Catalogue of American Amphibians and Reptiles.

de Sá, R.O. 1996. *Hyla multifasciata.*

Hyla multifasciata Günther

Hyla boans, sensu Daudin, 1800:12, pl. 8; *in* Sonnini and Latreille, 1801:184;

Auletris boans: Wagler, 1830:201

Hyla multifasciata Günther, 1858 (1859):101. Type-locality, "Para" (= Belém, Brasil), stated as "'Pará', (= Belém, Pará) Brasil" by Duellman, 1977:78. Holotype, British Museum (Natural History) BMNH 1947.2.23.6, probably an immature female (see Comments), "from Mr. Steven's collection," date of collection unknown (not examined by author).

Hyla albopunctata: Cochran, 1955:80 (part).

Hyla albopunctata multifasciata: Rivero, 1961:105.

Hyla daudini: Lutz, 1973:41 (*nomen substitutum* for *Hyla boans* Daudin).

• **Content.** No subspecies are recognized.

• **Definition.** *Hyla multifasciata* is a medium to large species in the *albopunctata* species group, adults ranging in size from 42-61 mm SVL (mean male SVL = 48 mm, mean female SVL = 53 mm). The head is longer than wide. The snout is rounded in dorsal view, whereas in lateral view it is rounded and protrudes slightly beyond the mandible. The canthus rostralis is rounded and distinct, the loreal region is concave, and the internarial region is convex. The eyes are large, approximately twice the diameter of the tympanum. The tympanum is separated from the eye by a distance slightly larger than one half the diameter of the tympanum. The supratympanic fold is well-developed. The upper arm is slender; the forearm is slender to slightly robust with a weak dermal fold extending from the elbow to the base of the disc of the 4th finger. The fingers are long, fringed, and have well-developed, round terminal discs. The distal subarticular tubercles are usually large, single, oval, and subconical (distal tubercle of digit III is bifid in KU 127808 and KU 127812). The proximal subarticular tubercles are more rounded and smaller. Small, subconical, supernumerary tubercles are present only on the proximal segments of the digits. The palmar tubercle is bifid and slightly developed. The modal webbing formula for the hand is: I —II 2^{+}—3.5 III 3^{-}—2.5 IV.

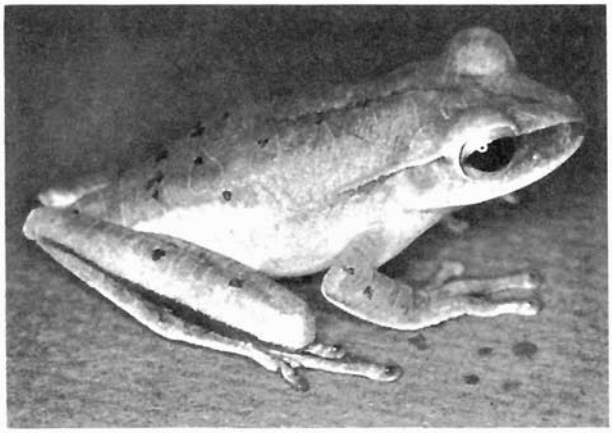
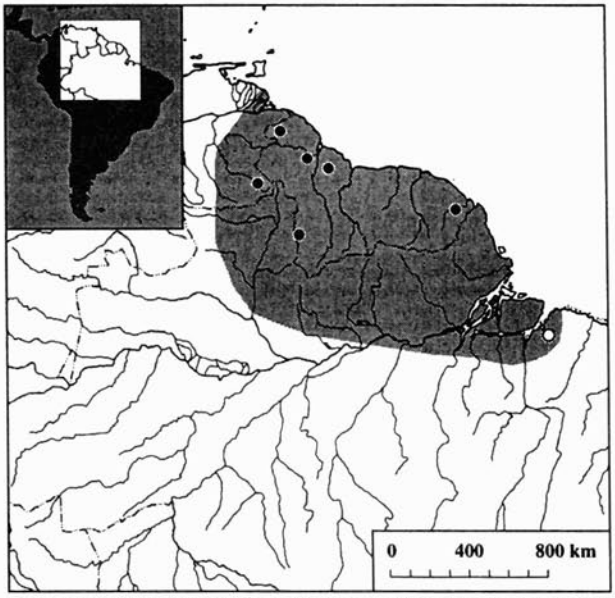


Figure 1. Adult *Hyla multifasciata* from Belém, IPEAN, Pará, Brasil (KU 128470, slide KU CT 3507). Photograph by William E. Duellman.



Map. Distribution of *Hyla multifasciata*; the type-locality given by Günther (1858 [1859]) is "Para [Brasil]," the circle indicates the locality *fide* Duellman (1977, "Belém, Pará, Brasil"); dots indicate other known records.

The hind limbs are long, slender, and lack a tarsal fold. The proximal subarticular tubercles are smaller than the distal tubercles. Poorly developed supernumerary tubercles are present on the proximal segments of the toes. The modal webbing formula for the foot is: I 2^{-}—2^{+} II 1—3^{-} III 1—3^{-} IV 2^{+}—1 V.

In preservative, the coloration of the dorsal surfaces of the body and of the fore- and hindlimbs is brown. Usually, 10 or 11 (range 8-12) transverse, darker brown stripes extend across the dorsum of the body (Fig. 1). These are well-defined and narrowly outlined by pale tan lines (USNM 291176). Some specimens have a narrow, black middorsal line extending from the tip of the snout posteriorly almost to the cloaca (USNM 291120). A few specimens have both the transverse dorsal stripes and the black middorsal line. The upper and lower lips are pale brown. Narrow and well-defined darker brown bars also are present on the dorsal surfaces of the thigh and shank. A white supraanal stripe is accentuated by a dark brown anal region. A creamy white line extends from the heel along the outer edge of the tarsus and fifth toe. Ventral to this white line, the coloration is dark brown. The posterior surface of the thighs and the flanks vary from uniformly pale brown to having dark brown vertical bars. The ventral surfaces are cream; some specimens have a finely spotted brownish throat.

The tadpoles of *Hyla multifasciata* have an elliptical body which is wider than deep (Fig. 2). The snout is acute in dorsal view and rounded in lateral view. The top of the head is slightly convex. In lateral view, the ventral contour of the body is planoconvex. The nostrils are oval, depressed, dorsal, their apertures are visible in lateral view. A small, medial, triangular dermal flap protrudes over the apertures. The internarial width is equal to that of the interorbital region and the oral disc. The eyes are dorsolateral and directed laterally. The spiracle is lateral, long, tubelike, and sinistral. The spiracular opening lies in the posterior third of the body, and is raised from the surface of the body. The cloacal tube is moderately long, medial, and fused to the ventral fin; the cloacal opening is dextral to the ventral fin. The anterior terminus of the dorsal fin extends slightly onto the body.

The anterior end of the ventral fin also lies at the base of the tail, but its anterior part is hidden by the cloacal tube. The margin of the ventral fin is subparallel to the axial axis of the tail, whereas the margin of the dorsal fin is curved uniformly. The longitudinal axis of the tail is straight. The caudal musculature is slender and tapers gradually to the posterior end of the tail. At the midpoint of the tail, the depth of the caudal musculature is slightly greater than the depth of the ventral fin and shallower than the dorsal fin. The tip of the tail is slightly flagelliform. The mouth is anteroventral and directed slightly anteriorly. The mouth has a pair of ventrolateral folds. A small medial portion of the upper lip lacks papillae; elsewhere marginal papillae are present in a single row along the border of the mouth. A few additional submarginal papillae are present in the ventrolateral folds. The upper beak is moderately deep and its margin has blunt serrations; is laterally convex, paramedially concave, and medially convex; and is strongly pigmented. The lower beak is shallow, uniformly concave, pigmented, and serrated. Two upper and three lower rows of denticles are present. The first upper row is continuous and shorter than the second row, which is narrowly interrupted medially. The first and second lower rows are of equal length, and the first row is interrupted medially. The third lower row is interrupted medially and is the shortest of all lower rows. In preservative, the snout, dorsum, and lateral surfaces of body are pale brown; the dorsal surface of the body and the area under the eyes have dark brown reticulations. The ventral region is transparent. The caudal musculature is pale brown with scattered dark brown spots. Dorsal and ventral fins are almost transparent with a few scattered brownish dots, which are most numerous on the ventral fin.

On the basis of five recordings (KU tapes 947-951) made at Ipean, 3 km east of Belém, Pará, Brasil, between 2015 and 2115 hrs at an air temperature of 27°C, the call of *Hyla multifasciata* consists of a single note. The mean call duration is 345 ms (range = 310-446 ms). The mean length of the call is 311 ms (234-386 ms), and emphasized frequencies are at 1 kHz (0.9-1.2 kHz), 2.1 kHz (2.0-2.2 kHz), and 2.7 kHz (2.5-3.0 kHz), and energy is visible on the sonogram up to 5.4 kHz (4.5-8.0 kHz). The mean number of pulses is 60.4 (46-72) per call, and the mean pulse rate is 158/s (124-184/s) (Fig. 3).

• **Diagnosis.** *Hyla multifasciata* differs from the other members of the *albopunctata* group by the following combination of characters: 1) modal webbing formula of the hand and the foot, 2) snout rounded in lateral view, 3) upper lip pale brown, 4) anal region dark brown with a white supraanal stripe, 5) flanks uniformly pale brown to cream and posterior surface of thighs uniformly brown, vertical dark brown bars may be present on both regions, 6) ventral edge of nasal unnotched, 7) frontoparietals not articulating medially, and 8) otic plate of squamosal broadly overlapping a bony crista parotica.

• **Descriptions.** Miranda-Ribeiro (1926) provided brief descriptions of external morphology and coloration. An additional description of adult external morphology, including morphological variation, secondary sex characteristics, osteology, and coloration are found in Lutz (1973). Tadpoles have not been previously described.

• **Illustrations.** Gunther's (1858 [1859]) original description included an illustration of the species (Pl. VIII, D). A color plate of *Hyla multifasciata* can be found in Lutz (1973) under the name *Hyla daudini*. Lescure (1976) included a reproduction of Daudin's (1802 [1803]) Plate XI, indicated that this plate is the same used in Sonnini and Latreille (1801), and that it resembles Plate 8 in Daudin (1800). Miranda-Ribeiro (1926) presented an illustration of this species (pl. 7, fig. 4) and of the pectoral girdle (fig. 49).

• **Distribution.** *Hyla multifasciata* is restricted to northeastern South America, ranging from eastern Venezuela through the Guianas to northeastern Brasil.

• **Fossil Record.** None.

• **Pertinent Literature.** Lynch (1979) included *Hyla multifasciata* as a characteristic component of the Central Cis-Andean Lowland Tropical Forests. In addition, he considered the pair *multifasciata-lanciformis* vicariants to *H. albopunctata*, which is a component of the Atlantic Tropical Forests. Lescure (1986a) indicated that *H. multifasciata* was an arboreal species with aquatic reproduction inhabiting flooded areas in eastern Amazonia. Rivero-Blanco and Dixon (1979) listed *H. multifasciata* inhabiting Dry Tropical Forest. Hoogmoed (1979) reported *Hyla multifasciata* as a lowland endemic in the Guianan region, at elevation between 0-1290 m, and found in savanna, open vegetation, and forest-edge situations. Subsequently, Hoogmoed and Gorzula (1979) reported the species also in gallery forest, provided a brief description of the reproductive behavior, and noted that males call at sunset from the middle through the end of the rainy season.

References to this species as *Hyla boans* occur in Daudin (1802 [1803], 1803), Fitzinger (1826), Duméril and Bibron (1841, part), Burmeister, 1856, part), Günther (1858 [1859]), Boulenger (1882, part), Beebe (1919, 1925), Ruthven (1919), Nieden (1923, part), Miranda-Ribeiro (1926, part), Crawford (1931), Crawford and Jones (1933), and Parker (1935); and as *H. multifasciata* in Cochran and Goin (1970), Duellman (1971), and Crump (1971).

• **Nomenclatural History.** Cochran (1955) considered *Hyla multifasciata* a synonym of *H. albopunctata* and included in the synonymy of *H. albopunctata* specimens identified as "*Hyla*

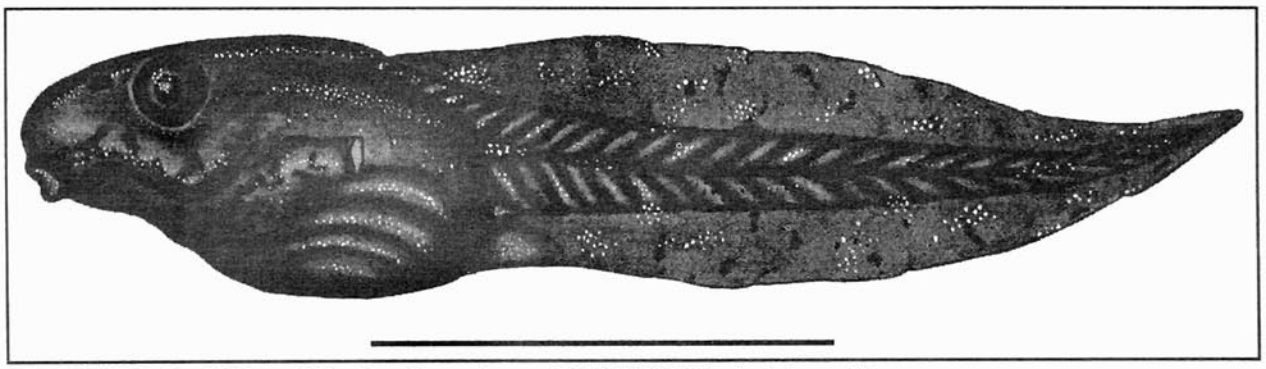


Figure 2. Tadpole of *Hyla multifasciata*, Gosner's stage 29 (KU 128016). Scale bar = 10 mm.

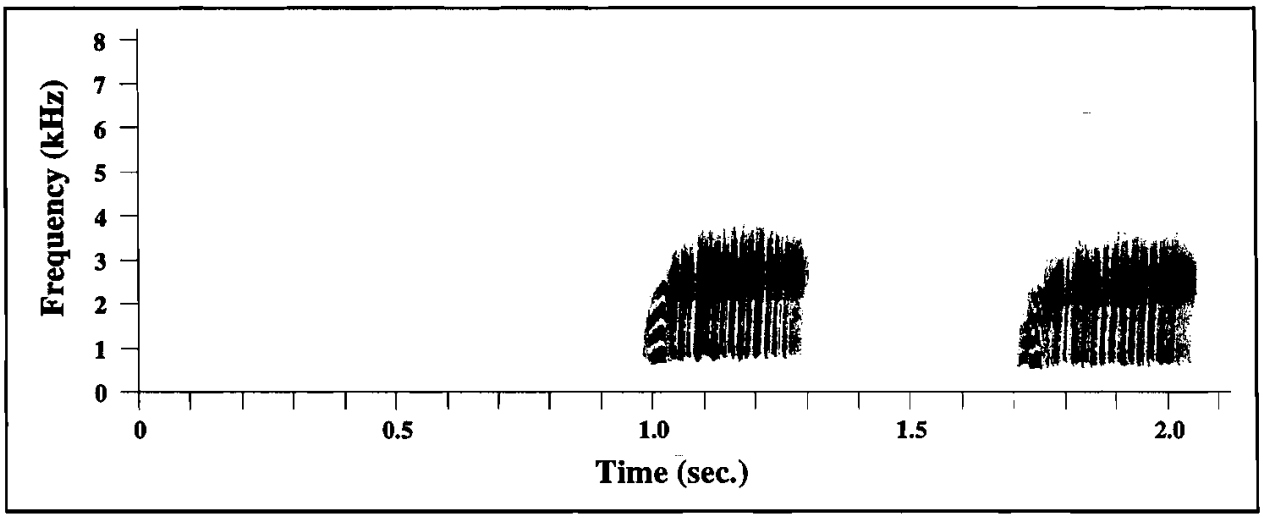


Figure 3. Audiospectrogram of the call of *Hyla multifasciata* from IPEAN, Belém, Pará, Brasil (KU 128471, KU tape 948).

boans Daud." (not *Hyla boans* of Linnaeus, 1758) by Crawford (1931), Crawford and Jones (1933), Beebe (1919, 1925), Parker (1935), and Ruthven (1919). However, those specimens are from Guyana and probably correspond to *Hyla multifasciata*. Further details on the nomenclatural history of *Hyla boans* Linnaeus (1758) and *Hyla albopunctata* Spix (1824), can be found in Duellman (1971) and de Sá (1995), respectively. Rivero (1961) treated *H. multifasciata* as a subspecies of *H. albopunctata*. However, these two species consistently show distinct color patterns, different mating calls, and disjunct geographic distributions. These differences warrant recognition of the two forms at the specific level. Cochran and Goin (1970) and Duellman (1971) correctly distinguished *Hyla multifasciata* from *H. albopunctata* and *H. lanciformis*. Lutz (1973) proposed the name *Hyla daudini* as substitute for "*Hyla boans* Daudin, 1802" (= 1802 [1803]). Subsequently, Lescure (1976) provided a detailed history of the name "*Hyla boans* Daudin," concluding that the description of coloration and illustrations of *Hyla boans* provided by Daudin (1800, 1802 [1803], 1803) and Sonnini et Latreille (1801) correspond to *Hyla multifasciata* Günther. In addition, he not only indicated that "*Hyla daudini* Lutz" is a synonym of "*Hyla boans* Daudin, 1800," but also that "*Hyla multifasciata* Günther," instead of "*Hyla albopunctata* Spix 1824," as proposed by Andersson (1900), ought to replace "*Hyla boans* Daudin, 1800." Later, Lescure (1986b) incorrectly considered *Hyla multifasciata* and *Hyla albopunctata* to represent a single taxon.

• **Remarks.** Nieden (1923) and Miranda-Ribeiro (1926) cited the geographic distribution of *Hyla albopunctata* reaching the Guiana region; de Sá (1995) suggested that these authors probably were working with a mixture of specimens corresponding to *albopunctata*, *raniceps*, and *multifasciata*.

King (1990) indicated that Beçak (1968) reported the diploid chromosome number of *Hyla multifasciata* as 2n = 24. However, Beçak (1968) did not work with *H. multifasciata*, but reported the *H. bischoffi* (as *H. multilineata*) chromosome number as 2n = 24; possibly King misread *multilineata* as *multifasciata*. Chromosome number for *H. multifasciata* remains unreported.

Lescure (1986b) claimed that mating calls between *Hyla multifasciata* from Guyana and *H. albopunctata* from southern Brazil did not differ. Consequently, based solely on calls, without explaining morphological and biogeographical differences, he incorrectly suggested that these two names constitute a single species. However, he presented no analysis of calls to support his conclusion. De Sá (1986) determined that the calls of these two species were consistently distinct.

Frank and Ramus (1995) proposed the use of the common name, Many-banded Treefrog.

• **Etymology.** The specific name is an adjective derived from the Latin *multus* (= much) + *fasciata* (= banded), presumably in reference to the banded dorsal pattern.

• **Comments.** Günther (1858 [1859]) reported that the holotype was an adult; Boulenger (1882) indicated that it was "half-grown," but that may have been in reference to his having thought that *Hyla multifasciata* was a synonym of the much larger *H. boans*; W.E. Duellman (pers. comm.) examined the specimen in 1969 and noted that it was immature; however, it does fall into the lower end of the range of sizes associated with mature specimens. A definitive determination of sex and maturity must await the opportunity to dissect the specimen.

Two characters, head longer than wider and lack of outer metatarsal tubercle, have been traditionally used to cluster *Hyla albopunctata*, *H. lanciformis*, *H. multifasciata*, and *H. raniceps* in the *albopunctata* species group. However, de Sá (1986) pointed out that these characteristics are shared with other *Hyla* species groups and do not provide evidence that the *albopunctata* group is monophyletic. The geographic range exhibited by *Hyla multifasciata* is characteristic of Guiana endemic taxa, except for the type locality which represents the southernmost record for the species.

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