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A NEW FOSSORIAL FROG FROM THE COLOMBIAN RAIN FOREST (ANURA: MICROHYLIDAE)

WILLIAM F. PYBURN

ABSTRACT: A new burrowing frog, *Synapturanus rabus*, is described from the province of Vaupés, Colombia. It is unique in the genus in color, pattern and relative eye size.

FROGS of the genus *Synapturanus* are small, burrowing anurans that inhabit the leaf litter and soft soil of the rain forest floor. Two species are presently known, both from northern South America (Nelson and Lescure, 1975; Pyburn, 1975). In 1974 and 1976 specimens representing a third species population were discovered near the villages of Timbó and Yapima in southeastern Vaupés, Colombia, a region where both of the other species also occur. For this distinctive new species, in reference to its dark brown color, I propose the name

Synapturanus rabus sp. nov.

Holotype.—USNM 199674, an adult ♀ obtained by the author on the S side of the Vaupés River near the village of Yapima (long. 69°28'W, lat. 1°03'N) Colombia, 21 April 1976.

Paratypes.—A series of six adult ♂♂ and one adult ♀, same data as for holotype, deposited as follows: USNM 200388, 200389; AMNH 92968, 92969; UTA A-4799, 4800, 4801. One adult ♀ obtained by J. K. Salser, Jr. on the S side of the Vaupés River near the village of Timbó, Vaupés, Colombia: UTA A-4077. Timbó is ≈ 50 km W of Yapima.

Diagnostic Characters.—A small, dark brown species of *Synapturanus* with a visible tympanum, sharp snout and relatively large eyes. The gula, dorsum, upper surfaces of limbs and sides of head and body are dark brown. A white or pale cream line along the canthus rostralis may extend onto the body and most specimens have irregular light spots on one or both legs. There is an unpigmented notch at the symphysis of the lower jaw and males have a glandular wrist boss that is similar in color to the

adjacent skin of the arm. The small size and dark color will readily distinguish this frog from the other known species in the genus.

Description of Holotype.—An adult ♀ with two well-yolked, unpigmented ovarian eggs. The body (SVL = 17.2 mm) is smooth-skinned, rotund, the head small and triangular (length = 5.1 mm, width = 4.7 mm) and the acuminate snout projects well beyond the lower jaw (snout length/snout width = 0.62). The loreal region is vertical and bounded below by a groove that extends from the lower, anterior rim of the eye to the lower edge of the circular, light rimmed nostril. There is an obscure, oval tympanum that is 1.2 mm along its long axis. The nostril is closer to the end of the snout than to the eye, the distance from eye to nostril being 1.5 mm. The eye diameter is 1.1 mm. A groove across the top of the head passes behind the eye, crosses the tympanum and terminates on the gula just medial to the jaw ramus. There is an unpigmented median notch in the anterior end of the lower jaw.

The tongue is as wide as the floor of the mouth and very long, its posterior, free portion extending backward into the pharynx. The circular choanae are widely separated, about twice the diameter of the external nares and, in palatal view, are partially hidden by the fold bearing the sulcus marginalis. There are no vomerine teeth.

The fingers are bordered by narrow dermal fringes, somewhat tapered and without discs or webs; relative lengths are $3 > 4 > 2 > 1$. There is a small palmar tubercle at the base of the rudimentary first finger and unpigmented subarticular spots on all fingers.

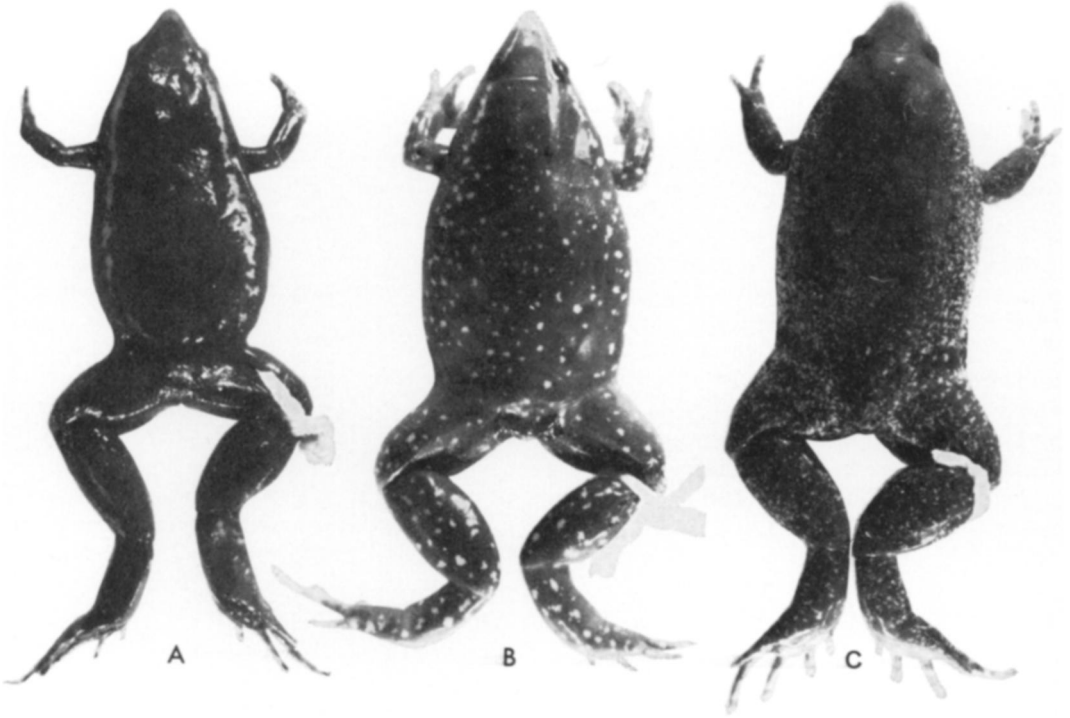


FIG. 1.—Dorsal view of (A) *Synapturanus rabus* ♀ paratype, SVL = 19.0 mm; (B) *S. salseri* ♀, SVL = 26.4 mm; (C) *S. mirandaribeiroi* ♂, SVL = 35.0 mm. Photograph by Jonathan Campbell.

There are skin folds at the knee and heel, a small inner metatarsal tubercle at the base of the first toe and unpigmented subarticular spots on the toes. The toes are subcylindrical, tapering and without webs. The outer four toes bear disc pads that are equal in width to, or slightly wider than, the adjacent part of the toe. Relative lengths of the toes are $4 > 3 > 5 > 2 > 1$. The tibia is 7.2 mm long.

In life the upper surfaces and sides of the head, body and limbs are uniformly dark brown except for a few light spots on the shanks and feet. A narrow cream stripe begins near the tip of the snout and passes on either side along the canthus rostralis and upper eyelid to a point on the body above the base of the arm. The two stripes join on the top of the snout and each stripe breaks into spots near its posterior end. The central part of the belly is translucent gray, the periphery of the belly and ventral sur-

faces of the thighs light brown. Lower surfaces of the snout, gula, arm, shank and foot are medium to dark brown.

Variation.—The light head stripe extends about $\frac{1}{2}$ way between eye and shoulder in USNM 200388, 200389, and UTA A-4801, whereas it is continuous with a dorsolateral body stripe in UTA A-4077. In the other paratypes the light stripe ends at a point above the base of the upper arm. All of the ♂♂ have a grayish, glandular boss on the upper medial side of the wrist. The ♀♀ do not have a wrist boss. Measurements in millimeters of six ♂♂ (\bar{x} and range) followed by measurements of two ♀♀ are: SVL, 16.4 (16.2–16.6), 18.1, 19.0; head length, 4.8 (4.5–5.0), 4.8, 5.2; head width, 4.6 (4.4–4.9), 4.7, 4.8; eye length, 1.2 (1.1–1.3), 1.2, 1.3; eye-to-nostril, 1.4 (1.2–1.6), 1.4, 1.6; tibia length, 6.7 (6.4–7.1), 7.5, 7.5.

Food.—The colons of three specimens were filled with ant remains.

Comparisons.—*Synapturanus rabus*, apparently the smallest species in the genus, has relatively larger eyes and a more acuminate snout than the other two forms (Table 1; Figs. 1, 2). All three

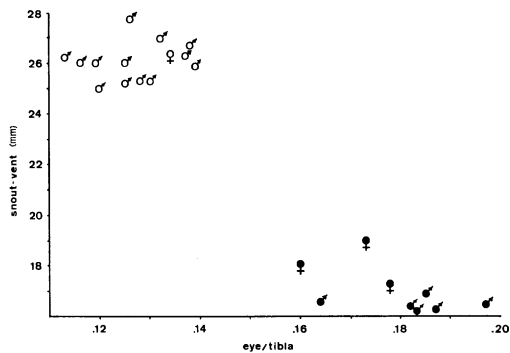


FIG. 2.—Relation between eye/tibia ratio and snout-vent length. Open symbols represent *S. salseri*, including holotype and six paratypes. Closed symbols represent the type series of *S. rabus*.

species have reduced eyes, probably an adaptation to their fossorial habits. Thus the relatively large eyes of *S. rabus* suggest that it may be the least specialized of the three.

Synapturanus rabus differs markedly from both *S. mirandaribeiroi* and *S. salseri* in having a darkly pigmented gula and in being uniformly dark brown dorsally. The reddish brown mottling on the throat, sides and hind limbs of *S. mirandaribeiroi* and the conspicuous light cream to orange spots on the back and limbs of *S. salseri* are not present in *S. rabus*. There is a median, unpigmented notch at the anterior end of the lower jaw in *S. rabus*, but not in *S. salseri* or *S. mirandaribeiroi*. Breeding ♂♂ of all three species have a glandular boss on the wrist which in *S. rabus* is gray-brown, not conspicuously different from the arm color. In the other two species the pale wrist boss contrasts with the darker arm color. There is a visible tympanum in *S. rabus* and in some specimens of *S. mirandaribeiroi* but not in *S. salseri*. All three species are myrmecophagous.

Remarks.—The specimens from Yapima were dug from the soil layer of the forest floor on a well drained slope ≈ 20 m from the edge of the flooded Vaupés River. The

soil temperature at 1400 h at 5 cm depth was 24.3°C. Two egg clutches 10 cm below the surface were excavated at this site. One clutch consisted of two embryos in capsules held together by clear jelly and was accompanied by an adult *S. rabus* of unknown sex. The other clutch of five capsuled embryos was accompanied by a female *S. salseri*. The clutches were ≈ 2 m apart, indicating that *S. rabus* and *S. salseri* have similar ecological requirements for reproduction.

Each of the 3 female *S. rabus* contained two large-yolked eggs, indicating that clutch size in this species is about half that of the larger *S. salseri*, which lays four to six eggs per clutch (Pyburn, 1975), and that clutch size is related to body size in these frogs.

The female *S. rabus* paratype from Timbó had enlarged, glandular oviducts when found on the surface of the forest floor, suggesting that at least some breeding females may move overland when seeking males, rather than moving through burrows or the subsurface root layer. A female *S. salseri* (UTA A-4291) containing mature eggs was also on the surface when captured, whereas all male *S. rabus* and *S. salseri* referred to herein and earlier (Pyburn, 1975) were taken from burrows below the surface.

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TABLE 1.—Snout-vent length and relative eye diameter of three species of *Synapturanus*. The *S. rabus* specimens are the type series (6♂♂, 3♀♀). The *S. salseri* series (13♂♂, 1♀) includes the holotype and 6 paratypes. Mean and ratio for *S. mirandaribeiroi* (7♂♂, 6♀♀) were calculated from data of Nelson and Lescure (1975) for the holotype and 12 paratypes.

Species	N	SVL in mm x̄ (range)	eye/SVL x̄ ± 2SD
<i>S. rabus</i>	9	17.0 (16.2–19.0)	.073 ± .011
<i>S. salseri</i>	14	26.1 (25.0–27.7)	.054 ± .006
<i>S. mirandaribeiroi</i>	13	29.9 (24.6–34.7)	.052 ± .013

History (AMNH) and University of Texas at Arlington Collection of Vertebrates (UTA).

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OBSERVATIONS ON PANCREAS : BODY WEIGHT RATIO CHANGE DURING DEVELOPMENT OF THE BULLFROG, *RANA CATESBEIANA*

ANNE FUNKHOUSER

DURING the later part of normal anuran development the pancreas undergoes a regression and subsequent reformation. This process has been described in *Rana pipiens* (Kuntz, 1924), *Rana catesbeiana* and *Hyla versicolor* (Janes, 1937), but lack of well defined larval stages made it difficult for early workers to quantify the degree of regression in relation to developmental stage. Faber (1956) describes almost complete degeneration of both acinar and islet tissue in *Xenopus laevis*, but quantitative changes are not given. Race et al. (1966) partially quantify this phenomenon in *Rana pipiens*, but the degree of change is obscured by grouping stages.

Tadpoles and adults of *Rana catesbeiana* were collected from one locality near Stockton, California. Prior to sacrifice tadpoles were staged by the methods of Gosner (1960) and Taylor and Kollros (1946). Animals without forelimbs (stage XIX and younger) were maintained in the laboratory for 4 days without food to eliminate material in the digestive tract. Adults and larvae with forelimbs (stage XX and older) were sacrificed within 2 days of capture. Animals were chilled on cracked ice, blotted damp dry and weighed to the near-

est 0.01 g. Under a dissecting microscope the pancreas was removed at the level of the bile duct, then weighed to the nearest 0.0001 g. Data were calculated as a ratio of milligrams pancreas weight : 100 g body weight.

In this case the staging method of Taylor and Kollros (1946) was more useful because it allowed more precise differentiation of the critical stages prior to and

TABLE 1.—Pancreas : body weight ratios (milligrams pancreas/100 grams body wt) of *Rana catesbeiana* tadpoles. $N = 10$.

Stage	Ratio	
	\bar{x}	SD
I	0.250	0.070
III	0.230	0.035
VI	0.190	0.032
X	0.180	0.037
XV	0.162	0.035
XVIII	0.147	0.042
XIX	0.140	0.032
XX	0.064	0.025
XXI	0.034	0.015
XXII	0.033	0.020
XXIII	0.023	0.009
XXIV	0.031	0.010
XXV	0.046	0.015
Adults	0.105	0.025