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NOTES ON TADPOLES OF THE GENUS  
*PLECTROHYLA*

BY NORMAN HARTWEG AND GRACE ORTON

WHILE collecting on Mount Ovando, District of Soconusco, Chiapas, the senior author obtained two new species of the genus *Plectrohyla* (*P. sagorum* and *matudai*, Hartweg, 1941, *Occ. Papers Mus. Zool. Univ. Mich.*, No. 437). From a small stream on the same mountain at an elevation of approximately 1800 meters he also collected a series of tadpoles believed to be of this genus. Subsequent examination has convinced the writers that two types are represented in the series.

Since we lack connecting developmental stages at present, it is not possible to correlate each of the larval forms with the adults of the correct species. Therefore it is uncertain whether the two larval types are dimorphic forms of one species or represent two distinct species, though we are inclined to take the latter view. By inference, provided no other species of *Plectrohyla* are present on Mount Ovando, the series represents *P. sagorum* and *P. matudai* (or dimorphic forms of either species).

Two series of specimens collected by Karl P. Schmidt at an altitude of 3500 feet on Volcán Tajumulco, Guatemala (F.M.N.H.<sup>1</sup> Nos. 20327 and 20720) and kindly loaned to us

<sup>1</sup> Throughout this paper, F.M.N.H. indicates Field Museum of Natural History; U.M.M.Z., University of Michigan Museum of Zoology.

by the Field Museum have furnished additional information. Both series contain two kinds of tadpoles—one a hyloid strikingly similar to the larvae from Mount Ovando and including two specimens in a later developmental stage, both of which show the distinct fleshy accessory protruding from the base of the thumb, a characteristic of the genus *Plectrohyla*.

In view of the interesting problems presented by this genus in both larval and adult stages, the writers consider it advisable to record the known larval characters in spite of the specific uncertainty. For the present, the larvae may be designated as *Plectrohyla* "form a" and *Plectrohyla* "form b."

From material now available to us, the tadpole of the genus *Plectrohyla* may be tentatively diagnosed as follows. Form slender but with strongly developed axial musculature; tail fins low. Eyes small, dorsolateral. Anus dextral. Spiracle sinistral. Lips moderately wide, thin, completely bordered with small papillae, not infolded laterally. A transverse inner row or area of papillae between lowermost tooth row and border of lower lip; similar papillae between uppermost tooth row and border of upper lip. Tooth rows 2/3. Beaks moderate in size, black, sharply serrated.

*Plectrohyla* "Form a"

DIAGNOSIS.—A pair of strong lateral tusks on upper beak; teeth of all three rows on lower lip distinctly smaller than those on upper lip, teeth of third (lowermost) row very minute; inner row or rows of papillae below lowermost tooth row separated from border of lip by wide, smooth area; usually only a few scattered papillae between first upper tooth row and border of upper lip. Tail musculature pale, irregularly mottled with brownish patches which tend to form dark bars across dorsal edge of musculature (particularly in smaller larvae); epidermis of throat white or very faintly marked with small linear melanophores.

LIST OF SPECIMENS.—U.M.M.Z. Nos. 88223(11), 88867(2), and 88868, Mount Ovando, District of Soconusco, Chiapas; F.M.N.H. Nos. 20327 (in part) and 20720 (in part), Volcán Tajumulco, Guatemala, 3500 feet.

DESCRIPTION (Fig. 1).—Form slender, body long and somewhat depressed, snout long and rounded. Eyes small, moderately close together, interorbital distance about equal to width of anterior dorsal musculature. Nostrils small, opening anterolaterally. Abdominal wall thin, with no muscular adhesive modifications. Tail about twice as long as head and body, musculature deep and broad, gradually tapering posteriorly. Tail fins low near body, becoming relatively higher posteriorly as musculature narrows; tail tip rounded; dorsal fin ends at tail base. Anus dextral, opening above a conspic-



FIG. 1. Tadpole of *Plectrohyla* "form a," lateral view.

uous elongated fold in ventral fin. Spiracle sinistral, nearer to tip of snout than to ventral base of tail; spiracular tube inconspicuous, slightly narrower than diameter of eye. Distance between spiracle and eye slightly greater than distance between eye and nostril and slightly less than distance between eye and lateral base of lips. Internarial space about equal to interorbital distance, and less than width of lips. Lateral-line system distinct.

MOUTHPARTS (Fig. 2).—Lips moderately wide, thin, entirely bordered with small papillae crowded into irregularly double row. Lateral surface of lips smooth, without folds or inner papillae. Tooth rows  $2/3$ . Upper rows about equal in length, longer than upper beak; outer end of second upper row about midway between end of beak and lateral edge of lip; second upper row usually slightly interrupted in mid-line. Lower tooth rows shorter than upper rows, and with distinctly smaller and frequently paler teeth, reduction in tooth size particularly evident in third lower row, in which teeth are very minute; first lower row usually slightly interrupted medially. A few scattered papillae between first upper tooth row and margin of upper lip; irregular row or rows of papillae bordering third

lower tooth row and separated from edge of lip by a wide, smooth area. Beaks of moderate size, black, sharply serrated; group of lateral serrations of upper beak enlarged and fused to form a pair of tusks, best developed in larger larvae; median part of beaks narrow.

COLOR (in formalin).—Brownish with a few small dark blotches; skin of abdomen transparent; epidermis of throat white or lightly marked with small linear melanophores; tail

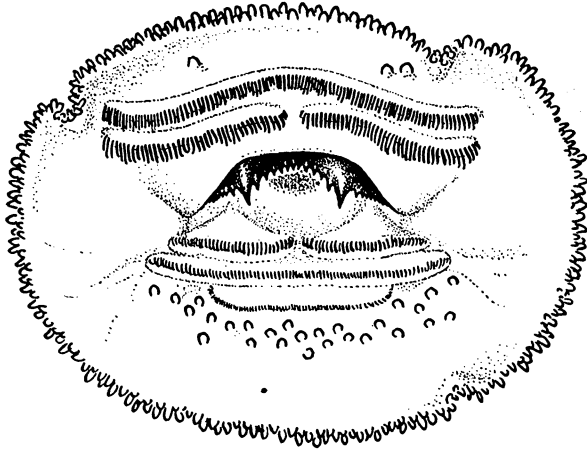


FIG. 2. Mouthparts of tadpole of *Plectrohyla* "form a," with beak closed.

musculature pale, irregularly mottled with brownish patches, which tend to form dark bars across dorsal edge of musculature, particularly in the smaller larvae; tail fins with scattered brown markings, less numerous in ventral fin.

MEASUREMENTS OF SPECIMEN IN FIGURE 1 (in millimeters).—Total length, 44.5; head and body length, 15.0; interorbital width, 4.0; width of lips, 4.5.

Although the F.M.N.H. tadpoles here assigned to *Plectrohyla* are in rather poor condition, they agree very closely with the larvae of "form a" from Chiapas, both in general characters and in the details of the mouthparts. The beaks are coarsely serrated, and the upper one has a pair of well-developed lateral

tusks. The teeth have for the most part been lost, but the tooth ridges remain—two on the upper lip and three on the lower. Details of the lips and papillae, as far as can be determined, are essentially the same as those of the Chiapas larvae described above.

*Plectrohyla* "Form b"

DIAGNOSIS.—Differs from *Plectrohyla* "form a" chiefly as follows: beaks sharply serrated but without tusks; relative reduction in size of teeth evident only in third lower row; a continuous transverse row of inner papillae between first upper tooth row and border of upper lip; inner row of papillae along lower lip about equidistant between lowermost tooth row and papillae bordering lip; lip narrower; tail musculature usually darker and less contrastingly marked, dorsal crossbars indistinct or absent; epidermis of throat dark, densely marked with linear melanophores.

LIST OF SPECIMENS.—U.M.M.Z. Nos. 88865(3) and 88866(10), Mount Ovando, District of Soconusco, Chiapas.

DESCRIPTION.—Form slender, body long and somewhat depressed, snout long and rounded. Eyes small, moderately close together, interorbital distance about equal to width of anterior dorsal musculature. Nostrils small, opening anterolaterally. Abdominal wall thin, with no muscular adhesive modifications. Tail about twice as long as head and body, musculature deep and broad, gradually tapering posteriorly. Tail fins low near body, becoming relatively higher posteriorly as musculature narrows; tail tip rounded; dorsal fin ends at tail base. Anus dextral, opening above a conspicuous elongated fold in ventral fin. Spiracle sinistral, slightly nearer to ventral base of tail than to tip of snout; spiracular tube inconspicuous, slightly narrower than diameter of eye. Distance between spiracle and eye distinctly greater than distance between eye and nostril, and usually slightly less than distance between eye and lateral base of lips. Internarial space about equal to interorbital distance and slightly less than width of lips.

**MOUTHPARTS.**—Lips moderately wide, thin, entirely bordered with small papillae crowded into irregularly double row. Lateral surface of lips smooth, without folds or inner papillae. Tooth rows 2/3. Upper rows about equal in length, longer than upper beak; outer end of second upper row about midway between end of beak and lateral edge of lip; second upper tooth row usually slightly interrupted in mid-line. Lower tooth rows usually slightly shorter than upper rows, teeth of third lower row reduced in size; first lower row interrupted or continuous with about equal frequency. A continuous transverse row of papillae between first upper tooth row and border of upper lip; inner row or area of papillae along lower lip about equidistant between lowermost tooth row and papillae bordering lip. Beaks of moderate size, with broad, black, sharply serrated borders; lateral serrations not hypertrophied into tusks.

**COLOR** (in formalin).—Brownish, with a few scattered dark blotches; skin of abdomen transparent; epidermis of throat dark, densely marked with linear melanophores; tail musculature brownish with darker blotches, dorsal crossbars indistinct or absent; tail fins with scattered brown markings, less numerous in ventral fin.

**MEASUREMENTS OF LARGE LARVA** (in millimeters).—Total length, 41.0; head and body length, 14.5; interorbital width, 3.5; width of lips, 4.0.

Two additional larvae, taken at 7500 feet on Volcán Tajumulco, Guatemala (F.M.M.H. No. 20328), may be referable to *Plectrohyla*, but differ from both of the preceding forms in several respects, particularly the following: head and body longer and heavier, tail relatively shorter; color very dark, uniform; smooth areas of lower lip much less expanded; no tusks. To give a complete description of these specimens seems inadvisable at this time, since no information is available to us concerning the adult of this form.



