

The genus is monotypic, but more species probably await description (see below).

Generic and specific characteristics are illustrated together in the species account of the only currently described taxon, *Allophryne ruthveni* (p. 112).

Tukeit Hill frogs are nocturnal, mostly arboreal, and inhabit primary forest where they are mainly found in the close vicinity of streams. They are explosive breeders, having apparently short breeding periods during the rainy season.

The genus *Allophryne* is taxonomically challenging with a long history of controversy, sharing many characteristics with Centrolenidae. There is still some debate regarding the family ranking of the genus. Frost *et al.* (2006) formerly ranked *Allophryne* in the family Centrolenidae, but Guayasamin *et al.* (2008) argued to maintain the use of Allophrynidae, pointing out a sister-group relationship between *Allophryne* and glass frogs (Centrolenidae).

Sexual dimorphism

Females of the only described species have more white spots on the black throat and less spicules on the dorsum. Males have a whitish central area visible through the skin on the chest and the belly.

Eggs

Deposited on a leaf overhanging water.

Tadpoles

Not formally described yet. Exotroph (possibly benthic, or fossorial like those of centrolenids).

Distribution

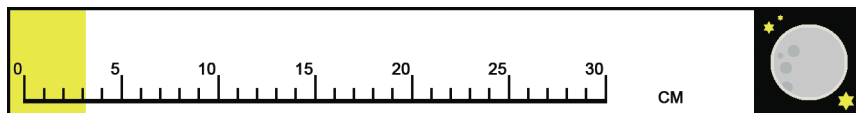
The genus *Allophryne* is currently reported throughout the Guiana Shield and in the states of Pará, Maranhão, and Rondônia in Brazil (Frost, 2008).

Allophryne ruthveni is expected in Bolivia according to De la Riva *et al.* (2000).

A putative new species of *Allophryne* has been reported from Peru (Rodríguez & Knell, 2003), which would suggest that the genus is more widespread than previously thought. However no description appeared since the discovery of the putative new species.

Allophryne ruthveni Gaige, 1926

1926: 1, pl. 1.



ENGLISH NAME: Tukeit Hill frog.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: "Tukeit Hill, below Kaiteur [sic] Falls, British Guiana".

SELECTED REFERENCES: Lynch & Freeman, 1966 (expanded description, in English); Hoogmoed, 1969 (additional data on natural history and colouration, B&W photos, in English); Caldwell & Hoogmoed, 1998 (extended account, colour photo, in English).

Field identification - Males reach 24.7 mm SVL, females 31.0 mm.

- Dorsal ground colour and pattern variable, ranging from greyish-brown to creamish bronze with dark irregular spots and/or reticulum; often a conspicuous cream spot on posterior face of upper arm; skin on dorsum smooth, covered with horny spicules (larger and more extensive in males).
- Ventral surface thickly areolate, translucent dark grey, with a whitish central area visible through the skin in males.
- Throat black with white spots (more extensive in females).
- Head very small, triangular, broader than long.
- Iris dark reddish brown.
- Fingers basally webbed, with lateral fringes.
- Tip of fingers and toes truncate.
- Toes moderately webbed, with lateral fringes.

Life history - Nocturnal, arboreal. Found in primary forest, often in the vicinity of creeks. Males call from 1-3 m above the ground. Eggs are deposited on a leaf overhanging water, from which tadpoles will fall into the water as they hatch; tadpoles probably feed on detritus.

Call - First described by Caldwell & Hoogmoed (1998: 666.2), who provided a spectrogram. It consists of a short, low, raspy trill produced at a rate of ca. 30 calls/min.

Tadpole - Not formally described. Lescure & Marty (2001) reported it as brownish grey, mottled with black, dorsoventrally flattened with a gradually tapering tail.

Abundance and distribution in KNP - Rare, collected only around main sampling localities # 2 and 5 (see Fig. 3), but the species is probably more widespread in the Park.

Geographic range - Has been reported throughout the Guiana Shield and in the states of Pará, Maranhão, and Rondônia in Brazil. Expected in Bolivia according to De la Riva *et al.* (2000).

Taxonomic comments – See generic account (p. 110).

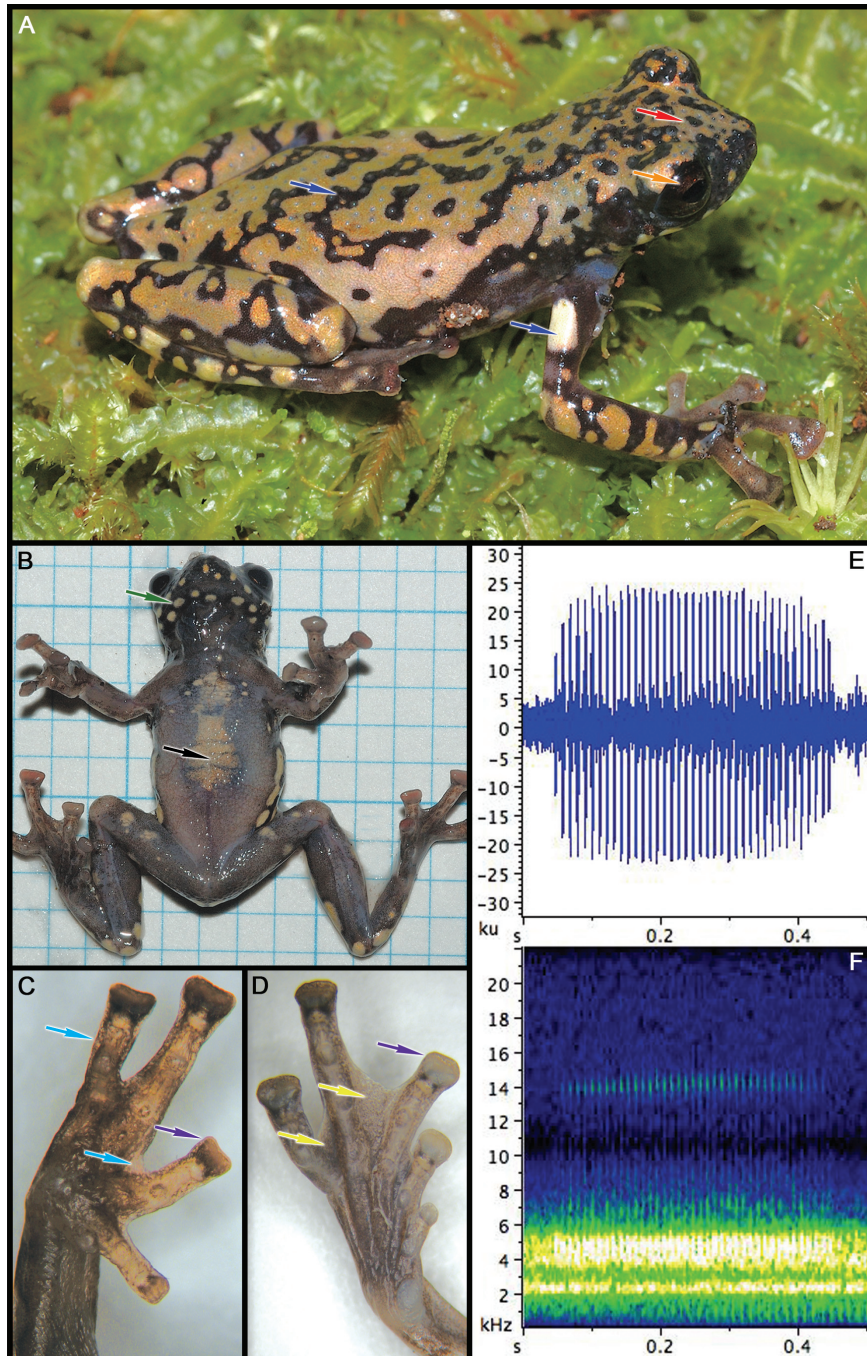


Fig. 78. *Allophryne ruthveni* Gaige, 1926. A. Dorsolateral view. B. Ventral surface of a male in life. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

***Anomaloglossus* Grant, Frost, Caldwell, Gagliardo,
Haddad, Kok, Means, Noonan, Schargel & Wheeler, 2006**

“ROCKET FROGS”



Fig. 79. *Anomaloglossus kaiei*, one of the 20 currently described species in the genus. Here a male carrying tadpoles. (Photo by P. J. R. Kok).

- ⇒ Small to medium size
- ⇒ Maxillary teeth present
- ⇒ Presence of a median lingual process (Fig. 80)
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum smooth to slightly granular (Fig. 44 A-C, H)
- ⇒ Vocal sac single, subgular (Fig. 56A)
- ⇒ Fingers unwebbed
- ⇒ Finger I < = > II when fingers adpressed
- ⇒ Dorsal surface of finger disc with two scutelike flaps (Fig. 51F)

The genus currently contains 20 species, but many still await description. Rocket frogs are diurnal, mostly terrestrial (some, like *A. kaiei* are forest-dwellers, some, like *A. beebei*, are bromeliad-dwellers, others like *A. degranvillei* are stream-dwellers), and inhabit a wide range of habitats, from savannah to tepui summits.

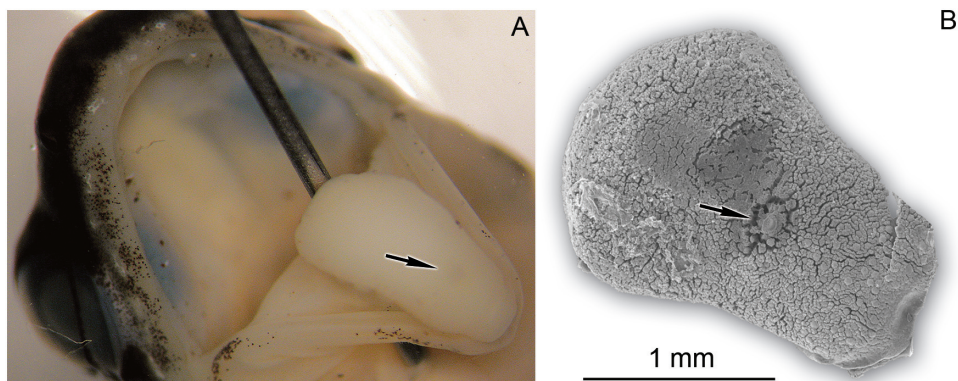


Fig. 80. The median lingual process (here in *Anomaloglossus kaiei*). (Photo A by P. J. R. Kok; scanning electron micrograph B by J. Cillis & P. J. R. Kok).

Sexual dimorphism

Not present in all species. Males of some species have the third finger or all fingers swollen, and/or a darker throat than females.

Eggs

Terrestrial, deposited on the ground, or on leaves of bromeliads (= phytotelmata).

Tadpoles

Extotroph (benthic or arboreal), or endotroph.

Distribution

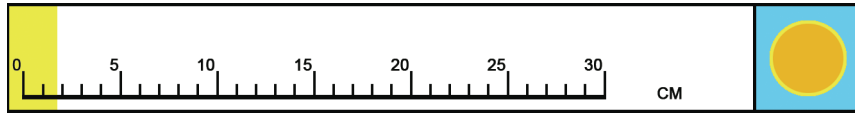
The genus *Anomaloglossus* is currently reported from the northern and eastern Amazon Basin, the Guiana Shield, and the Pacific slopes of the Andes in Colombia and Ecuador (Grant *et al.*, 2006).

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

1. Finger I distinctly shorter than Finger II; lateral fringes present on Fingers II & III; palm yellow; digits without small sky blue spots; hindlimbs without dark brown bars; dorsal colour usually yellow, and pattern usually absent or inconspicuous ***A. beebei*** (p. 116)
- 1'. Finger I and II equal in length; lateral fringes present on all fingers; palm dark brown or black; digits with sky blue spots; hindlimbs usually with distinct dark brown bars; dorsal colour brown, and pattern usually conspicuous
 ***A. kaiei*** (p. 118)

Anomaloglossus beebei (Noble, 1923)

1923: 289, figs 1-4.



ENGLISH NAME: Golden rocket frog, Beebe rocket frog.

LOCAL NAME (PATAMONA): Kayatik.

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

SELECTED REFERENCES: Bourne, 2001 (colour pattern, natural history, in English); Bourne *et al.*, 2001 (vocal communication, reproductive behaviour, in English); Kok *et al.*, 2006b (redescription, call description, tadpole description, colour photos, natural history, distribution, in English).

Field identification - Males reach 16.8 mm SVL, females 18.7 mm.

➤ Dorsal ground colour very variable (at least five different colour patterns), ranging from bright yellow to pale brown, with dorsolateral stripes (sometimes inconspicuous), with or without dark brown markings, juveniles greenish/yellowish white; skin on dorsum slightly granular.

➔ Ventral surface granular, immaculate yellow to yellowish orange in both sexes (fades to white in preservative).

➤ Throat immaculate in both sexes.

➤ When addressed, Finger I shorter than II; Finger III not swollen in males.

➤ Subarticular tubercles small, single.

➤ Fingers unwebbed, lateral fringes present on Fingers II and III.

➤ Toes moderately webbed.

➤ Discs on digits larger than adjacent phalange, with distinct dorsal scutes.

Life history - Diurnal. Found exclusively in large terrestrial bromeliads (*Brocchinia micrantha*). Males call from bromeliads. Eggs are deposited on the leaves of the bromeliad and tadpoles live in the water-filled phytotelm where they feed on detritus, insect larvae, other tadpoles, and unfertilized eggs deposited by the female.

Call - First described by Kok *et al.* (2006b: 60), who provided a spectrogram. It consists of 3-4 notes (high-pitch chirps) repeated at a rate of 44-51 calls/min.

Tadpole - First described by Kok *et al.* (2006b: 59). Exotroph, arboreal; yellow with dark mottling; LTRF = 2(2)/3.

Abundance and distribution in KNP - Very common locally in suitable habitat. Collected only around main sampling localities # 1 and 11 (see Fig. 3), but possibly more widespread in the Park in suitable habitats.

Geographic range - Reported only from Guyana, in KNP and on Mt Ayanganna.

Taxonomic comments - Identification of specimens from Mt Ayanganna needs formal confirmation, notably by call and tadpole comparisons.

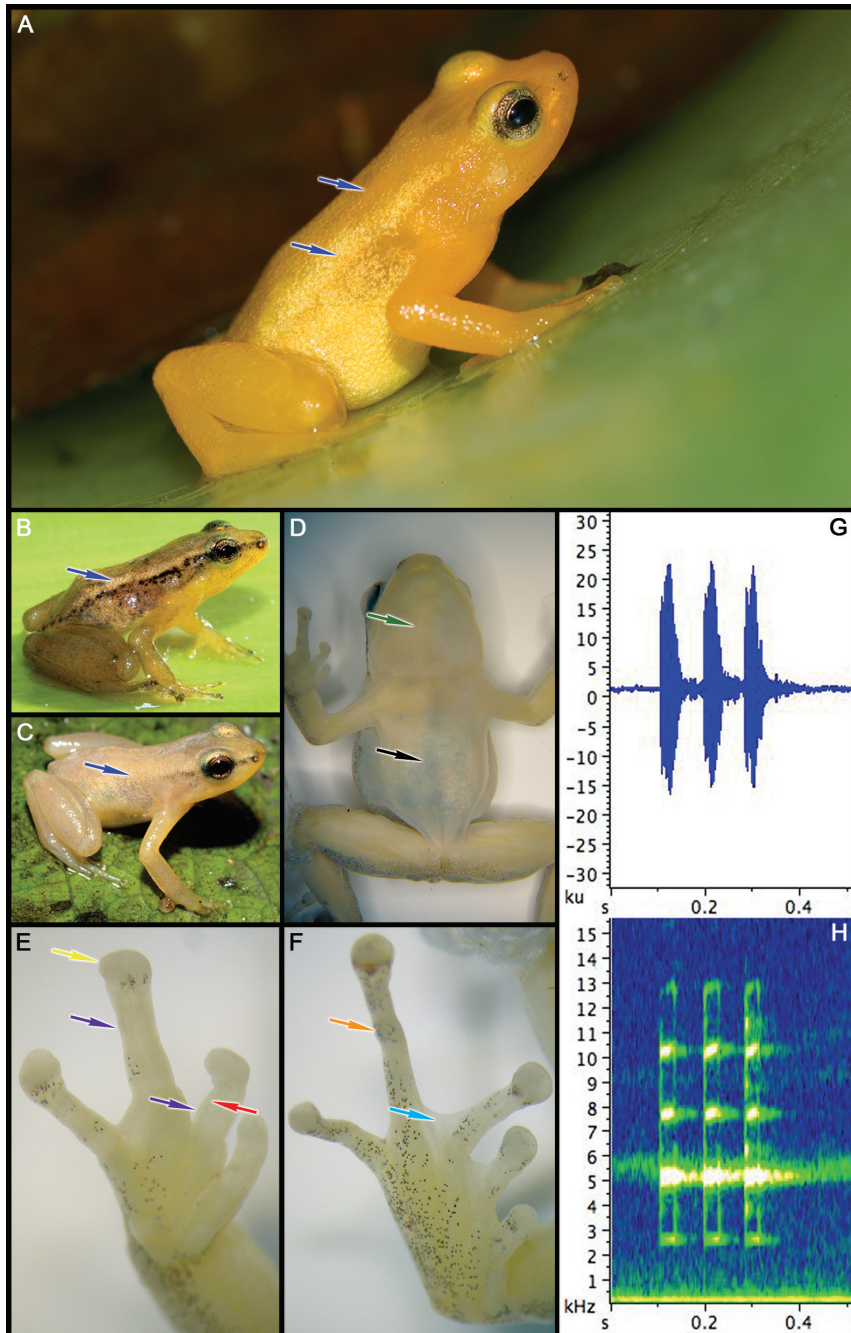
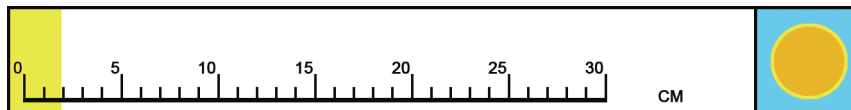


Fig. 81. *Anomaloglossus beebei* (Noble, 1923). A. Bright yellow morph. B. Brown morph. C. Juvenile. D. Ventral surface in preservative. E. Palm (preserved male specimen). F. Sole (preserved male specimen). G. Call, oscillogram. H. Call, spectrogram. (Photos by P. J. R. Kok).

***Anomaloglossus kaiei* (Kok, Sambhu, Roopsind, Lenglet & Bourne, 2006)**

2006a: 38, figs 1-8.



ENGLISH NAME: None; we propose "Kaie rocket frog".

LOCAL NAME (PATAMONA): Kokonbasli.

TYPE LOCALITY: "Kaieteur National Park, along Tukeit trail, Guyana, 5°11'06"N, 59°28'51"W, elevation ca. 400 m".

SELECTED REFERENCE: Kok *et al.*, 2006a (original description, call description, tadpole description, colour photos, natural history, distribution, in English).

Field identification - Males reach 18.9 mm SVL, females 19.8 mm.

➤ Dorsal ground colour variable, ranging from medium to reddish brown, with thin to inconspicuous dorsolateral line from eye to vent, and a wide black band from tip of snout laterally around body and above vent; skin on dorsum smooth to shagreened, posteriorly granular.

➤ Ventral surface smooth, immaculate orangish yellow in females, cream in males.

➤ Throat light greyish pink with dark spotting in males, immaculate yellow in females.

➤ When adpressed, Fingers I and II equal in length; all fingers slightly swollen in males.

➤ Subarticular tubercles small, single.

➤ Rudimentary webbing between Fingers II and III, lateral fringes present on all fingers.

➤ Toes moderately webbed.

➤ Discs on digits larger than adjacent phalanx, with distinct dorsal scutes.

Life history - Diurnal, terrestrial. Mostly found in primary forest, but also occurs in disturbed areas. Males call from over or under dead leaves on the ground. Eggs are probably laid in the leaf litter; tadpoles are usually carried by the male (rarely the female) and are deposited in very small pools where they feed on detritus, and sometimes on unfertilized eggs that are deposited by the female.

Call - First described by Kok *et al.* (2006a: 51), who provided a spectrogram. It consists of 1-2 notes (cricket-like chirps) repeated at a rate of 22-33 calls/min.

Tadpole - First described by Kok *et al.* (2006a: 47). Exotroph, benthic; dark brown with minute light dots; LTRF = 2(2)/3.

Abundance and distribution in KNP - Very common locally. Collected around all main sampling localities (see Fig. 3).

Geographic range - Reported only from Guyana, in KNP, but the species is widespread in the Pakaraima Mountains of Guyana (Kok, unpublished data).

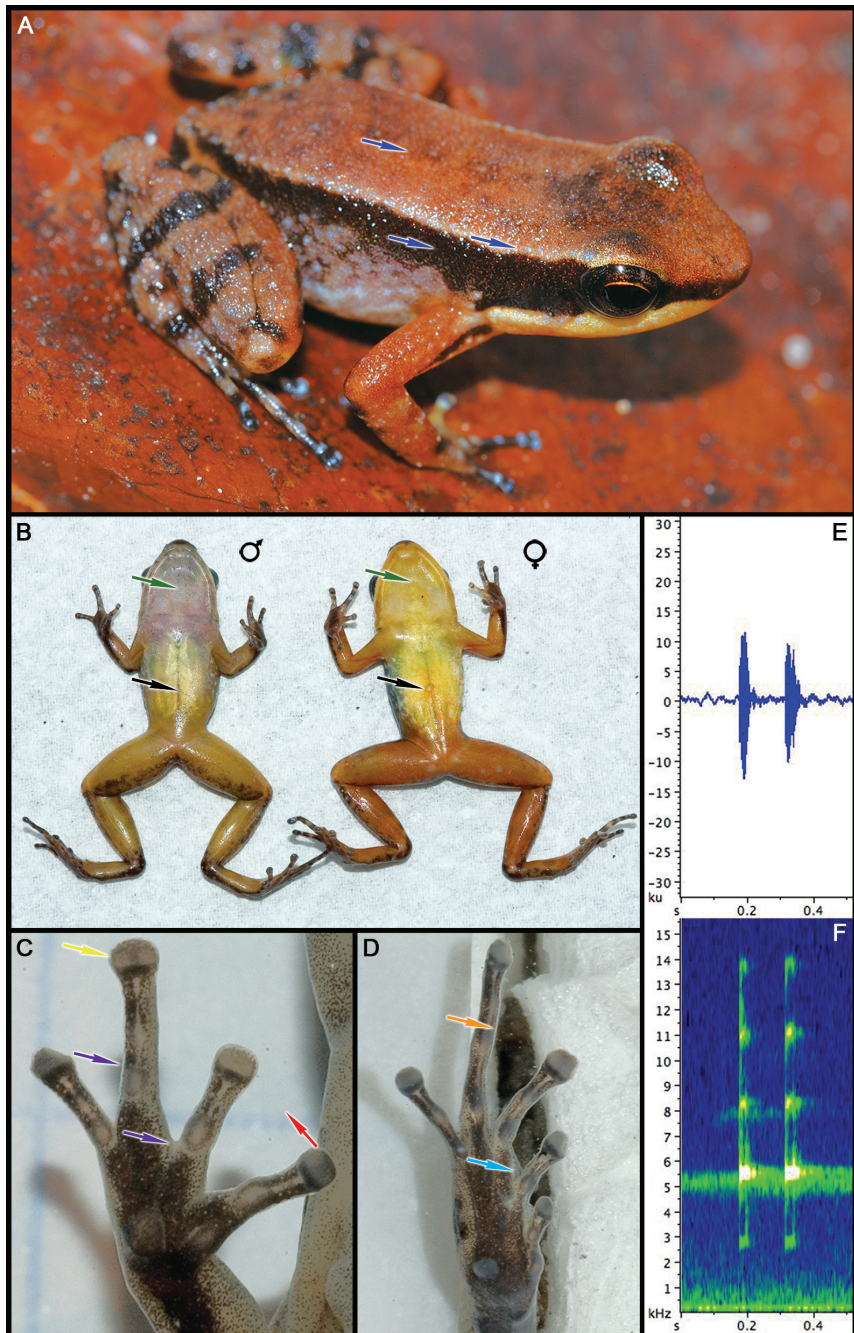


Fig. 82. *Anomaloglossus kaiei* (Kok, Sambhu, Roopsind, Lenglet & Bourne, 2006). A. Dorsolateral view of a female. B. Ventral surfaces of male and female in life. C. Palm (preserved male specimen). D. Sole (preserved male specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Atelopus Duméril & Bibron, 1841

“HARLEQUIN TOADS”



Fig. 83. *Atelopus hoogmoedi*, one of the ca. 83 currently described species in the genus. (Photo by P. J. R. Kok).

- ⇒ Small to medium size
- ⇒ Maxillary teeth absent
- ⇒ Usually brightly coloured with contrasting pattern
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum usually smooth (Fig. 44A), but shagreened to warty in some species (Fig. 44B-F)
- ⇒ Vocal sac single, subgular (Fig. 56A)
- ⇒ Finger I < II; first finger and toe very short; finger webbing at least between Fingers I-II, toes webbed
- ⇒ Finger discs unexpanded (Fig. 51A)
- ⇒ Tympanum absent (Fig. 43C)

The genus currently contains 83 species, although the taxonomic status of some of its members needs verification. Harlequin toads are diurnal and mostly terrestrial. Many species are stream-dwellers (meaning that they inhabit stream banks), but individuals may be found far from water. Several different toxins have been reported in a number of *Atelopus* species (e.g. tetrodotoxin).

Many populations of *Atelopus* recently drastically declined, and the genus appears to be very sensitive to the chytrid fungus *Batrachochytrium dendrobatidis*, which is one of the putative causes of the global amphibian decline.

Sexual dimorphism

Females are larger than males. Forearm in males is thicker proximally than distally, and Finger I has nuptial excrescences.

Eggs

Aquatic, deposited in gelatinous strings in streams or small adjacent pools, sometimes attached to submerged rocks.

Tadpoles

Exotroph (gastromyzophorous).

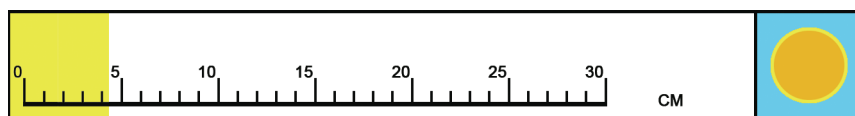
Distribution

The genus *Atelopus* is widespread and reported in Central and South America, from Costa Rica to Bolivia (Frost, 2008).

Only *Atelopus hoogmoedi* (p. 122) is currently recorded from Kaieteur National Park, where several healthy populations occur.

Atelopus hoogmoedi Lescure, 1974

1974: 998, figs 1-2.



ENGLISH NAME: None; we propose “Hoogmoed harlequin toad”.

LOCAL NAME (PATAMONA): Patakàlàlàk.

TYPE LOCALITY: “monts Atachi-Bacca (Guyane française)”

SELECTED REFERENCES: Lescure, 1974 (original description - under *A. pulcher hoogmoedi* – B&W photo, in French); Lescure & Marty, 2001 (brief description - under *A. spumarius hoogmoedi* - distribution, colour photo, in French); Lötters *et al.*, 2005 (brief description, colour photo, in French, English and Dutch).

Field identification - Males reach 31.8 mm SVL, females 42.8* mm.

- Dorsal ground colour dark brown to black, with variable pattern consisting of broad irregular yellow dorsolateral bands and markings, in which black spots are usually present; skin on dorsum smooth.
- Ventral surface smooth, yellow, orange or pinkish, usually with irregular black markings.
- Throat yellow, orange or pinkish, usually with irregular black markings.
- Tympanum absent.
- Arms and legs slender.
- First finger reduced, when addressed Finger I much shorter than II, fingers unwebbed.
- Toes I-II much reduced included in a pad-like web, toes moderately webbed.
- Disc on fingers and toes unexpanded.

Life history - Diurnal, terrestrial. Found on the leaf litter in primary forest, often near streams. Individuals may be found sleeping on low vegetation at night. Males call from the ground, close to small streams. Eggs are deposited in gelatinous strings in streams or in small adjacent pools.

Call - First described by Lescure (1981a: 900), who provided a spectrogram. It consists of a series of pulses increasing in pulse rate from the beginning to the end of the call and produced in about one second.

Tadpole - Unknown. Very likely exotroph, gastromyzophorous, like in other species of the genus.

Abundance and distribution in KNP - Rare, but may be locally common. Collected only around main sampling localities # 4 and 11 (see Fig. 3).

Geographic range - Reported only from the Guianas (French Guiana, Suriname and Guyana) and adjacent northern Brazil (states of Roraima, Pará and Amapá).

Taxonomic comments - Often reported as *Atelopus spumarius hoogmoedi* in the literature. Probably a complex of species that deserves a thorough revision.

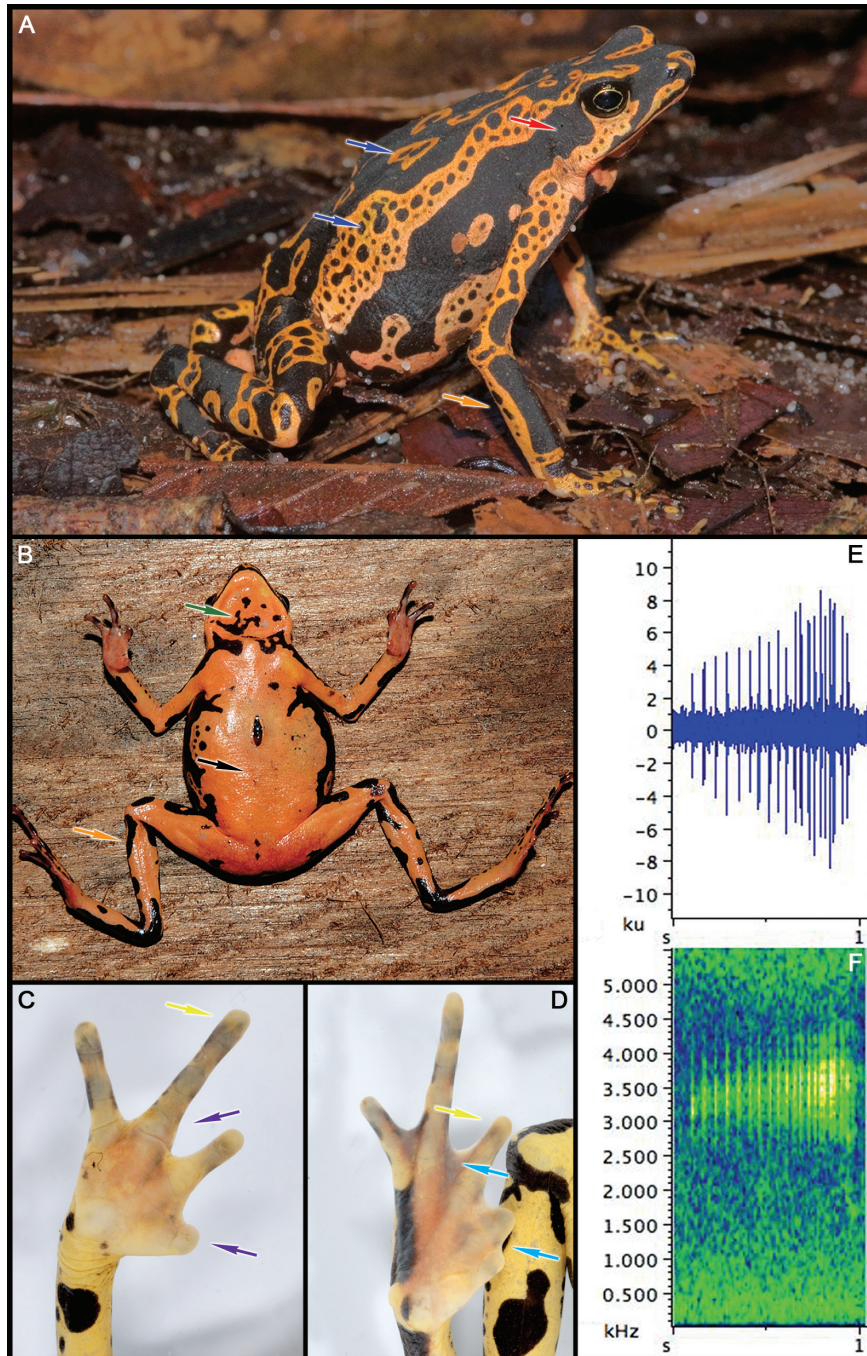


Fig. 84. *Atelopus hoogmoedi* Lescure, 1974. A. Dorsolateral view of a female. B. Ventral surface of a female in life. C. Palm (preserved female specimen). D. Sole (preserved female specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

Rhaebo Cope, 1862

“COPE TOADS”



Fig. 85. *Rhaebo guttatus*, one of the eight currently described species in the genus.
(Photo by P. J. R. Kok).

- ⇒ Medium to very large size
- ⇒ Maxillary teeth absent
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum smooth, tuberculate or spiculate (Fig. 44A, D-E)
- ⇒ Vocal sac single, subgular (Fig. 56A)
- ⇒ Fingers unwebbed to basally webbed
- ⇒ Finger I < = > II when fingers adpressed
- ⇒ Finger discs unexpanded (Fig. 51A)
- ⇒ Tympanum present, distinct or indistinct (Fig. 43A-B)
- ⇒ Parotoid glands present, ovoid to elongate (Fig. 47A)
- ⇒ Cranial crests absent or weakly developed

The genus currently contains eight species and includes the species formerly assigned to the *Bufo guttatus* species group.

Cope toads are diurnal or nocturnal, strictly terrestrial. They mainly inhabit tropical rainforest where they are often found along rivers and streams; some species are also found in open areas.

Sexual dimorphism

Males are usually smaller than females, in some species throat colour may vary between sexes (e.g. black in male vs. dark brown with white spots in female).

Eggs

Aquatic, deposited in long strings in temporary or permanent pools, sometimes close to streams, and possibly in slow-moving water.

Tadpoles

Unknown for several species. Exotroph (benthic); Lescure & Marty (2001) suggested a possible rheophilous tadpole in *Rhaebo guttatus*.

Distribution

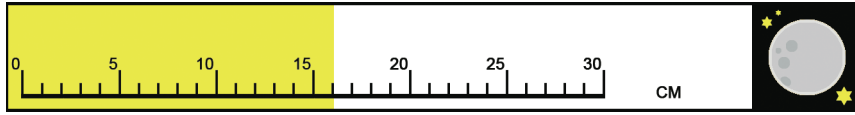
The genus *Rhaebo* is widespread and currently reported from eastern Honduras to Ecuador west of the Andes, and from the Guiana Shield to the upper Amazon Basin (Frost, 2008).

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

1. Skin on dorsum tuberculate (Fig. 44D); parotoid glands large, well visible (Fig. 47A); snout truncate in profile (Fig. 40B), not distinctly projecting beyond mouth; upper eyelid not laterally projecting beyond the eye; tympanum well distinct (Fig. 43A). ***R. guttatus*** (p. 126)
- 1'. Skin on dorsum spiculate (Fig. 44E); parotoid glands small to moderately large; snout acute in profile (Fig. 40B), distinctly projecting beyond the mouth; upper eyelid laterally projecting beyond the eye; tympanum barely distinct (Fig. 43B). ***R. nasicus*** (p. 128)

Rhaebo guttatus (Schneider, 1799)

1799: 218.



ENGLISH NAME: Spotted toad.

LOCAL NAME (PATAMONA): Walà.

TYPE LOCALITY: "India Orientali" [restricted to Suriname by Rivero, 1961]

SELECTED REFERENCES: Duellman, 1997 (brief description, colour photo, in English); Lescure & Marty, 2001 (brief description, distribution, colour photo, in French); Duellman, 2005 (brief description, tadpole description, call description and colour photo, in English).

Field identification - Males reach 137.8 mm SVL, females 177.0 mm.

- ➔ Dorsal ground colour orange tan to greyish brown, with no distinct pattern, but some large tubercles may be orange, reddish brown or dark brown; skin on dorsum tuberculate, sometimes spiculate, but always smooth on head.
- ➔ Ventral surface smooth to finely granular, orangish brown, pale grey or greyish brown with cream spots.
- ➔ Flanks dark reddish brown to dark brown, highly contrasting with the dorsal colour.
- ➔ Lower lip with creamy spots.
- ➔ Cranial crests absent, but presence of a canthal and a short preorbital ridge.
- ➔ Parotoid glands large, ovoid.
- ➔ When adpressed Finger I much longer than II, fingers unwebbed.
- ➔ Disc on fingers and toes unexpanded.

Life history - Nocturnal, terrestrial. Found in primary forest, near streams and rivers. Individuals may be found in very rocky areas (*i.e.* along the Potaro River at the base of Kaieteur Falls) and in caves. Males call from the ground, usually at the edge of streams or rivers. Eggs are deposited in gelatinous strings in streams or in small adjacent pools.

Call - The first comprehensive description seems to be that of Duellman (2005: 183), who provided a spectrogram. It consists of a series of loud notes (a plaintive mewling diminishing in frequency and loudness) repeated at a rate of about 75 notes/min.

Tadpole - The first detailed description is apparently that of Duellman (2005: 183), who provided a description of a stage-37 tadpole resulting from captive breeding. Exotroph, benthic, possibly rheophilous according to Lescure & Marty (2001); dark brown; LTRF = 2(1)/3.

Abundance and distribution in KNP - Common. Collected around main sampling localities # 1, 2, 6, 7, 10 and 12 (see Fig. 3). Probably widespread in the Park.

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

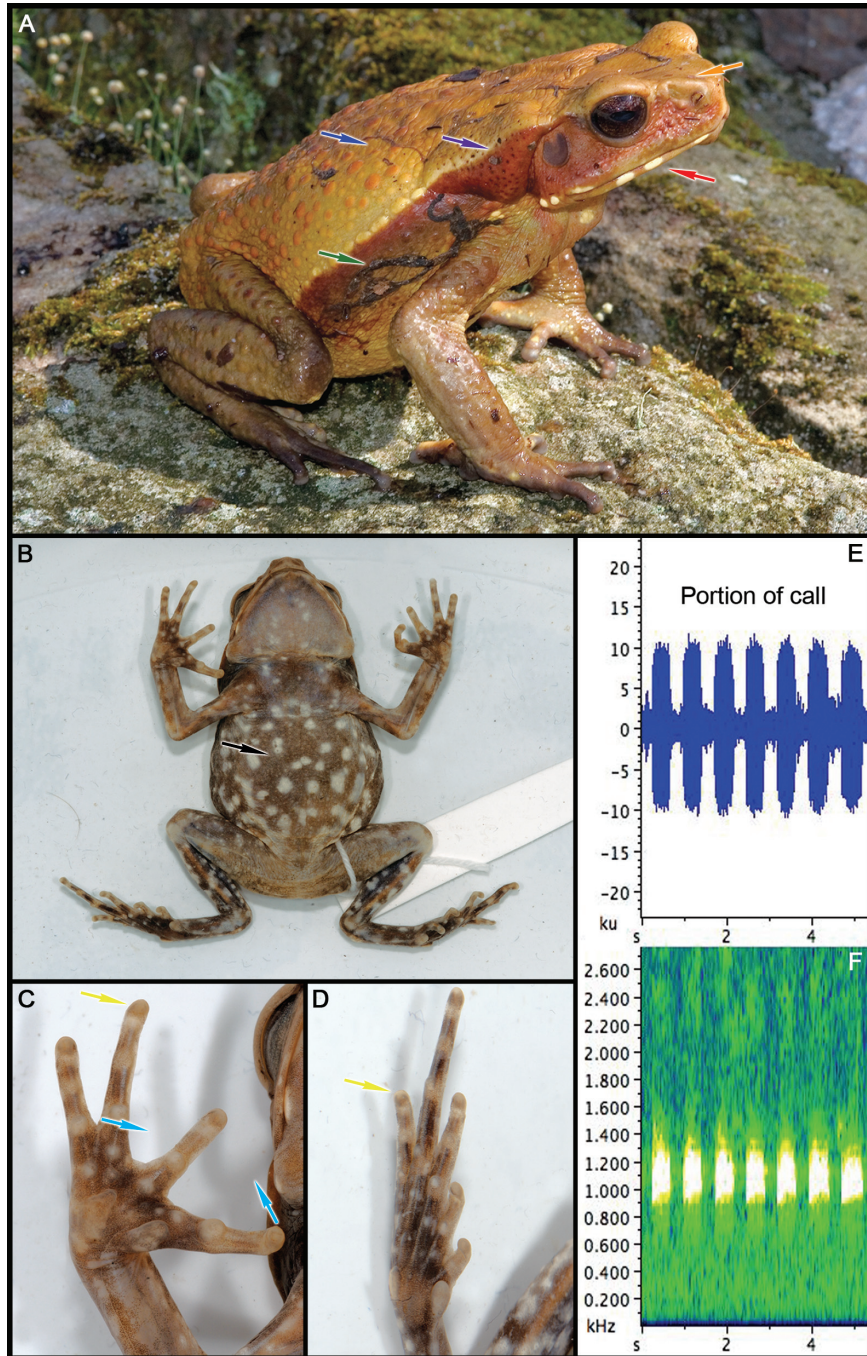
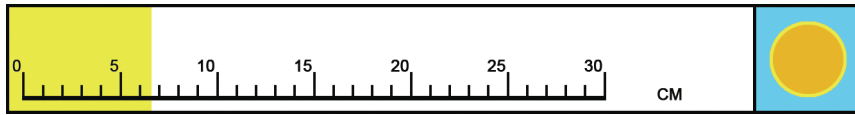


Fig. 86. *Rhaebo guttatus* (Schneider, 1799). A. Dorsolateral view of a female. B. Ventral surface of a preserved juvenile. C. Palm (preserved juvenile specimen). D. Sole (preserved juvenile specimen). E. Call, oscillogram. F. Call, spectrogram. (Photos by P. J. R. Kok).

***Rhaebo nasicus* (Werner, 1903)**

1903: 252.



ENGLISH NAME: Werner's toad.

LOCAL NAME (PATAMONA): Unknown.

TYPE LOCALITY: Unknown, restricted to "South America, probably along the Atlantic drainage" by Smith & Laurent (1950).

SELECTED REFERENCE: Hoogmoed, 1977 (description, habitat, distribution, B&W photos, in English).

Field identification - Males reach 47.2* mm SVL, females 68.5* mm.

➔ Dorsal ground colour very variable: medium brown, or greyish brown to reddish brown, sometimes with small greyish blue to sky blue spots (often present on flanks), and usually with a distinct pattern consisting of a black inverted triangle between the eyes connected further down on the back to a black "hour-glass" marking; in some specimens (especially juveniles) the dorsum only has one or more small dark spot; skin on dorsum spiculate.

➔ Ventral surface granular, dirty white with more or less extensive brown mottling.

➔ Upper eyelid laterally projecting beyond the eye.

➔ Snout acute in profile, distinctly projecting beyond the mouth.

➔ Cranial crests present, but low and not very distinct.

➔ Parotoid glands small to moderately large, elongate.

➔ When adpressed Finger I much longer than II, fingers unwebbed.

➔ Disc on fingers and toes unexpanded.

Life history - Diurnal, terrestrial. Found in primary forest only. Individuals are usually observed on the forest floor among leaf litter, sometimes far from water. Nothing is known about the reproductive behaviour of the species, but males probably call from the ground at the edge of small pools or slow-moving streams. Eggs are probably deposited in gelatinous strings in small water bodies or in slow-moving streams.

Call - Unknown.

Tadpole - Unknown. High probably exotroph, benthic, like in other species of the genus.

Abundance and distribution in KNP - Rare. Observed around main sampling localities # 6, 10 and 11 (see Fig. 3). Probably widespread in the Park.

Geographic range - Restricted to eastern Venezuela and Guyana.

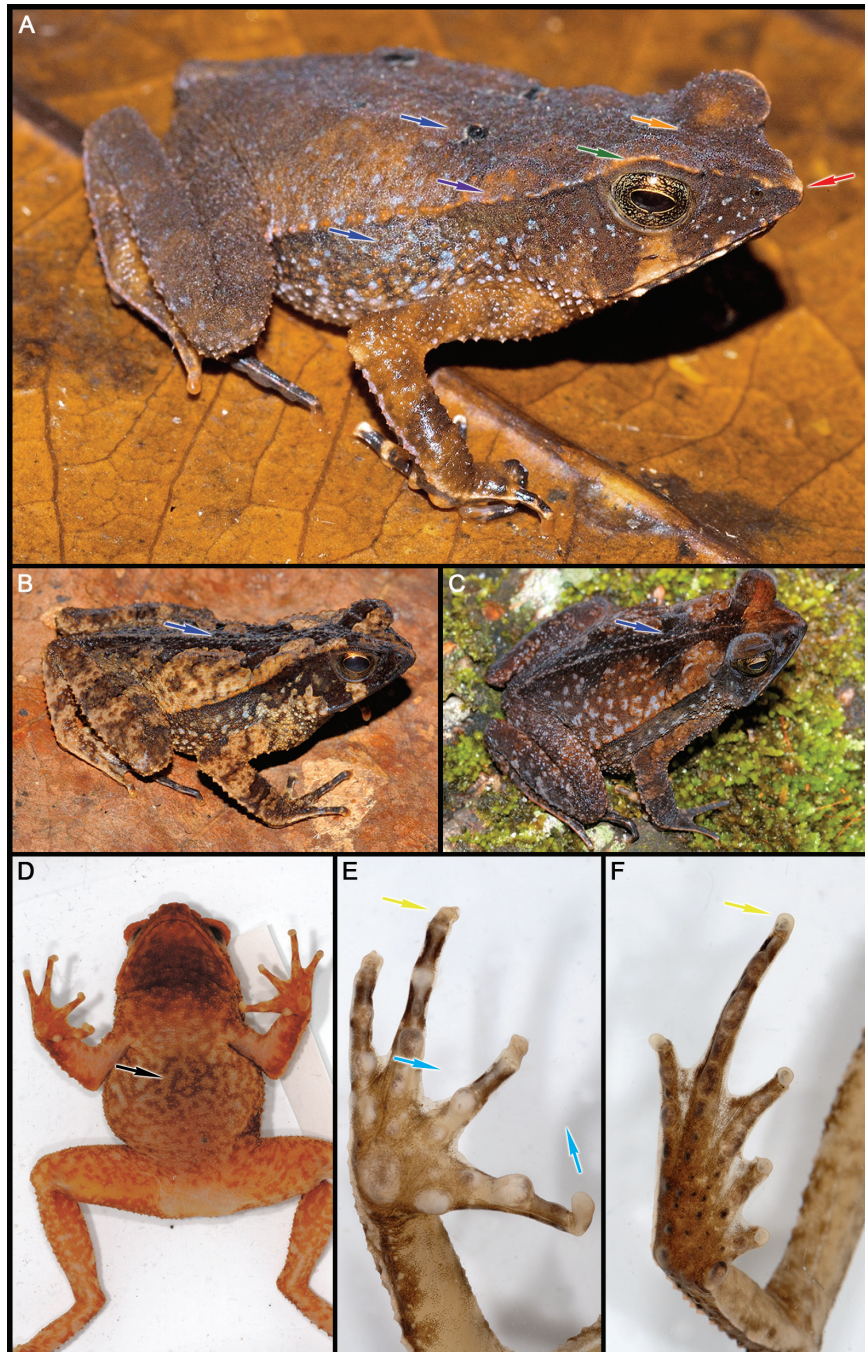


Fig. 87. *Rhaebo nasicus* (Werner, 1903). A. Dorsolateral view of a male. B, C. Dorsolateral views of males. D. Ventral surface of a preserved male. E. Palm (preserved male specimen). F. Sole (preserved male specimen). (Photos by P. J. R. Kok).

Rhinella Fitzinger, 1826

“SOUTH AMERICAN TOADS”



Fig. 88. Amplectant pair of *Rhinella marina* photographed in French Guiana. (Photo by P. J. R. Kok).

- ⇒ Medium to very large size
- ⇒ Maxillary teeth absent
- ⇒ Pupil horizontally elliptical (Fig. 42A)
- ⇒ Skin on dorsum rarely smooth, usually tuberculate to warty (Fig. 44A, D-F)
- ⇒ Vocal sac single, subgular (Fig. 56A)
- ⇒ Finger I < = > II when fingers adpressed
- ⇒ Finger discs unexpanded (Fig. 51A)
- ⇒ Tympanum present, distinct or indistinct (Fig. 43A-B)
- ⇒ Parotoid glands present, round, ovoid, trianguloid, or elongate (Fig. 47A)
- ⇒ Cranial crests absent or present (from weakly developed to hypertrophied)