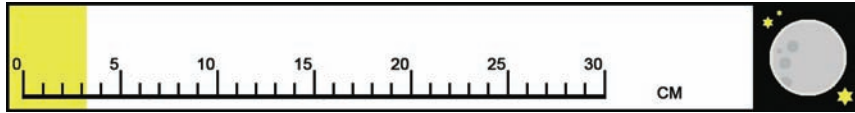


Osteocephalus exophthalmus Smith & Noonan, 2001

2001: 349, figs 1-3.



ENGLISH NAME: None; we propose "Big-eye slender-legged treefrog".

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "ca 30 km SE Imbaimadai, Mazaruni-Potaro District, Guyana... 5°37'30" N, 60°14'42" W".

SELECTED REFERENCE: Smith & Noonan, 2001 (original description, osteology, B&W photo and drawings, in English).

Field identification - Males reach 33.1* mm SVL, females 42.5* mm.

- Dorsal ground colour medium brown, with dark brown blotches, interorbital bar usually present; skin on dorsum smooth with very few tiny tubercles.
- Ventral surface granular, greyish white, with brown spotting located mainly on throat and belly, almost absent on chest.
- Eyes large and bulgy.
- Frontoparietal ridges absent, snout short.
- Iris greenish bronze to gold without conspicuous radiating black lines, but with irregular black vermiculations.
- Hidden surface of thighs black.
- Tarsal tubercles low, not very prominent.
- Toes about half-webbed.

Life history - Nocturnal, arboreal. Found in primary forest, usually not very far from water. Reproductive biology is totally unknown. Interestingly, non-spinous dorsa are present in males of bromeliad-breeding *Osteocephalus* species (vs. spinous dorsa in pond-breeding species, see comment by Jungfer & Hödl, 2002) and *Osteocephalus exophthalmus* might be a phytotelm-breeding species.

Call - Unknown

Tadpole - Unknown

Abundance and distribution in KNP - Very rare, observed only around main sampling localities # 1 and 4 (see Fig. 3), but probably more widespread in the Park.

Geographic range - Currently only reported from the type locality (Imbaimadai area, Guyana) and from Kaieteur National Park, Guyana.

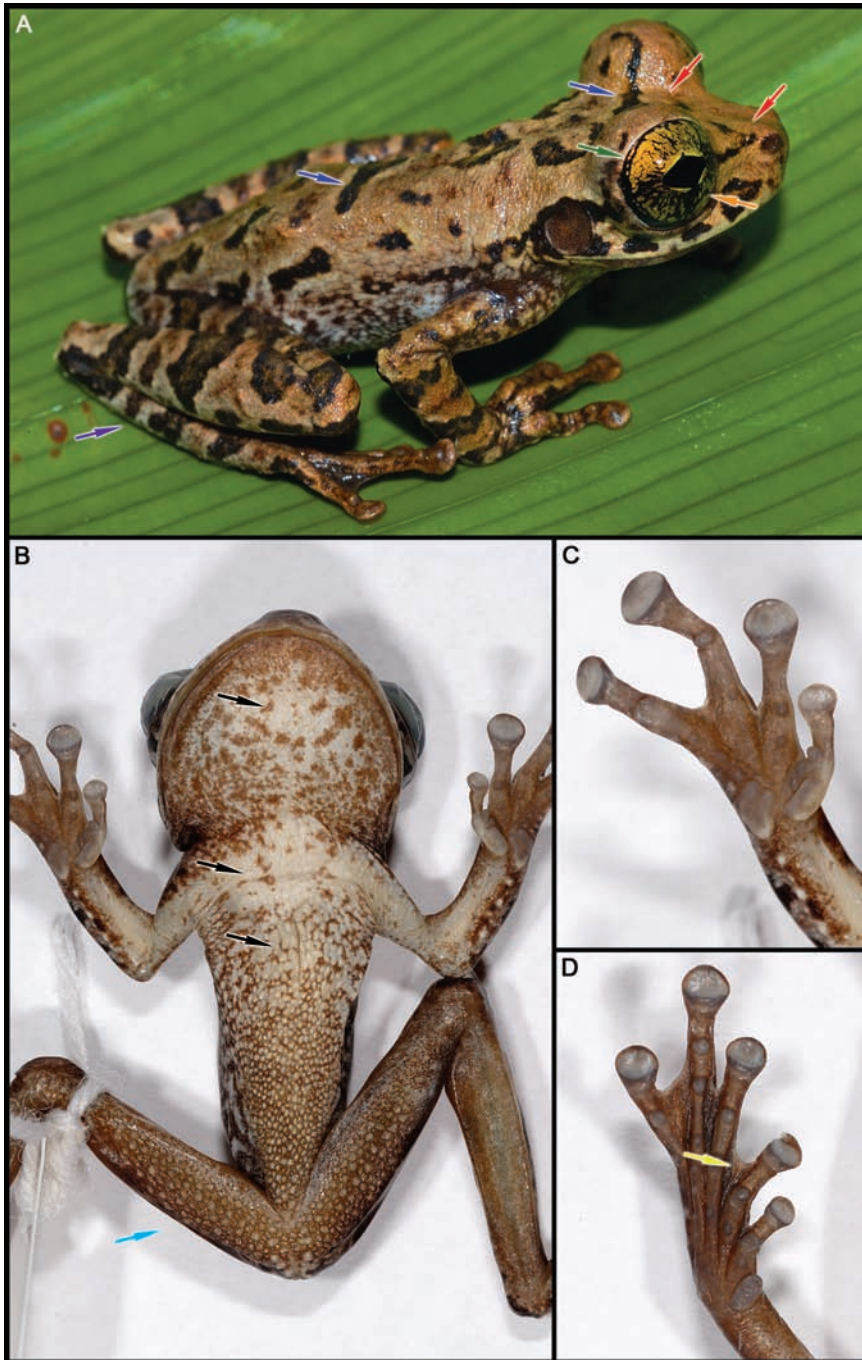
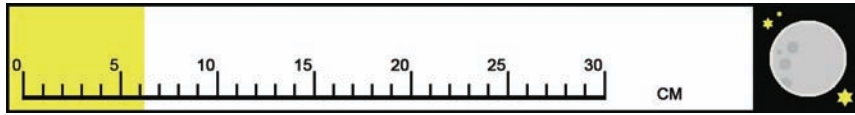


Fig. 117. *Osteocephalus exophthalmus* Smith & Noonan, 2001. A. Dorsolateral view of a male. B. Ventral surface of a preserved male. C. Palm (preserved male specimen). D. Sole (preserved male specimen). (Photos by P. J. R. Kok).

Osteocephalus leprieurii (Duméril & Bibron, 1841)

1841: 553.



ENGLISH NAME: Cayenne slender-legged treefrog.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "Cayenne" [French Guiana].

SELECTED REFERENCES: Lescure & Marty, 2001 (brief description, colour photo, in French); Jungfer & Hödl, 2002 (redescription, B&W drawings, colour photos, natural history, call description, distribution, in English).

Field identification - Males reach 45.7 mm SVL, females 61.0 mm.

- ➔ Dorsal ground colour variable, ranging from ochre, tan or reddish tan to dark tan, usually with up to four narrow, usually fragmented, dark brown transverse lines, and a narrow dark brown interorbital bar; skin on dorsum spiculate in males (more or less pronounced depending on breeding condition), smooth in females.
- ➔ Ventral surface granular, immaculate, creamy white to bright yellow.
- ➔ Broad, irregular, light subocular spot.
- ➔ Frontoparietal ridges absent, snout moderately long.
- ➔ Iris golden in its superior half, darker in its inferior half, lacking conspicuous radiating black lines, but with irregular black vermiculations.
- ➔ Hidden surface of thighs and foot webbing orange to reddish.
- ➔ Tarsal tubercles absent.
- ➔ Toes almost fully webbed.

Life history - Nocturnal, arboreal. Found in primary forest. The species is an explosive breeder, males congregate for a very short period (usually one or two nights) at the beginning of the rainy season and call from low vegetation, from the ground along flooded pools, sometimes floating in water. Eggs are deposited as a film on the water surface in seasonally flooded pools; tadpoles probably feed on detritus.

Call - The call of *Osteocephalus leprieurii sensu stricto* (see taxonomic comments) was described by Jungfer & Hödl (2002: 32), who provided a spectrogram. It is a complex call involving at least two different types of notes, which according to Lescure & Marty (2001) are produced at a rate of about 18 calls/min.

Tadpole - Probably still undescribed due to confusion with other species.

Abundance and distribution in KNP - Common, observed around main sampling localities # 1, 2, 4, 5 and 12 (see Fig. 3), probably widespread in the Park.

Geographic range - The species is found in the Guiana Shield and in northern Brazil, exact range unknown due to misidentification with other species.

Taxonomic comments - A composite of several cryptic species, *Osteocephalus leprieurii* Duméril & Bibron *sensu stricto* was recently redescribed by Jungfer & Hödl (2002). Many descriptions available in the literature involve other taxa.

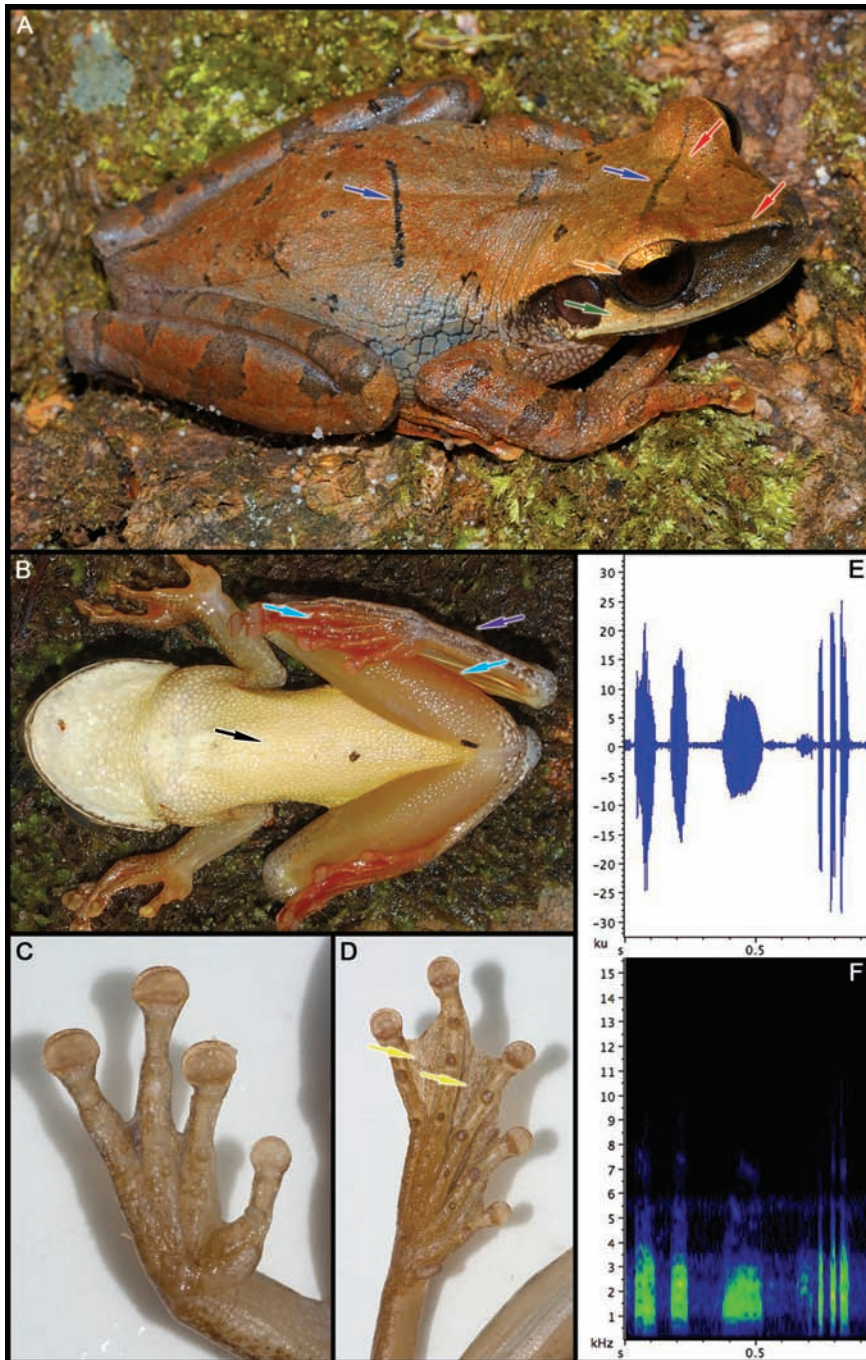
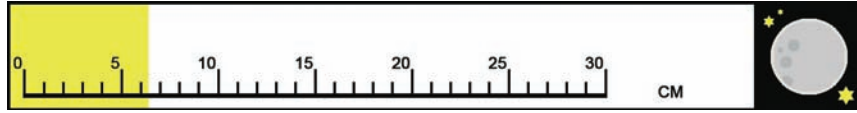


Fig. 118. *Osteocephalus lepreurii* (Duméril & Bibron, 1841). A. Dorsolateral view of a female. B. Ventral surface of a male in life. C. Palm (preserved female specimen). D. Sole (preserved female specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Osteocephalus oophagus Jungfer & Schiesari, 1995

1995: 1, figs 1-4.



ENGLISH NAME: None; we propose "Oophagous slender-legged treefrog".

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "Reserva Florestal Adolfo Ducke (2°55'S, 59°59'W), situated at km 26 of the Rodovia AM-010 (Manaus-Itacoatiara), Estado do Amazonas, Brazil".

SELECTED REFERENCES: Jungfer & Schiesari, 1995 (original description, call description, tadpole description, reproductive biology, B&W photos and drawings, distribution, in English); Lescure & Marty, 2001 (brief description, colour photo, in English); Lima *et al.*, 2006 (brief description, natural history, colour photos, in English).

Field identification - Males reach 53.0 mm SVL, females 62.7 mm.

➔ Dorsal ground colour ranging from tan to brown, marbled with dark brown, individuals with white spots are reported; skin on dorsum smooth to weakly tuberculate.

➔ Ventral surface granular, creamy white to yellowish white, with brown spots and flecks on chin and throat.

➔ Distinct dark transverse bars on limbs.

➔ Frontoparietal ridges indistinct, never prominent.

➔ Iris gold with conspicuous radiating black lines.

➔ No calcar on heel, but some small tubercles.

➔ Tarsal tubercles present, low.

➔ Toes about 2/3 webbed.

Life history - Nocturnal (although the species occasionally call during the day), arboreal. Found in primary forest, often in disturbed areas (*e.g.* clearings). Males call from near or inside bromeliads, usually between 0.5-10 m above the ground, but up to 30 m high. Eggs are deposited in the phytotelm of bromeliads (both epiphytic or terrestrial) or in holes in trees; tadpoles feed on fertilized eggs laid by the female.

Call - First described by Zimmerman (1983: 241 [under *Osteocephalus* sp.]); see also Zimmerman & Bogart (1984: 479 [under *Osteocephalus* sp.] and 1988: 98 [under *O. buckleyi*]), who provided spectrograms. The advertisement call is intraspecifically variable and mainly consists of one to six croaking notes; the call is produced very irregularly, usually not more than 2 calls/m.

Tadpole - First described by Hero (1990: 237 [under *Osteocephalus* sp.]); see also Jungfer & Schiesari (1995: 8) and Schiesari *et al.* (1996: 115). Exotroph, arboreal; chestnut brown; LTRF = 2(2)/3[1].

Abundance and distribution in KNP - Rare, observed and heard only around main sampling locality # 11 (see Fig. 3), but probably more widespread in the Park.

Geographic range - Exact range unknown. The species is found in the Guiana Shield and in the Amazon Basin, from east and north of State of Pará to eastern Colombia.

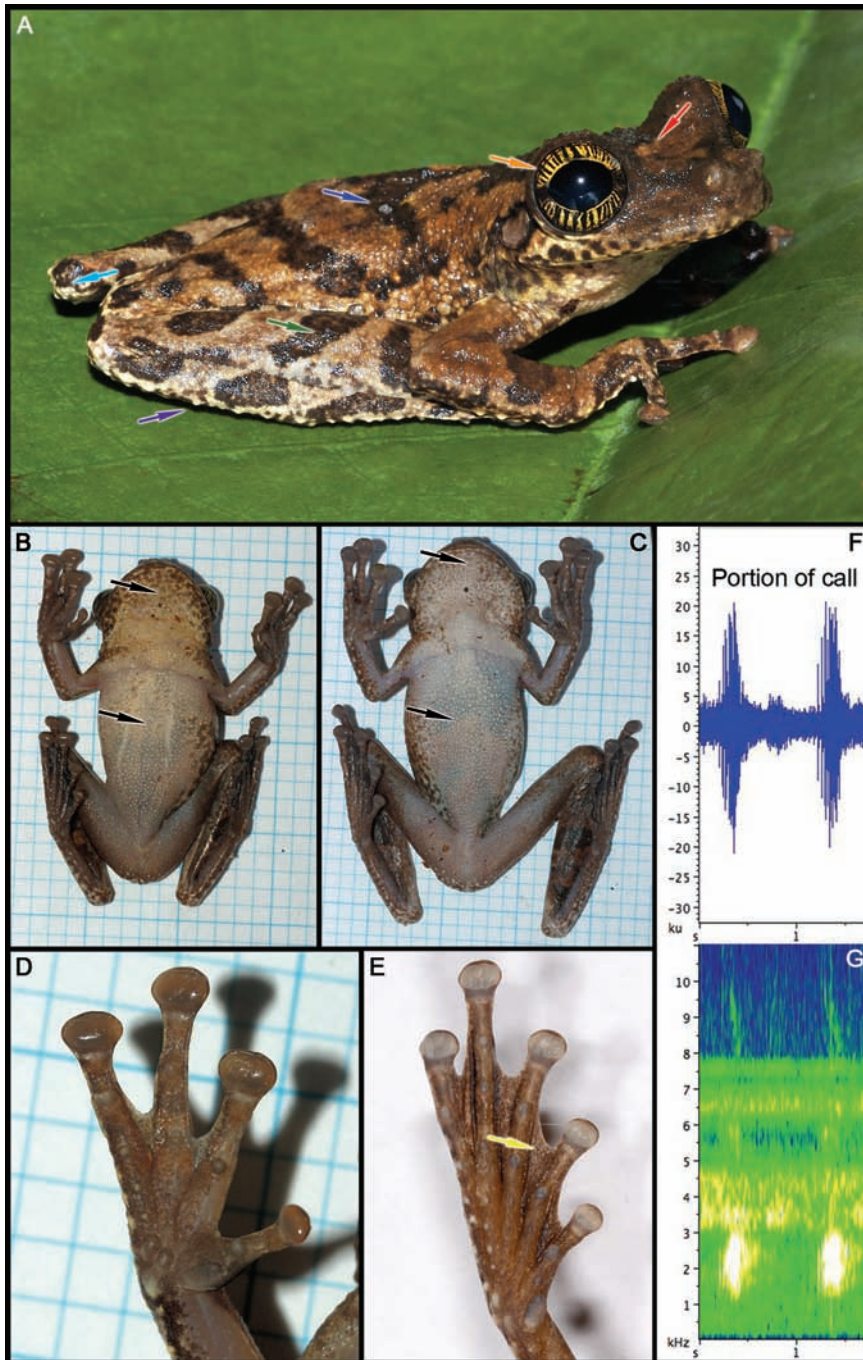
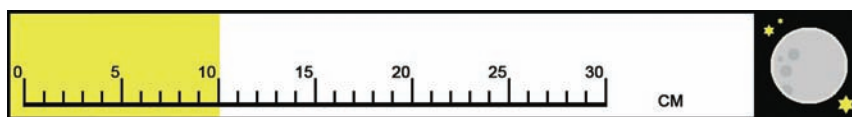


Fig. 119. *Osteocephalus oophagus* Jungfer & Schiesari, 1995. A. Dorsolateral view of a male. B. Ventral surface of a male in life. C. Ventral surface of a female in life. D. Palm (male specimen in life). E. Sole (male preserved specimen). F. Call, oscillogram. G. Call, spectrogram. (Photos by P. J. R. Kok).

***Osteocephalus taurinus* Steindachner, 1862**

1862: 77, pl. 6, figs 1-3.



ENGLISH NAME: Manaus slender-legged treefrog.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "Barra do Rio Negro in Brasilien".

SELECTED REFERENCES: Trueb & Duellman, 1971 (description, B&W drawings, distribution, in English); Duellman & Lescure, 1973 (call description, in English); Duellman, 2005 (description, tadpole description, call description, natural history, colour photo, in English).

Field identification - Males reach 92.0 mm SVL, females 104.0 mm.

- Dorsal ground colour very variable, ranging from tan to dark brown, with or without dark irregular markings, sometimes with a yellow middorsal stripe, rarely with small cream spots; skin on dorsum smooth to shagreened in females, spiculate in males.
- Ventral surface smooth, creamy white, usually with brown blotches on throat, chest, and sides of belly.
- Distinct dark transverse bars on limbs.
- Frontoparietal ridges prominent.
- Iris greenish bronze to gold with conspicuous radiating black lines.
- No calcar on heel, but some small tubercles.
- Tarsal tubercles absent or not prominent.
- Toes almost fully webbed.

Life history - Nocturnal, arboreal. Found in primary and secondary forest. Males call from low vegetation or from the ground along small pools. The species is an explosive breeder, and many males and females may be found in and around a same pool. Eggs are deposited as a film on the water surface of pools and small ponds; tadpoles feed on detritus.

Call - First described by Duellman & Lescure (1973: 9), who provided a spectrogram; see also Schlüter (1979: 224). It mainly consists of a series of low, strongly pulsed, growls produced at a rate of about 8-36 calls/min.

Tadpole - Confused with the tadpole of *Hypsiboas geographicus* by Duellman & Lescure (1973) and Duellman (1978). A complete description is provided in Duellman (2005: 228); see also Hero (1990: 238). Exotroph, benthic; brown; LTRF = 2(2)/3-7(1).

Abundance and distribution in KNP - Locally common, observed around main sampling localities # 5 and 11 (see Fig. 3), probably widespread in the Park.

Geographic range - Widespread in the Amazon Basin, from eastern Ecuador, Peru and northern Bolivia to northeastern Brazil and the Guiana Shield.

Taxonomic comments - Very probably a complex of several cryptic species (see comments by De la Riva *et al.*, 1995).

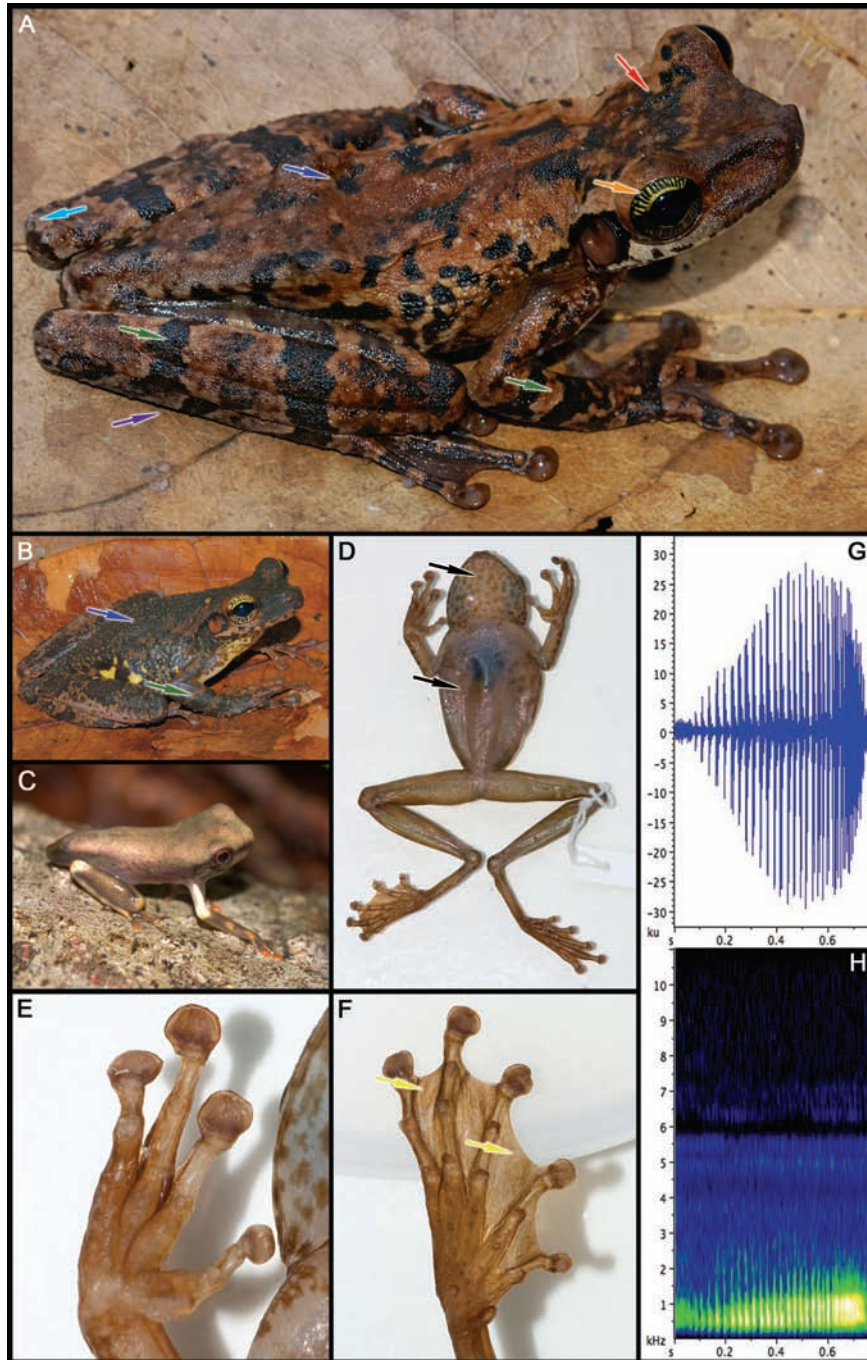


Fig. 120. *Osteocephalus taurinus* Steindachner, 1862. A. Dorsolateral view of a female. B. Dorsolateral view of a male. C. Metamorph. D. Ventral surface of a preserved male. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Phyllomedusa Wagler, 1830

“MONKEY FROGS”



Fig. 121. Calling male of *Phyllomedusa vaillantii*, one of the 32 described species in the genus. Here a specimen photographed in French Guiana. (Photo by P. J. R. Kok).

- ⇒ Medium to large size
- ⇒ Maxillary teeth present
- ⇒ Pupil vertically elliptical (Fig. 42B)
- ⇒ Skin on dorsum smooth, shagreened or finely granular (Fig. 44A-C)
- ⇒ Vocal sac not distinct (but vocal slits present, Fig. 53), single, subgular (Fig. 56A)
- ⇒ Digits opposable
- ⇒ Fingers and toes unwebbed
- ⇒ Finger discs expanded (Fig. 51B)
- ⇒ Tympanum present, distinct or indistinct (Fig. 43A-B)

The genus *Phyllomedusa* currently contains 32 species.

Phyllomedusa species are nocturnal and mostly arboreal, although some taxa are terrestrial (e.g. *P. atelopoides*). They mainly inhabit tropical rainforests, but are also found in savannah and seasonally arid areas.

Some species (e.g. *Phyllomedusa bicolor*) produce waxy skin secretions containing opioid peptides with analgesic properties (e.g. dermorphin, deltorphin) that are used by certain Amerindian tribes as a hunting aid and for disease prevention. Frog secretions are scraped off, dried and later mixed with saliva and applied to self-inflicted skin burns. The chemicals produced by the frog proved to be effective against various diseases, from heart and liver diseases to malaria.

Sexual dimorphism

Males have nuptial excrescences on the first finger. In most species males are slightly smaller than females.

Eggs

Egg masses are deposited above lentic water in most species (above lotic water in some taxa), on the tip of the upper surface of leaves, or in “leaf nests” made by folding one or two leaves into a funnel (into which eggs are laid).

Tadpoles

Exotroph (nektonic, suspension-rasper).



Fig. 122. The tadpole of *Phyllomedusa vaillantii*. (Photo by R. Ernst).

Distribution

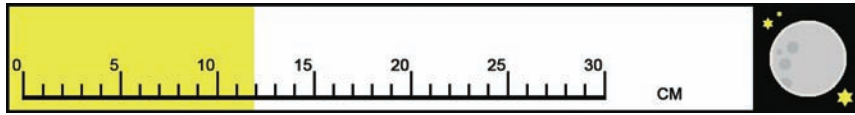
Species belonging to the genus *Phyllomedusa* are found from Panama, through South America east of the Andes, to northern Argentina and Uruguay, including Trinidad (Frost, 2008).

Field key to the *Phyllomedusa* species of Kaieteur National Park

1. Parotoid region rounded, without longitudinal row of small whitish tubercles; Toes I-II equal or subequal in length when adpressed; finger discs large, covering the tympanum ***P. bicolor*** (p. 192)
- 1'. Parotoid region angulate, with longitudinal row of small whitish tubercles; Toe I longer than II when adpressed; finger discs not covering the tympanum ***P. vaillantii*** (p. 194)

Phyllomedusa bicolor (Boddaert, 1772)

1772: 19, pls 1-2.



ENGLISH NAME: Giant monkey frog.

LOCAL NAME (PATAMONA): Pakoko (pron. Pa-go-go).

TYPE LOCALITY: "Guinea" [restricted to Suriname by Funkhouser, 1957].

SELECTED REFERENCES: Duellman, 1974 (description, B&W photo in English); Lescure *et al.*, 1995 (description, breeding behaviour, colour photos, in French); Lescure & Marty, 2001 (brief description, natural history, colour photo, in French).

Field identification - Males reach 115.3 mm SVL, females 120.5 mm.

- Dorsal colour green, dark green by night; skin on dorsum smooth (sometimes reported as "rough").
- Ventral surface granular, light grey, sometimes with a few white ocelli.
- White ocelli on lower lip, flank, and hidden surfaces of thigh.
- Parotoid region rounded, without longitudinal row of small whitish tubercles.
- Iris silvery grey.
- Fingers and toes unwebbed.
- Finger discs large, covering the tympanum.
- Toes I-II opposable, equal or subequal in length when adpressed.

Life history - Nocturnal, arboreal. Found in primary and secondary forest. Males call from trees (usually between 2-10 m), typically above or at the edge of pools or ponds. Eggs are laid over ponds and pools, in leaf nests made by folding one or more leaves into a funnel, from which tadpoles will fall into the water as they hatch; tadpoles feed on detritus.

Call - First description might be that of Zimmerman & Bogart (1984: 480), who provided spectrograms. It consists of a loud, explosive "bok" usually followed by several additional short, lower-pitched notes; the call is produced at a rate of about 3 calls/min.

Tadpole - First described by Hero (1990: 240) and Rada de Martínez (1990: 398). Exotroph, suspension-rasper; translucent orange with silver belly; LTRF = 2(2)/2-3(1).

Abundance and distribution in KNP - Common, observed only around main sampling localities # 5 and 11, but the species is probably widespread in the Park.

Geographic range - Widespread in the Amazon Basin from Ecuador, Peru and northern Bolivia east of the Andes to northern Brazil and the Guiana Shield.

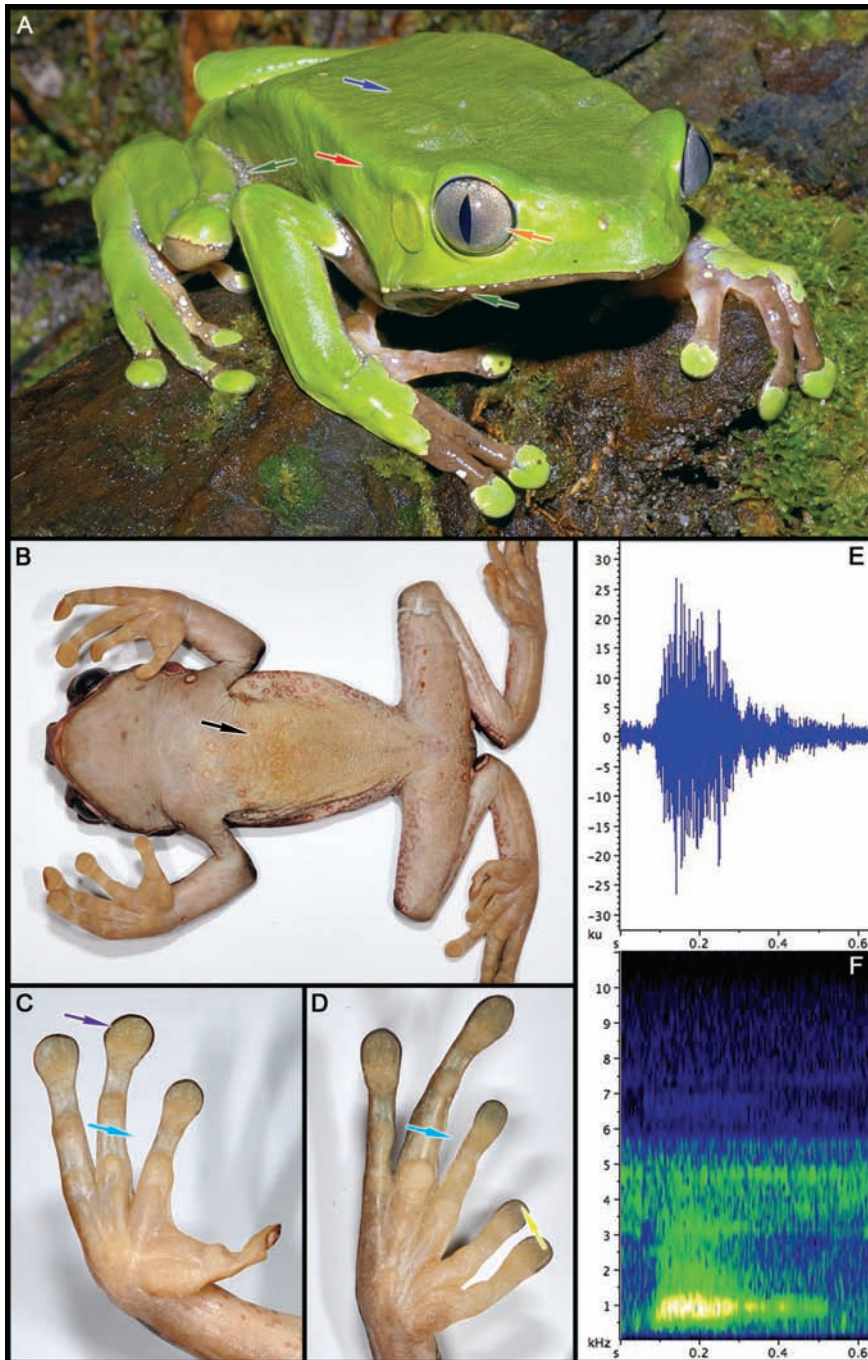
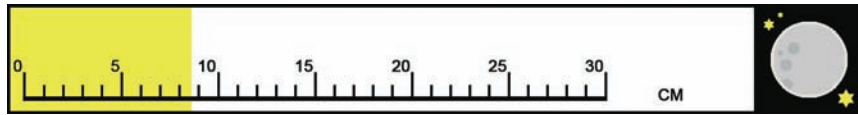


Fig. 123. *Phyllomedusa bicolor* (Boddaert, 1772). A. Dorsolateral view of a male. B. Ventral surface of a preserved male. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Phyllomedusa vaillantii Boulenger, 1882

1882: 427, pl. 29, fig. 2.



ENGLISH NAME: White-lined monkey frog.

LOCAL NAME (PATAMONA): Might be "Pakalais".

TYPE LOCALITY: "Santarém, Brazil".

SELECTED REFERENCES: Duellman, 1974 (description, B&W photo in English); Lescure *et al.*, 1995 (description, breeding behaviour, colour photos, in French); Lescure & Marty, 2001 (brief description, natural history, colour photo, in French).

Field identification - Males reach 65.0 mm SVL, females 87.3 mm.

- Dorsal colour pale or dark green to greyish green; skin on dorsum smooth (sometimes reported as "rough").
- Ventral surface granular, orange to reddish brown or greyish brown, usually with a few white ocelli on throat and chest.
- Cream, orange or reddish ocelli on flank and hidden surfaces of thigh, lower lip white.
- Parotoid region angulate, with longitudinal row of small whitish tubercles.
- Iris silvery grey.
- Fingers and toes unwebbed.
- Finger discs medium, not covering the tympanum.
- Toes I-II opposable, Toe I longer than II when adpressed.

Life history - Nocturnal, arboreal, but often observed sitting or walking on the ground. Found in primary and secondary forest. Males call from bushes (usually between 0.5-2 m above the ground), typically above or at the edge of pools or ponds. Eggs are laid over ponds and pools, in leaf nests made by folding one or more leaves into a funnel, from which tadpoles will fall into the water as they hatch; tadpoles feed on detritus.

Call - First description might be that of Duellman (1978: 181); see also Schlüter (1979: 227), who provided a spectrogram. It consists of a harsh "cluck"; the call is produced very irregularly, at a rate of about 12-14 calls/min.

Tadpole - First described by Duellman (1978: 181); see also Caramaschi & Jim (193: 262) and Hero (1990: 243). Exotroph, suspension-rasper; translucent orange with silver belly; LTRF = 2[2]/2-3[1].

Abundance and distribution in KNP - Common, observed around main sampling localities # 5, 10 and 11, but the species is probably widespread in the Park.

Geographic range - Widespread in the Amazon Basin from Ecuador, Peru and northern Bolivia east of the Andes to northern Brazil and the Guianas.

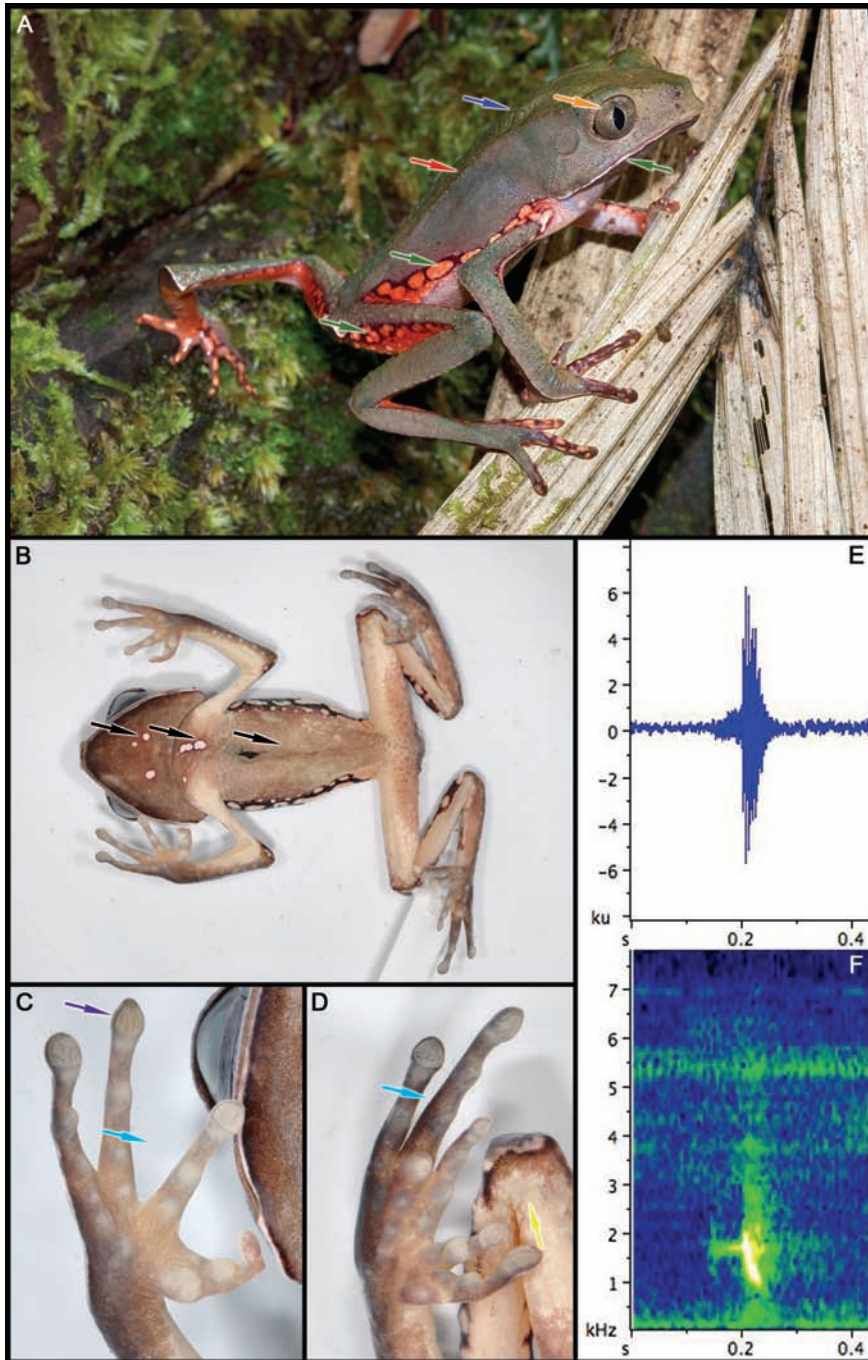


Fig. 124. *Phyllomedusa vaillantii* Boulenger, 1882. A. Dorsolateral view of a male. B. Ventral surface of a preserved male. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Scinax Wagler, 1830

“SNOUDED TREEFROGS”



Fig. 125. *Scinax ruber*, one of the 94 described species in the genus. (Photo by P. J. R. Kok).

- ⇒ Small to medium size
- ⇒ Snout relatively long, protruding beyond lower jaw
- ⇒ Maxillary teeth present
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum smooth, shagreened, granular or tuberculate (Fig. 44A-D)
- ⇒ Vocal sac single, subgular (Fig. 56A), bilobate subgular (Fig. 56B), or paired, lateral (Fig. 56D) in a few species
- ⇒ Toes extensively webbed, but webbing reduced between Toes I-II
- ⇒ Webbing between fingers absent or much reduced
- ⇒ Finger discs expanded (Fig. 51B)
- ⇒ Tympanum present, distinct (Fig. 43A)

The genus currently contains 94 species assigned to four different species groups (Faivovich *et al.* 2005): the *Scinax catharinae* group, the *S. perpusillus* group, the *S. rostratus* group, and the *S. uruguayus* group. Several species remain unassigned to any group.

Snouted treefrogs are nocturnal, terrestrial or arboreal. They inhabit a wide range of habitats, from savannah to tropical rainforest.

Sexual dimorphism

Males are smaller than females; there is no other evident sexual dimorphism or dichromatism, although males of some species are yellow when calling (e.g. *Scinax ruber*).

Eggs

Egg deposition sites are diverse in the genus: eggs may be laid in a foam nest constructed in temporary pools (e.g. *Scinax rizibilis*), in lotic water (e.g. *S. albicans*), or in lentic water (in most species). Lescure & Marty (2001) suggested deposition of eggs on a floating leaf or above water in *S. proboscideus*.

Tadpoles

Exotroph (benthic, nektonic).

Distribution

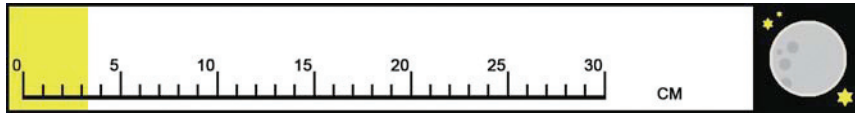
Species belonging to the genus *Scinax* are found from Mexico (eastern and southern parts) to Argentina and Uruguay, including Trinidad and Tobago and St Lucia (Frost, 2008).

Field key to the *Scinax* species of Kaieteur National Park

1. Posterior surface of thighs immaculate; no longitudinal stripes on dorsum ***S. boesemani*** (p. 198)
- 1'. Posterior surface of thighs with conspicuous yellowish blotches (Fig. 39B); usually distinct longitudinal stripes (Fig. 39G) on dorsum ***S. ruber*** (p. 200)

***Scinax boesemani* (Goin, 1966)**

1966: 229, fig. 1.



ENGLISH NAME: Boeseman's snouted treefrog.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "near Zanderij, Suriname District, Suriname".

SELECTED REFERENCES: Goin, 1966 (original description, B&W drawings, in English); Lescure & Marty, 2001 (brief description, natural history, colour photo, in French); Lima *et al.*, 2006 (brief description, natural history, colour photos, in English).

Field identification - Males reach 32.1 mm SVL, females 33.0 mm.

- ➔ Dorsal ground colour variable, ranging from tan to dark brown, depending on light intensity, with cream or yellow spotting (spots may be more or less visible depending on light intensity); skin on dorsum smooth to weakly granular.
- ➔ Ventral surface granular, white.
- ➔ Flanks with well-defined dark brown spots (spots may be more or less visible depending on light intensity).
- ➔ Dark line from nostril to arm insertion.
- ➔ Iris greyish brown to dark brown with inconspicuous irregular black vermiculations.
- ➔ Hidden surfaces of thighs greyish brown, immaculate.
- ➔ Webbing between Toes I-II reduced.
- ➔ Fingers unwebbed.

Life history - Nocturnal, arboreal. Found in savannah and open areas, very rarely observed in primary and secondary forest. Males call from low elevation in shrubs and bushes, sometimes from the ground, along seasonally flooded pools and small ponds, often in large choruses. Eggs are deposited as a film on the water surface of slow-moving streams, pools and small ponds; tadpoles feed on detritus.

Call - First described by Hödl (1977: 358), who provided a spectrogram. It consists of a buzzing trill produced at a rate of ca. 30 notes/min.

Tadpole - First described by de Sá *et al.* (1997: 15). Exotroph, nektonic; colour in life unknown; LTRF = 2(2)/3(1-2).

Abundance and distribution in KNP - Very common locally, observed around main sampling localities # 2, 3 and 4 (see Fig. 3), but probably widespread in the Park in suitable habitats.

Geographic range - The Guiana Shield and the Amazon Basin in Brazil.

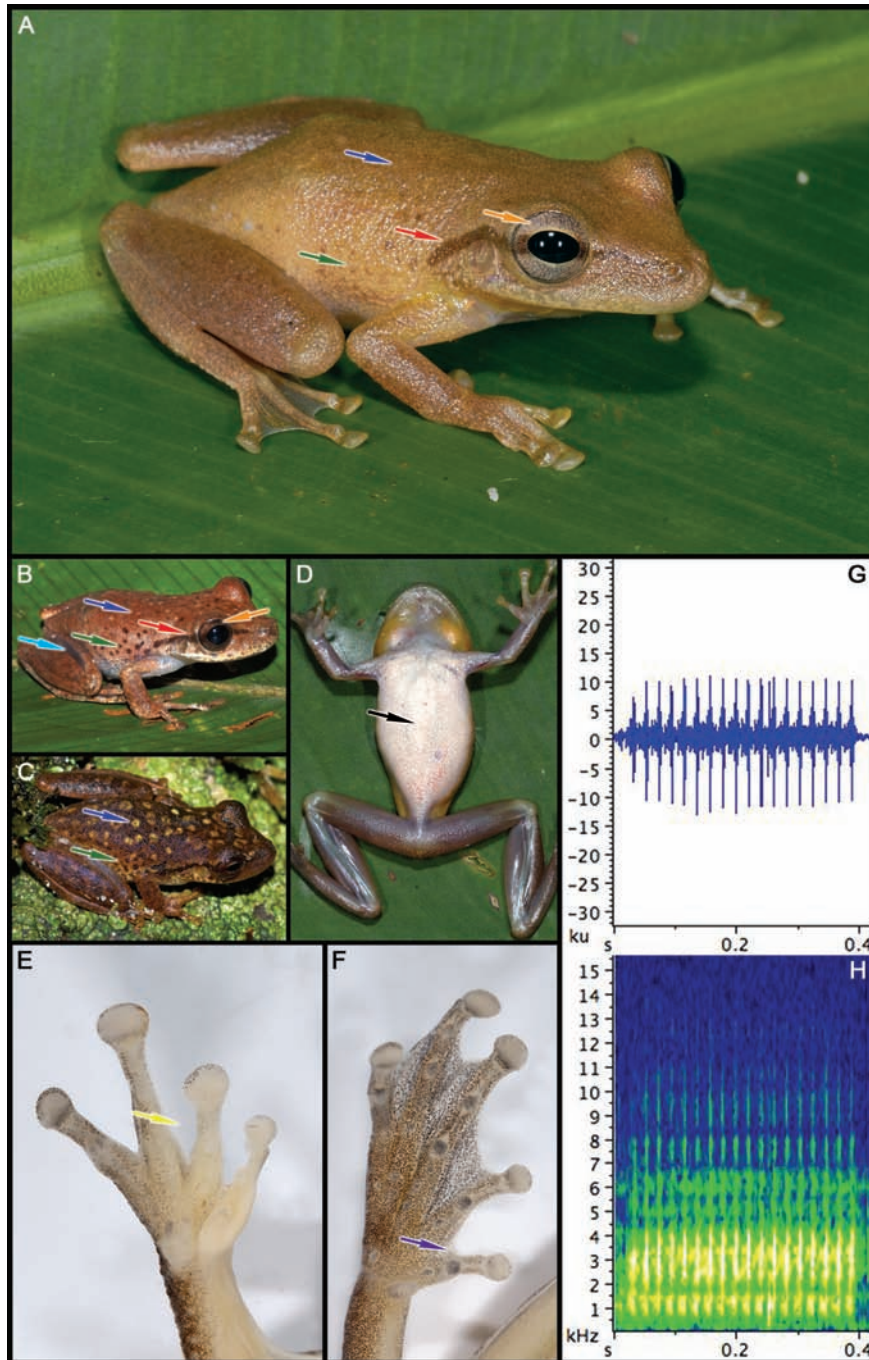
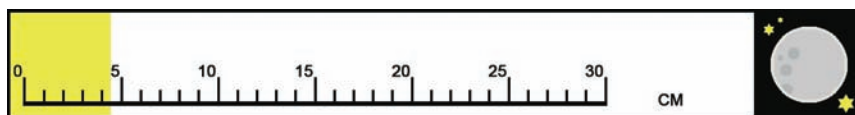


Fig. 126. *Scinax boesemani* (Goin, 1966). A-B. Dorsolateral views of males. C. Dorsolateral view of a female. D. Ventral surface of a male in life. E. Palm of hand (preserved male specimen). F. Sole of foot (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Scinax ruber (Laurenti, 1768)

1768: 35.



ENGLISH NAME: Red snouted treefrog.

LOCAL NAME (PATAMONA): Waroma.

TYPE LOCALITY: "America".

SELECTED REFERENCES: Duellman, 1978 (description, natural history, tadpole description, call description, B&W photo, in English); Duellman & Wiens, 1993 (description, natural history, colour photo, in English); Lescure & Marty, 2001 (brief description, natural history, colour photo, in French).

Field identification - Males reach 41.0 mm SVL, females 44.0 mm.

- ➔ Dorsal ground colour variable, ranging from cream, tan or grey to dark brown, depending on light intensity, usually with broad dark brown dorsolateral and lateral stripes and distinct lumbar spots (stripes inconspicuous in some specimens, sometimes broken into longitudinal spots); skin on dorsum smooth to weakly granular.
- ➔ Ventral surface granular, greyish white, cream or yellow.
- ➔ Flanks usually lack well-defined dark brown spots.
- ➔ Broken interorbital bar often present.
- ➔ Iris bronze with conspicuous irregular black vermiculations.
- ➔ Groin and hidden surfaces of thighs with yellowish or orange blotches on a dark background.
- ➔ Webbing between Toes I-II reduced.
- ➔ Fingers unwebbed.

Life history - Nocturnal, arboreal. Found in disturbed and open areas, rarely observed in secondary forest, very anthropophilic. Males call from low elevation in shrubs, bushes, or grasses along seasonally flooded pools and small ponds. Eggs are deposited as a film on the water surface of pools and small ponds; tadpoles feed on detritus.

Call - First description might be that of Duellman (1978: 164); see also Schlüter (1979: 220), who provided a spectrogram. It consists of a series of short loud trills ("aaah") produced at a rate of ca. 45 notes/min.

Tadpole - First described by Kenny (1969: 33); see also Duellman (1970: 185) and Hero (1990: 235 [under *Oloolygon* cf. *rubra*]). Exotroph, nektonic; silvery gold with black dots and a brown stripe from snout to eye; LTRF = 2(2)/3(1).

Abundance and distribution in KNP - Very common locally, observed around main sampling localities # 2, 3 and 10 (see Fig. 3), probably widespread in the Park.

Geographic range - Widespread (but see taxonomic comments), found from Panama through the Guiana Shield and northern Brazil, also on Trinidad & Tobago.

Taxonomic comments - A composite of as many as six cryptic species according to Fouquet *et al.* (2007). Call of specimens from the Rupununi savannah in southern Guyana is significantly different from specimens from KNP (Kok, unpubl. data).

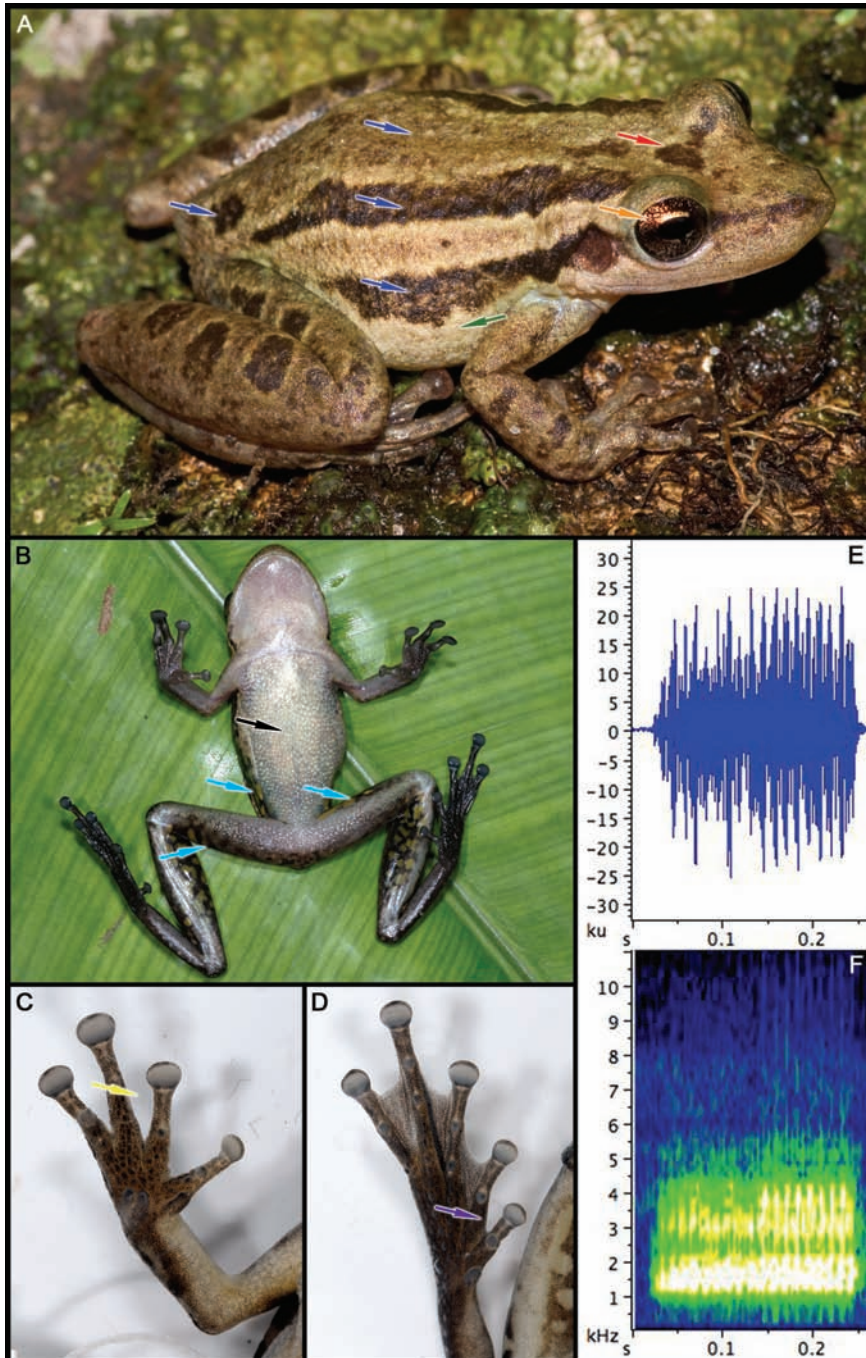


Fig. 127. *Scinax ruber* (Laurenti, 1768). A. Dorsolateral view of a male. B. Ventral surface of a male in life. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Tepuihyla Ayarzagüena, Señaris & Gorzula, 1993

“TEPUI TREEFROGS”



Fig. 128. *Tepuihyla talbergae*, endemic to Kaieteur National Park, one of the eight described species in the genus. (Photo by P. J. R. Kok).

- ⇒ Small to medium size
- ⇒ Maxillary teeth present
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum smooth, shagreened, tuberculate or spiculate (Fig. 44A-B, D-E)
- ⇒ Vocal sac poorly distinct (vocal slits small; absent in some species), single, subgular (Fig. 56A) or bilobate, subgular (Fig. 56B)
- ⇒ Toes no more than half-webbed, webbing absent or vestigial between Toes I-II
- ⇒ Webbing between fingers absent or vestigial
- ⇒ Finger discs expanded (Fig. 51B)
- ⇒ Tympanum present, distinct (Fig. 43A)

The genus currently contains eight species.

Tepui treefrogs are nocturnal, terrestrial or arboreal. They inhabit tropical primary forest and tepui summits and are often associated with bromeliads (Bromeliaceae). Very little is known about their natural history.

Sexual dimorphism

Males are distinctly smaller than females and have the dorsal skin spiculate, males in breeding condition have nuptial excrescences on the prepollex.

Eggs

Aquatic, lentic (e.g. in shallow swampy areas) or lotic (small streams), probably deposited as a film on the water surface. Breeding habits of most of *Tepuihyla* species are virtually unknown.

Tadpoles

Unknown, presumably exotroph (benthic, nektonic?).

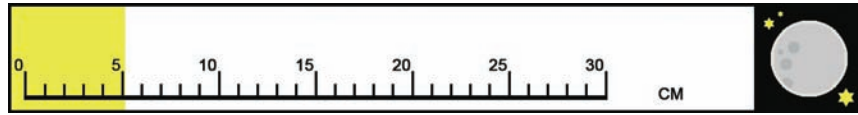
Distribution

Species belonging to the genus *Tepuihyla* are restricted to the mountains of eastern and southeastern Venezuela (Amazonas and Bolívar states) and the Pakaraima Mountains in Guyana (Frost, 2008). It must be noted that one species, *Tepuihyla celsae*, is reported from Cerro Galicia in Falcón State, northwestern Venezuela (Mijares-Urrutia *et al.*, 1999); that species was never seen alive and the type locality is considered as doubtful by Barrio-Amorós (2004).

Only *Tepuihyla talbergae* (p. 204) is currently reported from Kaieteur National Park, which is the lowest and easternmost known locality for the genus.

***Tepuihyla talbergae* Duellman & Yoshpa, 1996**

1996: 276, figs 1-3.



ENGLISH NAME: Kaieteur tepui treefrog.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "Kaieteur Falls, 366 m (05°10'S, 59°28'W), Mazaruni-Potaro District, Guyana".

SELECTED REFERENCES: Duellman & Yoshpa, 1996 (original description, B&W drawings and photo).

Field identification - Males reach 36.6* mm SVL, females 50.3* mm.

- Dorsal ground colour variable, ranging from pinkish grey, greyish tan to reddish brown, usually with minute dark brown flecks, sometimes with minute red flecks, rarely with a dark brown "hour-glass" pattern (exclusively observed in a few males); skin on dorsum smooth to shagreened in females, spiculate in males (breeding males have black keratinized nuptial excrescences on thumb).
- Ventral surface granular, greyish white; throat usually with brown spots and flecks (often more conspicuous in males).
- Dark brown canthal stripe from nostril to eye followed by a narrow dark brown stripe from eye to posterior edge of tympanum or to arm insertion.
- Upper lip white.
- Iris silver grey to bronze with inconspicuous irregular black vermiculations.
- Inner metatarsal tubercle projecting.
- Webbing between Toes I-II reduced.
- Fingers unwebbed.

Life history - Nocturnal, arboreal. Found in savannah and neighbouring forest-edge situations, usually perched on shrubs between 0.5-1.5 m above ground level. During the day the species typically takes refuge in terrestrial bromeliads (e.g. *Brocchinia micrantha*, *B. reducta*), but a few individuals were found in low-perched epiphytic bromeliads (max 1.5 m above the ground). Reproductive behaviour remains unknown, but males with keratinized nuptial excrescences and gravid females were exclusively collected at the end of November and at the beginning of December (which corresponds to the beginning of the short rainy season), which suggests that breeding might be restricted to a very short period of the year. One male in breeding condition was collected on 2 December 2005, in the water, sitting on an immersed rock at the edge of a small pool in savannah. Males (which lack vocal slits) probably call floating in the water or from the ground or low elevation in shrubs and bushes along seasonally flooded pools and small ponds. Eggs are probably deposited in seasonally flooded pools and small ponds in the savannah.

Call - Unknown.

Tadpole - Unknown.

Abundance and distribution in KNP - Common locally, observed only around main sampling localities # 2, 3 and 4 (see Fig. 3).

Geographic range - Endemic to Kaieteur National Park, Guyana.



Fig. 129. *Tepuihyla talbergae* Duellman & Yoshpa, 1996. A. Dorsolateral view of a female. B. Dorsolateral view of a male. C. Dorsal view of a male. D. Ventral surface of a preserved female. E. Palm (preserved female specimen). F. Sole (preserved female specimen). (Photos by P. J. R. Kok).

Trachycephalus Tschudi, 1838

“CASQUE-HEADED TREEFROGS”



Fig. 130. Calling male of *Trachycephalus coriaceus*, one of the 10 currently described species in the genus. Here a specimen from French Guiana. (Photo by C. Marty).

- ⇒ Medium to large size
- ⇒ Maxillary teeth present
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Vocal sacs usually paired, lateral (Fig. 56A), but vocal sac single, subgular in *T. hadrocephus* (Fig. 56D)
- ⇒ Skin glandular, very thick, smooth, shagreened or tuberculate (Fig. 44A-B, D)
- ⇒ Toes extensively webbed
- ⇒ Finger discs expanded (Fig. 51B)
- ⇒ Tympanum present, distinct (Fig. 43A)

The genus *Trachycephalus* currently contains 10 species, which are nocturnal and highly arboreal. They mainly inhabit primary tropical rainforest.

The genus *Phrynohyas* was recently synonymized with *Trachycephalus* by Faivovich *et al.* (2005); the two species from Kaieteur National Park were formerly known as *Phrynohyas coriacea* and *P. resinifictrix*.

Sexual dimorphism

There is no evident sexual dimorphism; in most species males are slightly smaller than females.

Eggs

Eggs are deposited in lentic water, as a film on the water surface, or as a gelatinous mass. Some species lay eggs in the canopy (up to 32 m high), in water-filled tree holes (*e.g.* *Trachycephalus resinifictrix*).

Tadpoles

Exotroph (benthic, nektonic, arboreal).

Distribution

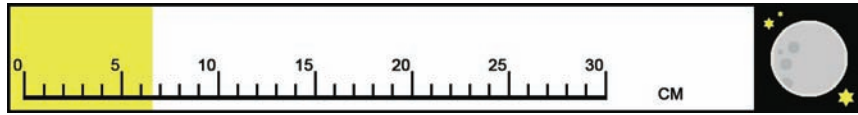
Species belonging to the genus *Trachycephalus* are found from Mexico, through Central and South America east of the Andes to northern Argentina and eastern Brazil, including Trinidad and Tobago (Frost, 2008).

Field key to the *Trachycephalus* species of Kaieteur National Park

1. Skin on dorsum smooth (Fig. 44A); iris dark bronze, lacking radiating lines (without a black cross); skin of flanks areolate (Fig. 44G); large bluish black spot above arm insertion. *T. coriaceus* (p. 208)
- 1'. Skin on dorsum tuberculate (Fig. 44D); iris golden with four radiating black lines (a black "Maltese cross"); skin on flanks not areolate; no bluish black spot above arm insertion *T. resinifictrix* (p. 210)

Trachycephalus coriaceus (Peters, 1867)

1867: 711.



ENGLISH NAME: Surinam casque-headed treefrog.

LOCAL NAME (PATAMONA): Etáule.

TYPE LOCALITY: "Surinam".

SELECTED REFERENCES: Duellman, 1978 (description, B&W photo, in English); Lescure *et al.*, 1996 (description, tadpole description, natural history, colour photos, in French); Duellman, 2005 (description, tadpole description, natural history, colour photo, in English).

Field identification - Males reach 63.0 mm SVL, females 67.6 mm.

- Dorsal ground colour ranging from tan (by day) to reddish brown (by night), with a large dark brown rectangular blotch narrowly outlined with a creamy border extending from upper eyelids to middle of the back (blotch sometimes broken in two, rarely absent), followed by a similar saddle-shaped dark brown blotch over the sacrum; skin on dorsum smooth, thick, glandular.
- Ventral surface areolate, creamy white to yellow.
- Thick supratympanic glandular fold covering the upper part of the tympanum.
- Skin on flanks areolate.
- Large bluish black spot below supratympanic fold, at arm insertion.
- Iris dark bronze, lacking radiating lines.
- Fingers half-webbed, finger webbing red.
- Toes 3/4 webbed, toe webbing red.

Life history - Nocturnal, arboreal. Exclusively found in primary forest. The species is an explosive breeder, which congregates for a short period, at the time of the first heavy rains. Males call on shrubs (up to 2 m above the ground) or while floating on the surface of the water. Eggs are deposited as a film on the water surface of temporary pools and small ponds; tadpoles feed on detritus.

Call - First described by Schlüter (1979: 225), who provided a spectrogram. It consists of a loud grinding growl, produced at a rate of about 28 calls/min according to Lescure & Marty (2001).

Tadpole - First briefly described by Rodriguez & Duellman (1994: 42); see also Lescure *et al.* (1996: 70) and Schiesari & Moreira (1996: 404). Exotroph, nektonic; greyish brown with or without black spots; LTRF variable = 2-3(3)/5-6(1), 4(1,2,4)/6(1).

Abundance and distribution in KNP - Very rare, only one specimen collected in the western part of the Park without precise locality, but probably widespread in KNP.

Geographic range - Apparently a disjunct distribution, but it is expected that new records will fill the gap. One population in the Guianas, another found from eastern Ecuador, Peru and northern Bolivia through the Amazon Basin to near Manaus, Brazil.

Remark - Photos A & C in figure 131 are of a specimen from French Guiana, D & E are of a specimen from Peru.

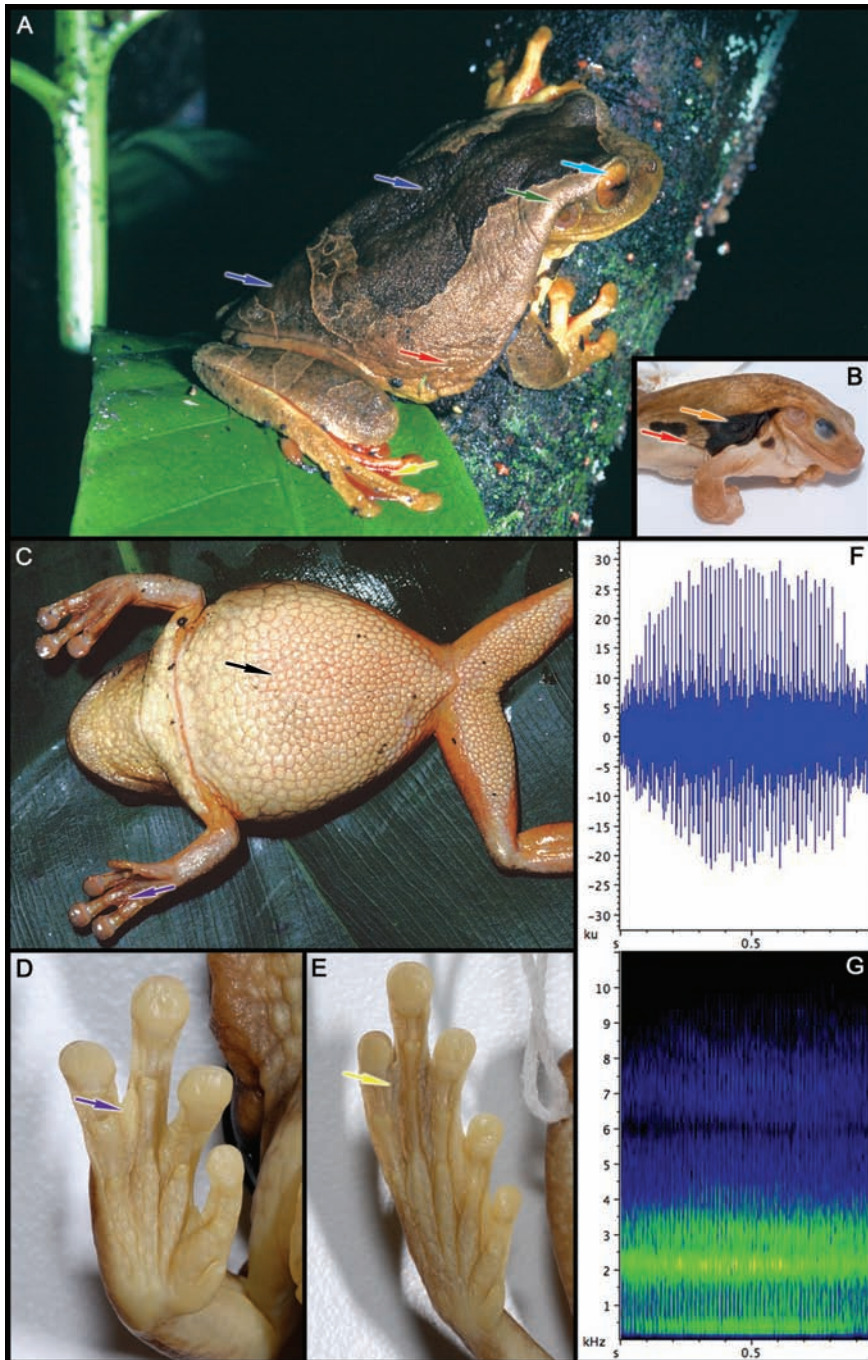
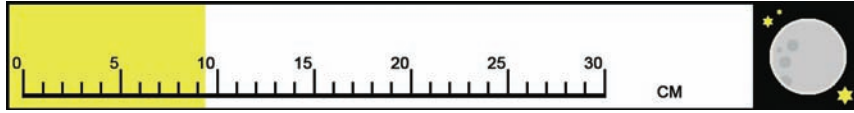


Fig. 131. *Trachycephalus coriaceus* (Peters, 1867). A. Dorsolateral view. B. Lateral view in preservative. C. Ventral surface in life. D. Palm (preserved specimen). E. Sole (preserved specimen). F. Call, oscillogram. G. Call, spectrogram. (Photos A, C-E by C. Marty, B by P. J. R. Kok).

Trachycephalus resinifictrix (Goeldi, 1907)

1907: 135, figs 56-57.



ENGLISH NAME: Kunawalu casque-headed treefrog.

LOCAL NAME (PATAMONA): Kunawa.

TYPE LOCALITY: "Mission of San Antonio do Prata, at the River Macaraná" [Brazil].

SELECTED REFERENCES: Zimmerman & Hödl, 1983 (call description, natural history, colour patterns, B&W drawing, distinction from *Trachycephalus venulosus*, in English); Lescure *et al.*, 1996 (description, natural history, colour photos, in French); Lescure & Marty, 2001 (brief description, natural history, colour photo, in French).

Field identification - Males reach 83.8 mm SVL, females 93.7 mm.

- Dorsal ground colour dark brown, with one large whitish, tan or greenish brown blotch narrowly outlined with a creamy border on the flank and another on the top of the head, the latter often having the shape of a triangle; skin on dorsum tuberculate (tubercles usually with white tip), thick, glandular.
- Ventral surface granular, greenish white to light brown.
- Supratympanic glandular fold not covering the upper part of the tympanum.
- Skin on flanks tuberculate, never areolate.
- No black spot at arm insertion.
- Iris golden with four radiating black lines (a black "Maltese cross").
- Fingers half-webbed, finger webbing greenish blue.
- Toes 3/4 webbed, toe webbing greenish blue.

Life history - Nocturnal, arboreal. Observed only in primary forest. Males call exclusively from water-filled cavities in hollow trunks or branches, at heights between 2.2-32 m (usually between 10-20 m). Eggs are deposited as a gelatinous mass in water-filled treeholes; tadpoles feed on conspecific eggs and detritus.

Call - First described by Zimmerman & Hödl (1983: 343), who provided spectrograms. It consists of 3-4 loud barklike notes, produced at a rate of about 4 calls/min according to Lescure & Marty (2001).

Tadpole - First described by Hero (1990: 239); see also Grillitsch (1992: 53) and Schiesari *et al.* (1996: 115). Exotroph, arboreal; dark olive; LTRF = 2(2)/3-5.

Abundance and distribution in KNP - Common, heard around main sampling localities # 5, 8, 9, 10, 11, 12 and 13 (see Fig. 3).

Geographic range - Widespread from eastern Ecuador, Peru and northern Bolivia through the Amazon Basin to the Guiana Shield.

Remark - Photos in figure 132 are of a specimen from Manaus, Brazil.

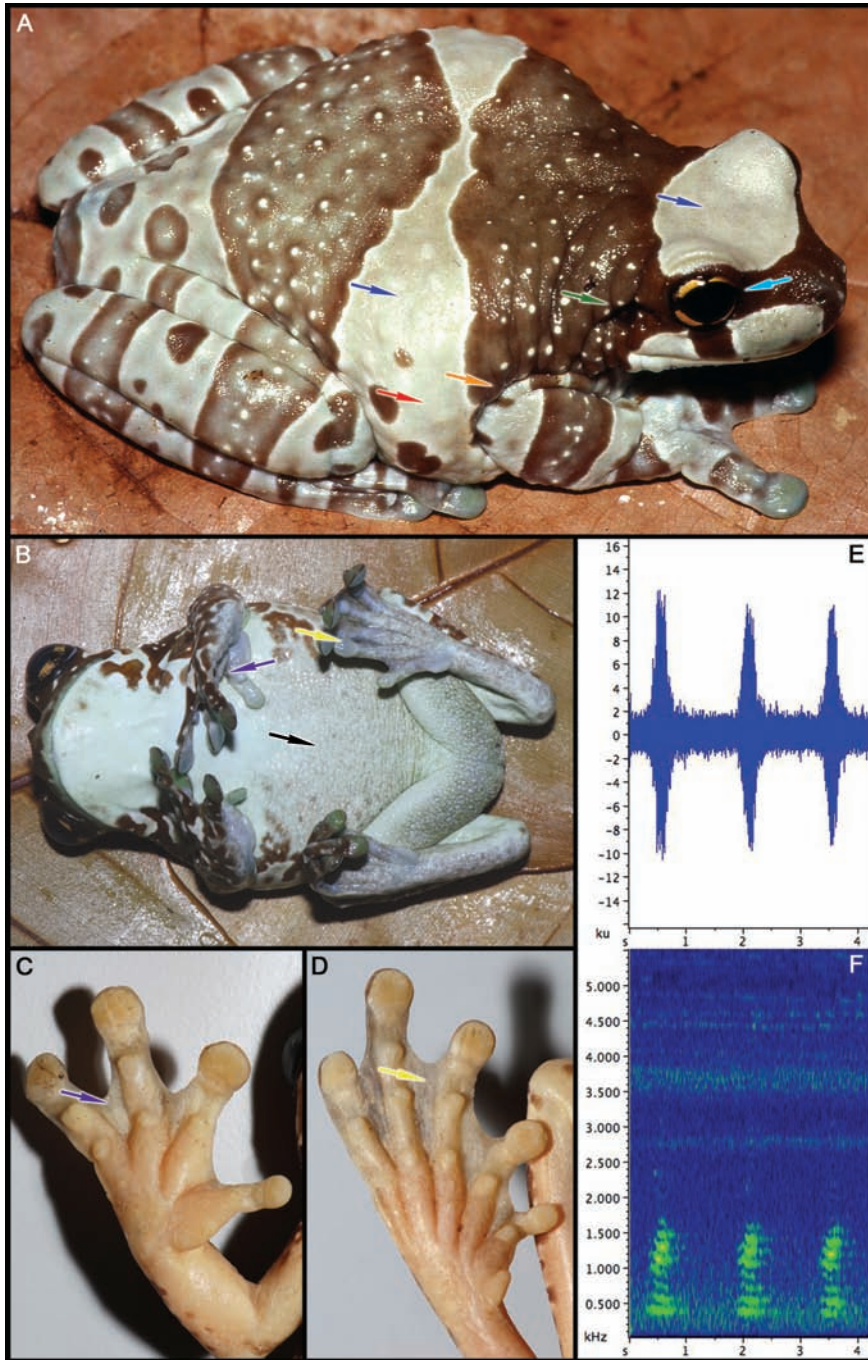


Fig. 132. *Trachycephalus resinifictrix* (Goeldi, 1907). A. Dorsolateral view. B. Ventral surface in life. C. Palm (preserved specimen). D. Sole (preserved specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by K. H. Jungfer).

Leptodactylus Fitzinger, 1826

“THIN-TOED FROGS”



Fig. 133. *Leptodactylus lutzi*, endemic to Guyana, one of the ca. 85 described species in the genus. (Photo by P. J. R. Kok).

- ⇒ Small to large size
- ⇒ Maxillary teeth present
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Vocal sac single, subgular (Fig. 56A), bilobate, subgular (Fig. 56B), or paired, subgular (Fig. 56E); vocal sac internal and indistinct in some species (e.g. *L. discodactylus*)
- ⇒ Skin on dorsum smooth to warty (Fig. 44A-F)
- ⇒ Ventral skin smooth (Fig. 44A)
- ⇒ Fingers unwebbed, toes no more than basally webbed
- ⇒ Finger I \geq II when fingers adpressed
- ⇒ Finger discs unexpanded (Fig. 51A), or slightly expanded
- ⇒ Tympanum present, distinct (Fig. 43A)

This large and diverse genus currently contains about 86 species. Thin-toed frogs are mostly nocturnal and terrestrial (some semiaquatic), they inhabit a wide range of habitats, from savannah to tropical primary forest. Several species produce toxic skin secretions.

The genera *Adenomera* and *Lithodytes* were synonymized with *Leptodactylus* by Frost *et al.* (2006). It has been suggested to use the term “*Leptodactylus marmoratus* group” (Heyer, 1973) for those species formerly included in *Adenomera* (Almeida & Angulo, 2006).

Sexual dimorphism

Very variable between species. Males of many species have enlarged forearms and/or keratinized spine(s) on the thumb (sometimes also on the chest); in some species males have a shovel-shaped snout used to excavate nesting chambers.

Eggs

Deposited in foam nests on land (sometimes in nesting chambers), or in water.

Tadpoles

Exotroph (benthic, carnivorous) or endotroph (nidicolous).

Distribution

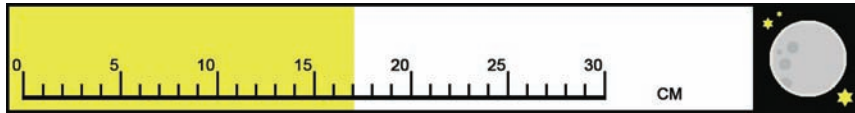
The genus is widespread and known from southern North America, the West Indies, and South America (Frost, 2008).

Field key to the *Leptodactylus* species of Kaieteur National Park

1. Skin smooth to finely granular (Fig. 44A-C); at least one pair of well-defined, usually continuous, dorsolateral folds (Fig. 46A) **2**
- 1'. Skin warty, tuberculate or spiculate (Fig. 44D-F); no well-defined, continuous dorsolateral folds **3**
2. Rear of thighs black with light spots (Fig. 39A) and immaculate pinkish stripe on the upper lip ***L. rhodomystax*** (p. 226)
- 2'. Not as above **5**
3. Body black with dorsolateral yellow stripes ***L. lineatus*** (p. 216)
- 3'. Not as above **4**
4. Ventral surface yellow, centre of belly immaculate ***L. lutzii*** (p. 220)
- 4'. Ventral surface whitish or greyish with dark mottling **6**
5. Dorsolateral folds extend to sacrum only ***L. knudseni*** (p. 214)
- 5'. Dorsolateral folds extend to groin **7**
6. Ventral pattern anastomosed (Fig. 39E), extending on the lower surface of legs ***L. petersii*** (p. 224)
- 6'. Ventral pattern not anastomosed, not extending on the lower surface of legs ***L. rugosus*** (p. 228)
7. Supernumerary plantar tubercles absent; stripe on the upper lip entering eye anteriorly ***L. longirostris*** (p. 218)
- 7'. Supernumerary plantar tubercles present (Fig. 50); stripe on the upper lip never entering eye anteriorly. ***L. mystaceus*** (p. 222)

Leptodactylus knudseni Heyer, 1972

1972: 3, fig. 2.



ENGLISH NAME: Knudsen's thin-toed frog.

LOCAL NAMES (PATAMONA): Chinau, Pùdùka.

TYPE LOCALITY: "Limoncocha, 0°24'S, 76°37'W, Provincia de Napo, Ecuador".

SELECTED REFERENCES: Heyer, 1979 (description, call description, in English), Heyer, 2005 (description, variation, call description, tadpole description, distribution, in English), Heyer & Heyer, 2006 (extended account, colour photo, in English).

Field identification - Males reach 170.0 mm SVL, females 154.0 mm.

- Dorsal ground colour variable, ranging from pinkish or greyish tan to orangish or reddish brown, with two or more broad dorsal transverse brown bands, sometimes ill-defined; flanks reddish in males; juveniles greyish with reddish dorsal transverse broad bands and reddish dorsolateral fold (fold more conspicuous than in adult); skin on dorsum smooth, slightly granular posteriorly.
- Ventral surface smooth, variable in colour and pattern, often creamish white with diffuse brown mottling; throat dark brown with pale flecks.
- Pair of low, often interrupted, dorsolateral folds extending from eye to sacral region, never entering groin. Supratympanic fold bifurcating on shoulder.
- Upper lip with dark triangular marks.
- Posterior thigh pattern variable, often black with reddish orange vermiculations.
- When addressed, Finger I much longer than Finger II.
- Lateral fringes on fingers and webbing absent.
- Male thumb with one large spine; large breeding males with chest spines.

Life history - Nocturnal, terrestrial. Found in primary and secondary forest, and in open areas, including savannah. Males call from various terrestrial sites, including edge of burrows or hollow trunks and flooded areas. Eggs are laid in foam nests, from which tadpoles escape into nearby water (temporary or semi-permanent) after heavy rains; tadpoles feed on frog eggs (hetero- and conspecific) and detritus.

Call - First described by Heyer (1979: 21), who provided a spectrogram. It consists of a single pulsed note (a loud rising "whoop") repeated at a rate of about 16-66 calls/min.

Tadpole - Probably first described by Duellman (1978: 109, as *Leptodactylus pentadactylus*), see also Hero (1990: 247). Exotroph, benthic/carnivorous; grey or dark olive; LTRF = 2(2)/2-3[1-2].

Abundance and distribution in KNP - Common. Observed around main sampling localities # 2, 4, and 11 (see Fig. 3), probably widespread in the park.

Geographic range - Widespread in the Amazon Basin, from Bolivia, Ecuador, Colombia and Peru, through Brazil and the Guiana Shield to Trinidad.

Taxonomic comments - The broad distribution and notably the geographic variation of the juvenile pattern suggest a possible complex of cryptic species.

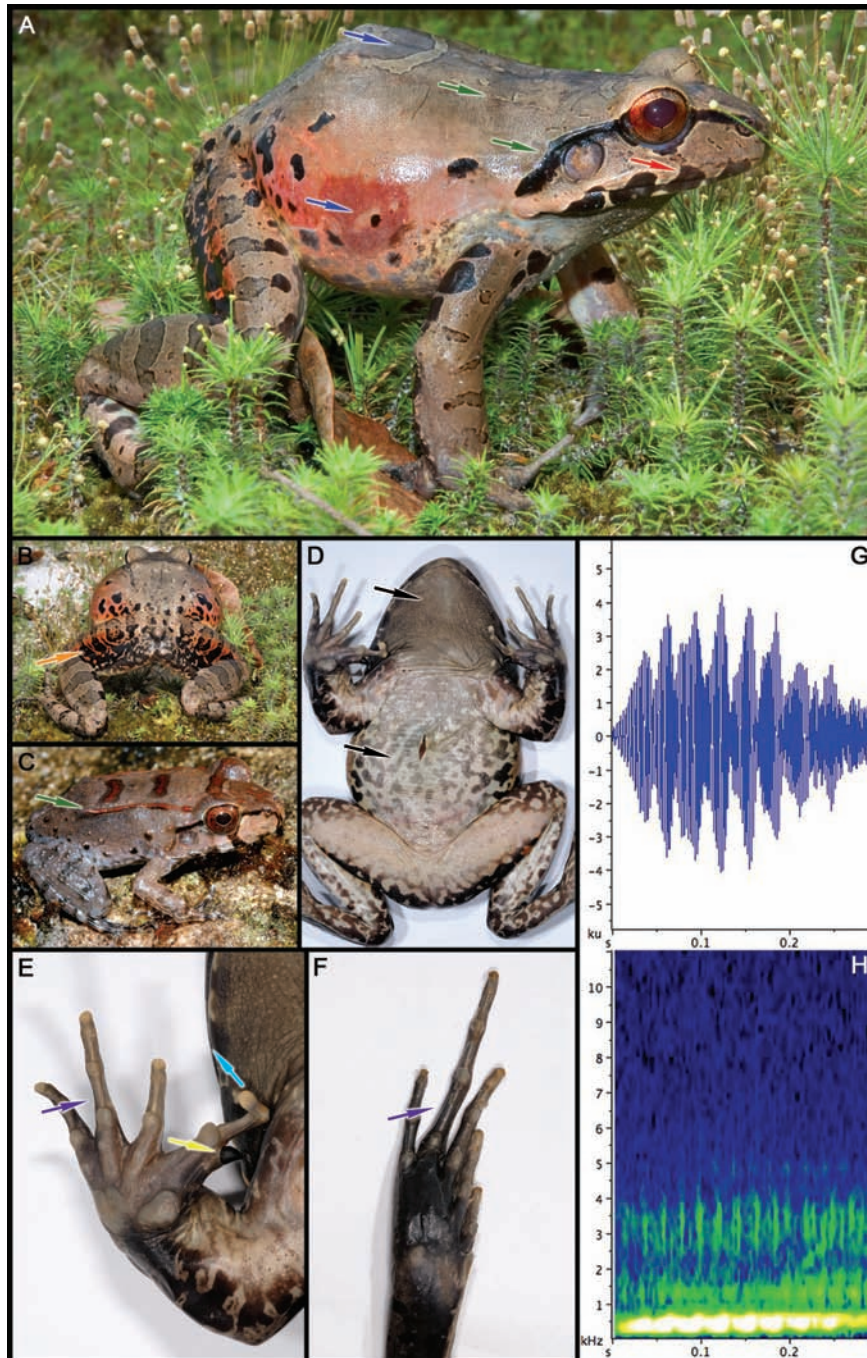
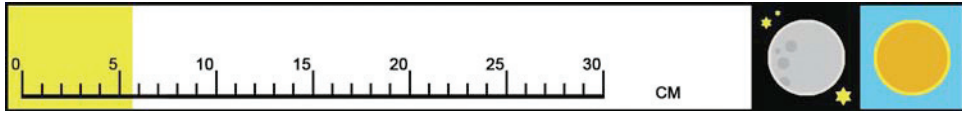


Fig. 134. *Leptodactylus knudseni* Heyer, 1972. A. Dorsolateral view of male. B. Posterior surface of thighs. C. Juvenile. D. Ventral surface in preservative. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus lineatus (Schneider, 1799)

1799: 138.



ENGLISH NAME: Gold-striped frog, painted antnest frog.

LOCAL NAMES (PATAMONA): Kubi gobi.

TYPE LOCALITY: Not stated.

SELECTED REFERENCES: Lamar & Wild, 1995 (natural history, tadpole description, B&W photos and drawings, in English); Schlüter & Regös, 1996 (tadpole description, in English); Duellman, 2005 (description, call description, tadpole description, colour photo, in English).

Field identification - Males reach 45.0 mm SVL, females 56.0 mm.

- Dorsal ground colour dark brown to black with yellowish to gold dorsolateral stripe from tip of snout to groin, sometimes shortly interrupted; skin on dorsum finely spiculate.
- Ventral surface smooth, light to dark grey with white flecks.
- Cream spots at angle of jaw and arm insertion.
- Bright red flashmarks (spots) on axilla, groin, and posterior surfaces of thighs and shanks (red spots totally absent in a 21.2 mm juvenile).
- More or less distinct transverse brown bars on limbs (bluish and more conspicuous in juveniles).
- Flanks immaculate light or dark grey to black.
- When addressed, Finger I slightly longer than Finger II.
- Lateral fringes on fingers and webbing absent.

Life history - Mainly nocturnal (although sometimes found by day), terrestrial. Found exclusively in primary forest, often associated with large nests of leaf cutting ant (*Atta* spp.). Males call from the entrance of or from subterranean tunnels in *Atta*-nests. Eggs are laid in foam nests constructed at the edge of temporary pools or at the mouth of partially submerged burrows, possibly also in water reservoirs in *Atta*-nests, from which tadpoles escape to water; larvae probably feed on detritus. *Leptodactylus lineatus* is part of a mimetic complex involving several species of the genera *Allobates* (Aromobatidae) and *Ameeraga* (Dendrobatidae).

Call - First described by Schlüter (1980: 240), who provided a spectrogram; see also Duellman (2005: 21). It consists of a short low whistle repeated at a rate of about 80-90 calls/min.

Tadpole - First described by Lamar & Wild (1995: 138); see also Schlüter & Regös (1996: 2). Exotroph, benthic; bright pink with a short metallic white middorsal stripe; LTRF varies from 0/0 to 2(2)/3(1) (apparently correlated with growth stages).

Abundance and distribution in KNP - Locally common (especially in the vicinity of large *Atta*-nests), but usually difficult to find. Observed around main sampling localities # 4 and 11 (see Fig. 3), probably widespread in the park.

Geographic range - Widespread in the Amazon Basin, reported from eastern Peru, Ecuador and Bolivia to the Guiana Shield.

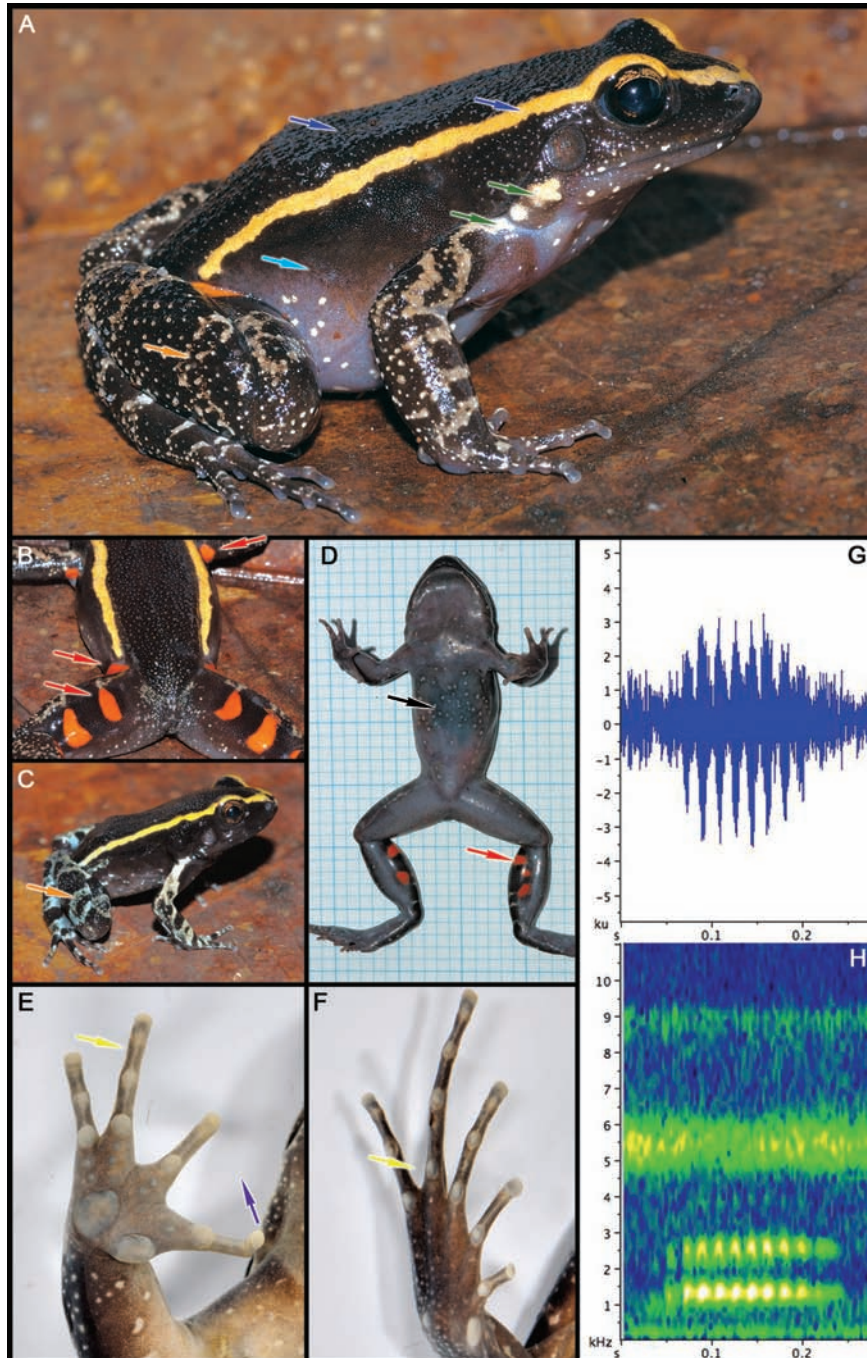
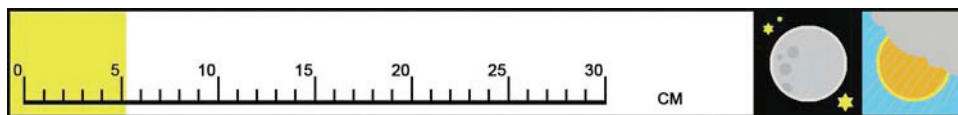


Fig. 135. *Leptodactylus lineatus* (Schneider, 1799). A. Dorsolateral view of female. B. Flashmarks on axilla and posterior surface of thighs. C. Juvenile. D. Ventral surface in life. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus longirostris Boulenger, 1882

1882: 240, pl. 16, fig. 3.



ENGLISH NAME: Long snouted thin-toed frog.

LOCAL NAMES (PATAMONA): Kuma-pik.

TYPE LOCALITY: "Santarém" [Brazil].

SELECTED REFERENCES: Heyer, 1978 (description, call description, colour pattern variation, B&W drawing of colour pattern, distribution, in English), Crombie & Heyer, 1983 (call description, tadpole description, morphological variation, natural history, distribution, in English), Duellman, 1997 (description, tadpole description, natural history, in English).

Field identification - Males reach 43.0 mm SVL, females 51.6 mm.

- Dorsal ground colour and pattern very variable, light brown to reddish brown, sometimes greyish or dark brown, uniform or with irregular dark brown markings, middorsal and paravertebral stripes absent or present; skin on dorsum smooth to finely granular.
- Ventral surface smooth, throat and chest cream or white, turning yellow on belly.
- Two to six dorsolateral folds (2-4 in most Kaieteur specimens). Distinct supratympanic fold forming an angle posteriorly to tympanum.
- Upper lip with a white, cream, light brown or pinkish stripe below eye, always entering eye anteriorly.
- Black stripe from tip of snout to eye.
- No distinct triangular dark brown interorbital bar, dorsal markings not bordered by cream lines.
- When adpressed, Finger I much longer than Finger II.
- Supernumerary plantar tubercles absent.

Life history - Mainly nocturnal (active by day during heavy rains), terrestrial. Found in open areas like savannah. Males call from the base of grass, hidden by the vegetation. Eggs are laid in foam nests, usually constructed in hidden small cavities excavated by the male, from which tadpoles escape after a heavy rain into shallow pools or small temporary streams flowing on rocks and sand; tadpoles feed on detritus.

Call - First described by Rivero (1971: 6) who provided a spectrogram, see also Crombie & Heyer (1983: 294). It consists of a short unpulsed note repeated at a rate of about 60-120 notes/min (weet, weet, weet).

Tadpole - First described by Crombie & Heyer (1983: 296), see also Duellman (1997: 24). Exotroph, benthic; pale brown with dark brown mottling; LTRF = 2(1)/3[1].

Abundance and distribution in KNP - Very common in suitable habitat. Observed only around main sampling locality # 3 (see Fig. 3), but probably more widespread in other savannahs in the park.

Geographic range - East of the Amazon Basin in northern Brazil and the Guiana Shield.

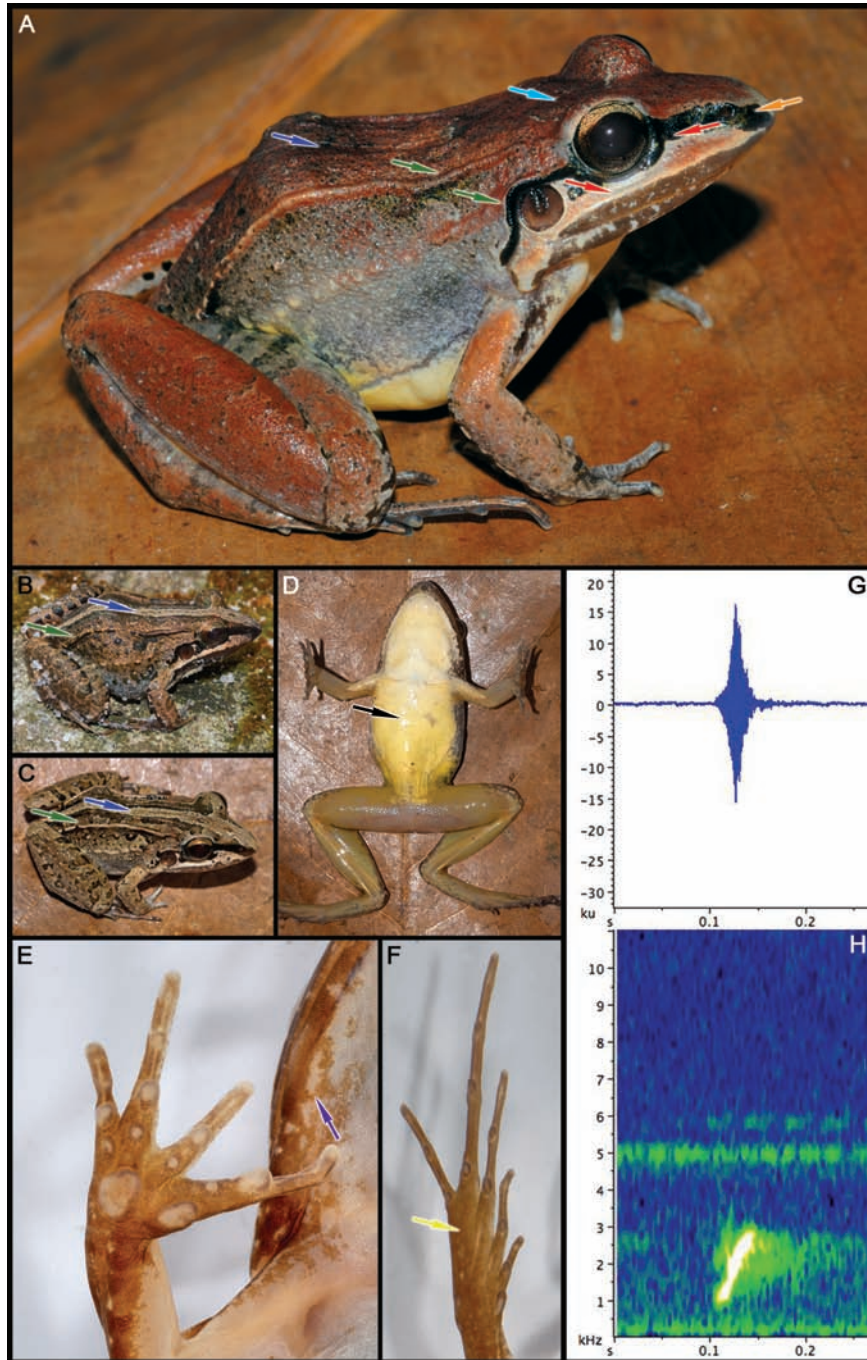
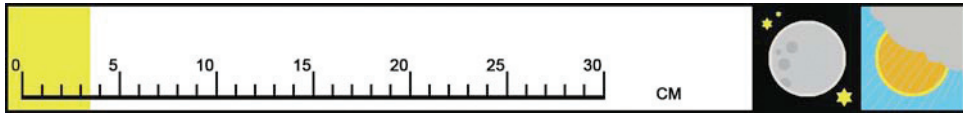


Fig. 136. *Leptodactylus longirostris* Boulenger, 1882. A. Dorsolateral view of unstriped morph. B, C. Dorsolateral views of striped morph. D. Ventral surface in life. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus lutzi (Heyer, 1975)

1975: 315, fig. 1.



ENGLISH NAME: Lutz's thin-toed frog.

LOCAL NAMES (PATAMONA): Quima.

TYPE LOCALITY: "Guyana, Chinapoon R., upper Potaro (probably Chenapowu River)".

SELECTED REFERENCES: Heyer, 1975 (original description, B&W photo, in English), Kok *et al.*, 2007 (extended account, description, colour variation, call description, natural history, colour photos, in English).

Field identification - Males reach 33.5 mm SVL, females 34.0 mm.

- ➔ Dorsal ground colour extremely variable, ranging from light or medium grey, dark brown or reddish brown to black, dorsal pattern usually present, very variable, consisting of more or less evident dark interorbital bar, postorbital ridges, and chevron between shoulders, sometimes with dark mottling and orangish brown oblique lateral stripe; skin on dorsum with numerous small warty tubercles.
- ➔ Ventral surface smooth, yellow to orangish yellow suffused with dark grey stippling on throat, chest, and perimeter of belly (centre of belly immaculate).
- ➔ Round black lumbar spots always present (inconspicuous in very dark specimens).
- ➔ Dark triangular seat patch always present.
- ➔ Posterior thigh pattern variable, but always black with distinct yellow, orange or red spotting or mottling.
- ➔ When adressed, Finger I slightly longer than Finger II.
- ➔ Lateral fringes on fingers and webbing absent.
- ➔ Fleshy proboscis on snout in males.

Life history - Mainly nocturnal, terrestrial. Found exclusively in primary forest. Males call on or under the leaf litter. Eggs are laid in foam nests constructed in excavated nesting chambers that have no entrance tunnel; high probably non-feeding tadpoles that complete development within the chamber.

Call - First described by Kok *et al.* (2007: 54), who provided a spectrogram. It consists of single note (a high-pitch "peep") repeated at a rate of about 17-23 calls/min.

Tadpole - Unknown. Probably endotroph, nidicolous.

Abundance and distribution in KNP - Locally common. Observed around main sampling localities # 1, 5, 6, and 11 (see Fig. 3), the species is probably widespread in the park.

Geographic range - Known only from the Pakaraima Mountains of Guyana.

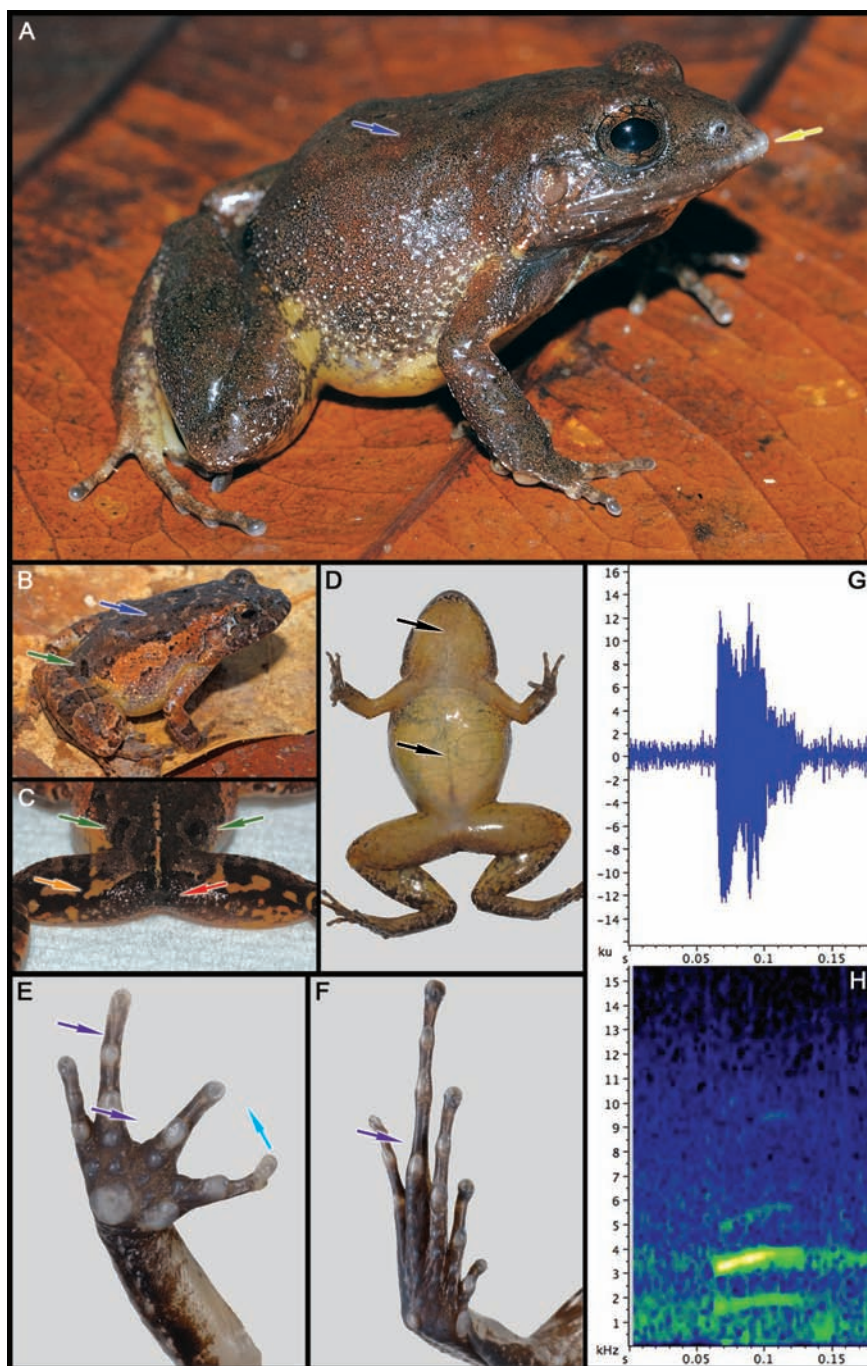
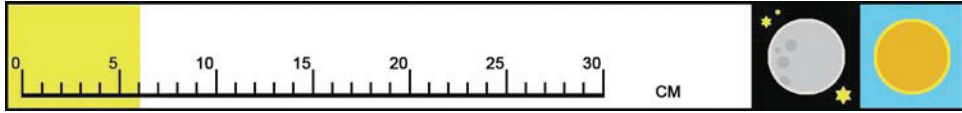


Fig. 137. *Leptodactylus lutzi* (Heyer, 1975). A. Dorsolateral view of male (pattern A of Kok *et al.*, 2007). B. Female (pattern E of Kok *et al.*, 2007). C. Posterior surface of thighs. D. Ventral surface in life (female). E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus mystaceus (Spix, 1824)

1824: 27, pl. 3, figs 1, 3.



ENGLISH NAME: Amazonian white-lipped frog.

LOCAL NAMES (PATAMONA): Kuma.

TYPE LOCALITY: "ad Bahiam in aqua fluvatilis; differ tab illa prope flumen Solimoens" [Bahia and Solimoes, Brazil].

SELECTED REFERENCES: Duellman, 1978 (description, tadpole description, call description, natural history, B&W photo, in English), Heyer, 1978 (description, call description, tadpole description, distribution, B&W photo, in English [as *Leptodactylus amazonicus*]), Heyer *et al.*, 1996 (call description, comparison with similar species, in English).

Field identification - Males reach 56.0 mm SVL, females 60.0 mm.

➤ Dorsal ground colour grey to light brown, sometimes reddish brown, with irregular dark brown, transverse, chevron-shaped bars bordered by cream lines; skin on dorsum smooth.

➤ Ventral surface smooth, creamy white (female and juvenile) to yellow (active male), some inconspicuous brown flecks on throat.

➤ Pair of dorsolateral folds extending from eye to groin, usually bordered by black ventrally, reddish in juveniles. Distinct supratympanic fold not forming an angle posteriorly to tympanum.

➤ Upper lip with a broad white or creamy white stripe below eye, not entering eye anteriorly.

➤ Broad black band from tip of snout to arm insertion.

➤ More or less triangular dark brown interorbital bar.

➤ When adpressed, Finger I much longer than Finger II.

➤ Supernumerary plantar tubercles present.

Life history - Mainly nocturnal (although individuals may be found by day), terrestrial. Usually found in primary forest, but occurs also in secondary vegetation and clearings. Males call from various secluded terrestrial sites, *i.e.* under logs, among leaves, or in small holes in the ground. Eggs are laid in foam nests, usually constructed in hidden small cavities excavated by the male, from which tadpoles escape into nearby water (temporary ponds) after heavy rains; tadpoles able to generate foam, feed on detritus.

Call - First described by Duellman (1978: 108) and Heyer (1978: 41, as *Leptodactylus amazonicus*) who provided a spectrogram, see also Heyer *et al.* (1996: 10). It consists of a series of pulsed notes (oit, oit, oit, oit, oit) repeated at a rate of about 40-120 notes/min.

Tadpole - First described by Duellman (1978: 108) and Heyer (1978: 41, as *Leptodactylus amazonicus*), see also Hero (1990: 248). Exotroph, benthic; olive tan; LTRF = 2(2)/3(1).

Abundance and distribution in KNP - Rare. Observed only around main sampling locality # 5 (see Fig. 3), but probably more widespread in the park.

Geographic range - Widespread in the Amazon Basin, from Paraguay to the Guiana Shield.

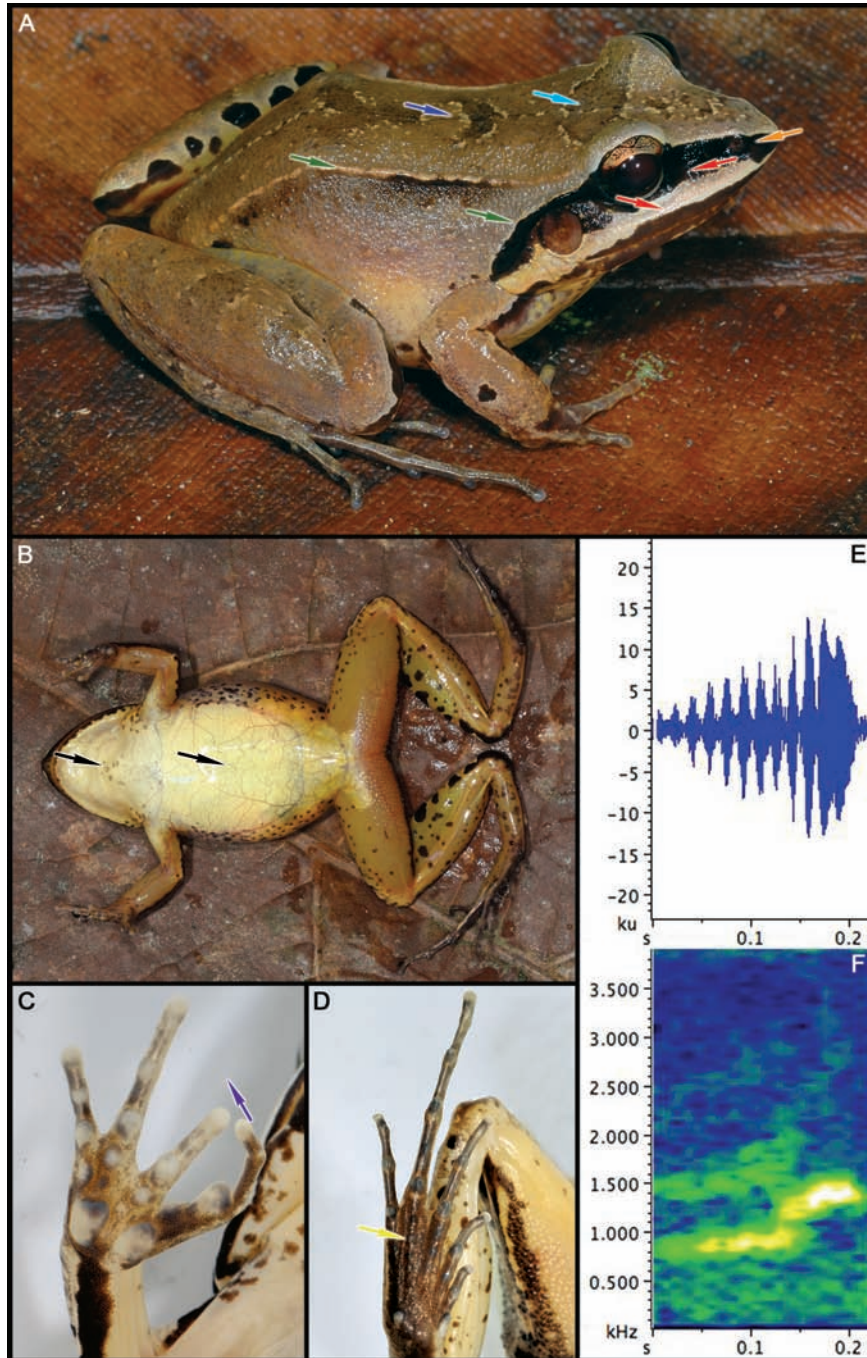
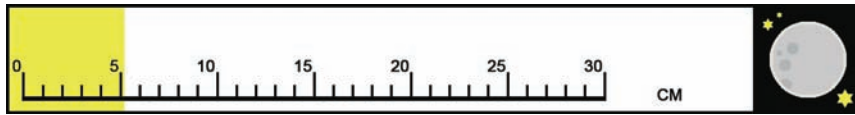


Fig. 138. *Leptodactylus mystaceus* (Spix, 1824). A. Dorsolateral view of male. B. Ventral surface of male in life. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

***Leptodactylus petersii* (Steindachner, 1864)**

1864: 254, pl. 16, figs 2, 2a-c.



ENGLISH NAME: Peter's thin-toed frog.

LOCAL NAMES (PATAMONA): Unknown.

TYPE LOCALITY: "Marabitanas" [Amazonas, Brazil].

SELECTED REFERENCES: Heyer, 1994 (description, call description, tadpole description, geographic variation, distribution, in English), Lescure & Marty, 2001 (short description, natural history, spectrogram, colour photo, in French).

Field identification - Males reach 41.1 mm SVL, females 51.3 mm.

- Dorsal ground colour variable, ranging from greenish or greyish brown to reddish brown, with irregular dark brown to black markings; skin on dorsum with many spicules and short elongated glandular ridges laterally.
- Ventral surface smooth, variable in pattern, white with extensive grey to black mottling always in an anastomotic pattern; throat dark grey with white spots.
- No prominent dorsolateral folds, but short glandular ridges and/or large to elongate glandular warts instead. Distinct supratympanic fold reaching arm insertion.
- Dark triangular interorbital mark.
- Iris bronze to reddish brown with two distinct light stripes from pupil to upper lip where they prolong into cream lip stripes.
- When addressed, Finger I much longer than Finger II.
- Lateral fringes on fingers absent or very weak, but extensive on toes, which are basally webbed.
- Male thumb with two large spines, no chest spines.

Life history - Nocturnal, terrestrial. Found exclusively in primary forest, sometimes in clearings. Males call hidden in the mud or under vegetation along ponds, marshes and flooded areas; calling activity is intense during heavy rains. Eggs are laid in foam nests constructed next to water, under vegetation or in the mud, from which tadpoles escape into nearby water; tadpoles feed on detritus.

Call - First described by Heyer (1994: 97) who provided several spectrograms from different geographic populations. It consists of a single pulsed note repeated at a rate of about 48 calls/min (weet, weet, weet, weet).

Tadpole - First described by Hero (1990: 252, as *Leptodactylus wagneri/podicipinus*), see also Heyer (1994: 96). Exotroph, benthic; dark brown to black; LTRF = 2(2)/3.

Abundance and distribution in KNP - Common. Observed around main sampling locality # 5 (see Fig. 3).

Geographic range - Widespread in the Amazon Basin, from Colombia, eastern Ecuador and Peru, and northern Bolivia to the Guiana Shield and central Brazil.

Taxonomic comments - Possibly a complex of cryptic species, the species found in KNP might prove to be a different taxon.

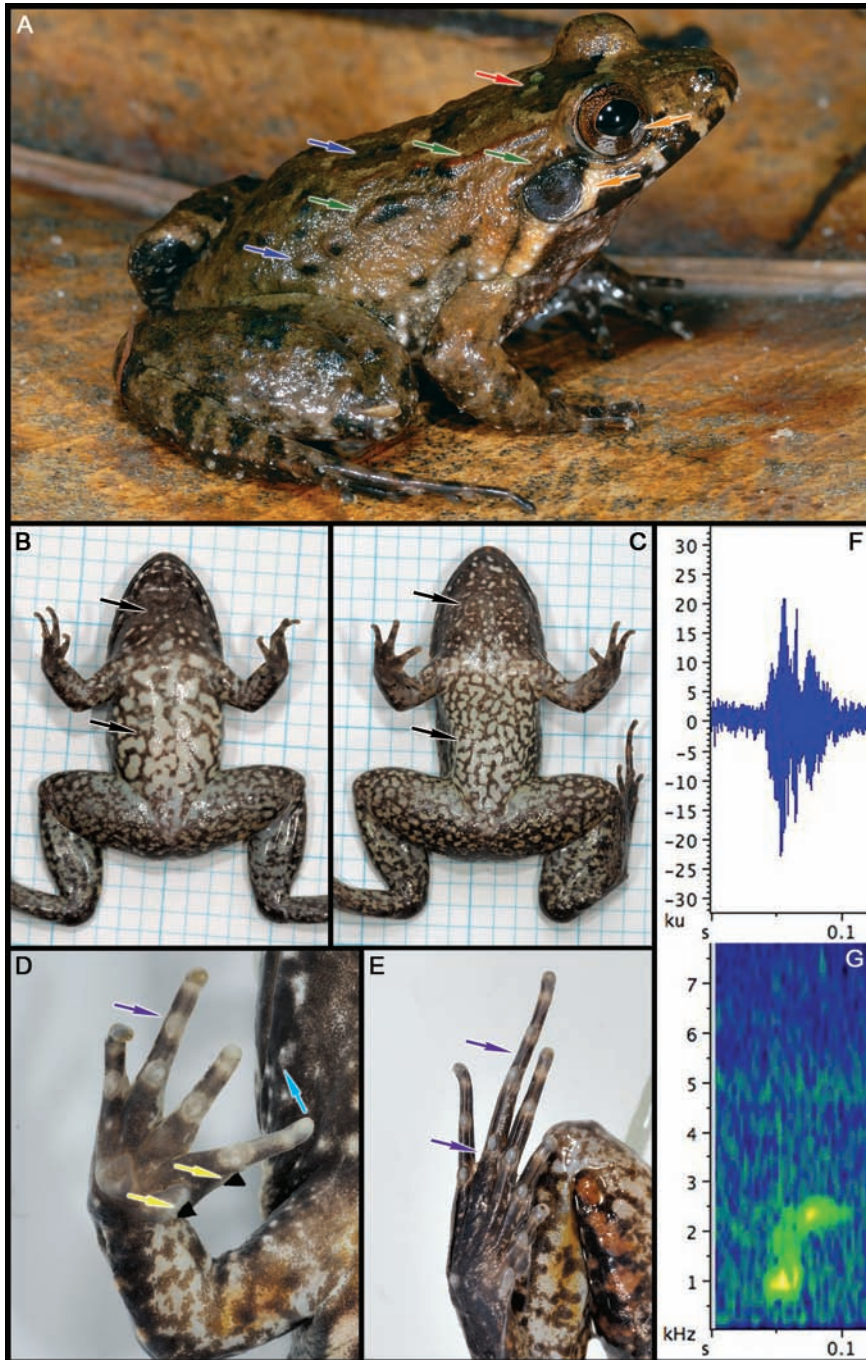
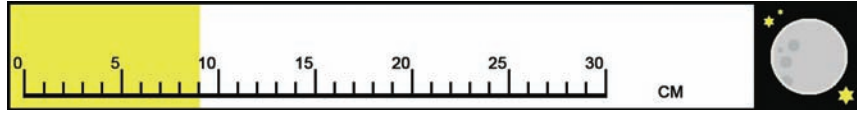


Fig. 139. *Leptodactylus petersii* (Steindachner, 1864). A. Dorsolateral view of a male. B, C. Ventral views of two males. D. Palm (preserved male specimen). E. Sole (preserved male specimen). F. Call, oscillogram. G. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus rhodomystax Boulenger, 1884

1884 "1883": 637, pl. 58, fig. 2.



ENGLISH NAME: Rose-lipped thin-toed frog.

LOCAL NAMES (PATAMONA): Pai-talo.

TYPE LOCALITY: "Yurimaguas, Huallaga River, Peru".

SELECTED REFERENCES: Duellman, 1978 (description, short tadpole description, natural history, B&W photo, in English), Heyer, 1979 (description, distribution, in English), Zimmerman & Bogart, 1988 (call description, ecology).

Field identification - Males reach 90.0 mm SVL, females 83.0 mm.

- Dorsal ground colour greyish brown to reddish brown (more reddish in juveniles), sometimes with narrow transverse bands and an interorbital bar, flanks orange tan; skin on dorsum smooth.
- Ventral surface smooth, creamy white suffused with brown, throat dark brown to black with white small spots and flecks.
- Pair of dorsolateral folds extending from eye to groin, usually dark brown and bordered by black ventrally. Distinct supratympanic fold extending to arm insertion.
- Upper lip with a broad pinkish tan stripe, entering eye anteriorly.
- Groin and posterior surfaces of thighs dark brown to black with greenish yellow or creamy spots.
- Fingers lack lateral fringes, toes basally webbed.
- When addressed, Finger I much longer than Finger II, male thumb with black spine (not illustrated).
- Supernumerary plantar tubercles absent.

Life history - Nocturnal, terrestrial. Found exclusively in primary forest. Males call from the ground, usually near puddles, sometimes partially submerged in water. Eggs are laid in foam nests constructed between the vegetation, near puddles or small ponds, sometimes floating on water, from which tadpoles escape into nearby water (small temporary ponds) after a heavy rain; tadpoles feed on conspecific and heterospecific eggs and tadpoles, probably also on detritus.

Call - First described by Zimmerman & Bogart (1988: 104) who provided a spectrogram. It consists of a powerful short, high-pitch, note repeated at a rate of about 12 notes/min.

Tadpole - First briefly described by Duellman (1978: 111), extensive redescription by Rodrigues *et al.* (2007: 62). Exotroph, benthic/carnivorous; dark brown to black; LTRF = 2(2)/3.

Abundance and distribution in KNP - Common. Observed around main sampling localities # 1, 2, 4, 5, 6, 8, 10, and 11 (see Fig. 3), can be considered as widespread in the park.

Geographic range - Widespread in the Amazon Basin, from eastern Ecuador and Peru to the Guiana Shield.

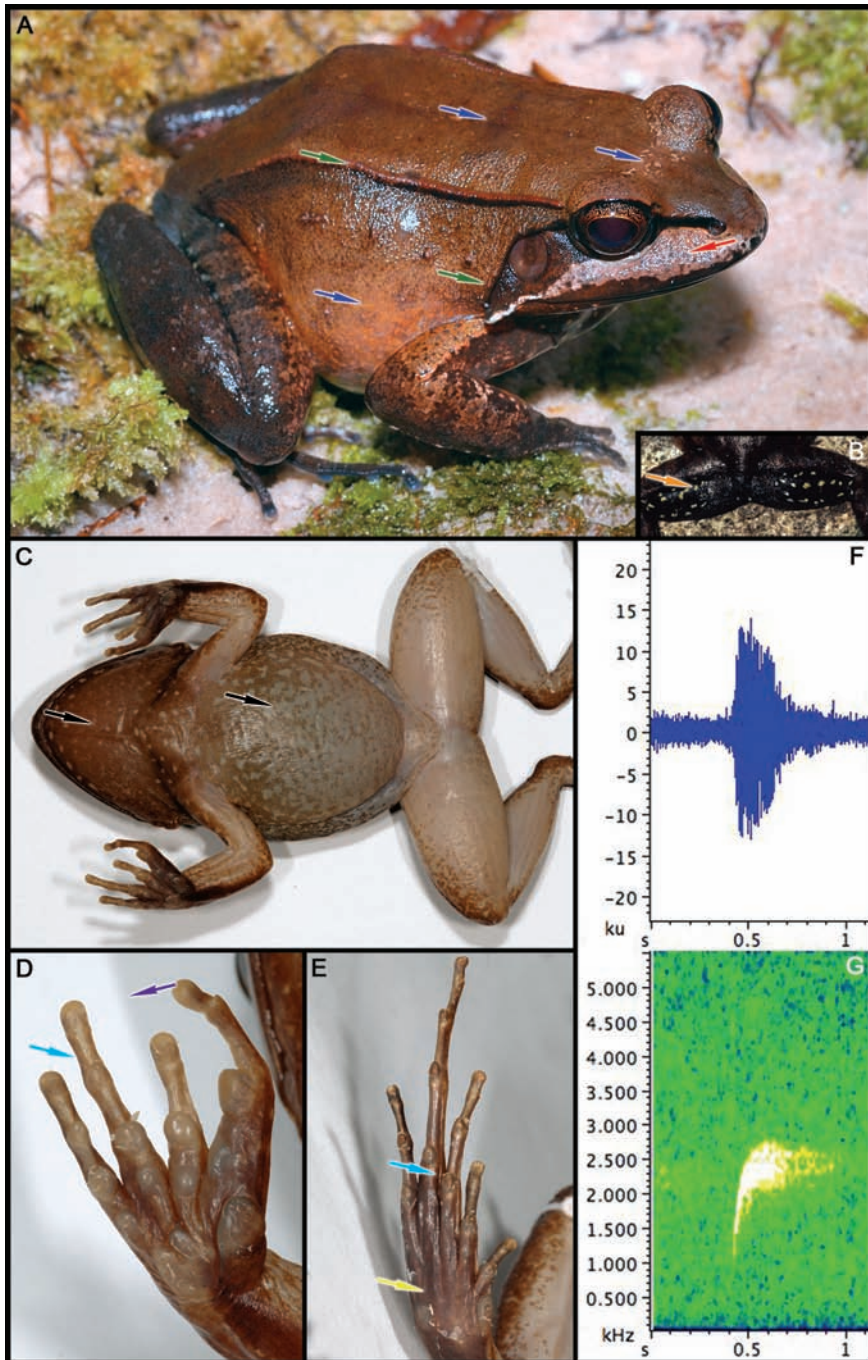
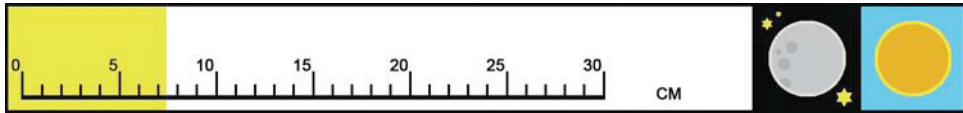


Fig. 140. *Leptodactylus rhodomystax* Boulenger, 1884. A. Dorsolateral view. B. Posterior surface of thighs. C. Ventral surface (preserved female specimen). D. Palm (preserved female specimen). E. Sole (preserved female specimen). F. Call, oscillogram. G. Call, spectrogram. (Photos by P. J. R. Kok).

Leptodactylus rugosus Noble, 1923

1923: 297.



ENGLISH NAME: Rugose thin-toed frog.

LOCAL NAMES (PATAMONA): Quoi.

TYPE LOCALITY: "near Kaieteur Falls, British Guiana".

SELECTED REFERENCES: Donnelly & Myers, 1991 (description, B&W photos, in English), Duellman, 1997 (description, tadpole description, call description, colour photo, in English), Heyer & Thompson, 2000 (extended account, call description, tadpole description, distribution, colour photo, in English).

Field identification - Males reach 72.0 mm SVL, females 74.0 mm.

- ➔ Dorsal ground colour variable, ranging from greyish or greyish brown to olive brown or reddish brown (dorsum bright red in some subadults), with irregular pale cream to greyish tan blotches and black markings; juveniles similar to adults, but dorsal markings more conspicuous; skin on dorsum rugose, warty.
- ➔ Ventral surface smooth, variable in pattern, white to light greyish brown with diffuse brown mottling (pattern more conspicuous in juveniles and subadults, which have ventral surface of thighs orangish); throat white, heavily marked with grey mottling in juvenile and female, grey in adult male.
- ➔ No dorsolateral fold, but short glandular ridges and/or large to elongate glandular warts on dorsum and flanks. Strong supratympanic fold.
- ➔ Dirty white, cream or brownish lines from eye to lip (ill-defined in some specimens).
- ➔ Dirty white, cream or brownish interorbital stripe.
- ➔ When addressed, Finger I much longer than Finger II.
- ➔ Lateral fringes on fingers and toes absent, webbing absent.
- ➔ Male thumb with 1-2 large spines; breeding males with paired chest spines.

Life history - Nocturnal, terrestrial; juveniles often active by day. Found in rocky and sandy habitats in open areas, but juveniles and subadults may be found in adjacent primary forest. Males call sitting on or under rocks. Eggs are laid in foam nests constructed under boulders, from which tadpoles escape into shallow small temporary streams flowing on rocks and sand; tadpoles feed on detritus.

Call - First described by Heyer (1979: 35) who provided a spectrogram, see also Duellman (1997: 26). It consists of a single powerful high-pitch trill repeated at a rate of about 1-7 calls/min.

Tadpole - First described by Heatwole *et al.* (1965: 361), see also Duellman (1997: 25). Exotroph, semiterrestrial; reddish brown with dark brown transverse marks; LTRF = 2(1)/3(1).

Abundance and distribution in KNP - Very common in suitable habitat. Observed around main sampling localities # 1, 2, 3, 4, 6, 10, and 11 (see Fig. 3), the species is mostly restricted to rocky habitats in the park.

Geographic range - Known only from the Guiana Shield, in the Pakaraima Mountains from eastern part of Bolívar State in Venezuela to western Guyana.

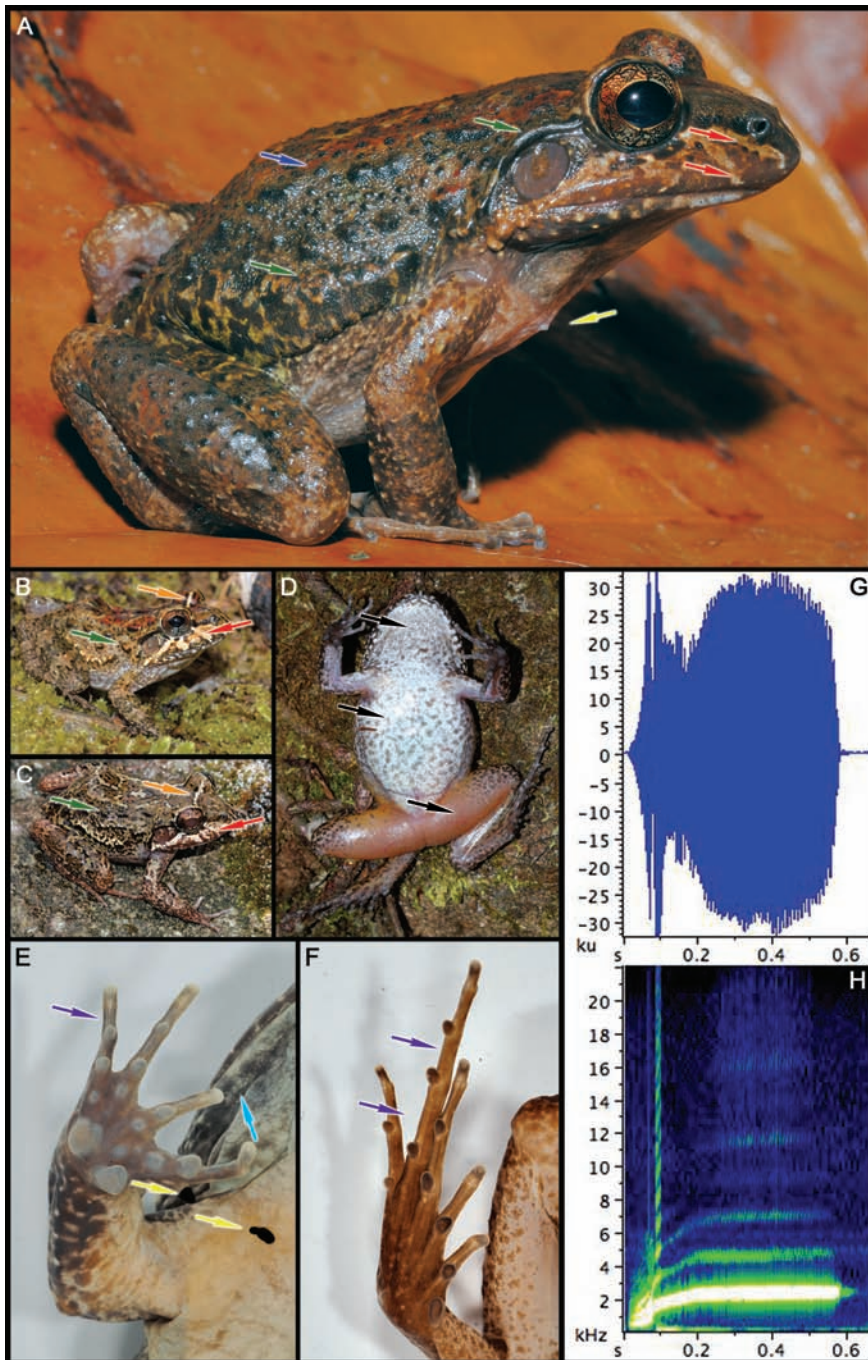


Fig. 141. *Leptodactylus rugosus* Noble, 1923. A. Dorsolateral view of male. B, C. Subadults. D. Ventral surface of subadult in life. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Synapturanus Carvalho, 1954

“DISC FROGS”



Fig. 142. *Synapturanus mirandaribeiroi*, a species currently not reported from the Park (compare with *S. salseri*); here from Manaus, Brazil. (Photo by K. H Jungfer).

- ⇒ Very small to medium size
- ⇒ Body globular, ovoid, eyes small
- ⇒ Maxillary teeth absent
- ⇒ Pupil circular (Fig. 42C)
- ⇒ Snout very long, acuminate (Fig. 40), protruding well beyond the lower jaw
- ⇒ Skin on dorsum and venter smooth (Fig. 44A)
- ⇒ Digits unwebbed
- ⇒ Finger I < II when fingers adpressed
- ⇒ First toe reduced
- ⇒ Finger discs unexpanded (Fig. 51A)
- ⇒ Tympanum present, distinct or indistinct (Fig. 43A-B)

The genus *Synapturanus* currently contains three species.

Disc frogs are fossorial, mostly nocturnal, and are found in the leaf litter and soft soils in tropical rainforest. They usually call during rain (which seems to induce calling). Due to their fossorial habit, little is known about their natural history and they might be much more common than expected.

Sexual dimorphism

Males are smaller than females and breeding males have a glandular swelling on the upper side of the wrist. There is no other evident sexual dimorphism or dichromatism.

Eggs

Eggs are terrestrial, they are deposited in a small burrow below the soil surface.

Tadpoles

Endotroph (nidicolous).

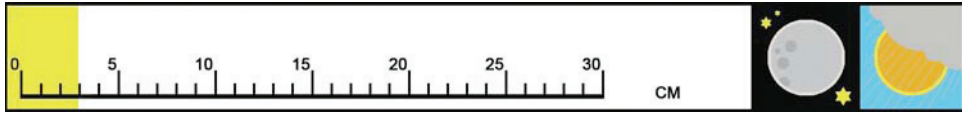
Distribution

Synapturanus species are reported from Colombia and adjacent Ecuador through the Guianas Shield to northern Brazil (Frost, 2008).

Only *Synapturanus salseri* (p. 232) is currently reported from Kaieteur National Park.

Synapturanus salseri Pyburn, 1975

1975: 440, fig. 1.



ENGLISH NAME: Timbo disc frog.

LOCAL NAMES (PATAMONA): Unknown.

TYPE LOCALITY: "Timbó, Vaupés, Colombia".

SELECTED REFERENCE: Pyburn, 1975 (original description, call description, tadpole description, B&W photo, in English).

Field identification - Males reach 27.6 mm SVL, females 29.4* mm.

- Dorsal ground colour medium brown to greyish brown, with irregular small cream to orange spots ; skin on dorsum smooth.
- Ventral surface smooth, pearl white, immaculate.
- Snout very long, acuminate, protruding well beyond lower jaw.
- Light cream line running from snout to upper eyelid, followed by small irregular spots from eye to shoulder.
- Tympanum indistinct.
- When adressed, Finger I shorter than Finger II.
- First toe much reduced.
- Digits unwebbed.

Life history - Mainly nocturnal (although the species may be heard calling during rainy days), terrestrial, fossorial. Found in primary forest, the species seems to prefer clearings. Males call exclusively during rain, from small burrows in the ground, below the leaf litter. Eggs are laid in burrows below the soil surface; tadpoles do not feed and complete their development within the burrow.

Call - First described by Pyburn (1975: 441), who provided a spectrogram. It consists of a short single plaintive whistle repeated at a rate of about 12 notes/min.

Tadpole - First described by Pyburn (1975: 442). Endotroph, nidicolous; cream white with a longitudinal light brown stripe.

Abundance and distribution in KNP - Rare. Observed or heard around main sampling localities # 2, 6, and 11 (see Fig. 3), the species is probably widespread in the Park.

Geographic range - Known only from the type locality and two localities in southern and southwestern Venezuela. Our record from Kaieteur National Park extends the known range about 850 km to the west. The species is also reported from near Manaus (see Zimmerman & Rodrigues, 1990, and Lima *et al.*, 2006), but we have some doubts about the identity of those specimens.

Taxonomic comments - Although our specimens fit very well the original description, we notice slight differences in the call between a recorded male from Kaieteur and the paratype recorded by Pyburn (1975). The specimens from central Amazonia illustrated in Lima *et al.* (2006) look quite different from our specimens and comparison between these populations and specimens from the type locality is required.

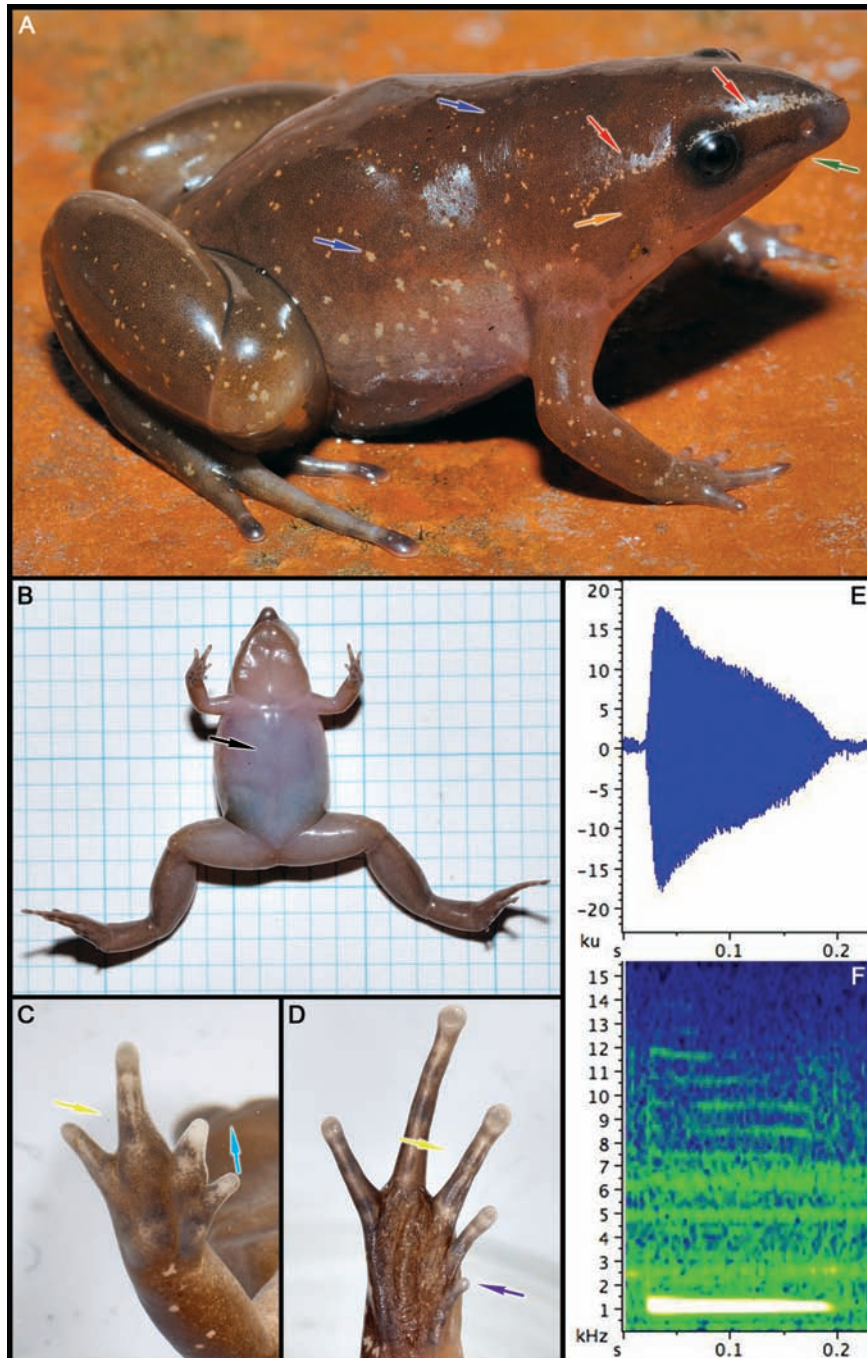


Fig. 143. *Synapturanus salseri* Pyburn, 1975. A. Dorsolateral view of a female. B. Ventral view of a female in life. C. Palm (preserved female specimen). D. Sole (preserved female specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Pipa Laurenti, 1768

“PIPAS”



Fig. 144. *Pipa pipa*, a species not recorded from Kaieteur National Park; here from Mabura Hill Forest Reserve, central Guyana. (Photo by R. Ernst).

- ⇒ Medium to large size
- ⇒ Body and head dorsoventrally depressed
- ⇒ Snout protruding beyond lower jaw
- ⇒ Maxillary teeth absent or present
- ⇒ Pupil circular (Fig. 42C)
- ⇒ Presence of a lateral line organ
- ⇒ Skin on dorsum spiculate (Fig. 44E)
- ⇒ Feet large, toes extensively webbed
- ⇒ Toes I-III usually capped with keratinous tips (except in *Pipa pipa* and *P. snethlageae*)
- ⇒ Fingertips modified into various arrangements of lobes (e.g. Fig. 51E)
- ⇒ Presence of dermal modifications around the mouth

The genus *Pipa* currently contains seven species.

Pipas are nocturnal and aquatic frogs. They live in permanent or temporary water bodies and in slow-moving streams in tropical rainforest. Individuals have been collected at considerable distance from water and they apparently cross land from a pond to another (when a pond dries out for example). Specimens disturbed in very small pools may quickly escape in the surrounding forest.

Courtship behaviour is complex, involving vertical circular turnovers.

Sexual dimorphism

Males are usually slightly smaller than females; no other evident sexual dimorphism or dichromatism is evident.

Eggs

Eggs are embedded in the dorsal skin of the female.



Fig. 145. A juvenile *Pipa pipa* emerging from its mother's back. (Photo by R. Ernst).

Tadpoles

Endotroph (paraviviparous) or exotroph (suspension-feeder).

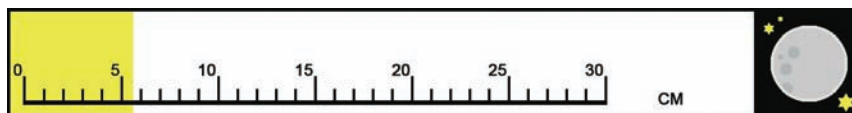
Distribution

Pipa species are found in northern South America, including Trinidad, and in Panama (Murphy 1997; Frost, 2008).

Only *Pipa arrabali* (p. 236) is currently reported from Kaieteur National Park.

***Pipa arrabali* Izecksohn, 1976**

1976: 508, figs 1-3.



ENGLISH NAME: Arrabal's pipa.

LOCAL NAMES (PATAMONA): Unknown.

TYPE LOCALITY: "Vila Amazônia, Município de Parintins, Estado do Amazonas, Brasil".

SELECTED REFERENCES: Izecksohn, 1976 (original description, B&W photos and drawing, in Portuguese); Trueb & Cannatella, 1986 (description, osteology, B&W drawings, distribution, in English); Buchacher, 1993 (natural history, breeding habits, in English).

Field identification - Males reach 40.0 mm SVL, females 57.0 mm.

- Dorsal colour greenish brown to greyish brown, with irregular dark brown spots; skin on dorsum spiculate.
- Ventral surface shagreened, slightly spiculate, whitish, pinkish to orangish brown with irregular dark spots; throat often darker.
- Body and head dorsolaterally depressed.
- Eyes small, pupil circular, iris greenish brown.
- Upper lip forming small pocket at angle of jaw.
- Keratinous tips on Toes I-III.
- Fingertips modified into four small equal-sized lobes.
- Feet large, toes extensively webbed.

Life history - Mainly nocturnal, highly aquatic, but can occasionally be found on land. Observed in primary forest, in slow-moving streams and in small pools and puddles along streams. Males probably call from the water as in other species of the genus. Eggs and larvae are kept in dermal pockets on the back of the female, and toadlets emerged when completely metamorphosed; juveniles and adults feed on insect larvae, earthworms and tadpoles.

Call - Unknown.

Tadpole - No free-swimming larval stage occurs in this species. Endotroph, paraviviparous.

Abundance and distribution in KNP - Rare. Observed only around main sampling localities # 2 and 11 (see Fig. 3), but the species is probably widespread in the Park.

Geographic range - Reported from eastern Venezuela, through Guyana and western Suriname to northern and central Brazil.

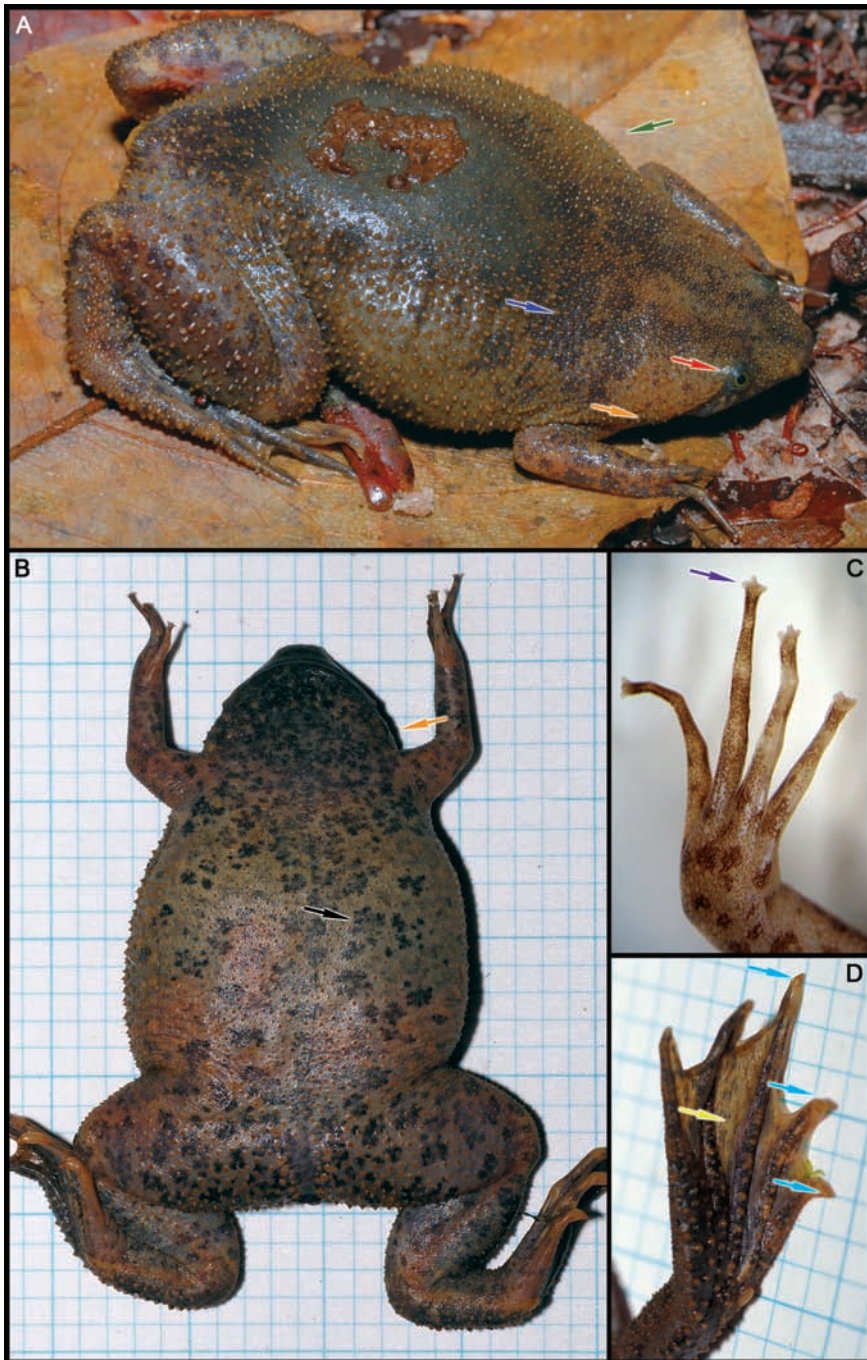


Fig. 146. *Pipa arrabali* Izecksohn, 1976. A. Dorsolateral view of a female. B. Ventral surface of a female in life. C. Palm (preserved female specimen). D. Sole (female specimen in life). (Photos by P. J. R. Kok).

***Pristimantis* Jiménez de la Espada, 1871**

“SOUTH AMERICAN RAIN FROGS”



Fig. 147. *Pristimantis jester*, a beautiful species that does not occur in Kaieteur National Park; here from Mt Maringma (Photo by P. J. R. Kok)

- ⇒ Very small to large size
- ⇒ Maxillary teeth present
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Head about as wide as body
- ⇒ Parotoid glands absent
- ⇒ Skin on dorsum smooth, shagreened, granular, tuberculate, spiculate or warty (Fig. 44A-F)
- ⇒ Vocal sac single, subgular (Fig. 56A)
- ⇒ Finger I < = > II when fingers adpressed
- ⇒ Fingers unwebbed
- ⇒ Finger discs expanded (Fig. 51B-C)
- ⇒ Tympanum present, distinct or indistinct, or absent (Fig. 43A-C)

Pristimantis is a very large genus currently containing ca. 430 species; additional species are described each year.

Heinicke *et al.* (2007) removed *Pristimantis* from the synonymy of *Eleutherodactylus* on the basis of molecular data. The genus is now subdivided in three subgenera and several species series and species groups (Hedges *et al.*, 2008).

South American rain frogs are nocturnal and mostly arboreal. They inhabit tropical rainforest and are not dependent on water bodies for reproduction (see below).

The genus is highly polymorphic (especially in skin texture), and most species of *Pristimantis* are exceedingly polychromatic, often rendering their identification problematic. A revision of the genus in the Guiana Shield is necessary to delimit exact species distribution and identify possible cryptic species.

Sexual dimorphism

Variable among species. Males are usually smaller than females and may have spinous nuptial pads or not.

Eggs

No eggs are laid (froglet births from oviduct) in at least one species (*Pristimantis jasperi*); eggs are terrestrial with no tadpole stage in other species.

Tadpoles

Endotroph (ovoviviparous or direct developer).

Distribution

Species belonging to the genus *Pristimantis* are found from Honduras to Bolivia, in the Guianas and in Trinidad and Tobago (Frost, 2008).

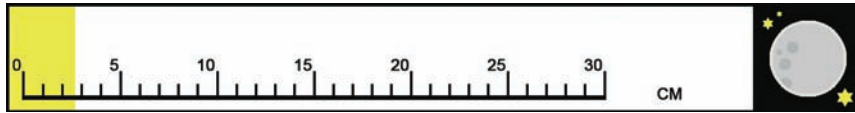
Only two species are currently recorded from Kaieteur National Park, but we suspect many additional species to be discovered.

Field key to the *Pristimantis* species of Kaieteur National Park

- 1. Yellowish spot on groin *P. cf. inguinalis* (p. 240)
- 1'. No yellowish spot on groin *P. cf. marmoratus* (p. 242)

Pristimantis cf. *inguinalis* (Parker, 1940)

1940: 263.



ENGLISH NAME: New River South American rain frog.

LOCAL NAMES (PATAMONA): Unknown.

TYPE LOCALITY: "New River, British Guiana".

SELECTED REFERENCES: Parker, 1940 (original description, in English); Lescure, 1981b (description, B&W photo, in French); Lescure & Marty, 2001 (brief description, colour photo, in French).

Field identification - Males reach 20.0 mm SVL, females 27.0 mm.

- Dorsal colour highly variable, greenish brown, brown or dark brown, with darker markings, with or without a broad dorsolateral stripe extending from upper eyelid to midbody; skin on dorsum tuberculate.
- Ventral surface smooth to weakly granular; throat and chest whitish with dark brown flecks, venter dark grey with whitish flecks.
- Iris grey to gold in its upper part, reddish grey in its lower part.
- W-shaped darker marking on neck.
- Yellowish spot on groin.
- Digital discs expanded, very large.
- When adpressed, Finger I shorter than II; fingers unwebbed.
- Webbing on feet absent or very basal.

Life history - Nocturnal, arboreal. Exclusively observed in primary forest, the species seems to be more common in clearings. Males call at dusk and during the first part of the night, at heights between 0.5-2.5 m, from small trees that usually have trunks of small diameter.

Call - Apparently not formally described. Lescure & Marty (2001: 347, 368) provided some data and an oscillogram and spectrogram. The call consists of a single metallic note ("tik"), repeated at a rate of about 10-20 notes/min.

Tadpole - No larval stage occurs in the genus. Endotroph, direct developer.

Abundance and distribution in KNP - Rare. Observed only around main sampling locality # 11 (see Fig. 3), but the species might be more widespread in the Park.

Geographic range - Restricted to the Guianas (Guyana, Suriname, French Guiana).

Taxonomic comments - Due to the high polymorphism and polychromatism of the genus, additional morphological, and ideally molecular comparisons are needed to clarify the identity of the Kaieteur specimens, which might prove to belong to a different species.

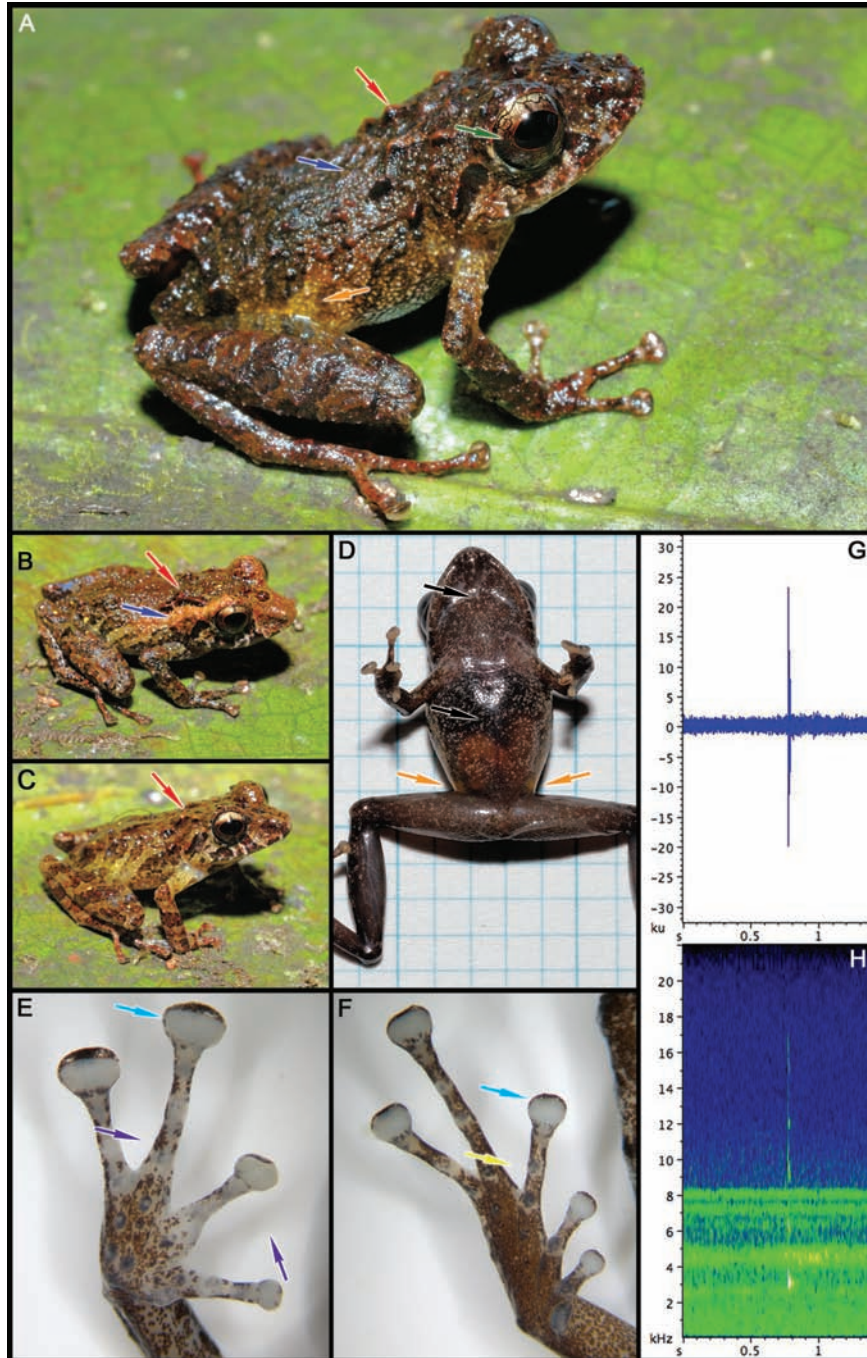
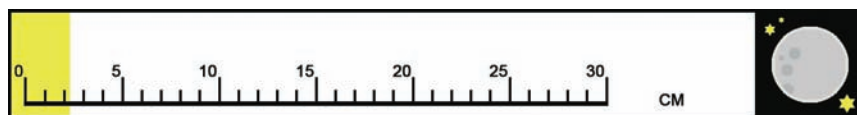


Fig. 148. *Pristimantis* cf. *inguinalis* (Parker, 1940). A. Dorsolateral view of a male. B. Dorsolateral view of a female. C. Dorsolateral view of a male. D. Ventral surface of a male in life. E. Palm of hand (preserved male specimen). F. Sole of foot (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

Pristimantis cf. *marmoratus* (Boulenger, 1900)

1900: 56, pl. 5, fig. 6.



ENGLISH NAME: Marbled South American rain frog.

LOCAL NAMES (PATAMONA): Unknown.

TYPE LOCALITY: "foot of Mt. Roraima" [Guyana].

SELECTED REFERENCES: Boulenger, 1900 (original description, B&W drawing, in English); Lescure, 1981b (description, in French); Lescure & Marty, 2001 (brief description, colour photo, in French).

Field identification - Males reach 19.0 mm SVL, females 22.5 mm.

- Dorsal colour highly variable, brown, greenish brown, greyish brown, reddish brown or dark brown, with darker markings; skin on dorsum tuberculate.
- Ventral surface weakly granular, greyish white.
- Iris greyish in its upper part, copper in its lower part.
- W-shaped darker marking on neck.
- No yellowish spot on groin.
- Digital discs expanded, large.
- When adpressed, Finger I shorter than II; fingers unwebbed.
- Webbing on feet basal.

Life history - Nocturnal, arboreal. Exclusively observed in primary forest. Males call at dusk and during the night, at heights between 0.5-1.5 m, from small bushes and trees.

Call - Apparently not formally described. Lescure & Marty (2001: 347, 368) provided some data and an oscillogram and spectrogram. The call consists of a series of 4-10 metallic notes, repeated at a rate of about 18 calls/min according to Lescure & Marty (2001).

Tadpole - No larval stage occurs in the genus. Endotroph, direct developer.

Abundance and distribution in KNP - Very rare. Only observed around main sampling locality # 10 (see Fig. 3), but the species might be more widespread in the Park.

Geographic range - Found in southern and eastern Venezuela, Guyana, Suriname, French Guiana, and Amapá State in Brazil.

Taxonomic comments - Due to the high polymorphism and polychromatism of the genus, additional morphological, and ideally molecular comparisons are needed to confirm the presence of this species in Kaieteur.

Remark - Photos in figure 151 are of a specimen from French Guiana.

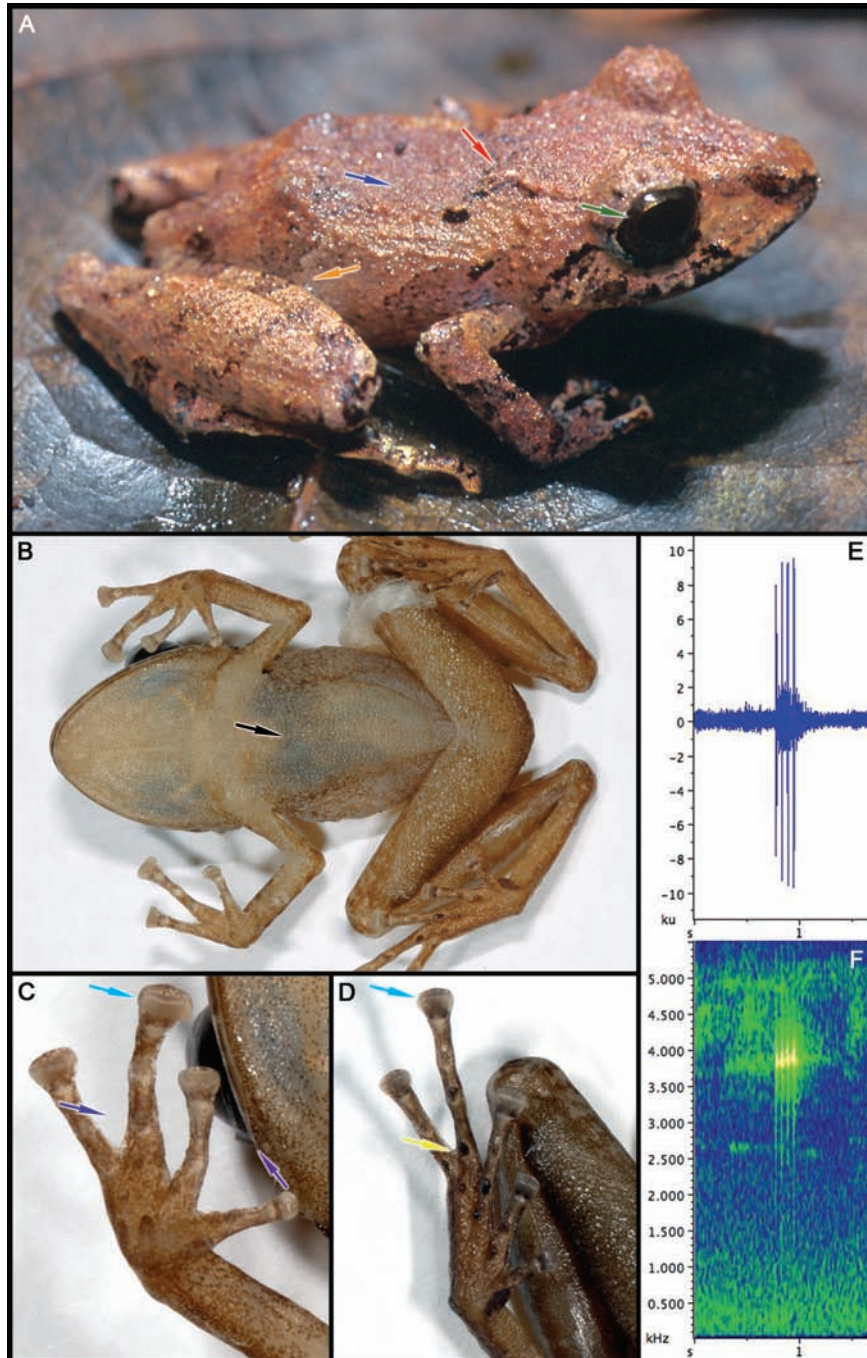


Fig. 149. *Pristimantis* cf. *marmoratus* (Boulenger, 1900). A. Dorsolateral view of a male. B. Ventral surface of preserved male. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

***Microcaecilia* Taylor, 1968**

“TINY CAECILIANS”

- ⇒ Tail absent (no discernible folds posterior to vent)
- ⇒ Primary annuli congruent with segmentation of trunk musculature, some may be divided posteriorly by secondary annular grooves
- ⇒ Scales present
- ⇒ Eyes covered by skull bone, not visible
- ⇒ Tentacle closer to eye position than to naris

The genus currently contains five species (a sixth species, from Suriname, is in press by M. Wilkinson and colleagues).

Distribution

Occurs from Ecuador through southern Venezuela to the Guiana Shield, also reported from São Paulo in Brazil (Frost, 2008).

***Microcaecilia* sp**

ENGLISH NAME: None.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: -

SELECTED REFERENCE: -

Field identification - Reaches 145.0 mm in total length.

- ➔ Body pinkish to bluish grey, darker in its two posterior thirds.
- ➔ Eyes not visible, covered by skull bone.
- ➔ Tentacle located below level of eye, very close to mouth.
- ➔ Only 9-18 secondary annuli, maximum 130 folds in total.

Life history - Virtually unknown. The only specimen collected was crawling on the ground in primary forest by day, after a heavy rain.

Abundance and distribution in KNP - Very rare. A single specimen collected around main sampling locality # 11 (see Fig. 3), but the species is probably more widespread in the Park.

Geographic range - Unknown, only three specimens currently known (one specimen from Kaieteur National Park, two additional specimens collected by R. Ernst at Mabura Hill Forest Reserve, central Guyana).

Taxonomic comments - *Microcaecilia* is a taxonomically challenging group. This species seems close to *Microcaecilia rabei* but differs in some discrete characters.

Remark - Photos in figure 152 are of a specimen from Mabura Hill Forest Reserve, central Guyana.



Fig. 150. *Microcaecilia* sp. A. Dorsolateral view of a living specimen. B. Close-up of neck and head of a living specimen. (Photos by R. Ernst).

Rhinatrema Duméril & Bibron, 1841

“TWO-LINED CAECILIANS”

- ⇒ Tail present (discernible folds posterior to vent)
- ⇒ Annuli not congruent with segmentation of trunk musculature, no distinction between primary and secondary annular grooves
- ⇒ Scales numerous
- ⇒ Eyes visible externally
- ⇒ Tentacle immediately anterior to or on the anterior edge of eye

The genus is currently monotypic, but see below.

Distribution

Occurs in the Guianas (Guyana, Suriname, French Guiana) and adjacent Amapá State in Brazil (Frost, 2008), but see below.

***Rhinatrema cf. bivittatum* (Guérin-Méneville, 1838)**

1838: 16, pl. 25, fig. 2.

ENGLISH NAME: Two-lined caecilian.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: “L’Amérique méridionale” [South America].

SELECTED REFERENCES: Taylor, 1968 (description, B&W drawings and photos, in English), Nussbaum & Hoogmoed, 1979 (description, distribution, in English), Lescure & Marty, 2001 (brief description, colour photo, in French).

Field identification - Reaches 235.0 mm in total length.

- ➔ Body medium to dark brown, with yellow lateral band and usually many irregular yellow flecks.
- ➔ Eyes well visible externally.
- ➔ Tentacle located just anterior to eye.
- ➔ Total number of body annuli 315-384.

Life history - Fossorial, subterranean; diurnal and nocturnal. Found in primary forest only. Breeding habits unknown, but probably breeds in streams with aquatic larva like other members of the family.

Abundance and distribution in KNP - Very rare, collected only around main sampling locality # 11 (see Fig. 3), but probably widespread in the Park.

Geographic range - Same as for the genus.

Taxonomic comments - The Kaieteur specimens substantially differ from specimens from the type locality (Cayenne, French Guiana) and most likely belong to an undescribed species (M. Wilkinson, D. Gower, P. Kok, pers. obs.).



Fig. 151. *Rhinatrema* cf. *bivittatum* (Guérin-Méneville, 1838). A. A living male. B. Close-up of neck and head of a living male. (Photos by P. J. R. Kok).

6. Conservation issues

It is hoped that the data presented here, most likely not complete, will serve as a basis for future research in the area. Rare or highly secretive species that could occur in the Park, including possible new taxa, might have been missed because not all the park area has been sampled with the same intensity. Higher elevation areas between 600-900 m above sea level in the western and southeastern parts of Kaieteur National Park were notably undersampled; special attention should be paid to arboreal habitats such as bromeliads and high canopy, which also remain understudied.

The exceptional beauty and superlative natural phenomenon of Kaieteur Falls coupled with our data on biodiversity (including published and unpublished information on the reptiles of Kaieteur) indicate that Kaieteur National Park meets several of the criteria used by UNESCO (2008) to establish a site's eligibility for World Heritage Status (e.g. criteria vii-x). In fact, the high biodiversity and high level of endemism observed in the Pakaraima Mountains of Guyana advocates for the designation of the entire region as a protected area. Protection of the region would also be protection of an important watershed.

Although a national park and a protected area, Kaieteur is inhabited by diamond miners. Some of these miners are working within the boundaries of the Park, but fortunately it appears that many of them are now working outside the protected area. Mechanized mining activities such as dredging and their associated habitat destruction and pollution are a threat to the fauna in certain parts of Kaieteur National Park, which have been extensively deforested (either for mining activities, for camp constructions, or for farming). It should be noted that early and less invasive techniques used to find gold and diamonds such as panning may have some benefits for the herpetofauna: small diamond/gold pits provide pools used as breeding sites by several species (e.g. *Osteocephalus taurinus*, *Phyllomedusa bicolor*, *Phyllomedusa vaillantii*, *Pipa arrabali*).

There are considerable anthropogenic alterations and pollution around Menzies Landing, notably due to diamond miners who use Menzies trail to bring food and gasoline from the Kaieteur airstrip to Menzies Landing. Gasoline is transported in large barrels that are rolled along the trail from the airstrip to Menzies Landing. It is common to see a layer of gasoline in the small streams running on and parallel to the trail.

Policy makers should be aware of the presence of unique endemic species that could be easily made extinct by development projects. Therefore we strongly suggest policy makers to be advised by scientists before making decisions that could be environmentally irreversible.

Tourists should be better informed and educated to preserve ecological quality of the site by minimizing their ecological impact (e.g. by proper disposal of waste, not disturbing the flora and the fauna).

7. Glossary

We are aware that some terms might be newly introduced or uncommon to the beginner. Explanations of many technical terms are already within the text, main others are defined in this section.

Acoustic foramen: the natural opening of the acoustic meatus.

Acuminate: narrowing to a slender point.

Acute: ending in a sharp point, pointed.

Alkalinisation: the process by which a substance becomes an alkali, which is a compound having very basic properties (the opposite of an acid).

Amplexus: the copulatory embrace of frogs and toads.

Annulus (pl. annuli): a ring-shaped structure or marking.

Anthropophilic: human-seeking or human-preferring; a species attracted by human beings.

Aposematic: relating to, characteristic of, or exhibiting aposematism (see aposematism).

Aposematism: an antipredator defence involving warning signals (e.g. warning colouration).

Aquatic: adapted to live in water; consisting of, relating to, or being in water.

Arboreal: adapted to live in the trees. Also an ecomorphological guild that includes lentic tadpoles adapted to live in water-filled phytotelmata or similar arboreal sites.

Arciferal pectoral girdle: an anuran pectoral girdle in which the epicoracoid cartilages are free and overlapping.

Atlantal: relating to the atlas.

Atlas: the first vertebra of the neck, articulating immediately with the skull.

Benthic: an ecomorphological guild that includes lentic or lotic tadpoles that rasp food from submerged surfaces mostly at or near the bottom.

Bicondylar: having two condyles.

Bicuspid: having two points (cusps) or prominences.

Bulbous: resembling a bulb in shape.

Carnivorous: an ecomorphological guild that includes lentic tadpoles that feed on macroinvertebrates and conspecific and heterospecific tadpoles.

Ceratobranchial: pertaining to the bone, or cartilage, below the epibranchial in a branchial arch.

Chorus (pl. choruses): several frogs calling together.

Clade: a group of biological taxa that share features inherited from a common ancestor.

Class: a taxonomic category of related organisms ranking below a superclass or phylum and above an order.

Cleithrum: a bone external and adjacent to the clavicle.

Cloaca: the common cavity into which the intestinal, genital, and urinary tracts open.

Columella: the ear bone of amphibians and reptiles.

Condyle: a rounded articulating prominence at the end of a bone.

Conspecific: a member of the same species.

Convergence: the adaptive evolution of superficially similar structures in distantly related organisms subjected to similar environment.

Cosmopolitan: occurring in many parts of the world.

Cotyle: a cuplike cavity or organ.

Crest: a narrow prominent ridge.

Cryptic: (1) difficult to detect, especially visually, because of the resemblance of an animal with its environment; (2) cryptic species are distinct taxa that are not or hardly distinguishable on the basis of morphology.

Dentary teeth: the teeth on the dentary bone in the lower jaw.

Dextral: of, or pertaining to the right side.

Diapophysis: the part of the transverse process of a thoracic vertebra that articulates with its corresponding rib.

Direct developer: an ecomorphological guild that includes species that have direct development (no tadpole stage).

Distal: remote from the point of attachment or origin.

Dorsal ground colour: the basic colour of the dorsal skin.

Ectotherm (or poikilotherm): an organism that depends on heat external sources to regulate its body temperature.

Endemic: restricted to a certain region or part of a region.

Endotroph (or endotrophic): an embryo or larva that entirely depends on vitellogenic yolk or other parentally produced material for its development; sometimes non-feeding.

Epiphytic: a plant that grows on another plant upon which it depends for mechanical support only (not for nutrients).

Euthanize: killing without pain.

Excrescence: a protruding outgrowth from a part of the body.

Exotroph (or exotrophic): a larva that feeds on various materials not parentally derived, or trophic eggs provided by the mother.

Explosive breeder: a species that breeds in a very short period (see explosive breeding).

Explosive breeding: when all animals of a population congregate and breed in a very short period.

Family: a taxonomic category of related organisms ranking below an order and above a genus.

Fibulare: the bone or cartilage of the tarsus that articulates with the fibula, which is the outer of the two bones of the hindlimb.

Filament: a slender tip of the tail in some tadpoles.

Firmisternal pectoral girdle: an anuran pectoral girdle in which the epicoracoid cartilages are fused along the midline.

Fossorial: adapted to live underground. Also an ecomorphological guild that includes lotic, fusiform tadpoles that inhabit leaf mats in slow water areas.

Frontal bones: cranial bones lying between the orbits and the parietal bones. Usually paired, but may fuse to form a single frontal bone, or fuse with the parietal bones to form a single frontoparietal bone.

Frontoparietal bones: cranial bones consisting of the fused frontal and parietal bones. May be paired or fused in a single frontoparietal bone.

Ganglion (pl. ganglia): an encapsulated neural structure consisting of a collection of cell bodies or neurons.

Gastromyzophorous: an ecomorphological guild that includes lotic tadpoles that have the belly modified in a ventral sucker.

Genus (pl. genera): a taxonomic category of related organisms ranking below a family and above a species.

Gill: respiratory organ of aquatic organisms that breathe oxygen dissolved in water.

Gill slit: one of a series of slitlike openings by which the water from the gill is discharged.

Girdle: an encircling arrangement of bones.

Gonad: a gland in which sex cells (= gametes) are produced.

Groin: the posterior part of the flank near hindlimb insertion.

Groove: a long narrow furrow or channel.

Hepatic peritoneum: the layers of tissue that cover the liver.

Herpetofauna: the amphibian and reptile fauna

Heterospecific: belonging to a different species.

Holarctic: a biogeographic region; of, or pertaining to the temperate and Arctic regions of the Northern Hemisphere (divided into the Nearctic and Palearctic regions).

Holochordal vertebrae: vertebrae in which the notochord (= the axial support of all embryonic vertebrates) is entirely replaced by bone.

Hydrography: the scientific description and analysis of the physical characteristics of earth's surface waters.

Insemination: the introduction of semen (the fluid containing spermatozoa) into the reproductive tract of the female.

Interclavicle: a median bone connected with the sternum.

Interhyoideus: a buccal elevator muscle.

Intraspecific: involving the members of one species; occurring within a species.

Jugal bone: the arch of bone beneath the eye.

Kingdom: the largest of the divisions of living organisms.

Keratinized: hardened with keratin, which is an insoluble protein substance that constitutes the bulk of various horny structures.

Lentic: of, or relating to, or living in any nonflowing water system.

Lotic: of, or relating to, or living in any flowing water system.

Macrophagous: an ecomorphological guild that includes lentic tadpoles that presumably feed by taking larger bites of attached materials on submerged substrates.

Medial: of, or pertaining to the midline.

Mimetic: relating to, characteristic of, or exhibiting mimetism (see mimetism).

Mimetism (or mimicry): the advantageous superficial resemblance of a palatable organism to an unpalatable, toxic organism (Batesian mimetism), or of an unpalatable, toxic organism to another unpalatable, toxic one (Müllerian mimetism).

Monophyletic: a group containing a hypothetical common ancestor and all its descendants; characterized by the possession of synapomorphies (see synapomorphy; paraphyletic; polyphyletic).

Monotypic: consisting of a single species.

Morphometrics: the study of variation and change in the form of organisms.

Nasal bones: cranial bones lying above the nasal capsule. Usually paired, but may be fused in a single element.

Nearctic: a biogeographic region; of, or pertaining to the temperate and Arctic regions of North America and Greenland.

Nektonic: an ecomorphological guild that includes lentic or lotic tadpoles that rasp food from submerged surfaces somewhere within the water column.

Nidicolous: an ecomorphological guild that includes species that have non-feeding tadpoles.

Nychthemeral: of, or relating to a 24h period.

Obtuse: blunt or rounded at the apex (tip).

Odontophores: the tooth-bearing processes of the vomer and palatine bones.

Opercular element: an ear cartilage or bone.

Order: a taxonomic category of related organisms ranking above a family and below a class.

Oviduct: the tube through which eggs (ova) pass from the ovary to the uterus or to the outside.

Oviparous: eggs that hatch outside the body of the mother.

Ovoviviparous: eggs that hatch within the female's oviduct without obtaining nourishment from it (birth of live offspring).

Palatines: paired bones in the anterior portion of the roof of the mouth.

Palatoquadrate: a series of bones or a cartilaginous rod constituting part of the roof of the mouth or upper jaw.

Palaearctic: a biogeographic region; of, or pertaining to the temperate and Arctic regions of Europe and Asia.

Papilla amphibiorum: a sensory area in the wall of the sacculus (one of the maculae of the vestibular apparatus) of the inner ear of amphibians.

Paraviviparous: an ecomorphological guild that includes species in which froglets hatch at various sites in or on the mother's body.

Parietal bones: cranial bones usually bordered by frontal bones anteriorly and occipital bone(s) posteriorly. Usually paired, but may fuse to form a single bone, or fuse with the frontal bones to form a single frontoparietal bone.

Paraphyletic: a group of taxa containing a hypothetical ancestor, but not all of its descendants; often characterized by the possession of plesiomorphic characters (see monophyletic; plesiomorphic; polyphyletic).

Parietal peritoneum: the layers of tissue that line the abdominal and pelvic cavities.

Parotoid gland: an enlarged external skin gland behind the eye in amphibians that secretes neurotoxic milky substance to deter predators.

Pedicellate: having or supported by a pedicel.

Penultimate: next to terminal.

Pericardial peritoneum: the layers of tissue that cover the heart.

Phalanx (pl. phalanges): a bone of a finger or toe.

Phylum: a primary division of a kingdom of living organisms.

Physiognomy: the external aspect.

Physiography: the scientific description and analysis of the natural features of the earth's surface.

Phytotelm (pl. phytotelmata): water-holding cavity in some part of a plant or plant product.

Plesiomorphic: primitive, as opposed to advanced; the quality of being group-defining only at a higher level.

Polychromatic: relating to, characteristic of, or exhibiting polychromatism (see polychromatism).

Polychromatism: the occurrence of several different colours and colour patterns in organisms of a same species (or in a population), independent of sexual variation.

Polymorphic: relating to, characteristic of, or exhibiting polymorphism (see polymorphism).

Polymorphism: the occurrence of several different morphological types in organisms of a same species (or in a population), independent of sexual variation.

Polyphyletic: a group of taxa containing some of the descendants of a hypothetical common ancestor, but not the hypothetical common ancestor itself; characterized by the possession of convergent characters (see monophyletic; paraphyletic).

Postorbital bone: cranial bone bordering the orbit posteriorly.

Postparietal bones: the series of paired bones on the posterodorsal surface of the skull.

Premaxilla (pl. premaxillae): one of a pair of bones located in front of and between the maxillary bones in the upper jaw of vertebrates; the anteriormost portion of the maxillary arch.

Presacral vertebrae: the vertebrae other than the sacral (pelvic) and caudal (tail) vertebrae.

Procoelous: a pattern of vertebral articulation in which the individual vertebrae have a concave anterior face and convex posterior face.

Prootic bone: a bone forming part of the auditory capsule.

Proximal: situated near the point of attachment or origin.

Pseudotail: the presence of a few postcloacal vertebrae in the terminal shield in some caecilians.

Pterygoid: a bone of the posterior palatal region (roof of the mouth).

Rank: to classify; a relative position in a classification.

Rheophilous: a generic term describing tadpoles adapted to live in microhabitats in the flowing parts of lotic systems.

Sacrum: a vertebra or vertebrae articulating with the pelvic girdle.

Sensu stricto: in the stricter sense; using a taxon restrictively in the sense of the original author.

Septomaxilla: a small bone between the nasal septum (which is the partition separating the two nasal cavities) and the maxilla (which is one of two identical bones that form the upper jaw).

Sexual dichromatism: an intraspecific difference in colour or colour pattern between the sexes.

Sexual dimorphism: an intraspecific morphological difference between the sexes.

Sinistral: of, or pertaining to the left side.

Species: a basic taxonomic category ranking below the genus (or subgenus) and consisting of related organisms capable of interbreeding and producing fertile offspring.

Splenic teeth: the teeth on the splenic bone in the lower jaw.

Superclass: a taxonomic category of related organisms ranking below a phylum and above a class.

Supratemporal bones: cranial bones situated in the temporal region.

Suspension-feeder: an ecomorphological guild that includes lentic tadpoles specialized in feeding on naturally suspended particles by pumping water in through the mouth, over the buccopharyngeal filtering system and out the spiracle.

Suspension-rasper: an ecomorphological guild that includes lentic tadpoles that apparently feed by filtering suspended particles from within the water column and rasping submerged surfaces.

Synapomorphy: a character shared by all basal members of a clade and derived from their hypothetical common ancestor (see monophyletic).

Tabular bones: cranial bones situated behind the supratemporal bones.

Taxon (pl. taxa): a particular taxonomic grouping, e.g. a particular species, genus, family, order, class, phylum or kingdom.

Tepui: a table-top mountain, typical of the Guiana Shield highlands.

Terminal: anatomical position pertaining to the end of a structure.

Terrestrial: adapted to live on land; consisting of, relating to, or being on land.

Tertiary: of third rank.

Tetralobate: having four lobes.

Tetrapod: literally an animal with four feet. Used here for members of the superclass Tetrapoda regardless the presence or absence of four limbs/feet.

Tibiale: the bone or cartilage of the tarsus that articulates with the tibia, which is

the inner of the two bones of the hindlimb.

Trilobate: having three lobes.

Truncate: terminating abruptly.

Ulna: the forearm.

Ultrasonic: of, or producing acoustic frequencies that are above the range audible by the human ear (*i.e.* frequencies above *ca.* 20,000 Hertz).

Urostyle: a styliform process forming the posterior extremity of the vertebral column.

Vacuum: a space that contains no air or other gas.

Vent: the cloacal opening.

Visceral peritoneum: the layers of tissue that cover the viscera (intestines).

Viviparous: live offspring develop within the oviduct or uterus by receiving nutrition from the mother.

Xeric: of, characterized by, or adapted to an arid habitat.

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9. Acknowledgments

Books of this nature take years of rigorous work and the unwavering support of numerous friends and colleagues to produce and complete. This is our small way of thanking those who have supported us throughout the years:

To our main Guyanese field companions and trainees: Deokie “Jackie” Arjoon, Paul Benjamin, Festus Marco, Indranee Roopsind, Hemchandranauth Sambhu, Solomon “Jack” Garcia, Giuliano “Kinky” Seegobin (whose friendship and kind hospitality was really appreciated), and Reuben Williams, we owe you our greatest debt and on many occasions our laughter, through the sometimes difficult situations.

To friends who helped with logistics in Guyana: KP our taxi driver in Georgetown, and the Nyron Rahaman family at Menzies Landing, with a special thanks to Farida Rahaman for her hospitality and wonderful cooking; collectively you guys can organize the world!

To all the enthusiast porkknockers of Menzies Landing that collected specimens for us; thank you for taking time off from your gruelling day’s work to run after a frog, lizard or snake.

To friends and colleagues who provided photographs that were used (or not) in some of the figures: Raffael Ernst (Technische Universität, Berlin), Philippe Gaucher (CNRS-Guyane, Cayenne), Marinus Hoogmoed (Museu Paraense Emílio Goeldi, Belém), Karl-Heinz Jungfer (Gaildorf), Christian Marty (Montjoly), and Andreas Schlüter (Staatliches Museum für Naturkunde, Stuttgart), we appreciate your efforts.

To friends and colleagues who provided call recordings that were used to generate oscillograms and spectrograms when no adequate recording was available from Kaieteur: Raffael Ernst, Philippe Gaucher, Karl-Heinz Jungfer, Christian Marty, and Andreas Schlüter, thank you for your support.

To Ross MacCulloch (Royal Ontario Museum, Ontario), Andreas Schlüter, and Celsa Señaris (Museo de Historia Natural La Salle, Caracas) for kindly supplying some literature, to Darrel Frost (American Museum of Natural History, New York) for permitting us to use a figure from one of his great papers, to Julien Cillis (Institut Royal des Sciences Naturelles de Belgique, Brussels) for technical assistance in Scanning Electron Microscopy, to César Barrio-Amorós (Fundación AndígenA, Mérida), Santiago Castroviejo-Fisher (Uppsala University, Uppsala), Raffael Ernst, Julian Faivovich (Museo Argentino de Ciencias Naturales, Buenos Aires), Taran Grant (Pontificia Universidade Católica do Rio Grande do Sul, Porto Alegre), Marinus Hoogmoed, Karl-Heinz Jungfer, Amy Lathrop (Royal Ontario Museum, Ontario), Ross MacCulloch, Les Minter (University of Limpopo, Limpopo), Brice Noonan (The University of Mississippi, Mississippi), Andreas Schlüter, Mark Wilkinson and David Gower (The Natural History Museum, London) for constructive and interesting discussions we owe an equally great debt.

For the loan or exchange of specimens under their care we thank Jon Campbell and Carl Franklin (University of Texas at Arlington, Arlington), Enrique La Marca

(Universidad de los Andes, Mérida), Ross MacCulloch and Robert Murphy (Royal Ontario Museum, Ontario), Anne-Marie Ohler and Laure Pierre (Muséum National d'Histoire Naturelle, Paris), Celsa Señaris and Gilson Rivas (Museo de Historia Natural La Salle, Caracas), Andreas Schlüter and Raffael Ernst, and Koos van Egmond (Nationaal Natuurhistorisch Museum, Leiden).

Tenki kulu (thank you in Patamona) to the Chenapou Community for welcoming us into their village, and to the following persons for sharing their knowledge and wisdom with us: Rupert Williams, Abel Albert, Edna Albert, David Anderson, Yvette Andrew, Les Benjamin, Silvie Benjamin, Saron Branch, Donald Daniels, Shirley Daniels, Susan Edward, Vincent Edwards, K. Edwin, Cassimiro Francisco, Jackson Fredricks, Henry Fredricks, Hildma Fredricks, Clement Jimmy, Lio John, Wendy John, Austin Kanichio, Linda Kanichio, Rufford Nagalla, Abel Marco, Jackie Marco, M.J. Marco, Samuel Marco, Shaquila Marco, Melvina Melville, Valerie Pablo, Septmus Simon, Jannis Skybar, Juliana Stephen, Linda Williams, and Stanley Williams.

Tenki kulu also to Melina Kalamandeen, Andrew Higgins, Ministry of Amerindian Affairs, George Simon at the Amerindian Research Unit, University of Guyana, Guyana Forestry Commission, Navin Roopnarine of the National Parks Commission, and Bhaleka Suelall of the Ministry of Agriculture Hydrometeorological Services – Guyana.

We also deeply acknowledge the Prime Minister of Guyana, The Honorable Samuel Hinds for his help and support, the Ambassador of Guyana in Brussels, His Excellency Patrick Gomes and his secretary Myrna Vincke and all the personnel of the Guyana Embassy in Brussels for their help in many ways, and Georges Lenglet (Institut Royal des Sciences Naturelles de Belgique, Brussels) for his support and collaboration in the Global Taxonomy Initiative research project.

Permission to conduct this study at Kaieteur National Park was granted by Shyam Nokta and Inge Nathoo of the Guyana National Parks Commission, with specimen verification conducted by the Department of Biology, University of Guyana, and research and collection permits issued by the Guyana Environmental Protection Agency. We cannot express how grateful we are for your help, oftentimes going beyond the call of duty to assist.

We are, of course, indebted to the Belgian Directorate-General of Development Cooperation for its generous financial support. The King Léopold III Fund for Nature Exploration and Conservation provided additional support.

The first author wishes to express gratitude to his partner Sylvie De Passe and his daughter Lili Kok for their patience during his long absences in the field without proper communication and during the (too) many hours spent at home in his study trying to complete this book.

Finally, we thank the editors of the *AbcTaxa* series for inviting us to produce this manual, Mark Wilkinson for helpful comments on the caecilian part of the text and Ron Heyer (Smithsonian Institution, Washington DC) for a critical review of a previous version of the manuscript.

10. About the authors



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11. Appendix – Taxonomic index

Species treated and page numbers that hold taxa descriptions are in bold, page numbers that hold species illustrations are in italics.

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Introduction to the taxonomy of the amphibians of Kaieteur National Park, Guyana

One of the impediments to understanding amphibian diversity in the Neotropics is the lack of complete, taxonomically accurate treatments of the amphibian species from geographically restricted areas. Botanists have long appreciated the importance of such studies and have reported the studies as florulas. The present work can be paraphrased as the amphibian faunula of Kaieteur National Park. A successful florula or faunula must be based on intensive sampling. It needs to be presented in such a way that users of the work can incorporate new taxonomic changes because sufficient information provided in the faunula/florula allows the worker to assess whether new taxonomic results apply to the faunula/florula involved. This is particularly critical for amphibian species, which are undergoing massive taxonomic revisions, especially in tropical regions. The authors of the Kaieteur National Park faunula present the data needed to determine the proper name(s) for Kaieteur National Park taxa.

Another feature of this work is the only detailed resource of which I am aware that documents how to successfully undertake amphibian fieldwork, including permit application procedures, equipment needed for work in remote areas, sampling methodology, collecting equipment, data collection, voucher specimen preservation, molecular study samples, advertisement call recordings, etc.

The amphibian faunula of Kaieteur National Park is a welcome addition to the altogether too few intensive amphibian publications of northern South America such as those for Santa Cecilia, Ecuador and Reserve Ducke, Brasil.

December 2008

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Produced with the financial support
of the Directorate General for
Development Cooperaton