A new species of *Hyla* (Anura: Hylidae) from eastern Brazil

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Abstract. A new species of small treefrog, related to *Hyla branneri* (here considered a full species), *H. decipiens*, and *H. oliveirai*, is described. The new species is known from the south of Bahia State to the north of Espírito Santo State in eastern Brazil. The new species is characterized by small size, snout mucronate or rounded in dorsal view and nearly truncate in profile, canthus rostralis evident, and large head. In most specimens, the color patterns show a light triangular mark on the head and light lateral stripes.

Introduction

In the coastal region of Brazil, the small sized species *Hyla branneri* Cochran, *H. decipiens* A. Lutz, and *H. oliveirai* Bokermann, despite the clear relationships between them, are not allocated to any species groups of *Hyla* (see Lutz, 1973; Frost, 1985). During a survey of the anuran fauna at the Conceição da Barra and Santa Teresa municipalities in the Espírito Santo State (southeastern Brazil), we collected specimens of a new species of *Hyla*, described herein, that seems to be related with the species mentioned above.

Methods

Specimens used in the description or examined for comparisons are deposited in AL (Adolpho Lutz collection, deposited in Museu Nacional, Rio de Janeiro, Brazil), CFBH (Departamento de Zoologia, Universidade Estadual Paulista, Rio Claro, São Paulo, Brazil); MNRJ (Museu Nacional, Rio de Janeiro, Brazil); MZUSP (Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil), and ZUEC (Museu de História Natural, Universidade Estadual de Campinas, Campinas, São Paulo, Brazil).

We took the following measurements to the nearest 0.01 mm, with calipers: snout-vent length (SVL), head length (HL), head width (HW), thigh length (THL), tibia length

(TBL), and foot length (FL). Five other variables: eye diameter (ED), tympanum diameter (TD), interorbital distance (IOD), eye-nostril distance (END), and internasal distance (IND), were measured using an ocular micrometer in a Zeiss stereomicroscope. All measurements are expressed in millimeters and followed Duellman (1970) and Cei (1980). Webbing formula notation follows Myers and Duellman (1982).

All specimens collected were fixed in formalin 10% and transferred after three to five days into 70% ethanol for permanent storage. Drawings of the holotype were made using a Zeiss stereomicroscope with a drawing tube.

Hyla haddadi sp. nov.
(figs 1 and 2)

Holotype. MNRJ 17325, adult male, collected at the Mata do Queixada, Município de Conceição da Barra (18°35′S: 39°44′W; sea level), Estado do Espírito Santo, Brasil, between 30 July and 8 August 1992, by R.P. Bastos, C. Zamprogno and R. Cometti.

Paratypes. CFBH 1537-1538, adult male and gravid female, collected at the Município de Conceição da Barra, Estado do Espírito Santo, between 8 and 18 August 1991 by R.P. Bastos, C. Zamprogno and R. Cometti.; CFBH 1629-1632, 1634-1635, five adult males and one gravid female collected with the holotype; MNRJ 1286, 16234-16238, six adult males collected at the Município de Santa Teresa, Estado do Espírito Santo, between 24 and 31 November 1942 by Carvalho and Myers; MNRJ 17078-17082, three adult males and two gravid females collected at the Estação Experimental de Linhares,

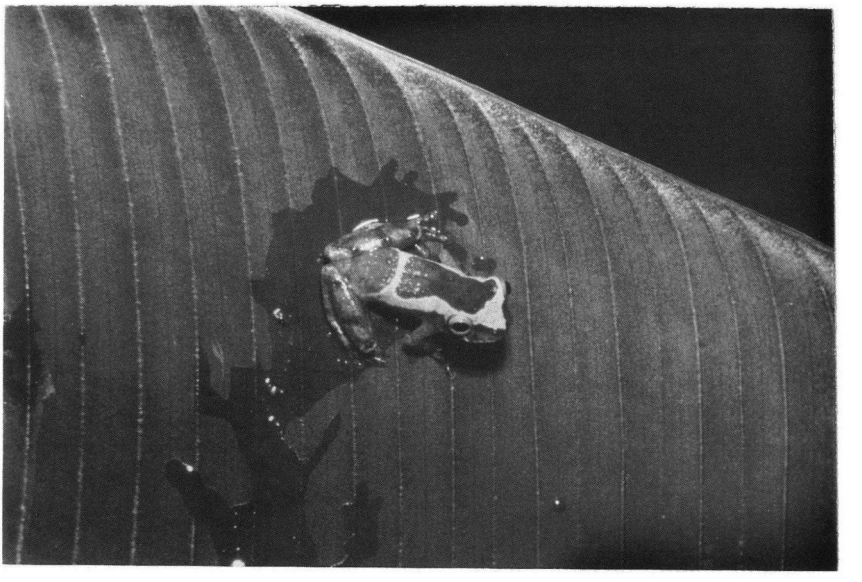

Figure 1. *Hyla haddadi*, CFBH 2595 (paratype), adult male.

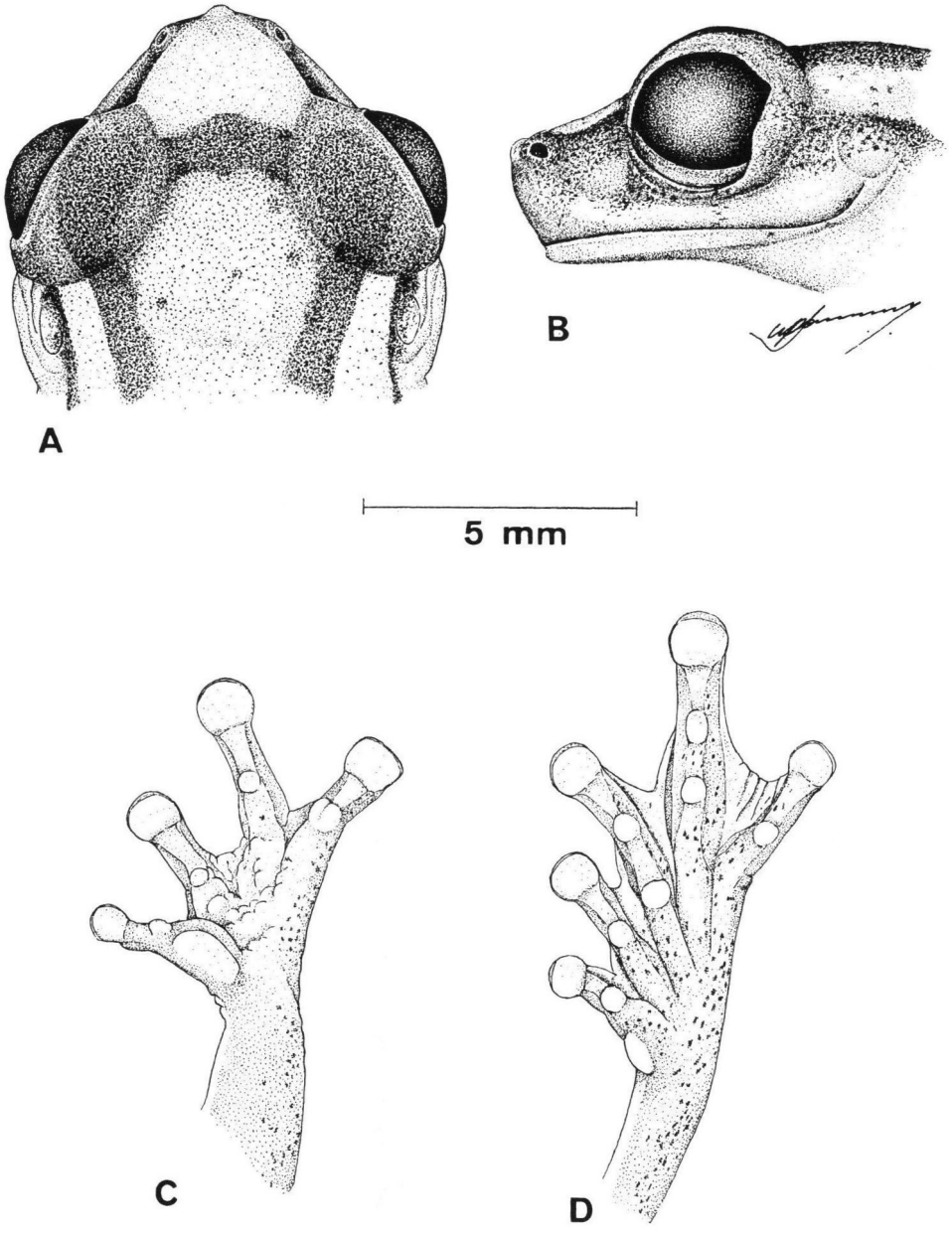

Figure 2. *Hyla haddadi*, MNRJ 17325 (holotype). (A) Dorsal and (B) lateral views of head; ventral views of (C) hand and (D) foot.

Município de Linhares, Estado do Espírito Santo, on 5 December 1977 by M. Soma, E.P. Caramaschi and U. Caramaschi; CFBH 2595, ZUEC 8898-8899, 8913, two adult males and two gravid females collected at the Museu de Biologia Mello-Leitão, Município de Santa Teresa, Estado do Espírito Santo, on 4 and 5 March 1988 by J.P. Pombal, Jr., O.C. Oliveira, A.P.L.S. de Almeida and R.P. Bastos.

Diagnosis. A small species (males 15.8-19.45 mm SVL, females 21.9-24.0 mm SVL), related to *H. branneri*, *H. decipiens*, and *H. oliveirai* (see remarks), characterized by: (1) large head; (2) snout short, mucronate or rounded in dorsal view and nearly truncate in profile; (3) canthus rostralis distinct; and (4) color pattern of most specimens, with a light triangular area on the head, and a wide line on the back.

From *H. oliveirai*, the new species differs by its (1) larger head, (2) canthus rostralis more evident, (3) larger tympanum, (4) longer eye-nostril distance, (5) transverse stripes on limbs (absent in *H. oliveirai*), and (6) absence of white interorbital strip (see Bokermann, 1963). *Hyla haddadi* differs from *H. decipiens* by its (1) larger head, (2) canthus rostralis more evident, (3) loreal region more concave. From *H. branneri*, the new species differs by its (1) larger head, (2) absences of the white spot under the eye (some specimes do not have the white spot under the eye in *H. branneri*; Lutz, 1973), (3) smaller adhesive discs. By its larger size, *Hyla haddadi* is distinguished further from *H. branneri* and *H. decipiens* (see Cochran, 1948; Lutz, 1973).

Description of holotype. Body slender (fig. 1); head slightly longer than wide; snout short, its shape mucronate in dorsal view and nearly truncate in profile (fig. 2A, B); nostrils directed laterally; canthus rostralis distinct, straight; loreal region slight concave; tympanum distinct, rounded, its diameter about 1/3 eye diameter; supratympanic fold weak; eye large, protruding; vocal sac single, externally expanded; vocal slits present; tongue medium-sized, ovoid, shallow notched posteriorly; vomerine tooth row between and anteromedial to the choanae; choane medium-sized, slightly elliptical and oblique. Forearm moderately robust, arm slender; fingers short, subarticular tubercle bilobate in the fourth finger and rounded in the others; inner metacarpal tubercle single, very large and elliptical; finger discs medium-sized, rounded; thumb disk smaller than those of the others fingers (fig. 2C); thumb disk diameter nearly equal to the diameter of tympanum; webbing formula, I2 - 2II2 - 3III2 1/2 - 2IV; finger lengths I = II < IV < III. Legs moderately slender, feet with small, elliptical inner metatarsal tubercle; on each toe a single, small and rounded subarticular tubercle; toe disks rounded, nearly the same size that the finger disks (fig. 2D); webbing formula, I2 - 2II 1 1/3 - 2 1/2III2 - 3IV2 1/2 - 1V; toe lengths I < II < V < III < IV. Skin on dorsum and throat smooth, belly and undersurfaces of thighs and anal region glandular.

Color of the holotype in preservative. Dorsum brown with dark brown spots; throat and venter creamy white; light triangular area on the head between the eye and canthus

Table 1. Measurements (in mm) of males and females of *Hyla haddadi*.

	Males ($n = 17$)			Females ($n = 6$)		
	$\bar{x}$	s	Range	$\bar{x}$	s	Range
SVL	17.74	1.27	15.80 - 19.45	22.60	0.79	21.90 - 24.00
HL	6.36	0.33	5.90 - 6.85	7.31	0.38	6.65 - 8.35
HW	6.18	0.44	5.50 - 6.85	7.50	0.52	6.85 - 8.35
ED	2.16	0.20	1.81 - 2.75	2.43	0.20	2.19 - 2.69
TD	0.73	0.09	0.50 - 0.94	1.02	0.15	0.81 - 1.25
IOD	2.53	0.24	2.19 - 3.13	2.87	0.23	2.63 - 3.13
END	1.46	0.20	1.13 - 2.00	1.57	0.13	1.38 - 1.75
IND	1.54	0.11	1.38 - 1.69	1.92	0.22	1.50 - 2.13
THL	9.03	0.64	8.20 - 9.95	11.04	0.44	10.50 - 11.55
TBL	9.34	0.52	8.40 - 10.25	11.34	0.50	10.75 - 12.10
FL	7.73	0.43	7.00 - 8.40	9.80	0.79	8.65 - 10.75

rostralis, prolonging laterally on the back until inguinal region; brown transverse stripes presents on upper surfaces of arms and legs.

Measurements of the holotype. SVL 18.55; HL 6.85; HW 6.65; ED 2.13; TD 0.75; IOD 2.63; END 1.19; IND 1.50; THL 9.45; TBL 9.70; FL 8.15.

Variation and color in life. Measurements (mean, standard deviation, range) of 17 adult males and six adult females are given in table 1. Snout may be mucronate (74%) or rounded (26%). The vomerine teeth may be weakly evident. About 80% of individuals (males and females) have a light triangular area on the head and a lateral stripe. Most of the individuals (54%) have the light lateral stripe prolonging to the inguinal regional; some individuals (46%) have the stripe until the middle of the back.

In life (based on slide of the specimens CFBH 2595; fig. 1), snout and stripes white, weakly brownish; dark brown inside this draw; posterior parts of body brown; brown legs with dark gray stripes; iris bluish gray.

Natural history. We collected *Hyla haddadi* in coastal rain forest (Atlantic Forest), and in the scrubby "restinga" vegetation (see Eiten, 1992, for definition and characterization of "restinga" vegetation). Males were observed at permanent ponds, at night, calling perched on vegetation above the ground. Gravid females were collected in several months of the year: February, March, July, August, December. Some individuals were captured, at day, in the interior of terrestrial bromeliads in restinga. Clutches and tadpoles are unknown. The closely related species *Hyla decipiens* and *H. branneri* deposit the egg clutch on leaves above water (Lutz, 1947; Cochran, 1955, pers. obs.).

Distribution. The new species is known from the municipalities of Aracruz, Conceição da Barra, Linhares, Santa Teresa (localized in Espírito Santo State) and Ilhéus (Bahia State), all localities in eastern Brazil. In some parts of its geographic distribution,

H. haddadi is sympatric with *H. branneri* and *H.* cf. *decipiens* (Lutz, 1973; see also additional specimens examined).

Etymology. The specific name honors Célio F.B. Haddad, our friend and professor, for his contribution to the knowledge of the Brazilian anurofauna.

Remarks. Cochran (1948) considered *H. branneri* as a subspecies of *H. bipunctata* Spix, and Lutz (1973) as a subspecies of *H. decipiens*; this arrangement was followed by subsequent authors (e.g., Duellman, 1977, 1993; Frost, 1985). Herein, we considered *H. branneri* as a full species. *Hyla branneri* differs from *Hyla decipiens* by having (1) head larger; (2) canthus rostralis more evident; (3) snout narrower, (4) white spot below the eye (in *H. branneri* some specimens do not have this white spot below the eye; Lutz, 1973). However, *H. decipiens* and *H. branneri* are sympatric in Itaguaí, state of Rio de Janeiro. Herein, we identified some specimens as *H.* cf. *decipiens* and *H.* cf. *oliveirai*; further studies are necessary to determine the status of these populations.

Hyla branneri, *H. decipiens*, *H. haddadi* and *H. oliveirai*, are close related species. However, their relationships with other species groups of *Hyla* have not been discussed yet (Frost, 1985). Because of the morphological similarities, we suggest a relationship with the *H. microcephala* group.

Additional specimens examined

Hyla bipunctata: Linhares, ES: ZUEC 8607-08; Itaguaí, RJ: ZUEC 1155, 1626, 5170-73, 5231-32; Magé, RJ: ZUEC 6922; Terezópolis, RJ: ZUEC 6319. *Hyla decipiens*: Itaguaí, RJ: MNRJ 17085, 17087; Rio de Janeiro, RJ: AL 090 (2 specimens), 091 (syntypes), MNRJ 1910, 10287-90, 20802-03 (topotypes), MZUSP 59143-44 (topotypes). *Hyla* cf. *decipiens*: Conceição da Barra, ES: CFBH 1950; São Matheus, ES: CFBH 1608-10. *Hyla haddadi*: Ilhéus, BA: MNRJ 15538-39. *Hyla branneri*: Itabuna, BA: ZUEC 8644-45, 8653; Itajibá, BA: ZUEC 3573; Ilhéus, BA: MNRJ 15479-91; Jequié, BA: ZUEC 2171; Maracás, BA: MNRJ 15494-506; Salvador, BA: MNRJ 3919, 2267-85; Linhares, ES: MNRJ 3905; Santa Teresa, ES: ZUEC 7522; Recife, PE: ZUEC 8716; Itaguaí, RJ: MNRJ 17086, 17088-89. *Hyla oliveirai*: Maracás, BA: MNRJ 3668 (paratype). *Hyla* cf. *oliveirai*: Valença, BA: MNRJ 15540-44.

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