
Accepted: 3 March 1982
Associate Editor: Stephen Tilley

Museum of Natural History and Department of Systematics and Ecology, The University of Kansas, Lawrence, KS 66045, USA

APPENDIX I

In preparing the description of A. mitchelli, I have had the benefit of examining the following specimens housed in the University of Kansas (KU) and the University of Texas at Arlington (UTA) collections. The collecting localities and elevations (when available) are given.

**Abronia aurita** (1) GUATEMALA: Baja Verapaz: E slope Cerro Quisis, 1829 m, KU 190851.

**Abronia chiszari** (1—holotype) MÉXICO: Veracruz: 2.5 mi E Cuétzalan, 360 m, UTA R-3195 (that this is the exact provenance is doubtful).

**Abronia deppei** (7) MÉXICO: Guerrero: Omilteme, 2134 m, UTA R-4451, 5553, 5645-46, 5653-54; 1.6 km N Puerto del Gallo, 2621 m, UTA R-4151.

**Abronia fuscolabialis** (1) MÉXICO: Oaxaca: 5.8 km W Totontepec, 2103 m, UTA R-9899.

**Abronia lythrochila** (1) MÉXICO: Chiapas: 8 km NW San Cristóbal de las Casas, 2385 m, UTA R-3354.

**Abronia mixteca** (11) MÉXICO: Oaxaca: Tejocotes, 2286 m, UTA R-5786, 5790, 6126, 6228, 6825, 6827, 6989, 7737, 7825, 10277; 2377 m, KU 106303 (paratype).

**Abronia t. taeniata** (2) MÉXICO: Hidalgo: 3 km W Xochicoatlan, KU 54055; Rio Chinameca, 8 km N Tianguistengo, 1020 m, KU 101144.

**Abronia t. graminea** (5) MÉXICO: Veracruz: 3 km W Acultzingo, KU 26484-87, 26827.

Herpetologica, 38(3), 1982, 361-366
© 1982 by The Herpetologists' League, Inc.

A NEW SPECIES OF THE GENUS LEPIDOPHYMA (SAURIA: XANTUSIIDAE) FROM MICHOACÁN, MÉXICO

ROBERT L. BEZY, ROBERT G. WEBB, AND TICUL ALVAREZ

**ABSTRACT:** A new species of Lepidophyama is described from Michoacán, 250 km northwest of the previously known northern limit of the genus on the Pacific coast of México. The species resembles L. smithii in having low numbers of femoral pores and lateral tubercle rows, but differs in having fewer dorsal and gular scales.

**Key words:** Reptilia; Squamata; Xantusiidae; Lepidophyama; Systematics; México

**THREE** specimens of a species of *Lepidophyama* were collected at a locality in Michoacán which lies 250 km northwest of the previously known northern limit of the genus along the Pacific coast of México. Comparisons with over 1200 specimens of all nominal taxa of the genus indicate that the material from Michoacán represents a previously undescribed species.

The specimens are deposited in the collections of the Escuela Nacional de Ciencias Biológicas, Instituto Politécnico Nacional (ENCB) and of the Natural History Museum of Los Angeles County (LACM). The nomenclature used in this paper follows Bezy (1972, 1973, and unpublished); the terminology for scolation is largely that of Savage (1963). Comparisons were made with topotypic material of all nominal taxa (Bezy, 1973; Smith, 1973), except *L. lipetzi* (Smith and Alvarez del Toro, 1977) for which the original description was used in conjunction with specimens judged to represent the species.

**Lepidophyama tarascae** sp. nov.

**Holotype.**—ENCB 9221 (original field number A.O. 6193) (Fig. 1), an adult male
obtained near Mexiquillo, Aquila Dis-
trict, Michoacán, México, by Aurelio Ocaña, on 10 July 1976. Mexiquillo
(18°08′N, 103°56′W) is a small town on
the coast of Michoacán, ca. 77 km (air)
WNW of Lázaro Cárdenas and the mouth
of the Rio Balsas.

Paratypes.—Two, ENCB 9222 (A.O.
6194) and LACM 134226 (formerly ENCB
9223, A.O. 6195), same locality, collector
and date as holotype.

Diagnosis.—The hypodigm of L. ta-
rascae has 16–18 total (both legs) femoral
pores; 16–17 well-developed lateral rows
of tubercles (axilla to groin) (Fig. 2); 2–3
dorsal interwhorls (separating large tail
whorls); four scales (total both sides) sep-
ard postocular from second postor-
torial from second postor-
bital supralabial; paravertebral rows het-
erogeneous, each with 16 large paraver-
tebbral tubercles (axilla to groin), usually
separated within-row by 1 intermediate-
sized tubercle and 0–1 small scales, and
between-rows by 2–3 mid-dorsal scales
(Fig. 2); 41–43 gulars (fold to second in-
fralabials); 145–150 mid-dorsal scales (oc-
ciput to rump); and a distinct row of large
tubercles on the lateral nuchal area ex-
tending from the posteroventral tympan-
ic margin to above the gular fold (Fig. 3).

L. tarascae differs from all other species
of the genus (except some L. smithii) in
having a distinct lateral nuchal row of
large tubercles; from all except L. smithii
in having less than 20 lateral tubercle
rows (16–17 vs. 20–46); and from all
except L. smithii and L. occulor in
having less than 20 total femoral pores
(16–18 vs. 20–44). In addition, L. taras-
ca differences from L. smithii and
L. occulor in having fewer dorsal scales (145–150 vs.
164–224 and 213–242, respectively) and
fewer gulars (41–43 vs. 44–59 and 59–71,
respectively).

Description of holotype.—Measure-
ments (in mm): Snout–vent length, 93; tail
length, 110 (of which 52 is regenerated);
head length, 22.1; head width 15.1; head
depth, 11.3; orbit length, 3.9; fourth toe
length, 12.1.

The nasal and anterior labial regions
are slightly damaged on both sides of the
head, the integument partially missing,
exposing maxillae and teeth. The de-
FIG. 2.—Lateral (upper) and paravertebral (lower) tubercle rows of the holotype (ENCB 9221) of *Lepidophyма tarascae*, new species.

FIG. 3.—Side of head of holotype (upper, ENCB 9221) of *Lepidophyма tarascae*, new species, showing lateral nuchal row of large tubercles; and of *L. smithii* (lower, LACM 130027, 1 km NW Puerto Márquez, Guerrero, México).

Description of paratype ENCB 9222 is substituted [in brackets], when a character is not clear on the holotype. Nasals in contact posterior to rostral, followed by median frontonasal, two prefrontals (no median prefrontal), and two frontals (medial suture of the frontals longer than that of prefrontals); median interparietal (wider anteriorly than posteriorly) touching both frontals anteriorly and postparietals posteriorly, and separating lateral parietals; position of parietal organ not discernible; postparietals lacking anomalous sutures. Nostril bordered by nasal, postnasal, and first supralabial; postnasal followed by anterior loreal (ca. same height as postnasal, its contact with frontonasal narrow, especially on right side), and posterior loreal (slightly more than twice size of anterior loreal); very narrow vertically linear preocular. More or less complete orbital ring of tiny scales; loreolabial (or frenocular, between lower posterior part of posterior loreal and fifth supralabial) in broad contact with [fourth] supralabial; three postoculars, lower largest, triangular; two upper postoculars, both touching parietals, uppermost touching frontals.

Postoculars followed by two anterior temporals (upper larger), very large median temporal (slightly larger than parietal), and large posterior temporal (ca. one-fourth size of postparietal); single row of two small scales separating large median temporal and seventh supralabial; postocular separated from seventh supralabial by anterior lower temporal plus one small scale; pretympanic area with four (right)/three (left) enlarged scales (arranged in vertical row) followed by five/six large auriculars. [Seven supralabials] (integument of first [four] lacking), fifth below eye, seventh smaller than sixth. Large mental followed by four pairs of infralabials, with first three pairs large and fourth pair smallest (ca. one-fifth size of third pair), and first two pairs having broad common median sutures; gular scales small, 41 along midline between fold and second pair of infralabials; row of 14/15 large tubercles (≥ three times size of adjacent scales) extending from posterodorsal margin of tympanum to above gular fold.

Dorsal and lateral surfaces of body covered by small granules or scales of varying sizes, with interspersion of numerous...
enlarged, keeled tubercles. Paravertebral rows of tubercles heterogeneous in size, composed of large keeled tubercles ($\geq$ three times size of adjacent mid-dorsal scales), each usually followed by one small scale and one intermediate-sized keeled tubercle (ca. twice size of dorsal scales); 16 large tubercles in each paravertebral row between axilla and groin. Vertebral area of uniformly small granules, three between paravertebral rows, 145 along vertebral line between occiput and rump. Large tubercles on sides of body arranged in vertical rows with six in each row at midbody; 17 vertical rows between axilla and groin; two (mostly) or three vertical rows of small granules (midbody) between vertical rows of tubercles; dorsolateral areas of uniformly small granules, three between paravertebral rows and dorsalmost tubercles of lateral vertical rows (at midbody).

Ventral scales flat, mostly smooth, quadrangular, in 10 longitudinal rows at midbody; lateralmost row of ventrals elevated, keeled, each ca. two-thirds size of adjacent ventrals, and not reaching axillary region; 35 transverse rows of ventral scales (several intercalary rows) from gular fold to vent, including three rows of preanals; two scales in first and second rows of preanals, and four scales in last (posteriormost) row; lateralmost preanals of last row ca. one-fourth size of adjacent medial preanals. Scales on surfaces of limbs heterogenous in size, mostly keeled; dorsal surface of hindlimbs with scattered large keeled tubercles; 8/10 femoral pores; 23/22 fourth toe lamellae, 2/3 divided.

Tail encircled with whorls of large tubercular keeled scales, separated by two or three interwhorls of smaller keeled scales; 12 segments on unregenerated part of tail; third (posteriormost) interwhorl of each segment largest, ca. two-thirds length of whorl; first (anteriormost) interwhorl never complete ventrally, consisting of small separated scales in first (proximalmost) segment, increasing in size in posterior segments to form a dorsally complete interwhorl of 16 scales (in segment 12) subequal to those of the following (second) interwhorl.

Color dark brown on all dorsal surfaces; small white spots arranged in paravertebral rows (just below paravertebral row of tubercles), fading on posterior two-thirds of body; dorsolateral row of very small, faint spots on neck, fading posterior to axilla; lateral nuchal tubercle row dirty white. Top and sides of head mostly uniform brown (paler than body); lower jaw dark brown with white bars on sutures between large scales (mental, infralabials); ventral surfaces dirty white, individual scales white with brown pigment concentrated on anterior portion; brown pigment least on gulars, forming dark crescent on anterior one-third of ventral body scales, and covering all but posterior keels of ventral caudal scales.

Variation.—Sex, $\delta$, $\delta$, $\varphi$ (for ENCB 9221, LACM 134226, ENCB 9222, in that order); snout–vent length (mm), 93, 66, 65; tail length/snout–vent length, unknown, 1.48, 1.45; total femoral pores, 18, 17, 16; lateral tubercle rows (axilla to groin), 17, 16, 17; scales between paravertebral rows, 3.0, 3.0, 2.0; total dorsal caudal interwhorsls (between first six whorls), 11 (all); total complete ventral interwhorls (between first six whorls), 10, 7, 10; total dorsal caudal annuli (whorls + interwhorls), unknown, 127, 123; median prefrontals, 0 (all); scales (total both sides) separating postocular from second postorbital supralabial, 4 (all); gulars, 41, 43, 43; ventrals (gular to vent), 35, 34, 34; ventrals across midbody, 10 (all); keeled ventrals across midbody, 2, 6, 6; fourth toe lamellae, 23, 22, 23; divided fourth toe lamellae, 2, 1, 2; dorsal scales (occiput to rump), 145, 150, 145; dorsal scales in row above paravertebral tubercles (axilla to groin), 74, 74, 77; total (both sides) supralabials (anterior to second postorbital labial), unknown, 14, 12; second infralabial contact, 1, 0, 0; gulars contacting first infralabial, 0, 1, 1; anomalous postparietal sutures, 0 (all); large paravertebral tubercles sepa-
rated within-row by a distance equal to 2.5 dorsal scales (all); scales in one paravertebral row (axilla to groin), (a) total, 45, 46, 42, (b) smaller than 1.5 dorsal scales, 15, 15, 11, (c) larger than 1.5 dorsal scales, 30, 31, 31, (d) larger than 2.0 dorsal scales, 24, 23, 28, (e) larger than 3.0 dorsal scales, 16 (all); width of postero-lateral preanal/width of posteromedial preanal, 0.41, 0.65, 0.71; height of postnasal/height of anterior loreal, 1.02, 0.99, 0.94; height of second postorbital supralabial/height of first postorbital supralabial, 0.83, 0.69, 0.74; length of frontal/length of postparietal, 0.74, 0.86, 0.88; length of postocular/length of orbit, 0.27, 0.43, 0.19; length of nasal/length of prefrontal, 0.45, 0.69, 0.64; prefrontal, length along midline/length along lateral border, 0.49, 0.30, 0.29; interparietal, posterior width/anterior width, 0.78, 0.84, 0.96.

Distribution and ecology.—The three specimens of *L. tarascae* were caught in museum special traps set in a rocky ravine in tropical semi-deciduous forest. Additional occurrences of the species may be anticipated along the Pacific flank of the Sierra de Coalcomán from the Rio Balsas to the Rio Coahuayana.

Etymology.—The species is named for the Tarascan people whose vast empire once extended from the Mesa Central to the coast of Michoacán (Stanislawski, 1947).

Discussion

*L. tarascae* most closely resembles *L. smithii* in having fewer femoral pores, lateral vertical rows of tubercles, and dorsal caudal interwhorls than other species in the genus. The lateral tubercles are large and well-aligned into a relatively few vertical rows. The paravertebral tubercles are concomitantly large and tend to encroach upon the small scales in the row, resulting in short runs of tubercles (particularly in ENCB 9222) that are nearly as juxtaposed as those of *L. tuxtlae* and *L. pajapanensis*. In the latter two species, the rows consist of uninterrupted juxtaposed tubercles of a relatively homogeneous intermediate-size, while in *L. tarascae*, they contain 16 large tubercles (≥ three times dorsal scales), 14–15 intermediate-sized tubercles (1.5–2.9 times dorsal scales) and 11–15 small scales (0.5–1.4 times dorsal scales). A similar pattern exists for the caudal scales of *L. tarascae*. The large size of the whorls is associated with a reduction in number of dorsal interwhorls, approaching the two that are characteristically present in *L. gaigeae*, *L. radula* and *L. dontomasi*. In these latter species, the whorls are relatively undifferentiated from the interwhorls, while in *L. tarascae* they differ strikingly in size and keel development.

The population of *L. tarascae* occurs 250 km northwest of the range of *Lepidophyma smithii*, which extends on the Pacific versant from Guerrero (Mautz and Lopez-Forment, 1978) to El Salvador. Only three specimens of *L. tarascae* are currently available, but these have been compared with data from 264 *L. smithii*. The degree of divergence in scalation between the two taxa is approximately equivalent to that between *L. tuxtlae* and *L. pajapanensis*, species that are sympatric in the Los Tuxtlas region of Veracruz. Differences in scalation between the several disjunct populations (including three named races) of *L. smithii* (Bezy, unpublished) are considerably less than between it and *L. tarascae*. For example, *L. tarascae* is approximately as divergent in dorsal scale number (x = 146.7, n = 3) from *L. smithii* of the northernmost population in Guerrero (x = 186.6, SE = 1.51, n = 11) as from those to the south on the Isthmus of Tehuantepec (x = 189.0, SE = 2.03, n = 44). These data suggest that it is unlikely that additional material from the area between the ranges of *L. smithii* and *L. tarascae* will bridge the morphological gap between the two species.

Acknowledgments.—We thank Sr. Aurelio Ocaña and Dr. Díaz Pardo for collecting the type series, Dr. Carl Lieb and Mr. Martin Ruggles for field assistance, Mr. John De Leon for photography and Dr. John W. Wright for reviewing the manuscript.
TWO NEW SPECIES OF POISON-DART FROGS 
(COLOSTETHUS) FROM COLOMBIA

JOHN LYNCH

ABSTRACT: Two dendrobatids, provisionally assigned to Colostethus, are named from the Cordillera Oriental of Colombia near Bogotá, Colombia. Both species differ from other Colostethus in lacking the vocal slits and in having elongate anal sheaths. One species is cavernicolous and occurs at elevations above 3000 m (caves within paramos). The other species occurs along mountain streams in areas once supporting high altitude cloud forests (elevations ca. 2400–2800 m).

Key words: Amphibia; Salientia; Dendrobatidae; Colostethus; Colombia; High altitude; Troglodytic; Relationships

Dendrobatid frogs of the genus Colostethus are considered the most primitive members of the poison-dart frog family (Edwards, 1974; Lynch, 1971; Noble, 1931). Edwards (1974) recognized 62 species distributed through forested (plus páramo) environments of the Neotropics from Costa Rica and Tobago south to Bolivia and to eastern and southeastern Brasil. The frogs included in the genus by Edwards have toe discs and pads, obvious scutes atop the digital pads, premaxillary/maxillary dentition, and usually drab patterns involving pale dorsolateral, lateral (= oblique), and/or ventrolateral stripes. These features (most of which are synapomorphies of the family or a more inclusive group) are combined with the absence of pumiliotoxin-C class alkaloids [(found in all Dendrobates + Phyllobates; Myers et al., 1978) = skin toxins auctorum] to “define” Colostethus.

In 1979, Sr. Vladimir Corredor and Dr. Pedro M. Ruiz showed me some peculiar frogs collected at various mountain sites in the vicinity of Bogotá by staff and students from the Instituto de Ciencias Na-