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A NEW GENUS AND SPECIES OF
MICROHYLID FROG FROM ECUADOR

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By

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Two tiny frogs were collected in the Oriente of Ecuador in 1962, and were presumed, at the time, to be juveniles. Subsequent dissection of these specimens revealed them to be adults of an undescribed microhylid. Additional specimens of this frog have been secured more recently by William E. Duellman and his associates at The University of Kansas. He generously has made this material available and has encouraged me to describe the creature.

Syncope new genus

Type species.—*Syncope antenori*, new species.

Diagnosis.—Seven presacral vertebrae, the first two partially or completely fused (Fig. 1); coccyx articulating with sacrum by two narrowly separated condyles; a small tympanum distinctly differentiated; foot with only four toes evident externally.

The first of these character states alone serves to distinguish the new genus from other American microhylids, the second from the African genus *Breviceps* which shares the vertebral count, and the third and fourth afford convenient external means of recognition. Among the American genera only *Otophryne* possesses a tympanum and in this genus the structure is relatively huge, about equal to the orbit in diameter; although the inner toe of *Otophryne* is small, it is quite distinct. Other osteological features of *Syncope* are:

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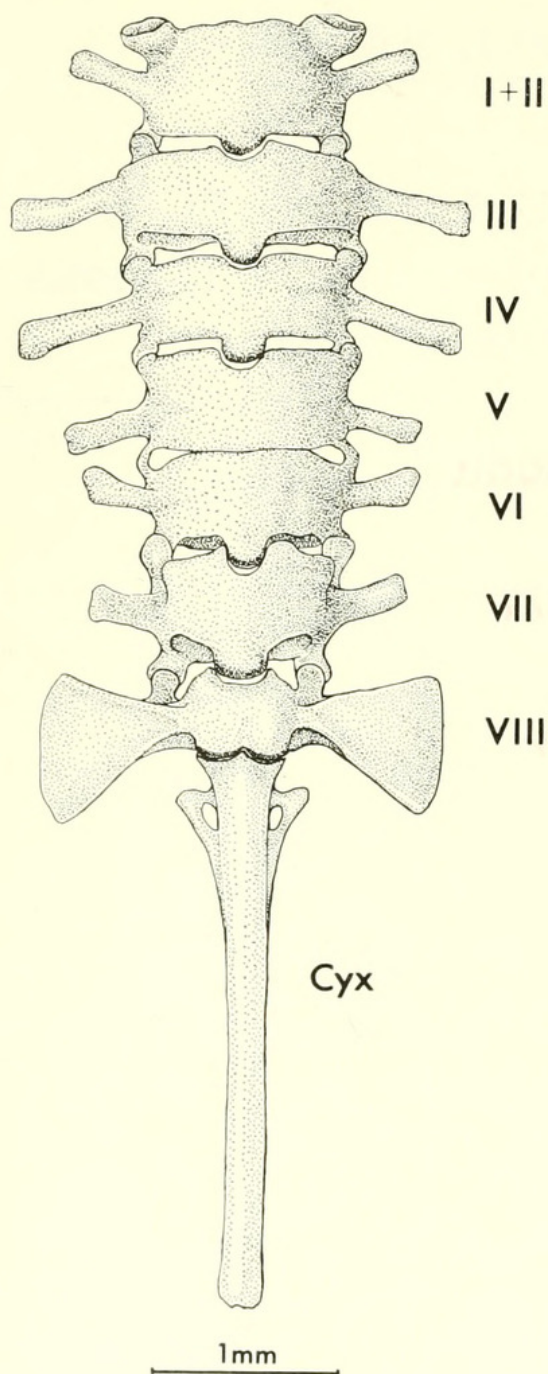


FIG. 1. Vertebral column of *Syncope* in ventral aspect.

vertebrae procoelous; sacral diapophyses expanded; coccyx with basal transverse processes, vestigial or well developed; procoracoid cartilage and clavicle present but reduced, the latter curved, meeting the coracoid in its distal third; omosternum absent; ethmoids paired (*sensu* Parker, 1934); quadratojugal absent, the maxillary arch incomplete; edentulous; premaxilla with notched palatal shelf; maxilla thin, bladelike, with no palatal shelf posteriorly; inner nares bordered anteromedially by a narrow crescentic anterior prevomer; posterior prevomer well developed, medially fused with ethmoid (Fig. 2); no discrete palatine; pterygoid with long anterior ramus

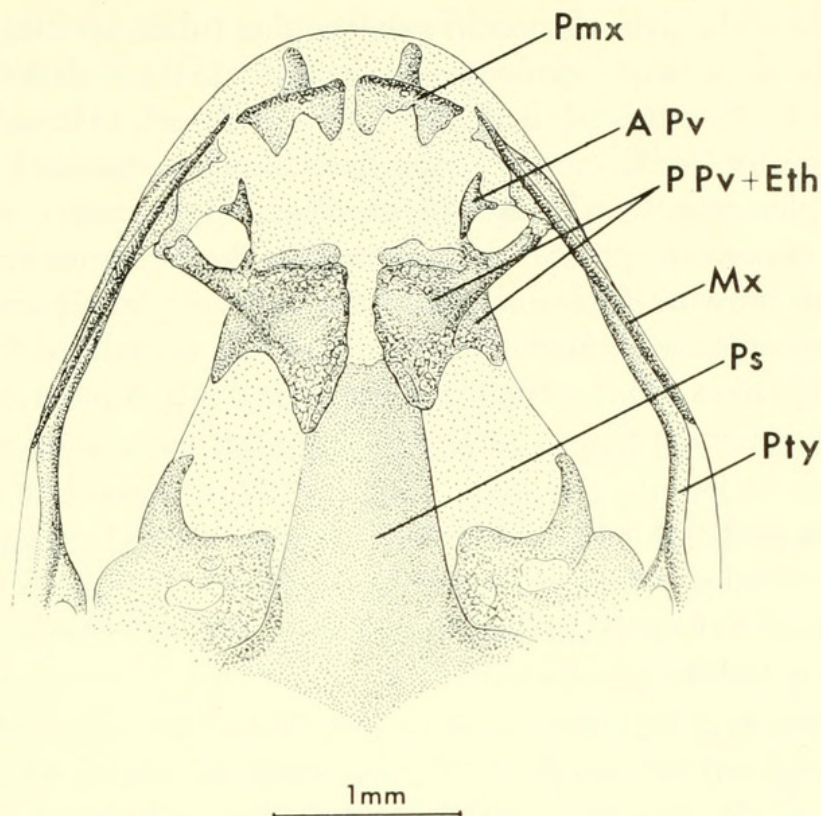


FIG. 2. Anterior cranial elements of *Syncope* in palatal aspect.

articulating with maxilla; anterior ramus of squamosal vestigial; nasals and frontoparietals closely approximated in midline; phalangeal formula of hand 2, 2, 3, 3, of foot 1, 2, 3, 4, 3, the terminal phalanges of inner finger and of inner and outer toes reduced to minute but discrete nodules.

Syncope antenori new species

Holotype.—University of Kansas Museum of Natural History (KU) 124009, an adult female collected on 18 July 1968 by W. E. Duellman and Linda Trueb at Puerto Libre, Río Aguarico, 570 m, Provincia Napo, Ecuador.

Paratypes.—KU 124001-08, 124010-11, all from the type locality, July 1968.

Allotype.—University of Michigan Museum of Zoology (UMMZ) 131699, a male, 7 August 1962, C. F. Walker, 9 km E of Puyo, Provincia Pastaza, Ecuador.

Description of Holotype.—Viewed from above, snout somewhat truncate, interorbital width twice that of eyelid; canthal area rounded; loreal region oblique; head skin smooth; no postorbital fold. In lateral aspect, snout strongly projecting over lower jaw, nostril much closer to snout than to eye; tympanum distinct, its diameter nearly half that of eye. Fingers bluntly rounded at tips, $3 > 2 > 4 > 1$, 1 and 4 rudimentary, 3 much the longest, all margined

with fleshy web; palms smooth, subarticular tubercles absent. Foot with only four toes evident, small but distinct disks at tips, $4 > 3 > 5 > 2$, the normal first toe not developed externally; soles smooth except for a feeble, rounded inner metatarsal tubercle. Tongue elongate, oval, extensively free posteriorly; two low, rounded, transverse palatal dermal ridges, the posterior the longer. Color dark brown above and below, flecked with small white spots, more numerous and larger ventrally than dorsally. Snout-vent length 12.3, tibia 6.0, foot 4.9, head width 4.2, tympanum 0.8 mm.

Variation.—The largest specimen, an adult female paratopotype, is 13.2 mm in length; the male allotype is 11.2 mm in length with well developed testes, and shows no external sexual dimorphism in structure or color. No vocal sac is apparent nor are there any apertures present indicative of an internal sac. The membrane covering the testes is lightly pigmented.

The vertebral number, as shown by X-ray photographs, is constant throughout the series of 13 specimens, as is also some degree of fusion of the first two vertebrae. In those individuals in which the fusion of vertebrae I and II is complete (Fig. 1), there are only six functionally independent presacral elements. Thus the reduction of the column has been achieved in part by fusion, a frequent occurrence among anurans, and in part by elision, a much rarer event. The partial fusion of vertebrae V and VI of the figured specimen represents an individual variation. The coccygeal processes vary from mere vestiges to the maximum shown in the figure, which is approached by only one other individual. The forward tilt of the processes supplies evidence that the shortening of the column has been achieved by the incorporation of a former vertebral element into the coccyx, concurrent with the transfer of the sacral function from vertebra IX to vertebra VIII. A parallel situation has been described by Tihen (1960) in the African bufonid genus *Mertensophryne*, and may be inferred in certain species of the American bufonid genus *Rhamphophryne* (Trueb, 1971) which exhibit seven presacral vertebrae with no evidence of fusion. The coccygeal processes of *Syncope* are thus not strictly homologous with those of discoglossids and ascaphids. Their presence is to be interpreted as a derived rather than primitive condition.

It has been remarked frequently that departures from the standard foot structure, four fingers and five toes, are rare among anurans. Most of the exceptions seem to occur among diminutive species. In the African bufonid genus *Didynamipus*, with a maximum recorded length of 18 mm, only three toes are apparent ex-

ternally. Still smaller is the Neotropical brachycephalid *Psyllophryne didactyla* (♀ 10.2 mm, ♂ 8.6 mm) recently described by Izecksohn (1971), in which only two fingers and three toes are obvious. The phalangeal formula of these genera is not of record. In *Syncope* the phalangeal formula reveals that suppression of the inner toes has not been complete, nor has it in *Geobatrachus*, a genus of disputed familial relationship, which also lacks an externally evident inner toe and shares with *Syncope* the pedal formula: 1, 2, 3, 4, 3. Dwarfing seems to have been accompanied by pedomorphosis affecting the foot structure independently in these four unrelated lines.

Although patently specialized in most respects, *Syncope* retains two primitive character states, distinct tympanum and posterior prevomer. Derived states include loss of a presacral vertebra, reduction of clavicle, absence of palatine, quadratojugal, externally evident inner toe, and diminutive size. Examination of Table 1, in which the principal character states of the American microhyline genera are presented, shows clearly that *Syncope* could not have evolved from any existing genus. Presumably it has arisen from a

TABLE 1. Occurrence of Character States among American Genera of Microhylid Frogs

	Included taxa	Presacral vertebrae	No. of toes	Tympanum	Clavicle A to scapula B not to scapula	Posterior prevomer	Palatine	Maxillary arch complete, incomplete	Premaxillary notch	Coccygeal process
<i>Arcovomer</i> *	1	8	5	—	B	+	—	I	+	—
<i>Chiasmocleis</i>	11	8	5	—	B	—	—	C	+	+, —
<i>Ctenophryne</i>	1	8	5	—	—	—	—	C	+	—
<i>Dasypops</i>	1	8	5	—	B	—	—	I	+	—
<i>Dermatonotus</i>	1	8	5	—	A	—	—	C	—	—
<i>Elachistocleis</i>	2	8	5	—	B	—	—	C	+	—
<i>Gastrophryne</i>	5	8	5	—	—	—	—	C	+	—
<i>Glossostoma</i>	2	8	5	—	—	+	+	C	+	—
<i>Hamptophryne</i>	1	8	5	—	B	+	—	C	+	—
<i>Hypopachus</i>	14	8	5	—	A	—	—	C	+	—
<i>Hyophryne</i>	1	?	5	—	B	+	+	C	+	—
<i>Myersiella</i> **	1	8	5	—	—	—	—	I	—	+
<i>Otophryne</i>	2	8	5	+	A	—	—	C	+	—
<i>Relictovomer</i>	1	8	5	—	B	+	—	I	+	—
<i>Synapturanus</i>	1	8	5	—	—	—	—	C	—	—
<i>Stereocyclops</i>	1	8	5	—	A	+	+	C	+	—
<i>Syncope</i>	1	7	4	+	B	+	—	I	+	+

* Unique in its T-shaped terminal phalanges

** Presacral vertebra VIII procoelous.

relatively primitive stock prior to the loss of the tympanum and posterior prevomer. This same stock may have given rise subsequently to *Chiasmocleis*, *Elachistocleis*, *Hamptophryne*, and other more advanced genera.

In Parker's (1934) monograph, which relies heavily on condition of the pectoral girdle, the new species keys out to *Chiasmocleis*, and that structure indeed is so similar to the girdle of *Chiasmocleis albopunctata* (Parker, 1934:117) as to obviate the need of an additional figure. In Carvalho's (1954) key to the American genera, one is balked at the first couplet because the combination of a differentiated tympanum and a reduced clavicle was unknown to that author.

Etymology.—The generic name, a word of Greek origin, is common to English and most European languages (with only minor variations in orthography) as a figure of speech denoting a shortening by elision. In the present context it alludes to the loss of one presacral element from the vertebral column. The specific name acknowledges the notable contributions of Antenor Leitão de Carvalho to our knowledge of the morphology and biology of the American microhylids.

Remarks.—The specimens in the Kansas collection, 124001-124011, were taken at Puerto Libre on the north bank of the Río Aguarico, just below the mouth of the Río Cofanes. All were collected at night, from litter on the forest floor or from leaves of low herbs and ferns. The two frogs in the Michigan collection, UMMZ 131699, were flushed from a large patch of low terrestrial bromeliads in humid forest about 9 km E of Puyo. Several small groups of eggs in early stages of development were found in these bromeliads. An effort to rear some of these eggs was unsuccessful, and no evidence exists that the eggs were indeed those of *Syncope* other than the treacherous evidence of propinquity of eggs and adults. In two mature, unspawned females the complement of well-yoked follicles is 3 and 4 respectively. One ovulated egg, free in the coelom, is about 1.2 mm in diameter and is heavily pigmented.

Acknowledgments.—Thanks are due Alice G. C. Grandison, British Museum (Natural History) and Richard Zweifel, American Museum of Natural History for the loan of three species not otherwise available to me, and to Martha Lackey for her painstaking care with the figures.

Resumen.—*Syncope antenori*, se llama el nuevo genero y especie de ranas microhylid del este Ecuatoriano. *Syncope* se diferencia de

otros microhylids americano porque tiene siete vertebras pre-sacrales, el coxis articulado con el sacro por dos condilos angostos y separados, un timpano pequeño claramente visible, y tiene solo cuatro dedos en las patas posteriores.

Material Examined.—*Arcovomer passarellii*: KU 93232-6, 92237 (cl. & st.), Brasil. *Chiasmocleis albopunctata*: UMMZ 63972, 104324, Bolivia; *C. bassleri*: UMMZ 68197, Bolivia; *C. hudsoni*: BMNH 1947.2.11.93, Guyana; *C. panamansis*: UMMZ 126775, Panamá; *C. ventrimaculata*: KU 126668, Ecuador. *Ctenophryne geayi*: AMNH 44787, Brasil; 42887, Perú. *Dasypops schirchi*: UMMZ 115660, Brasil. *Dermatonotus muelleri*: UMMZ 105318, 105321, Brasil. *Elachistocleis bicolor*: UMMZ 66534, Bolivia. *Gastrophryne olivacea*: UMMZ S-2643 (skeleton), Texas; *G. usta*: UMMZ S-1068 (skeleton), Guatemala. *Glossostoma aterrimum*: UMMZ 123591, Costa Rica; *G. aequatoriale*: AMNH 17553, 17562, Ecuador. *Hamptophryne boliviana*: UMMZ 63966, Bolivia. *Hypopachus aquae*: UMMZ S-1032 (skeleton), Guatemala; *H. oxyrrhinus*: UMMZ 128077 (skeleton), 128550 (cl. & st.), Nayarit, México; *H. cuneus*: UMMZ S-2314 (skeleton), Tamaulipas, México; *H. inguinalis*: UMMZ S-2927 (skeleton), Guatemala. *Hyophryne histrio*: none examined; data from Carvalho (1954). *Myersiella subnigra*: KU 93264 (cl. & st.), Brasil. *Otophryne robusta*: UMMZ 85137-40, Venezuela. *Relictovomer pearsei*: UMMZ 45569, 45573, Colombia. *Synapturanus microps*: UMMZ 85143, Venezuela. *Stereocyclops incrassatus*: UMMZ 115659, Brasil; cranial data from Carvalho (1948). *Syncope antenori*: KU, UMMZ, type material, listed above, Ecuador.

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