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A new species of beaked toad, *Rhinella* (Anura: Bufonidae), from the State of Bahia, Brazil

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ABSTRACT. A new species of beaked toad, *Rhinella*, is described from Itacaré (14°17'S, 38°60'W; 13 m altitude), State of Bahia, Northeastern Brazil. *Rhinella skuki* **sp. nov.** is related to *R. boulengeri* and distinguished by the size small (SVL 26.2 mm in male); head longer than wide; snout, viewed from above, long, narrow, spatulate, with lateral borders parallel and rounded tip; in profile, long, strongly acute; parotoid glands large, rounded; tympanum concealed; dorsum rugose, with rounded tubercles uniformly distributed; vocal sac and vocal slits absent; fingers slender, not webbed nor ridged; first finger hypertrophied, with a rounded nuptial pad on the inner surface; toes slender, slightly fringed; webbing absent; ground color of dorsal surfaces dark brownish gray with an interorbital bar and dorsolateral blotches clear brownish gray, leaving an apparent pattern of arrows on dorsum; venter and ventral surfaces of arms and thighs cream with diffuse gray stains and dots; gular region and chest dark brownish gray.

KEY WORDS. Amphibia; Northeastern Brazil; *Rhinella skuki* **sp. nov.**; Taxonomy.

The species originally or secondarily included in *Rhamphophryne* Trueb, 1971 [*R. acrolopha* Trueb, 1971, *R. festae* (Peracca, 1904), *R. lindae* Rivero & Castaño, 1990, *R. macrorhina* Trueb, 1971, *R. nicefori* (Cochran & Goin, 1970), *R. rostrata* (Noble, 1920), *R. ruizi* Grant, 2000, *R. tenrec* Lynch & Renjifo, 1990, and *R. truebae* Lynch & Renjifo, 1990)] occur in Northwestern South America and in Central America, ranging from Northern Peru, Ecuador, Colombia, to adjacent Panama, between 800-1300 m altitude (Frost 2011). The only exception is *R. proboscidea* (Boulenger, 1882), occurring in Eastern Brazil, in the states of Bahia and Minas Gerais, associated to the Atlantic Rain Forest, at altitudes between the sea level and 890 m (Izecksohn 1976, Feio *et al*. 2003). Chaparro *et al*. (2007a) transferred all species of the genera treated by Frost *et al*. (2006) as *Rhinella* Fitzinger, 1828 (which included *Rhamphophryne*) and *Chaunus* Wagler, 1828 into *Rhinella*. This action resulted in the secondary homonymy of *Bufo (Oxyrhynchus) proboscideus* Spix, 1824 (formerly *Rhinella proboscidea*) and *Phryniscus proboscideus* Boulenger, 1882 (formerly *Rhamphophryne proboscidea*). A new name, *Rhinella boulengeri* Chaparro, Pramuk, Gluesekamp & Frost, 2007, was proposed as replacement for the latter (Chaparro *et al*. 2007b).

In this paper, a new species of *Rhinella* related to *R. boulengeri* from the State of Bahia, Northeastern Brazil, is described.

MATERIAL AND METHODS

Examined specimens and data were obtained from the collections of the Museu Nacional, Rio de Janeiro, RJ, Brazil (MNRJ), Museu de Zoologia, Universidade Federal da Bahia, Salvador, BA, Brazil (UFBA), and Museu de Zoologia, Universidade Federal de Viçosa, MG, Brazil (MZUFV).

Measurements, in millimeters (mm), followed Napoli (2005): (SVL) snout-vent length, (HL) head length, (HW) head width, (IND) internarial distance, (END) eye to nostril distance, (ED) eye diameter, (UEW) upper eyelid width, (IOD) interorbital distance, (HAL) hand length, (THL) thigh length, (TL) tibia length, (FL) foot length.

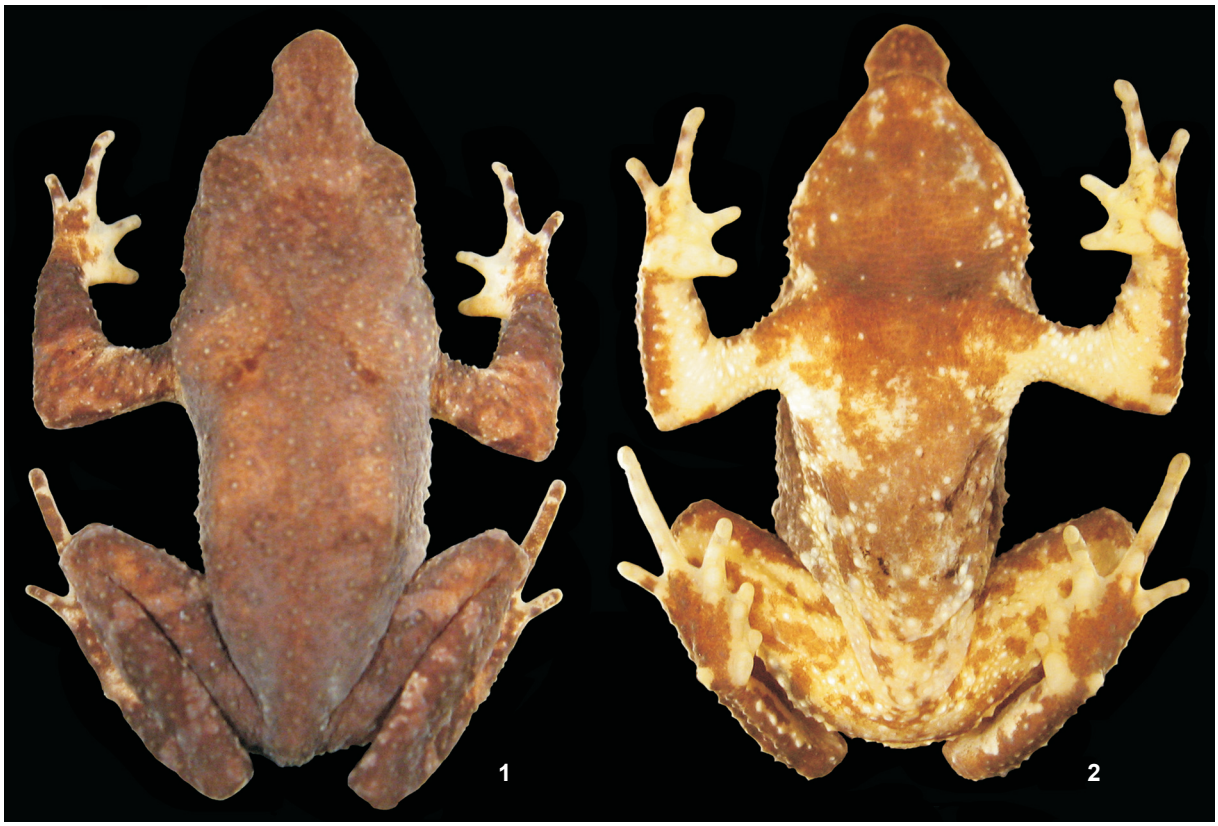
TAXONOMY

Rhinella skuki **sp. nov.**

Figs 1-12

Holotype. Brazil: *Bahia*: Itacaré (14°17'S, 38°60'W; 13 m altitude), MNRJ 74619, adult male (Figs 1-2), 14 January 2006, Marco Antônio de Freitas *leg*.

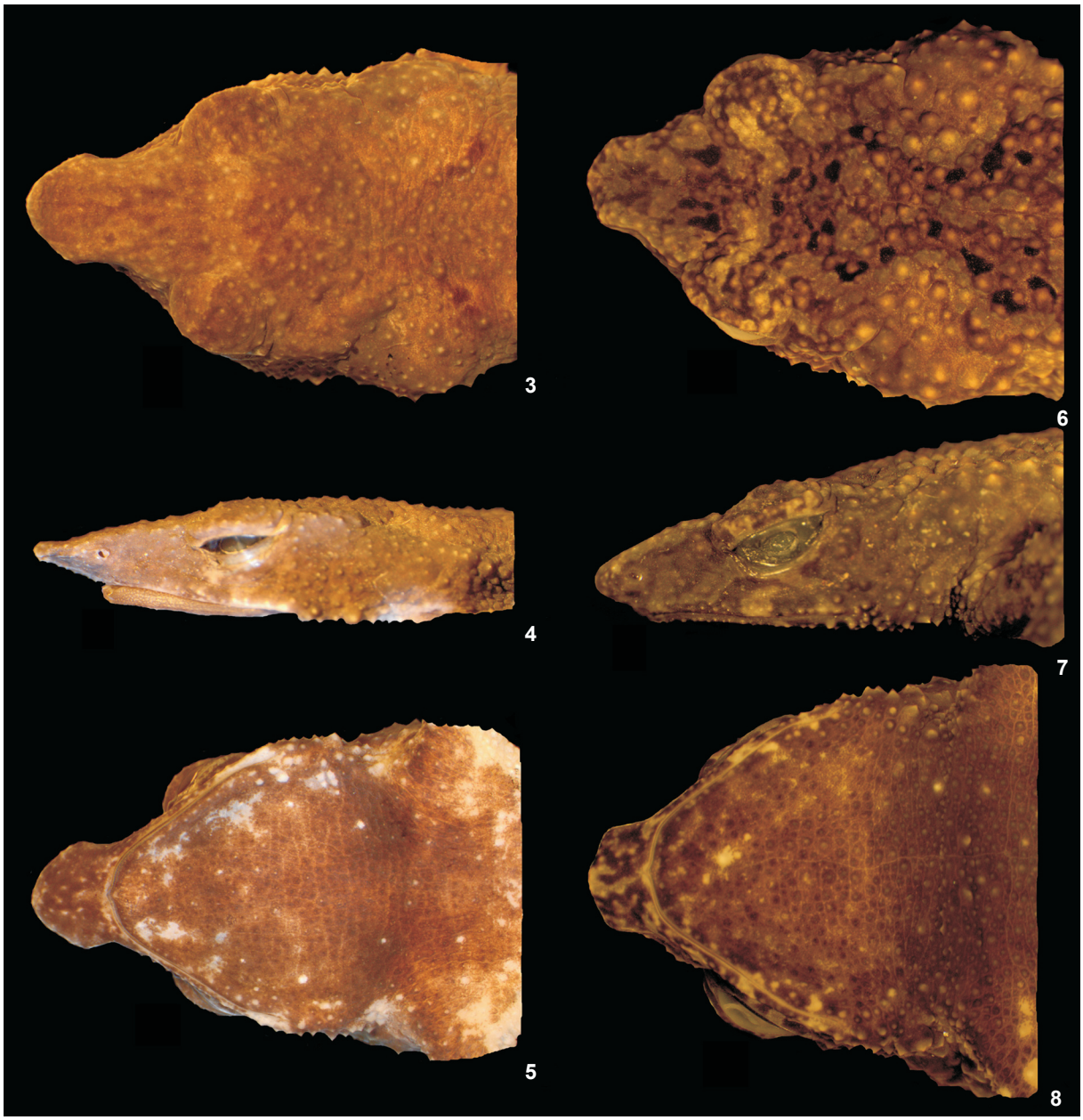
Diagnosis. A species related to *Rhinella boulengeri*, characterized by: 1) size small (SVL 26.2 mm in male); 2) head longer than wide; 3) snout, viewed from above, long, narrow, spatulate, with parallel lateral borders and rounded tip; in profile, long, strongly acute; 4) parotoid glands large, rounded; 5) tympanum concealed; 6) dorsum rugose, with rounded tubercles uniformly distributed; 7) vocal sac and vocal slits absent; 8) fingers slender, not webbed nor ridged; first finger hypertrophied, with a rounded nuptial pad on the inner surface; 9) toes slender, slightly fringed; webbing absent; 10) ground color of dorsal surfaces dark brownish gray with an interorbital bar and dorsolateral blotches clear brownish gray, leaving an apparent pattern of arrows on dorsum; (11) venter and ventral surfaces of arms and thighs cream with diffuse gray stains and dots; gular region and chest dark brownish gray.



Figures 1-2. *Rhinella skuki* **sp. nov.**, holotype, MNRJ 74619, SVL 26.2 mm, in dorsal (1) and ventral (2) views.

Comparisons with other species. *Rhinella skuki* **sp. nov.** is readily distinguished from *R. boulengeri* by the smaller size (SVL 26.2 mm in male of *R. skuki* **sp. nov.**; 39.2-46.4 mm in males of *R. boulengeri*), snout long, narrow, spatulate, with parallel lateral borders and rounded tip in dorsal view, and long, strongly acute, in lateral view (snout short, wide, approximately truncate in dorsal view, and only acute in lateral view in *R. boulengeri*; Figs 3-8), head longer than wide (wider than long in *R. boulengeri*), and dorsal tubercles large and uniformly distributed (dorsal tubercles small, numerous, densely distributed in *R. boulengeri*).

Description of holotype. Stout build (Figs 1-2); head slightly longer than wide, HW 94.4% of HL, HW 32.4% of SVL, HL 34.3% of SVL. Snout, viewed from above, long, narrow, spatulate, with parallel lateral borders and rounded tip (Fig. 9); in lateral view, long, strongly acute (Fig. 10); canthus rostralis distinct, slightly concave; loreal region vertical, slightly concave; dorsum of snout concave. Nostrils lateral, nearer to the tip of snout than to eyes (snout to nostril distance 84.6% of eye to nostril distance); internarial distance slightly larger than eye to nostril distance, slightly smaller than eye diameter, and equal to the interorbital distance. Eyes large, not prominent, lateral, slightly directed ahead; eye to nostril distance smaller than eye diameter and interorbital distance, and larger than the upper eyelid width. Upper eyelid width smaller than interorbital distance. Tympanum concealed. Upper eyelid, head, dorsal skin, and dorsal surface of arms and legs rugose, with rounded tubercles uniformly distributed. Cephalic crests absent. Dorsum rugose, with rounded tubercles uniformly distributed. Parotoid gland large, rounded; forearm and tibial glands absent. Flanks, ventral skin, and ventral surfaces of arms and legs with rounded tubercles uniformly distributed; gular region and chest barely rugose, with few tubercles. Vocal sac and vocal slits absent; choanae small, widely separated; tongue long, free, not notched behind. Arms robust, forearm and arm approximately equal, without dermal crests. Hand robust (Fig. 11) with fingers slender, not webbed nor ridged, tips rounded, slightly expanded; fingers lengths I<II<IV<III; first finger hypertrophied, with a rounded nuptial pad on the inner surface; subarticular tubercles rounded, proximal tubercles more developed than distal ones; supernumerary tubercles absent; outer metacarpal tubercle large, elliptical, twice as long as wide; inner metacarpal tubercle large, rounded. Legs long, thigh and tibia lengths almost equal (THL 99.1% of TL; THL 40.4% of SVL; TL 40.8% of SVL); sum of tibia and thigh lengths 81.3% of SVL. Foot large (Fig. 12), foot length smaller than tibia and thigh lengths, 35.5% of SVL. Toes slender, slightly fringed; toes

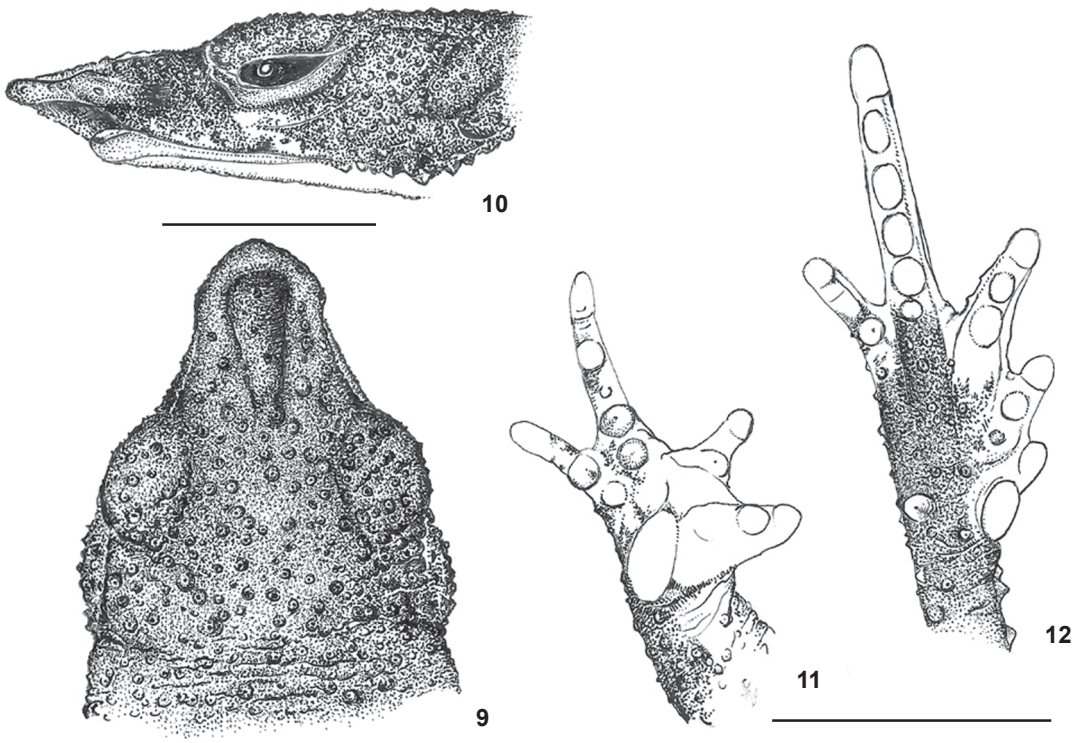


Figures 3-8. (3-5) *Rhinella skuki* **sp. nov.**, holotype, MNRJ 74619, SVL 26.2 mm: (3) dorsal view of head; (4) lateral view of head; (5) ventral view of head. (6-8) *Rhinella boulengeri*, UFBA 10086, SVL 27.8 mm: (6) dorsal view of head; (7) lateral view of head; (8) ventral view of head.

lengths I<II<V<III<IV; toe tips rounded, slightly expanded; webbing absent; subarticular tubercles large, rounded; sole of foot with distinct, large rounded supernumerary tubercles; outer metatarsal tubercle small, rounded; inner metatarsal tubercle very large, elliptical, with the external border free; three rows of approximately aligned tubercles on the ventral surface of tarsus. Anal region not modified, rugose.

Measurements of holotype (mm): SVL 26.2; HL 9.0; HW 8.5; IND 3.0; END 2.6; ED 2.9; UEW 2.3; IOD 3.0; HAL 6.4; THL 10.6; TL 10.7; FL 9.3.

Color in preservative. Background color of dorsal surfaces dark brownish gray with an interorbital bar and dorsolateral blotches clear brownish gray, leaving an apparent pattern of arrows on dorsum; arms and hands clear brownish gray with



Figures 9-12. *Rhinella skuki* **sp. nov.**, holotype, MNRJ 74619, SVL 26.2 mm: (9) dorsal view of head; (10) lateral view of head: (11) hand; (12) foot. Scale bars: 5 mm.

dark brownish gray blotches; legs dark brownish gray with transversal clear brownish gray bars. Venter and ventral surfaces of arms and thighs cream with diffuse gray stains and dots; gular region and chest dark brownish gray; hands cream; tarsus and feet gray and toes cream.

Additional specimens examined. *Rhinella boulengeri*: Brasil, *Bahia*: Arataca, Fazenda Boa Sorte (MNRJ 26455); Catu (UFBA 10086-10087, 10551); Macarani (MZUFV 6001); Salvador, Rio Cururipe (MNRJ 2733-2734); Vera Cruz (UFBA 10108); Wenceslau Guimarães (UFBA 10470). *Minas Gerais*: Almenara, Fazenda Limoeiro (MZUFV 4134-4138, MZUFV 5929-5934).

Geographic distribution: Known from the type locality, in the municipality of Itacaré, state of Bahia, northeastern Brazil. This locality is within the general range of *R. boulengeri*, but apparently the latter has a more inland distribution than *R. skuki* (Fig. 13).

Etymology. The species is dedicated to our late friend and herpetologist Gabriel "Gabo" Skuk. He was born in Montevideo, Uruguay, on 01 January 1962, and graduated in Biological Sciences by the Universidad de La República Oriental del Uruguay, Facultad de Ciencias (1980-1986); obtained his Master in Zoology (1989-1994) and PhD in Zoology (1994-1999) by the Universidade de São Paulo, Brazil. Great collector and fine biological observer, he was a pleasant companion, always prompt to help any person that asked for, even if in prejudice of his own interests. He was a professor in the Universidade Federal de Alagoas, Maceió, State of Alagoas, Brazil. Enthusiast of diving and submarine hunting, he drowned and died at the Tabuba beach, in the municipality of Paripueira, about 30 km North of Maceió, on 19 March 2011, at 49 years age.

DISCUSSION

The extensively disjunct distribution among the Andean members of the former *Rhamphophryne* and the two species occurring in eastern Brazil is remarkable, but not unique (e.g., see distribution of species of the eleutherodactylid genus *Adelophryne* in Hoogmoed *et al*. 1994, and of the bufonid species included in the *Rhinella margaritifera* group in Caramaschi & Pombal 2006). However, apparently the closely related *R. boulengeri* and *R. skuki* constitute an independent evolutionary branch. All species of the former genus *Rhamphophryne* and the species of *Rhinella sensu* Frost *et al*. (2006) (i.e., species currently allocated to the *R. margaritifera* group) present characteristic dorsolateral rows of tubercles extending from the posterior margin of the head or parotoid gland posteriorly along the flanks to or near to the groin (Trueb 1971, Hoogmoed 1990); *R. boulengeri* and *R. skuki* lack this character. Additionally, all species of the former genus *Rhamphophryne* have webbed hand and foot and developed cephalic crests; however, *R. boulengeri*

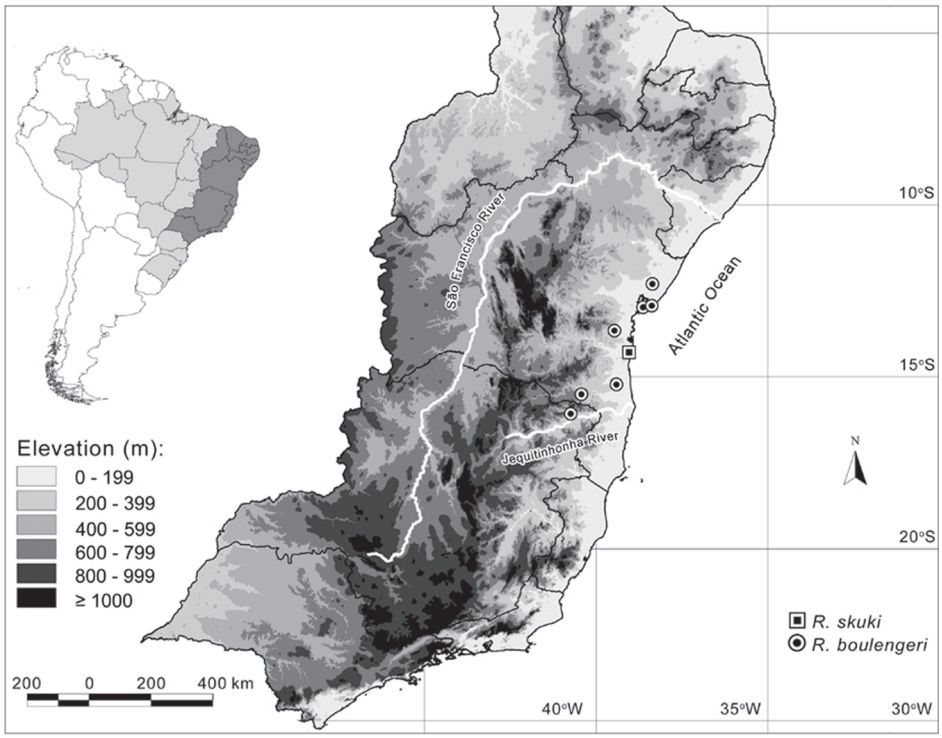


Figure 13. Geographic distribution of *Rhinella skuki* **sp. nov.** (square) and *R. boulengeri* (dots).

and *R. skuki* have free fingers and toes and no cranial crests. *Rhinella acrolopha*, *R. festae*, *R. macrorhina*, *R. tenrec*, and *R. truebae* present snout long and ventrally curved, *R. nicefori*, *R. rostrata*, and *R. ruizi* have a short and rounded snout, and *R. lindae* has an acuminate, more or less, triangular snout in dorsal view and protruding in lateral view (snout long, pointed, directed anteriorly in *R. boulengeri* and *R. skuki*); *R. lindae* and *R. truebae* have external tympanic membrane (absent in *R. boulengeri* and *R. skuki*), and *R. rostrata* have developed vocal slits (absent in *R. skuki*) (cf. Grant 2000, Lynch & Renjifo 1990, Rivero & Castaño 1990, Trueb 1971).

Rhinella skuki is currently known from one specimen (holotype), obtained in a locality in eastern State of Bahia, practically at the sea level. Intensive fieldwork in the region is needed to evaluate the actual distribution of this species, its population size, and conservation status.

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