.7 mm, and 1.8 times the length of the body. Dorsal fin height: 2.7 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.9 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row, and dorsal gap. Submarginal papillae have one to two rows in the lateral folds. Jaw sheath narrow, finely serrated, upper one arc-shape or slight M-shape, and lower one V-shape. Tooth row formula 2(2)/4(1), A1-2 and P1-2 of the same length, P3 shorter than P1-2, and P4 shorter than the others.

Coloration in formalin: Body has brown covered with dark speckles dorsally, and transparent ventrally. Spiracle is transparent. Tail is transparent with brown blotches, and shows a longitudinal median dark narrow stripe located at the first third of the tail. Fins are transparent with brown blotches.

Comments: The tadpoles described by Heyer et al. (1990) differ from those studied herein by tooth row formula 2(2)/3(1,2).

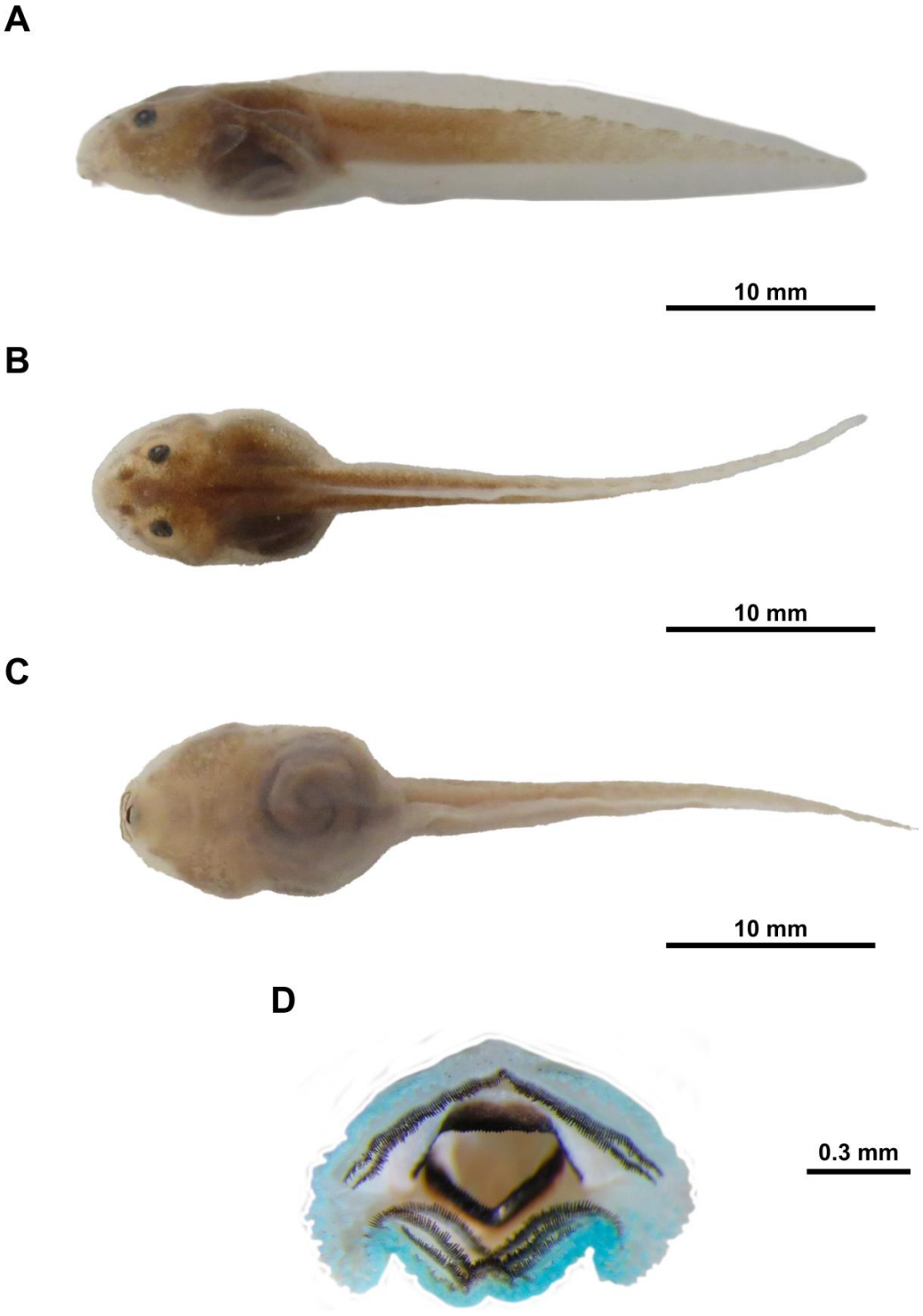

Figure 5. *Boana bandeirantes.*

***Boana bischoffi* (Boulanger, 1887; Fig. 6a-d)**

Characterization

We collected 624 individuals of *B. bischoffi* in five protected areas: P.E. Carlos Botelho, P.E. Jurupará, PETAR, and PESM núcleos Curucutu and Santa Virgínia. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 37.85 ± 9.4 mm. Body length: 13.5 ± 3.55 mm. Body ovoid in dorsal view, and globular depressed in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.4 ± 0.65 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.515 ± 0.15 mm of diameter, reniform, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, long, lateroventral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube median, and dextral. Tail length: 24.05 ± 6.0 mm, and 1.75 times the length of the body. Dorsal fin height: 2.55 ± 0.7 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the border between body and tail at a low slope. Ventral fin height: 1.85 ± 0.3 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row, and narrow dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has light brown covered with dark speckles dorsally, and transparent ventrally. Spiracle is transparent. Tail is transparent with large dark spots, and shows a longitudinal median dark narrow stripe located at the first third of the tail. Fins are transparent with large dark spots.

Comments: The tadpoles described by Heyer et al. (1990) differ from those studied herein by: i) spiracle directed posterodorsally; and ii) body and tail dark gray.

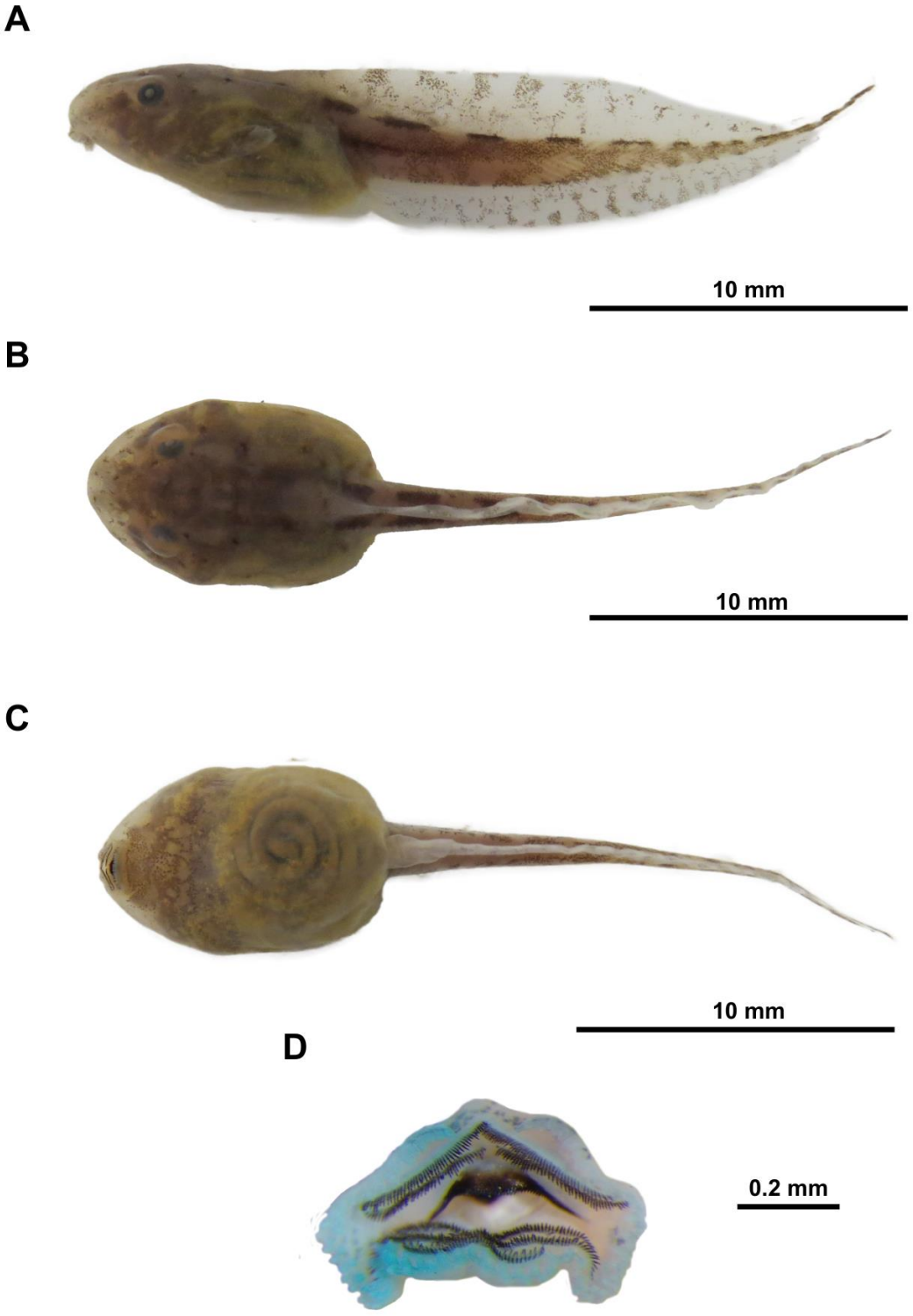

Figure 6. *Boana bischoffi*.

***Boana caingua* (Carrizo, 1991; Fig. 7a-d)**

Characterization

We collected 46 individuals of *B. caingua* at E.E. Santa Bárbara. We analysed fourteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 47.9 ± 2.6 mm. Body length: 18.5 ± 0.3 mm. Body ovoid in dorsal view, and depressed/globular in lateral view. Snout oval in dorsal and lateral views. Eyes with 1.55 ± 0.04 mm of diameter, positioned dorsolally, and directed laterally. Nostrils with 0.45 ± 0.008 mm of diameter, reniform, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, long, dorsolateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube long, dextral, and fused to ventral fin. Tail length: 29.6 ± 1.5 mm, and 1.6 times the length of the body. Dorsal fin height: 2.95 ± 0.2 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.25 ± 0.2 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row in the upper lip, dorsal gap, two rows in the angular regions of the oral disc, and one to two rows in the lower lip. Submarginal papillae are sparse in the laterals. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(1,2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige. Fins are transparent, with large dark spots, and show a longitudinal median dark narrow stripe located at the first third of the tail.

Comments: The tadpoles described by Kolenc et al. (2008) differ from those studied herein by: i) nostrils oval; and ii) variation in tooth row formula 2(1,2)/3(1), 2(1,2)/3, 2(1,2)/3(1,2) or 2(1,2)/0.

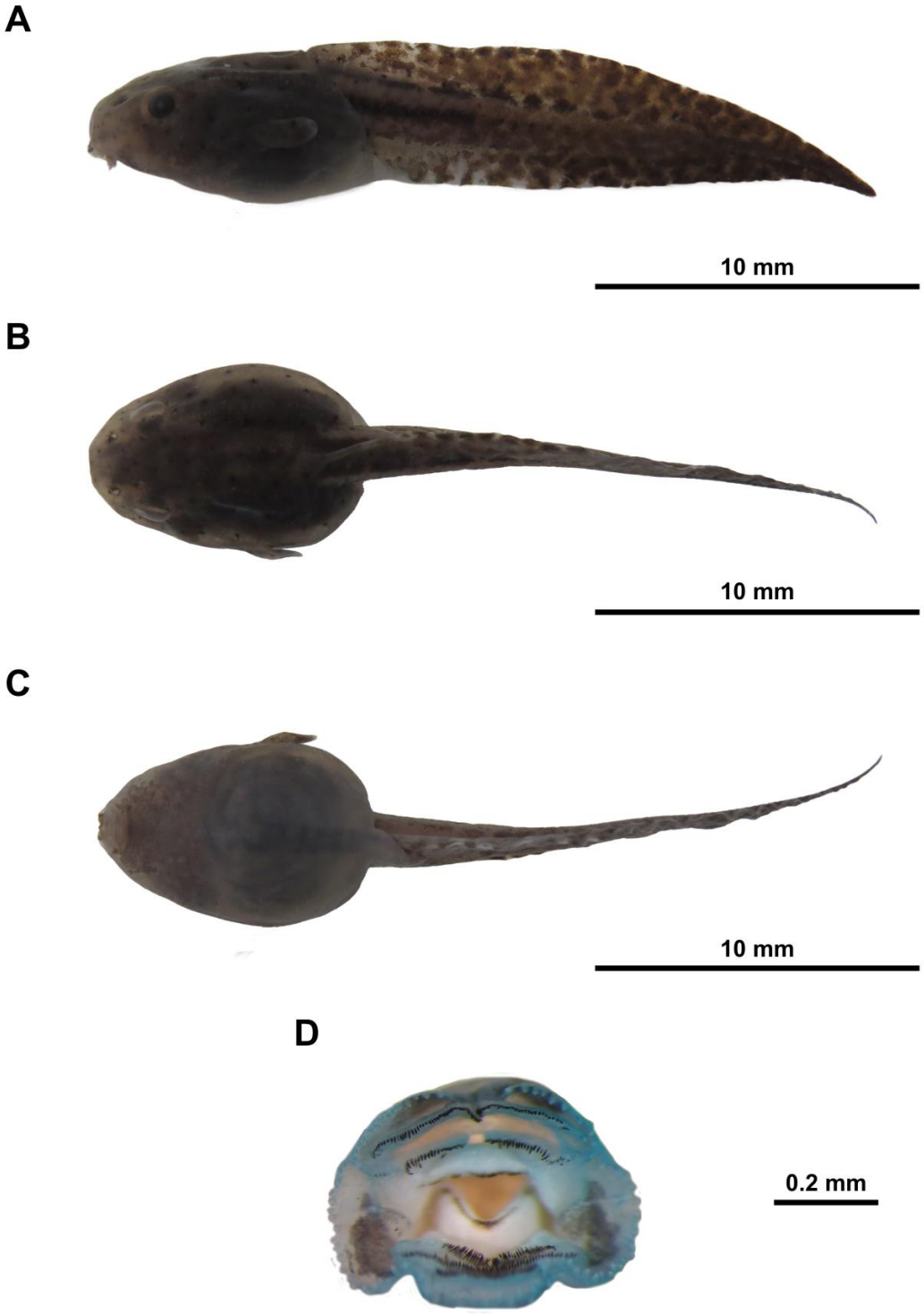

Figure 7. *Boana caingua*.

***Boana caipora* Antunes, Faivovich & Haddad, 2008 (Fig. 8a-d)**

Characterization

We collected nine individuals of *B. caipora* at P.E. Carlos Botelho. We analysed one individual in stage 26 for morphological characterization (Appendix Table S1).

Body: Total length: 21.85 mm. Body length: 8.0 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.45 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.1 mm diameter, rounded, positioned anterodorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, long, lateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube long, dextral, and fused to ventral fin. Tail length: 13.7 mm, and 1.7 times the length of the body. Dorsal fin height: 1.85 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.65 mm, and convex margin.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row in the upper lip, dorsal gap, two rows in laterals, and two rows in lower lip. Submarginal papillae are sparse in the laterals. Jaw sheath narrow, finely serrated, and upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A-1 longer than A-2, and P-1 and P-2 of the same length shorter than P-3.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with large dark spots. Fins are transparent with a few dark dots, and show a longitudinal median dark narrow stripe located at the first third of the tail.

Comments: The tadpoles described by Antunes et al. (2008) differ from those studied herein by: i) nostrils rounded; ii) oral disc ventral; and iii) the tooth row formula 2(2)/4(1).

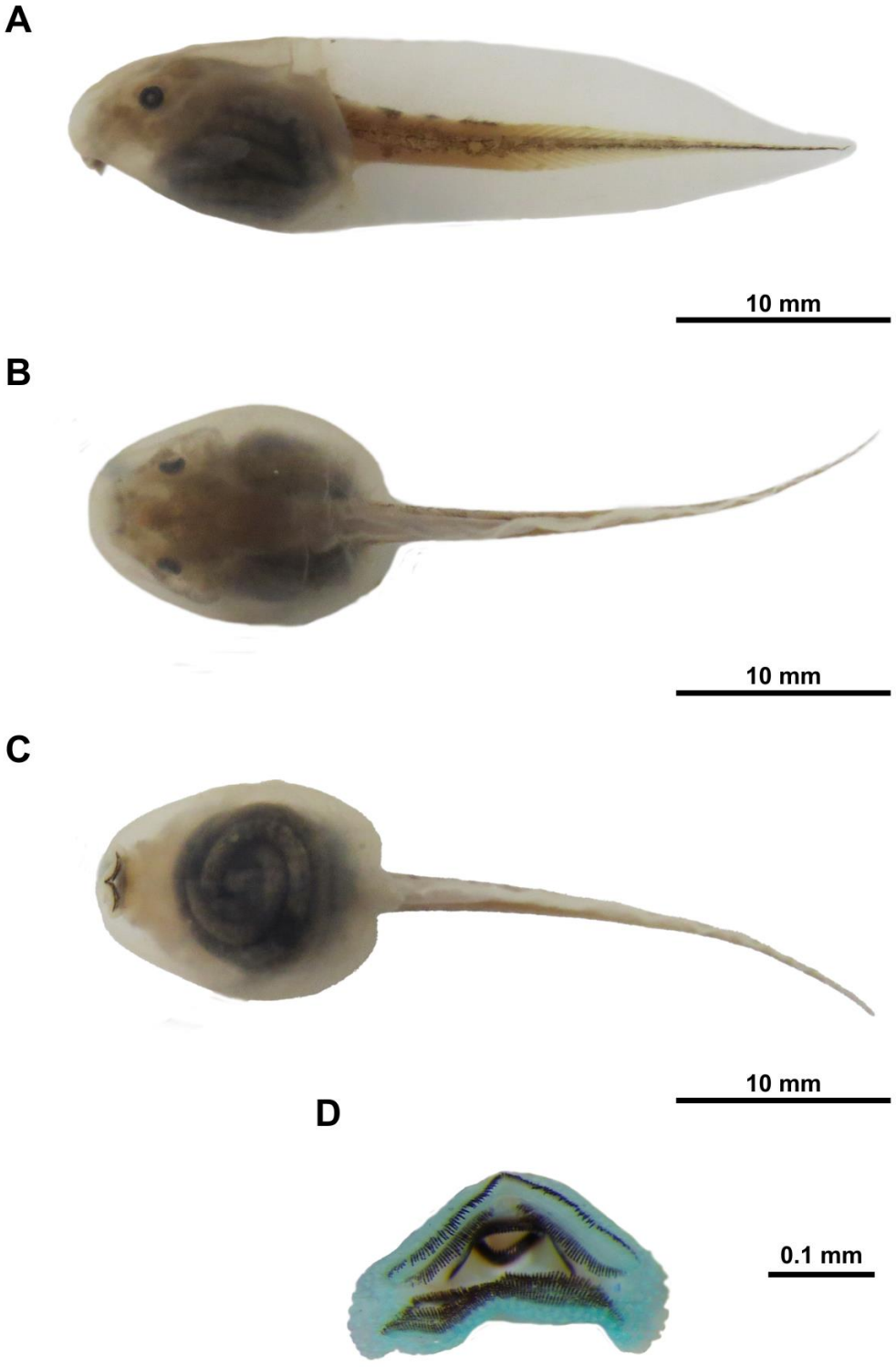

Figure 8. *Boana caipora.*

***Boana faber* (Wied-Neuwied, 1821; Fig. 9a-d)**

Characterization

We collected 2312 individuals of *B. faber* in 11 protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Santa Bárbara, FEENA, P.E. Carlos Botelho, P.E. Jurupará, PESM núcleos Curucutu, São Sebastião and Santa Virgínia, and PETAR. We analysed twelve individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 73.7 ± 11.9 mm. Body length: 26.05 ± 3.5 mm. Body ovoid in dorsal view, widest behind the eyes, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 3.4 ± 0.75 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 1.2 ± 0.3 mm of diameter, reniform, positioned dorsolaterally, opening directed dorsolaterally, and projection on marginal rim. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 47.95 ± 9.75 mm, and 1.85 times the length of the body. Dorsal fin height: 4.85 ± 0.95 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the border between body and tail at a low slope. Ventral fin height: 3.25 ± 0.8 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have one row in the upper lip, dorsal gap, two rows in the laterals, and two rows in the lower lip. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/4(1), A-1 and A-2 of the same length, P-1 and P-2 of the same length, P-3 shorter than P-1 and P-2, and P-4 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is dark brown with large dark spots, concentrated in the posterior third of the tail, and shows a longitudinal median dark stripe located at the first third of the tail. Fins are dark brown with large dark spots.

Comments: The tadpoles described by Kolenc et al. (2008) differ from those studied herein by: i) nostrils oval; ii) upper jaw sheath arc-shape; and iii) some infra-angular submarginal papillae are usually present. The tadpoles described by Cei (1980) are similar to those studied herein.

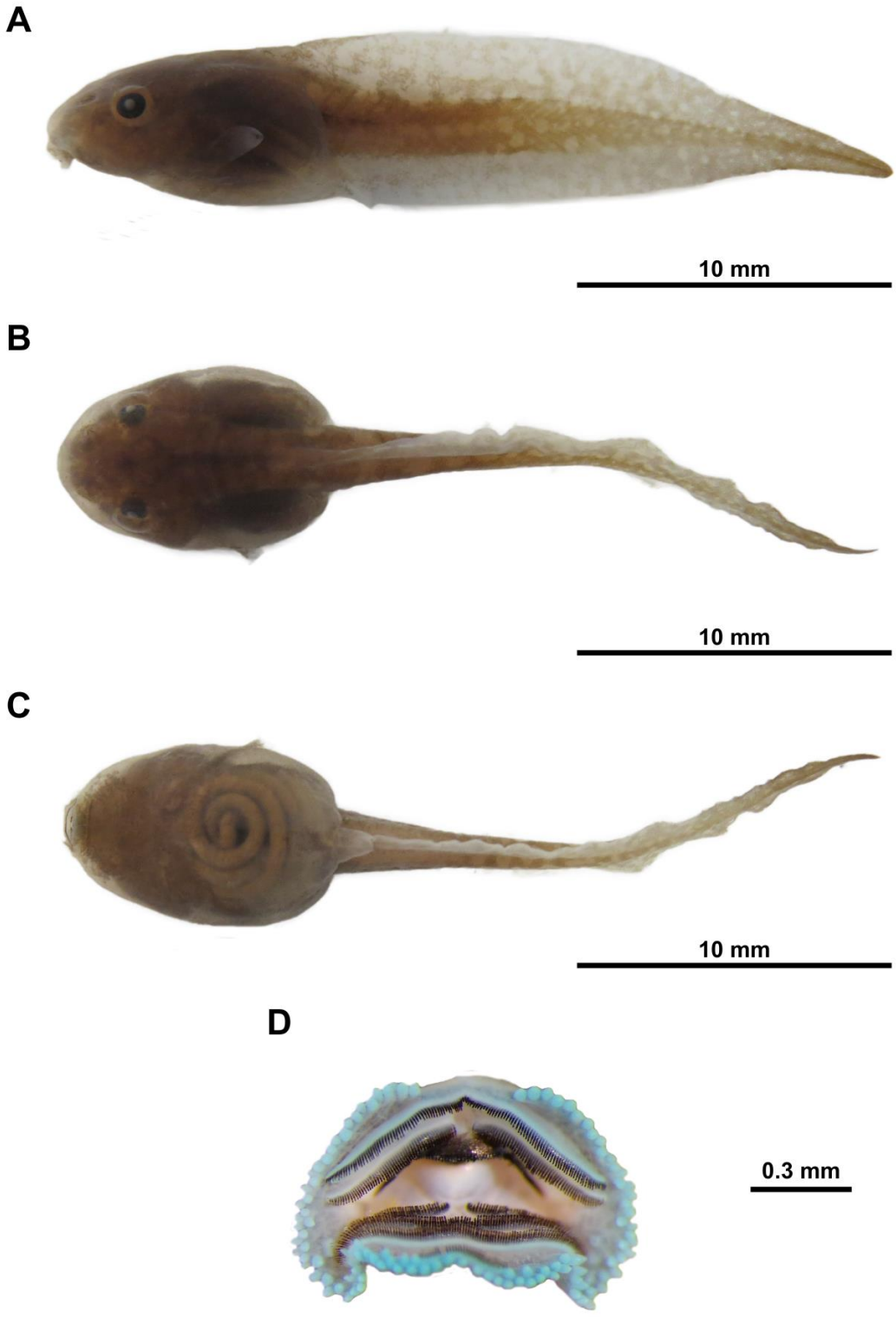

Figure 9. *Boana faber*.

***Boana lundii* (Burmeister, 1856; Fig. 10a-d)**

Characterization

We collected 19 individuals of *B. lundii* in three protected areas: E.E. Assis, E.E. Caetetus, and FEENA. We analysed three individuals in the stages 33 to 34 for morphological characterization (Appendix Table S1).

Body: Total length: 44.5 ± 1.55 mm. Body length: 16.45 ± 1.9 mm. Body ovoid in dorsal view, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.25 ± 0.07 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.35 ± 0.05 mm of diameter, oval, positioned dorsolaterally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, short, lateroventral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 27.8 ± 1.25 mm, and 1.7 times the length of the body. Dorsal fin height: 2.7 ± 0.3 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.05 ± 0.15 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc ventral, and emarginate ventrally. Marginal papillae have one row in the upper lip, dorsal gap, two rows in the laterals, and two rows in the lower lip. Submarginal papillae are sparse with conical shape. Jaw sheath narrow, finely serrated, upper one M-shape or arc-shape, and lower one V-shape. Tooth row formula 2(1,2)/4(1), A1-2 and P1-3 of the same length, and P4 shorter than the others.

Coloration in formalin: Body has grayish-brown covered with small dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail has gray with brown speckles, and shows a longitudinal median dark narrow stripe located at the first third of the tail. Fins have gray with brown speckles.

Comments: The tadpoles described by Bokermann & Sazima (1973) differ from those studied herein by: i) body triangular/elongated in lateral view; ii) marginal papillae with two rows in the upper lip; and iii) tooth row formula 2(2)/3(1). The described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) snout oval in dorsal view; ii) eyes positioned dorsally; iii) centripetal wall not fused to the body wall and longer than external wall; and iv) tooth row formula 2(2)/4(1).

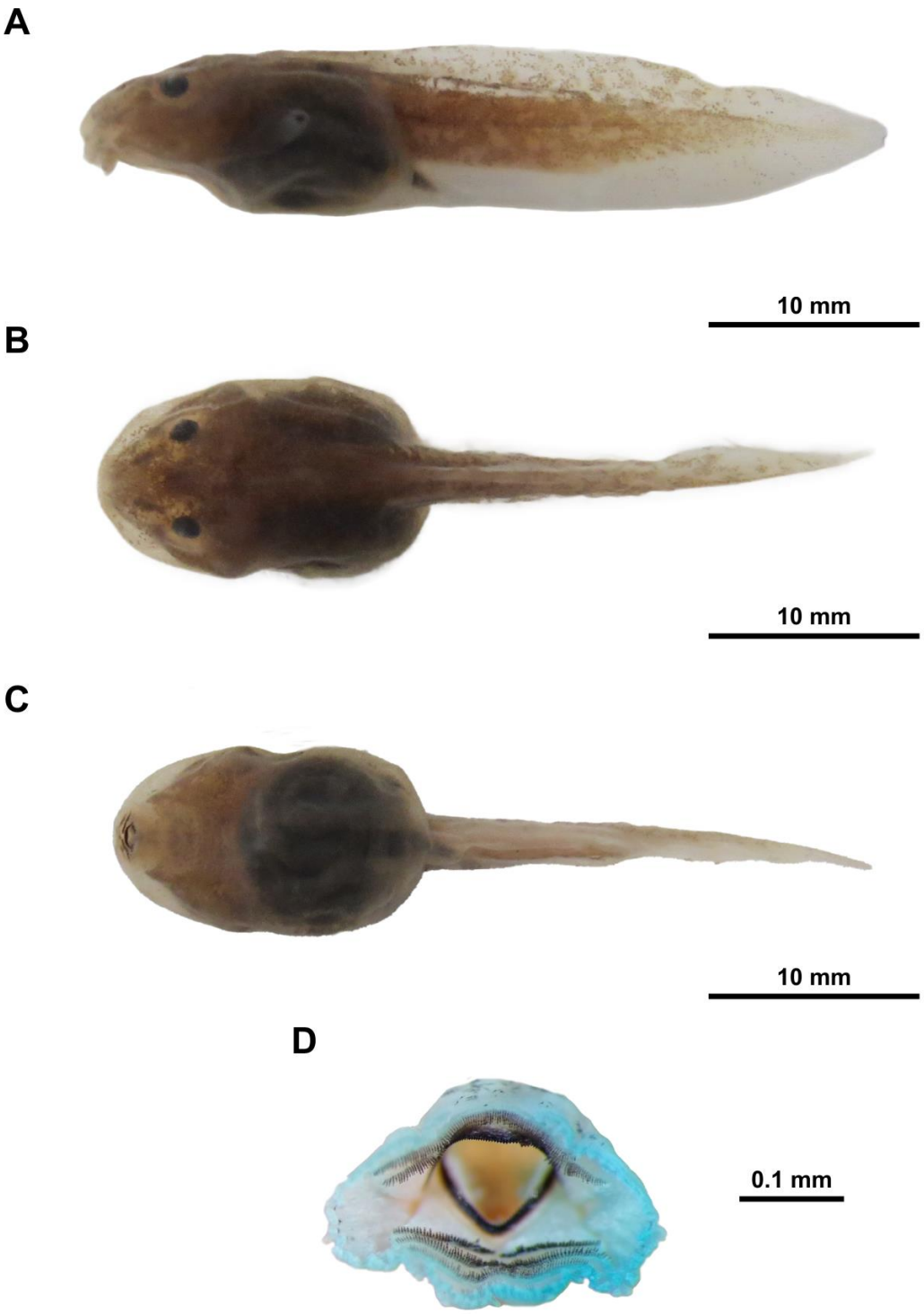

Figure 10. *Boana lundii.*

***Boana pardalis* (Spix, 1824; Fig. 11a-d)**

Characterization

We collected 26 individuals of *B. pardalis* in four protected areas: P.E. Carlos Botelho, P.E. Jurupará and PESM núcleos São Sebastião and Santa Virgínia. We analysed one individual in the stage 33 for morphological characterization (Appendix Table S1).

Body: Total length: 33.7 mm. Body length: 12.45 mm. Body ovoid in dorsal view, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.75 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.3 mm of diameter, reniform, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, long, dorsolateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 23.3 mm, and 1.7 times the length of the body. Dorsal fin height: 2.05 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.3 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae has one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1) or 2(2)/4(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has light brown covered with dark speckles dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with dark dots concentrated in the dorsal edge. Fins are transparent with dark dots, and show a longitudinal median dark narrow stripe located at the first third of the tail.

Comments: The tadpoles described by Bokermann (1968) differ from those studied herein by: i) body trapezoidal/truncated in lateral view; ii) marginal papillae has one row; and iii) body has black ventrally.

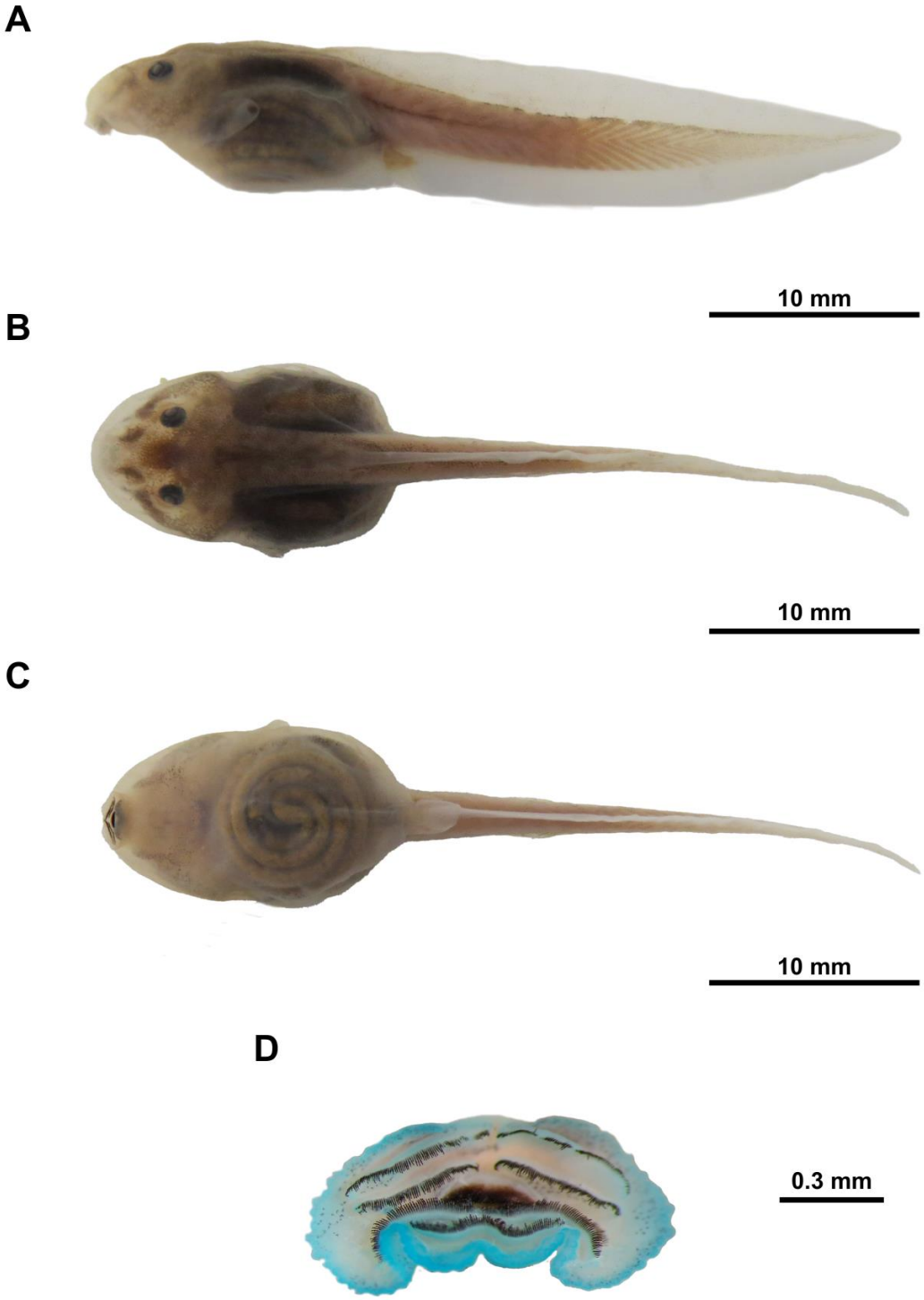

Figure 11. *Boana pardalis.*

***Boana semilineata* (Spix, 1824; Fig. 12a-d)**

Characterization

We collected 157 individuals of *B. semilineatus* in three protected areas: E.E. Juréia-Itatins, P.E. Jurupará and PESM núcleo São Sebastião. We analysed fourteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 57.15 ± 8.55 mm. Body length: 25.25 ± 2.65 mm. Body ovoid in dorsal view, wider behind the eyes, and ovoid in lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 2.2 ± 0.25 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.6 ± 0.095 mm, rounded, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, short, dorsolateral, opening at the posterior third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 31.8 ± 6.15 mm, and 1.25 times the length of the body. Dorsal fin height: 4.65 ± 0.4 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 4.8 ± 0.45 mm, and convex margin.

Oral disc: Oral disc ventral. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/4(1), A1-2 and P1-2 of the same length, and P3-P4 of the same length and shorter than the others.

Coloration in formalin: Body has black dorsally, and slightly transparent ventrally. Tail is black. Fins are black, but some individuals showed transparent fins with large dark brown spots.

Comments: The tadpoles described by Bokermann (1963) differ from those studied herein by: i) body elliptical in lateral view; ii) eyes positioned dorsally; and iii) the tooth row formula 2(2)/4.

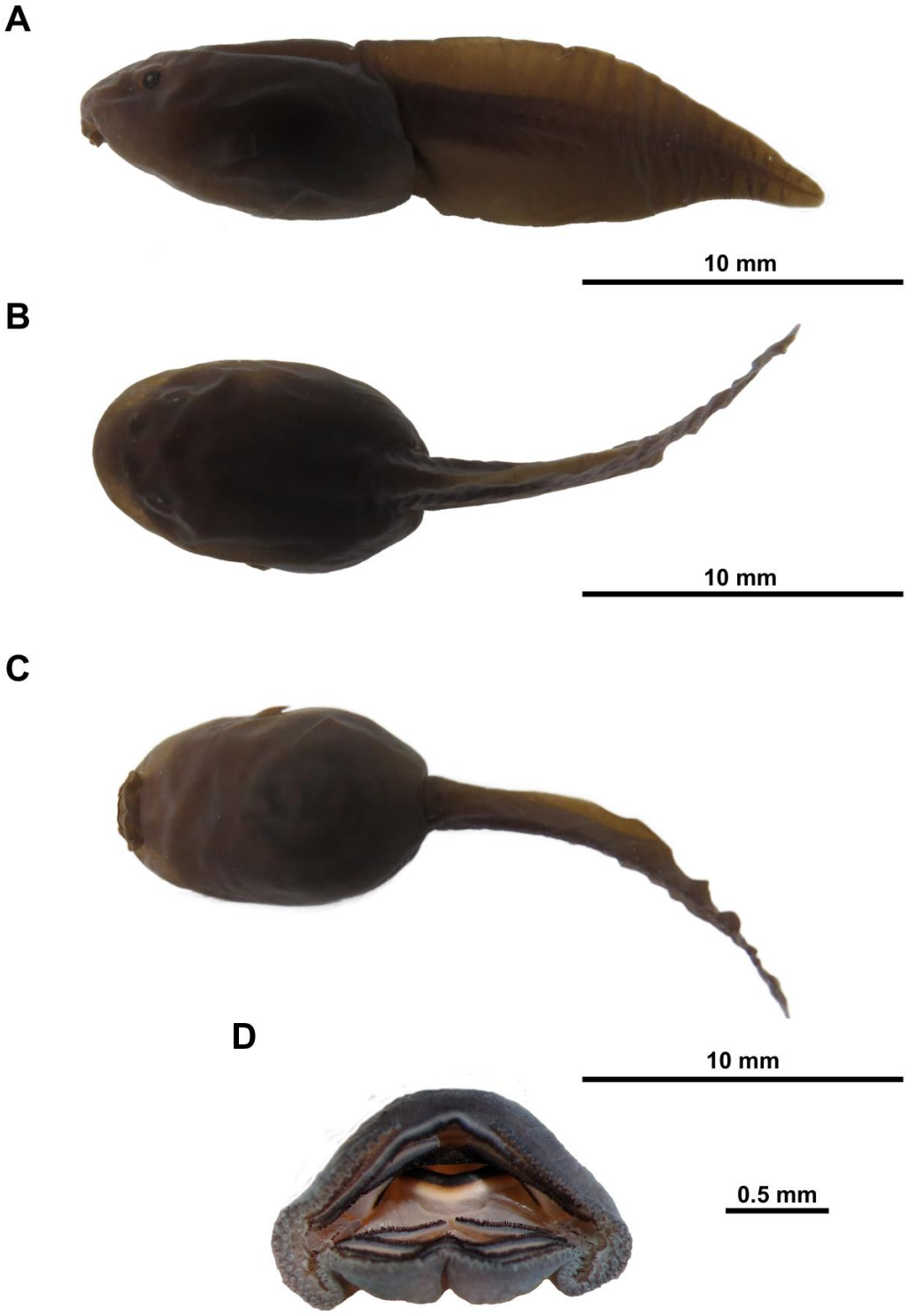

Figure 12. *Boana semilineata.*

Bokermannohyla Faivovich et al., (2005)

***Bokermannohyla circumdata* (Cope, 1871; Fig. 13a-d)**

Characterization

We collected 78 individuals of *B. circumdata* in six protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará, PESM núcleos Curucutu, Santa Virgínia and São Sebastião. We analysed ten individuals in the stages 33 to 37 for morphological characterization (Appendix Table S1).

Body: Total length: 49.85 ± 3.4 mm. Body length: 16.6 ± 1.4 mm. Body ovoid in dorsal view and ovoid/compressed in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.35 ± 0.35 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.45 ± 0.05 mm of diameter, elliptical, positioned anterolaterally, opening directed dorsolaterally, and projections on marginal rim. Spiracle sinistral, lateral, short, opening at the posterior middle third of the body, centripetal wall fused to the body wall, and free distal edge. Vent tube short, dextral, and fused to ventral fin. Tail length: 33.45 ± 2.55 mm, and 2.0 times the length of the body. Dorsal fin height: 2.45 ± 0.35 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the border between body and tail at a low slope. Ventral fin height: 1.85 ± 0.4 mm, and slightly convex margin.

Oral Disc: Oral disc directed anteroventrally, and ventrally emarginated. Marginal papillae with a narrow gap on the upper lip, one row in the upper lip, two rows in the lower lip, and two rows in the laterals of the oral disc. Submarginal papillae are sparse in the laterals. Jaw sheaths are finely serrated, upper one arc-shaped, and lower one V-shaped. Tooth row formula 2(2)/3(1) or 2(2)/4(1), A1-2 of the same length, and P4 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark speckles. Dorsal and ventral fins are transparent with dark speckles, parallel dorsal stripes which extend from the eyes to the end of the tail, and a lateral narrow dark brown stripe found at the anterior third of the tail.

Comments: The tadpoles described herein are similar to those described by Mongin et al. (2013).

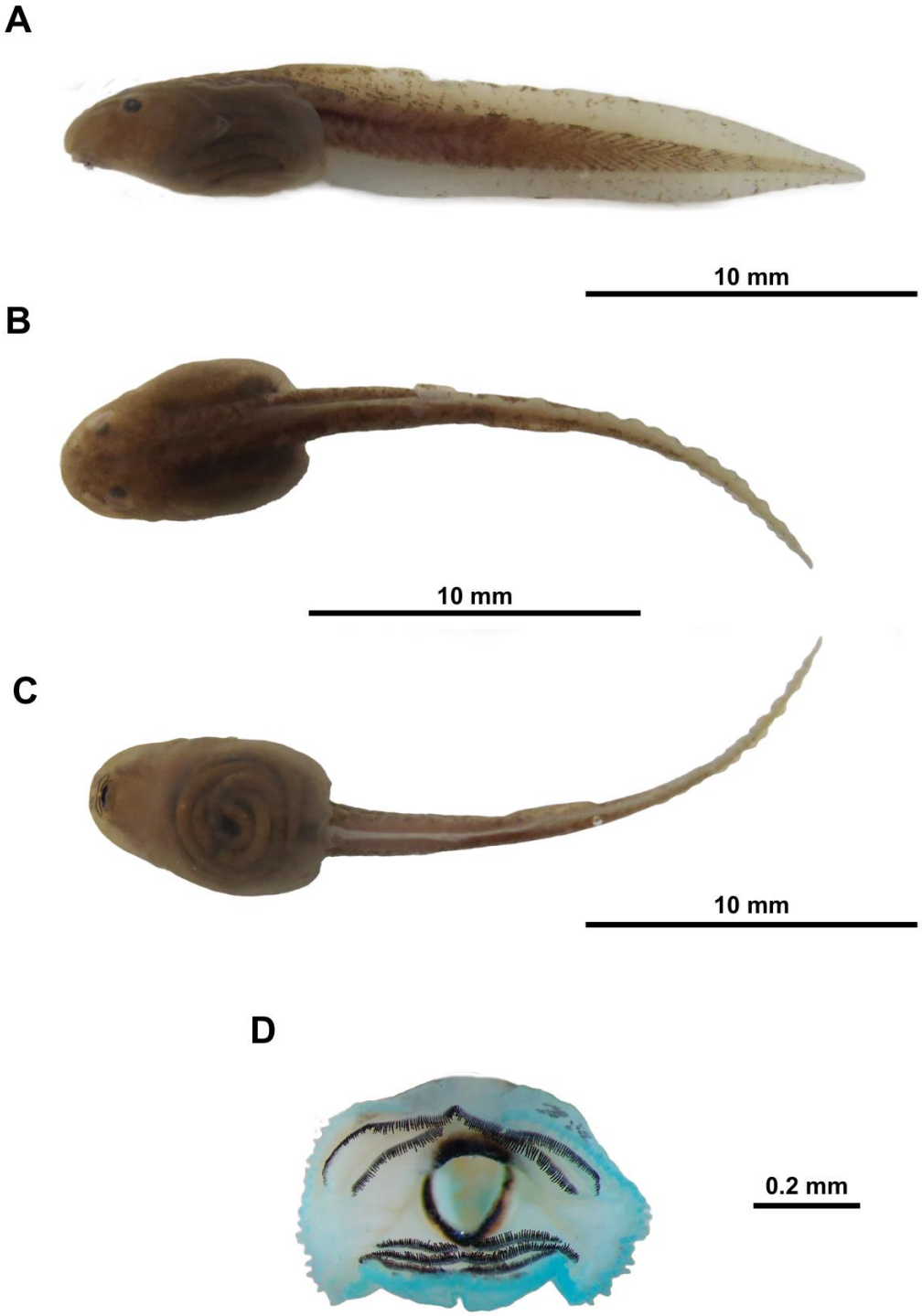

Figure 13. *Bokermannohyla circumdata.*

***Bokermannohyla hylax* (Heyer, 1985; Fig. 14a-d)**

Characterization

We collected 35 individuals of *B. hylax* in four protected areas: P.E. Jurupará, E.E. Juréia-Itatins, and PESM núcleos Santa Virgínia and São Sebastião. We analysed two individuals in the stages 36 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 53.95 ± 4.35 mm. Body length: 16.95 ± 0.15 mm. Body elongated ovoid in dorsal view and ovoid/compressed in lateral view. Snout rounded in the dorsal view and pointed in the lateral view. Eyes with 1.55 ± 0.06 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.4 ± 0.025 mm of diameter, reniform, positioned dorsolaterally, opening directed dorsolaterally, and projections on marginal rim. Spiracle sinistral, lateroventral, short, opening at the posterior middle third of the body, centripetal wall fused to body wall, and free distal edge. Vent tube short, dextral, and fused to ventral fin. Tail length: 37.3 ± 3.85 mm, and 2.2 times the length of the body. Dorsal fin height: 2.05 ± 0.55 mm, with slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.8 ± 0.15 mm, and slightly convex margin.

Oral disc: Oral disc directed anteroventrally, and ventrally emarginated. Marginal papillae have one row, and narrow dorsal gap. Submarginal papillae are absent. Jaw sheaths serrated, upper one arc-shaped, and lower one V-shape. Tooth row formula 2(2)/4(1), A1-2 of the same length, and P4 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with dark speckles. Dorsal and ventral fins are transparent with dark speckles, and a lateral dark brown stripe found at the anterior third of the tail.

Comments: The tadpoles described by Bertolucci et al. (2003) differ from those studied herein by: i) marginal papillae have two poor-defined rows and no dorsal gap; ii) submarginal papillae in the angular region; and) tooth row formula 2(2)/4(1) and 2(2)/4.

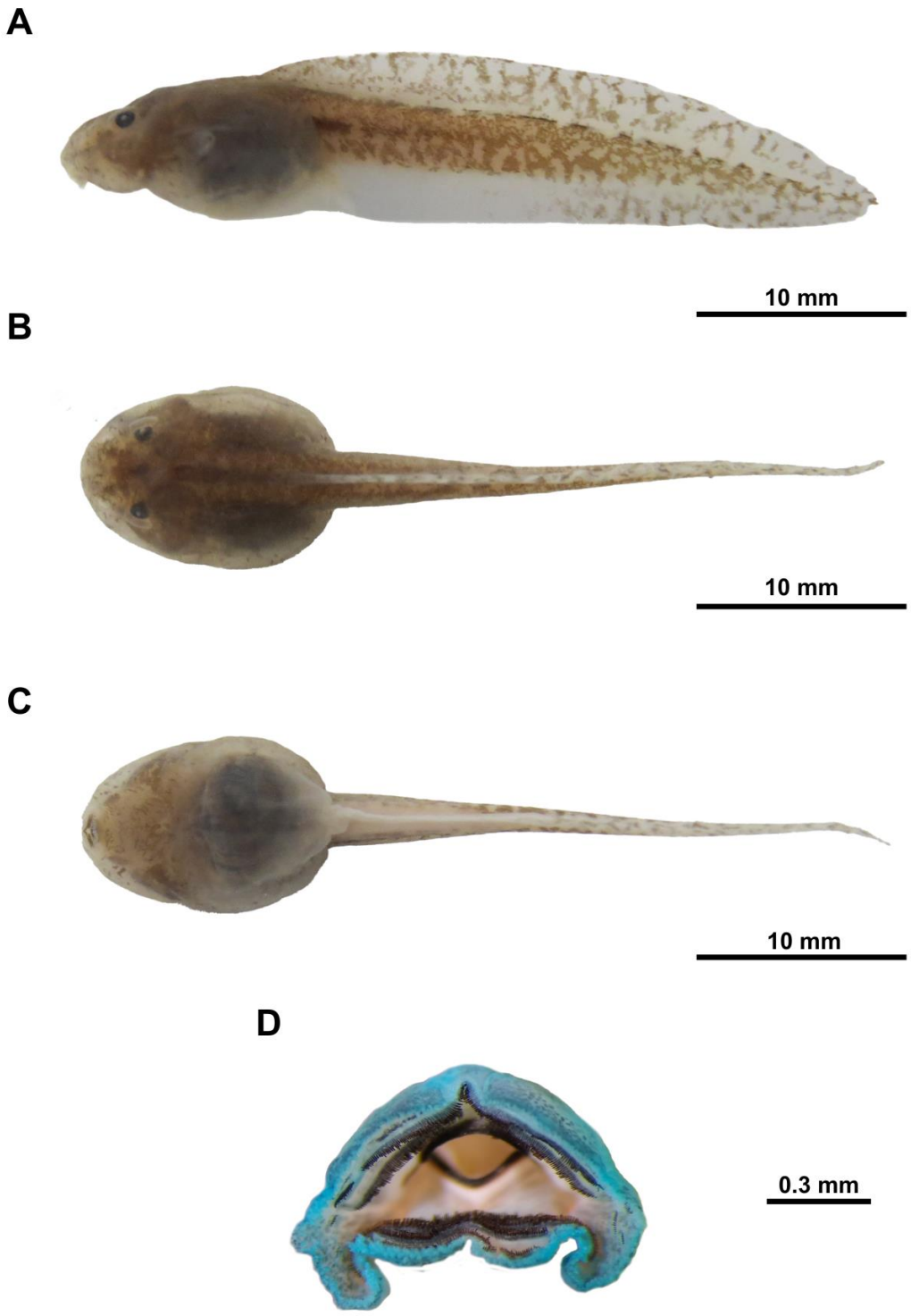

Figure 14. *Bokermannohyla hylax.*

Chiasmocleis Méhely, 1904

***Chiasmocleis albopunctata* (Boettger, 1885; Fig. 15a-d)**

Characterization

We collected 121 individuals of *C. albopunctata* at E.E. Assis. We analysed five individuals in the stages 33 to 35 for morphological characterization (Appendix Table S1).

Body: Total length: 15.3 ± 0.9 mm. Body length: 16.95 ± 0.15 mm. Body elliptical in dorsal view and ovoid in lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 0.9 ± 0.2 mm of diameter, positioned laterally, and directed laterally. Nostrils are absent. Spiracle ventral, long, positioned medially, and opening at the posterior third of the body. Vent tube short, positioned medially, and fused to ventral fin. Tail length: 8.4 ± 0.1 mm, and 1.2 times the length of the body. Dorsal fin height: 1.4 ± 0.06 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.9 ± 0.2 mm, and convex margin.

Oral disc: Oral disc terminal, partially covered by two semi-circular symmetrical flaps, and flaps ornamented at the border. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheaths are absent. Tooth row formula 0/0.

Coloration in formalin: Body has light brown covered with dark dots dorsally, and whitish ventrally. Spiracle is transparent. Tail is transparent with dark dots. Dorsal and ventral fins are transparent with dark blotches, and a few dark speckles.

Comments: The tadpoles described by Oliveira & Giaretta (2006) differ from those studied herein by the body almost prismatic in dorsal view and acuminated anteriorly.

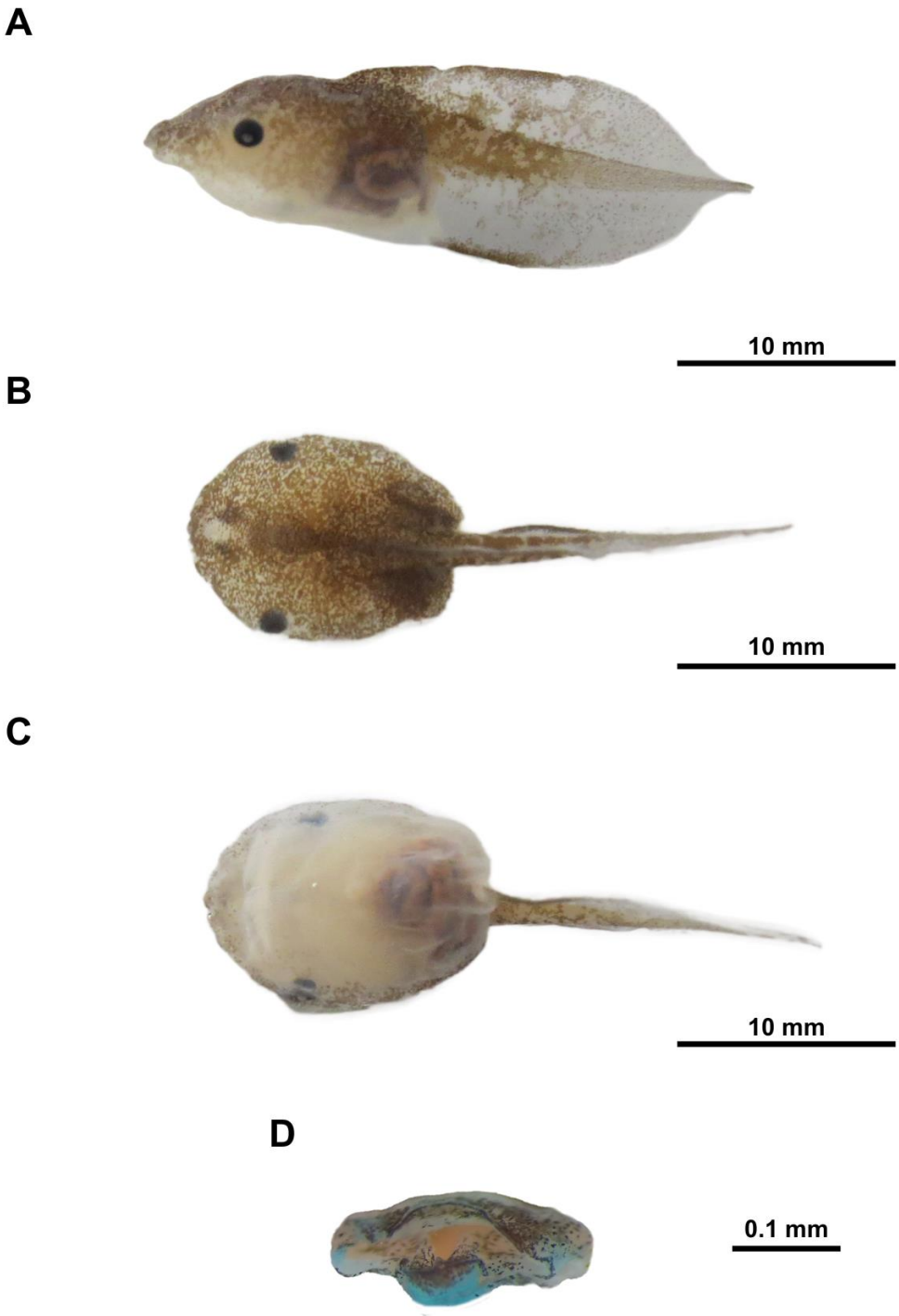

Figure 15. *Chiasmocleis albopunctata.*

***Chiasmocleis leucosticta* (Boulenger, 1888; Fig. 16a-d)**

Characterization

We collected 100 individuals of *C. leucosticta* at P.E. Carlos Botelho. We analysed fifteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 17.7 ± 1.1 mm. Body length: 7.7 ± 0.6 mm. Body ovoid in dorsal and lateral views. Snout rounded in the dorsal view, and sloped in lateral view. Eyes with 0.7 ± 0.05 mm of diameter, positioned laterally, and directed laterally. Nostrils are absent. Spiracle ventral, long, positioned medially, opening at the posterior third of the body, and close to ventral fin. Vent tube short, positioned medially, and concealed by the spiracle. Tail length: 10.0 ± 0.45 mm, and 1.3 times the length of the body. Dorsal fin height: 2.2 ± 0.2 mm, convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 2.1 ± 0.5 mm, and convex margin.

Oral disc: Oral disc terminal, partially covered by two semi-circular symmetrical flaps, and flaps ornamented at the border. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheaths are absent. Tooth row formula 0/0.

Coloration in formalin: Body is transparent with dark dots dorsal and ventrally. Spiracle is transparent. Tail is transparent with dark dots. Dorsal and ventral fins are transparent with dark blotches.

Comments: The tadpoles described by Langone et al. (2007) differ from those studied herein by: i) body depressed/elliptical; ii) nostrils rounded; and iii) the ventral fin normal.

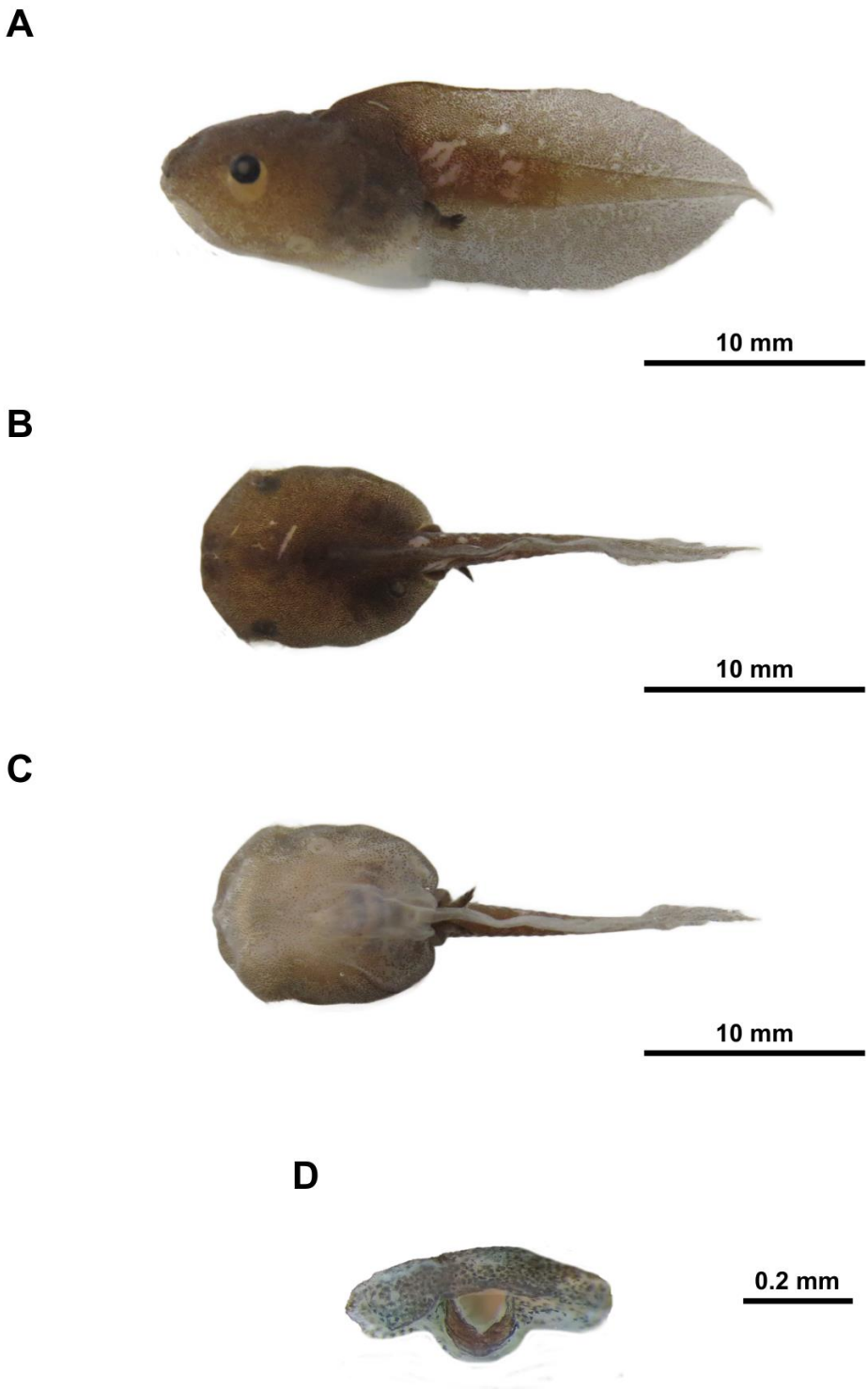

Figure 16. *Chiasmocleis leucosticta.*

Crossodactylus Duméril & Bibron, 1841

***Crossodactylus caramaschii* Bastos & Pombal, 1995 (Fig. 17a-d)**

Characterization

We collected 70 individuals of *C. caramaschii* in three protected areas: E.E. Caetetus, P.E. Carlos Botelho and P.E. Jurupará. We analysed eight individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 38.8 ± 4.0 mm. Body length: 16.0 ± 1.45 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 1.2 ± 0.25 mm of diameter, positioned dorsally, and directed laterally. Nostrils with 0.35 ± 0.035 mm of diameter, reniform, positioned anterolaterally, opening directed dorsolaterally, and projections on marginal rim. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than external wall. Vent tube long, dextral, and fused to ventral fin. Tail with 22.9 ± 2.8 mm length, and 1.4 times the length of the body. Dorsal fin height: 2.9 ± 0.35 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.95 ± 0.06 mm, and slightly convex margin.

Oral disc: Oral disc directed anteroventrally. Marginal papillae have one row in the upper lip, dorsal gap, two rows in the lower lip, and one row in the laterals of oral disc. Submarginal papillae are absent. Jaw sheath thick, upper one arc-shaped, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with large dark spots. Dorsal and ventral fins are transparent with large dark spots.

Comments: There is no description of *C. caramaschii* tadpoles in the literature.

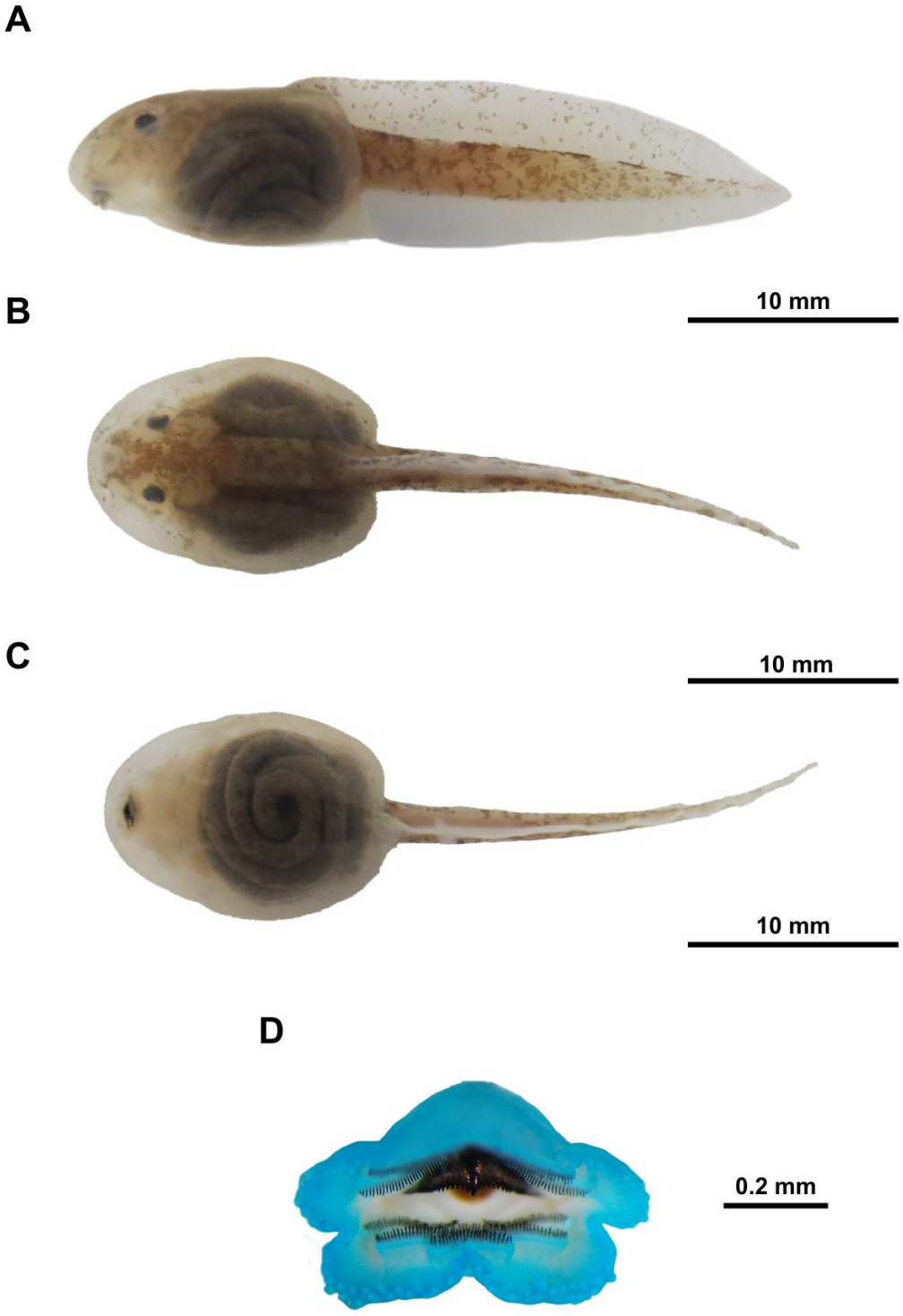

Figure 17. *Crossodactylus caramaschii.*

Cycloramphus Tschudi, 1838

***Cycloramphus boraceiensis* Heyer, 1983 (Fig. 18a-d)**

Characterization

We collected four individuals of *C. boraceiensis* at PESM núcleo São Sebastião. We analysed four individuals in the stages 33 to 35 for morphological characterization (Appendix Table S1).

Body: Total length: 28.1 ± 6.8 mm. Body length: 6.9 ± 1.6 mm. Body elongated in dorsal view, and elongated/depressed in lateral view. Snout rounded in dorsal view, and sloped in lateral view. Eyes with 1.0 ± 0.2 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.2 ± 0.05 mm of diameter, ovoid, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, ventral, and opening at the posterior middle third of the body. Vent tube large and medial. Tail length: 21.0 ± 2.8 mm, and 3.0 times the length of the body. Dorsal and ventral fins parallel to the tail muscle's longitudinal axis, and emerging from the posterior third of the tail.

Oral disc: Oral disc ventral. Marginal papillae have one row, small, rounded, and absent in the upper lip. Submarginal papillae are absent. Jaw sheaths are narrow, serrated, upper and lower with a V-shape. Tooth row formula 2/3(1), A1-2 of the same length, P2 longer than P1, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and white ventrally. Spiracle is transparent. Tail is brown with dark dots, and large dark spots.

Comments: The tadpoles described by Heyer (1983) differ from those studied herein by: i) spiracle not visible, and ii) tooth row formula 2/3.

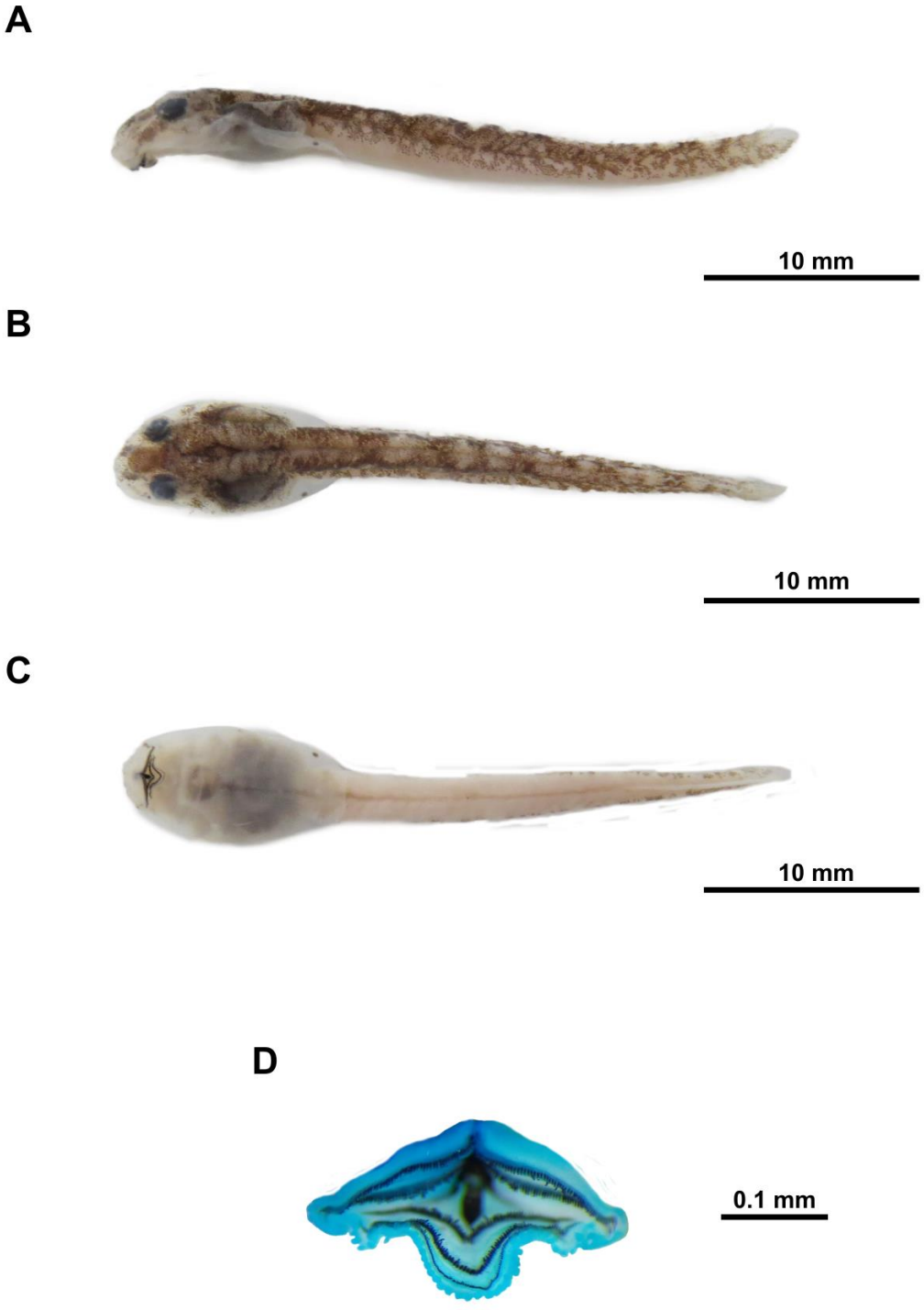

Figure 18. *Cycloramphus boraceiensis.*

***Cycloramphus eleutherodactylus* (Miranda-Ribeiro, 1920; Fig. 19a-d)**

Characterization

We collected two individuals of *C. eleutherodactylus* at PETAR. We analysed one individual in stage 36 for morphological characterization (Appendix Table S1).

Body: Total length: 27.9 mm. Body length: 7.15 mm. Body elongated in dorsal view, narrower behind the eyes, and elongated/compressed in lateral view. Snout rounded in the dorsal and in the lateral view. Eyes with 1.0 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.2 mm of diameter, ovoid, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, ventral, and opening at the posterior middle third of the body. Vent tube large and medial. Tail length: 20.7 mm, and 3.0 times the length of the body. Dorsal and ventral fins parallel to the tail muscle's longitudinal axis, and emerging from the posterior third of the tail.

Oral disc: Oral disc ventral. Marginal papillae have one row, large, rounded, and absent in the upper lip. Submarginal papillae are absent. Jaws sheaths are narrow, finely serrated, with upper and lower ones V-shape. Tooth row formula 2/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and grayish ventrally. Spiracle is transparent. Tail is dark brown with dark dots, and large dark spots.

Comments: There is no description of *C. eleutherodactylus* tadpoles in the literature.

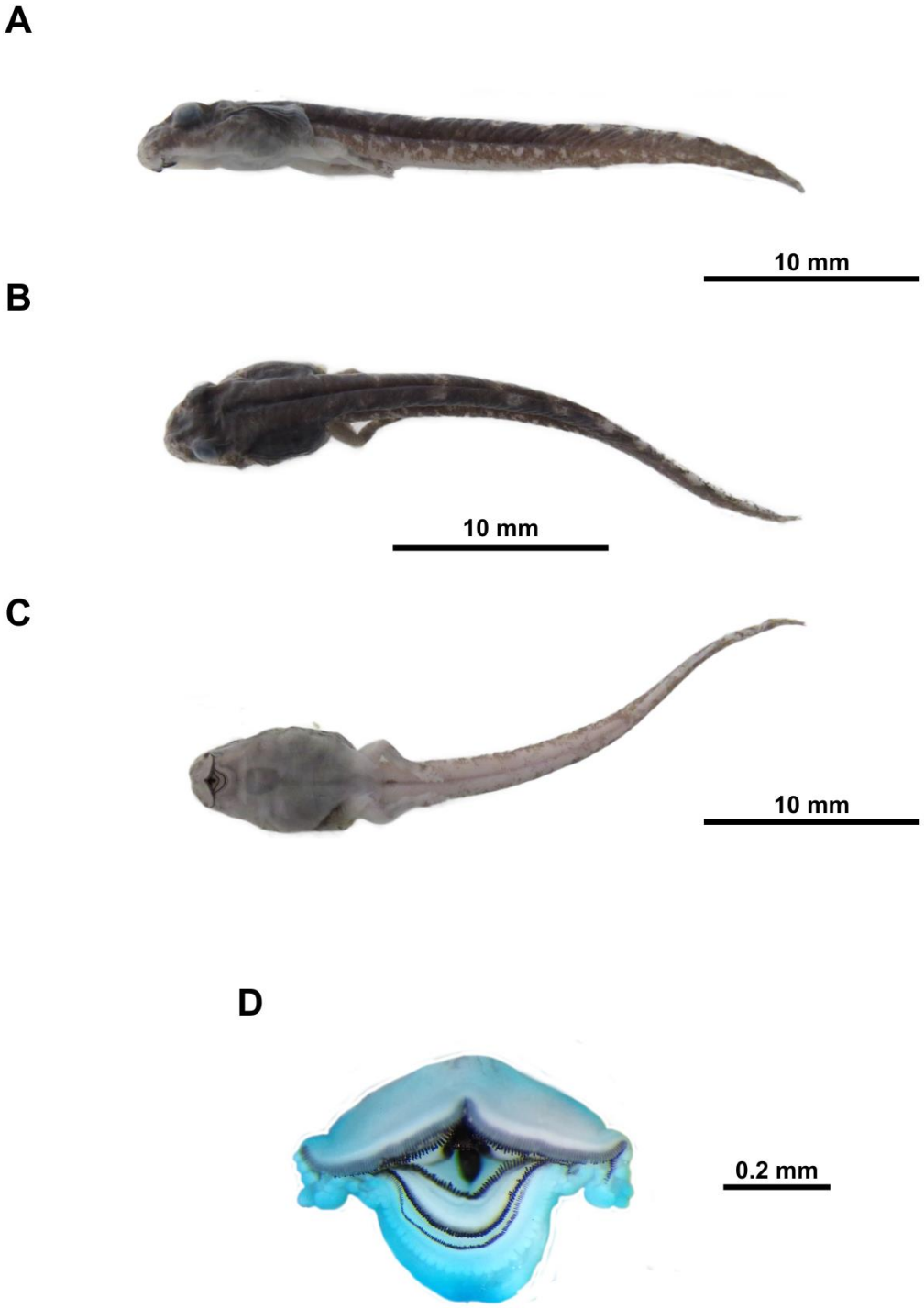

Figure 19. *Cycloramphus eleutherodactylus.*

Dendropsophus Fitzinger, 1843

***Dendropsophus berthalutzae* (Bokermann, 1962; Fig. 20a-d)**

Characterization

We collected five individuals of *D. berthalutzae* at PESM São Sebastião. We analysed two individuals in the stage 33 and 35 for morphological characterization (Appendix Table S1).

Body: Total length: 18.4 and 11.8 mm. Body length: 6.84 and 5.48 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout sloped in dorsal and lateral views. Eyes with 0.8 and 0.7 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.1 mm of diameter, ovoid, positioned frontally, and opening directed dorsolaterally. Spiracle sinistral, short, positioned lateroventral, opening at the posterior middle third of the body, and centripetal wall fused to body wall and longer than external wall. Vent tube short, and dextral. Tail length: 11.67 and 6.37 mm, and 1.7 times the length of the body. Dorsal fin height: 1.49 and 0.4 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.0 and 0.25 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have one row, and a large dorsal gap. Submarginal papillae are absent. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 0/0.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with large dark brown spots. Fins are transparent with large dark brown spots concentrated at the posterior third of the tail.

Comments: The tadpoles described by Bokermann (1963) differ from those studied herein by: i) body elongated in lateral view; ii) snout sloped in dorsal and lateral views; iii) laterally has a dark line from eyes to tip of snout.

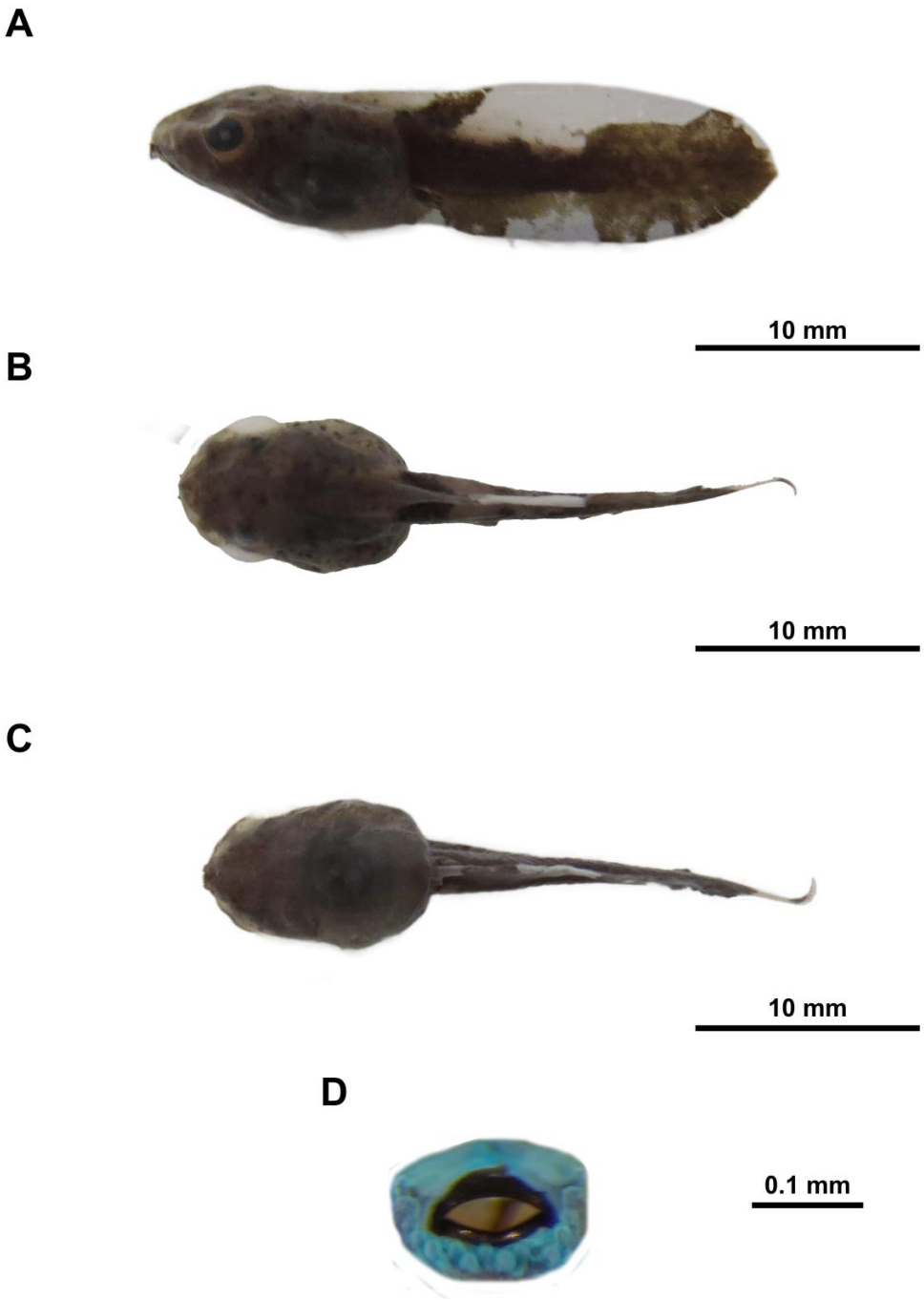

Figure 20. *Dendropsophus berthalutzae.*

***Dendropsophus elegans* (Wied-Neuwied, 1824; Fig. 21a-d)**

Characterization

We collected 43 individuals of *D. elegans* in four protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará and PETAR. We analysed eight individuals in the stage 34 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 30.6 ± 3.05 mm. Body length: 10.4 ± 1.0 mm. Body elongated in dorsal view, and triangular/globular in lateral view. Snout sloped in dorsal and lateral views. Eyes with 1.25 ± 0.15 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.125 ± 0.015 mm of diameter, rounded, positioned frontally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than external wall. Vent tube short and dextral. Tail length: 20.25 ± 2.45 mm, and 1.95 times the length of the body. Dorsal height: 2.2 ± 0.2 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.6 ± 0.25 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have one row in the laterals, two rows in the lower lip, and dorsal gap. Submarginal papillae are absent. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 0/0 and 0/1.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown and covered with dark dots. Some individuals had white bodies and tails . Fins are transparent with large dark spots, and dark speckles.

Comments: The tadpoles described by Gomes & Peixoto (1991) differ from those studied herein by: i) tooth row formula described only as 0/0; ii) snout sloped in dorsal and lateral views; iii) fins are yellowish-brown to grayish.

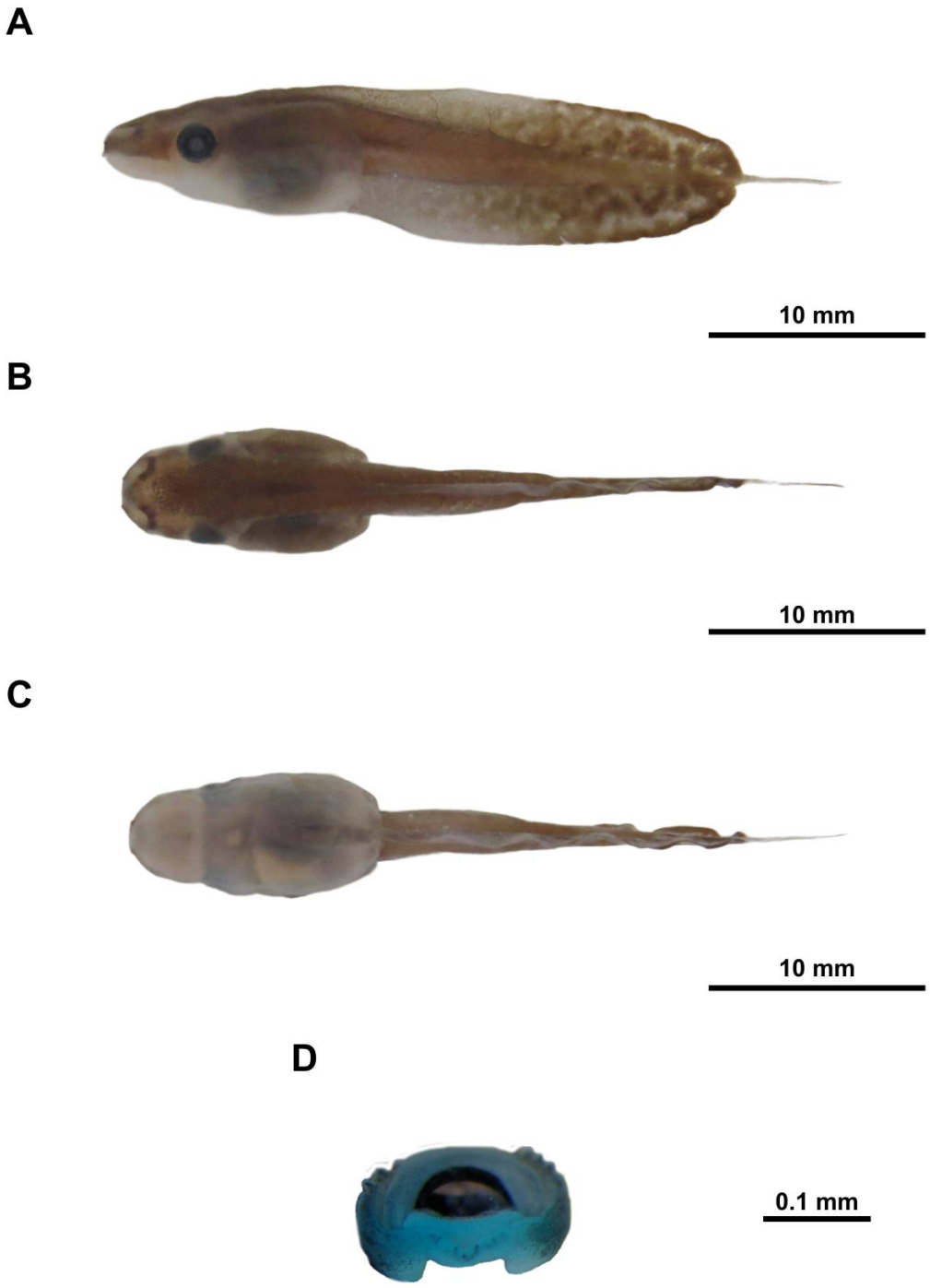

Figure 21. *Dendropsophus elegans.*

***Dendropsophus elianeae* (Napoli & Caramaschi, 2000; Fig. 22a-d)**

Characterization

We collected 12 individuals of *D. elianeae* in two protected areas: E.E. Assis and E.E. Caetetus. We analysed six individuals in the stages 34 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 31.4 ± 1.0 mm. Body length: 8.65 ± 0.01 mm. Body ovoid/elongated in dorsal view, and triangular/compressed in lateral view. Snout tapered in dorsal view, and sloped in lateral view. Eyes with 1.0 ± 0.03 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.08 ± 0.07 mm of diameter, ovoid, positioned anterolaterally, and opening directed anteriorly. Spiracle sinistral, short, lateral, opening at the posterior middle third of the body, centripetal wall fused to body wall, and of the same length as external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 22.7 ± 0.35 mm, and 2.6 times the length of the body. Dorsal fin height: 2.3 ± 0.09 mm, convex margin, and rises on the border between body and tail at a high slope. Ventral fin height: 1.75 ± 0.01 mm, and convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 0/0.

Coloration in formalin: Body has grayish-brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is grayish-brown with dark dots. Fins are transparent with dark blotches, with a cream longitudinal stripe extending from the tip of the snout to the spiracle.

Comments: There is no description of *D. elianeae* tadpoles in the literature.

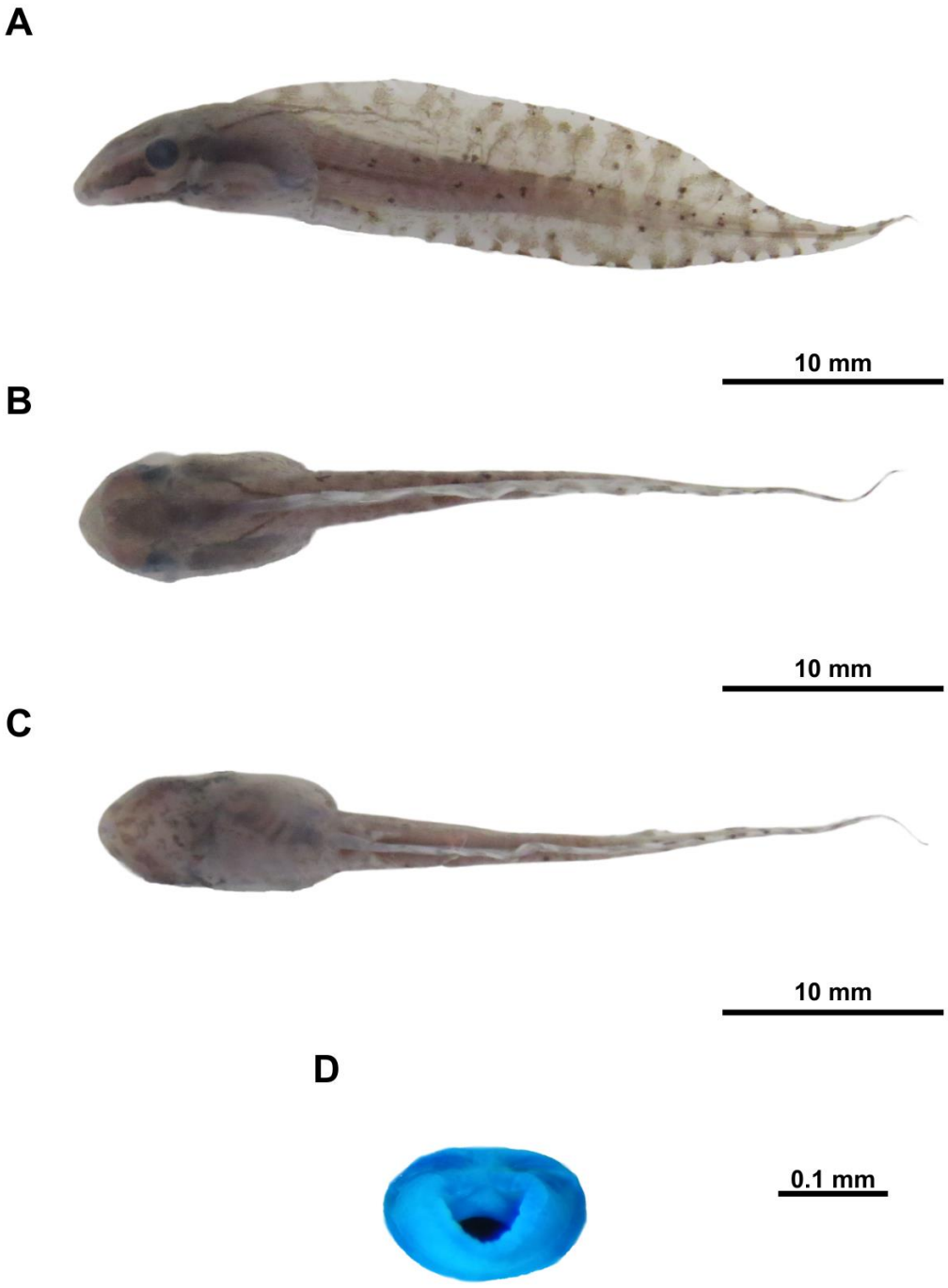

Figure 22. *Dendropsophus elianeae*.

***Dendropsophus giesleri* (Mertens, 1950; Fig. 23a-d)**

Characterization

We collected 87 individuals of *D. giesleri* at P.E. Carlos Botelho. We analysed twenty four individuals in the stages 34 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 26.5 ± 0.95 mm. Body length: 10.4 ± 0.5 mm. Body elliptical in dorsal view, and ovoid in lateral view. Snout sloped in dorsal and lateral views. Eyes with 1.4 ± 0.03 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.145 ± 0.03 mm of diameter, rounded, closer to snout than eyes, positioned frontally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, and centripetal wall fused to body wall and of the same length as external wall. Vent tube short, dextral, and opening direct posteriorly. Tail length: 16.1 ± 0.75 mm, and 1.55 times the length of the body. Dorsal fin height: 2.55 ± 0.1 mm, convex margin, and rises on the border between body and tail at a slow slope. Ventral fin height: 2.35 ± 0.25 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have one row extending ventrally and laterally, with a wide dorsal gap. Submarginal papillae are absent. Jaw sheaths thick, finely serrated, and upper and lower with arc-shape. Tooth row formula 0/1, two ridges between papillae and lower jaw sheath, first ridge with or without row of denticles.

Coloration in formalin: Body has light brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is light brown and covered with dark dots. Some individuals had white bodies and tails. Fins are transparent with dark speckles, with few large dark spots at the edges of both fins. Body in the dorsal view has a pair of cream longitudinal stripes extending from the tip of the snout to the tail base.

Comments: The tadpoles described by Santos et al. (1998) differ from those studied herein by: i) nostrils directed anteriorly; ii) oral disc anteroventral; and iii) marginal papillae has one row extending ventrally and laterally; iv) snout sloped in dorsal and lateral views.

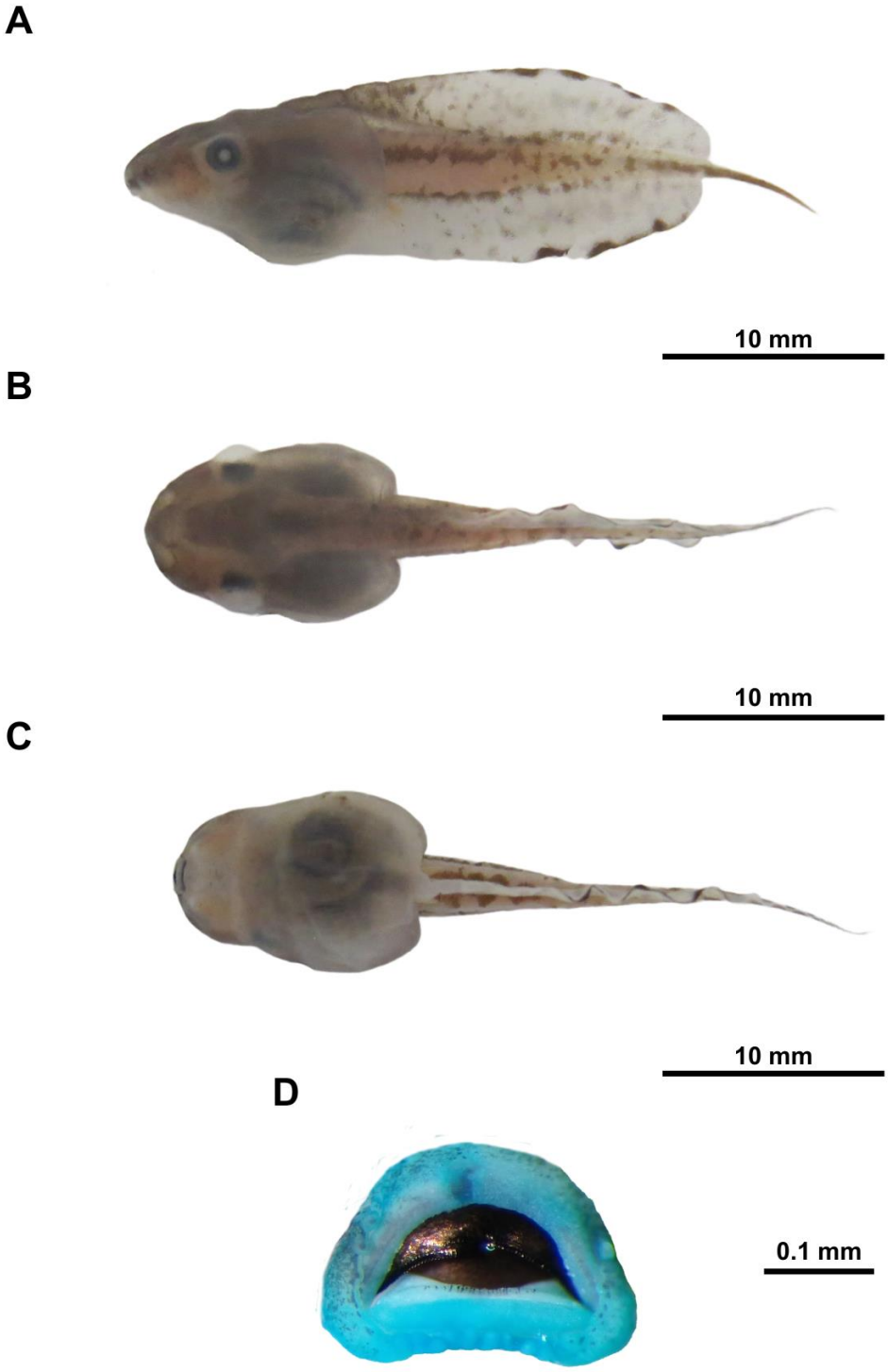

Figure 23. *Dendropsophus giesleri.*

***Dendropsophus jimi* (Napoli & Caramaschi, 1999; Fig. 24a-d)**

Characterization

We collected five individuals of *D. jimi* at E.E. Santa Bárbara. We analysed two individuals in the stages 35 and 36 for morphological characterization (Appendix Table S1).

Body: Total length: 29.95 and 31.33 mm. Body length: 7.2 and 7.3 mm. Body ovoid/elongated in dorsal view, and triangular in lateral view. Snout pointed in the dorsal view, and sloped in the lateral view. Eyes with 0.75 and 0.88 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.09 and 0.12 mm of diameter, ovoid, positioned anterolaterally, and opening directed anteriorly. Spiracle sinistral, short, dorsolateral, opening at the posterior middle third of the body, and centripetal wall fused to body wall and of the same length as external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 22.67 and 24.02 mm, and 1.3 times the length of the body. Dorsal fin height: 2.15 and 2.16 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.2 and 1.18 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shaped. Tooth row formula 0/0.

Coloration in formalin: Body has yellowish-brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is yellowish-brown and covered with dark dots. Fins are transparent with dark speckles.

Comments: There is no description of *D. jimi* tadpoles in the literature.

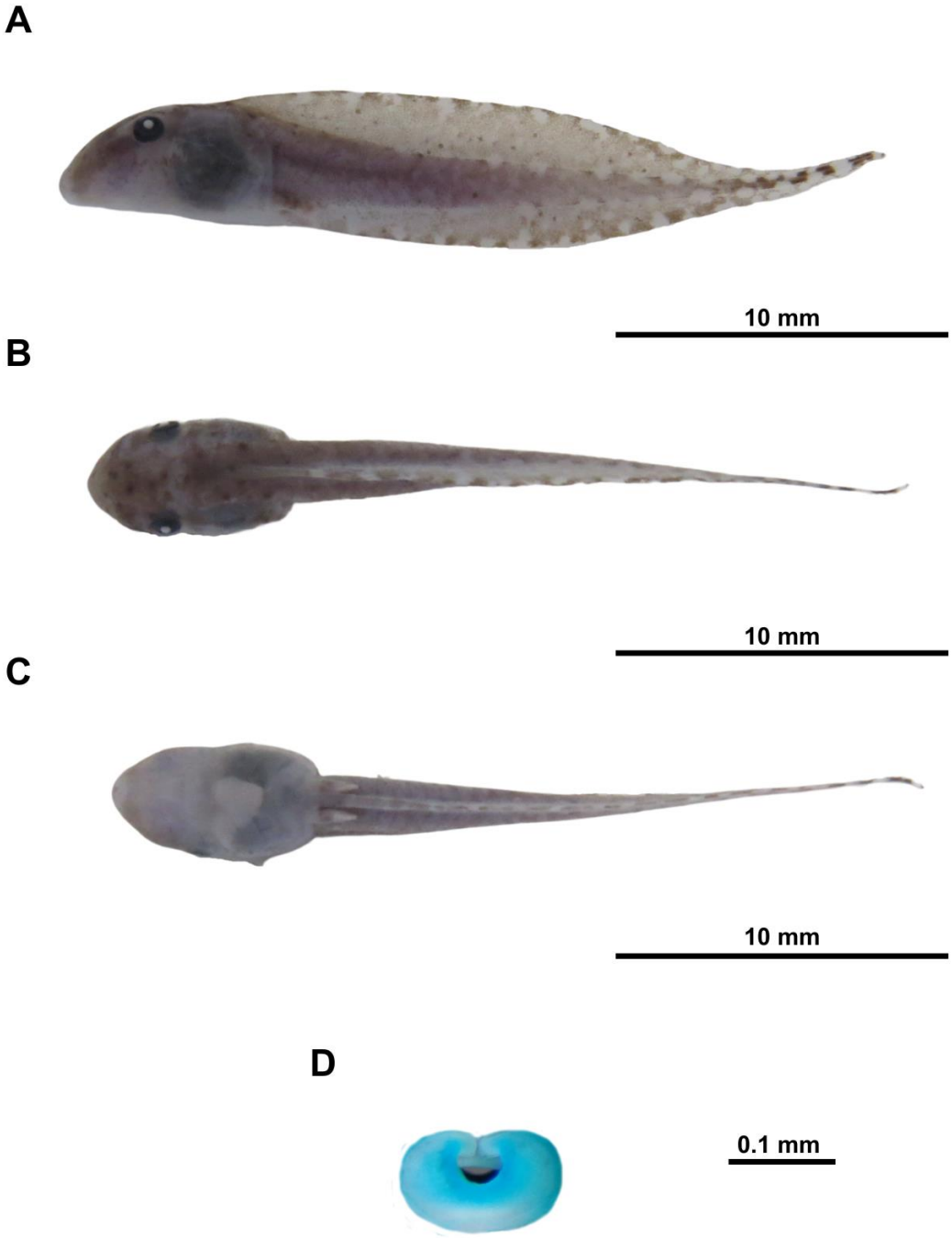

Figure 24. *Dendropsophus jimi*.

***Dendropsophus microps* (Peters, 1872; Fig. 25a-d)**

Characterization

We collected 95 individuals of *D. microps* in four protected areas: E.E. Juréia-Itatins, P.E. Jurupará, PESM núcleo Santa Virgínia and PETAR. We analysed nineteen individuals in the stages 33 and 38 for morphological characterization (Appendix Table S1).

Body: Total length: 26.0 ± 3.1 mm. Body length: 9.35 ± 0.9 mm. Body ovoid in dorsal view, and ovoid/triangular in lateral view. Snout sloped in dorsal and lateral views. Eyes with 1.0 ± 0.15 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.125 ± 0.025 mm of diameter, rounded, frontally positioned, and opening directed dorsolaterally. Spiracle sinistral, short, lateral, opening at the posterior middle third of the body, centripetal wall fused to body wall, and of the same length as external wall. Vent tube short and dextral. Tail length: 16.5 ± 2.45 mm, 1.75 times the length of the body, and ending in a flagellum. Dorsal fin height: 2.25 ± 0.4 mm, convex margin, and rises on the middle portion of body length at a low slope. Ventral fin height: 2.45 ± 0.4 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have one row extending ventrally and laterally, and a dorsal gap. Submarginal papillae are absent. Jaw sheaths thick, finely serrated, with upper and lower jaws arc-shape. Tooth row formula 0/1, and two ridges between papillae and lower jaw sheath, first ridge with or without row of denticles.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown and covered with dark dots. Fins are transparent with brown speckles, two parallel light stripes extending from the tip of the snout to the middle third of the tail, and a longitudinal stripe in the lateral extending from the tip of the snout to end of the tail.

Comments: The tadpoles described by Bokermann (1963) differ from those studied herein by: i) body elliptical in dorsal view; ii) marginal papillae have two rows in the lower lip; and iii) whitish ventrally. The tadpoles described by Heyer et al. (1990) differ from those studied herein by: i) eyes situated dorsolaterally; ii) oral disc anteroventral; iii) tooth row formula 0/0; and iv) fins are creamy with brownish marbling. The tadpoles described by Santos et al. (1998) differ from those studied herein by body elliptical in dorsal view.

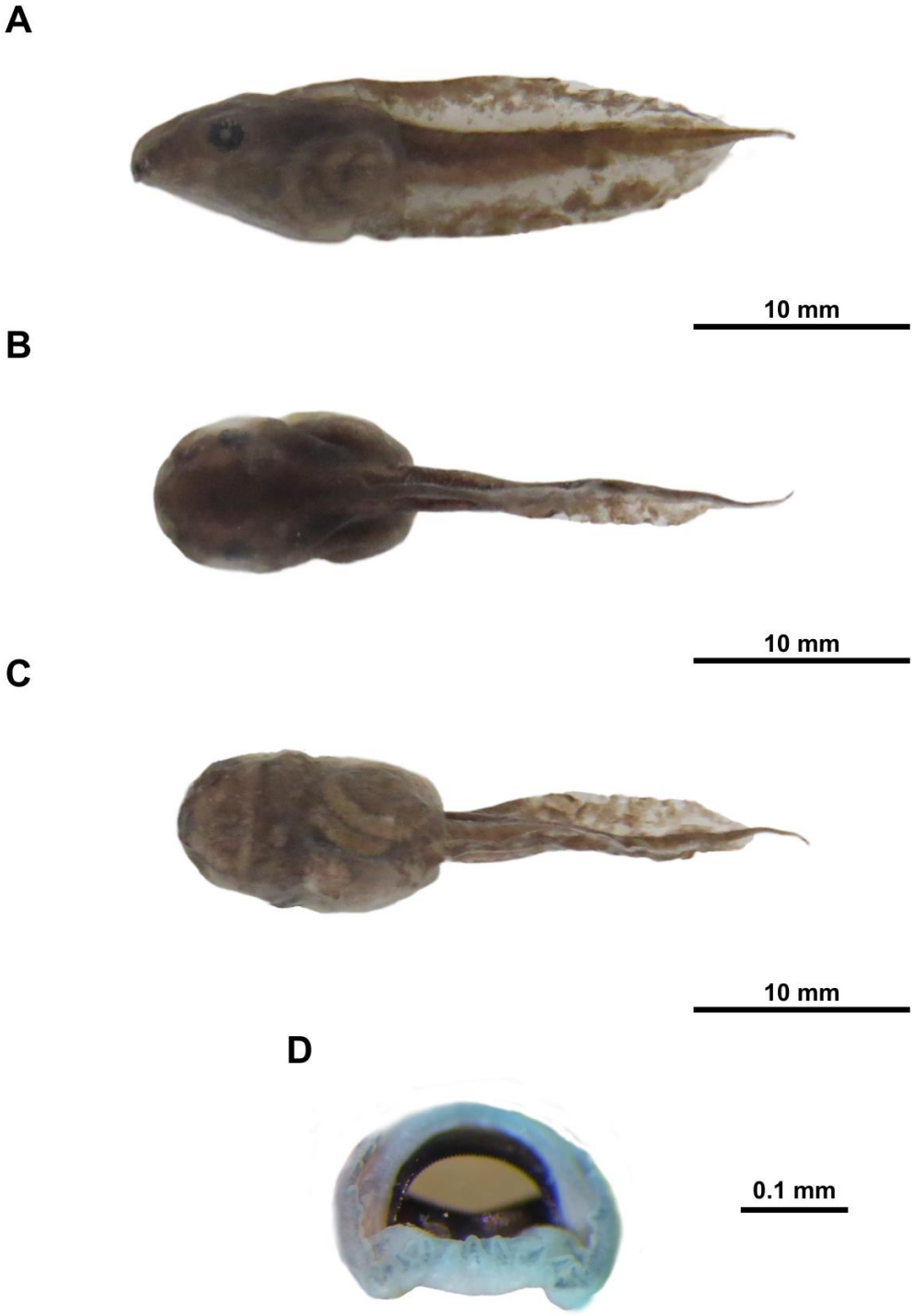

Figure 25. *Dendropsophus microps.*

***Dendropsophus minutus* (Peters, 1872; Fig. 26a-d)**

Characterization

We collected 841 individuals of *D. minutus* in 12 Protected Areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Juréia-Itatins, E.E. Santa Bárbara, FEENA, P.E. Carlos Botelho, P.E. Jurupará, P.E. Vassununga, PETAR and PESM núcleos Curucutu and Santa Virgínia. We analysed seventy-five individuals in the stages 33 and 38 for morphological characterization (Appendix Table S1).

Body: Total length: 34.25 ± 4.45 mm. Body length: 11.15 ± 1.15 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 1.4 ± 0.15 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.2 ± 0.1 mm of diameter, rounded, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, lateral, opening at the posterior middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to the ventral fin. Tail length: 23.15 ± 3.25 mm, 2.1 times the length of the body, and ending in a flagellum. Dorsal fin height: 3.4 ± 0.65 mm, convex margin, and rises on the middle portion of the body at a high slope. Ventral fin height: 4.45 ± 1.0 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have two rows broadly interrupted on the upper lip. Submarginal papillae are absent. Jaw sheaths thick, finely serrated, upper and lower jaws have arc-shape, upper jaw narrower than the lower one. Tooth row formula varies 0/0, 0/1 or 1/1.

Coloration in formalin: Body has gray covered with brown dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is gray and covered with brown dots. Fins are transparent with dark speckles, and a few large dark spots. Fins have a longitudinal brown medial stripe in the first third of the tail. In the lateral view there is a longitudinal brown stripe extending from the tip of the snout to the middle of the body.

Comments: The tadpoles described by Bokermann (1963) differ from those studied herein by: i) body elliptical in dorsal view; and ii) nostrils positioned laterally. The tadpoles described by Vizotto (1967) differ from those studied herein by: i) body rhombus in lateral view; ii) nostrils elliptical; and iii) tooth row formula 1/2. The tadpoles described by Kenny

(1969) differ from those studied herein by: i) marginal papillae have single row and ii) coloration yellowish silver ventrally. The tadpoles described by Heyer et al. (1990) differ from those studied herein by: i) nostrils elliptical situated laterally; ii) eye situated dorsolaterally; iii) oral disc anteroventral; iv) tooth row formula 1/2; and v) coloration silvery-white ventrally. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) nostrils positioned laterally; ii) oral disc anteroventral; iii) marginal papillae have one row ventrally and two rows laterally; iv) tooth row formula varies from 0/0, 0/1 and 1/2 with the last being more common; and v) lower jaw sheath U-shaped.

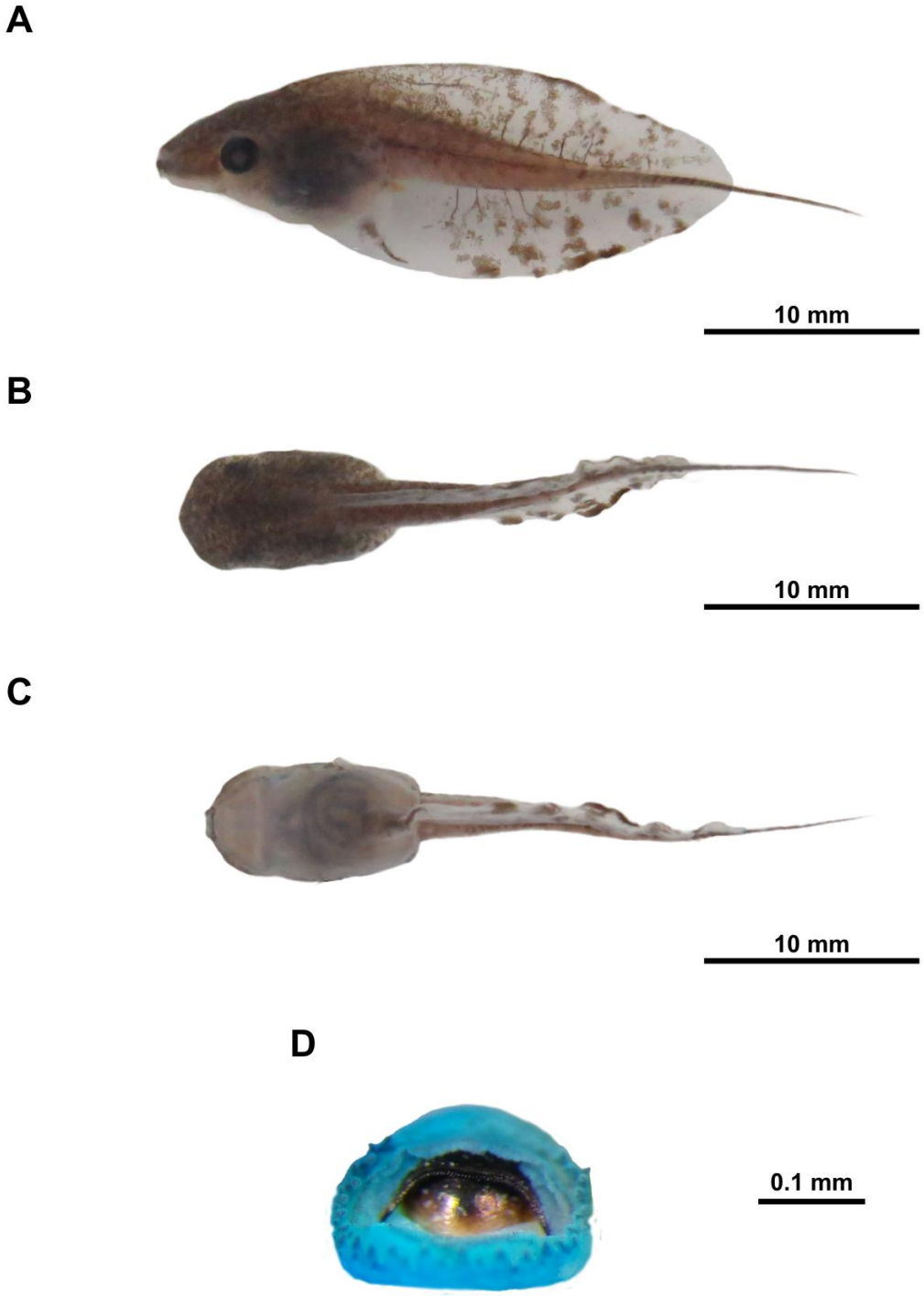

Figure 26. *Dendropsophus minutus.*

***Dendropsophus nanus* (Boulenger, 1889; Fig. 27a-d)**

Characterization

We collected 44 individuals of *D. nanus* in four Protected Areas: E.E. Assis, E.E. Caetetus, E.E. Santa Bárbara and FEENA. We analysed twenty-two individuals in the stages 33 and 38 for morphological characterization (Appendix Table S1).

Body: Total length: 27.2 ± 4.1 mm. Body length: 7.5 ± 0.95 mm. Body ovoid/compressed in dorsal view and ovoid/elongated in lateral views. Snout rounded/pointed in dorsal view, and sloped in lateral view. Eyes with 0.9 ± 0.085 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.1 ± 0.02 mm of diameter, ovoid, positioned laterally, and opening directed anterolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and the same length as the external wall. Vent tube short, dextral, and positioned at the origin of the ventral fin. Tail length: 19.65 ± 3.15 mm, 2.6 times the length of the body, and ending in a flagellum. Dorsal fin height: 2.25 ± 0.4 mm, slightly convex margin, and rises on the border between body and tail at a high slope. Ventral fin height: 1.35 ± 0.3 mm, and convex margin.

Oral disc: Oral disc terminal, modified to a protractile tube. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheaths are narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 0/0.

Coloration in formalin: Body has gray covered with brown dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is gray and covered with brown dots. Fins are transparent with brown blotches, showing a longitudinal brown narrow stripe in the first third of the tail and two longitudinal light stripes, dorsal and parallel, extending from the tip of the snout to the middle third of the tail.

Comments: The tadpoles described by Lavilla (1990) differ from those studied herein by: i) body depressed and violin-shaped in dorsal view; and ii) spiracle lateral. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) body triangular/depressed in lateral view; ii) eyes directed anterolaterally; iii) spiracle long; iv) oral disc anteroventral; and v) coloration reddish-brown. The tadpoles described by Schulze et al (2015) differ from those studied herein by ventral fin not exceeding body height. Lavilla (1990)

stated that the descriptions by Bokermann (1963) and Cei (1980) were actually based on tadpoles of *Dendropsophus sanborni*.

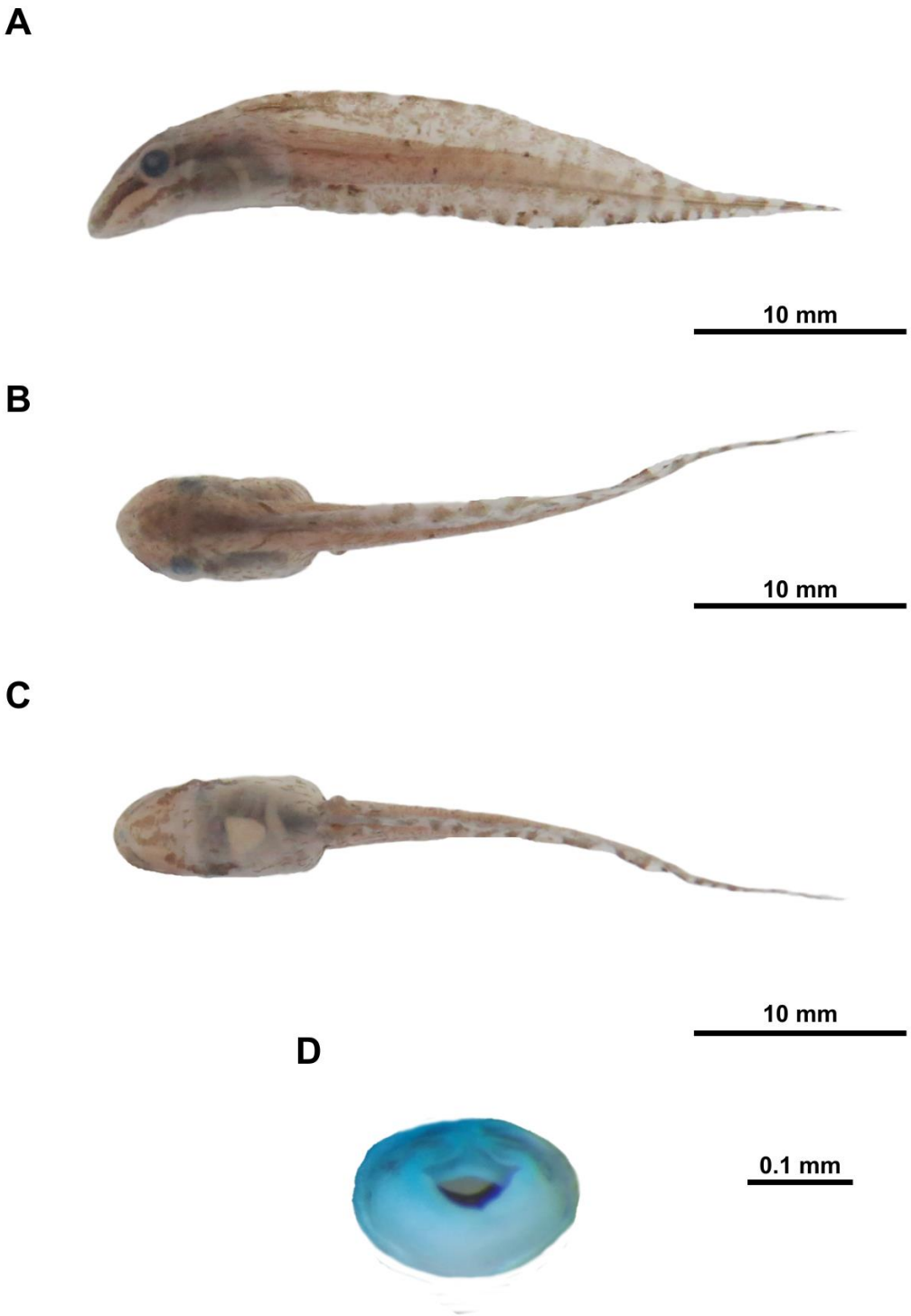

Figure 27. *Dendropsophus nanus.*

***Dendropsophus werneri* (Cochran, 1952; Fig. 28a-d)**

Characterization

We collected nine individuals of *D. werneri* in two protected areas: E.E. Juréia-Itatins and PETAR. We analysed one individual in stage 36 for morphological characterization (Appendix Table S1).

Body: Total length: 30.55 mm. Body length: 8.9 mm. Body ovoid/elongated in dorsal view and ovoid/elongated in lateral views. Snout conical in dorsal view, and sloped in lateral view. Eyes with 0.9 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.1 mm of diameter, ovoid, positioned anterolaterally, and opening directed anteriorly. Spiracle sinistral, short, lateroventral, opening at the posterior middle third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 21.05 mm, 2.35 times the length of the body, and ending in a flagellum. Dorsal fin height: 2.75 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.95 mm, slightly and convex margin.

Oral disc: Oral disc terminal, and modified into a suctorial tube. Marginal papillae have one row in the upper lip and laterals, dorsal gap, and two to three rows in the lower lip. Submarginal papillae are absent. Jaw sheaths are narrow, finely serrated, upper and lower ones arc-shape. Tooth row formula 0/0.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is yellowish-brown with small spots. Fins are transparent with brown blotches, some dark dots, and two longitudinal light stripes, dorsal and parallel, extending from the tip of the snout to the middle third of the tail.

Comments: There is no description of *D. werneri* tadpoles in the literature.

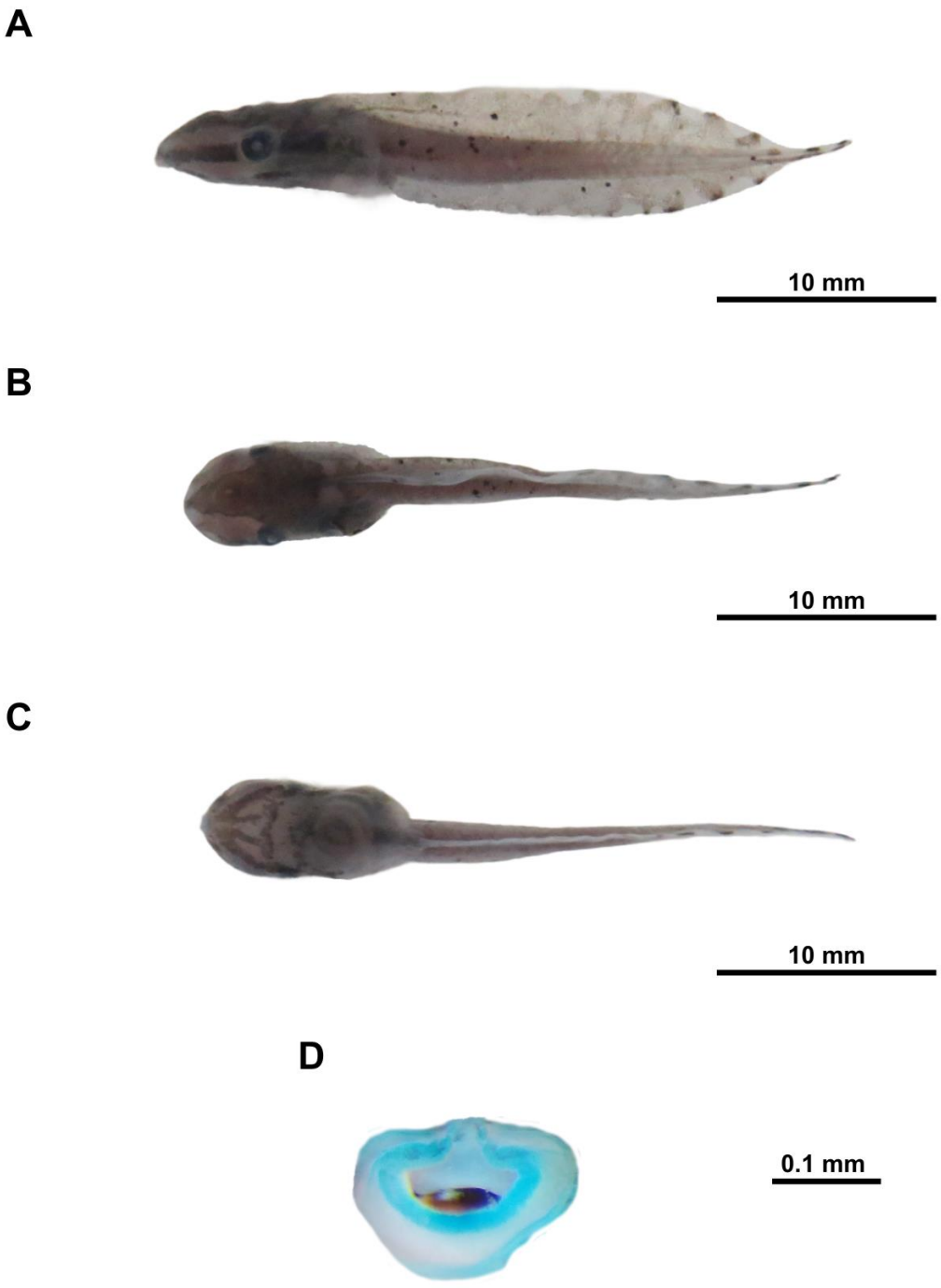

Figure 28. *Dendropsophus werneri.*

Elachistocleis Parker, 1927

***Elachistocleis bicolor* (Guérin-Méneville, 1838; Fig. 29a-d)**

Characterization

We collected four individuals of *E. bicolor* in two protected areas: E.E. Assis and E.E. Santa Bárbara. We analysed three individuals in the stages 33 and 38 for morphological characterization (Appendix Table S1).

Body: Total length: 24.05 ± 3.55 mm. Body length: 9.0 ± 1.7 mm. Body ovoid in the dorsal view, and triangular/depressed in the lateral view. Snout rounded in dorsal view, and truncated in lateral view. Eyes with 0.705 ± 0.145 mm of diameter, positioned laterally, and directed laterally. Nostrils are absent. Spiracle sinistral, long, ventral, opening at the posterior third of the body, centripetal wall fused to vent tube, and shorter than the external wall. Vent tube long, medial, and fused to ventral fin. Tail length: 14.8 ± 0.2 mm, and 1.65 times the length of the body. Dorsal fin height: 1.75 ± 0.15 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.6 ± 0.01 mm, and slightly convex margin.

Oral disc: Oral disc terminal. Paired dermal flap suspended in front of the mouth, dermal flap edges mostly not jagged. Marginal papillae are absent. Submarginal papillae are absent. Jaw sheaths are absent. Tooth row formula 0/0.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and dark brown with a few spots with no pigment ventrally. Spiracle is transparent. Tail is whitish with dark dots covering almost all of its length. Fins are transparent with large dark spots, showing a longitudinal and medial lighter stripe located at the first third of the tail.

Comments: The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by body depressed and rounded in dorsal view.

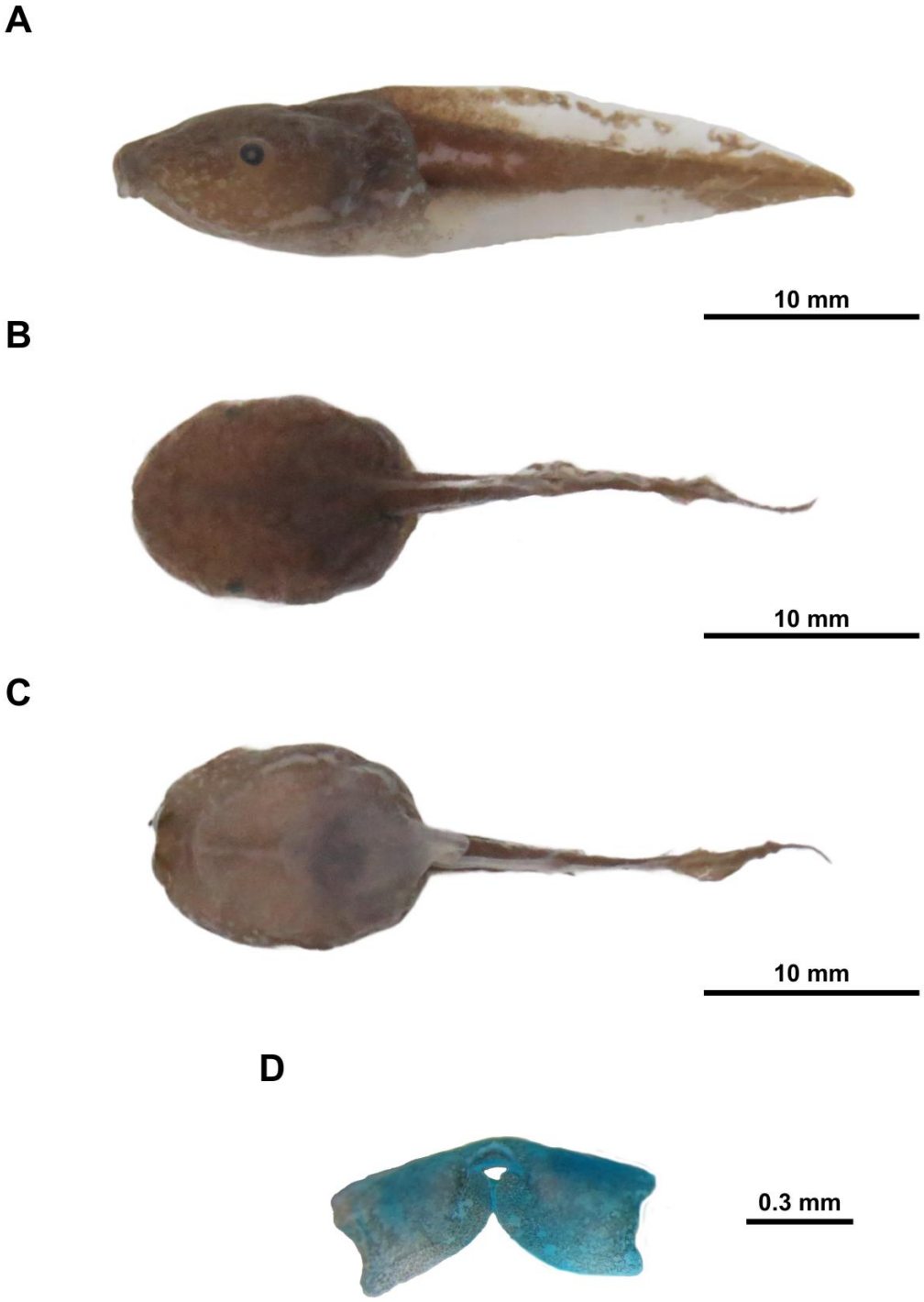

Figure 29. *Elachistocleis bicolor.*

Hylodes Fitzinger, 1826

***Hylodes phyllodes* Heyer & Cocroft, 1986 (Fig. 30a-d)**

Characterization

We collected four individuals of *H. phyllodes* at PESM São Sebastião. We analysed one individual in stage 36 for morphological characterization (Appendix Table S1).

Body: Total length: 30.65 mm. Body length: 9.7 mm. Body ovoid in the dorsal view, narrower behind the eyes, and ovoid/depressed in the lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 0.6 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.15 mm of diameter, rounded, positioned dorsally, opening directed dorsolaterally, and small projection on marginal rim. Spiracle sinistral, short, lateral, opening at the middle third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube short, dextral, and fused to ventral fin. Tail length: 20.8 mm, and 2.15 times the length of the body. Dorsal fin height: 1.3 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.0 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the upper lip and laterals, dorsal gap, and two rows in the lower lip. Submarginal papillae are sparse in the laterals of the oral disc. Upper jaw sheath narrow, serrated, and arc-shape. Lower jaw sheath thick, roughly serrated, and V-shape. Tooth row formula 2(2)/3(1); A1-2 and P1-3 of the same length.

Coloration in formalin: Body has beige covered with dark dots and some small dark spots dorsally, and transparent ventrally. Spiracle is transparent. Tail has beige with dark speckles, and a few large dark spots. Fins are transparent with large dark spots.

Comments: The tadpoles described by Heyer et al (1990) differ from those studied herein by absence of two rows of marginal papillae in the lower lip.

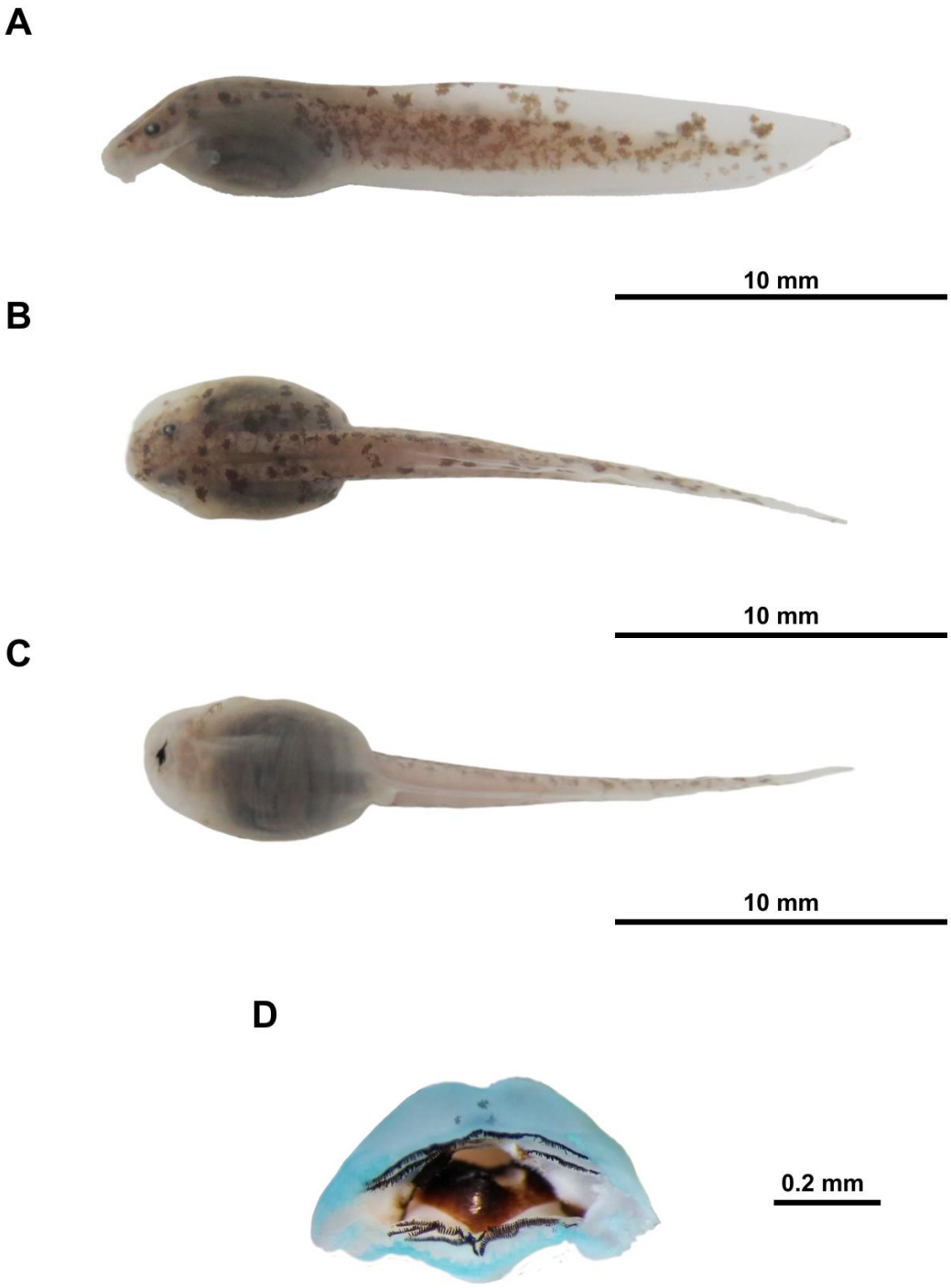

Figure 30. *Hylodes phyllodes.*

***Hylodes sazimai* Haddad & Pombal, 1995 (Fig. 31a-d)**

Characterization

We collected two individuals of *H. sazimai* at PETAR. We analysed one individual in the stage 38 for morphological characterization (Appendix Table S1).

Body: Total length: 43.1 mm. Body length: 15.05 mm. Body elliptical in dorsal view, and ovoid/depressed in lateral view. Snout rounded in the dorsal and in the lateral view. Eyes with 1.1 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.35 mm of diameter, elliptical, positioned anterolaterally, opening directed dorsolaterally, and projection on marginal rim. Spiracle sinistral, short, lateral, opening at the middle third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube short, dextral, and fused to ventral fin. Tail length: 28.3 mm, and 1.9 times the length of the body. Dorsal fin height: 2.6 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.2 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the upper lip and laterals, dorsal gap, and two rows in the lower lip. Submarginal papillae are absent. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1); A1-2 and P1-3 of the same length.

Coloration in formalin: Body has brown dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with large dark spots concentrated in the posterior third of the tail. Fins are transparent with dark speckles.

Comments: The tadpoles described in Haddad & Pombal (1995) differ from those studied herein by: i) nostrils directed laterally; ii) dorsal fin origination on body; iii) the oral disc ventral; iv) marginal papillae have two or three rows of small papillae interrupted on a large area on the anterior labium.

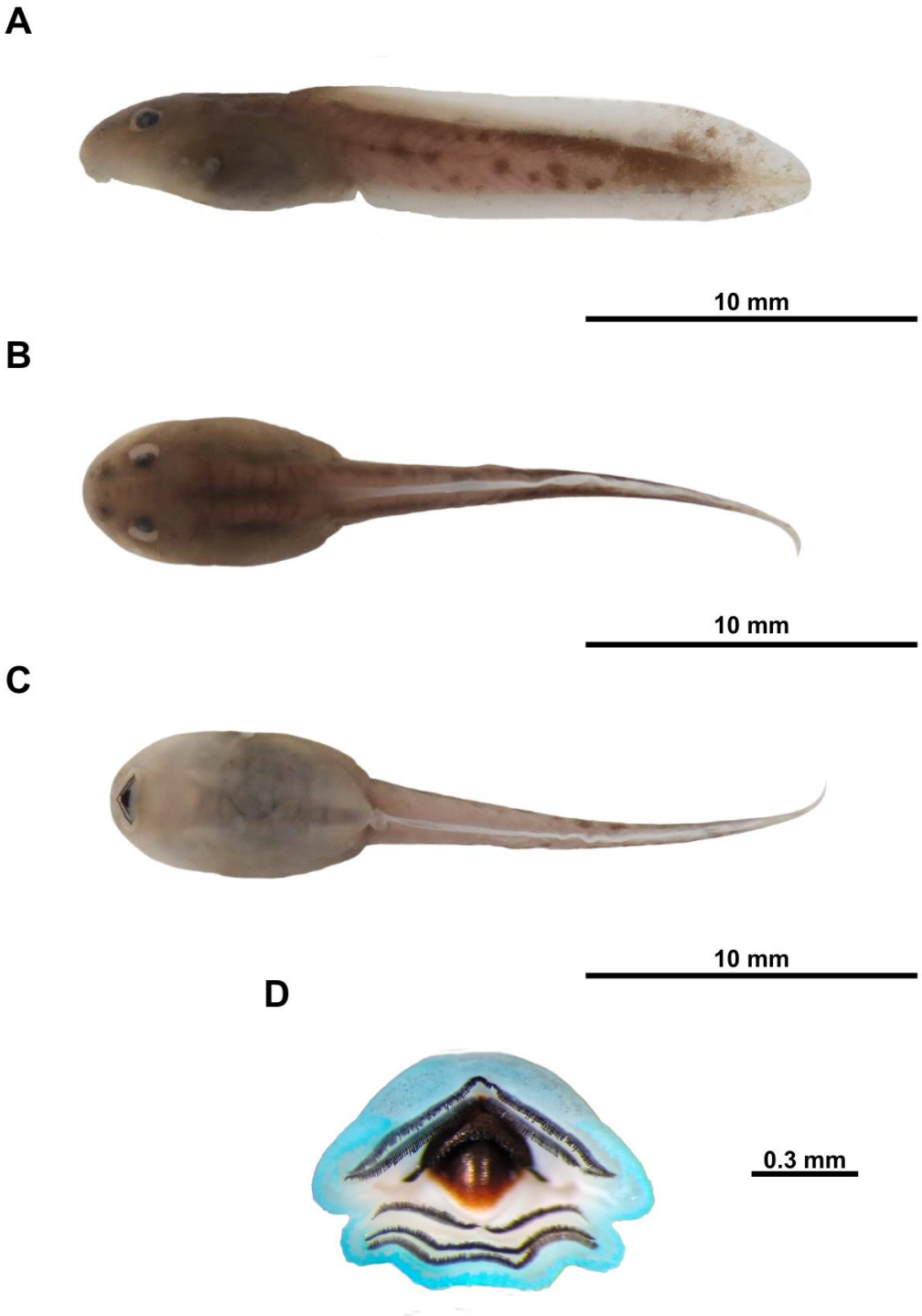

Figure 31. *Hylodes sazimai.*

Leptodactylus Fitzinger, 1826

***Leptodactylus chaquensis* Cei, 1950 (Fig. 32a-d)**

Characterization

We collected 15 individuals of *L. chaquensis* at E.E. Assis. We analysed four individuals in the stage 38 for morphological characterization (Appendix Table S1).

Body: Total length: 43.75 ± 3.6 mm. Body length: 17.55 ± 0.65 mm. Body ovoid/elongated in the dorsal view, and ovoid/compressed in the lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.75 ± 0.08 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.395 ± 0.085 mm of diameter, rounded, and positioned dorsally, opening directed anterodorsally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall not fused to body wall, and of the same length as the external wall. Vent tube long, medial, and fused to ventral fin. Tail length: 24.75 ± 3.95 mm, and 1.4 times the length of the body. Dorsal fin height: 2.75 ± 0.35 mm, slightly convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 2.6 ± 0.45 mm, and convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the upper, moderate dorsal gap, one row in the lower lips, and two rows in the laterals. Submarginal papillae have one row in the lower lip and laterals. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2/3, A1-2 of the same length, and P1-3 slightly of the same length.

Coloration in formalin: Body has brown covered with dark dots dorsally, concentrated in the laterals of the posterior third of the body, and transparent ventrally. Spiracle is transparent. Tail is brown and covered with dark dots. Fins are transparent, covered with dark dots, and show a dark narrow median and longitudinal stripe located at the first third of the tail.

Comments: The tadpoles described by Cei (1980) differ from those studied herein by the spiracle located latero-medially. The tadpoles described by Schulze et al. (2015) differ from those studied herein by: i) snout slightly tapering in lateral view and ii) oral disc terminal, located and directed anteroventrally.

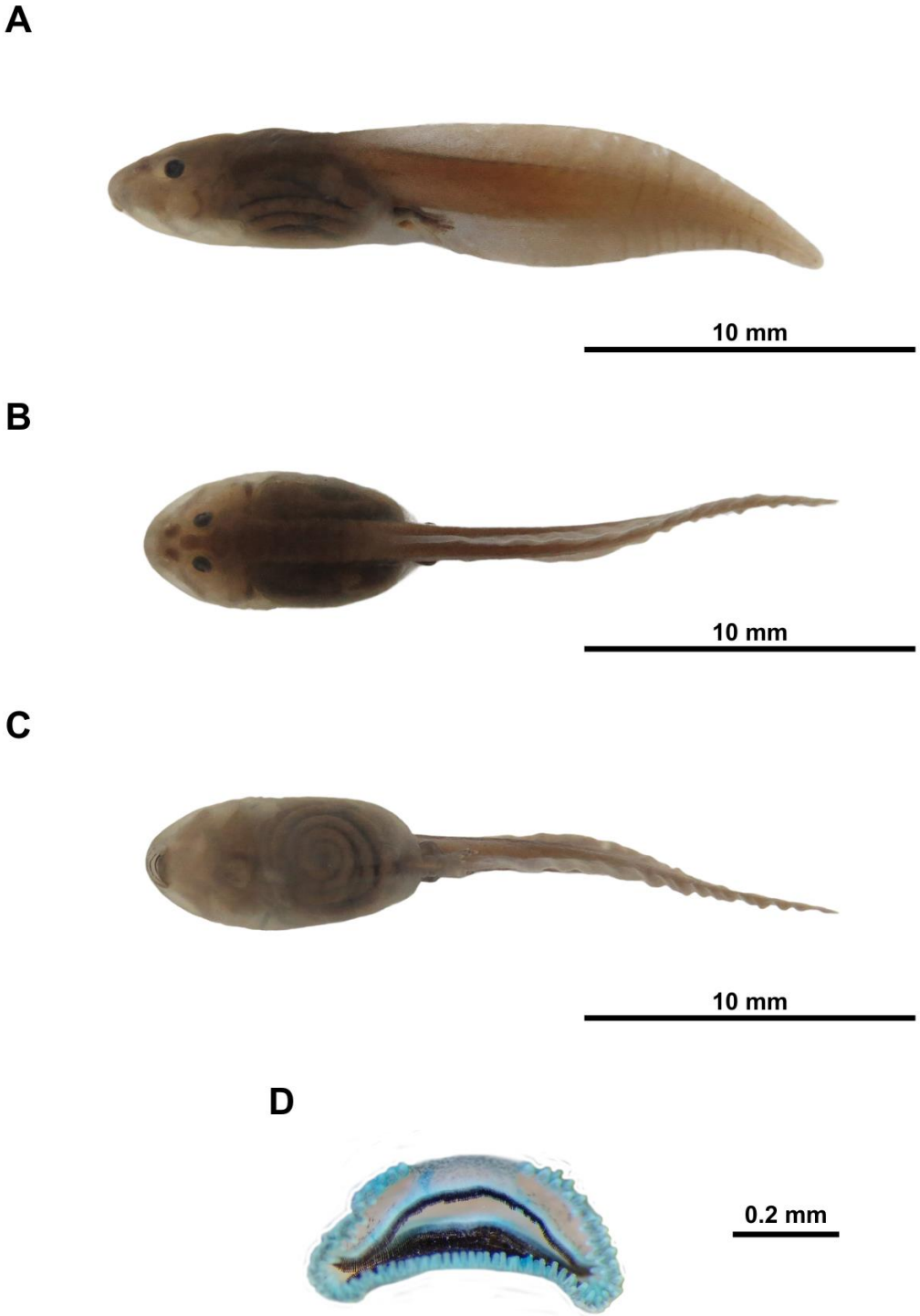

Figure 32. *Leptodactylus chaquensis.*

***Leptodactylus flavopictus* Lutz, 1926 (Fig. 33a-d)**

Characterization

We collected 125 individuals of *L. flavopictus* at P.E. Carlos Botelho. We analysed thirteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 67.2 ± 8.4 mm. Body length: 26.8 ± 4.0 mm. Body ovoid in dorsal view, and triangular/compressed in lateral view. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 2.1 ± 0.7 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.6 ± 0.2 mm of diameter, elliptical, positioned frontally, and opening dorsolaterally directed. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short and dextral. Tail length: 40.2 ± 4.3 mm, and 1.5 times the length of the body. Dorsal fin height: 3.1 ± 0.3 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.75 ± 0.4 mm, and slightly convex margin.

Oral disc: Oral disc almost terminal. Marginal papillae have two to three rows, and a dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2, P3 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and opaque ventrally. Spiracle is transparent. Tail is brown and covered with dark dots. Fins are transparent, and covered with dark dots.

Comments: The tadpoles studied herein do not differ from those described by Bokermann (1957).

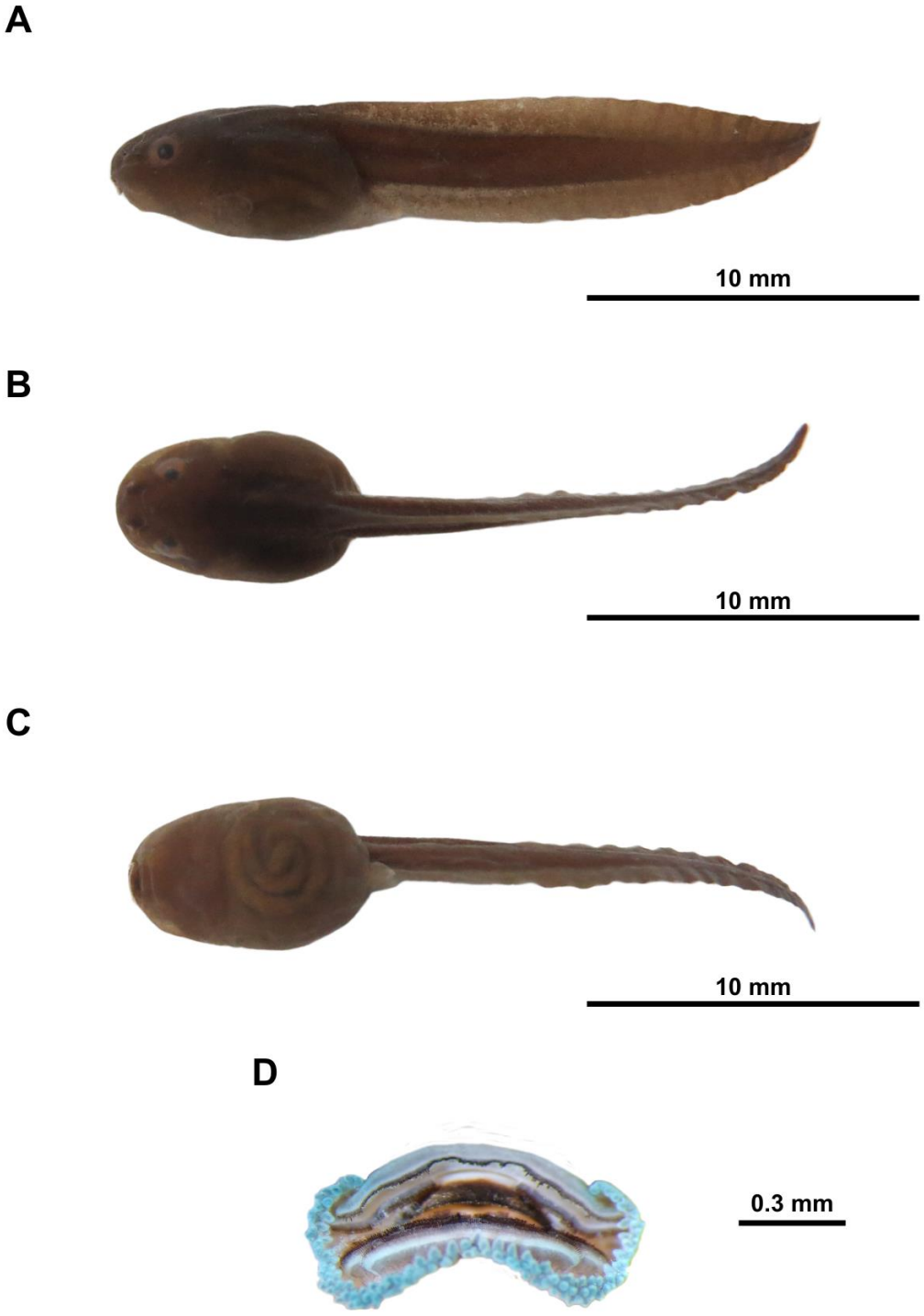

Figure 33. *Leptodactylus flavopictus.*

***Leptodactylus furnarius* Sazima & Bokermann, 1978 (Fig. 34a-d)**

Characterization

We collected four individuals of *L. furnarius* at PESM núcleo Curucutu. We analysed one individual in stages 33 for morphological characterization (Appendix Table S1).

Body: Total length: 30.6 mm. Body length: 10.4 mm. Body ovoid in dorsal view, wider behind the eyes, and ovoid/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.4 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.08 mm of diameter, ovoid, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, medial, and fused to ventral fin. Tail length: 20.1 mm, and 1.9 times the length of the body. Dorsal fin height: 1.65 mm, margin parallel to the longitudinal axis of the tail muscle and, rises on the border between body and tail at a low slope. Ventral fin height: 1.6 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the upper lip, dorsal gap, and two rows in the lower lip and laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shaped, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-3 of the same length, and P2 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and opaque ventrally. Spiracle is transparent. Tail is brown and covered with dark dots. Fins are transparent with large dark spots, and show a dark narrow median and longitudinal stripe located at the first third of the tail.

Comments: The tadpoles described in Sazima & Bokermann (1978) differ from those studied herein by: i) body elliptical in lateral view; and ii) tooth row formula 2(1)/3(1). The tadpoles described in Heyer & Heyer (2004) differ from those studied herein by the dorsum and sides of the body blackish-gray.

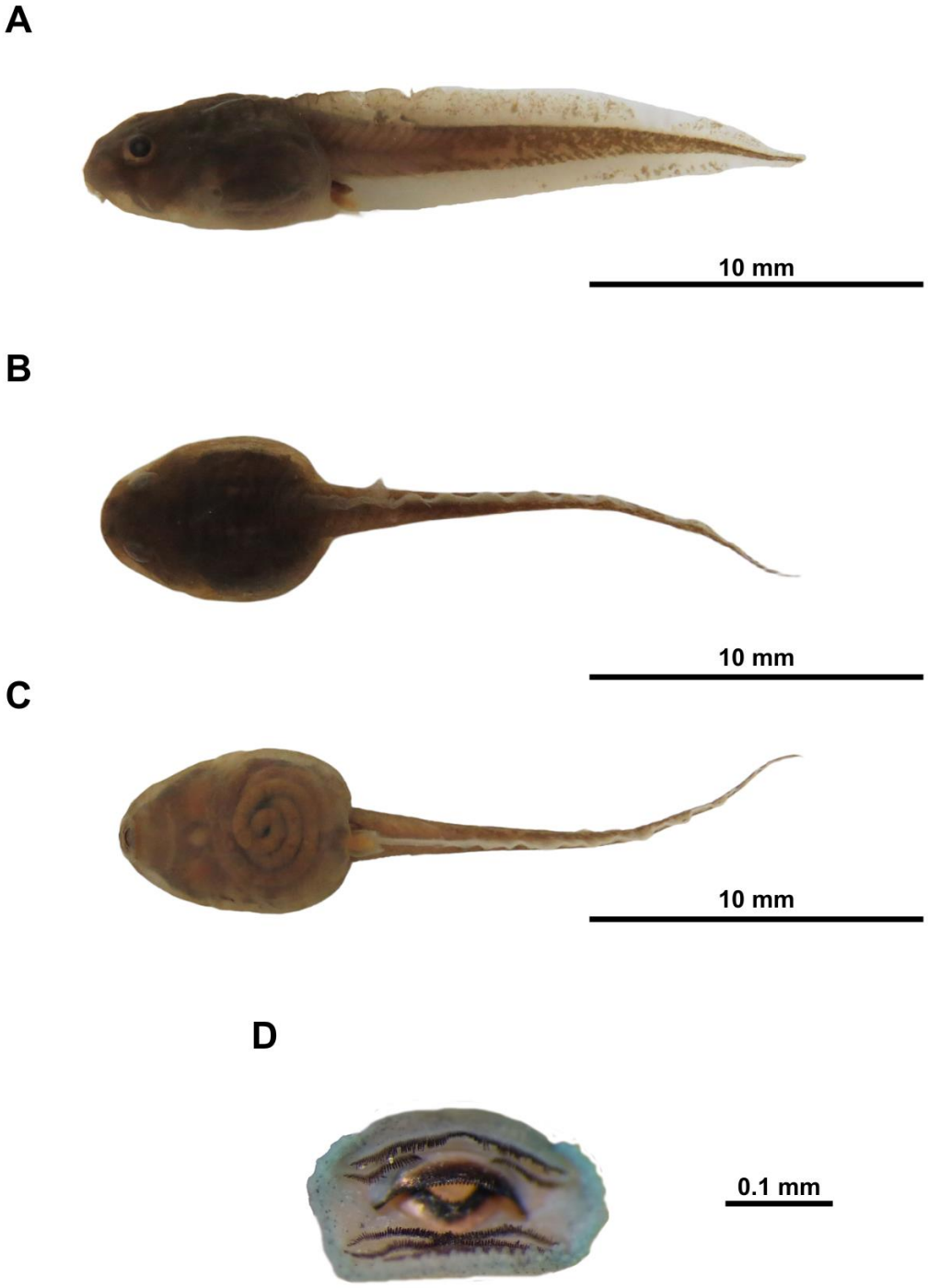

Figure 34. *Leptodactylus furnarius.*

***Leptodactylus fuscus* (Schneider, 1799; Fig. 356a-d)**

Characterization

We collected 248 individuals of *L. fuscus* in six protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Jataí, E.E. Santa Bárbara and P.E. Vassununga. We analysed seventeen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 31.9 ± 3.75 mm. Body length: 11.7 ± 0.65 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 0.95 ± 0.2 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 2.05 ± 0.05 mm of diameter, ovoid, positioned anterodorsally, and opening directed laterally. Spiracle sinistral, short, directed posterodorsally, opening at the middle third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube long, medial, and fused to ventral fin. Tail length: 20.05 ± 3.5 mm, and 1.7 times the length of the body. Dorsal fin height: 1.6 ± 0.15 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.3 ± 0.05 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the upper lip, dorsal gap, and two rows in the lower lip and laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, lower one V-shape, and upper and lower jaw of the same width. Tooth row formula 2(2)/3(1), A1 shorter than A2, P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has gray covered with dark dots dorsally, and opaque ventrally. Spiracle is transparent. Tail is gray with dark blotches. Fins are transparent with small dark spots, and show a longitudinal dark narrow median stripe located at the first third of the tail.

Comments: The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) eyes dorsal and directed laterally; ii) nostrils positioned dorsally; iii) tooth row P-2 longer than P-1; iv) coloration of the body and tail muscle dark brown in the dorsal-half and brownish-cream in the ventral-half. The tadpoles described by Schulze et al. (2015)

differ from those studied herein by: i) snout semi-parabolic in lateral view; and ii) tooth row P-1 slightly longer than P-2 and P-3.

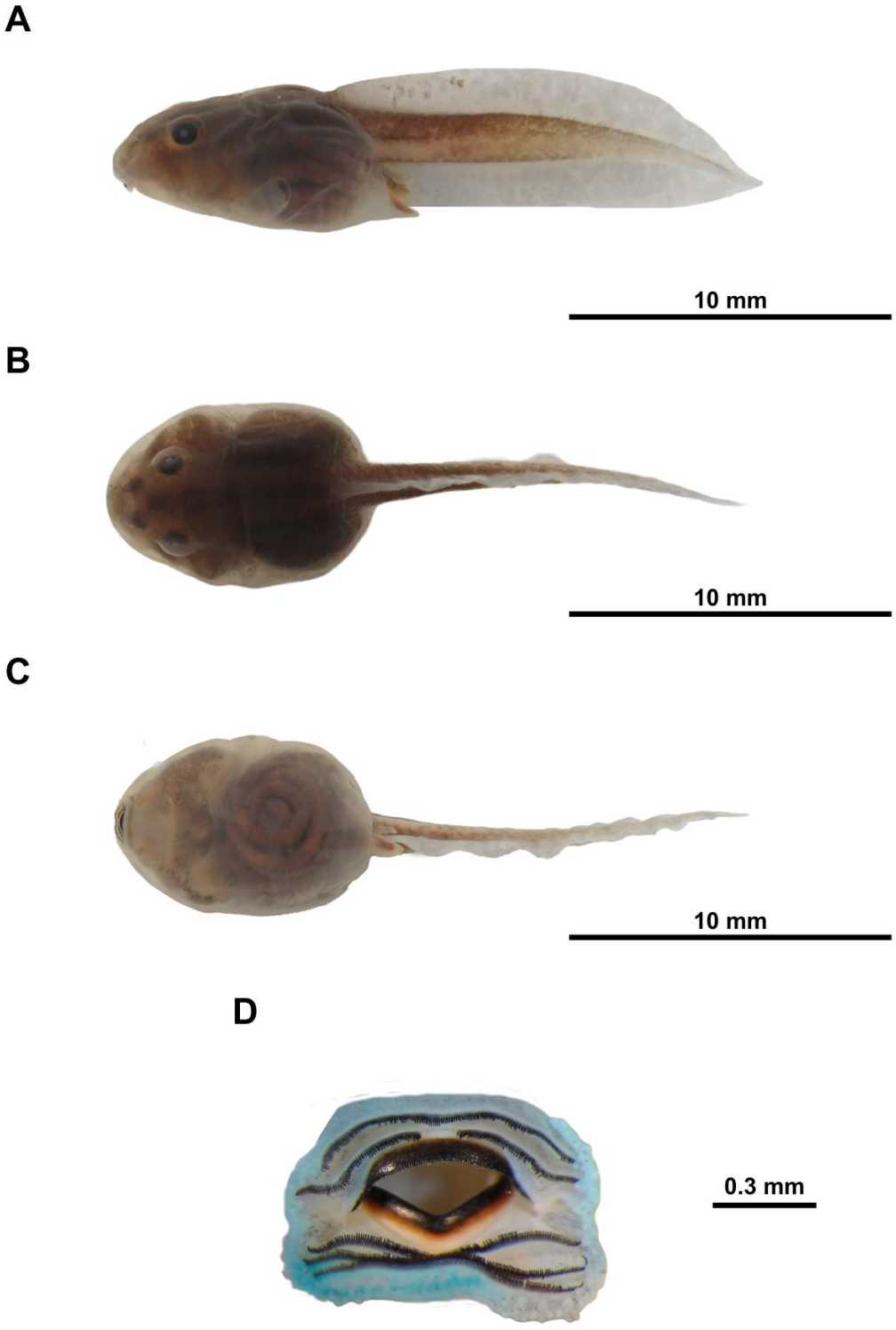

Figure 35. *Leptodactylus fuscus.*

***Leptodactylus labyrinthicus* (Spix, 1824; Fig. 36a-d)**

Characterization

We collected 25 individuals of *L. labyrinthicus* in five protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Jataí and E.E. Santa Bárbara. We analysed seven individuals in the stages 34 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 58.0 ± 11.05 mm. Body length: 18.85 ± 2.45 mm. Body elliptical/elongated in dorsal view and ovoid in lateral views. Snout rounded in dorsal and lateral views. Eyes with 1.4 ± 0.085 mm of diameter, positioned and directed dorsolaterally. Nostrils with 0.3 ± 0.03 mm of diameter, rounded, positioned anterodorsally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube long, medial, and fused to ventral fin. Tail length: 39.6 ± 9.85 mm, and 2.1 times the length of the body. Dorsal fin height: 2.35 ± 1.0 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the border between body and tail at a low slope. Ventral fin height: 2.0 ± 0.65 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginated ventrally. Marginal papillae are absent in the upper lip and have one row in the lower lip and laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 1/2(1), and P1 longer than P2.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with large dark spots. Fins are transparent with large dark spots, and show a longitudinal dark narrow median stripe located at the first third of the tail.

Comments: The tadpoles described by Vizotto (1967) differ from those studied herein by nostrils elliptical. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) body depressed, oval in dorsal view and globular/depressed in lateral view; and ii) nostrils positioned dorsally.

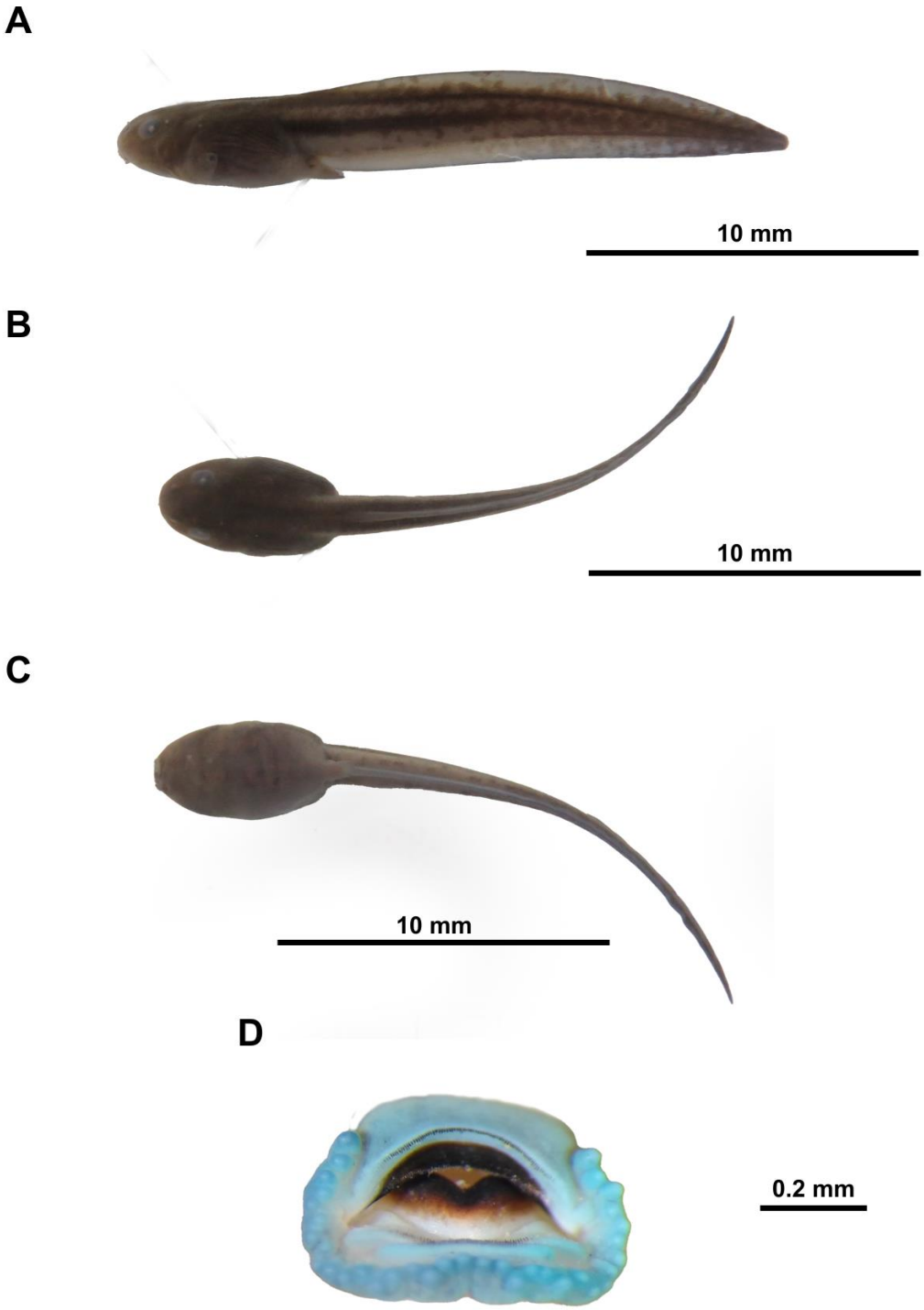

Figure 36. *Leptodactylus labyrinthicus.*

Leptodactylus latrans **(Steffen, 1815; Fig. 37a-d)**

Characterization

We collected 72 individuals of *L. latrans* in four protected areas: E.E. Assis, P.E. Jurupará, PESM núcleo Curucutu and PETAR. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 44.4 ± 3.0 mm. Body ovoid/elongated in the dorsal and oval/elongated in the lateral views. Body length: 17.25 ± 0.65 mm. Snout oval in the dorsal and rounded in the lateral views. Eyes with 1.35 ± 0.2 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.3 ± 0.06 mm of diameter, rounded, positioned anterodorsally, and opening directed dorsally. Spiracle sinistral, long, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, of the same length as the external wall, and free distal edge. Vent tube long, medial, and fused to ventral fin. Tail length: 26.5 ± 1.9 mm, and 1.5 times the length of the body. Dorsal fin height: 2.9 ± 0.03 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 3.0 ± 0.2 mm, and convex margin.

Oral disc: Oral disc anteroventral, and emarginated ventrally. Marginal papillae have two rows in the upper lip and lower lips, and three rows in the laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shaped. Tooth row formula 2/3, A1-2 of the same length, P1-2 of the same length, and slightly longer than P-3.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown and covered with dark dots, and shows a dark narrow median and longitudinal stripe located at the first third of the tail. Fins have brown covered with dark dots.

Comments: The tadpoles studied herein do not differ from those described by Cei (1980). The tadpoles described in Rossa-Feres & Nomura (2006) differ from those studied herein by: i) body depressed, globular/depressed in lateral view; ii) nostrils positioned dorsally; and iii) coloration black.

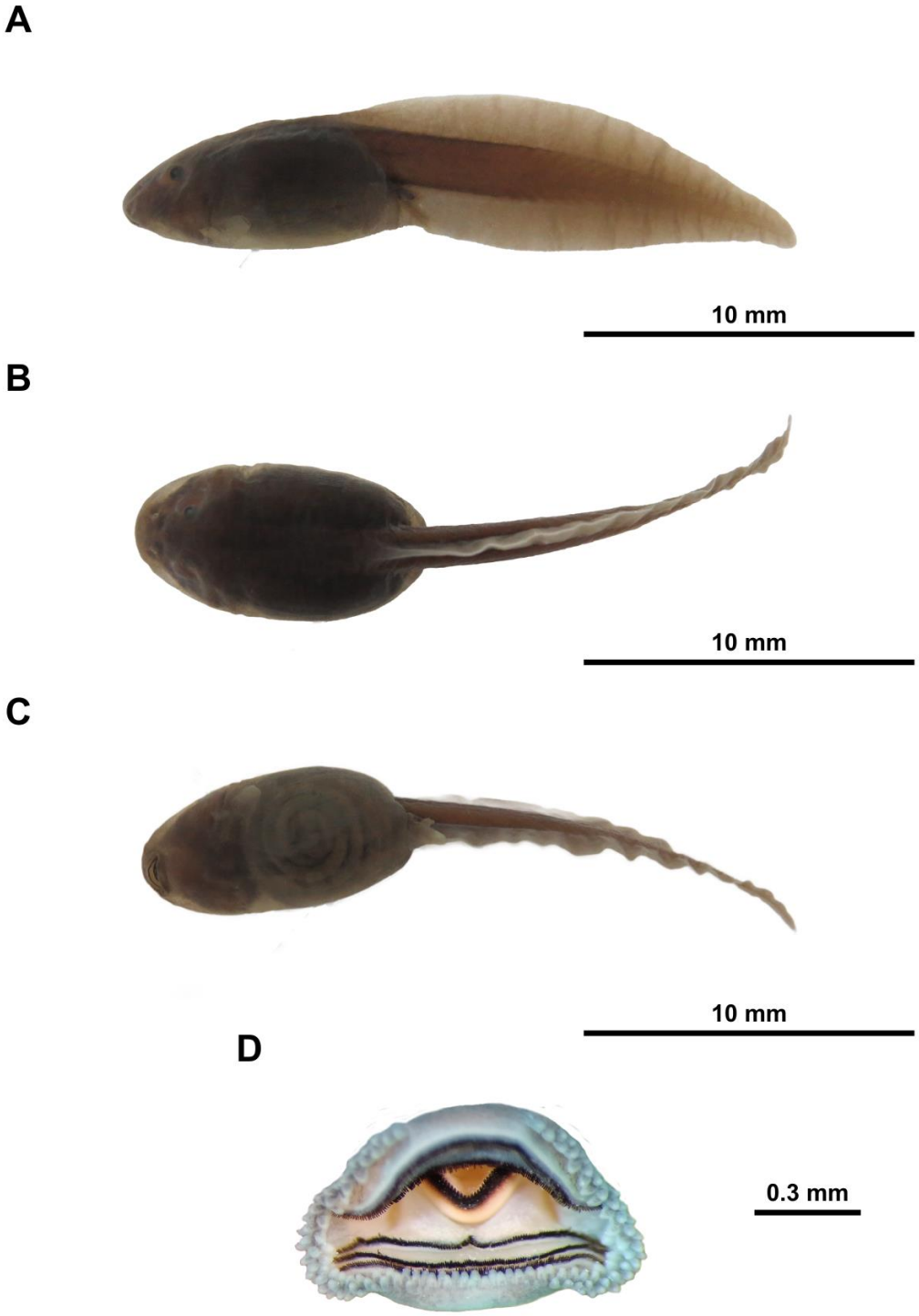

Figure 37. *Leptodactylus latrans.*

***Leptodactylus notoaktites* Heyer, 1978 (Fig. 38a-d)**

Characterization

We collected 16 individuals of *L. notoaktites* at PETAR. We analysed two individuals in the stage 33 for morphological characterization (Appendix Table S1).

Body: Total length: 24.05 ± 1.5 mm. Body length: 9.2 ± 0.75 mm. Body ovoid in dorsal and lateral views. Snout rounded in dorsal and lateral views. Eyes with 0.95 ± 0.15 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.25 ± 0.065 mm of diameter, rounded, positioned dorsally, and opening directed anterolaterally. Spiracle sinistral, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube long and medial. Tail length: 14.5 ± 0.5 mm, and 1.55 times the length of the body. Dorsal fin height: 1.55 ± 0.4 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.35 ± 0.15 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body dark brown uniform dorsally; and brown little transparent ventrally. Spiracle is transparent. Tail is transparent with dark speckles, and shows a longitudinal dark narrow median stripe located at the first third of the tail. Fin is transparent with dark speckles.

Comments: There is no description of *L. notoaktites* tadpoles in the literature.

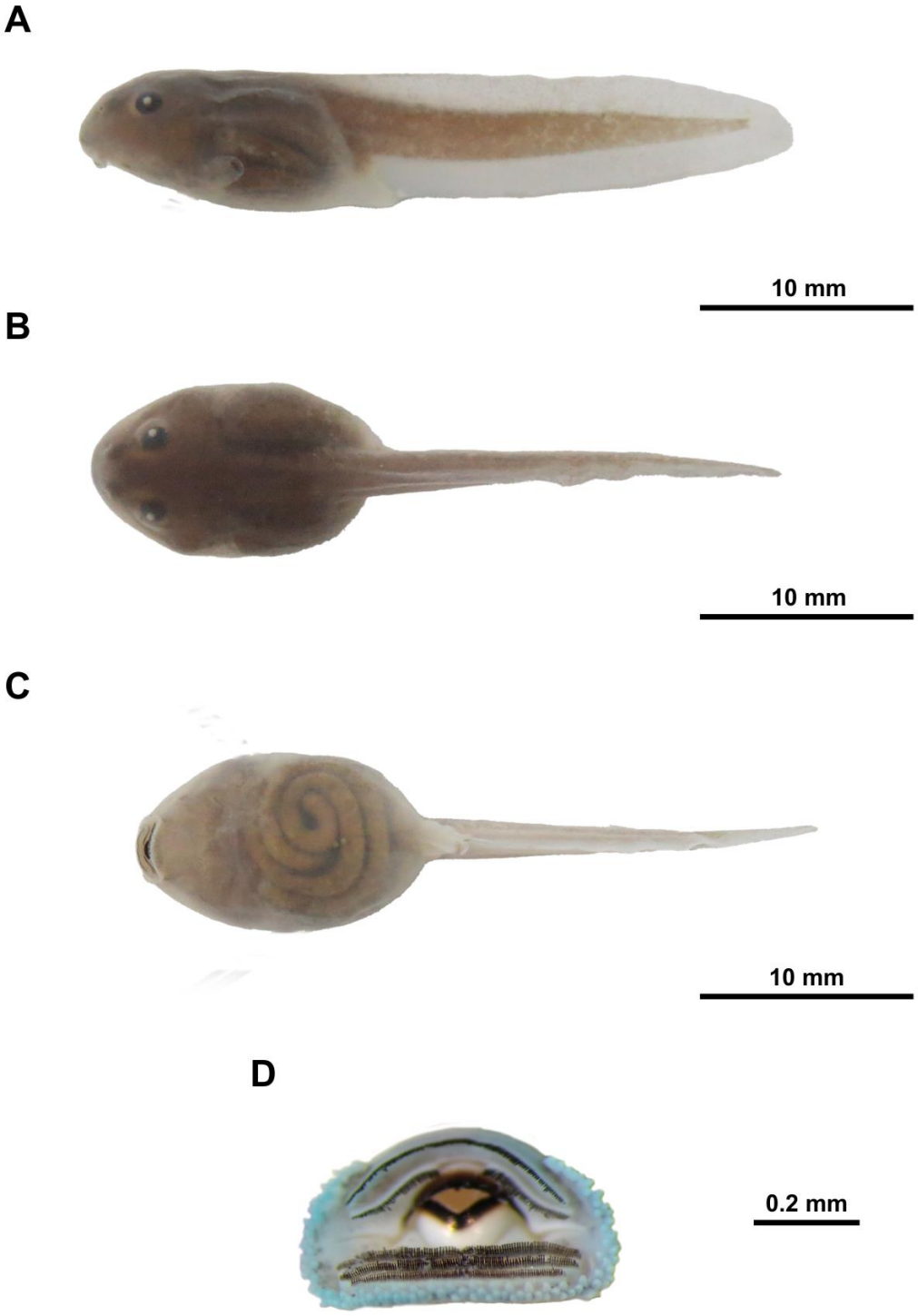

Figure 38. *Leptodactylus notoaktites.*

***Leptodactylus plaumanni* Ahl, 1936 (Fig. 39a-d)**

Characterization

We collected 16 individuals of *L. plaumanni* at PESM núcleo Curucutu. We analysed four individuals in the stages 33 to 37 for morphological characterization (Appendix Table S1).

Body: Total length: 30.1 ± 2.25 mm. Body length: 11.1 ± 0.35 mm. Body ovoid in dorsal and lateral views. Snout truncated in the dorsal view and rounded in the lateral views. Eyes with 1.3 ± 0.045 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.25 ± 0.02 mm of diameter, rounded, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube short and medial. Tail length: 18.9 ± 2.25 mm, and 1.7 times the length of the body. Dorsal fin height: 1.4 ± 0.15 mm, margin parallel to the longitudinal axis of the tail muscle, and rises before the border between body and tail at a low slope. Ventral fin height: 1.2 ± 0.15 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral. Marginal papillae have one row of in the upper lip, wide dorsal gap, and two rows in the lower lip and laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1 shorter than A2, P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with large dark spots. Fins are transparent with dark speckles, show a longitudinal dark narrow median stripe located at the first third of the tail, and a lighter dorsal spot V-shape located between the eyes and the nostrils.

Comments: The tadpoles described by Grosso (2015) differ from those studied herein by: i) nostrils ovoid and located dorsolaterally; ii) marginal papillae have a single alternate row; and iii) submarginal papillae have two or three at the commissures in some specimens.

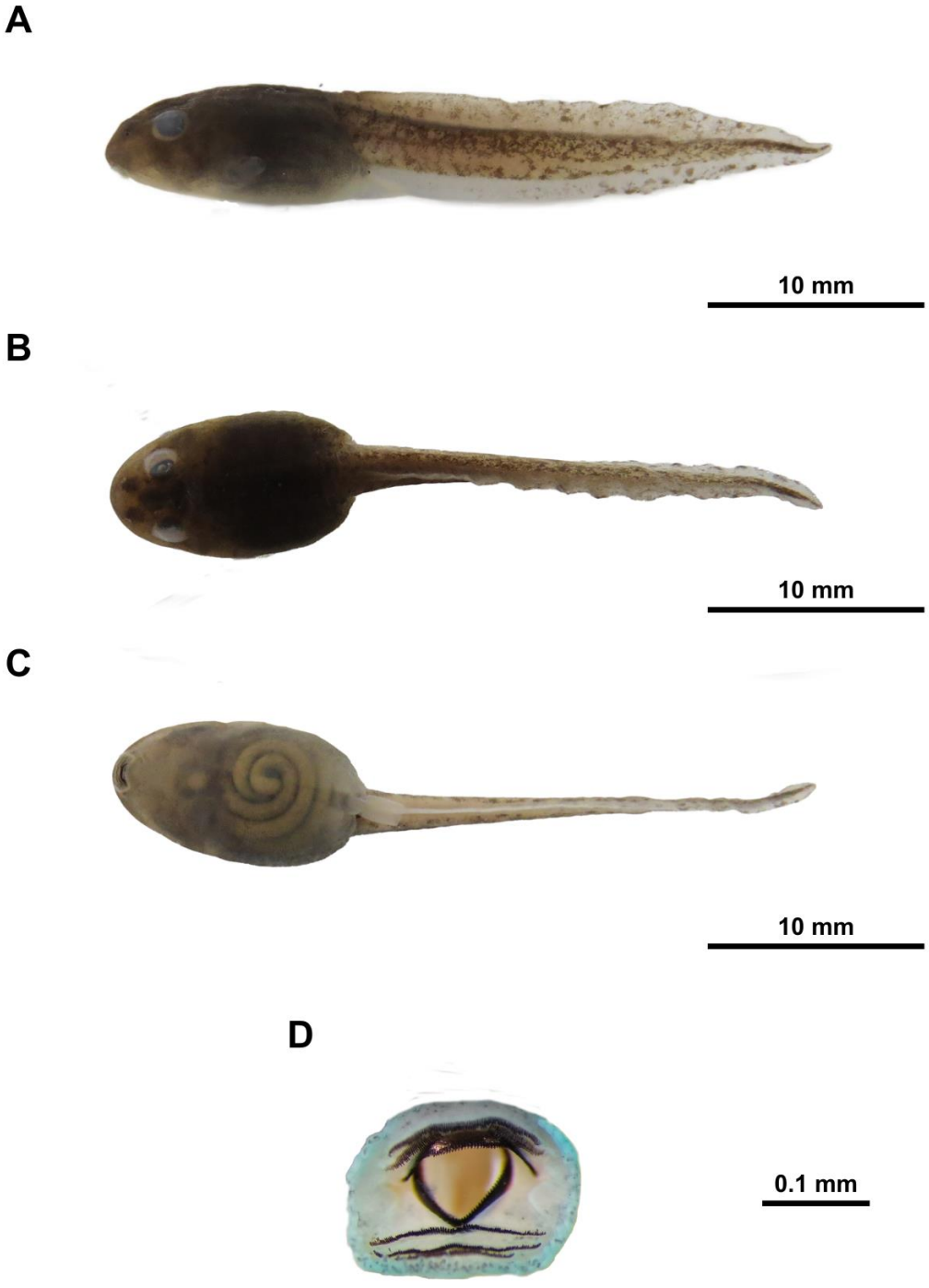

Figure 39. *Leptodactylus plaumanni.*

***Leptodactylus podicipinus* (Cope, 1862; Fig. 40a-d)**

Characterization

We collected 141 individuals of *L. podicipinus* in two protected areas: E.E. Assis and E.E. Caetetus. We analysed ten individuals in stage 37 for morphological characterization (Appendix Table S1).

Body: Total length: 27.0 ± 1.5 mm. Body length: 11.25 ± 0.45 mm. Body ovoid-elongated in dorsal view, and ovoid/compressed in lateral view. Snout rounded in the dorsal view and tapering in the lateral view. Eyes with 0.75 ± 0.05 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.2 ± 0.03 mm of diameter, ovoid, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, same length as the external wall, and with free distal edge. Vent tube long, medial, and fused to ventral fin. Tail length: 15.8 ± 1.15 mm, and 1.4 times the length of the body. Dorsal fin height: 1.65 ± 0.25 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.5 ± 0.15 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate ventrally. Marginal papillae have two rows in the upper lip, dorsal gap, two to three rows in the lower lip, and two rows in the laterals. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3, A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark speckles. Fins are brown with dark speckles.

Comments:

The tadpoles described by Vizotto (1967) differ from those studied herein by: i) nostrils elliptical; and ii) tooth row formula 2/3. The tadpoles described by Kenny (1969) differ from those studied herein by nostrils opening dorsally.The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) snout oval in dorsal view; and ii) nostrils with opening directed laterally. The tadpoles described by Schulze et al. (2015) differ from those studied herein by: i) oral disc not emarginated; ii) marginal papillae absent in the upper

lip; iii) A-1 slightly shorter than A-2; iv) eyes positioned dorsolaterally; v) spiracle with centripetal wall not completely fused to body wall. The tadpoles described by Heyer (1994) do not differ from those studied herein.

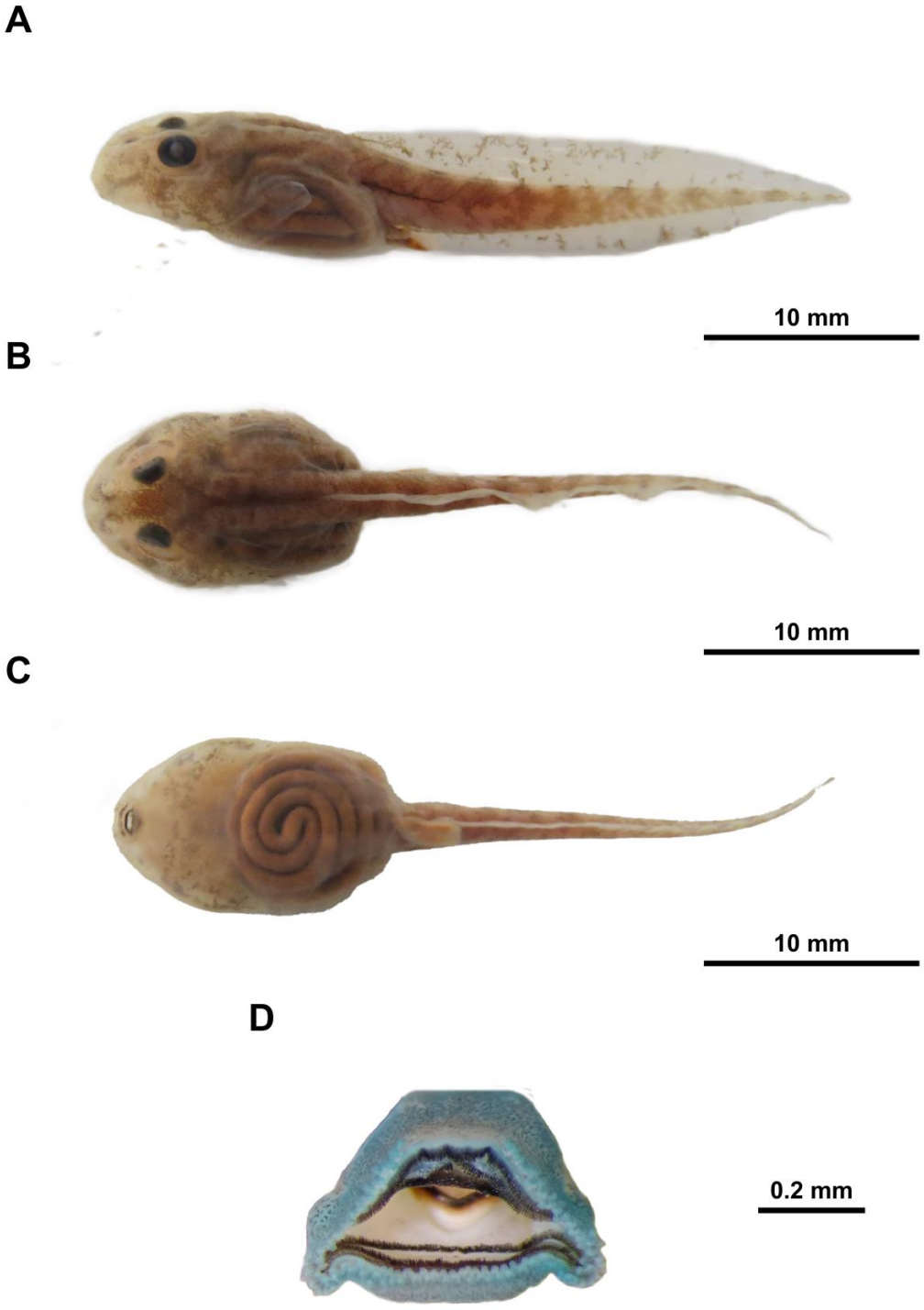

Figure 40. *Leptodactylus podicipinus.*

Ololygon

***Ololygon littoralis* (Pombal & Gordo, 1991; Fig. 41a-d)**

Characterization

We collected 157 individuals of *S. littoralis* in four protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará, and PESM núcleo São Sebastião. We analysed eighteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 22.65 ± 2.45 mm. Body length: 8.3 ± 0.9 mm. Body ovoid in dorsal view, and ovoid/depressed in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 0.8 ± 0.1 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.25 ± 0.02 mm of diameter, ovoid, positioned dorsolaterally, and opening dorsally directed. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, and centripetal wall fused to body wall and of the same length as the external wall. Vent tube long, dextral, and fused to ventral fin. Tail length: 14.3 ± 1.75 mm, and 1.7 times the length of the body. Dorsal fin height: 1.4 ± 0.25 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.25 ± 0.2 mm, and convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae have three to four rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3, A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with large brown spots and few dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is grayish-brown with dark dots. Fins are transparent with large dark spots, few blood vessels apparent, and show a narrow dark longitudinal medial stripe located at the first third of the tail.

Comments: The tadpoles studied herein do not differ from those described by Pombal & Gordo (1998) (1957).

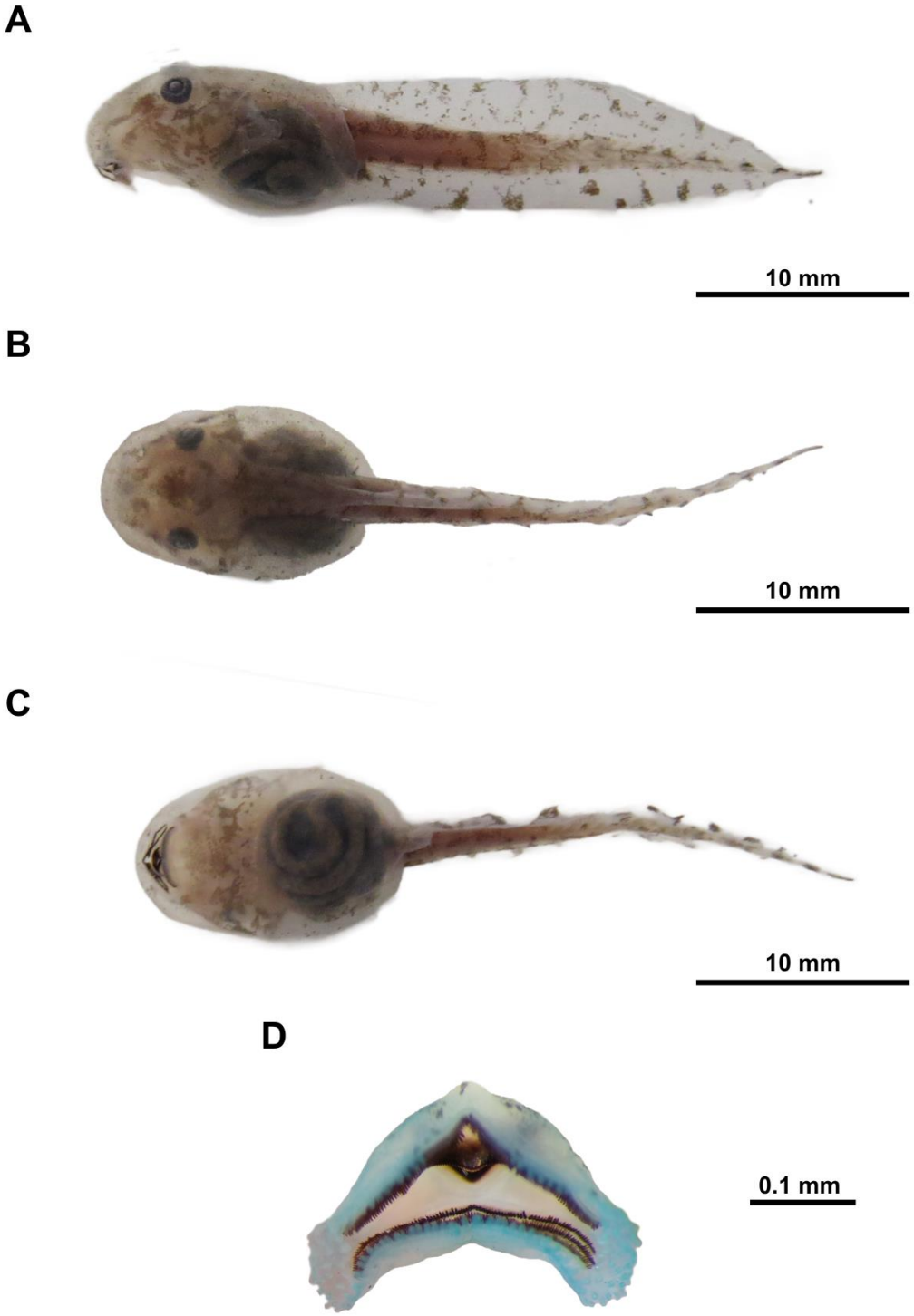

Figure 41. *Ololygon littoralis.*

***Ololygon obtriangulata* (Lutz, 1973; Fig. 42a-d)**

Characterization

We collected 20 individuals of *S. obtriangulatus* in two protected areas: P.E. Jurupará and PESM núcleo Santa Virgínia. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 29.3 ± 1.2 mm. Body length: 10.3 ± 0.1 mm. Body ovoid in dorsal and lateral views. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 1.1 ± 0.4 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.2 ± 0.1 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 18.8 ± 1.3 mm, and 1.8 times the length of the body. Dorsal fin height: 2.15 ± 0.6 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.0 ± 0.2 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and a dorsal gap. Submarginal papillae have four to five rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one M-shaped, and lower one V-shaped. Tooth row formula 2(2)/3, and A1-2 and P1-3 of the same length.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark dots, and few large dark spots. Fins are transparent with large dark spots, and blood vessels apparent.

Comments: The tadpoles described by Heyer et al. (1990) do not differ from those studied herein.

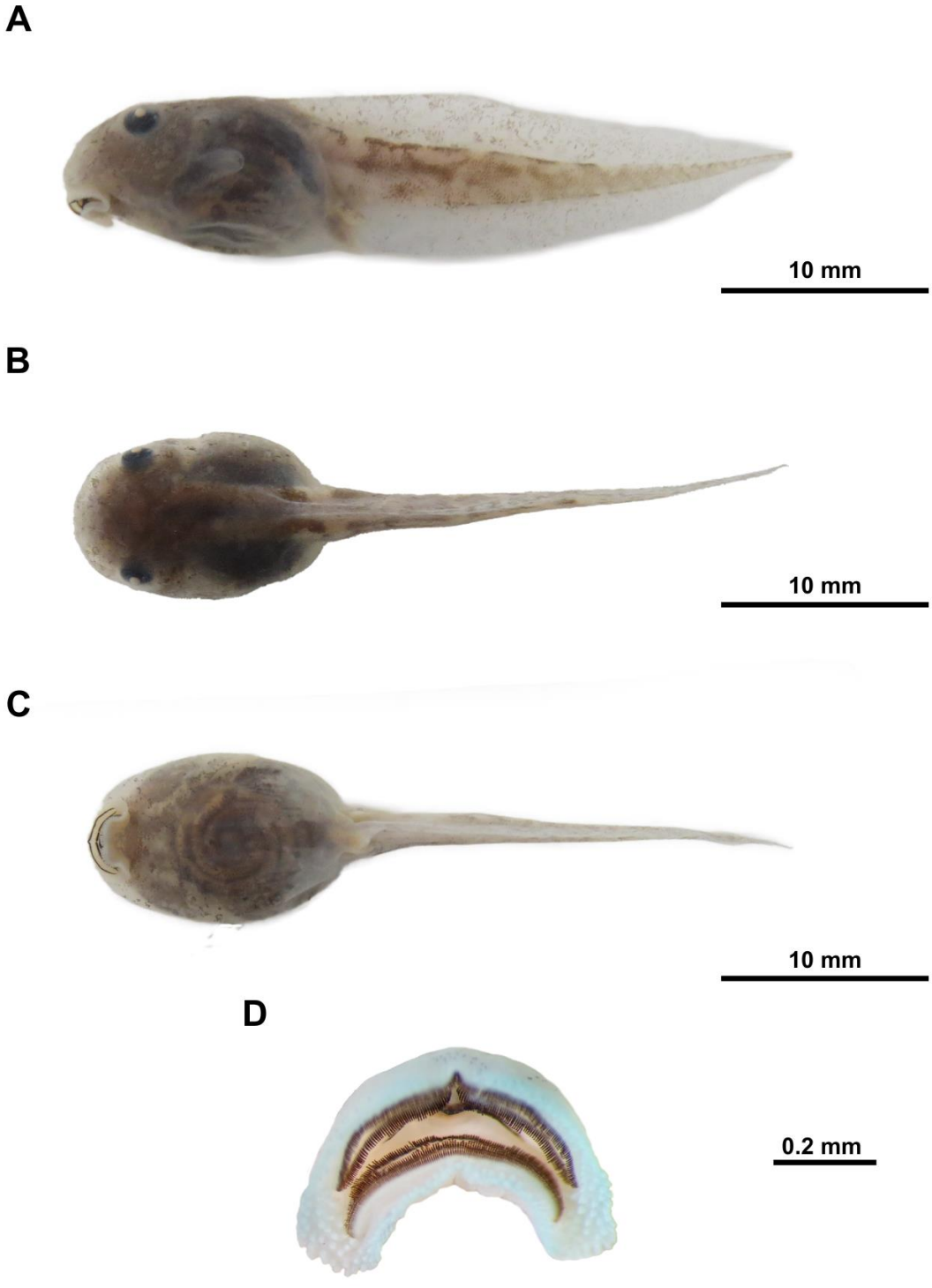

Figure 42. *Ololygon obtriangulata.*

***Ololygon perpusilla* (Lutz & Lutz, 1939; Fig. 43a-d)**

Characterization

We collected 19 individuals of *S. perpusillus* in two protected areas: PESM núcleos São Sebastião and Santa Virgínia. We analysed ten individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 17.45 ± 0.95 mm. Body length: 6.05 ± 0.15 mm. Body ovoid in dorsal and lateral views. Snout rounded in dorsal and lateral views. Eyes with 0.4 ± 0.35 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.055 ± 0.05 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, dorsolateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 11.3 ± 1.05 mm, and 1.85 times the length of the body. Dorsal fin height: 1.1 ± 0.45 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the border between body and tail at a low slope. Ventral fin height: 0.95 ± 0.2 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc ventral. Marginal papillae have one row, and dorsal gap. Submarginal papillae have two rows in the laterals of the oral disc. Jaw sheath thick, serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3, and A1-2 and P1-3 of the same length.

Coloration in formalin: Body has yellowish-brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is yellowish-brown and covered with dark dots. Fins are transparent with dark speckles.

Comments: The tadpoles described by Peixoto et al (2002) differ from those studied herein by marginal papillae having one or two rows in the upper lip, and two rows in the lower lip.

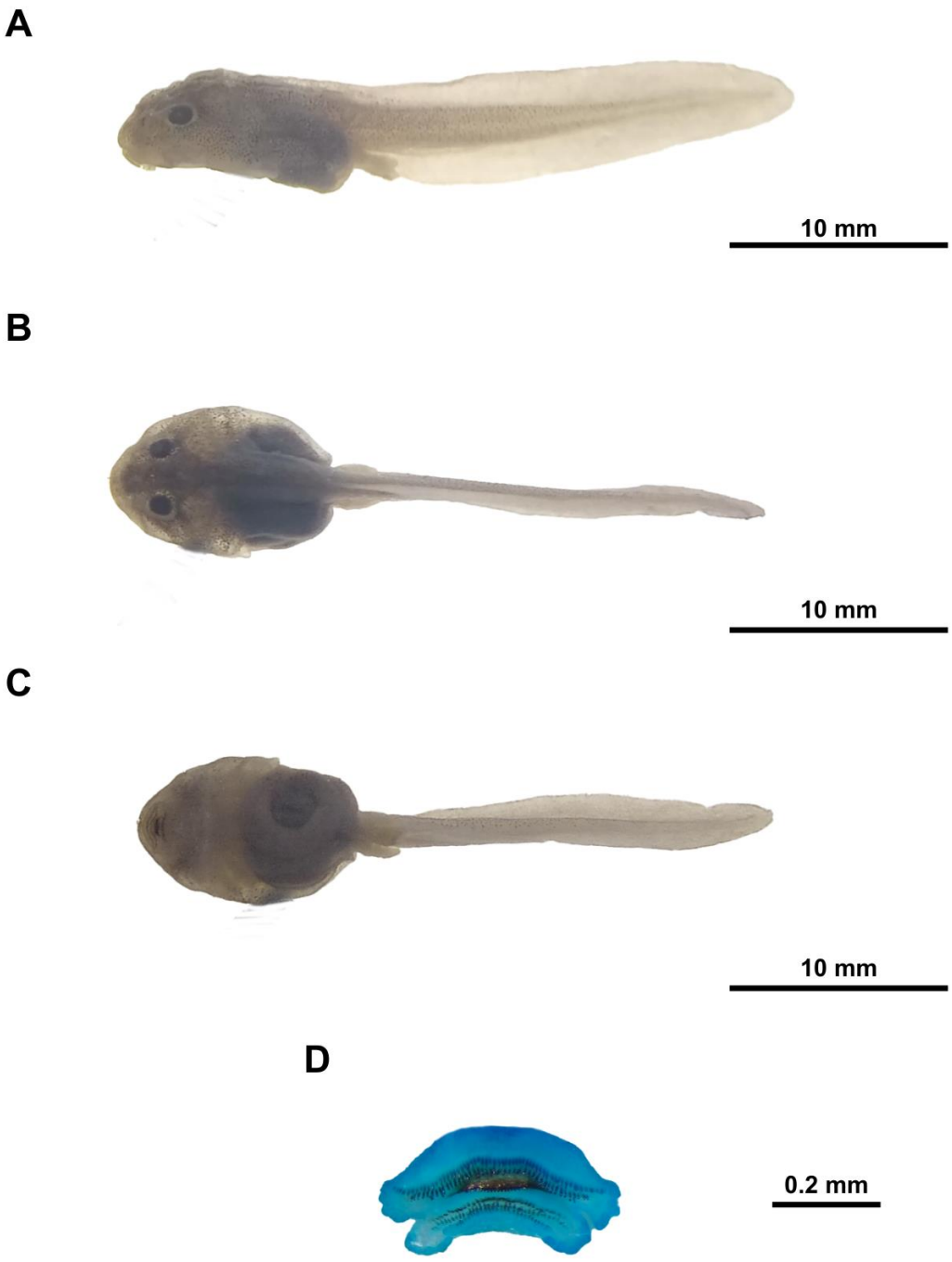

Figure 43. *Ololygon perpusilla.*

***Ololygon rizibilis* (Bokermann, 1964; Fig. 44a-d)**

Characterization

We collected 227 individuals of *S. rizibilis* in four protected areas: P.E. Carlos Botelho, P.E. Jurupará, PESM núcleo Santa Virgínia and PETAR. We analysed thirty-two individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 22.25 ± 2.3 mm. Body length: 10.0 ± 7.5 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 0.95 ± 0.15 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.3 ± 0.055 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube long, dextral, and fused to ventral fin. Tail length: 14.0 ± 2.4 mm, and 1.4 times the length of the body. Dorsal fin height: 1.8 ± 0.25 mm, slightly convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 1.45 ± 0.25 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae have two to three rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3, and A1-2 and P1-3 of the same length.

Coloration in formalin: Body has light brown covered with large dark spots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with large dark spots. Fins are transparent with dark speckles.

Comments: The tadpoles described by Bokermann (1964) differ from those studied herein by: i) oral disc ventral; ii) marginal papillae have one row; and iii) tooth row formula 2(2)/3(3).

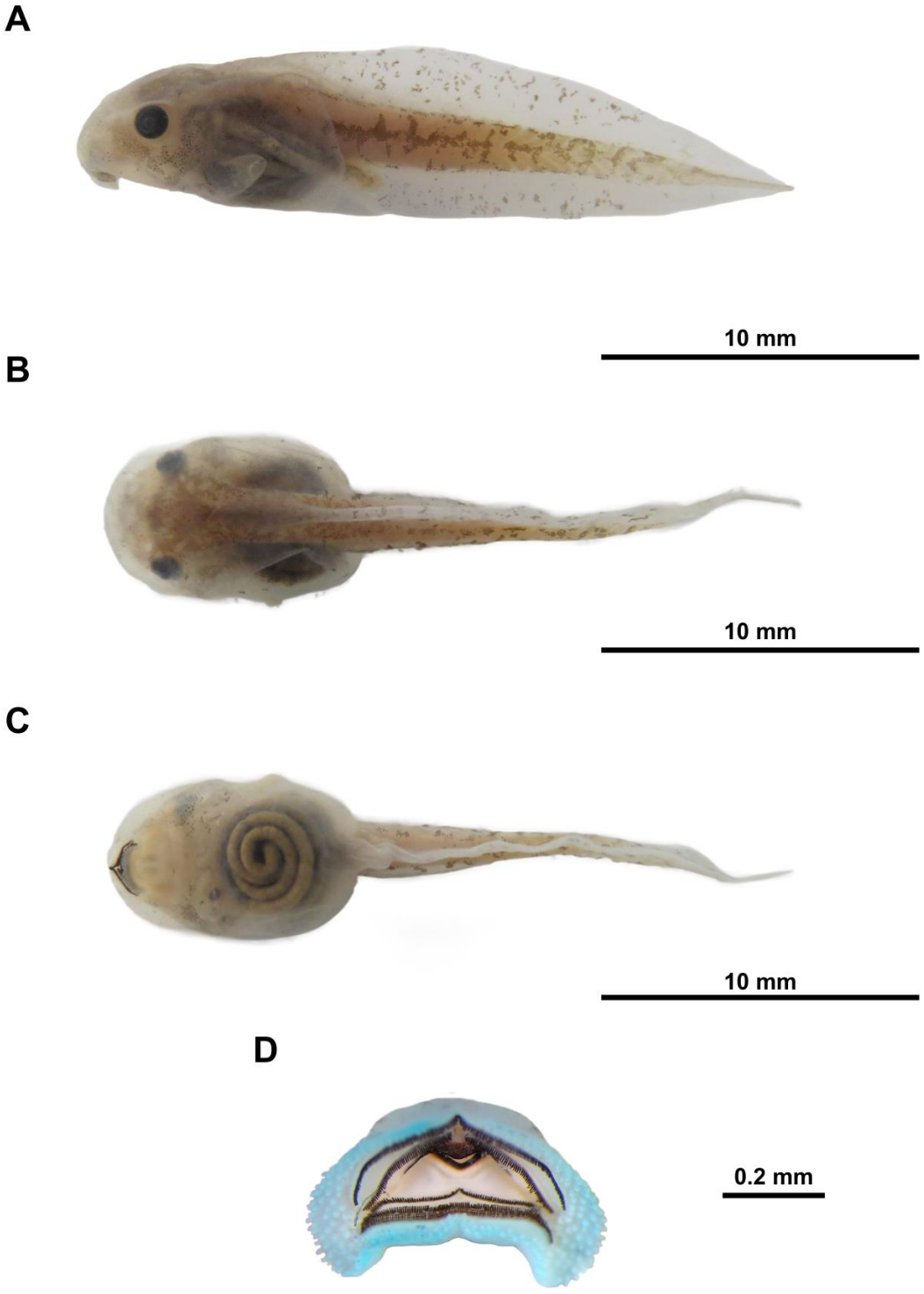

Figure 44. *Ololygon rizibilis.*

Phrynomedusa Miranda-Ribeiro, 1923

***Phrynomedusa dryade* (Baêta et al, 2016; Fig. 45a-d)**

Characterization

We collected five individuals of *P. dryade* at PESM núcleo Santa Virgínia. We analysed three individuals in the stages 34 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 47.8 ± 6.5 mm. Body length: 15.8 ± 0.15 mm. Body elliptical in the dorsal view, and ovoid/depressed in the lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.7 ± 0.55 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.3 ± 0.2 mm of diameter, oval, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, ventral, and opening at the middle third of the body. Vent tube long, dextral, and fused to ventral fin. Tail length: 32.05 ± 0.6 mm, and 2.05 times the length of the body. Dorsal fin height: 2.05 ± 0.4 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 3.0 ± 0.7 mm, and convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have two rows on upper and lower lips. Submarginal papillae are scattered in the laterals of the lower lip. Jaw sheath narrow, finely serrated, upper one arc-shaped, and lower one V-shaped. Tooth row formula 2(2)/3(1), A1-2 of the same length; and P1-3 of the same length.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark speckles, and a longitudinal brown line, from the junction with the body to the tip of the tail. Fins are transparent with dark speckles, and show a light interorbital line.

Comments: The tadpoles described by Baêta et al. (2016) differ from those studied herein by: i) upper jaw sheath U-shape; and ii) dorsal and ventral fins are unpigmented.

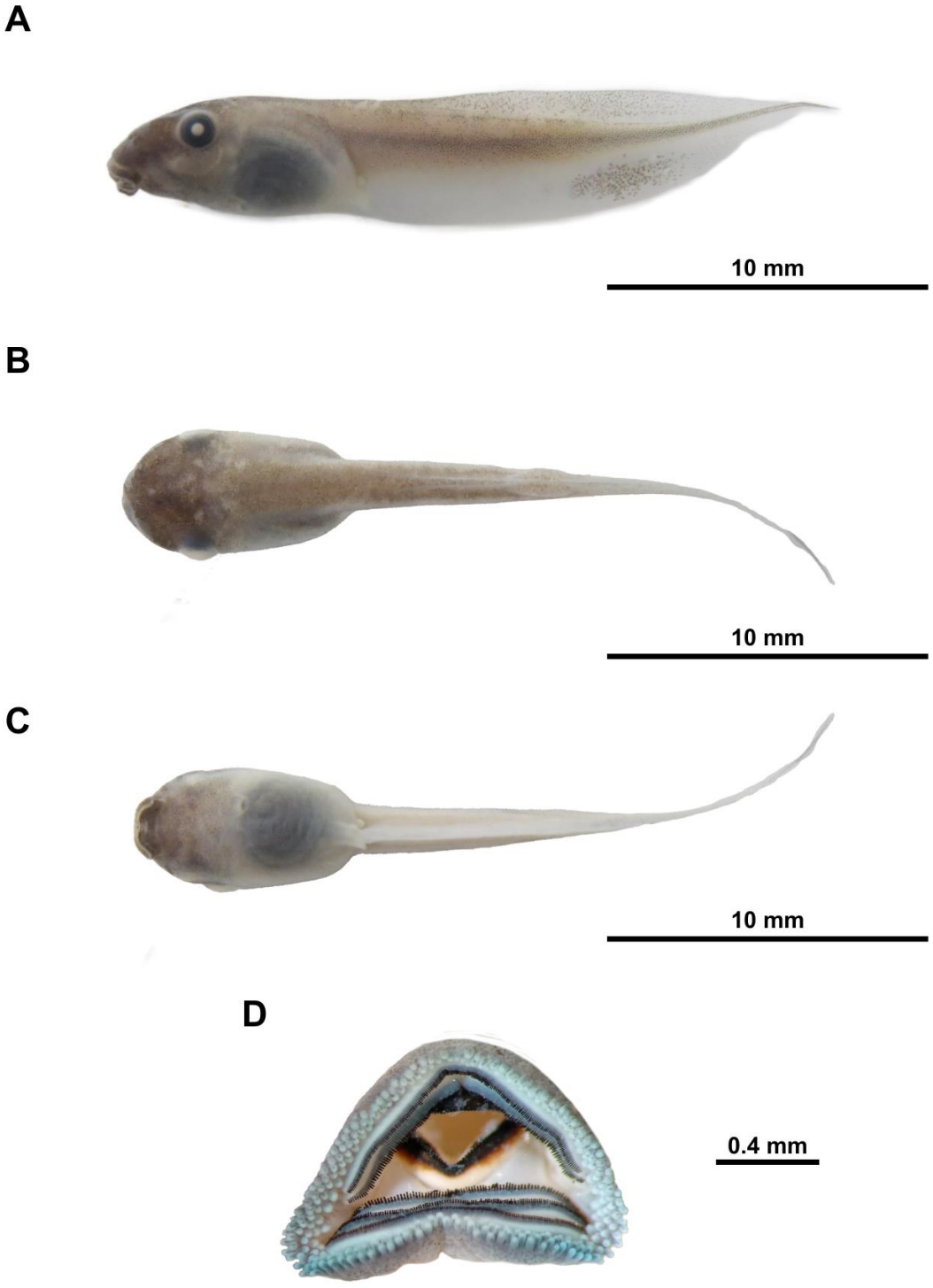

Figure 45. *Phrynomedusa dryade.*

Phyllomedusa Wagler, 1830

***Phyllomedusa distincta* Lutz, 1950 (Fig. 46a-d)**

Characterization

We collected ten individuals of *P. distincta* at P.E. Carlos Botelho. We analysed four individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 48.15 ± 6.9 mm. Body length: 16.8 ± 2.75 mm. Body ovoid in the dorsal view, and triangular in the lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 2.15 ± 0.65 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.25 ± 0.07 mm of diameter, rounded, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, ventral, and opening at the middle third of the body. Vent tube long, dextral, and fused to ventral fin. Tail length: 31.15 ± 4.45 mm, and 1.85 times the length of the body. Dorsal fin height: 1.35 ± 0.5 mm, rises on the base of the muscular portion of the tail, and margin parallel to the longitudinal axis of the tail muscle. Ventral fin height: 4.1 ± 1.75 mm, and maximum height in the middle part of the fin and tapering in the final third.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and a dorsal gap. Submarginal papillae have one to two rows in the laterals. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark dots. Fins are transparent with dark blotches, and show a dorsal dark brown blotch extending from the nostrils to the middle third of the body.

Comments: The tadpoles described by Cruz (1982) differ from those studied herein by: i) nostrils directed ventrally; ii) oral disc anterior; and iii) marginal papillae have two rows.

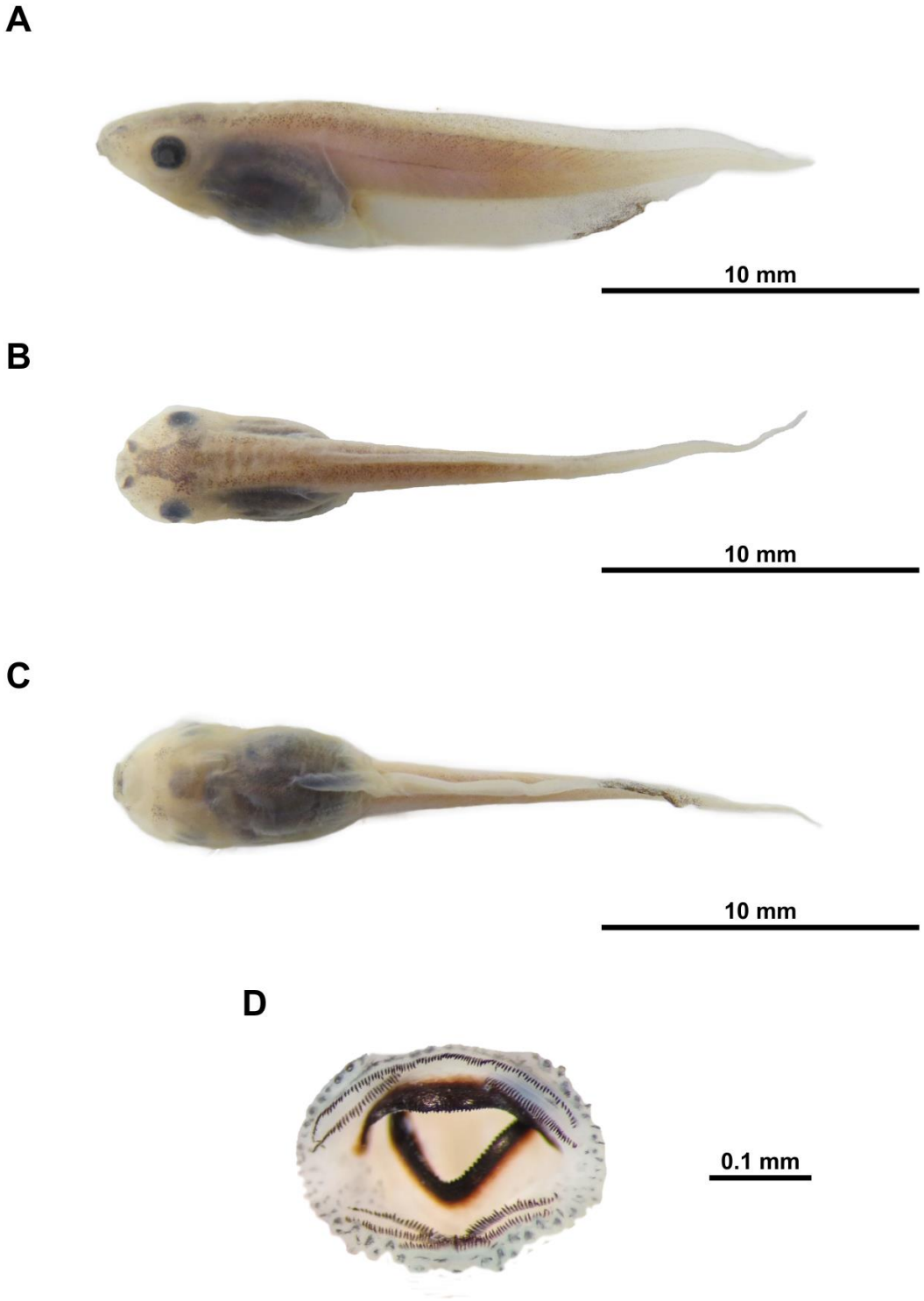

Figure 46. *Phyllomedusa distincta.*

***Phyllomedusa tetraploidea* Pombal & Haddad, 1992 (Fig. 47a-d)**

Characterization

We collected 14 individuals of *P. tetraploidea* in two protected areas: E.E. Assis and E.E. Caetetus. We analysed five individuals in the stages 34 to 37 for morphological characterization (Appendix Table S1).

Body: Total length: 47.65 ± 4.0 mm. Body length: 16.4 ± 1.2 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.55 ± 0.1 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.2 ± 0.01 mm of diameter, reniform, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, short, ventral, and opening at the middle third of the body. Vent tube long and dextral. Tail length: 31.55 ± 3.45 mm, and 1.9 times the length of the body. Dorsal fin height: 1.25 ± 0.02 mm, margin parallel to the longitudinal axis of the tail muscle, and rises on the base of the muscular portion of the tail. Ventral fin height: 4.0 ± 0.35 mm, and maximum height in the middle part of the fin and tapering in the final third.

Oral disc: Oral disc almost terminal. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae have two rows in the laterals. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has grayish-brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is gray with dark dots. Fins are transparent with dark spots, and show a dorsal dark brown blotch extending from the nostrils to the middle third of the body.

Comments: The tadpoles described by Pombal & Haddad (1992) differ from those studied herein by: i) body piriform in dorsal view; ii) oral disc anteroventral; and iii) marginal papillae have one row.

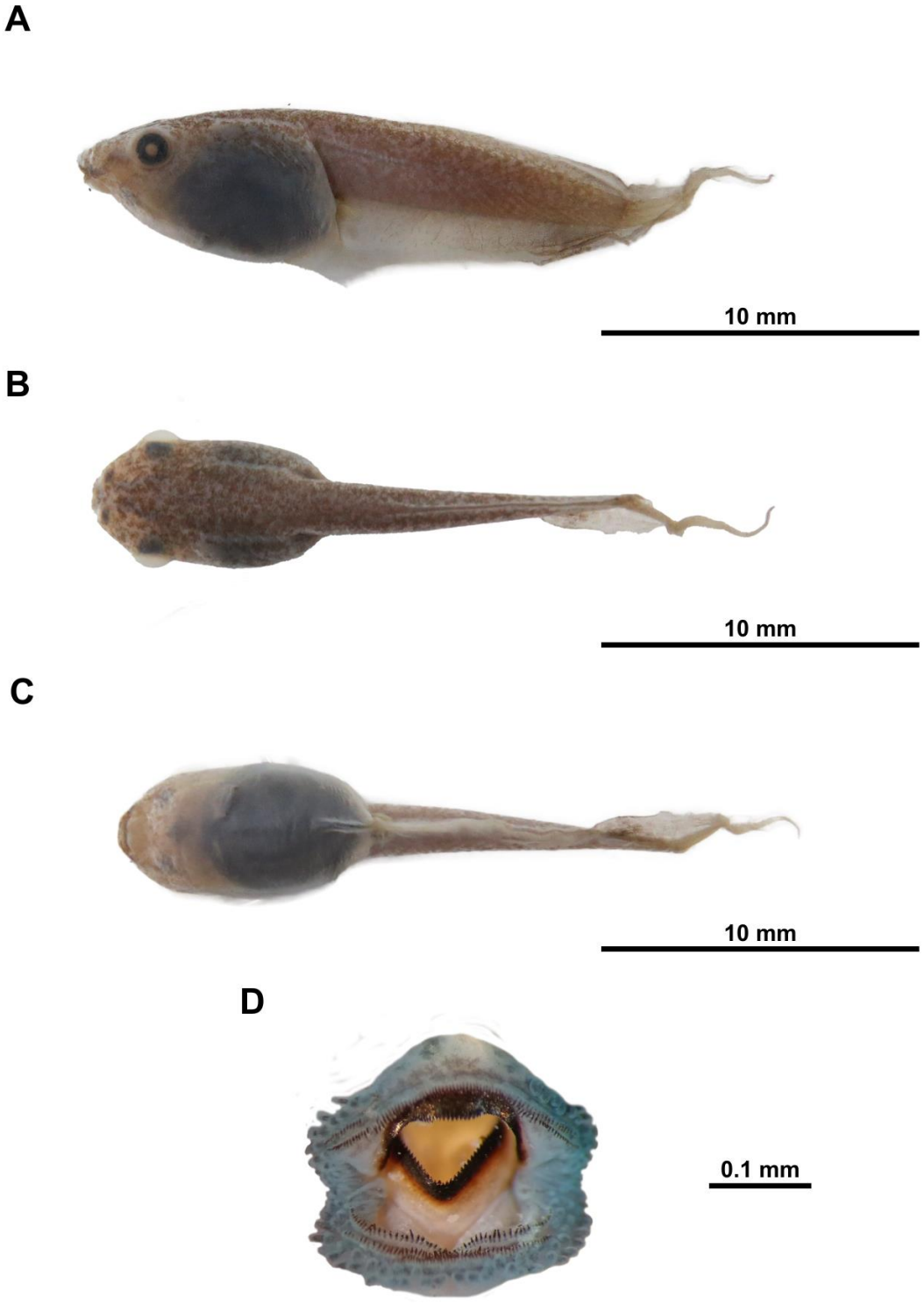

Figure 47. *Phyllomedusa tetraploidea.*

Physalaemus Fitzinger, 1826

***Physalaemus atlanticus* Haddad & Sazima, 2004 (Fig. 48a-d)**

Characterization

We collected 23 individuals of *P. atlanticus* at PESM núcleo São Sebastião. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 18.05 ± 1.15 mm. Body length: 7.5 ± 0.4 mm. Body ovoid in dorsal view, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.15 ± 0.85 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.25 ± 0.2 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateroventral, opening at the posterior third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube short, and medial. Tail length: 10.8 ± 0.8 mm, and 1.45 times the length of the body. Dorsal fin height: 1.0 ± 0.1 mm, slightly convex margin, and rises after the middle portion of the body at a low slope. Ventral fin height: 0.95 ± 0.3 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row in the upper lip, dorsal gap, and two rows in the lower lip and laterals of the oral disc. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1 longer than A2, and P1-3 of the same length.

Coloration in formalin: Body has brown covered with small dark spots dorsally, except for two blotches with no pigmentation located between nostrils and eyes, and transparent ventrally. Spiracle is transparent. Tail is transparent with small brown spots concentrated in the first third, and edges of the tail. Fins are transparent with a few brown blotches.

Comments: The tadpoles described in Haddad & Sazima (2004) differ from those studied herein by oral disc ventral.

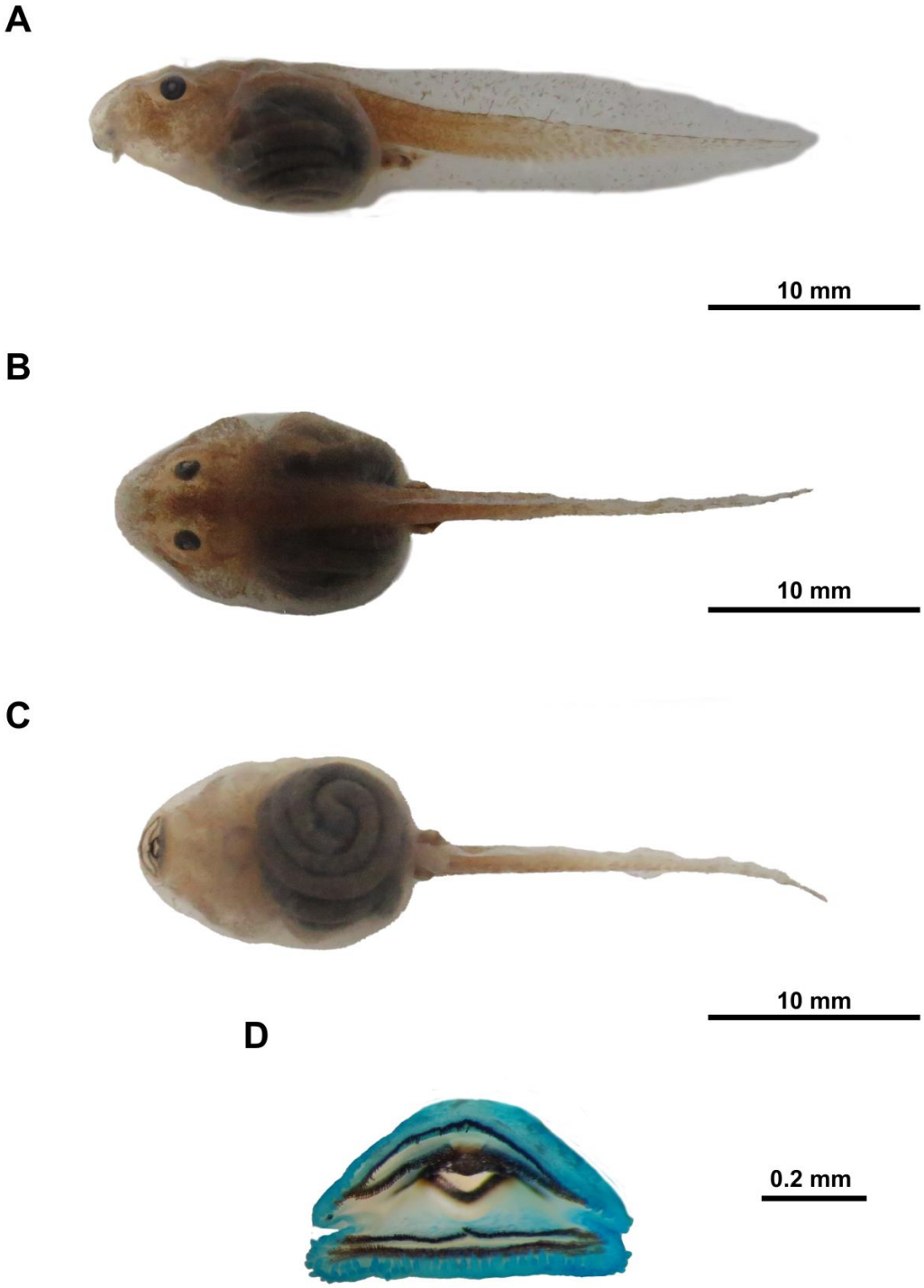

Figure 48. *Physalaemus atlanticus.*

***Physalaemus bokermanni* Carlos & Haddad, 1985 (Fig. 49a-d)**

Characterization

We collected ten individuals of *P. bokermanni* at PESM núcleo São Sebastião. We analysed two individuals in the stages 36 and 38 for morphological characterization (Appendix Table S1).

Body: Total length: 13.33 and 19.68 mm. Body length: 7.13 and 7.56 mm. Body ovoid in dorsal view, and depressed/globular in lateral view. Snout pointed in the dorsal, and rounded in the lateral view. Eyes with 0.24 and 0.25 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.1 and 0.06 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateroventral, opening at the posterior third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube short and medial. Tail length: 6.3 and 11.9 mm, and 1.25 times the length of the body. Dorsal fin height: 0.7 and 0.8 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 0.4 and 0.9 mm, slightly and convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shaped, and lower one V-shape. Tooth row formula 2(2)/3(1), A1 longer than A2, P1-2 of the same length, and P-3 slightly lower than P1-P2.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark speckles. Fins are transparent with large dark spots.

Comments: The tadpoles described by Cardoso & Haddad (1985) differ from those studied herein by: i) body hexagonal in dorsal view; and ii) oral disc ventral; iii) upper one M-shaped.

Figure 49. *Physalaemus bokermanni*.

***Physalaemus cuvieri* Fitzinger, 1826 (Fig. 50a-d)**

Characterization

We collected 632 individuals of *P. cuvieri* in ten protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Jataí, E.E. Santa Bárbara, FEENA, P.E. Jurupará, P.E. Vassununga and PESM núcleos Curucutu and Santa Virgínia. We analysed twenty-seven individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 22.5 ± 0.2 mm. Body length: 9.45 ± 0.9 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.7 ± 0.15 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.25 ± 0.07 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube long and dextral. Tail length: 14.55 ± 0.25 mm, and 1.4 times the length of the body. Dorsal fin height: 1.4 ± 0.35 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 0.9 ± 0.25 mm, margin parallel to the longitudinal axis of the tail muscle, and ending in an acuminate tip.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal and ventral gaps. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, lower one U-shape, and lower jaw sheath wider than upper one. Tooth row formula 2(2)/3(1), A1 shorter than A2, P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, but some individuals show a grayish coloration, and transparent ventrally. Spiracle is transparent. Tail is light brown with dark speckles. Fins are transparent with dark speckles.

Comments: The tadpoles described by Cei (1980) differ from those studied herein by: i) dorsal fin lanceolate; and ii) tooth row formula 2/3(1). The tadpoles described by Heyer et al. (1990) do not differ from those studied herein. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) nostrils oval, with a small projection on marginal rim; ii) spiracle long; iii) vent tube medial; iv) oral disc ventral; and v) A1 and A2 of the same length.

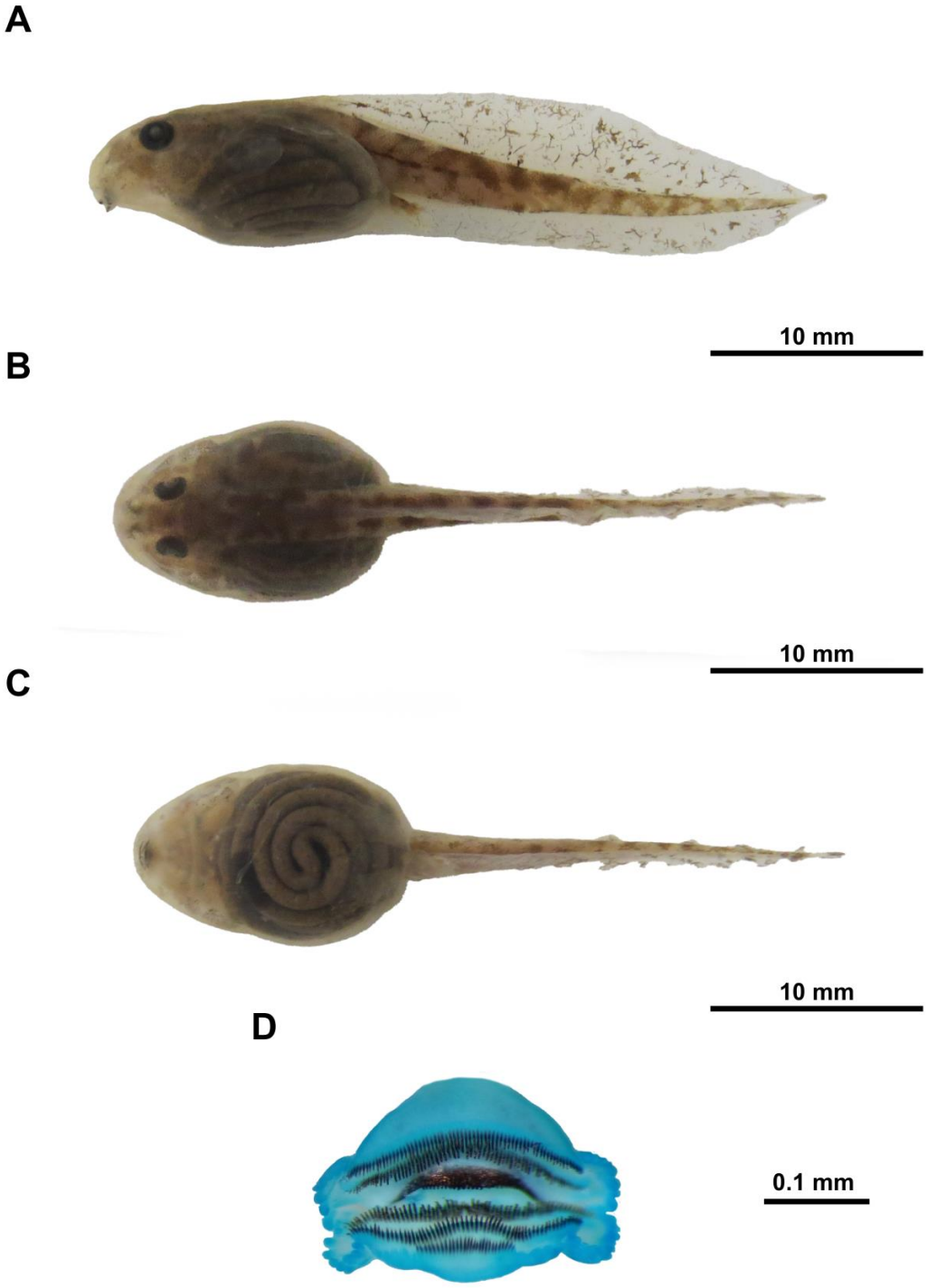

Figure 50. *Physalaemus cuvieri.*

Physalaemus lateristriga **(Steindachner, 1864; Fig. 51a-d)**

Characterization

We collected 254 individuals of *P. lateristriga* in two protected areas: P.E. Carlos Botelho and PETAR. We analysed twenty-six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 22.7 ± 3.4 mm. Body length: 9.65 ± 1.55 mm. Body ovoid in dorsal view, narrower behind the eyes, and depressed/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.8 ± 0.05 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.3 ± 0.04 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, dorsolateral, opening at the middle third of the body, centripetal wall fused to body wall, and of the same length as the external wall. Vent tube concealed, and fused to the ventral fin. Tail length: 13.15 ± 2.5 mm, and 1.3 times the length of the body. Dorsal fin height: 1.5 ± 0.3 mm, slightly convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 1.05 ± 0.25 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae have two to three rows scattered in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 of the same length, P2-3 of the same length, and shorter than P1.

Coloration in formalin: Body has brown covered with small dark spots gathered in irregular blotches dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown and covered with small dark spots. Fins are transparent with brown blotches.

Comments: There is no description of *P. lateristriga* tadpoles in the literature.

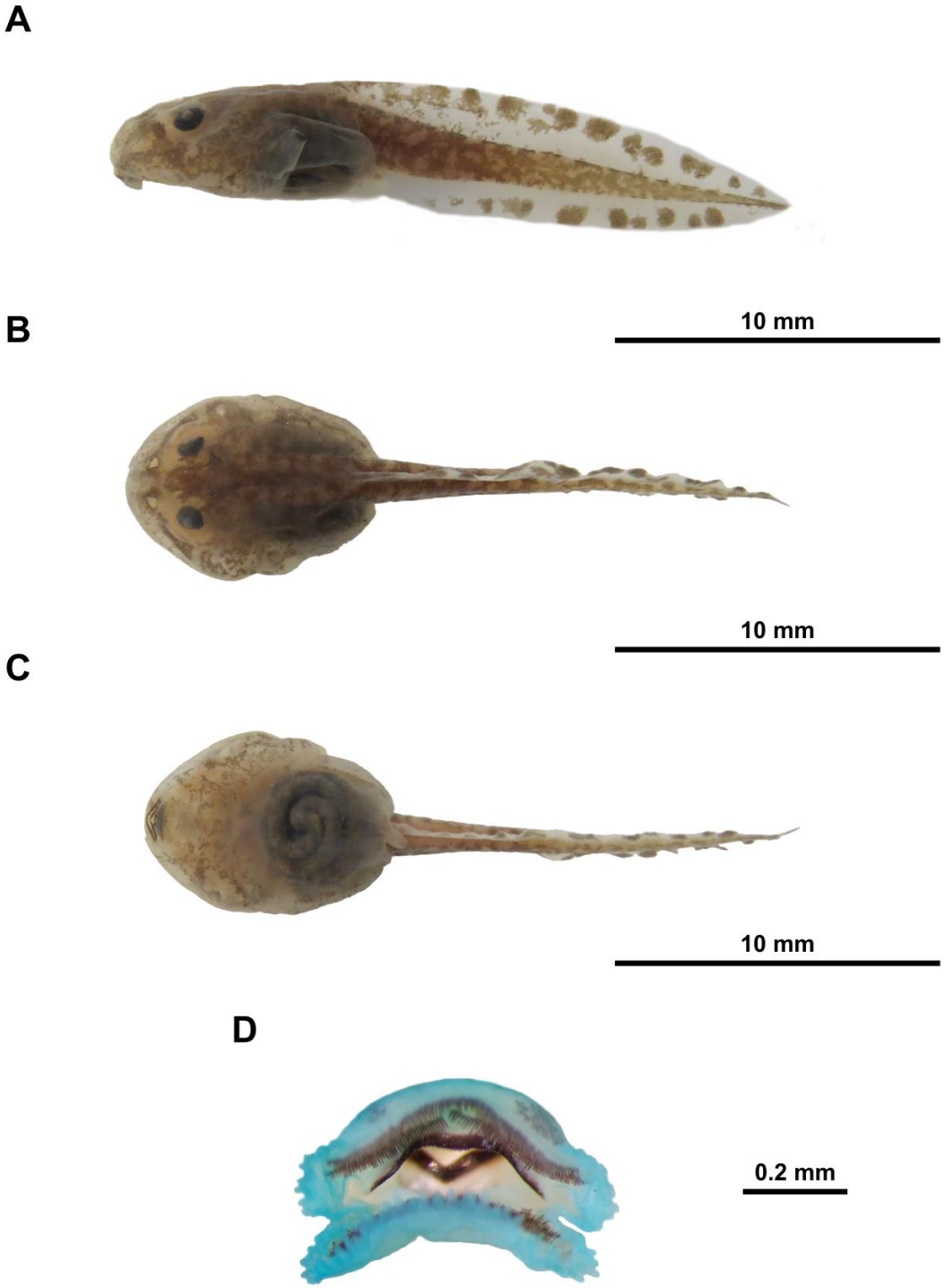

Figure 51. *Physalaemus lateristriga.*

***Physalaemus marmoratus* (Reinhardt & Lutken, 1892; Fig. 52a-d)**

Characterization

We collected eight individuals of *P. marmoratus* in two protected areas: E.E. Assis and P.E. Vassununga. We analysed four individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 23.95 ± 0.2 mm. Body length: 10.3 ± 1.3 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.85 ± 0.1 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.25 ± 0.06 mm of diameter, rounded, positioned dorsally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the middle third of the body, centripetal wall fused to body wall, longer than the external wall, and free distal edge. Vent tube dextral, and fused to ventral fin. Tail length: 14.0 ± 1.25 mm, and 1.35 times the length of the body. Dorsal fin height: 1.75 ± 0.03 mm, slightly convex margin, ending in an acuminate tip, and rises on the border between body and tail at a low slope. Ventral fin height: 0.85 ± 0.1 mm, margin parallel to the longitudinal axis of the tail muscle, and ending in an acuminate tip.

Oral disc: Oral disc ventral, and emarginate laterally. Marginal papillae have one row, dorsal gap, and two narrow ventral gaps. Submarginal papillae have one to five rows that are longer than the marginal papillae. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/2(1), A1-2 of the same length, and P2 shorter than P1.

Coloration in formalin: Body has grayish-brown dorsally covered with black dots forming a semi-circular arch around the internal margin of the nostrils, and transparent ventrally. Spiracle is transparent. Tail is white with large brown spots. Fins are transparent with large brown spots concentrated at the edges of the tail, and show a dark narrow longitudinal medial stripe in the first third of the tail.

Comments: The tadpoles described by Nomura et al. (2003) differ from those studied herein by spiracle long. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) snout oval in dorsal view, and ii) nostrils with a very small projection on the marginal rim.

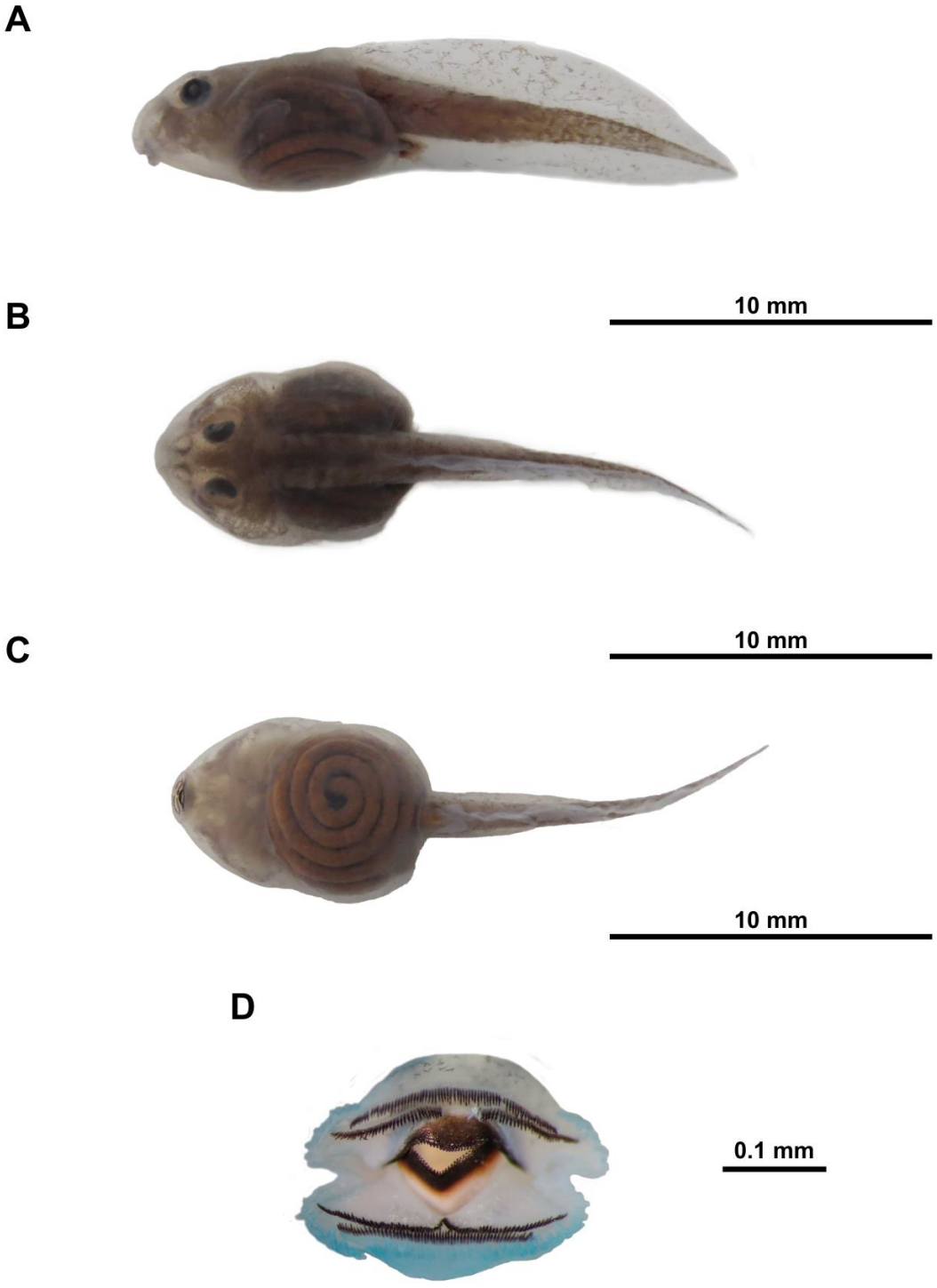

Figure 52. *Physalaemus marmoratus.*

***Physalaemus nattereri* (Steindachner, 1863; Fig. 53a-d)**

Characterization

We collected 83 individuals of *P. nattereri* at E.E. Assis. We analysed seven individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 28.85 ± 7.5 mm. Body length: 12.8 ± 2.5 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout pointed in the dorsal view, and tapered in the lateral view. Eyes with 0.7 ± 0.4 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.15 ± 0.02 mm of diameter, rounded, positioned dorsally, and opening dorsally directed. Spiracle sinistral, long, lateral, opening at the middle third of the body, centripetal wall fused to body wall, and same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 16.3 ± 5.2 mm, and 1.25 times the length of the body. Dorsal fin height: 1.6 ± 0.8 mm, convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 1.0 ± 0.6 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shaped, lower one V-shape, and upper and lower jaw sheath of the same width. Tooth row formula 2(2)/3(1), A1 shorter than A2, P-2 slightly shorter than P-1, and P3 shorter than the others.

Coloration in formalin: Body has light brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with small brown spots. Fins are transparent with large brown spots, and show a dark narrow longitudinal medial stripe in the first third of the tail.

Comments: The tadpoles described by Vizotto (1967) differ from those studied herein by: i) tail rhombus narrowing rapidly from half to the tip; and ii) upper jaw sheath arc-shape. The tadpoles described by Cei (1980) were based on the description of Vizotto (1967). The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) oral disc ventral; ii) upper jaw sheath arc-shape; and iii) ventral fin with margin parallel to the longitudinal axis of the tail muscle. The tadpoles described by Schulze et al (2015) differ from those studied herein by: i) snout rounded in dorsal view, and ii) oral disc ventral.

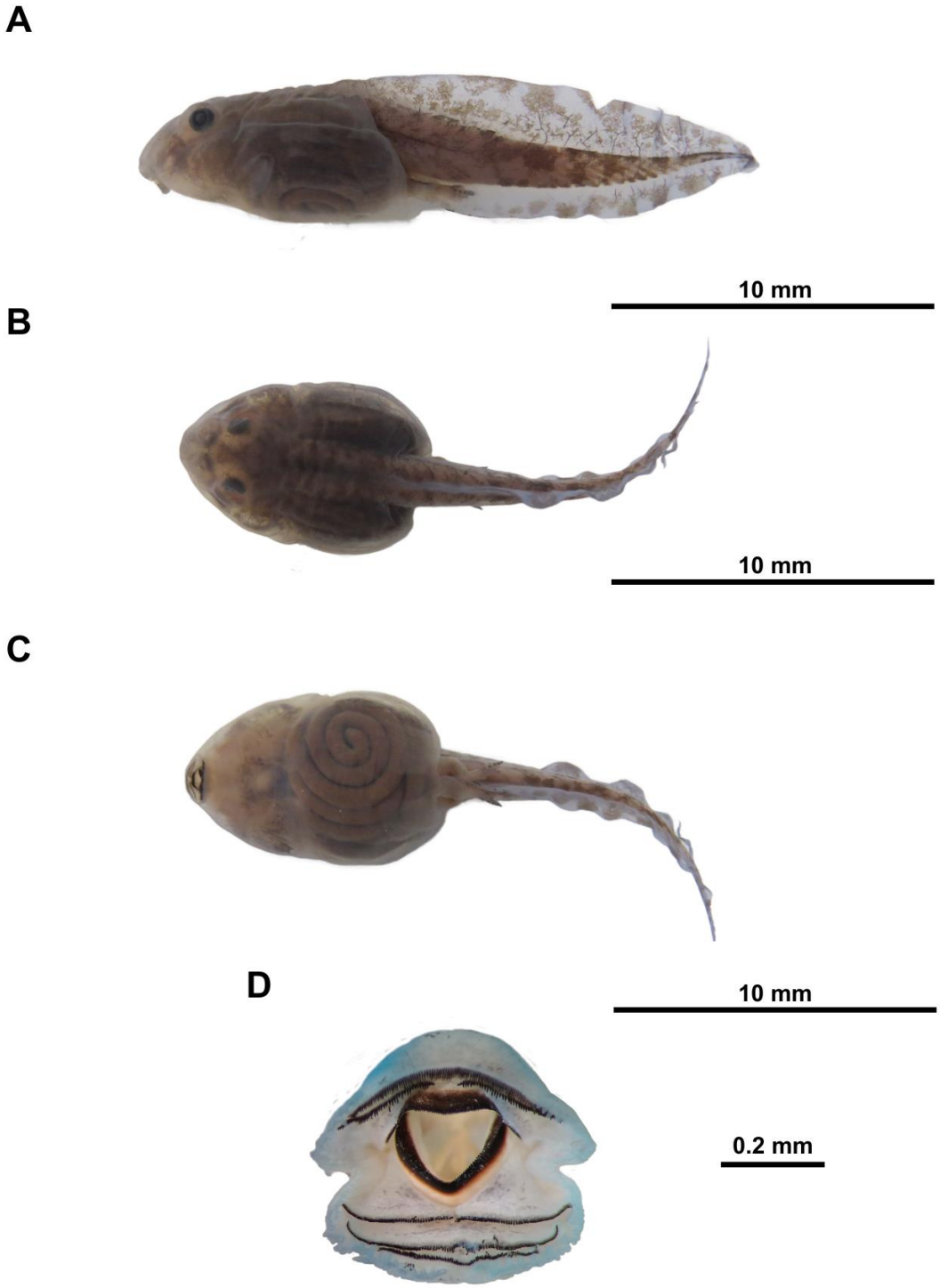

Figure 53. *Physalaemus nattereri.*

***Physalaemus olfersii* (Lichtenstein & Martens, 1856; Fig. 54a-d)**

Characterization

We collected 248 individuals of *P. olfersii* in three protected areas: P.E. Jurupará and PESM núcleos São Sebastião and Santa Virgínia. We analysed thirty-two individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 23.9 ± 2.75 mm. Body length: 10.35 ± 1.2 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.76 ± 0.075 mm of diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.3 ± 0.04 mm of diameter, rounded, positioned dorsally, opening directed dorsally, and projection on marginal rim. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube long, dextral, and fused to ventral fin. Tail length: 13.3 ± 1.85 mm, and 1.3 times the length of the body. Dorsal fin height: 1.6 ± 0.2 mm, slightly convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 1.05 ± 0.2 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row in the upper lip, dorsal gap, and two rows in the lower lip and laterals of the oral disc. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark brown blotches. Fins are transparent with large brown spots concentrated at the edges of the fins.

Comments: The tadpoles described by Giaretta et al. (2009) do not differ from those studied herein.

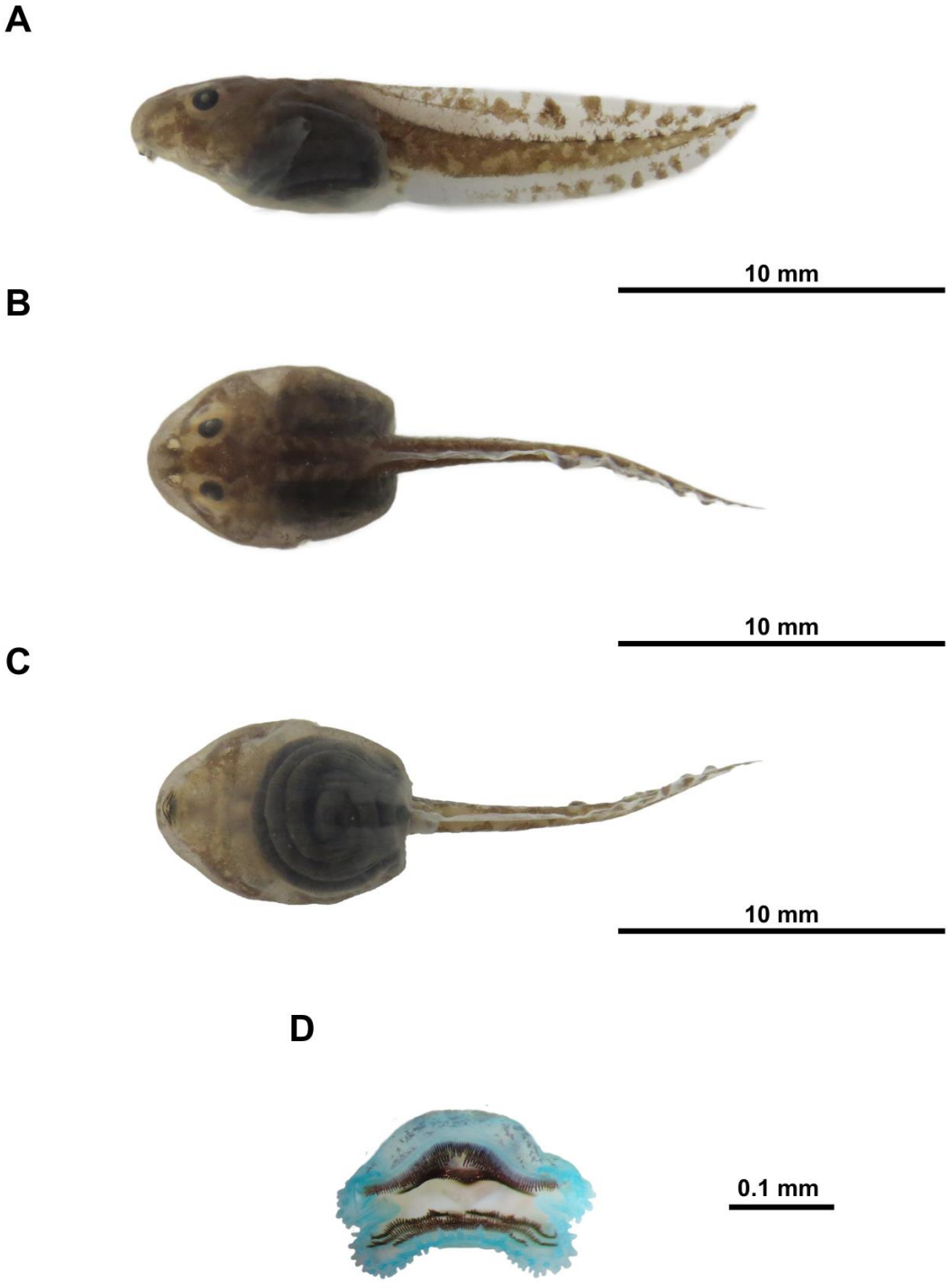

Figure 54. *Physalaemus olfersii.*

Proceratophrys Miranda-Ribeiro, 1920

***Proceratophrys boiei* (Wied-Neuwied, 1824; Fig. 55a-d)**

Characterization

We collected 42 individuals of *P. boiei* in two protected areas: P.E. Carlos Botelho and PESM núcleo São Sebastião. We analysed five individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 40.05 ± 10.65 mm. Body length: 19.65 ± 4.95 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 1.45 ± 0.2 mm diameter, positioned dorsally, and directed dorsolaterally. Nostrils with 0.55 ± 0.09 mm of diameter, elliptical, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, short, lateral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short and dextral. Tail length: 20.4 ± 5.95 mm, and 1.1 times the length of the body. Dorsal fin height: 3.4 ± 0.7 mm, convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 2.85 ± 0.6 mm, and convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1 shorter than A2, P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has beige covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with dark dots. Fins are transparent with dark speckles.

Comments: The tadpoles described in Izecksohn et al. (1979) differ from those studied herein by: i) nostrils reniformes; and iii) submarginal papillae scattered in the laterals of oral disc.

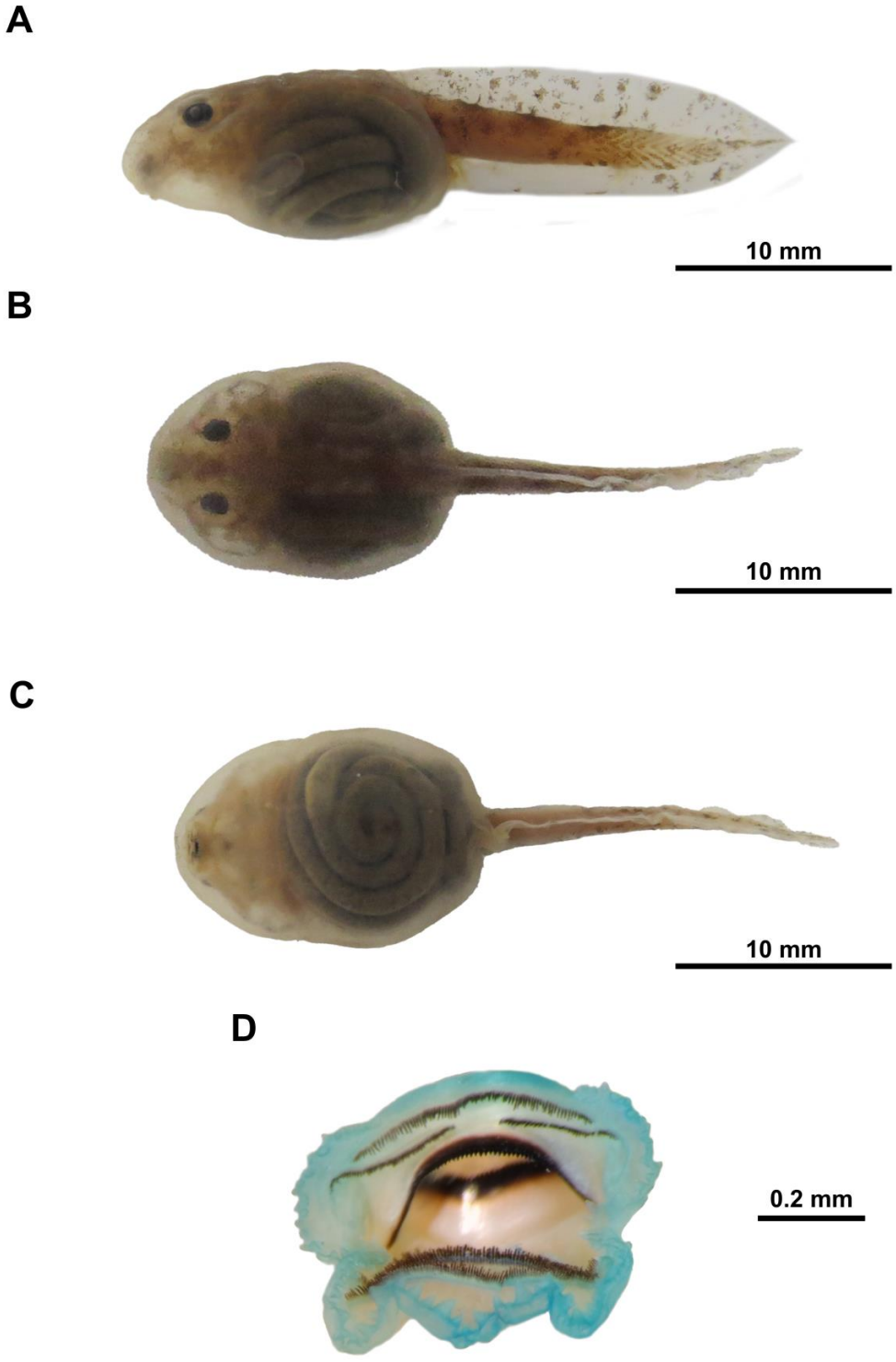

Figure 55. *Proceratophrys boiei.*

Rhinella Fitzinger, 1826

***Rhinella icterica* (Wied-Neuwied, 1824; Fig. 56a-d)**

Characterization

We collected 226 individuals of *R. icterica* in six protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará, PESM núcleos Curucutu and Santa Virgínia, and PETAR. We analysed thirty-four individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 20.0 ± 1.95 mm. Body length: 9.3 ± 1.0 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in dorsal view, and ovoid in lateral view. Eyes with 0.65 ± 0.09 mm diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.2 ± 0.03 mm of diameter, elliptical, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, long, lateral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall with free distal edge. Vent tube short and dextral. Tail length: 10.75 ± 1.15 mm, and 1.5 times the length of the body. Dorsal fin height: 1.5 ± 0.35 mm, convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 1.35 ± 0.3 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3, A1-2 and P1-3 of the same length.

Coloration in formalin: Body has dark gray covered with dark dots dorsally, and opaque or grayish ventrally. Spiracle is transparent. Tail is dark brown with dark dots. Fins are transparent with dark speckles.

Comments: The tadpoles described in Cei (1980) differ from those studied herein by: i) nostrils elliptical.

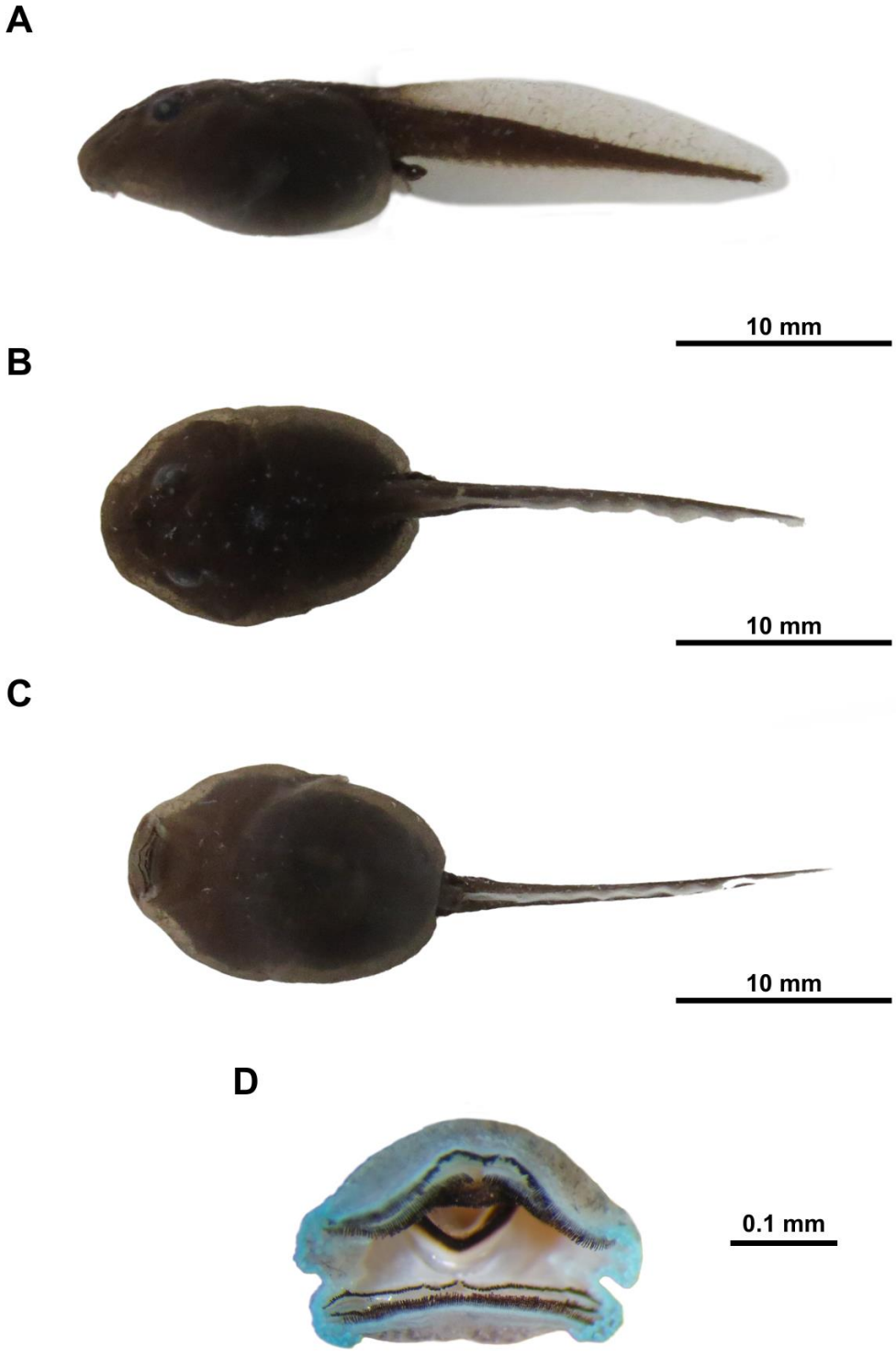

Figure 56. *Rhinella icterica.*

***Rhinella ornata* (Spix, 1824; Fig. 57a-d)**

Characterization

We collected 148 individuals of *R. ornata* in five protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupara, PESM núcleo Curucutu and PETAR. We analysed nineteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 18.35 ± 1.65 mm. Body length: 8.2 ± 0.65 mm. Body ovoid in dorsal view, and ovoid/globular in lateral view. Snout rounded in dorsal and lateral views. Eyes with 0.55 ± 0.08 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.25 ± 0.045 mm of diameter, elliptical, positioned anterolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall with free distal edge. Vent tube short and medial. Tail length: 10.3 ± 0.1 mm, and 1.25 times the length of the body. Dorsal fin height: 1.5 ± 0.1 mm, slightly convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 1.45 ± 0.15 mm, and slightly convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row in the laterals of the oral disc, and are absent in the upper and lower lips. Submarginal papillae have two rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3, A1-2 and P1-3 of the same length.

Coloration in formalin: Body has dark brown covered with dark dots dorsally, and opaque ventrally. Spiracle is transparent. Tail is dark brown with dark dots. Fins are transparent with dark speckles.

Comments: The tadpoles described by Heyer et al. (1990) differ from those studied herein by eyes directed laterally.

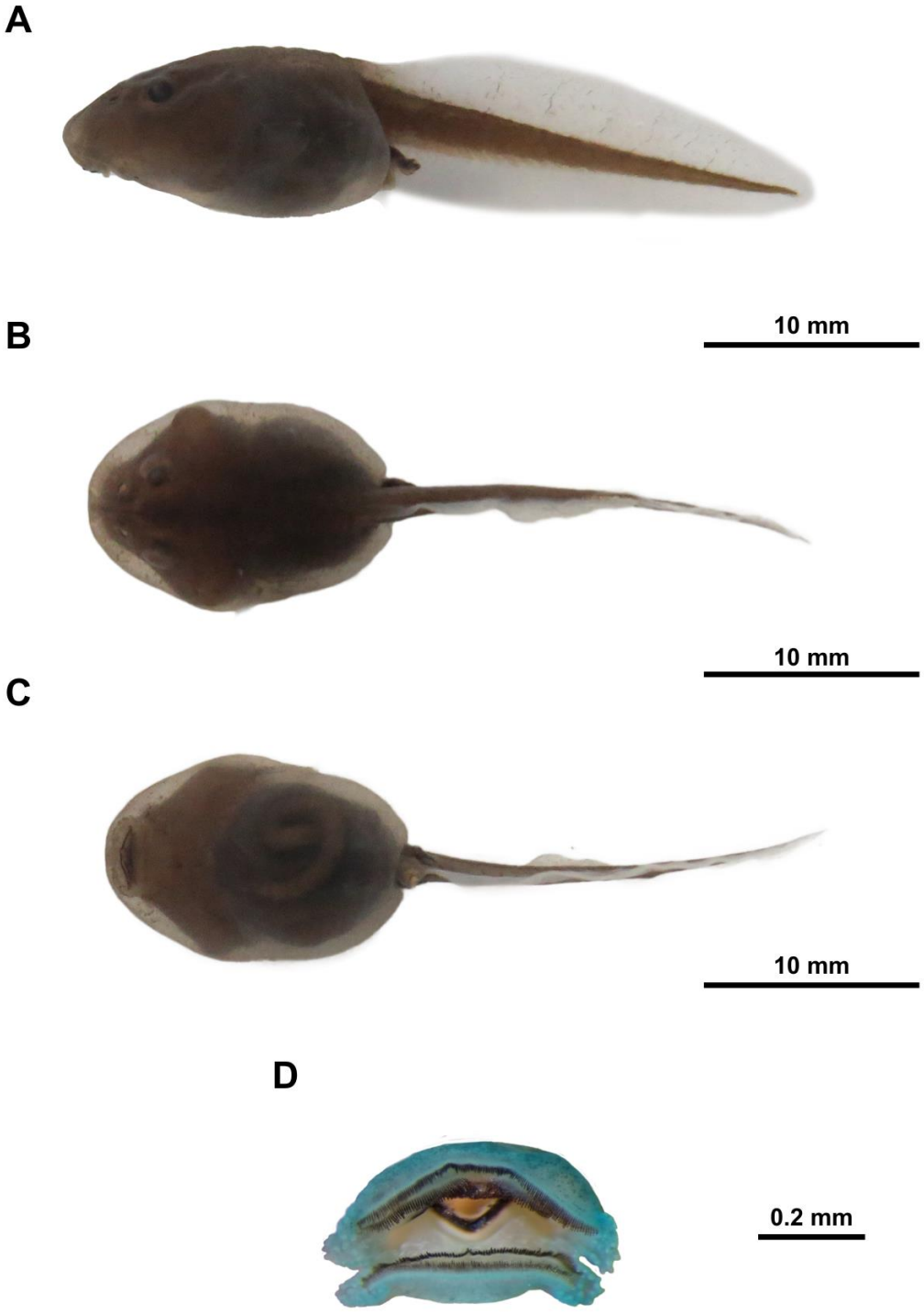

Figure 57. *Rhinella ornata.*

***Rhinella schneideri* (Werner, 1894; Fig. 58a-d)**

Characterization

We collected 2764 individuals of *R. schneideri* in three protected areas: E.E. Caetetus, E.E. Santa Bárbara and FEENA. We analysed thirty individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 21.15 ± 1.15 mm. Body length: 9.9 ± 1.5 mm. Body ovoid in dorsal view, and globular/depressed in lateral view. Snout rounded in the dorsal, and sloped in the lateral view. Eyes with 0.75 ± 0.055 mm of diameter, positioned dorsolaterally, and directed dorsolaterally. Nostrils with 0.35 ± 0.1 mm of diameter, ovoid, positioned dorsally, and opening directed dorsolaterally. Spiracle sinistral, long, lateral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, medial, and fused to ventral fin. Tail length: 11.3 ± 0.45 mm, and 1.15 times the length of the body. Dorsal fin height: 1.0 ± 0.2 mm, slightly convex margin, and rises on the border between body and tail at a high slope. Ventral fin height: 1.05 ± 0.2 mm, and margin parallel to the longitudinal axis of the tail muscle.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal and ventral gaps. Submarginal papillae have one to two rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3, A1-2 of the same length, and P-3 a little shorter than P-1 and P-2.

Coloration in formalin: Body has dark gray covered with dark dots dorsally, and whitish ventrally. Spiracle is transparent. Tail is dark gray with dark dots. Fins are transparent with dark speckles.

Comments: The tadpoles described by Vizotto (1967) differ from those studied herein by: i) body elliptical in dorsal view; ii) nostrils reniform; and iii) oral disc ventral; iv) upper jaw sheath arc-shape and lower one angular in the medial part. The tadpoles described in Cei (1980) were based on the description of Vizotto (1967). The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) eyes directed laterally; ii) nostrils with a very small projection on the marginal rim; and iii) upper jaw sheath arc-shape and lower one U-shape.

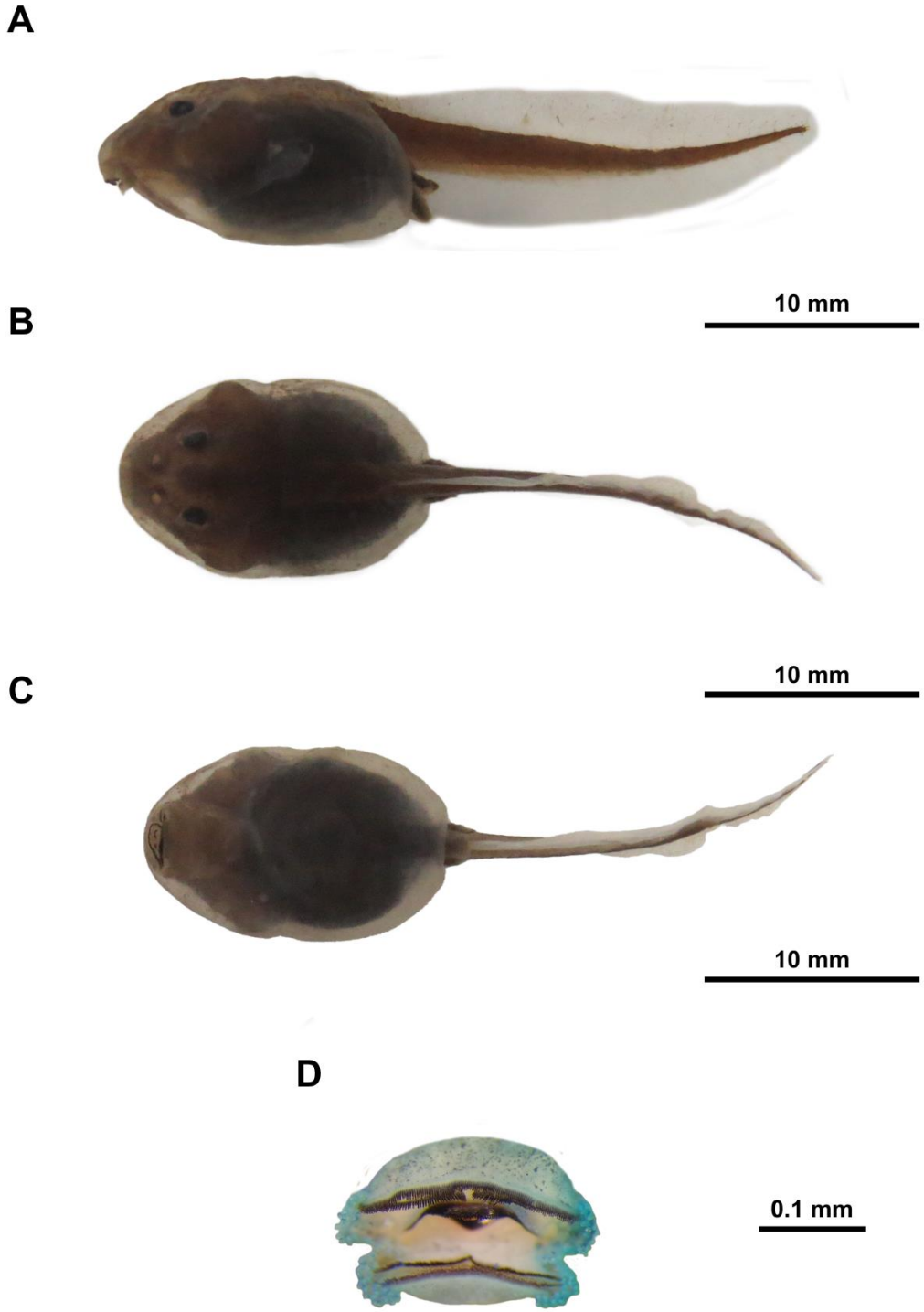

Figure 58. *Rhinella schneideri*.

Scinax Wagler, 1830

***Scinax crospedospilus* (Lutz, 1925; Fig. 59a-d)**

Characterization

We collected 23 individuals of *S. crospedospilus* in two protected areas: P.E. Carlos Botelho and P.E. Jurupará. We analysed eight individuals in the stages 33 to 37 for morphological characterization (Appendix Table S1).

Body: Total length: 32.6 ± 2.9 mm. Body length: 10.75 ± 0.75 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout truncated in dorsal view and slightly tapered in lateral view. Eyes with 1.4 ± 0.4 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.3 ± 0.85 mm of diameter, rounded, positioned dorsolaterally, and opening directed dorsolaterally. Spiracle sinistral, long, dorsolateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 21.95 ± 2.35 mm, and 2.05 times the length of the body. Dorsal fin height: 2.45 ± 0.4 mm, slightly convex margin, and rises midway on body length. Ventral fin height: 2.6 ± 0.75 mm, and convex margin.

Oral disc: Oral disc terminal. Marginal papillae have one row interrupted on upper and lower lips. Submarginal papillae have one to two rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(1,2)/3(1), A1-2 of the same length, P-2 longer than P-1, P-3 shorter than the others and P-3 appearing as a modified part of the lower lip.

Coloration in formalin: Body has light brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is beige with dark dots. Fins are transparent with dark dots, and show a longitudinal narrow dark medial stripe located at the first third of the tail.

Comments: The tadpoles described by Heyer et al. (1990) differ from those studied herein by: i) nostrils elliptical; ii) oral disc anteroventral, and iii) body and tail gray.

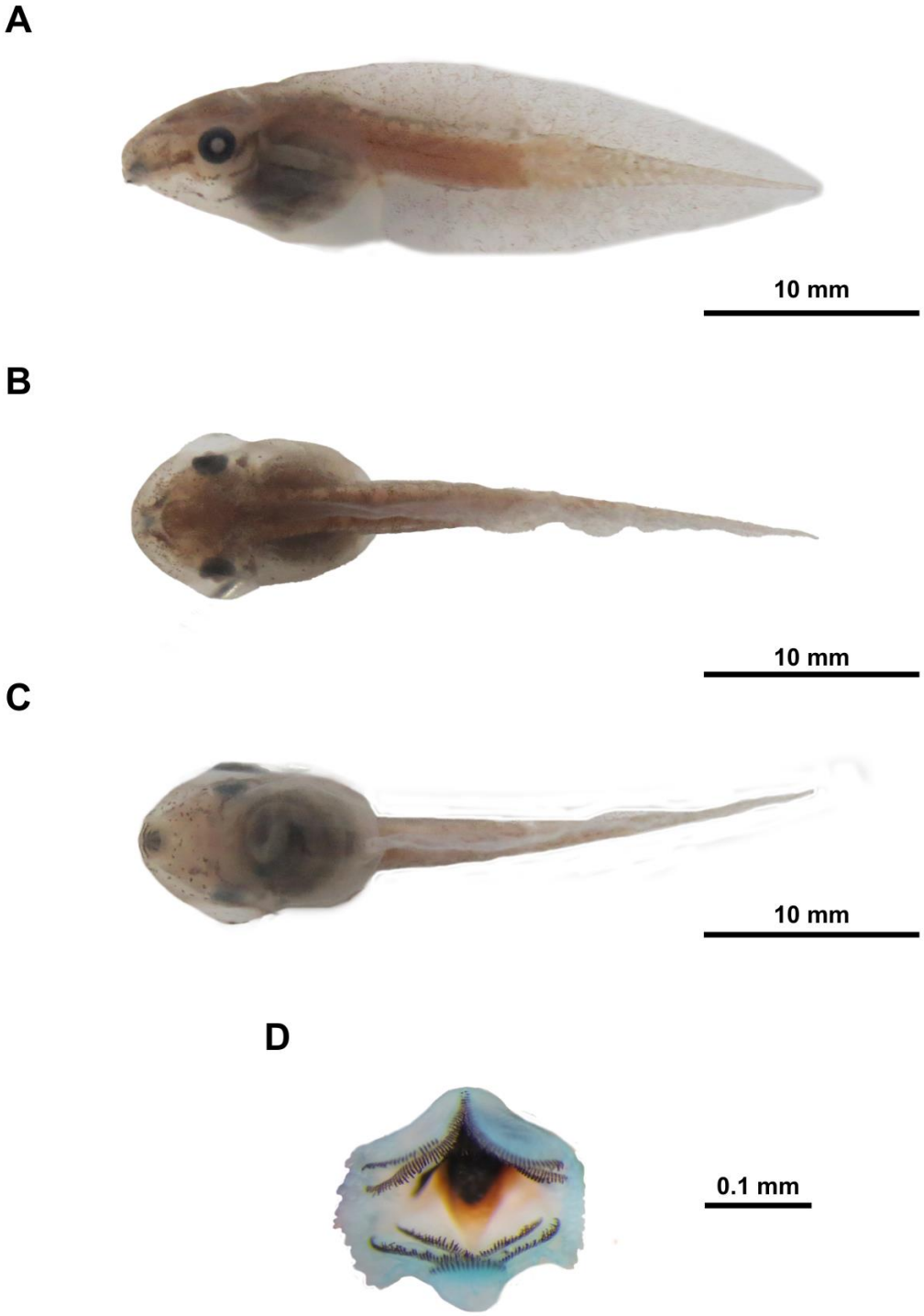

Figure 59. *Scinax crospedospilus.*

***Scinax fuscomarginatus* (Lutz, 1925; Fig. 60a-d)**

Characterization

We collected 203 individuals of *S. fuscomarginatus* in two protected areas: E.E. Caetetus and E.E. Santa Bárbara. We analysed eighteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 26.4 ± 3.2 mm. Body length: 8.5 ± 0.7 mm. Body ovoid in dorsal view, truncated in the anterior portion, and triangular/compressed in lateral view. Snout rounded in dorsal view and lateral views. Eyes with 1.05 ± 0.045 mm diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.2 ± 0.02 mm of diameter, ovoid, positioned dorsolaterally, and opening directed dorsolaterally. Spiracle sinistral, short, dorsolateral, opening at the middle third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 17.45 ± 2.65 mm, 2.05 times the length of the body, and ending in a flagellum. Dorsal fin height: 2.3 ± 0.3 mm, convex margin, and rises on the anterior third of the body at a high slope. Ventral fin height: 2.25 ± 0.25 mm, and convex margin tapering abruptly at the tip.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae are absent. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-A2 of the same length, P1-P2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has gray covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is gray with dark dots. Fins are transparent with brown blotches, few blood vessels apparent, and show a longitudinal narrow dark medial stripe located at the first third of the tail.

Comments: The tadpoles described by Vizotto (1967; treated as *Hyla parkeri*) differ from those studied herein by: i) body rhombus in lateral view; ii) nostrils reniform; iii) marginal papillae have two rows in the laterals of oral disc; iv) lower jaw sheath arc-shape; and v) tooth row formula 2(2)/3 with tendency for bipartition of P-1. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those studied herein by: i) eyes positioned laterally; ii) nostrils rounded; iii) submarginal papillae aggregated in the lateral of oral disc; iv) P-2 longer than P-1 and P-3; v) lower jaw sheath U-shape; vi) body has light brown coloration.

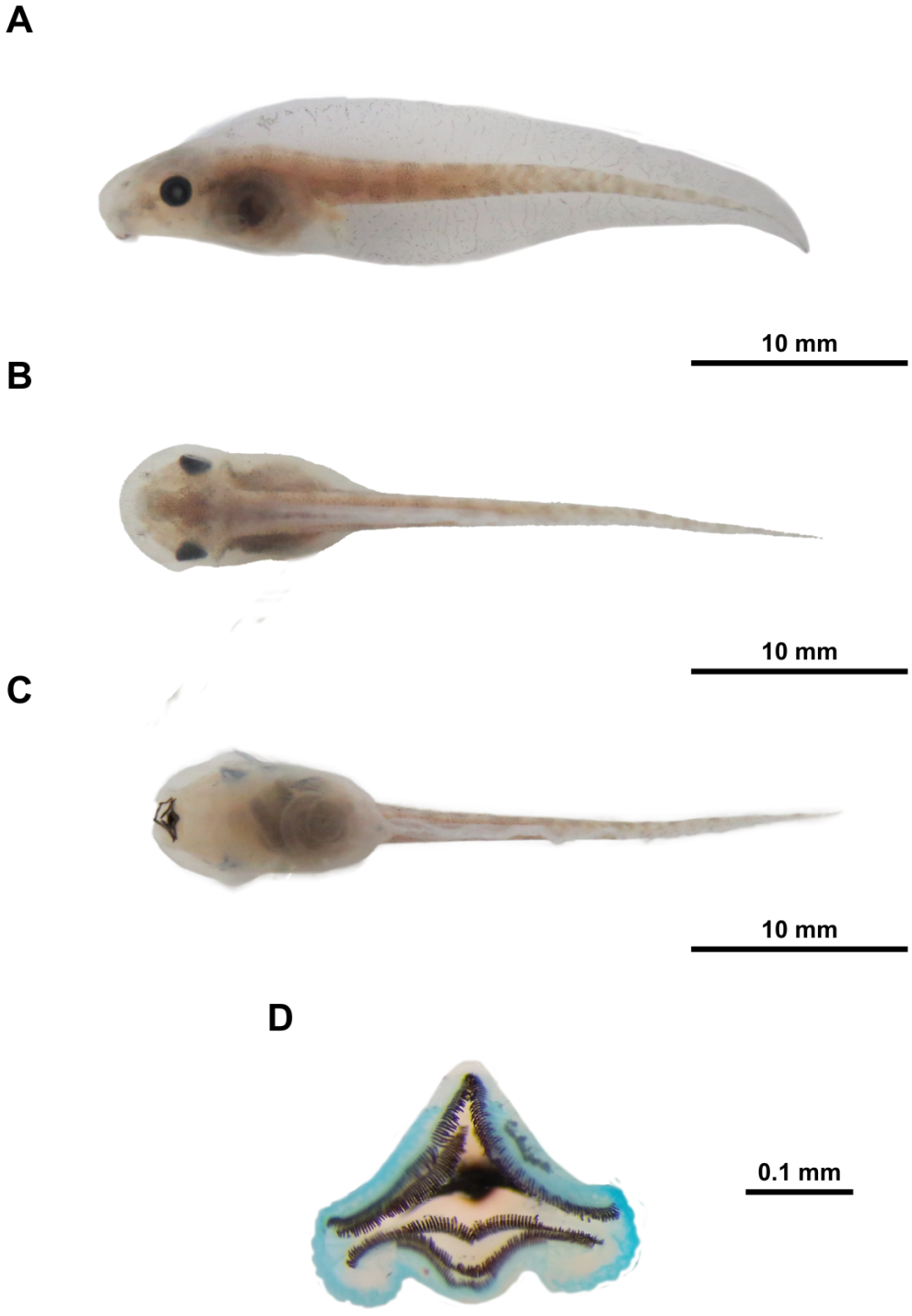

Figure 60. *Scinax fuscomarginatus.*

***Scinax fuscovarius* (Lutz, 1925; Fig. 61a-d)**

Characterization

We collected 926 individuals of *S. fuscovarius* in eight protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Jataí, E. E. Santa Bárbara, FEENA, P.E. Carlos Botelho and P.E. Vassununga. We analysed seventy-six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 39.7 ± 5.25 mm. Body length: 12.45 ± 1.35 mm. Body compressed ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view and sloped in the lateral view. Eyes with 1.6 ± 0.2 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.4 ± 0.07 mm of diameter, oval, positioned dorsolaterally, and opening directed laterally. Spiracle sinistral, long, dorsolateral, opening at the posterior third of the body, and centripetal wall fused to body wall and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 27.0 ± 4.2 mm, and 2.15 times the length of the body. Dorsal fin height: 4.45 ± 0.65 mm, convex margin, and rises on the middle third of the body at a median slope. Ventral fin height: 4.9 ± 0.8 mm, and convex margin margin tapering abruptly at the tip.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae are sparse in the lateral regions of the oral disc. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-A2 of the same length, P1-P2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has grayish-brown covered with brown dots and a few large brown spots dorsally, but some individuals show a silverfish-brown coloration, and transparent ventrally. Spiracle is transparent. Tail is grayish-brown with dark dots. Fins are transparent with brown dots, few blood vessels apparent, and show a longitudinal narrow dark medial stripe located at the first third of the tail. Between the internal and interocular space there is a dark contour pattern like the bell format.

Comments: The tadpoles described by Vizotto (1967) differ from those studied herein by: i) body rhombus in lateral view; ii) nostrils elliptical; and iii) submarginal papillae have four to six rows in the lateral region of the oral disc. The tadpoles described in Cei (1980) were based on the description of Vizotto (1967). The tadpoles described by Rossa-Feres & Nomura

(2006) differ from those studied herein by: i) oral disc emarginate ventrally; and ii) upper jaw sheath M-shape. The tadpoles described by Schulze et al. (2015) differ from those studied herein by: i) nostrils ovoid; and ii) upper jaw sheath M-shape.

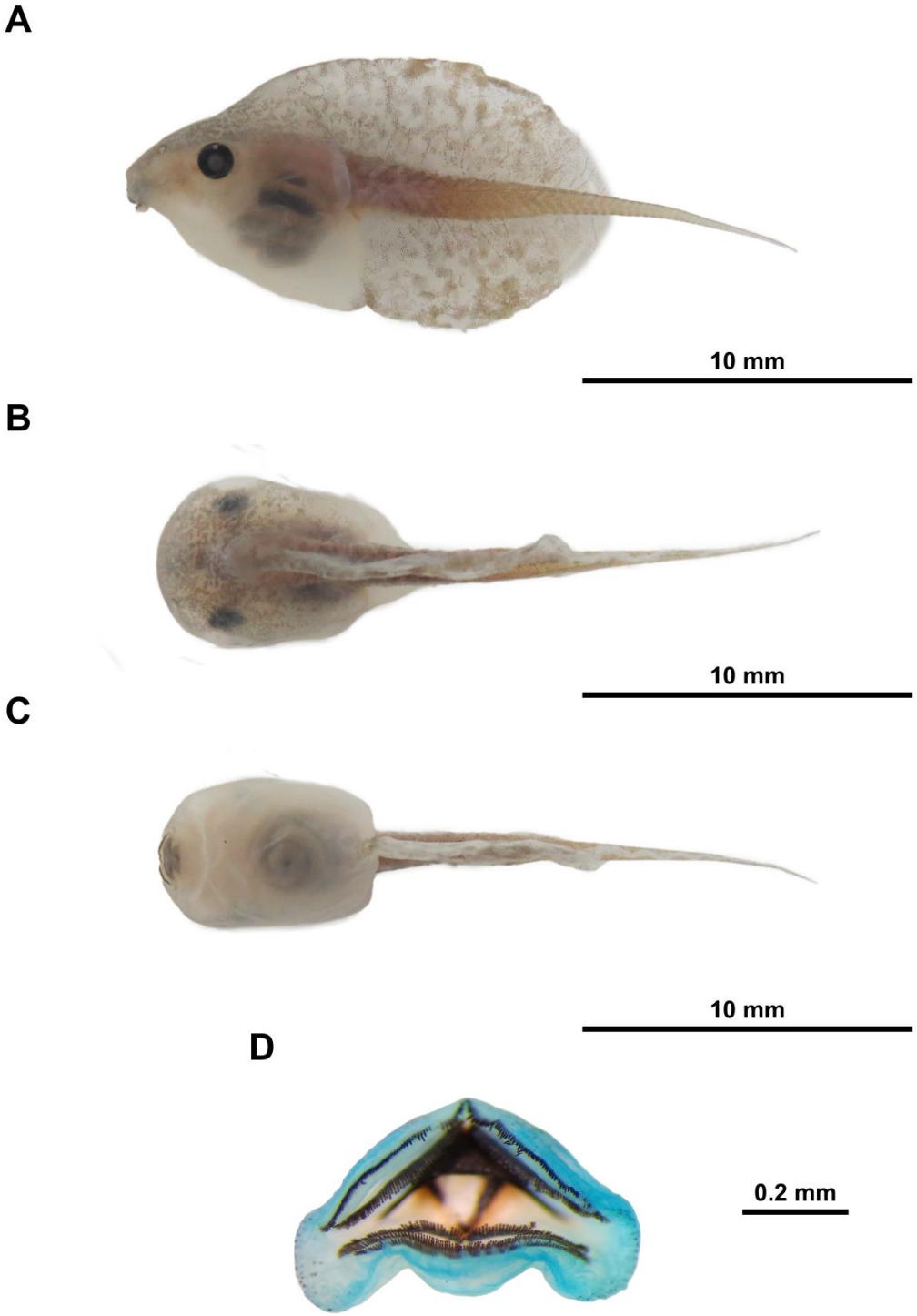

Figure 61. *Scinax fuscovarius.*

***Scinax hayii* (Barbour, 1909; Fig. 62a-d)**

Characterization

We collected 449 individuals of *S. hayii* at PESM núcleo Santa Virgínia. We analysed thirty-two individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 30.5 ± 3.3 mm. Body length: 11.2 ± 0.8 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 1.4 ± 0.1 mm of diameter, eyes positioned laterally, and directed laterally. Nostrils with 0.3 ± 0.04 mm of diameter, rounded, positioned dorsolaterally, opening directed dorsally. Spiracle sinistral, long, lateral, opening at the posterior third of the body, and centripetal wall fused to body wall and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 20.0 ± 2.3 mm, and 1.8 times the length of the body. Dorsal fin height: 3.4 ± 0.35 mm, convex margin, and rises on the middle of the body length at a high slope. Ventral fin height: 3.45 ± 0.35 mm, and convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae have three to four rows in the laterals of the oral disc. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(1,2)/3(1). A1-2 and P1-3 of the same length.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with dark dots. Fins are transparent with dark dots, few blood vessels apparent, and show a narrow dark longitudinal medial stripe located at the first third of the tail.

Comments: The tadpoles described by Heyer et al. (1990) differ from those studied herein by body sub-cylindrical in dorsal view.

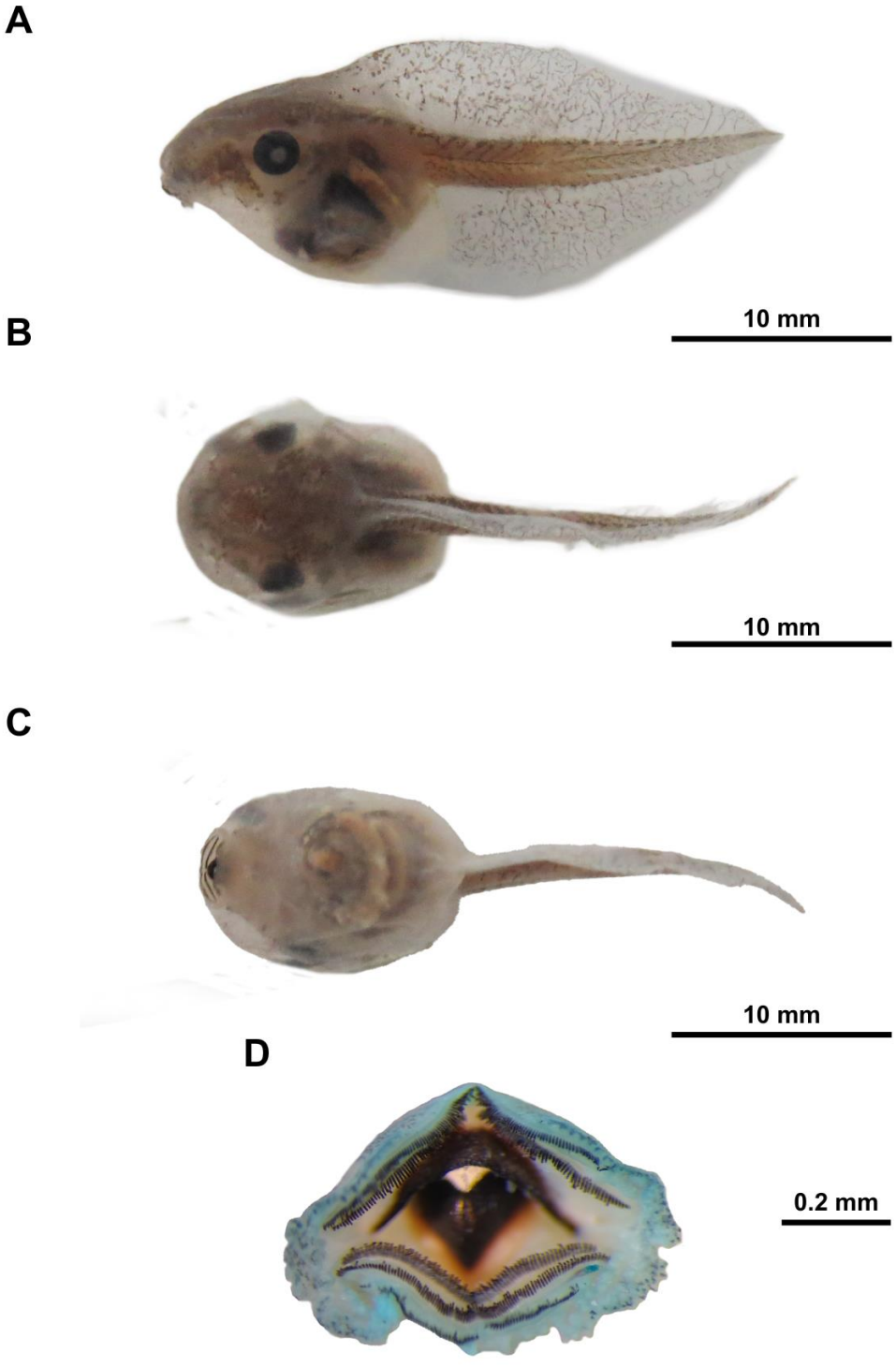

Figure 62. *Scinax hayii*.

***Scinax imbegue* Nunes, Kwet & Pombal, 2012 (Fig. 63a-d)**

Characterization

We collected 50 individuals of *S. imbegue* at E.E. Juréia-Itatins. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 26.75 ± 6.6 mm. Body length: 9.5 ± 6.6 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 1.05 ± 0.35 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.2 ± 0.01 mm of diameter, ovoid, positioned dorsolaterally, and opening directed dorsally. Spiracle sinistral, long, lateral, opening at the posterior third of the body, and centripetal wall fused to body wall and of the same length as the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 17.3 ± 5.0 mm, and 1.8 times the length of the body. Dorsal fin height: 2.55 ± 0.65 mm, convex margin, and rises on the border between body and tail at a median slope. Ventral fin height: 2.5 ± 0.75 mm, and convex margin.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae have three to four rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is light brown with dark dots. Fins are transparent with dark dots, few blood vessels apparent, and show a narrow dark longitudinal medial stripe located at the first third of the tail.

Comments: There is no description of *S. imbegue* tadpoles in the literature.

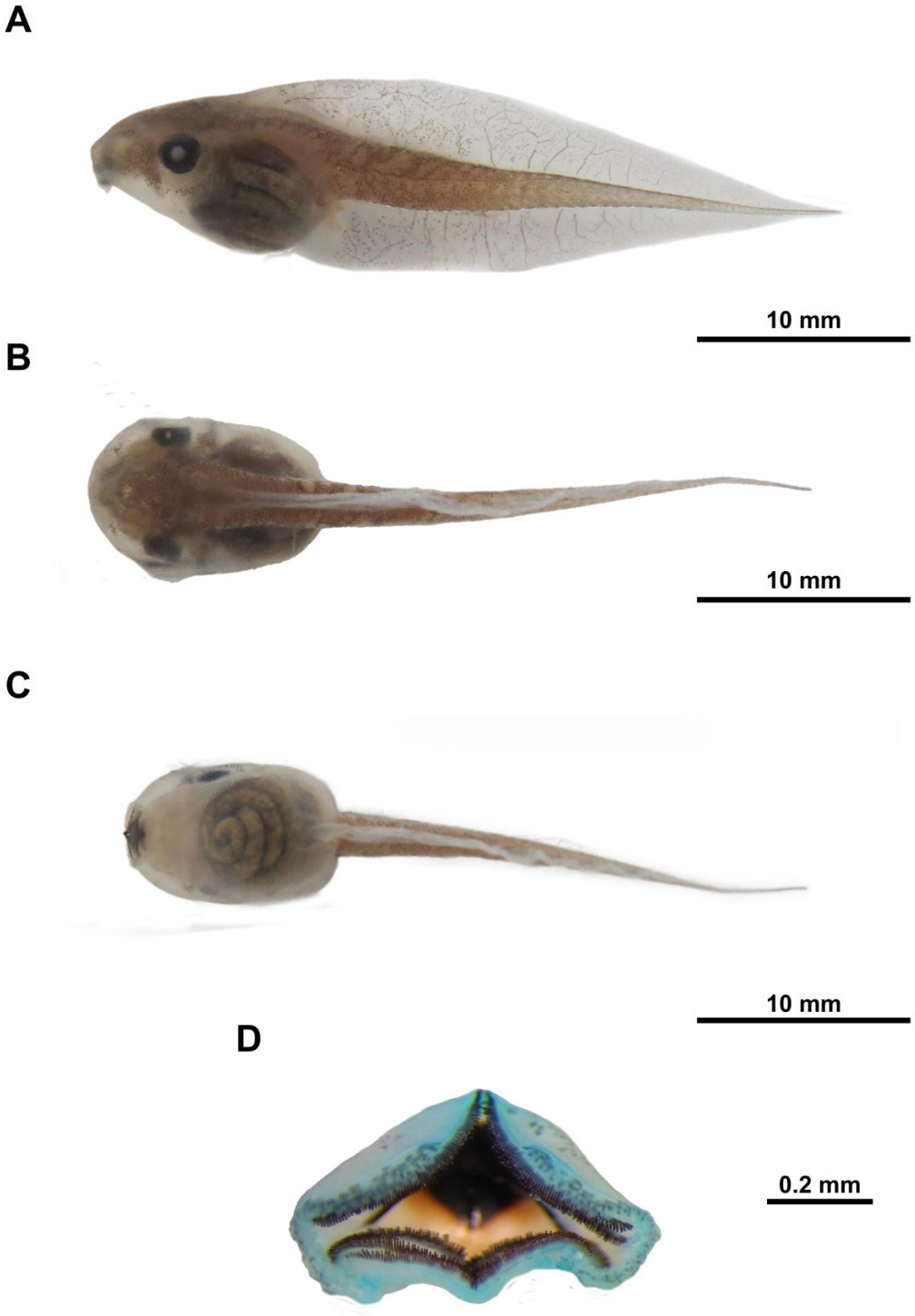

Figure 63. *Scinax imbegue.*

Scinax perereca Pombal, Haddad & Kashara, 1995 (Fig. 64a-d)

Characterization

We collected 273 individuals of *S. perereca* in five protected areas: E.E. Juréia-Itatins, P.E. Carlos Botelho, P.E. Jurupará, PESM núcleo Curucutu, and PETAR. We analysed fifteen individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 30.35 ± 2.85 mm. Body length: 9.95 ± 1.55 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view, and pointed in the lateral view. Eyes with 1.3 ± 0.15 mm of diameter, positioned dorsolaterally, and directed laterally. Nostrils with 0.3 ± 0.025 mm of diameter, rounded/ovoid, positioned dorsolaterally, and opening directed dorsally. Spiracle sinistral, short, lateroventral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 20.55 ± 1.5 mm, and 2.05 times the length of the body. Dorsal fin height: 3.2 ± 0.8 mm, convex margin, and rises on the middle third of the body at a low slope. Ventral fin height: 3.3 ± 0.75 mm, and convex margin tapering at the end.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have one row, and dorsal gap. Submarginal papillae have one to two rows in the laterals of the oral disc, and part of the lower lip. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-A2 of the same length, and P1-P3 of the same length.

Coloration in formalin: Body has brown covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with few large dark spots. Fins are transparent with dark blotches, and blood vessels apparent.

Comments: The tadpoles described by Pugliese & Bastos (2001) differ from those studied herein by: i) nostrils positioned dorsally; ii) marginal papillae variable in number and arrangement – some specimens present them in most of oral disc, expect for a small part on upper labium, whereas others present marginal papillae only on lower labium, extending a little to lateral portion; and ii) tail has yellowish coloration.

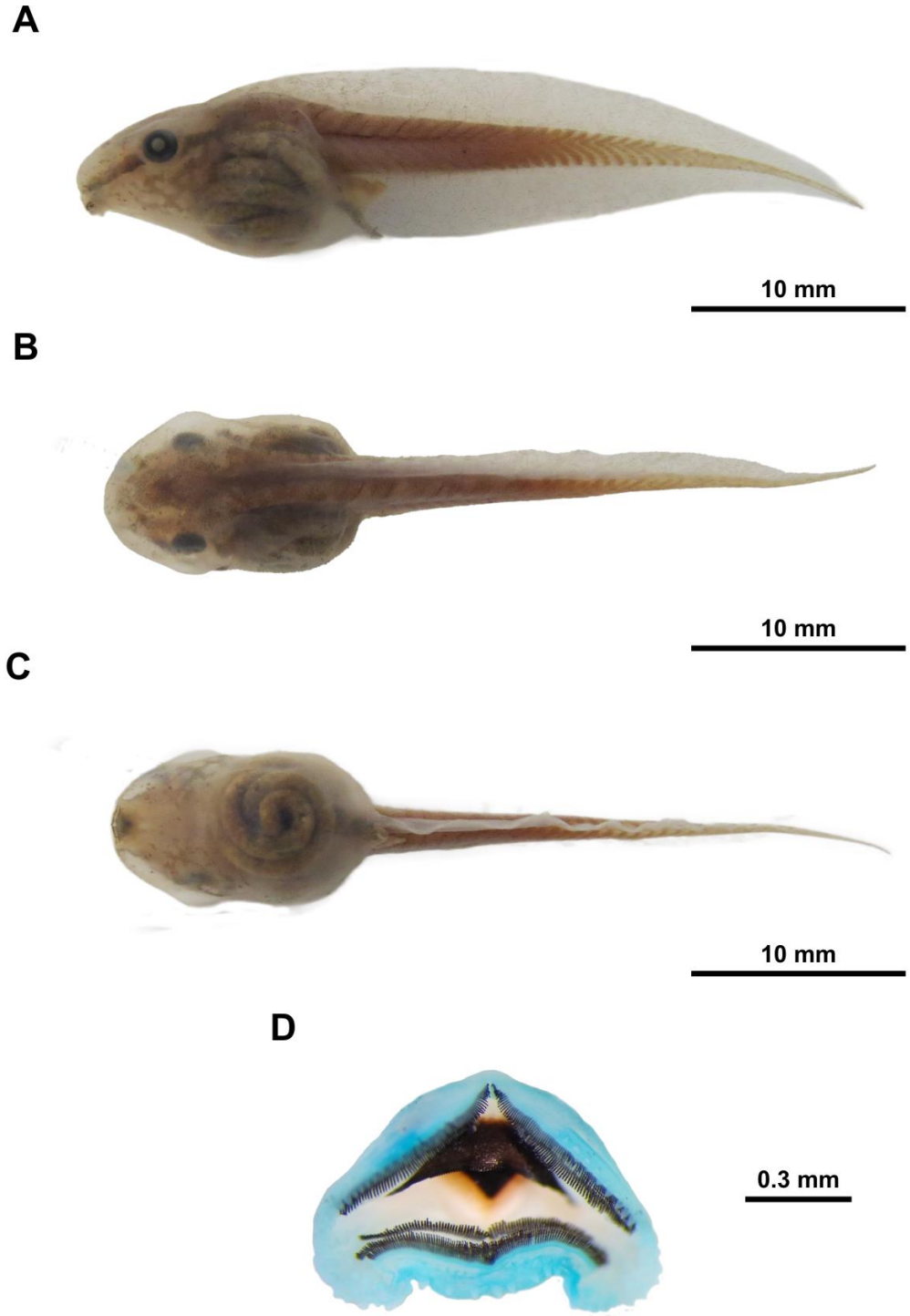

Figure 64. *Scinax perereca.*

***Scinax similis* (Cochran, 1952; Fig. 65a-d)**

Characterization

We collected 355 individuals of *S. similis* in six protected areas: E.E. Assis, E.E. Caetetus, E.E. Itirapina, E.E. Santa Bárbara, FEENA and P.E. Vassununga. We analysed twenty-eight individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 30.45 ± 2.85 mm. Body length: 9.8 ± 0.45 mm. Body ovoid in dorsal view, and triangular in lateral view. Snout rounded in the dorsal view, and sloped in the lateral view. Eyes with 1.5 ± 0.3 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.3 ± 0.065 mm of diameter, ovoid, positioned dorsolaterally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall, and longer than the external wall. Vent tube short, dextral, and fused to ventral fin. Tail length: 20.35 ± 2.85 mm, 2.05 times the length of the body, and ending in a flagellum. Dorsal fin height: 2.9 ± 0.3 mm, convex margin, and rises on the middle of the body at a low slope. Ventral fin height: 2.95 ± 0.25 mm, and convex margin tapering sharply at the end.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and dorsal gap. Submarginal papillae have one irregular row in the laterals of the oral disc. Jaw sheath thick, finely serrated, upper one M-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has gray covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail is gray with large dark spots. Fins are transparent with large dark spots, show a longitudinal narrow medial stripe located at the first third of the tail, and lateral stripe from snout to eye not always clear.

Comments: The tadpoles described by Alves & Silva (1999) differ from those by: i) upper jaw sheath arc-shape; and ii) body and tail have cream coloration. The tadpoles described by Rossa-Feres & Nomura (2006) differ from those by: i) nostrils rounded; ii) oral disc emarginated ventrally; and iii) body light brown dorsally.

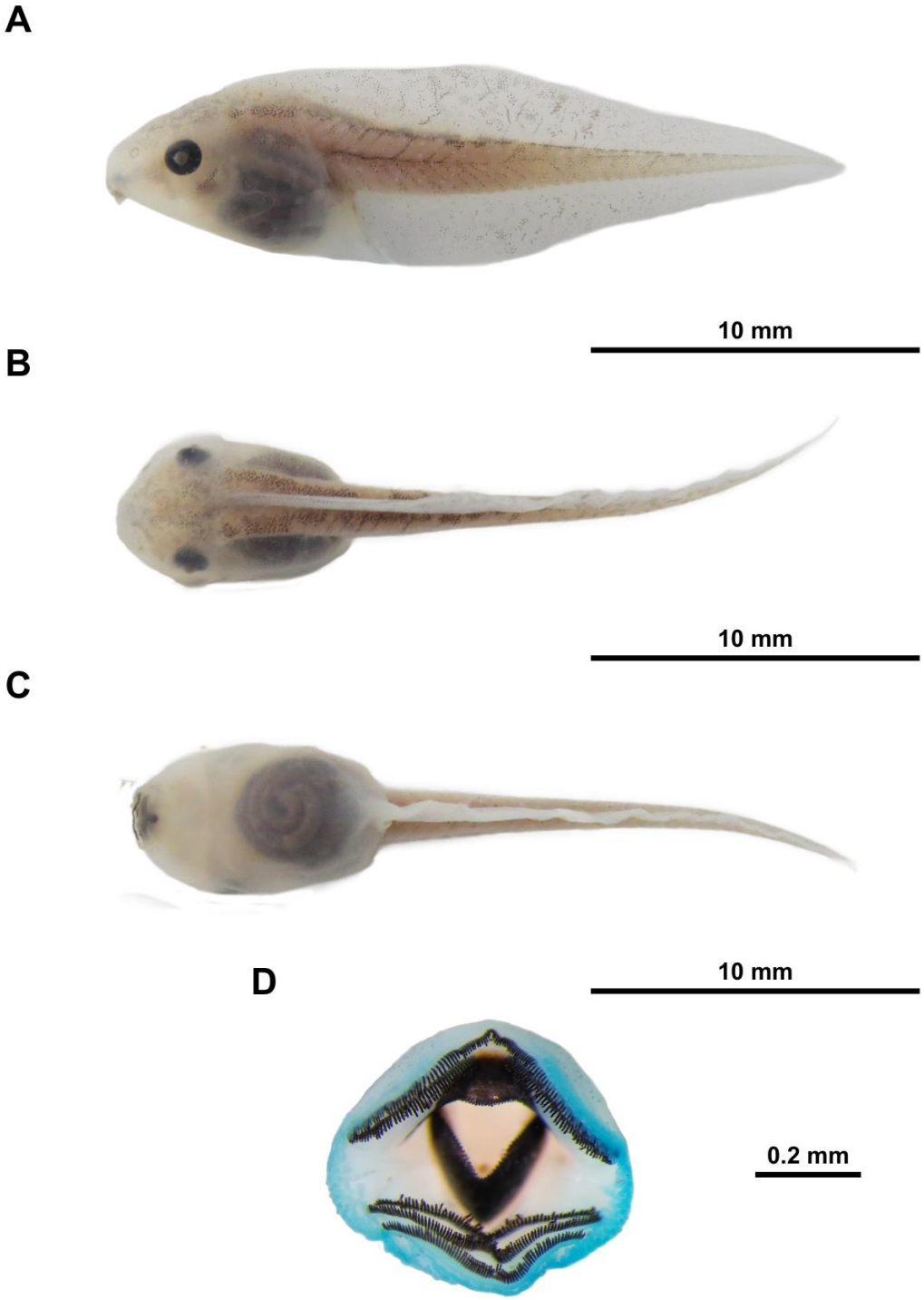

Figure 65. *Scinax similis.*

***Scinax tymbamirim* Nunes, Kwet & Pombal, 2012 (Fig. 66a-d)**

Characterization

We collected 149 individuals of *S. tymbamirim* in five protected areas: E.E. Juréia-Itatins, P.E. Jurupará, PESM núcleos Curucutu and São Sebastião, and PETAR. We analysed six individuals in the stages 33 to 38 for morphological characterization (Appendix Table S1).

Body: Total length: 26.85 ± 3.25 mm. Body length: 9.3 ± 0.85 mm. Body ovoid in dorsal view, and triangular-elongated in lateral view. Snout rounded in dorsal and lateral views. Eyes with 1.0 ± 0.09 mm of diameter, positioned laterally, and directed laterally. Nostrils with 0.2 ± 0.04 mm of diameter, rounded, positioned dorsolaterally, and opening directed dorsally. Spiracle sinistral, short, lateral, opening at the posterior third of the body, centripetal wall fused to body wall and longer than the external wall, and free distal edge. Vent tube short, dextral, and fused to ventral fin. Tail length: 17.6 ± 2.9 mm, and 1.9 times the length of the body. Dorsal fin height: 2.15 ± 0.2 mm, convex margin, and rises on the border between body and tail at a low slope. Ventral fin height: 2.2 ± 0.3 mm, and convex margin.

Oral disc: Oral disc anteroventral. Marginal papillae have one row, and dorsal gap. Submarginal papillae have one to two rows in the laterals of the oral disc. Jaw sheath thick, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 2(2)/3(1), and A1-2 and P1-2 of the same length, and P3 shorter than the others.

Coloration in formalin: Body has brown covered with dark dots and few dark speckles dorsally, and transparent ventrally. Spiracle is transparent. Tail is brown with large dark spots. Fins are transparent with dark speckles, blood vessels apparent, and show a longitudinal narrow medial stripe located at the first third of the tail.

Comments: There is no description of *S. tymbamirim* tadpoles in the literature**.**

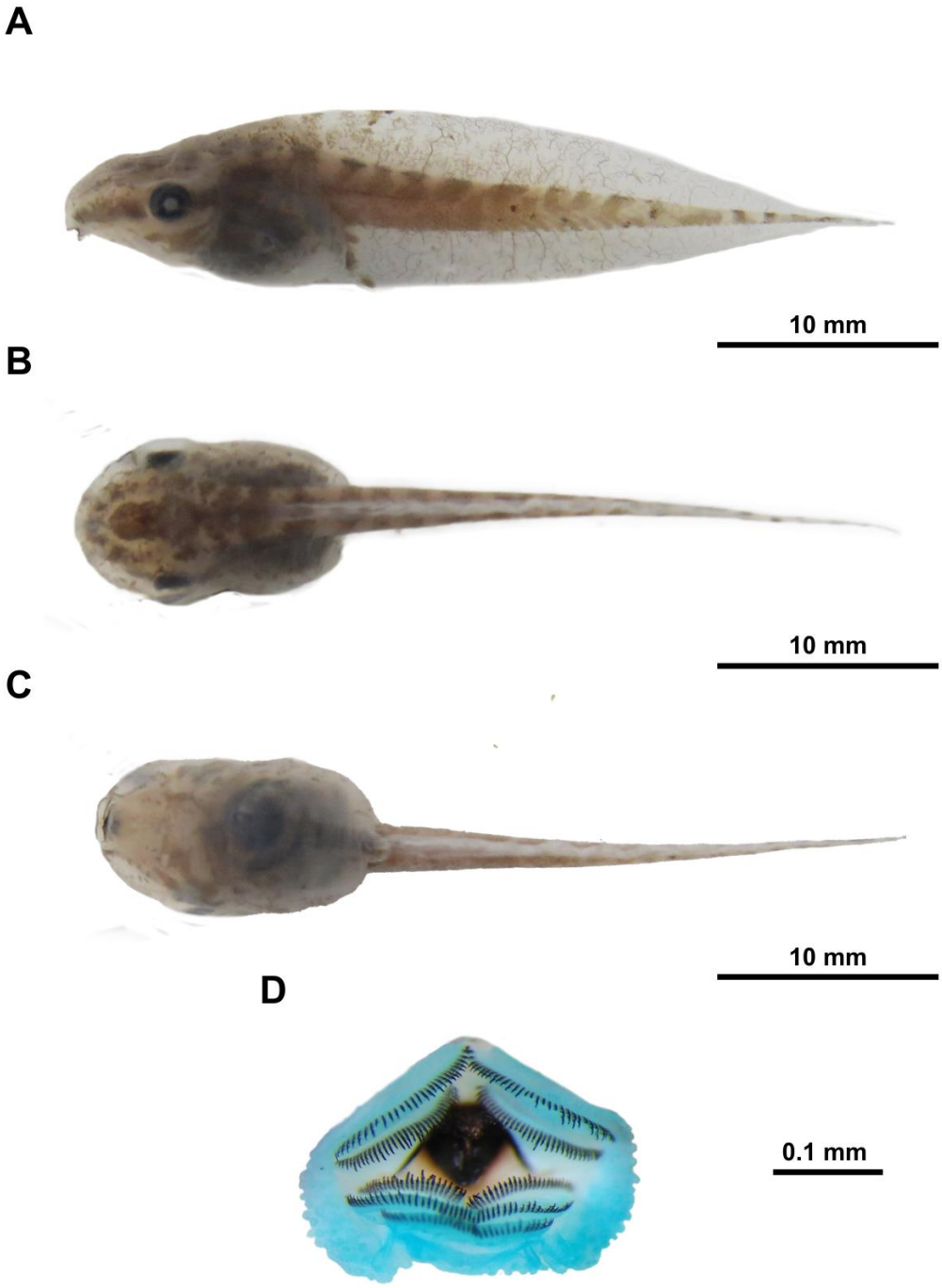

Figure 66. *Scinax tymbamirim.*

Trachycephalus Tshudi, 1838

***Trachycephalus mesophaeus* (Hensel, 1867; Fig. 67a-d)**

Characterization

We collected 68 individuals of *T. mesophaeus* at PETAR. We analysed five individuals in the stages 33 and 34 for morphological characterization (Appendix Table S1).

Body: Total length: 30.4 ± 1.6 mm. Body length: 10.35 ± 0.35 mm. Body elliptical in dorsal view, and triangular in lateral view. Snout rounded in dorsal view, and truncated in lateral view. Eyes with 1.2 ± 0.06 mm diameter, positioned laterally, and directed laterally. Nostrils with 0.3 ± 0.04 mm of diameter, rounded, positioned anterolaterally, and opening dorsolaterally directed. Spiracle sinistral, short, lateroventral, opening at the middle third of the body, centripetal wall fused to body wall and longer than the external wall, and free distal edge. Vent tube short, medial, and fused to ventral fin. Tail length: 20.05 ± 1.4 mm, 1.9 times the length of the body, and ending in a flagellum. Dorsal fin height: 1.5 ± 0.3 mm, convex margin, and rises on the beginning of the posterior third of the body at a median slope. Ventral fin height: 1.5 ± 0.1 mm, and convex margin tapering sharply at the end.

Oral disc: Oral disc anteroventral, and emarginate laterally. Marginal papillae have two rows, and a dorsal gap. Submarginal papillae have one to three rows in the laterals of the oral disc. Jaw sheath narrow, finely serrated, upper one arc-shape, and lower one V-shape. Tooth row formula 4(1,2,4)/6(1), A-1 and A-2 widely interrupted, A-3 and A-4 of the same length, P-3 is the largest posterior row, and P-6 is the shortest posterior row.

Coloration in formalin: Body has grayish-beige covered with dark dots dorsally, and transparent ventrally. Spiracle is transparent. Tail has gray with dark dots concentrated at the edges of the tail, and a longitudinal interrupted medial stripe throughout the extension of the tail. Fins are transparent with a few dark speckles.

Comments: The tadpoles described by Carvalho-Silva et al. (2002) differ from those studied herein by: i) body ovoid in lateral view; and ii) tooth row formula 4(1,3,4)/7(1). The tadpoles described by Prado et al. (2003) differ from those studied herein by body rectangular in dorsal view.

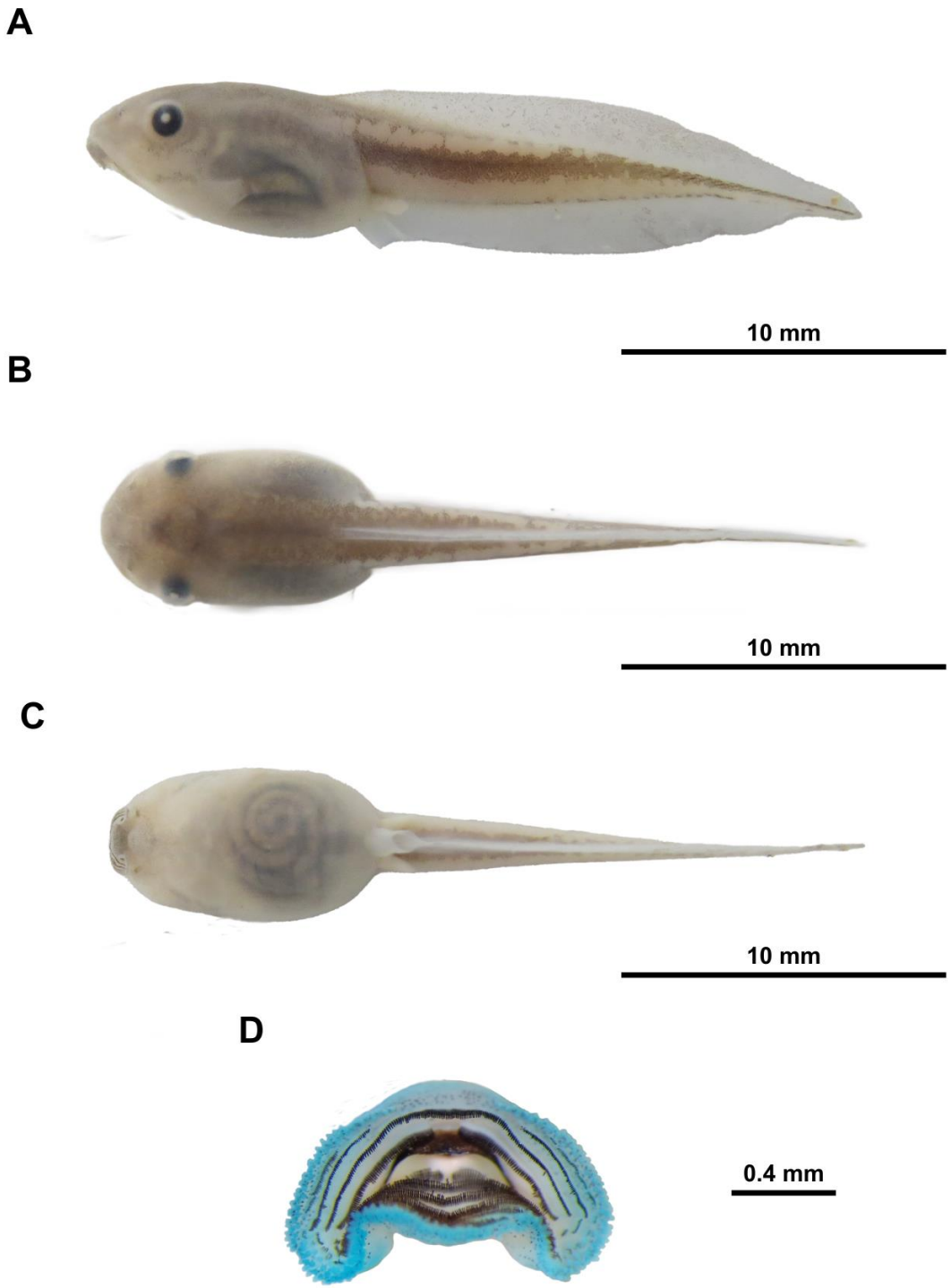

Figure 67. *Trachycephalus mesophaeus.*

DISCUSSION

We characterized and illustrated the tadpoles of 65 anuran species found in 14 protected areas in the State of São Paulo, Brazil. Despite the increase in the number of tadpole descriptions in the recent decades in Brazil (Provete et al 2012), the tadpoles of *Cycloramphus eleutherodactylus, Dendropsophus elianeae, D. jimi, D. werneri, Leptodactylus notoaktites, Physalaemus lateristriga, Scinax imbegue,* and *S. tymbamirim* are illustrated for the first time in this study. We also observed some divergences in morphological and diagnostic characters of tadpoles studied herein with those already described based on different populations. We attributed these differences to two reasons discussed below.

The first factor is related to the period that tadpoles have been described. Most of the tadpoles descripted in South America are from the 20s to the 80s (Andrade et al. 2007; Provete et al. 2012). These descriptions were done without standardization of external morphological attributes, often containing only a photograph or draw of the tadpole, along with information about its size, body color, and sampling site (Andrade et al. 2007; Provete et al. 2012). For example, some authors described external attributes (e.g., spiracle, tail or fin) as short or long, position of oral disc as terminal, anteroventral or ventral, but most of these studies did not specify the criteria used. This scenario has changed and anuran tadpole descriptions have included standardized morphological description more recently (e.g. McDiarmid & Altig 1999; Altig 2007; Schulze et al. 2015). Furthermore, recent studies have included more detailed descriptions containing internal oral structure and chondrocranium, behavioral and ecological descriptions, and revision of already described species (e.g. Rossa-Feres & Nomura 2006; Andrade et al, 2007; Provete et al 2012; 2014; Schulze et al. 2015). The second reason is related to intraspecific variation due to geographical variation. For example, Santos et al. (1998) examining individuals of *D. giesleri* and *D. microps* found remarkable differences in marginal papillae, number of row denticles, body length and coloration between individuals of distinct populations. In fact, intraspecific variation has already been described to most of the genera studied herein (e.g., Kenny 1969, Rossa-Feres & Nomura 2006; Kolenc et al. 2008; Schulze et al. 2015). However, it is important to recognize the differences caused by artefacts resulting from collection process and tadpole storage from those of intraspecific variations due to geographical variation.

Difficulties in identifying larval stage of anurans are a major hindrance in wildlife surveys and to elaborate conservation and management programs. In these cases, approaches combining molecular and morphological data are useful and necessary to correctly identify anuran larvae in such highly diverse regions like the Neotropics (Schulze et al. 2015), particularly regarding the species complexes (e.g., *Scinax ruber* clade or *Physalaemus lateristriga*/*P. olfersii*). The data we present here may facilitate tadpole identification and foster the inclusion of larval stage in wildlife surveys.

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APPENDIX

Table 1. Body measures (mean and Standard deviation) of tadpoles from 65 anuran species sampled in 14 protected areas in São Paulo State, Brazil. FRS = number of register in the laboratory; GS = Gosner (1960) development stages; IND = internasal distance; IOD = interorbital distance; BL = body length; BW = body width; BH = body height; TMW = tail muscle width; TMH = tail muscle height; TAL = tail length; MTH = maximum tail height; TL = total length; DFH = dorsal fin height; VFH = ventral fin height; DER = right eye diameter; DEL = left eye diameter; DNR = right nostril diameter; DNL = left nostril diameter; and "–" = **absence of body measure. (Source Rezende 2017).**

Genus	Species	Measures	IND (mm)	IOD (mm)	TMW (mm)	TMH (cm)	BL (cm)	TAL (cm)	MTH (cm)	TL (cm)	Dolhomed (mm)	Dnarmed (mm)	DFH (cm)	VFH (cm)
Bokermannohyla	*B. circumdata*	M	2.567	3.825	3.082	0.474	1.660	3.344	0.766	4.987	1.373	0.439	0.247	0.187
	EG 33 a 37 (n= 10)	DV	0.612	1.188	0.751	0.089	0.141	0.257	0.121	0.340	0.372	0.050	0.035	0.039
	B. hylax	M	2.748	4.423	3.037	0.466	1.693	3.729	0.723	5.396	1.554	0.419	0.205	0.178
	EG 38 (n=2)	DV	0.639	1.226	0.103	0.064	0.013	0.385	0.033	0.436	0.058	0.023	0.054	0.015
Chiasmocleis	*C. albopunctata*	M	-	5.213	1.258	0.120	0.678	0.842	0.457	1.530	0.913	-	0.141	0.190
	EG 33 e 35 (n=5)	DV	-	1.059	0.212	0.013	0.017	0.097	0.023	0.087	0.179	-	0.006	0.017
	C. leucosticta	M	-	3.398	1.050	0.171	0.772	1.003	0.545	1.771	0.677	-	0.217	0.213
	EG 33 a 38 (n=15)	DV	-	0.238	0.057	0.004	0.061	0.046	0.085	0.109	0.050	-	0.022	0.049
Crossodactylus	*C. caramaschii*	M	1.769	2.754	2.319	0.384	1.606	2.291	0.749	3.882	1.200	0.349	0.288	0.194
	EG 33 a 38 (n=8)	DV	0.360	0.322	0.395	0.089	0.143	0.278	0.083	0.402	0.237	0.036	0.033	0.006
Cycloramphus	*C. boraceiensis*	M	0.825	2.403	1.695	0.201	0.687	2.104	0.782	2.811	1.021	0.178	-	-
	EG 33 a 35 (n=4)	DV	0.078	0.513	0.509	0.041	0.160	0.575	0.780	0.680	0.182	0.053	-	-
	C. eleutherodactylus	M	0.585	2.650	1.835	0.209	0.685	2.072	0.209	2.788	0.998	0.185	-	-
	EG 35 e 36 (n=2)	DV	0.134	0.127	0.290	0.016	0.042	-	0.016	-	0.011	0.014	-	-
Dendropsophus	*D. berthalutzae*	M	1.625	2.682	1.180	0.150	0.616	0.902	0.343	1.513	0.780	0.114	0.096	0.101
	EG 33 e 35 (n=2)	DV	0.211	0.315	0.345	0.026	0.096	0.375	0.076	0.464	0.089	0.001	0.076	0.026
	D. elegans	M	1.787	3.332	1.869	0.212	1.039	2.024	0.669	3.058	1.238	0.126	0.219	0.260
	EG 34 a 38 (n=8)	DV	0.133	0.258	0.202	0.035	0.102	0.243	0.064	0.303	0.128	0.014	0.020	0.023

	D. elianeae	M	0.493	3.075	1.975	0.219	0.865	2.274	0.625	3.137	0.980	0.081	0.227	0.175
	EG 34 a 38 (n=6)	DV	0.389	0.344	0.059	0.013	0.001	0.035	0.002	0.101	0.033	0.072	0.009	0.001
	D. giesleri	M	2.623	4.156	1.865	0.275	1.042	1.612	0.718	2.647	1.372	0.147	0.256	0.234
	EG 34 a 38 (n=24)	DV	0.061	0.124	0.015	0.029	0.049	0.077	0.034	0.096	0.027	0.024	0.012	0.024
	D. jimi	M	0.674	2.765	1.611	0.188	0.729	2.335	0.545	3.064	0.821	0.113	0.216	0.122
	EG 35 a 36 (n=2)	DV	0.052	0.089	0.007	0.008	0.010	0.095	0.001	0.098	0.096	0.021	0.001	0.006
	D. microps	M	2.293	3.594	1.692	0.208	0.933	1.647	0.685	2.604	1.028	0.126	0.225	0.246
	EG 33 a 38 (n=19)	DV	0.321	0.360	0.215	0.034	0.088	0.246	0.110	0.308	0.150	0.025	0.042	0.042
	D. minutus	M	2.312	3.898	1.964	0.331	1.113	2.316	1.069	3.427	1.408	0.203	0.341	0.443
	EG 33 a 38 (n=75)	DV	0.223	0.480	0.340	0.086	0.115	0.323	0.199	0.444	0.135	0.113	0.066	0.102
	D. nanus	M	0.836	2.518	1.511	0.216	0.750	1.967	0.516	2.719	0.883	0.112	0.224	0.134
	EG 33 a 38 (n=22)	DV	0.143	0.180	0.246	0.035	0.094	0.314	0.078	0.410	0.083	0.019	0.042	0.029
	D. seniculus	M	0.760	5.610	2.020	0.239	0.919	1.532	0.728	2.484	1.350	0.040	0.248	0.273
	EG 32 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	D. werneri	M	0.909	2.881	1.668	0.160	0.892	2.160	0.614	3.055	0.899	0.124	0.274	0.195
	EG 36 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
Elachistocleis	*E. bicolor*	M	-	5.467	1.620	0.207	0.898	1.482	0.511	2.407	0.705	-	0.173	0.160
	EG 33 e 38 (n=3)	DV	-	2.551	0.375	0.027	0.169	0.188	0.049	0.357	0.145	-	0.016	0.001
Hylodes	*H. phyllodes*	M	2.410	2.530	2.080	0.258	0.971	2.078	0.491	3.067	0.620	0.160	0.130	0.102

	EG 26 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	H. sazimai	M	2.483	3.017	2.558	0.489	1.504	2.820	0.763	4.310	1.115	0.367	0.260	0.221
	EG 38 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
Hypsiboas	*H. albomarginatus*	M	2.071	3.281	2.115	0.342	1.478	2.380	0.715	3.858	1.173	0.468	0.244	0.197
	EG 33 a 38 (n=11)	DV	0.191	0.474	0.351	0.047	0.116	0.204	0.093	0.276	0.202	0.089	0.054	0.031
	H. albopunctatus	M	1.852	3.167	2.521	0.471	1.684	2.964	0.922	4.559	1.633	0.523	0.333	0.225
	EG 33 a 38 (n=17)	DV	0.690	0.915	1.219	0.083	0.396	0.647	0.135	0.728	0.199	0.049	0.054	0.036
	H. bandeirantes	M	2.372	3.537	2.599	0.466	1.649	2.969	0.802	4.591	1.376	0.425	0.269	0.189
	EG 36 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	H. bischoffi	M	2.219	4.050	2.663	0.698	1.350	2.403	0.724	3.785	1.396	0.514	0.257	0.186
	EG 33 a 38 (n=6)	DV	0.755	1.678	1.348	0.938	0.357	0.597	0.210	0.940	0.634	0.150	0.071	0.031
	H. caingua	M	2.464	4.266	2.813	0.393	1.850	2.962	0.843	4.792	1.572	0.445	0.295	0.226
	EG 33 a 38 (n=14)	DV	0.043	0.053	0.091	0.009	0.028	0.150	0.051	0.258	0.039	0.008	0.021	0.019
	H. caipora	M	1.299	2.076	1.410	0.159	0.798	1.370	0.521	2.184	0.447	0.122	0.187	0.165
	EG 26 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	H. faber	M	5.374	10.698	8.013	1.034	2.633	4.893	1.536	7.496	3.396	1.280	0.501	0.334
	EG 33 a 38 (n=13)	DV	0.985	2.383	1.822	0.357	0.358	0.977	0.201	1.187	0.804	0.290	0.086	0.078
	H. lundii	M	2.338	3.913	2.505	0.451	1.646	2.781	0.792	4.451	1.239	0.348	0.268	0.203
	EG 33 a 34 (n=3)	DV	0.049	0.089	0.098	0.064	0.019	0.124	0.043	0.157	0.069	0.051	0.029	0.015
	H. pardalis	M	1.664	2.204	1.568	0.302	1.243	2.130	0.572	3.371	0.759	0.289	0.204	0.130

	EG 33 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	H. semilineatus	M	3.909	8.317	3.786	0.547	2.525	3.180	1.420	5.716	2.197	0.579	0.467	0.479
	EG 33 a 38 (n=14)	DV	0.535	1.536	2.101	0.049	0.267	0.615	0.182	0.854	0.267	0.093	0.042	0.047
Leptodactylus	*L. chaquensis*	M	2.253	3.740	2.825	0.368	1.756	2.475	0.921	4.375	1.733	0.393	0.274	0.262
	EG 38 (n=4)	DV	0.053	0.167	0.199	0.038	0.064	0.395	0.058	0.361	0.082	0.086	0.033	0.046
	L. flavopictus	M	4.065	7.510	5.572	0.577	2.677	4.020	1.131	6.718	2.140	0.573	0.313	0.275
	EG 33 a 38 (n=13)	DV	1.271	2.378	2.021	0.047	0.402	0.432	0.106	0.841	0.677	0.231	0.031	0.039
	L. furnarius	M	0.658	1.082	0.983	0.265	1.043	2.014	0.481	3.060	0.406	0.081	0.165	0.158
	EG 33 (n=1)	DV	-	-	-	-	-	-	-	-	-	-	-	-
	L. fuscus	M	1.239	2.416	1.722	0.278	1.172	2.007	0.438	3.191	0.970	0.207	0.159	0.133
	EG 33 a 38 (n=17)	DV	0.176	0.454	0.381	0.036	0.066	0.349	0.077	0.376	0.183	0.049	0.014	0.004
	L. labyrinthicus	M	2.199	3.668	3.360	0.574	1.885	3.961	0.890	5.800	1.389	0.311	0.234	0.199
	EG 34 a 38 (n=7)	DV	0.160	0.332	0.455	0.095	0.246	0.985	0.175	1.105	0.084	0.031	0.112	0.063
	L. latrans	M	2.237	3.735	2.338	0.301	1.724	2.652	0.902	4.440	1.343	0.314	0.289	0.300
	EG 34 a 38 (n=6)	DV	0.109	0.148	0.421	0.065	0.064	0.189	0.078	0.303	0.215	0.062	0.003	0.021
	L. mystacinus	M	1.311	2.312	2.066	0.291	1.449	2.054	0.621	3.546	1.060	0.186	0.195	0.188
	EG 33 a 38 (n=20)	DV	0.622	0.995	0.335	0.038	0.094	0.177	0.053	0.335	0.201	0.100	0.032	0.010
	L. notoaktites	M	1.495	2.840	1.625	0.192	0.918	1.455	0.475	2.403	0.963	0.255	0.153	0.134
	EG 33 (n=2)	DV	0.191	0.297	0.290	0.028	0.076	0.047	0.067	0.150	0.131	0.064	0.041	0.014
	L. plaumanni	M	1.800	2.925	2.260	0.222	1.108	1.892	0.489	3.010	1.278	0.271	0.139	0.120
	EG 33 a 37 (n=4)	DV	0.068	0.090	0.213	0.017	0.033	0.224	0.033	0.227	0.047	0.019	0.013	0.015
	L. podicipinus	M	1.212	1.721	1.449	0.286	1.123	1.581	0.559	2.697	0.766	0.186	0.164	0.152

	EG 37 (n=10)	DV	0.069	0.057	0.066	0.027	0.046	0.115	0.042	0.151	0.051	0.027	0.026	0.015
Phrynomedusa	*P. marginata*	M	4.950	5.259	3.858	0.495	1.578	3.206	0.827	4.782	1.710	0.301	0.203	0.298
	EG 34 a 38 (n=3)	DV	1.506	3.968	0.491	0.186	0.015	0.059	0.021	0.064	0.570	0.228	0.040	0.068
Phyllomedusa	*P. distincta*	M	2.620	6.944	3.477	0.475	1.678	3.113	0.905	4.815	2.170	0.237	0.136	0.410
	EG 33 a 37 (n=4)	DV	0.035	0.858	0.726	0.120	0.273	0.446	0.153	0.690	0.629	0.072	0.050	0.175
	P. tetraploidea	M	2.529	5.707	2.775	0.559	1.641	3.154	0.925	4.764	1.535	0.200	0.127	0.401
	EG 34 a 37 *(n=5)*	DV	0.136	0.423	0.273	0.067	0.119	0.346	0.015	0.397	0.118	0.012	0.002	0.033
Physalaemus	*P. atlanticus*	M	0.800	1.742	0.886	0.132	0.752	1.079	0.335	1.805	1.171	0.240	0.101	0.094
	EG 33 a 38 (n=6)	DV	0.330	0.896	0.548	0.025	0.040	0.080	0.066	0.116	0.872	0.198	0.010	0.031
	P. bokermanni	M	0.401	0.779	0.457	0.134	0.735	0.914	0.283	1.651	0.252	0.084	0.081	0.069
	EG 36 e 38 (n=2)	DV	0.040	0.001	0.076	0.006	0.030	0.401	0.053	0.449	0.009	0.025	0.002	0.030
	P. cuvieri	M	0.682	1.392	1.046	0.182	0.943	1.329	0.357	2.252	0.699	0.245	0.143	0.092
	EG 33 a 38 (n=91)	DV	0.119	0.230	0.239	0.054	0.090	0.154	0.082	0.218	0.140	0.070	0.035	0.025
	P. lateristriga	M	0.809	1.815	1.139	0.210	0.967	1.284	0.395	2.272	0.781	0.290	0.148	0.106
	EG 33 a 38 (n=27)	DV	0.049	0.106	0.088	0.057	0.153	0.250	0.068	0.340	0.055	0.039	0.028	0.026
	P. marmoratus	M	0.782	1.593	1.215	0.255	1.029	1.404	0.449	2.393	0.860	0.231	0.175	0.085
	EG 34 a 38 (n=4)	DV	0.025	0.073	0.053	0.019	0.131	0.122	0.003	0.021	0.109	0.065	0.003	0.012
	P. nattereri	M	0.741	1.693	1.258	0.164	1.280	1.635	0.366	2.885	0.714	0.130	0.160	0.098
	EG 33 a 38 (n=7)	DV	0.284	0.900	0.559	0.076	0.250	0.522	0.257	0.752	0.394	0.020	0.081	0.062

	P. olfersii	M	0.824	1.834	1.066	0.223	1.034	1.347	0.422	2.398	0.760	0.286	0.160	0.105
	EG 33 a 38 (n=32)	DV	0.098	0.169	0.114	0.030	0.115	0.179	0.046	0.263	0.070	0.041	0.022	0.020
Proceratophrys	*P. boeiei*	M	1.723	3.545	2.289	0.381	1.964	2.039	0.851	4.004	1.450	0.534	0.341	0.283
	EG 33 a 38 (n=5)	DV	0.178	0.674	0.311	0.086	0.495	0.595	0.228	1.064	0.181	0.091	0.069	0.061
Rhinella	*R. icterica*	M	0.921	1.878	0.941	0.161	0.931	1.077	0.385	2.002	0.661	0.202	0.151	0.133
	EG 33 a 38 (n=34)	DV	0.124	0.292	0.165	0.027	0.102	0.113	0.088	0.195	0.088	0.031	0.033	0.028
	R. ornata	M	0.858	1.567	0.860	0.132	0.818	1.030	0.380	1.836	0.548	0.264	0.148	0.146
	EG 33 a 38 (n=19)	DV	0.073	0.188	0.123	0.019	0.063	0.098	0.026	0.164	0.078	0.043	0.008	0.013
	R. schneideri	M	1.009	2.072	1.051	0.156	0.992	1.129	0.302	2.114	0.755	0.355	0.098	0.103
	EG 33 a 38 (n=30)	DV	0.141	0.396	0.178	0.029	0.149	0.043	0.067	0.117	0.057	0.102	0.019	0.022
Scinax	*S. crospedospilus*	M	2.612	4.688	2.330	0.276	1.077	2.193	0.792	3.259	1.404	0.296	0.244	0.259
	EG 33 a 37 (n=8)	DV	0.479	1.185	0.752	0.052	0.077	0.234	0.068	0.292	0.408	0.084	0.038	0.073
	S. fuscomarginatus	M	2.062	2.975	1.475	0.176	0.849	1.743	0.722	2.642	1.069	0.201	0.232	0.227
	EG 33 a 38 (n=18)	DV	0.164	0.090	0.087	0.028	0.068	0.266	0.170	0.320	0.045	0.021	0.029	0.025
	S. fuscovarius	M	3.123	5.234	2.391	0.545	1.250	2.712	1.239	3.977	1.586	0.379	0.440	0.489

***EG* 33 a 38 (n=80)**	**DV**	**0.400**	**0.711**	**0.437**	**0.503**	**0.135**	**0.411**	**0.167**	**0.513**	**0.205**	**0.066**	**0.063**	**0.078**
S. hayii	**M**	**2.635**	**4.633**	**1.918**	**0.315**	**1.118**	**1.999**	**0.922**	**3.051**	**1.380**	**0.294**	**0.339**	**0.344**
***EG* 33 a 38 (n=32)**	**DV**	**0.203**	**0.387**	**0.123**	**0.023**	**0.081**	**0.232**	**0.076**	**0.330**	**0.117**	**0.039**	**0.034**	**0.034**
S. imbegue	**M**	**1.998**	**3.334**	**1.589**	**0.230**	**0.951**	**1.728**	**0.714**	**2.674**	**1.054**	**0.220**	**0.253**	**0.252**
***EG* 33 a 38 (n=6)**	**DV**	**0.598**	**1.072**	**0.394**	**0.034**	**0.141**	**0.520**	**0.213**	**0.660**	**0.348**	**0.011**	**0.067**	**0.077**
S. littoralis	**M**	**1.439**	**2.607**	**1.159**	**0.187**	**0.829**	**1.431**	**0.379**	**2.267**	**0.794**	**0.255**	**0.139**	**0.127**
***EG* 33 a 38 (n=18)**	**DV**	**0.197**	**0.272**	**0.205**	**0.038**	**0.091**	**0.174**	**0.059**	**0.247**	**0.104**	**0.024**	**0.026**	**0.021**
S. obtriangulatus	**M**	**2.250**	**4.143**	**2.082**	**0.246**	**1.028**	**1.883**	**0.667**	**2.928**	**1.135**	**0.211**	**0.216**	**0.200**
***EG* 33 a 38 (n=6)**	**DV**	**0.880**	**1.974**	**0.445**	**0.028**	**0.008**	**0.131**	**0.100**	**0.121**	**0.388**	**0.086**	**0.059**	**0.023**
S. perereca	**M**	**2.590**	**3.994**	**1.750**	**0.282**	**1.005**	**2.095**	**0.877**	**3.082**	**1.287**	**0.316**	**0.325**	**0.334**
***EG* 33 a 38 (n=15)**	**DV**	**0.288**	**0.888**	**0.228**	**0.042**	**0.177**	**0.206**	**0.205**	**0.374**	**0.199**	**0.032**	**0.079**	**0.076**
S. perpusillus	**M**	**0.324**	**0.796**	**0.514**	**0.112**	**0.605**	**1.129**	**0.267**	**1.744**	**0.411**	**0.053**	**0.110**	**0.094**
***EG* 33 a 38 (n=10)**	**DV**	**0.289**	**0.686**	**0.452**	**0.013**	**0.016**	**0.105**	**0.029**	**0.094**	**0.358**	**0.049**	**0.046**	**0.021**
S. rizibilis	**M**	**1.647**	**3.034**	**1.394**	**0.220**	**1.002**	**1.402**	**0.471**	**2.227**	**0.953**	**0.288**	**0.179**	**0.146**
***EG* 33 a 38 (n=32)**	**DV**	**0.217**	**0.442**	**0.419**	**0.039**	**0.728**	**0.240**	**0.078**	**0.232**	**0.152**	**0.056**	**0.025**	**0.026**
S. similis	**M**	**2.669**	**4.281**	**2.149**	**0.288**	**0.981**	**2.037**	**0.840**	**3.046**	**1.486**	**0.281**	**0.292**	**0.295**
***EG* 33 a 38 (n=28)**	**DV**	**0.524**	**1.031**	**0.367**	**0.058**	**0.044**	**0.286**	**0.066**	**0.287**	**0.318**	**0.063**	**0.031**	**0.026**
S. tymbamirim	**M**	**1.987**	**3.092**	**1.593**	**0.227**	**0.932**	**1.758**	**0.643**	**2.686**	**0.997**	**0.224**	**0.213**	**0.221**
***EG* 33 a 38 (n=6)**	**DV**	**0.124**	**0.335**	**0.162**	**0.035**	**0.084**	**0.289**	**0.065**	**0.325**	**0.092**	**0.038**	**0.020**	**0.028**

Trachycephalus	***T. lepidus***	**M**	**5.563**	**8.089**	**3.949**	**0.400**	**1.815**	**2.800**	**1.072**	**4.788**	**1.866**	**0.542**	**0.296**	**0.353**
	***EG* 34 a 38 (n=8)**	**DV**	**0.058**	**0.205**	**0.100**	**0.020**	**0.010**	**0.017**	**0.057**	**0.219**	**0.096**	**0.047**	**0.007**	**0.008**
	T. mesophaeus	**M**	**3.502**	**5.106**	**2.268**	**0.220**	**1.035**	**2.005**	**0.528**	**3.039**	**1.212**	**0.320**	**0.152**	**0.152**
	***EG* 33 e 34 (n=5)**	**DV**	**0.198**	**0.239**	**0.120**	**0.011**	**0.035**	**0.138**	**0.034**	**0.159**	**0.060**	**0.040**	**0.029**	**0.012**