

A New Species of *Megaelosia* from the Mantiqueira Range, Southeastern Brazil

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ABSTRACT.—A new species of frog of the genus *Megaelosia* is described. The new form closely resembles *Megaelosia massarti* and is distinguished from it by coloration pattern and number of chromosomes. Natural history notes, tadpole description, and a discussion on the conservation status of the new species are provided.

Megaelosia (Mir.-Rib., 1923) (Anura: Leptodactylidae) species are known to occur in forested mountain rivers of the Atlantic Forest in Southeastern Brazil (Giaretta et al., 1993). The genus was recently reviewed, and four species were recognized (Giaretta et al., 1993). Recent findings of *Megaelosia* individuals in the Mantiqueira Range revealed a new species. Here the new species is characterized by aspects of its morphology, coloration, and karyotype. In addition, notes on natural history and tadpole morphology are provided. The conservation status of the new species is discussed.

MATERIAL AND METHODS

The new species was collected at the Parque Florestal do Itapetinga (23°15'S; 46°45'W, 1250 m asl), Atibaia municipality, Mantiqueira range of São Paulo state, Brazil. The Serra da Mantiqueira is badly defined in its continental face and, in the São Paulo and Rio de Janeiro states, the east border runs approximately parallel to the coastal Serra do Mar (Fig. 1) (Moreira and Camelier, 1977).

The terminology and measurements used in the specimens description follow Lynch (1971) and Giaretta et al. (1993). Tadpoles identification were based in comparisons among developmental series and staging follows Gosner (1960). The karyotype was based on eight mitotic metaphases obtained from the gills of two tadpoles. Herpetological works in the type locality of the new species have been carried out since 1991 (Giaretta, 1994) and, since just one species of *Megaelosia* was found there, there is little chance in confounding congeneric tadpoles. Terminology in the karyotype description follows Levan et al. (1964). The types and voucher specimens are housed in the Museu de História Natural da Universidade Estadual de Campinas (ZUEC) (Campinas, SP, Brazil).

Megaelosia boticariana sp. nov.

Holotype.—ZUEC 9561, a 74.9 mm SVL female bearing immature eggs, collected in March 1994 in the Parque Florestal do Itapetinga, Municipality of Atibaia, state of São Paulo, southeastern Brazil.

Paratypes.—ZUEC 9562, a 78.1 mm SVL female (Fig. 2) bearing immature eggs, collected in November 1993; ZUEC 9563, a 46.8 mm SVL juvenile, collected in April 1993. All individuals were collected in the type locality (Fig. 1).

Diagnosis (See also figures in Giaretta et al., 1993).—Snout round in dorsal and lateral views; fold of fifth toe not reaching the outer metatarsal tubercle; dorsum of fingers smooth; no evidence of scutes on finger tips; belly finely reticulated, 30 pairs of chromosomes. The new species differs from *M. goeldii* in snout shape and in the extension of the fold of the fifth toe; from *M. lutzae* in snout shape; from the holotype of *M. bocainensis* (Giaretta et al., 1993) by the absence of scutes and tubercles on the fingers and by having the tympanum partially covered by the supratympanic ridge; from *M. massarti* by showing a finely reticulated belly and females about 28% smaller in size.

Description of the Holotype (Fig. 3).—Snout outline round in dorsal and lateral views; canthus rostralis evident and straight; lores concave; tympanum distinct, small, about 32% of the eye diameter; maxillary arch with fanglike teeth; one large vomerine tooth between and slightly posterior each choanae; a round median pin-like process in the mandibular symphysis region, which has a correspondent case in the maxillae. Finger length II < IV < I < III; upper surfaces of fingers smooth. Dorsal surfaces of body, belly, throat, upper surface of upper arms, thighs, and forearms smooth. Lower surfaces of thighs smooth anteriorly and finely granular posteriorly. Supratympanic ridge conspicuous, com-

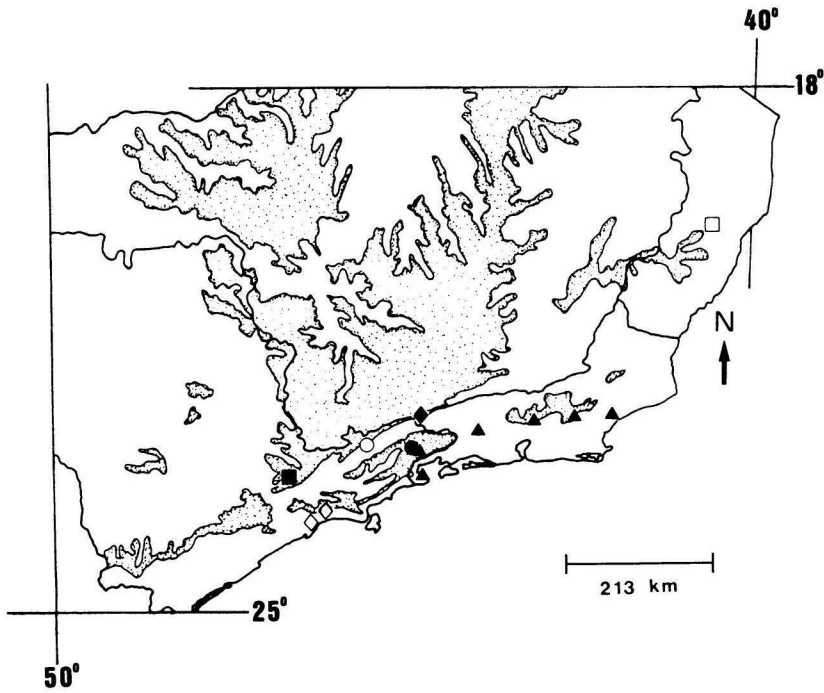


FIG. 1. Occurrence of *Megaelosia* species in southeastern Brazil. Open square = *Megaelosia* sp.1.; closed triangles = *Megaelosia goeldii*; closed diamond = *Megaelosia lutzae*; closed circle = *Megaelosia bocainensis*; open diamond = *Megaelosia massarti*; open circle = *Megaelosia* sp.2, and closed square = *Megaelosia boticariana* sp. nov. Stippled areas join approximate 800 meter contours.

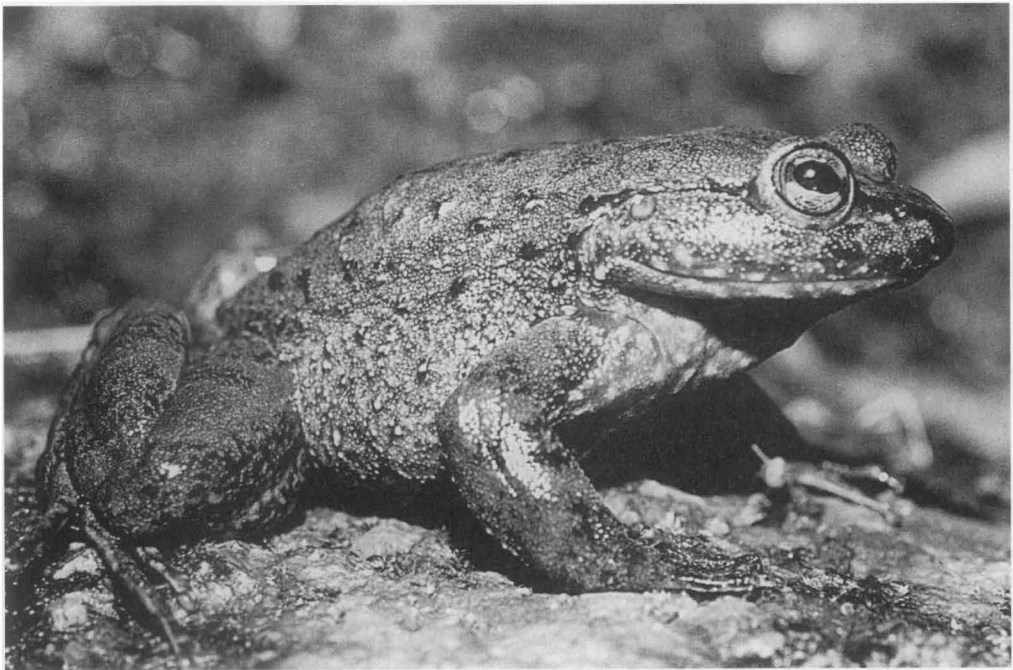


FIG. 2. *Megaelosia boticariana* sp. nov. in life (paratype ZUEC 9562).

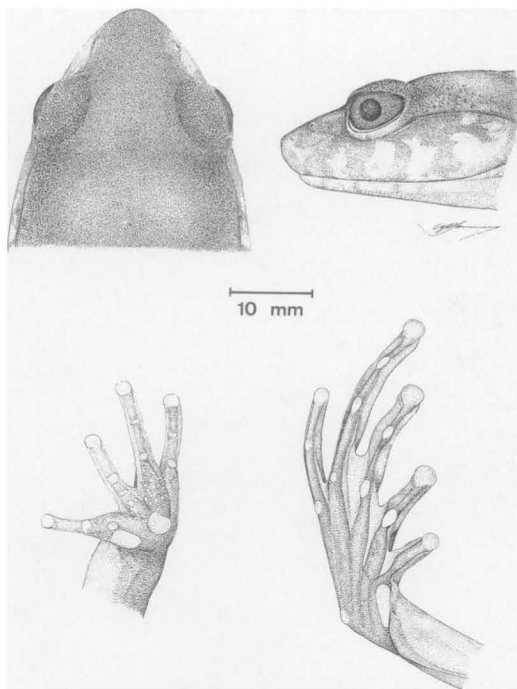


FIG. 3. *Megaelosia boticariana* sp. nov. (holotype ZUEC 9561). Head, dorsal (above left) and lateral view (above right); hand (below left) and foot (below right).

posed of a dermal fold which covers part of the upper border of the tympanum, extending from behind eye to near arm insertion. Fingers and toes tips slightly enlarged; finger tips with no evidence of scutes; toe tips with distinct scutes fused to the subunguis. Sides of fingers weakly fringed. Toes with traces of basal webbing and extensively fringed on sides; fold of the fifth toe not reaching the outer metatarsal tubercle. Inner metatarsal tubercle elliptical, $3.3\times$ the length of the round outer. Subarticular tubercles round on hands and feet. Inner tarsal fringe extending from middle of first phalange of toe I to near tibia-tarsus articulation. Toe length $I < II < V < III < IV$. Proportions, in relation to SVL (74.9 mm) are: head length 39% (from posterior border of tympanum to top of snout); head width 46%; thigh length 53%; shank length 53%; foot length 54%.

Color and Variation.—Dorsal surfaces of living individuals yellowish-brown or yellowish-green; many, small yellow blotches on belly and throat; iris copper, finely reticulated in black. Two or three darker bars in thigh and shank. One bar in each forearm. Ventral surface of body finely reticulated in pale gray and many, small pale yellow blotches. Alcohol preserved individuals are dark gray on the dorsal surfaces. The paratype ZUEC 9562 shows large sparse

black warts on the dorsolateral regions of the body. Maximum observed size of the species was 95.3 mm SVL (a live female).

Tadpoles.—Similar to that of *M. massarti*, described and figured in Heyer et al. (1990) and Giaretta et al. (1993). Body ovoid in dorsal and lateral view. Eyes dorsolaterally positioned. Nares in the mid distance from the eyes to the tip of snout. Spiracle sinistral. Cloacal tube short and broad, opening dextrally. Tail deeper than body. Tip of the snout rounded. Mouth directed anteroventrally. Median region of upper lip lacking papillae. Five teeth rows; the upper and lower rows adjacent to beak narrowly interrupted medially. Beak strongly developed and grossly serrated. Lateral line system well defined on body and tail. Preserved tadpoles have pale brown body and pale gray fins with large irregular brown spots. Proportions, in relation to a 99.3 mm long tadpole (ZUEC, 9564; stage 25; collected November 1995), are: body length = 34.1%; body width = 23.5%; mouth width = 10.5%; eye diameter = 3.1%; eye-nostril distance = 5.0%; spiracle = 1.8%; anal tube = 3.1%.

Karyotype.—A diploid number of 30 chromosomes was found in *Megaelosia boticariana* sp. nov. (Fig. 4). The karyotypes are formed by 11 metacentric pairs (1, 3, 5, and 8–15); by 3 submetacentric pairs (2, 4, and 7) and 1 subtelocentric pair (6). A conspicuous secondary constriction is present in the short arms of the pair 1.

Habitat and Natural History.—The Parque Florestal do Itapetinga and adjacent areas are covered by an altitudinal semi-deciduous forest. The local climate is seasonal, with a dry/cold season (with frequent frosts in July) and a wet/warm season, from October to February. The individuals of the new species were found in a small (0.5 m wide) clean, cold montane rivulet. Five frogs were found at the water edge, hidden in the crevices between granitic rocks. Three females (including the two types) emitted weak vocalizations when handled in the field. Tadpoles were found at night in deeper pools. Small tadpoles (32–44 mm) were found in middle November.

Etymology.—The specific epithet honours the Fundação Boticário de Proteção à Natureza, that supports projects in nature conservation in Brazil, including the herpetological studies in the type locality of the new species.

DISCUSSION

A general updated distributional pattern of *Megaelosia* species is presented in the Fig. 1; see Giaretta et al. (1993) for a discussion on the northernmost species, *Megaelosia* sp.2 refers to a population with a particular karyotype (Giaretta and Aguiar Jr, in prep.). The karyotype of *M. boticariana* sp. nov. ($2n = 28$) closely resem-

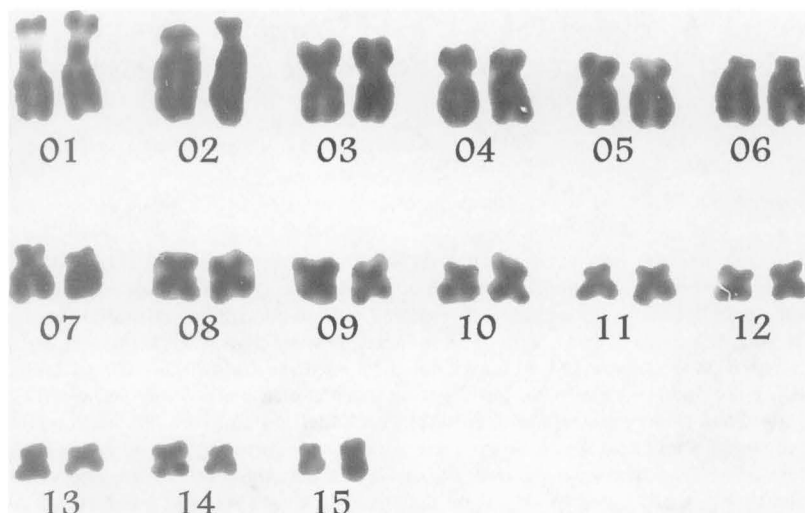


FIG. 4. Karyotype of a tadpole of *Megaelosia boticariana* sp. nov. (3100X). Note the secondary constriction on the first pair.

bles that of *M. massarti* ($2n = 30$) (Melo et al., 1995) in size and form of chromosomes, but not in number. The senior author had manipulated living individuals of *M. massarti* in the field and never observed call emission in this species; this behavioral difference may reinforce the diagnosis between these species. Besides, *M. boticariana* sp. nov. and *M. massarti* occur in different hydrographic basins. Conservation interests prevented us from making a larger type series and killing more individuals for karyotypic analysis. The new species is only known from the type locality, a 1800 ha forest remnant, where only 240 ha are protected effectively. Forests around the type locality are smaller and scattered and the open lands have been occupied by human settlements. Thus, we suggest that *M. boticariana* sp. nov. could be regarded as a threatened frog species.

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LITERATURE CITED

- GIARETTA, A. A. 1994. Utilização de recursos e potencial reprodutivo dos leptodactilídeos (Amphibia-Anura) de uma floresta semidecídua de altitude no sudeste do Brasil. Unpubl. MS Diss., Univ. Est. Campinas, São Paulo.
- GIARETTA, A. A., W. C. A. BOKERMANN, AND C. F. B. HADDAD. 1993. A review of the genus *Megaelosia* (Anura: Leptodactylidae) with description of a new species. *J. Herpetol.* 27:276–285.
- GOSNER, K. L. 1960. A simplified table for staging anuran embryos and larvae with notes on identification. *Herpetologica* 16:183–190.
- HEYER, W. R., A. S. RAND, C. A. G. CRUZ, O. L. PEIXOTO, AND C. E. NELSON. 1990. *Frogs of Boracéia*. *Arq. Zool., São Paulo* 31:237–358.
- LEVAN, A., K. FREDGA, AND A. A. SANDBERG. 1964. Nomenclature for centromeric position on chromosomes. *Hereditas* 52:201–220.
- LYNCH, J. D. 1971. Evolutionary relationship, osteology, and zoogeography of leptodactyloid frogs. *Misc. Publ. Univ. Kansas Mus. Nat. Hist.*, 53:1–238.
- MOREIRA, A. A. N., AND C. CAMELIER. 1977. Relevo. In *Geografia do Brasil, Região sudeste*. IBGE. 1–50.
- MELO, A. S., S. M. RECCO-PIMENTEL, AND A. A. GIARETTA. 1995. The karyotype of the stream dwelling frog *Megaelosia massarti* (Anura, Leptodactylidae, Hylodinae). *Cytologia* 60:49–52.

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