

5-UN1  
8128 [unclear]

MUS. COMP. Zool.  
LIBRARY

JUL 8 1974  
HARVARD  
UNIVERSITY

## **OCCASIONAL PAPERS**

**of the  
MUSEUM OF NATURAL HISTORY  
The University of Kansas  
Lawrence, Kansas**

---

NUMBER 26, PAGES 1-6

JUNE 17, 1974

---

### **DESCRIPTION OF A NEW SPECIES OF MICROHYLID FROG, *CHIASMOCLEIS*, FROM ECUADOR**

By

CHARLES F. WALKER<sup>1</sup> AND WILLIAM E. DUELLMAN<sup>2</sup>

Seven specimens of a small microhylid frog were obtained in Amazonian Ecuador in 1972. Although these frogs possess a suite of internal and external characters distinctly different from other known American microhylids, they clearly seem to be allied with certain species currently placed in the genus *Chiasmocleis*. The new species is characterized by extensive webbing between the toes; in allusion to the duck-like feet, we propose that the frog be named

#### ***Chiasmocleis anatipes* new species**

*Holotype*.—University of Kansas Museum of Natural History (KU) 146035, an adult male, from Santa Cecilia, 340 m., Provincia Napo, Ecuador, collected on 2 April 1972 by Martha L. Crump.

*Paratopotypes*.—KU 146034, 146036 (cleared and stained), 146037-38 obtained with the holotype; 146039 collected by Martha L. Crump on 4 April 1972; University of Michigan Museum of Zoology (UMMZ) 132897 collected by Martha L. Crump on 19 April 1973.

*Diagnosis*.—*Chiasmocleis anatipes* differs from its congeners and all other known American species of microhylids by having the toes webbed to the bases of the terminal phalanges of each digit. Within *Chiasmocleis* this amount of webbing is approached only in *C. leucosticta*, in which the penultimate phalange of the third toe and the penultimate and antepenultimate phalanges of the fourth toe are free of webbing.

---

<sup>1</sup> Curator, Division of Herpetology, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 48104.

<sup>2</sup> Curator, Division of Herpetology, Museum of Natural History, and Professor, Department of Systematics and Ecology, University of Kansas, Lawrence, Kansas 66045.





FIG. 1. *Chiasmocleis anatis*, KU 146034, ♂, 19.0 mm in snout-vent length.

*Description.*—Snout-vent length (6 males) 18.0-19.4 ( $\bar{x}$ =18.97) mm, body relatively slender; snout tapered medially anterior to eyes, rounded in dorsal view, projecting beyond lip and inclined posteroventrally in profile; interorbital distance equal to length of snout, three times width of eyelid; tympanum concealed; postorbital fold absent. Forelimbs slender; first finger well developed, shortest; second and fourth fingers equal in length; third finger much the longest; lateral fringes present on fingers; tips of digits round; subarticular tubercles subconical; palmar tubercle bifid. Hind limbs moderately slender; ratio of tibia length to snout-vent length 0.432-0.482 ( $\bar{x}$ =0.462); ratio of foot length to snout-vent length 0.447-0.492 ( $\bar{x}$ =0.475); tarsal folds absent; inner metatarsal tubercle elliptical; outer metatarsal tubercle absent; toes slender with terminal discs,  $1 < 2 < 5 < 3 < 4$ ; subarticular tubercles small, round; webbing extending to bases, or middle, of discs on all toes. Skin smooth dorsally and ventrally; with scattered, minute spicules on dorsal surfaces of head, body, and hind limbs. Anal opening directed posteriorly at mid-level of thighs; anal folds absent; tongue elongate, shallowly notched behind, and free posteriorly for about half its length; vocal slits extending along nearly entire length of jaws.

Color in preservative: Dorsum dull brown with faint darker mottling and grayish white spicules; narrow middorsal tan stripe in three specimens (absent in others); posterior surfaces of thighs pale brown, densely mottled with dark brown; throat gray mottled with cream; belly and ventral surfaces of thighs and shanks cream with bold dark brown mottling, especially posteriorly and laterally.

Color in life: Dorsum dull olive-green to dull brown with green and/or gold metallic flecks (Fig. 1); upper arms tan or orange; pos-



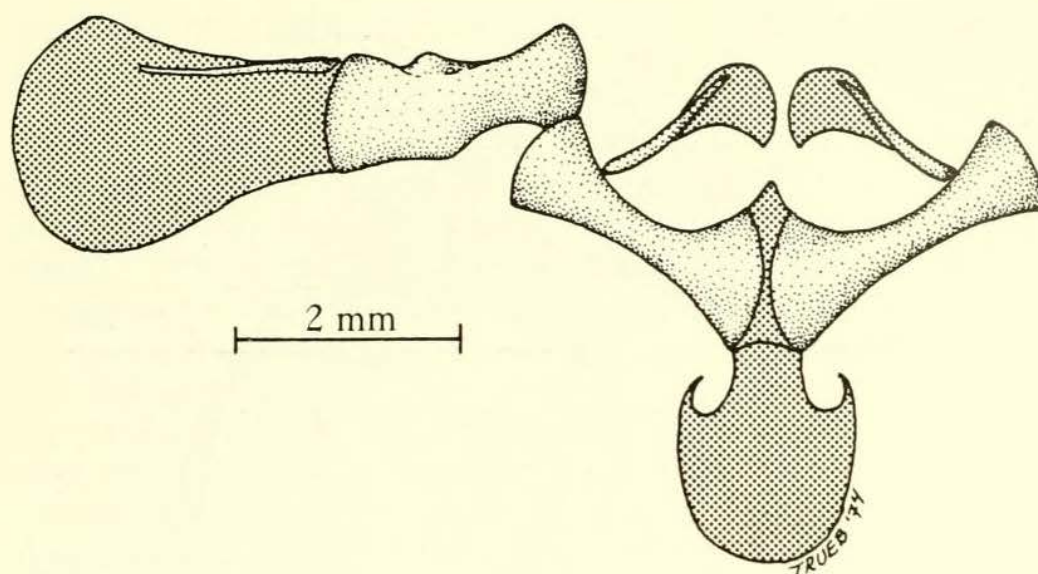


FIG. 2. Ventral view of pectoral girdle of *Chiasmocleis anatis* (KU 146036). Stippled areas are completely cartilaginous except for the sternum which shows some secondary calcification proximally.

terior surfaces of thighs dull gray with black flecks; narrow median middorsal tan stripe in three specimens; throat gray with black mottling; belly and ventral surfaces of legs white with brown-black marks; iris reddish brown.

*Osteology*.—Eight presacral vertebrae, all procoelous; sacral diapophyses expanded; coccyx lacking transverse processes basally; clavicle curved, anteriorly concave, distal ends meeting coracoid but not extending to scapula; vestiges of procoracoid and epicoracoid cartilages associated with medial ends of clavicles; proximal ossified portion of scapular uncapitate; slender, ossified cleithrum incorporated in otherwise cartilaginous suprascapula; omosternum absent (Fig. 2); quadratojugal reduced to small spur posteriorly; maxillary arch incomplete; premaxillary with notched palatal shelf (Fig. 3); posterior prevomer large, separated from anterior prevomer, fused to sphenethmoid medially; palatine absent (Fig. 3); planum antorbitale of sphenethmoid ossified, extending to maxillary; phalangeal formula of hand 2-3-4-3, of foot 3-3-4-5-4; terminal phalanges knob-like.

*Tadpoles*.—Five tadpoles (KU 146836) with well-developed hind limbs and webbed feet have body length of 8.5-9.5 ( $\bar{x}=9.1$ ) mm and total lengths of 30.0-32.5 ( $\bar{x}=31.5$ ) mm; body as deep as wide, widest anteriorly with bluntly rounded snout; snout in profile round; eyes small, directed laterally; spiracles paired, ventrolateral; cloacal tube dextral; caudal musculature slender, tapering gradually to pointed tip well beyond terminus of fins; dorsal fin not extending onto body; fins deepest at midlength of tail, about twice depth of musculature; mouth small, terminal, directed anterodorsally, lack-



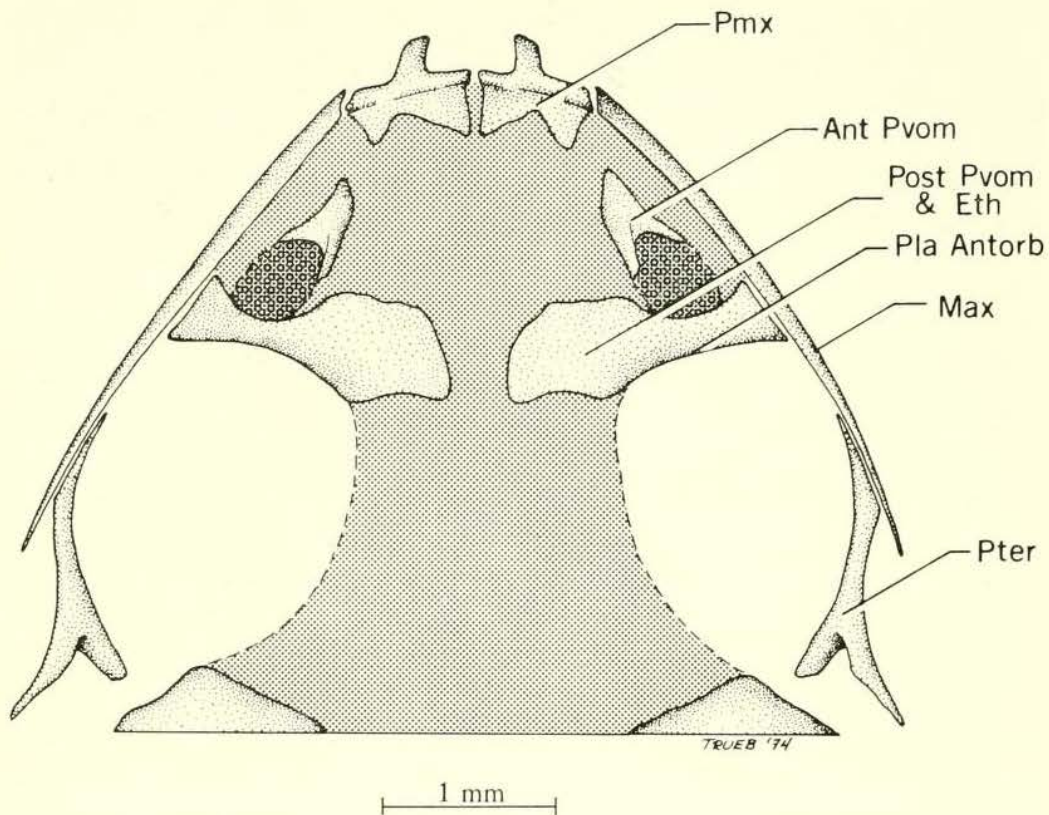


FIG. 3. Palate of *Chiasmocleis anatis* (KU 146036). Stippled areas represent cartilaginous or unossified parts of the skull. Abbreviations: *Ant Pvom*, anterior prevomer; *Eth*, sphenethmoid; *Max*, maxillary; *Pla Antorb*, planum antorbitale; *Pmx*, premaxillary; *Post Pvom*, posterior prevomer; *Pter*, pterygoid.

ing papillae. In preservative, creamy tan with dark brown streak on ventral edge of caudal musculature and minute brown flecks on caudal fins; in life, body olive-tan above, yellowish white below.

*Natural History.*—All frogs were found at night on the ground or on herbaceous leaves (<25 cm above ground) near a semi-permanent pond in primary rainforest. No activity was observed. Tadpoles were found by day swimming near the surface of the pond. At the same time tadpoles of *Chiasmocleis ventromaculata* (Andersson) and *Hamptophryne boliviana* (Parker) were found in the pond. Adults of these species were found on the forest floor near the pond on the same nights as adults of *Chiasmocleis anatis* were found. Other microhylids occurring at Santa Cecilia include *Chiasmocleis bassleri* Dunn and *Ctenophryne geayi* Mocquard. The stomach of one individual contained the remains of several small red ants; other stomachs were empty.

*Remarks.*—As noted in the diagnosis, *Chiasmocleis anatis* differs from all known species of the genus as having the toes fully webbed. Carvalho (1954:11) noted the sexual dimorphism in webbing in *Chiasmocleis* and placed *Nectodactylus spinulosus* (Mi-



randa-Ribeiro, 1924) in the synonymy of *Chiasmocleis leucosticta* (Boulenger, 1888). The amount of webbing present in *Chiasmocleis anatypes* is much greater than that in *C. leucosticta*; furthermore, according to Miranda-Ribeiro (1927: fig. 100), the hand of *C. leucosticta* is palmate, whereas the fingers are free in *C. anatypes*. The other species of *Chiasmocleis* known from Santa Cecilia (*C. bassleri* and *C. ventrimaculata*) include both males and females, none of which has the toes more than one-third webbed.

Among the twelve species now assigned to *Chiasmocleis*, several are inadequately known as regards the structure of the skull and vertebral column. Walker (1973, Table 1) erred in ascribing a complete maxillary arch to the genus; in fact, the arch is consistently incomplete. In this assemblage of species, *Chiasmocleis anatypes* stands alone in that the last presacral vertebra is procoelous and a posterior prevomer is present. *Arcovomer* also has a distinct posterior prevomer, but differs in its T-shaped terminal phalanges. A posterior prevomer is present also in *Relictovomer* but is much smaller than that in *Chiasmocleis anatypes*. The last presacral vertebra is amphicoelous in both *Arcovomer* and *Relictovomer*. The uniformly procoelous vertebral condition of *Chiasmocleis anatypes* is shared with *Myersiella* and *Syncope*; however, the former lacks a posterior prevomer and has transverse coccygeal processes, whereas *Syncope* is unique among American microhylids in having only seven presacral vertebrae and four toes. Although *Chiasmocleis anatypes* exhibits a peculiar combination of character states that might be used to accord it generic status, we prefer to associate it provisionally with those species with which it shares the most characters. As the several species presently referred to *Chiasmocleis* become more completely known with regard to the structure of the skull and vertebrae, it is probable that some regrouping will be necessary. The superficial resemblance of *C. anatypes* to *C. leucosticta* is striking, suggesting that these two are almost certainly congeneric; *Nectodactylus* Miranda-Ribeiro, type *spinulosus*, apparently a synonym of *leucosticta*, is an available generic name, in the event that generic distinction should prove desirable.

*Resumen.*—*Chiasmocleis anatypes*, nueva especie, procedente de Santa Cecilia, Provincia Napo, Ecuador, diffiere de otras especies del mismo género por tener membrana interdigital completa en los pies, ocho vertebrae presacras procélicas, prevomer posterior grande, arco maxilar incompleto, y falanges terminales redondeadas.

*Acknowledgments.*—This research on microhylids frogs is part of a project on the herpetofauna of Santa Cecilia by Duellman, supported by the National Science Foundation (GB-35483). We are grateful to Linda Trueb for executing the drawings.

## LITERATURE CITED

CARVALHO, A. L. DE

1954. A preliminary synopsis of the genera of American microhylid frogs. Occas. Pap. Mus. Zool. Univ. Michigan, 555:1-19.

MIRANDA-RIBEIRO, A. DE

1927. Notas para servirem ao estudo dos gymnobatrachios (Anura) Brasileiros. Arch. Mus. Nac., Rio de Janeiro, 27:1-227.

WALKER, C. F.

1973. A new genus and species of microhylid frog from Ecuador. Occas. Pap. Mus. Nat. Hist. Univ. Kansas, 20:1-7.