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TAXONOMIC STATUS OF *MELANOPHRYNISCUS STELZNERI DORSALIS*
(MERTENS, 1933) AND *MELANOPHRYNISCUS STELZNERI FULVOGUTTATUS*
(MERTENS, 1937) (AMPHIBIA, ANURA, BUFONIDAE)¹

(With 10 figures)

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ABSTRACT: The species groups of the genus *Melanophryniscus* (Anura, Bufonidae) are defined. *Melanophryniscus dorsalis* (Mertens, 1933) and *M. fulvoguttatus* (Mertens, 1937), in the *M. stelzneri* group, are proposed as full species, redescribed, and their geographical distribution is realized.

Key words: Amphibia; Anura; Bufonidae; *Melanophryniscus dorsalis*; *Melanophryniscus fulvoguttatus*; Taxonomy.

RESUMO: Posição taxonômica de *Melanophryniscus stelzneri dorsalis* (Mertens, 1933) e *Melanophryniscus stelzneri fulvoguttatus* (Mertens, 1937) (Amphibia, Anura, Bufonidae).

Os grupos de espécies do gênero *Melanophryniscus* (Anura, Bufonidae) são definidos. *Melanophryniscus dorsalis* (Mertens, 1933) e *M. fulvoguttatus* (Mertens, 1937), do grupo de *M. stelzneri*, são propostas como espécies plenas, redescritas e suas distribuições geográficas são definidas.

Palavras-chave: Amphibia; Anura; Bufonidae; *Melanophryniscus dorsalis*; *Melanophryniscus fulvoguttatus*; Taxonomia.

INTRODUCTION

The genus *Melanophryniscus* Gallardo, 1961, a taxon presumably monophyletic according to GRAYBEAL & CANNATELLA (1995), is currently composed by 16 species separated in three groups (CARAMASCHI & CRUZ, 2002). These species groups are based only in similar external morphology, have not been assessed by a modern taxonomical analysis, and several modifications are expected in the future.

In this paper we treat on species belonging to the *M. stelzneri* group, through the reevaluation of the taxonomic status of *M. s. dorsalis* and *M. s. fulvoguttatus*. Both are proposed as full species, redescribed, and their

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geographical distribution is realized. Additionally, the species groups of the genus *Melanophryniscus* are defined and their component species referred.

MATERIAL AND METHODS

Abbreviations of the collections housing specimens are MNRJ (Museu Nacional - Rio de Janeiro, RJ, Brazil), AL-MN (Adolpho Lutz Collection, housed in MNRJ), and EI (Eugenio Izecksohn Collection, Universidade Federal Rural do Rio de Janeiro, RJ, Brazil).

Measurements, in millimeters (mm), are: SVL (snout-vent length); HL (head length); HW (head width); IND (internarial distance); END (eye to nostril distance); ED (eye diameter); UEW (upper eyelid width); IOD (interorbital distance); THL (thigh length); TL (tibia length); FL (foot length). Measurements taken with dial calipers under stereomicroscope Zeiss SV-4.

Melanophryniscus dorsalis (Mertens, 1933), new status (Figs.1-5)

Dendrophryniscus stelzneri dorsalis MERTENS, 1933.

Melanophryniscus stelzneri dorsalis – GALLARDO, 1961; BRAUN, 1978; BRAUN & BRAUN, 1980; CÉSPEDÉZ, 1997; CÉSPEDÉZ & ALVAREZ, 2000; CÉSPEDÉZ & MOTTE, 2001.

Diagnosis – A medium sized species of the *M. stelzneri* group, diagnosed by the following characters: (1) SVL 20.5-24.2mm in males, 23.1-24.8mm in females; (2) head broader than long; (3) skin on dorsal and lateral surfaces of body with corneous spines on shallow warts, and additional scattered spines directly on the skin of head and dorsal surfaces of members; (4) ground color of dorsum, loreal region, flanks, and venter dark brown; (5) a distinct, fragmented clear brown stripe on dorsal midline from head to urostile region; (6) two small pale yellow blotches on the gular region, at both corners of mandible; (7) variable pale yellow blotches on the chest, just at the insertion of the arms, belly, and ventral surfaces of forearms and thighs.

Description – General aspect robust, bufonoid (Fig.1). Head broader than long; head width nearly 30% of SVL; head lacking cranial crests; snout short, narrow, slightly projecting beyond the anterior margin of mouth, rounded in dorsal and lateral views (Figs.2-3); canthus rostralis rounded; loreal region vertical, slightly concave; nostrils very small, situated at near tip of snout, directed anteriorly; IND approximately 80% of UEW, 63% of IOD, and equals END; UEW about 74% of IOD; ED 1.4 times IND, 1.1 times UEW, and approximately 80% of IOD; tympanum concealed; vocal slits present in males; tongue much longer than wide, with posterior margin free, rounded; choanae small, rounded, largely separated.

Arms slender, lacking ulnar folds; axillary membrane absent. Hand (Fig.4) with fingers long, slender; length of fingers I<II<IV<III; tip of fingers narrow, rounded, not differentiated as discs; fingers not fimbriated; webbing absent. Outer palmar

tubercle moderately sized, rounded; inner palmar tubercle small, rounded, approximately a half of the outer tubercle; subarticular tubercles developed, rounded, but some divided mainly on fingers III and IV; supernumerary tubercles present. Legs short, robust, lacking tarsal folds; THL slightly smaller than TL; sum of THL and TL approximately 70% of SVL. Foot (Fig.5) with toes slender; length of toes $I < II < V < III < IV$; tip of toes narrow, rounded, not differentiated as discs; toes slightly fimbriated, barely one third webbed; web border indented. Inner metatarsal tubercle large, prominent, ovoid; outer metatarsal tubercle large, rounded, approximately equal in size to inner metatarsal tubercle; subarticular tubercles developed, subconical; supernumerary tubercles poorly developed.

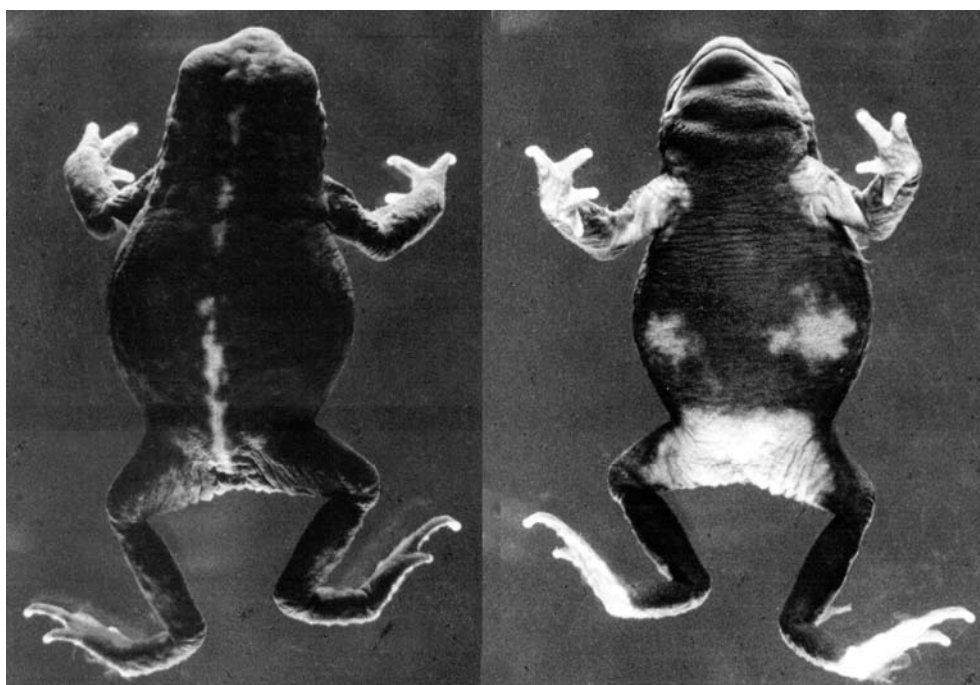


Fig.1- *Melanophryniscus dorsalis* (Mertens, 1933) (MNRJ 27337). Dorsal and ventral views.

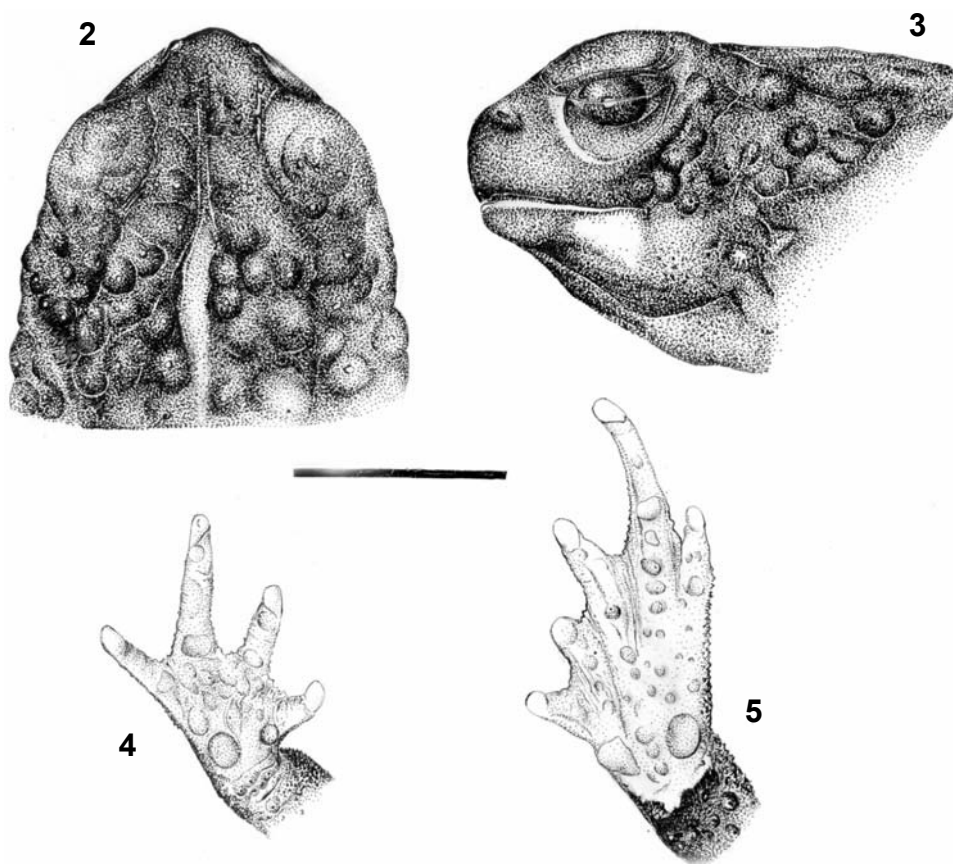
Skin on dorsal and lateral surfaces of body with corneous spines on shallow warts; additional scattered spines directly on the skin of head and dorsal surfaces of members; ventral skin finely granulose with scattered spines on belly; ventral surface of thighs granulose and spinulose. Cloacal opening directed posteriorly at mid-level of thighs.

In preservative (70% ethanol), ground color of dorsum, loreal region, flanks, and venter dark brown; a distinct, complete or fragmented clear brown stripe on dorsal midline from head to urostyle region; two small pale yellow blotches on the gular region, at both corners of mandible; the pale yellow color is also observed

on the chest, just at the insertion of the arms, as variable blotches on belly, ventral surfaces of forearms and thighs, and palmar and plantar surfaces.

Variation – Variations in measurements are presented in table 1. The midline dorsal stripe is poorly developed or absent in some specimens.

Geographic distribution – Coastal region of Brazil, from southern of the State of Santa Catarina, in Imbituba ($28^{\circ}14'S$, $48^{\circ}40'W$), to the northern of the State of Rio Grande do Sul, in Torres ($29^{\circ}20'S$, $49^{\circ}43'W$). BRAUN (1978) and BRAUN & BRAUN (1980) refer the occurrence of this species delimited to the coastal line between Laguna ($28^{\circ}28'S$, $48^{\circ}46'W$), State of Santa Catarina, and Tramandaí ($29^{\circ}59'S$, $50^{\circ}08'W$), State of Rio Grande do Sul, Brazil. CESPEDEZ (1997) extended the range for this species to Dept. Apostoles ($27^{\circ}51'S$, $55^{\circ}46'W$), Province of Misiones, Argentina.



Melanophryniscus dorsalis (Mertens, 1933) (MNRJ 27337): fig. 2- dorsal view of head; fig. 3- lateral view of head; fig. 4- hand; fig. 5- foot. Scale bar = 5mm.

TABLE 1

Measurements of *Melanophryniscus dorsalis* (Mertens, 1933)

Characters	♂ (n = 8)			♀ (n = 2)
	Range	$\bar{x}$	SD	Range
SVL	20.5-24.2	22.5	1.52	23.1-24.8
HL	6.0-7.4	6.9	0.44	7.0-7.2
HW	6.2-7.9	7.3	0.55	7.4-7.7
IND	1.5-1.9	1.7	0.13	1.7-1.9
END	1.6-1.9	1.7	0.09	1.7-1.8
ED	2.1-2.7	2.4	0.23	2.5-2.6
UEW	1.9-2.2	2.1	0.09	2.0-2.3
IOD	2.4-3.1	2.7	0.24	2.7
THL	6.4-9.4	7.8	1.08	7.1-8.7
TL	7.1-8.9	8.0	0.70	7.7-9.0
FL	9.5-14.5	12.4	1.72	12.5-14.0

(n) number of specimens; ($\bar{x}$) mean; (SD) standard deviation*Melanophryniscus fulvoguttatus* (Mertens, 1937), new status
(Figs.6-10)*Phryniscus nigricans* – BOETTGER, 1885, 1892; (?) BOULENGER, 1894; BUDGETT, 1899 (part).*Atelopus stelzneri* – PERACCA, 1895 (part); BERG, 1896 (part); BERTONI, 1939 (part).*Dendrophryniscus stelzneri* – MÜLLER & HELLMICH, 1936 (part); FREIBERG, 1942 (part); CEI, 1956 (part).*Dendrophryniscus stelzneri fulvoguttatus* MERTENS, 1937.*Melanophryniscus stelzneri fulvoguttatus* – GALLARDO, 1961 (part), 1987 (part); LUTZ, 1972 (part); CEI, 1980 (part), 1987 (part); CONTRERAS & CONTRERAS, 1982; BASSO & WILLIAMS, 1996; BALDO & ARZAMENDÍA, 1998; KOKUBUM & BERNARDE, 1998; PRIGIONI & LANGONE, 1998, 2000; CÉSPEDÉZ & ALVAREZ, 2000; BALDO, 2001; CÉSPEDÉZ & MOTTE, 2001.*Melanophryniscus stelzneri* – SCOTT & LOVETT, 1975; AQUINO, SCOTT & MOTTE, 1996 (part).

Diagnosis – A medium sized species of the *M. stelzneri* group, diagnosed by the following characters: (1) SVL 23.1-25.0mm in males, 26.3-28.0mm in females; (2) head broader than long; (3) skin on dorsal and lateral surfaces of body with corneous spines on shallow warts, and additional scattered spines directly on the skin of head and dorsal surfaces of members; (4) ground color of dorsum, loreal region, flanks, and venter dark brown; (5) dorsal surfaces with numerous, irregular pale yellow spots; (6) a series of pale yellow spots on the border of mandible; (7) ventral surfaces with numerous irregular pale yellow spots or blotches, with a remarkably large longitudinal blotch on thighs.

Description – General aspect robust, bufonoid (Fig.6). Head broader than long; head width nearly 30% of SVL; head lacking cranial crests; snout short, broad,

slightly projecting beyond the anterior margin of mouth, rounded in dorsal and lateral views (Figs.7-8); canthus rostralis rounded; loreal region vertical, slightly concave; nostrils very small, situated at near tip of snout, directed anteriorly; IND approximately 87% of UEW, 64% of IOD, and 90% of END; UEW about 72% of IOD; ED 1.2 times IND, 1.1 times UEW, and approximately 80% of IOD; tympanum concealed; vocal slits present in males; tongue much longer than wide, with posterior margin free, rounded; choanae small, rounded, largely separated.

Arms slender, lacking ulnar folds; axillary membrane absent. Hand (Fig.9) with fingers long, slender; length of fingers $I < II < IV < III$; tip of fingers narrow, rounded, not differentiated as discs; fingers not fimbriated; webbing absent. Outer palmar tubercle large, rounded; inner palmar tubercle small, pear shaped, approximately a half of the outer tubercle; subarticular tubercles developed, rounded, but some divided mainly on fingers III and IV; supernumerary tubercles present. Legs short, robust, lacking tarsal folds; THL larger than TL; sum of THL and TL approximately 90% of SVL. Foot (Fig.10) with toes slender; length of toes $I < II < V < III < IV$; tip of toes narrow, rounded, not differentiated as discs; toes slightly fimbriated, barely one third webbed; web border indented. Inner metatarsal tubercle large, ovoid, prominent; outer metatarsal tubercle large, ovoid, approximately equal in size to inner metatarsal tubercle; a rounded tubercle between inner and outer metatarsal tubercles; subarticular tubercles developed, subconical, but some divided mainly on toes III and IV; supernumerary tubercles developed.

Skin on dorsal and lateral surfaces of body and on members with corneous spines on shallow warts; additional scattered spines directly on the skin of head; ventral skin granulose with scattered spines on belly; ventral surface of thighs granulose and spinulose. Cloacal opening normal, directed posteriorly at mid-level of thighs.

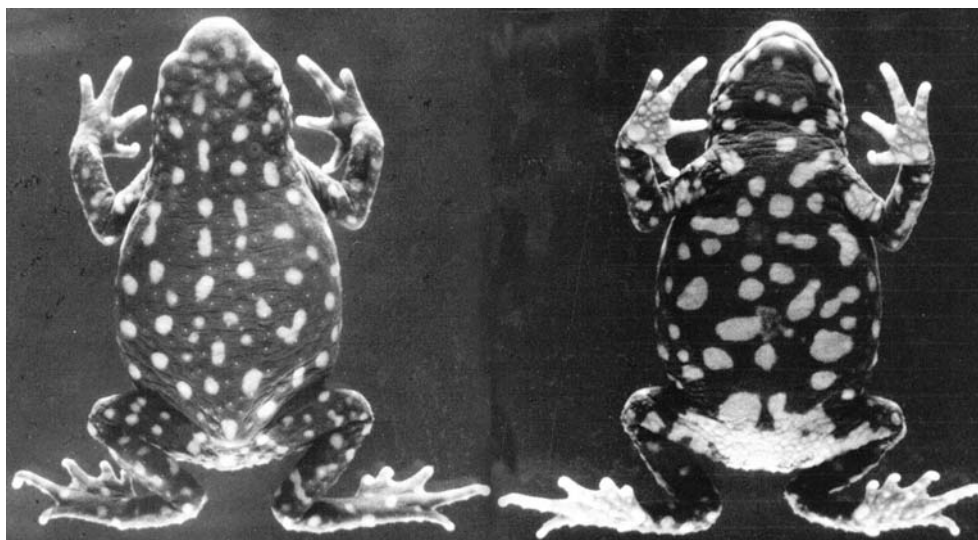
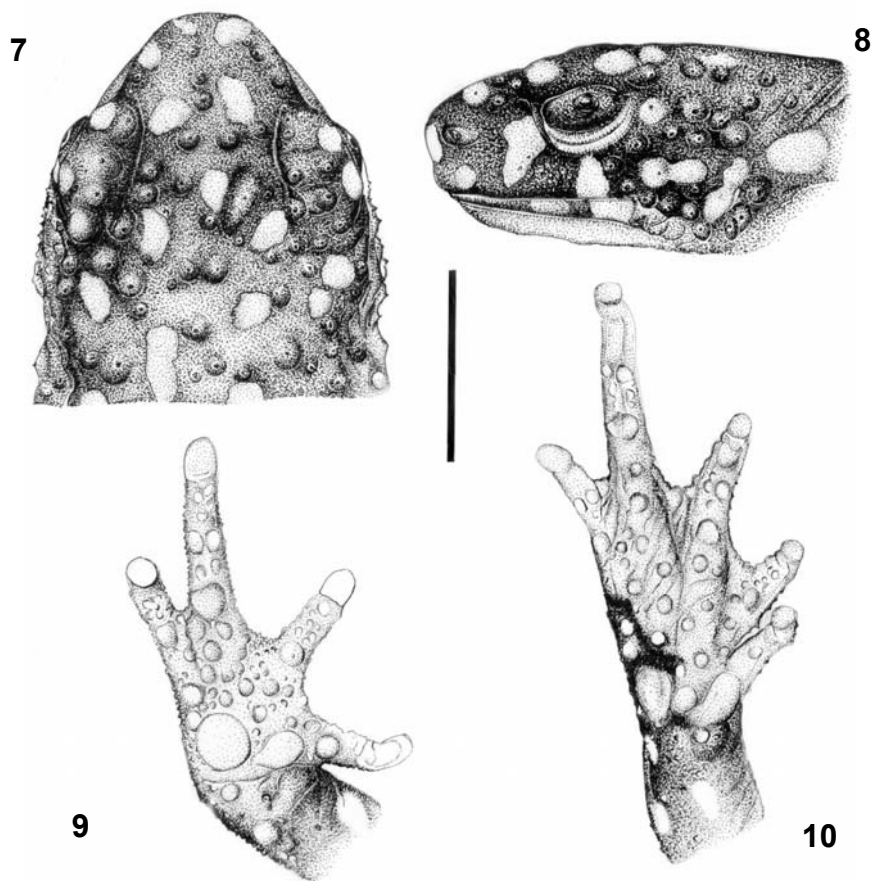


Fig.6- *Melanophryniscus fulvoguttatus* (Mertens, 1937) (EI 4250): dorsal and ventral views.

In preservative (70% ethanol), ground color of dorsum, loreal region, flanks, and venter dark brown; dorsal surfaces with numerous, irregular pale yellow spots; a series of pale yellow spots on the border of mandible; ventral surfaces with numerous irregular pale yellow spots or blotches, with a remarkably large longitudinal blotch on thighs.

Variation – Variations in measurements are presented in table 2. The number, size, and shape of the pale yellow spots and blotches are variable.

Geographic distribution – Inland South America, in Brazil, State of Mato Grosso do Sul (Maracaju, 21°37'S, 55°10'W; Jardim, 21°29'S, 56°08'W; Bela Vista, 22°06'S, 56°31'W), and Paraguay (Pavón, not located; Sapucaí, 25°40'S, 56°55'W). According to BALDO (2001), the species occurs in the Province of Formosa, Argentina, in the Departments Concepción, Guairá, Paraguari and San Pedro, Paraguay, and in the State of Mato Grosso do Sul, Brazil.



Melanophryniscus fulvoguttatus (Mertens, 1937) (EI 4250): fig.7- dorsal view of head; fig.8- lateral view of head; fig.9- hand; fig.10- foot. Scale bar = 5mm.

TABLE 2

Measurements of *Melanophryniscus fulvoguttatus* (Mertens, 1937)

Characters	♂ (n = 10)			♀ (n = 5)		
	Range	$\bar{x}$	SD	Range	$\bar{x}$	SD
SVL	23.1-25.0	23.8	0.65	26.3-28.0	27.1	0.78
HL	5.6-7.6	7.0	0.59	7.4-8.1	7.7	0.26
HW	6.8-8.1	7.7	0.39	7.7-8.2	7.9	0.19
IND	1.5-2.0	1.8	0.17	1.9-2.0	2.0	0.05
END	1.6-2.2	2.0	0.16	2.1-2.3	2.2	0.08
ED	2.0-2.5	2.3	0.17	2.2-2.5	2.4	0.11
UEW	2.0-2.2	2.1	0.08	2.0-2.4	2.2	0.16
IOD	2.6-3.0	2.8	0.13	2.7-3.5	3.0	0.31
THL	8.0-8.7	8.4	0.23	8.5-9.3	8.9	0.33
TL	7.1-8.3	7.8	0.32	8.3-8.9	8.7	0.25
FL	11.0-12.8	11.9	0.56	12.7-14.0	13.4	0.47

(n) number of specimens; ($\bar{x}$) mean; (SD) standard deviation

DISCUSSION

The species of *Melanophryniscus* may be arranged in three species groups. The *M. moreirae* group is defined by species which have very developed warts with an apical corneous spine on dorsal surfaces and flanks, absence of conspicuous color pattern of contrasting spots or blotches on dorsum, and absence of a protuberance on the snout [*M. moreirae* (Miranda-Ribeiro, 1920) and *M. sanmartini* Klappenbach, 1968]. The *M. stelzneri* group involves species having corneous spines on shallow warts or directly on skin when these are absent, usually presence of conspicuous color pattern of contrasting spots or blotches on dorsum, and absence of a protuberance on the snout [*M. atroluteus* (Miranda-Ribeiro, 1920), *M. cupreuscapularis* Céspedes & Alvarez, 2000, *M. dorsalis* (Mertens, 1933), *M. fulvoguttatus* (Mertens, 1937), *M. klappenbachi* Prigioni & Langone, 2000, *M. montevidensis* (Philippi, 1902), *M. rubriventris* (Vellard, 1947), and *M. stelzneri* (Weyenbergh, 1874)]. The *M. tumifrons* group is defined by including species having very developed warts with an apical corneous spine on dorsal surfaces and flanks, color pattern on dorsum without contrasting dots, and a conspicuous, rounded protuberance on the snout, extending to between the eyes [(*M. cambaraensis* Braun & Braun, 1979, *M. devicenzii* Klappenbach, 1968, *M. macrogranulosus* Braun, 1973, *M. orejasmirandai* Prigioni & Langone, 1986, *M. pachyrhynus* (Miranda-Ribeiro, 1920), *M. simplex* Caramaschi & Cruz, 2002, *M. spectabilis* Caramaschi & Cruz, 2002, and *M. tumifrons* (Boulenger, 1905)]. This arrangement is different from that proposed by CÉSPÉDEZ & MOTTE (2001) for the species and subspecies of *Melanophryniscus* from Argentina and Paraguay and based only on body size and type of habitat.

KLAPPENBACH & LANGONE (1992) reviewed the taxonomic status of *Melanophryniscus* species from Uruguay and considered *M. atroluteus* and *M. montevidensis* as full species. Through the present recognition of *M. dorsalis* and *M. fulvoguttatus*, the *M. stelzneri* species group stands with eight species. The presence of dorsum and belly very spotted by similar in shape and size cream (in life, yellow on dorsum, and yellow and red on venter) spots separate *M. fulvoguttatus* and *M. klappenbachii* from all other species of the *M. stelzneri* species group. In *M. fulvoguttatus*, the spots are more numerous and shorter than in *M. klappenbachii* (PRIGIONI & LANGONE, 2000). The presence of a distinct clear brown stripe on dorsal midline from head to urostile region in *M. dorsalis* promptly separate it from the other species of the *M. stelzneri* species group (*M. atroluteus* has dorsum uniformly brown to dark brown; *M. cupreuscapularis* has dorsum uniformly brown to dark brown with two whitish blotches on shoulders; *M. montevidensis* has dorsum uniformly brown to dark brown, sometimes with clear cream spots; *M. rubriventris* and *M. stelzneri* have dorsum with scattered clear spots and blotches, mainly on shoulders; GALLARDO, 1961; CEI, 1980; LANGONE, 1994; CÉSPEDEZ & ALVAREZ, 2000; our data).

The occurrence of *M. dorsalis* is limited to the coastal line between Laguna, in the southern part of the State of Santa Catarina, and Tramandaí, in the northern part of the State of Rio Grande do Sul, Brazil, and has never been collected inland. The extension of the range of the species to Dept. Apostoles, Province of Misiones, Argentina, proposed by CÉSPEDEZ (1997) must be reevaluated. *Melanophryniscus fulvoguttatus* is an inland species, occurring in the Province of Formosa, Argentina, in the Departments Concepción, Guairá, Paraguari and San Pedro, Paraguay, and in the State of Mato Grosso do Sul, Brazil.

SPECIMENS EXAMINED

Melanophryniscus atroluteus – BRAZIL: RIO GRANDE DO SUL: Uruguaiana (MNRJ 27349-27350). URUGUAY: MALDONADO (MNRJ 3023, 13117).

Melanophryniscus dorsalis – BRAZIL: SANTA CATARINA: Imbituba, Praia de Itapirubá (MNRJ 27337-27341). RIO GRANDE DO SUL: (MNRJ 3024); Torres (MNRJ 3022, 3037, 27342-27346, AL-MN 450, EI 4233).

Melanophryniscus fulvoguttatus – BRAZIL: MATO GROSSO DO SUL: Maracaju (MNRJ 4220-4244); Jardim (MNRJ 27347-27348); Fazenda Costa Perón, Bela Vista (EI 1969-1978); Bela Vista (EI 4234-4256). PARAGUAY: Pavón (MNRJ 2666, 5855); Sapucaí (AL-MN 4735-4736).

Melanophryniscus klappenbachii – ARGENTINA: CHACO: Resistencia (AL-MN 5190).

Melanophryniscus montevidensis – URUGUAY: MONTEVIDEO: Montevideo, Parque Nacional Roosevelt (MNRJ 27351); ROCHA: La Coronilla (MNRJ 27352-27354).

Melanophryniscus stelzneri stelzneri – ARGENTINA: CORDOBA: Achiras (MNRJ 27355); Sierra San Luís (MNRJ 3367, EI 1424-1425).

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