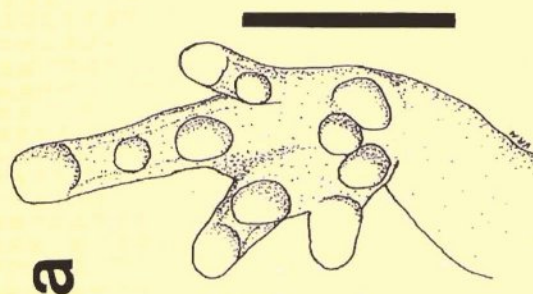
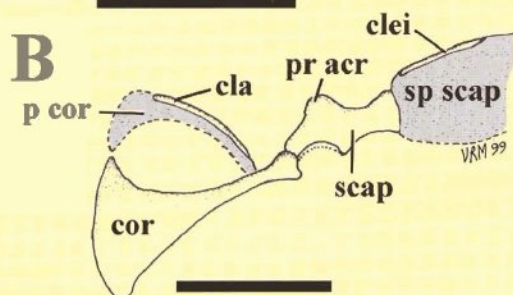
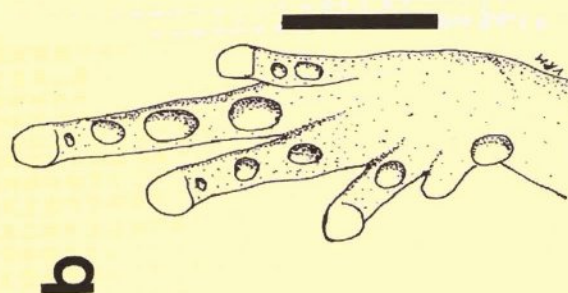
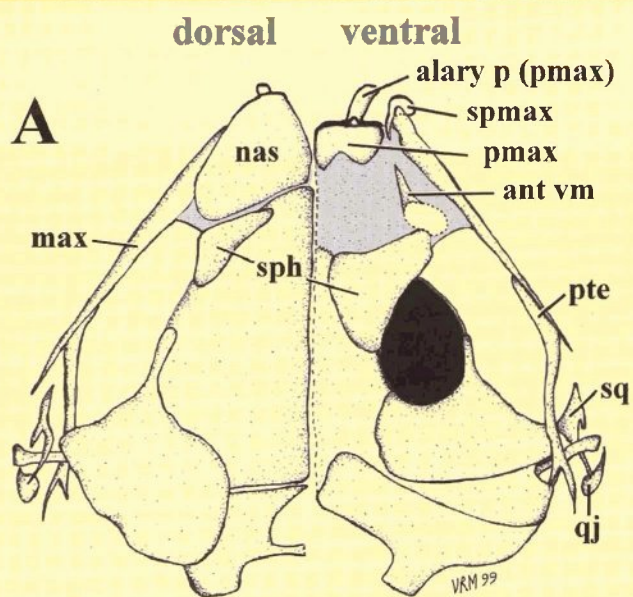


FACULTAD DE CIENCIAS BIOLÓGICAS

BIOTEMPO

REVISTA DE INVESTIGACIÓN



A NEW SPECIES OF *Chiasmocleis* (ANURA: MICROHYLIDAE) FROM SOUTHERN AMAZONIAN PERU WITH COMMENTS ON SOME OTHER MICROHYLIDS.

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RESUMEN

Se describe una especie nueva de *Chiasmocleis* de Pakitza, Parque Nacional del Manu, Perú, está en simpatria con *Chiasmocleis ventrimaculata* y vocaliza en la hojarasca. Esta nueva especie está muy relacionada a *C. bassleri* y podrían formar un grupo supraespecífico. Se comentan algunos caracteres de *C. ventrimaculata* y *C. bassleri*.

Palabras claves: Nueva especie de *Chiasmocleis*, Anura, Amazonia, Manu, Peru.

SUMMARY

A new species of *Chiasmocleis* from Pakitza, National Park of Manu, Peru described herein, is syntopic with *C. ventrimaculata* and its leaf litter calling. The new species is related to *C. bassleri* and could be form a supra-species group. Some characters of *C. ventrimaculata* and *C. bassleri* are commented upon.

Key words: New Species *Chiasmocleis* from Peru, Amphibians, Anura, Manu, Amazonian, Peru.

INTRODUCTION

Six of the 18 genera of microhylid frogs present in South America occur in the Peruvian Amazon (Rodríguez *et al.*, 1993; Morales, 1995; Wild, 1995). Of these six, only *Ctenophryne* lacks a clavicle and procoracoid, and the other five *Altigus* (with clavicle long, Wild, 1995), *Chiasmocleis*, *Elachystocleis*, *Hamptophryne* and *Syncope* present a much-reduced clavicle (Zweifeld, 1986). The genus *Chiasmocleis* has 19 recognized species that occur from Panama and north-western Colombia through the Amazonian and Guyana west forest of northern South America, the Atlantic Tropical Forest of southern Brazil, and the dry forest and Cerrados of Bolivia, central and southern Brazil, and Paraguay (Frost, 1985; Frost, 2006). Three species of *Chiasmocleis*, *C. anatis* Walker and Duellman, 1974, *C. bassleri* Dunn, 1949, and *C. ventrimaculata* (Anderson, 1945), have been reported from the wet forest of Amazonian Peru (Rodríguez *et al.*, 1993; Morales, 1995).

During our work on the herpetofauna of Madre de Dios (Morales and McDiarmid, 1996), we collected a number of interesting species some of which proved to be

new (e.g. *Colostethus conspicuus*, Morales, 2002, *Dendrobates biolat*, Morales, 1992; *Eleutherodactylus buccinator* Rodríguez & Duellman, 1994, *E. olivaceus*, Köhler, *et al.* 1998, *E. skydmainos* Flores and Rodríguez, 1997). Among the many frog species collected in the forest near Pakitza, a guard station for the National Park of Manu (11°56'S, 71°18'W), 350 m elevation, on the Rio Manu, Madre de Dios, Peru, was an undescribed species of microhylid frog of the genus *Chiasmocleis*. Here we describe that species and comment on other population of Peruvian frog of the genus *Chiasmocleis*.

MATERIALS AND METHODS

The type material was deposited in the Museo de Historia Natural, Universidad Nacional Mayor de San Marcos, Lima, Perú (MHNSM) and the National Museum of Natural History of the Smithsonian Institution, Washington, D.C., U.S.A. (USNM).

The following measurement is utilized only for the new specie: Long from snout to vent (SVL), head width (HW), head long (HL), tibia long (TL), distance between center of external narines (N-N), distance

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between center of the narine to angle anterior of the eye (N-E), distance between angle anterior of the eyes (E-E). Osteological terminology follows Trueb (1973), de Sá and Trueb (1991) and Trueb (1992). This study was based in different expositions (20 – 31 secs) of the X-ray of USNM 342862. The call analysis has made with Canary 1.2.1 (Charif *et al.*, 1995).

***Chiasmocleis superciliarbus* new species**

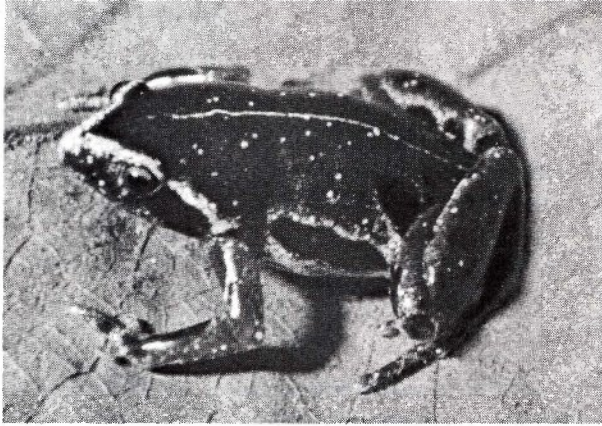


Figure 1.- Male of *Chiasmocleis superciliarbus* new species, paratype USNM 342862, National Park of Manu, Station Pakitza, Madre de Dios, Peru. No scale. Photo: Victor R. Morales.

HOLOTYPE. - MHNSM 16174; a mature male from Pakitza, Reserve Zone, Manu National Park, ca. 57 km (airline) NW of the mouth of the Rio Manu, on the Rio Manu, 350m, 11°56'47"S, 71°17'00"W, Madre de Dios, Peru. Collected by. Victor R. Morales and María E. Guevara (field series VRM 18377), 11. February. 1990.

PARATYPE. - MHNSM 16175 (field series VRM 18380) and USNM 342862 (field series VRM 18379) same date of holotype.

DIAGNOSIS

1) SVL, male = 18.4 - 18.7 mm, female unknown; 2) body trunk ovoid with dermal smaller spine; 3) snout projecting in ventral view; round in dorsal view; 4) fingers robust with a few dermal smaller spines; 5) second finger slightly longer than the fourth; 6) fourth finger shorter; 7) third finger more robust than other fingers; 8) toes with fringes and few dermal smaller spines;; 9) webbing absent; 10) supratympanic fold extends from below the posterior angle of the eye to the shoulder; 11) first toe much shorter, the tip reaches one-third under the first articular tubercle of the second toe; 12) flank with one or two dark spots on a light background; 13) ventral pattern with spots on a light background.

Chiasmocleis superciliarbus is similar to *C. bassleri*, and both may form the *bassleri* group with the follow-

ing characters: finger robust and short; flanks with one or two dark spots, but if the spots are not present, the flanks show a fine clear line between the joint of the ventral and dorsal pattern coloration; ventral pattern with dark spots on a light background. The morphological difference features among *Chiasmocleis* species is summarize in the Table 1. *Chiasmocleis superciliarbus* differ from the other species of microhylid that are present in the South Amazonian of Peru by the following features: clavicle and procoracoid present, toes free (*Ctenophryne geayi* without clavicle and procoracoid and toes with extended web); the first finger very short and uniform dorsum coloration pattern (*Hamptophryne boliviana* with first finger longer than second and dorsal coloration pattern with dark rhombus-shaped).

DESCRIPTION OF THE HOLOTYPE

(Fig. 1)

Adult male, 18.7 mm snout-vent length; snout pointed in dorsal view and rounded in lateral view; snout tip projects beyond the mouth; canthus rostralis straight, loreal region vertical; tympanum concealed; supratympanic fold extends from below the posterior angle of the eye to the shoulder; eyes small and anterolateral; fingers and toes with few dermal spine; limbs robust and short; first finger shorter than second, second finger slightly longer than fourth; third finger with extensive fringe and the other fingers with a slight fringe; articular tubercles visible on second, third and fourth fingers, articular tubercles on first finger are corn-like; palmar tubercles moderately round; tips of fingers and toes round; toes with fringe; first toe does not extend to the first articular tubercle of the second toe; granulation on the sole of the foot minute and scattered; inner metatarsal tubercle oval and inconspicuous; inner tarsal tubercle and webbing absent. Dorsum with few smaller dermal spines also on the dorsum of the thigh and tibia; venter smooth (Figure 2 a,b).

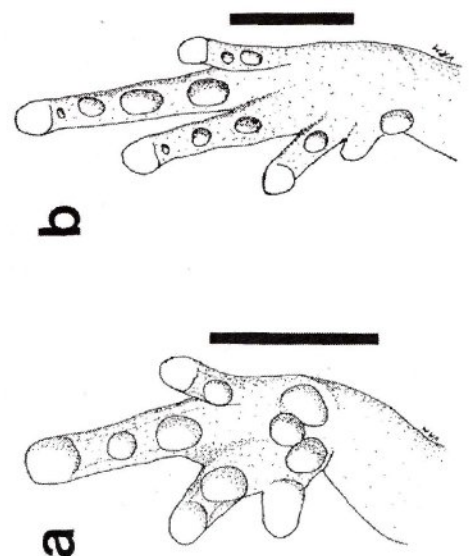


Figure 2.- Hand and foot of *Chiasmocleis superciliarbus* new species, holotype MUSN 16174. Line = 3 mm.

Coloration in alcohol. - Dorsum brown with a narrow white vertebral line that extends from the cloaca to the posterior angle of the eye; small white granules; narrow white band extends from the anterodorsal border of the arm, with a short interruption at the shoulder, to the supratympanic fold and to the border of the eyelid and above the nares to terminate at tip of the nose where it forms a point with the other band; upper lip with white spots on a brown background; the area of the tympanum is darker than the dorsum; the anterior dorsum of the arm and dorsum of the forearm patterned with large dark mottling; dorsum of the arm with clear spots on a brown background; posterior region of the arm with small dark brown mottling; flanks with one or two dark brown irregular blotches bordered by small clear brown spots; dorsal region of the groin with dark brown mottling; dorsal and posterior region of the thigh brown; anterior region of the thigh with dark brown mottling on a white background; dorsum of the tibia and tarsus brown; metatarsus with dark brown mottling on a white background; three brown spots on a white background occur on the anteroventral border of the tibia and on the posteroventral region of the thigh; throat dark with clear spots; chest, venter and the venter of the thigh with dark brown irregular mottling on a white background.

In life, dorsum dark brown with light orange-copper flecks; flanks brown and venter dark brown with white background; pupil black; iris copper.

MEASUREMENTS (in mm) AND RATE OF HOLOTYPE

SVL = 18.7; HW = 7.95; HL = 6.52; LT = 9.40; N-N = 1.70; N-E = 1.95; E-E = 3.36; LT/SVL = 0.50; HL/SVL = 0.35; NE/HL = 0.30; E-E/HW = 0.42; N-N/HW = 0.21; N-N/E-E = 0.50.

OSTEOLOGY

Quadratojugal reduced to small spur; squamosal slender, triradiate; maxillary arch incomplete; septomaxilla large, arcuate and with a large distal crista; premaxillary with palatal shelf and alary process expanded; anterior vomer small, reach with a distal crista; palatine absent; a paired sphenothmoid very developed (Fig. 3A); clavicle slightly curved, not meeting coracoid; procoracoid conspicuous, and proximal portion extend nearly to epicoracoid; proximal ossified portion of scapula uncapitate with the pars acromialis very pronounced; slender and large, ossified cleithrum; omosternum absent (Fig. 3B); phalangeal formula of hand 2-3-4-3, of foot 3-3-4-5-4; terminal phalanges triangle-like with reduced lateral expansion; eight presacral vertebrae, procoelous, vertebrae 7 and 8 with a paired posterior apophyses; sacral diapophyses expanded; coccyx with small transverse processes.

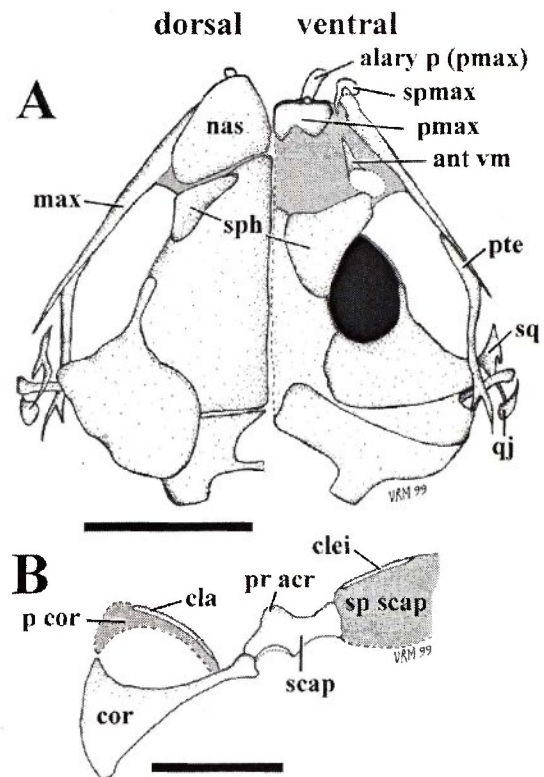


Figure 3.- A) Some cranial bones of *Chiasmocleis superciliarbus* new species, paratype USNM 342862, X-ray. Abbreviations: alary p (pmax) = alary process of premaxilla, spmax = septomaxilla, pmax = premaxilla, ant vm = anterior vomer, nas = nasal, sph = sphenothmoid, max = maxillary, pte = pterygoid, sq = squamosal, qj = quadratojugal, Line = 2 mm. B) Ventral view of pectoral girdle of *Chiasmocleis superciliarbus* new species, holotype MUSM 16174. Abbreviations: cor = coracoid, p cor = precoracoid, cla = clavicle, pr acr = pars acromialis, scap = scapula, clei = cleithrum, sp scap = suprascapula. Line = 1 mm. Stippled pattern cartilaginous area.

ADVERTISMENT CALL

The species calls at night on the leaf litter near the bank of a small reservoir at 25°C. The call (Fig. 4) corresponds to a long trill of pulses about 12.4 sec, and composed of two set pulses. The pulses of each set are 0.031 sec in duration with 0.037 sec between each pulse of each set. The time between each set was 0.066 sec. The range of frequency of the pulses was 2985.8 - 3205.5 Hz (Dominant frequency 3100 Hz). Nelson (1973) showed the call of five *Chiasmocleis* ranged over 3350 Hz. Of these, the sonogram of *C. panamensis* has pulse duration 0.03 - 0.04 similar to *C. superciliarbus*, but the frequency in *C. panamensis* was higher (4800-5500 Hz). Other species, *C. schudikarensis*, mentioned by Zimmerman & Bogart (1988), had a pulse duration (0.03) similar to *C. superciliarbus* but also with higher frequencies (5830 - 7420 Hz).

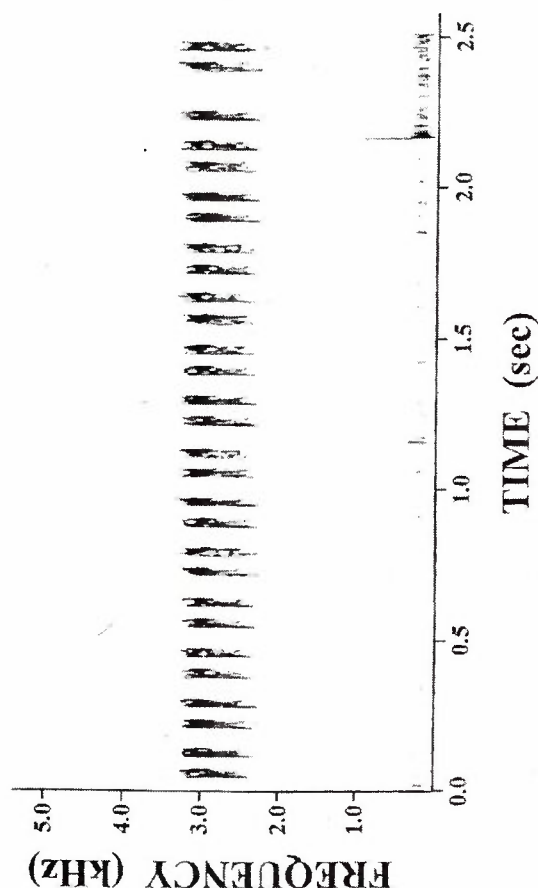


Figure 4.- Sonogram of the advertisement call of *Chiasmocleis superciliarbus* new species, paratype MUSM 16175 from Pakitza Station, National Park of Manu; air temperature 25°C; wide band 345 Hz.

ETYMOLOGY

The nome *superciliarbus* of this species (*sepercilius* = eyebrow and *albus* = white) is referent to the conspicuous white band over eyes like a eyebrow.

COMMENT OF OTHER MICROHYLID

Chiasmocleis bassleri. - Duellman (1978) and Rodriguez & Duellman (1994) distinguished the population from Santa Cecilia, Ecuador and Iquitos region, Peru as

C. bassleri with basally webbed toes, dorsum and flank are brown, throat and chest are gray and venter with large dark spots, but they did not mentioned the number of spots. Dunn (1949), in the description of *C. bassleri*, mentioned toes free and the abdomen with five large dark spot. The population from near Panguana (< 1,000 m, Pasco, Peru, MHNSM 14274 & 14279) has the characteristics of *C. bassleri sensu stricto*: not toe webbing, five large black spots in the abdomen and the clavicle is slender, reduced and does not touch the

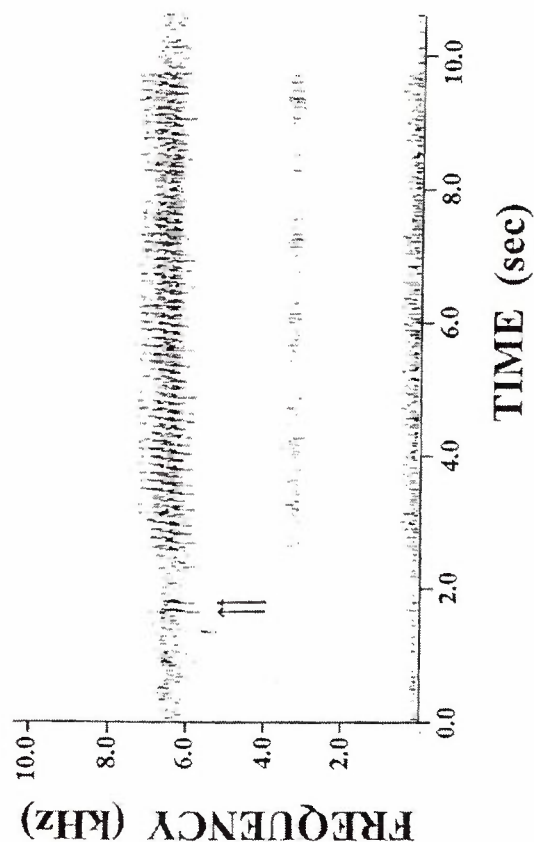


Figure 5.- Sonogram of one synchronize chorus of *Chiasmocleis ventrimaculata* MUSM 16176 (field series VRM 18372) from Pakitza, National Park of Manu, Perú. Air Temperature 24°C, wide bands 345 Hz. The arrows show the beginning-pulse that made the specimens synchronize with their neighbors.

coracoid. The population of *C. bassleri* reported from Santa Cecilia and Iquitos could be a different species than *C. bassleri*.

Chiasmocleis ventrimaculata. - Nelson (1973) reported the call of *C. ventrimaculata* from Vaupes, Colombia with a frequency between 3350 - 3700 Hz and pulse duration from 0.10 - 0.18 sec. The call of the *C. ventrimaculata* from Peruvian central amazon (Panguana) has a frequency range of 5120 - 6960 Hz and a pulse duration of 0.09 - 0.011 sec (Schlüter, 1980; Schlüter & Salas 1989). VRM & RWM recorded the call of *C. ventrimaculata* at Pakitza, Manu, and this call had a frequency range of 6278 - 6762 Hz (Dominant frequency 6460 Hz), a pulse duration of 0.09 sec.

he call began with two pulses (Fig. 5). The first pulse had a frequency range of 5262 - 5742 Hz (Dominant frequency 5600 Hz) and 0.063 sec duration, and the second pulse had a frequency range of 5520 - 6969 Hz (Dominant frequency 6460) and a 0.06 sec duration. These two first pulses have not been mentioned in the

populations from Vaupes (Colombia) and Panguana (Peru). In the sonogram of *C. panamensis* Nelson (1972, 1973) showed one initial pulse of the call, but he did not mention the characteristic of the pulse. Apparently, the beginning-pulses of *C. ventrimaculata*, from Pakitza, synchronized the chorus. On the other hand, the population of *C. ventrimaculata* from Vaupes (Colombia) could be a different species than the Panguana and Manu (Peru) populations, because the species from Colombia has a lower frequency than the Peruvian species.

ACKNOWLEDGMENTS

To Jesus Cordova of the Museo de Historia Natural, UNMSM, Peru borrowed the specimens, and we acknowledge all scientific people that work at Pakitza. Steve Goethe made the X-ray. Ron Altig comments the manuscript.

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Table 1. Summary of morphological features among species of *Chiasmocleis*: Body Form (BF), Snout Size (SS), Snout Dorsal view (SD), Snout Lateral view (SL), Fingers and Toes Disc (FTD), Web on Finger (WF), Web on Toes (WT), Flank Spot (FS), Inguinal Spot (IS), Pattern Dorsal (PD), Vertebral Line (VL), Pattern Ventral (PV), Dorsal Dermal Spine (DDS) and Web Dermal Spine (WDS).

Species	BF	SS	SD	SL	FTD	WF	WT	FS	IS	PD	VL	PV	DDS	WDS
<i>superciliarbus</i>	ovoid	short	rounded	rounded	present	absent	absent	present	present	uniform	present	reticulate	present	present
<i>alagoanus</i>	ovoid	short	truncate	rounded	absent	absent	absent	absent	absent	uniform	present	reticulate	absent	absent
<i>albopunctatta</i>	elongate	short	rounded	rounded	absent	absent	absent	absent	absent	marble	absent	reticulate	present	present
<i>anatipes</i>	elongate	short	rounded	protruding	absent	absent	present	absent	absent	marble	absent	reticulate	absent	absent
<i>atlantica</i>	ovoid	short	truncate	protruding	absent	absent	absent	absent	absent	uniform	absent	reticulate	present	present
<i>bassleri</i>	ovoid	short	rounded	protruding	absent	absent	absent	present	present	uniform	present	reticulate	absent	absent
<i>capixaba</i>	elongate	short	rounded	rounded	absent	absent	present	absent	absent	marble	absent	uniform	present	present
<i>carbalhoi</i>	ovoid	short	rounded	rounded	absent	absent	absent	absent	absent	uniform	absent	uniform	present	present
<i>centralis</i>	ovoid	large	rounded	protruding	present	absent	present	absent	absent	uniform	absent	reticulate	absent	absent
<i>cordeiroi</i>	ovoid	large	rounded	rounded	absent	absent	present	absent	absent	uniform	absent	uniform	present	present
<i>crucis</i>	ovoid	short	rounded	rounded	absent	present	present	absent	absent	uniform	absent	uniform	present	present
<i>gnoma</i>	ovoid	short	truncate	rounded	absent	absent	absent	absent	absent	uniform	absent	reticulate	present	present
<i>hudsoni</i>	ovoid	large	rounded	rounded	absent	absent	absent	absent	absent	uniform	absent	reticulate	absent	absent
<i>jimi</i>	ovoid	short	rounded	rounded	absent	absent	absent	absent	absent	uniform	absent	reticulate	absent	absent
<i>leucosticta</i>	ovoid	short	truncate	protruding	absent	present	present	absent	absent	uniform	present	reticulate	present	present
<i>mehelyi</i>	ovoid	large	rounded	rounded	absent	absent	absent	absent	absent	marble	absent	reticulate	present	present
<i>panamensis</i>	elongate	short	truncate	protruding	absent	absent	absent	present	absent	marble	absent	reticulate	absent	absent
<i>schubarti</i>	ovoid	short	rounded	rounded	absent	absent	present	absent	absent	uniform	present	reticulate	present	present
<i>schudikarensis</i>	ovoid	short	truncate	protruding	present	absent	present	absent	present	uniform	present	reticulate	absent	absent
<i>ventrimaculata</i>	ovoid	large	rounded	protruding	present	absent	absent	absent	absent	uniform	present	reticulate	absent	absent