Check List **4**(4): 382–385, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Amphibia, Anura, Cycloramphidae, *Odontophrynus moratoi*: Distribution extension and advertisement call

Cinthia Aguirre Brasileiro [1]
Itamar Alves Martins [2]
Jorge Jim [3]

[1] *Universidade Estadual de Campinas, Museu de História Natural.*
Caixa Postal 6109, CEP 13083-000. Campinas, SP, Brazil. E-mail: cinthia_brasileiro@yahoo.com.br

[2] *Universidade de Taubaté, Instituto Básico de Biociências, Laboratório de Zoologia.*
Av. Tiradentes, 500. CEP 12030-180. Taubaté, SP, Brazil.

[3] *Universidade Estadual Paulista, Departamento de Zoologia.*
Rubião Junior s/n. CEP 18618-000. Botucatu, SP, Brazil.

Odontophrynus moratoi (Figure 1) is a small-sized frog (Table 1), presently known only from swampy areas (22°53'11" S, 48°30'78" W) in Rubião Júnior, municipality of Botucatu, state of São Paulo, southeastern Brazil, on elevations higher than 800 m (Jim and Caramaschi 1980). Herein we report on a new locality for *O. moratoi* as well as its advertisement call.

Field work was carried out between 1999-2002 at Estação Ecológica de Itirapina (EEI; 22°12'53" S, 47°54'41" W; 720-750 m), municipalities of Itirapina and Brotas, state of São Paulo, southeastern Brazil, where some individuals of *O. moratoi* were recorded. The *Instituto Brasileiro do Meio Ambiente and Recursos Naturais Renováveis* (IBAMA) issued collection permits for the field work (02027.010426/99-21). The EEI is composed by well preserved natural Cerrado vegetation such as *cerrado sensu stricto*, *campo cerrado*, gallery forest, marshes, and mainly *campo sujo* and *campo limpo* (*sensu* Eiten 1972). Specimens of *O. moratoi* were recorded only in a *campo sujo* area near a gallery forest.

This new record extends the distribution of *O. moratoi* approximately 105 km northwest of the type-locality (Figure 2). Females and males of *O. moratoi* from EEI were slightly smaller than those of the type series although we have not performed a statistical test to check for significant differences between populations (Table 1).

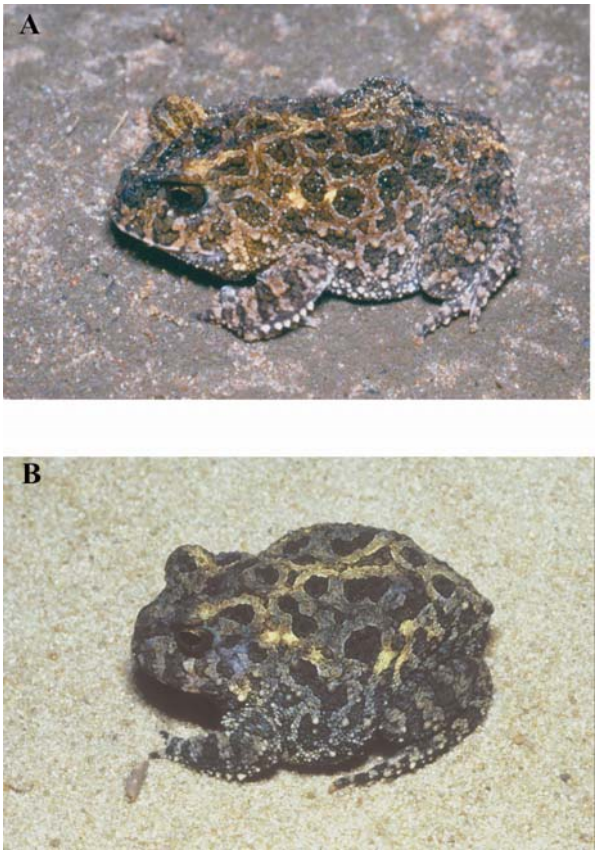

Figure 1. (A) *Odontophrynus moratoi* from type-locality, municipality of Botucatu, state of São Paulo, Brazil (Photo by I. Sazima), and (B) *O. moratoi* from *Estação Ecológica de Itirapina*, municipalities of Itirapina and Brotas, state of São Paulo, Brazil. Photo by R. J. Sawaya.

Check List **4**(4): 382–385, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

Table 1. Mean, standard deviation ($\bar{x}$ ± SD), and amplitude (max. – min.) of snout-vent length (in mm) of adults of two populations of *Odontophrynus moratoi* from the state of São Paulo, Brazil.

	Botucatu	*Estação Ecológica de Itirapina*
Males	$\bar{x}$ = 27.6; N = 24 * (25.8 – 31)	$\bar{x}$ = 28.0 ± 3.1; N = 65 (24.7 – 30.9)
Females	$\bar{x}$ = 35.7 ± 2.3; N = 2 (34.1 – 37.4)	$\bar{x}$ = 36.6 ± 4.9; N = 75 (32.1 – 41.6)

* Data from Jim and Caramaschi (1980), which shows no standard deviation.

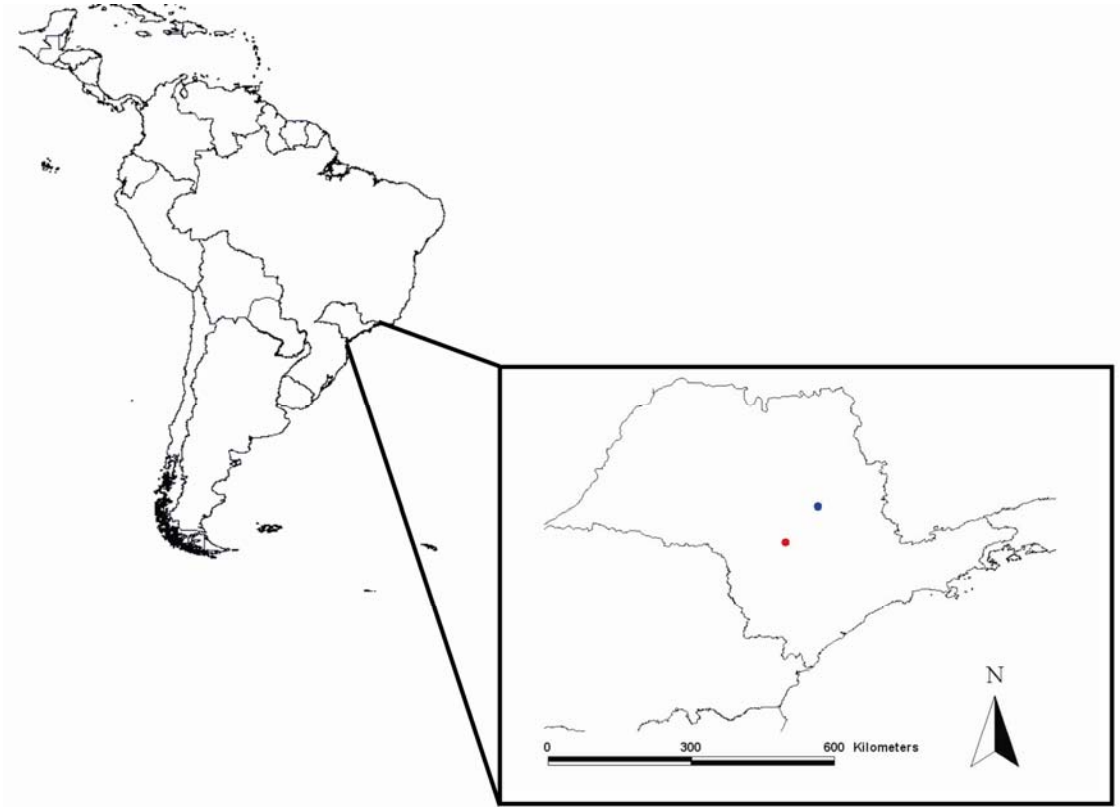

Figure 2. Distribution records of *Odontophrynus moratoi* in the state of São Paulo, Brazil. Red, type-locality; blue, *Estação Ecológica de Itirapina*.

Calls of two specimens of *O. moratoi* were recorded in Rubião Júnior (type-locality), municipality of Botucatu, state of São Paulo on 1983, with a Crowncorder tape recorder and a Crowncorder cardioid professional microphone. Calls of four individuals of *O. moratoi* from EEI were recorded in December 2001, with a Marantz PMD222 tape recorder and a Sennheiser ME 66 directional microphone. All tape-recorded vocalizations were digitized with a sampling rate of 44,100 Hz and 16 bits per sample in mono mode. Acoustic analyses were performed using the software CoolEdit 96 (Syntryllium Software Corporation), with a 20,000 Hz sampling frequency. The 256 points option (FFT – Fast Fourier Transform) and, when necessary, the 1,024 points option was used, mainly to determine fundamental frequencies.

Check List **4**(4): 382–385, 2008.
ISSN: 1809-127X

NOTES ON GEOGRAPHIC DISTRIBUTION

The advertisement calls of *O. moratoi* from both localities are very similar (Table 2, Figures 3 and 4). The call is characterized by short, pulsed notes regularly repeated. The mean dominant frequency of the population from Botucatu was 1,348 Hz (N = 59 calls), whereas that of the population from Itirapina was 1,342 Hz (N = 126 calls). Main variations of advertisement calls between populations were observed in temporal parameters, such as note duration and number of pulses per note (Table 2), although we have not performed a statistical test to check for significant differences between the populations. However, these differences are probably due to social interactions among individuals when calls were recorded. Specimens from Itirapina were in chorus, and the recorded individuals were calling in duets (Figure 4), whereas individuals from Botucatu were calling alone (Figure 5).

Calling males, females with eggs, and amplectant pairs were observed in EEI during three different rainy seasons (1999, 2000, 2001, 2002). On the contrary, in Botucatu, the population of *O. moratoi* seems to be decreasing. In the last ten years, no individuals were heard or observed, despite intense searches every rainy season. The possible causes of the decline might be habitat destruction due to urbanization (especially drainage of swampy areas) and agriculture (e.g. replace native grasses by pasture).

The present record represents not only a relevant contribution for the geographic distribution of *O. moratoi*, but also important information for reassessing the conservation status of the species. The EEI is an effective protected area used exclusively for research, thus it is possible that this population will not be affected by human impacts such as those seen at Botucatu.

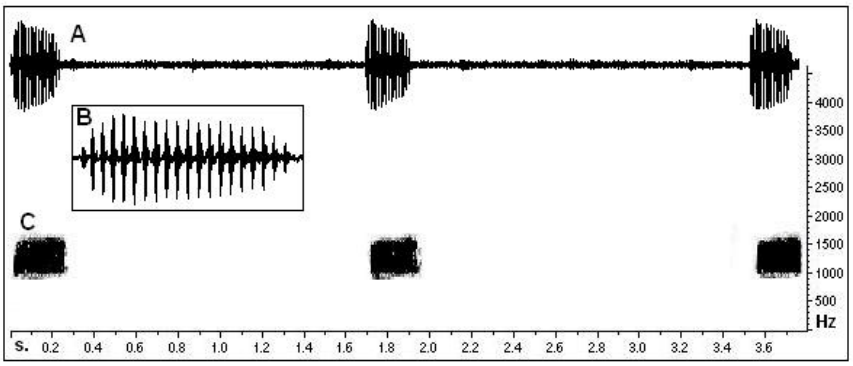

Figure 3. A, oscillogram; B, detailed oscilogram of note; and C, sonogram of the advertisement call of *Odontophrynus moratoi* from Botucatu, São Paulo. Air temperature 20 ºC.

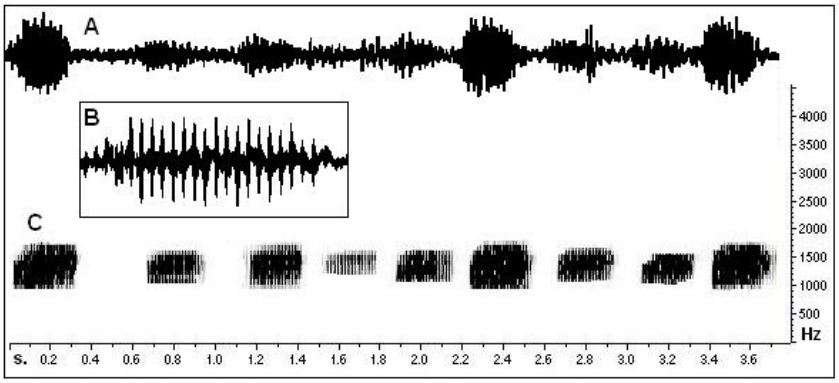

Figure 4. A, oscillogram; B, detailed oscilogram of note; and C, sonogram of the advertisement call of *Odontophrynus moratoi* from *Estação Ecológica de Itirapina*, São Paulo. Air temperature 22 ºC.

NOTES ON GEOGRAPHIC DISTRIBUTION

Table 2. Mean, standard deviation ($\bar{x}$ ± SD), and amplitude (max. – min.) of acoustic parameters of the advertisement calls of *Odontophrynus moratoi* from Botucatu and *Estação Ecológica de Itirapina* (EEI), Itirapina, state of São Paulo, Brazil.

	Botucatu (n = 59) *	EEI (n = 126) **
Frequency bands (Hz)	928.6 - 1659.5 ± 41.2 (853 – 1756)	842 – 1776 ± 86.5 (752 – 1979)
Dominant frequency (Hz)	1348.7 ± 86.6 (1153 – 1420)	1342 ± 73.7 (1174 – 1444)
Note duration (ms)	206.8 ± 17.6 (146 – 238)	245.4 ± 28.7 (185 – 307)
Number pulse per note	17.5 ± 1.5 (12 – 20)	20.5 ± 2.5 (15 – 26)
Note repetition rate (note/min.)	29.9 ± 1.3 (28.6 – 31.5)	32.3 ± 6.0 (28.9 – 41.8)

* Calls from two individuals, Air temperature 20 ºC; ** Calls from four individuals, air temperature 22 ºC.

In fact, this species is considered Vulnerable by the Red List of Threatened Species of São Paulo state, and Critically Endangered by the Brazilian Red List of threatened species and IUCN list (IUCN 2006). Further inventories in preserved areas around Botucatu and EEI are required to better identify the real conservation status of *O. moratoi*. However, this category will probably change if other populations are found. We suggest to consider *O. moratoi* as a data deficient species in the Brazilian and Local Red Lists.

Voucher specimens of *Odontophrynus moratoi* from *Estação Ecológica de Itirapina* are deposited at the *Coleção de Anfíbios, Departamento de Zoologia, Universidade Estadual Paulista*, Rio Claro, state of São Paulo, Brazil (CFBH 6515, 12854-12862), and also at the *Museu de Zoologia "Prof. Dr. Adão José Cardoso"*, *Instituto de Biologia*, *Universidade Estadual de Campinas*, Campinas, state of São Paulo, Brazil (ZUEC 13021).

Acknowledgements

We are grateful to the *Instituto Florestal* for permission to work in the *Estação Ecológica de Itirapina* and providing logistical support. Many people helped in the fieldwork, especially Ricardo. J. Sawaya, Mara C. Kiefer, and Graziella Giradelli. Ivan Sazima and Ricardo J. Sawaya provided photos of specimens; Maria Tereza C. Thomé helped with the map and Hilton M. Oyamaguchi digitalized calls from Itirapina population. Sílvio Cesar Almeida gave us some information on the occurrence of individuals in Botucatu in the last years. Bruno V.S. Pimenta, Ulisses Caramaschi and an anonymous reviewer provided helpful suggestions. Field work was funded by *Fundação de Amparo à Pesquisa do estado de São Paulo* (FAPESP), *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq) and Neotropical Grassland Conservancy. CAB thanks FAPESP for graduate fellowships. IAM thanks FAPESP for financial support (01/13341-3 and 06/56007-0). This is publication number 34 of the project "*Ecologia do Cerrado de Itirapina*".

Literature cited

Eiten, G. 1972. The Cerrado vegetation of Brazil. The Botanical Review 38: 201-341.

IUCN. 2006. IUCN Red List of Threatened Species. Accessible at http://www.iucnredlist.org. Captured on 24 April 2008.

Jim, J. and U. Caramaschi. 1980. Uma nova espécie de *Odontophrynus* da região de Botucatu, São Paulo, Brasil (Amphibia, Anura). Revista Brasileira de Biologia 40(2): 357-360.

Received May 2008
Accepted September 2008
Published online October 2008