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A NEW GENUS AND SPECIES OF MICROHYLID FROG FROM ECUADOR

HARVARD
UNIVERSITY

By

CHARLES F. WALKER¹

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:

¹ Curator, Division of Herpetology, Museum of Zoology, University of Michigan, Ann Arbor, Michigan 48104.

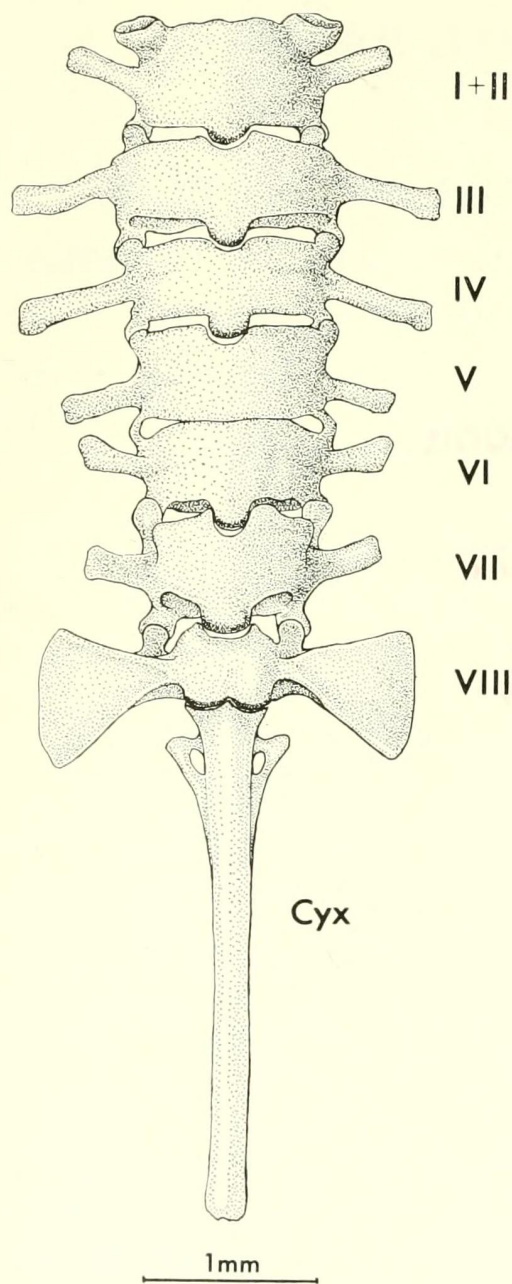


FIG. 1. Vertebral column of *Syncope* in ventral aspect.

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

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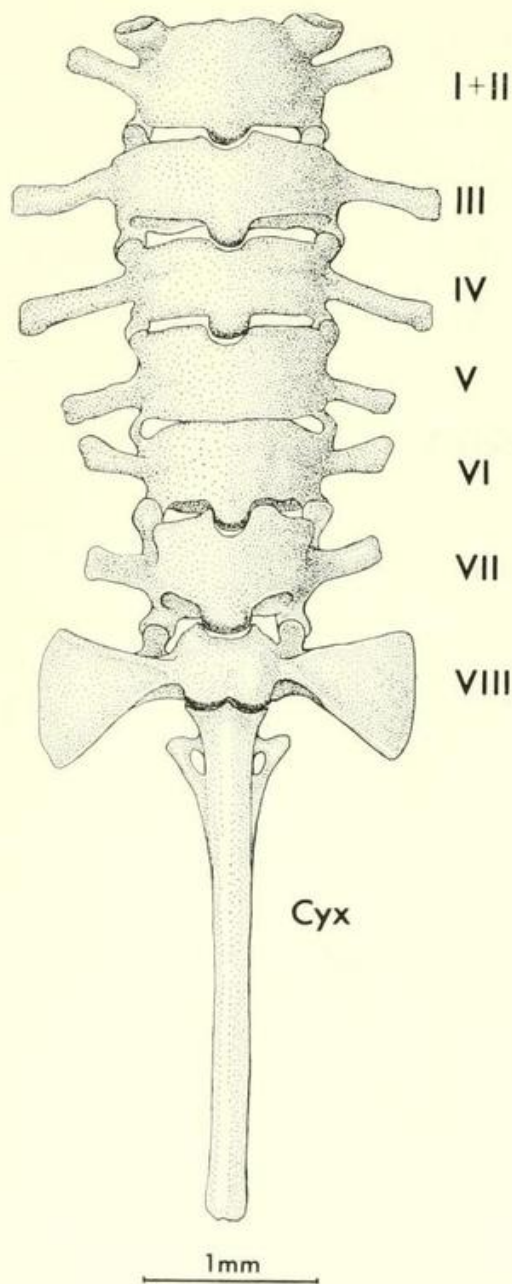


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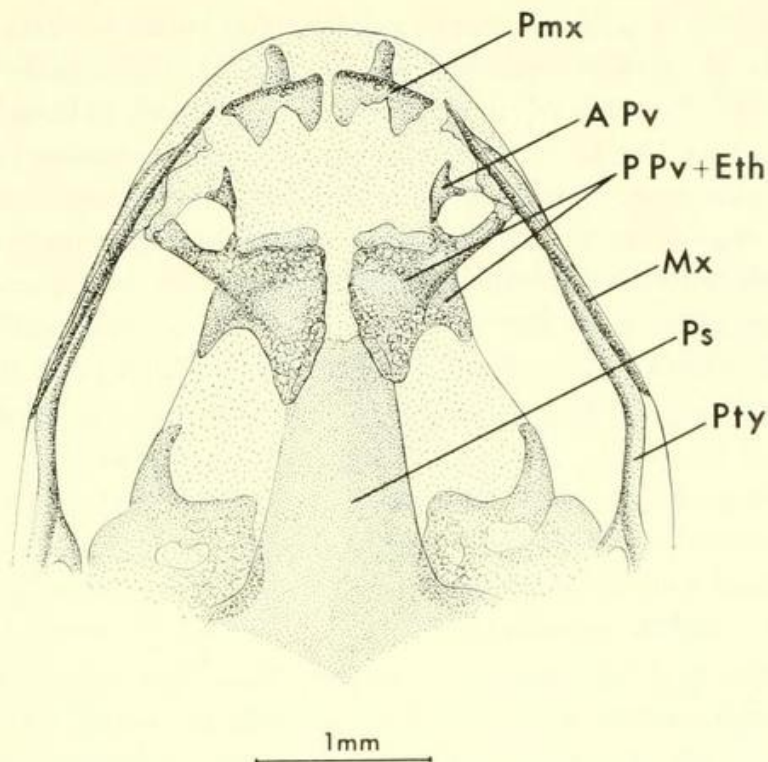


FIG. 2. Anterior cranial elements of *Syncope* in palatal aspect.

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 microhylid 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.