

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Leiuperidae, *Physalaemus bokermanni*: Distribution extension.

Maria Tereza Chiarioni Thomé¹
Hilton Masaharu Oyamaguchi¹
Cinthia Aguirre Brasileiro²

¹Departamento de Ecologia, Instituto de Biociências, Universidade de São Paulo. Rua do Matão, Travessa 14. CEP 05508-900, São Paulo, SP, Brazil. E-mail: mtcthome@yahoo.com.br

²Museu de História Natural, Instituto de Biologia, Universidade Estadual de Campinas. Caixa Postal 6109. CEP 13083-970, Campinas, SP, Brazil.

Physalaemus bokermanni Cardoso & Haddad, 1985 (Figure 1) belongs to the *Physalaemus signifer* group, which is widely distributed throughout the Atlantic Forest (see Frost 2006). Nevertheless, *P. bokermanni* is only known to inhabit the type locality in the Serra de Paranapiacaba (23°45' S, 46°22' W; municipality of Santo André), in the state of São Paulo, Brazil.



Figure 1. *Physalaemus bokermanni* from Serra de Paranapiacaba, municipality of Santo André, state of São Paulo, Brazil. Photo by A. J. Cardoso.

During recent surveys, we found *P. bokermanni* in two new localities: 1) Barra do Una, municipality of São Sebastião (23°43'31" S, 45°45'11" W, collected in 17 October 2005), and 2) Ilha do Tatu, an urban region of the municipality of Cubatão (23°55'27" S, 46°25'14" W, collected in 12-14 July 2006). Thus, our observations provide new records of the poorly known *P. bokermanni* and extend the distribution approximately 62 km NE and 20 km SW, as well as its altitudinal range up to at least 750 m (Figure 2).

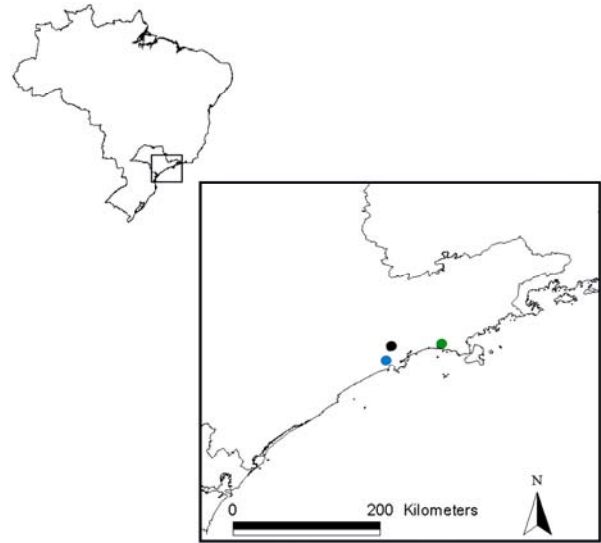


Figure 2. Distribution records of *Physalaemus bokermanni*, in the state of São Paulo, Brazil. Blue: Ilha do Tatu (municipality of Cubatão); black: type locality; green: Barra do Una (municipality of São Sebastião).

The identification of the *P. signifer* group is difficult and may depend on vocalization analysis (Haddad and Pombal 1998). We recorded advertisement calls of *P. bokermanni* in both localities, and they were similar to the original description (Cardoso and Haddad 1985) (Table 1). There was some variation in the size of individuals, although it was not statistically significant (ANOVA $F = 3.32$; $P = 0.08$); average snout-vent length of males was a little shorter in the populations of Barra do Una and Cubatão compared to the population found in its type-locality (Table 2).

Individuals were found calling near ponds inside the lowland forests, a variation of Atlantic forest restricted to the shores characterized by flat relief and frequent flooding. We observed signs of disturbance by human activity in both study sites, especially in Ilha do Tatu, which consists of a small area (around 2 ha) completely surrounded by residential areas and roads. Despite these disturbances, populations of *P. bokermanni* appeared healthy. Individuals were in reproductive activity in July and October, apparently presenting a prolonged pattern of reproduction (*sensu* Wells 1977), and we observed clutches in Ilha do Tatu and juveniles in Barra do Una.

NOTES ON GEOGRAPHIC DISTRIBUTION

Table 1. Comparisons of advertisement calls of three populations of *Physalaemus bokermanni* from the state of São Paulo, Brazil.

	Paranapiacaba *	Ilha do Tatu **	Barra do Una ***
Pulses per note	4-5	5-8 ($\bar{x} = 5.8 \pm 0.9$; N= 30)	5-7 ($\bar{x} = 5.3 \pm 1.6$; N= 5)
Note duration (s)	0.2	0.17- 0.25 ($\bar{x} = 0.2 \pm 0.1$; N= 17)	0.18- 0.3 ($\bar{x} = 0.2 \pm 0.1$; N= 5)
Interval between note (s)	0.4 – 0.6	0.2-0.7 ($\bar{x} = 0.3 \pm 0.2$; N= 17)	0.2-0.3 ($\bar{x} = 0.3 \pm 0.1$; N= 5)
Frequency range (kHz)	2.5 – 5.2	1.8 – 5.3	1.8 – 4.8

* Calls reported by Cardoso and Haddad (1985), air temperature 18 °C; ** Calls from three individuals, air temperature 17-19 °C; *** Calls from one individual, air temperature 18.5 °C.

Table 2. Snout-vent length of adults of three populations of *Physalaemus bokermanni* from the state of São Paulo, Brazil.

	Paranapiacaba *	Ilha do Tatu	Barra do Una
Males	15.3-17.0 ($\bar{x} = 16.2 \pm 0.7$; N= 5)	15.1-15.3 ($\bar{x} = 15.2 \pm 0.1$; N= 2)	14.0-15.8 ($\bar{x} = 15.1 \pm 0.8$; N= 5)
Females	-	17.1 (N= 1)	15.5-17.9 ($\bar{x} = 17.1 \pm 0.9$; N= 8)

* Data from Cardoso and Haddad (1985)

According to the GAA (Global Amphibian Assessment) and IUCN (2006), *P. bokermanni* is listed in the “DD” (data deficient) category. However, GAA states that on the basis of current information regarding distribution and habitat status, *P. bokermanni* qualifies for listing as Critically Endangered or Endangered (IUCN 2006). The conservation status of *Physalaemus bokermanni* does not seem to be of concern to Brazilian authorities as it is not on the Official List of Brazilian Fauna Threatened with Extinction (Brasil 2006).

Little is known about the distribution and abundance of Brazilian anuran fauna (see Pimenta et al. 2005). As a result, visits to new localities often seem to lead to reconsideration of the conservation status of endangered species (see recent examples in Peloso and Gasparini 2006; Marques et al. 2006). These records, together with ours, support the idea that the inclusion of anuran species on “red lists” should be avoided as long as knowledge about the real distribution of species is deficient, and highlight the importance of natural history information.

Voucher specimens were collected and deposited at the Célio F. B. Haddad anuran collection, Departamento de Zoologia, Universidade Estadual Paulista, Rio Claro, São Paulo, Brazil (Cubatão: CFBH 12505-12507; São Sebastião: CFBH9766-9775 and 12897-12899).

Acknowledgements

We thank Ricardo J. Sawaya and Fausto E. Barbo for help during the fieldwork at Barra do Una; FAPESP, National Science Foundation, Fundação O Boticário para Proteção da Natureza, and Idea Wild for financial support; Ibama for collecting permits (037/2005; 0103/06) and Tuim Parque for logistical support. We also thank Célio F. B. Haddad for identifying the specimens and for providing the photo, taken by Adão José Cardoso. CAB acknowledges FAPESP (03/06014-1) for Post-doctoral fellowships, MTCT and HMO acknowledges CNPq for graduate funding.

Literature cited

Brasil - Ministério do Meio Ambiente. 2006. Lista da Fauna Brasileira Ameaçada de Extinção. Accessible at <http://www.ibama.gov.br/fauna/extincao.php>. Captured on 22 October 2006.

NOTES ON GEOGRAPHIC DISTRIBUTION

- Cardoso, A. J. and C. F. B. Haddad. 1985. Nova espécie de *Physalaemus* do grupo *signiferus* (Amphibia, Anura, Leptodactylidae). *Revista Brasileira de Biologia* 45 (1/2): 33-37.
- Haddad, C. F. B. and J. P. Pombal Jr. 1998. Redescription of *Physalaemus spiniger* (Anura: Leptodactylidae) and description of two new reproductive modes. *Journal of Herpetology* 32 (4): 557-565.
- Frost, Darrel R. 2006. Amphibian Species of the World: an Online Reference. Version 4. Accessible at <http://research.amnh.org/herpetology/amphibia/index.php>. American Museum of Natural History, New York. Captured on 17 August 2006.
- IUCN, Conservation International, and NatureServe. 2006. GAA: Global Amphibian Assessment. Accessible at www.globalamphibians.org. Captured on 13 August 2006.
- Marques, R. M., P. F. Colas-Rosas, L. F. Toledo, and C. F. B. Haddad. 2006. Amphibia, Anura, Bufonidae, *Melanophryniscus moreirae*: distribution extension. *Check List* 2 (1): 68-69.
- Peloso, P. L. and J. L. Gasparini. 2006. Amphibia, Anura, Hylidae, *Dendropsophus ruschii* (Weygoldt & Peixoto, 1987): Rediscovery of Ruschi's treefrog in an Atlantic Rainforest remnant in Espírito Santo, Brazil. *Check List* 2 (2): 38-40.
- Pimenta, B. V. S., C. F. B. Haddad, L. B. Nascimento, C. A. G. Cruz, and J. P. Pombal, Jr. 2005. Comment on "Status and trends of Amphibian declines and extinctions worldwide". *Science* 309: 1999b.
- Wells, K. D. 1977. The courtship of frogs. Pp. 233-262. In D. H. Taylor and S. I. Guttman, (eds.), *The reproductive biology of amphibians*. New York, Plenum.

Received October 2006

Accepted November 2006

Published online January 2007