

A NEW SPECIES OF *LEPOSOMA* (SQUAMATA: GYMNOPHTHALMIDAE) FROM THE ATLANTIC FOREST OF BRAZIL

MIGUEL TREFAUT RODRIGUES

*Universidade de São Paulo, Instituto de Biociências, Departamento de Zoologia,
Caixa Postal 11.461, CEP 05422-970, São Paulo, Brazil*

ABSTRACT: A new species of *Leposoma* is described from the Atlantic rainforests of the State of Bahia, Brazil. The new species has a single frontonasal scale, elongate dorsals, lanceolate ventrals in transverse and diagonal rather than in longitudinal rows, and conical tubercles on the side of the neck. It further differs from all congeneric species by having the lowest total number of femoral pores (six), and fourth finger, and fourth toe lamellae (seven and 10, respectively). The new species was obtained syntopically with *Leposoma scincoides*.

Key words: *Leposoma nanodactylus*; New species; Gymnophthalmidae; Brazil

LIZARDS of the genus *Leposoma* occur exclusively in tropical forest areas, from Costa Rica to the Atlantic slopes of eastern Brazil. Among other features, they are characterized by the synapomorphic absence of the second process series on the caudal vertebrae (Presch, 1980). Based on overall similarity, the 11 species presently recognized can be separated in two species groups (Rodrigues and Borges, 1997; Ruitbal, 1952). Species of the *scincoides* group (*Leposoma scincoides* and *L. baturitensis*) have elongate dorsal scales and lanceolate ventrals that are arranged in diagonal rather than in longitudinal rows. *Leposoma scincoides* is restricted to the Atlantic forests of eastern Brazil from Terezópolis in the State of Rio de Janeiro to Salvador in the State of Bahia. *Leposoma baturitensis* seems to be endemic to Serra de Baturité, an isolated forested mountain range in the semiarid Caatingas of the State of Ceará, northeastern Brazil. In species of the *parietale* group, dorsal scales are wider and shorter, ventral scales range from rectangular to rhomboid, are keeled and slightly mucronate, and are arranged in regular longitudinal rows (Rodrigues and Borges, 1997). Species of the *parietale* group, all occurring from Amazonia to the north, are *L. hexalepis* from the Orinoco Basin in Colombia; *L. ioanna* from the Valle de Cauca, Pacific Colombia; *L. rugiceps* from the Canal Zone of Panama to Santa Marta and Valle de Rio Magdalena in Colombia; *L.*

southi ranging from Costa Rica throughout Panama to Colombia; *L. parietale* from the Amazonian slopes of the Andes in Peru, Ecuador, Colombia, and adjacent Brazil; *L. percarinatum* and *L. guianense* from central and eastern Amazonia; and *L. oswaldoi* and *L. snethlageae* from western Amazonia of Brazil (Avila-Pires, 1995; Ayala and Harris, 1982; Rodrigues and Borges, 1997; Uzzell and Barry, 1971).

Although the *parietale* group is more species rich than the *scincoides* group, field work in eastern Brazil revealed that the *scincoides* group is more diverse than previously thought. Herein, I describe a new species of the *scincoides* group from the Atlantic rainforests of the State of Bahia, Brazil, one of the most threatened forest habitats in the world. This new species was collected almost 10 yr ago, and its description has been waiting for other conspecific specimens. As no additional specimens have been obtained, its description follows in order to stimulate further collection and to provide a more accurate record of biological diversity.

MATERIALS AND METHODS

The holotype was collected during a survey of the herpetofauna of the Atlantic forests of State of Bahia. During this survey, several specimens of other species of *Leposoma* were collected and housed at the herpetological collection of the Museu de Zoologia da Universidade de São Paulo

(MZUSP). I obtained data from the literature, preserved specimens at MZUSP, and specimens housed in the following collections (Appendix I): Universidade Federal do Ceará (UFC), Universidade Federal da Paraíba (UFPB), Museu Nacional do Rio de Janeiro (MN), Chicago Field Museum (FMNH), Museu de História Natural—Universidade de Campinas (ZUEC), and the private collection of Sérgio Potsch Carvalho e Silva (SPCS). Scale nomenclature and scale counts are according to Uzzell and Barry (1971). Snout-vent length and tail length were measured to the nearest 1 mm with a ruler.

SPECIES DESCRIPTION

Leposoma nanodactylus sp. nov.

Holotype.—MZUSP 66.474, an adult male obtained at São José do Macuco (Fazenda Unacau): State of Bahia: Brazil (15°09' S, 39°18' W); collected by Miguel T. Rodrigues on 15 October 1986.

Diagnosis.—A *Leposoma* having a single frontonasal scale, lanceolate ventrals in transverse but not longitudinal rows, conical granules on the side of the neck, six femoral pores, and very few subdigital lamellae on the digits: seven on Finger IV and 10 on Toe IV, respectively. As in other species of *Leposoma*, the second process series on caudal vertebrae is absent.

Leposoma nanodactylus differs from all other species of *Leposoma* by having (data for *L. nanodactylus* followed by combined data for all other species) the lowest total number of femoral pores (six, 8–17), the lowest number of subdigital lamellae under Finger IV (seven, 8–14), and the lowest number of subdigital lamellae on Toe IV (10, 11–21). It can be distinguished from the species of the *parietale* group by its lanceolate ventrals in transverse and diagonal rows. *Leposoma nanodactylus* is clearly a member of the *scincoides* group by its lanceolate ventrals arranged in diagonal rather than in regular longitudinal rows. *Leposoma scincoides* differs from *L. nanodactylus* in having a longitudinally divided frontonasal scale (single in *nanodactylus*). In *L. scincoides*, all scales on the dorsal surface of the head are heavily stri-

ated; such striations also are present in *L. nanodactylus*, but they are weak, and absent on the frontonasal. *Leposoma scincoides* further differs from *nanodactylus* in the following characters (data for *nanodactylus* in parentheses): 19–21 ventrals (18); femoral pores 12–16 (6); subdigital lamellae on Finger IV 11–14 (7); subdigital lamellae on Toe IV 15–21 (10). *Leposoma nanodactylus* can be distinguished from *L. baturitensis* by the following characters (data for *nanodactylus* in parentheses): 24–26 (27) scales around midbody; 25–27 (33) dorsals; 9–11 (6) total femoral pores; 11–12 (7) subdigital lamellae under Finger IV; 16–18 (10) subdigital lamellae on Toe IV. *Leposoma baturitensis* presents a strong dichromatism in color pattern; males being almost black laterally and ventrally, and females dorsally brown with a cream venter. The adult male and only specimen known of *L. nanodactylus* has a dark brown to black pigmentation ventrolaterally, but the midventral region is cream. Adult males of *L. scincoides*, as do females, have a cream venter. *Leposoma nanodactylus* also differs from the two species of the *scincoides* group by having the first supraocular divided in two small granules. Table 1 summarizes data for all species of *Leposoma*, considering specimens examined and data from the literature.

Description of the holotype.—(Figs. 1–2). Rostral broad, wider than high, contacting first supralabial, nasal, and frontonasal. Frontonasal single, as large as long, biconcave posteriorly, just reaching anterior supraocular, in broad contact with rostral, nasal, loreal, and prefrontals. Prefrontals in broad contact. Frontal hexagonal with lateral margins slightly concave; approximately twice as long as wide; posteriorly adjacent to paired frontoparietals. Frontoparietals larger than prefrontals, in broad contact. Interparietal as large as frontal with almost straight lateral margins. Parietals wider than interparietal, posterior margins rounded. Supraoculars five; the fourth largest, second the smallest. First supraocular longitudinally elongate, in contact with first superciliary; second triangular, lacking contact with superciliaries;

TABLE 1.—Scales around body (SAB), number of dorsal and ventral scales, total number of femoral pores, IV finger, and IV Toe infradigital lamellae in the genus *Leposoma*. Data were taken from specimens examined (Appendix I) and from Avila-Pires (1995), Ayala and Harris (1982), Ruibal (1952), and Uzzel and Barry (1971).

Species	SAB	Dorsals	Ventrals	Femoral pores	IV finger	IV toe
<i>baturitensis</i>	24–26	25–27	17–18	9–11	11–12	16–18
<i>guianense</i>	23–26	30–35	19–25	9–12	9–12	14–17
<i>hexalepis</i>	33–35	31–34	23–26	males unknown	13	15–16
<i>ioanna</i>	21–22	28–30	20	males unknown	12–15	17–20
<i>nanodactylus</i>	27	33	18	6	7	10
<i>oswaldoi</i>	26–29	32–34	20–23	10–12	9–11	13–15
<i>parietale</i>	23–27	30–38	19–24	10–17	8–11	10–16
<i>percarinatum</i>	24–27	35–40	22–28	parthenogenetic	10–13	15–20
<i>rugiceps</i>	20–25	27–31	22–24	10	11–13	17–18
<i>scincoides</i>	25–30	29–35	19–21	12–16	11–14	15–21
<i>snethlageae</i>	24–26	31–36	21–23	8–12	8–10	11–14
<i>southi</i>	20–25	28–33	20–24	8	10	13

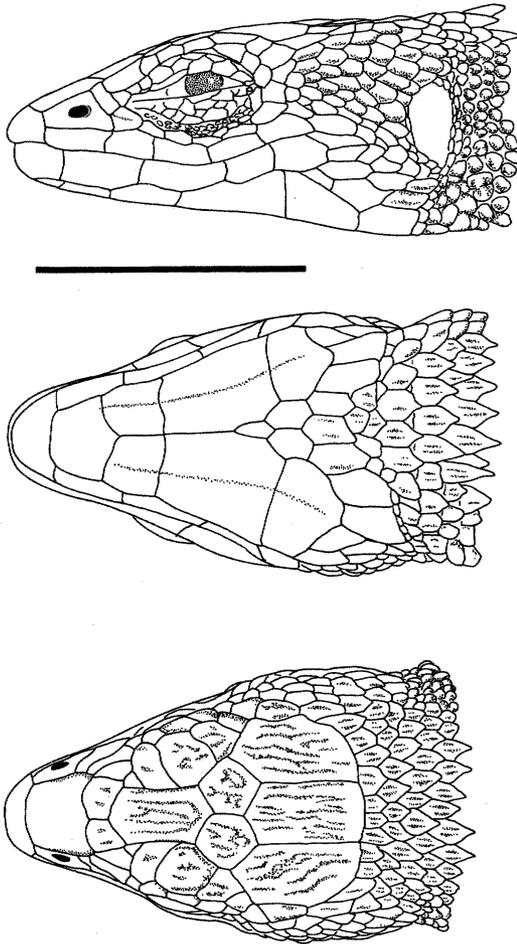


FIG. 1.—Lateral, ventral, and dorsal views of the head of the holotype of *Leposoma nanodactylus* (MZUSP 66.474, holotype). Scale bar = 5 mm.

both granular, corresponding in position to first supraocular of other species of *Leposoma*. Nasal large, longer than wide, entire, with the nostril in center. Loreal posterior to nasal, long, narrow, and diagonally oriented; anterior to pentagonal frenocular. Infraorbital granules four. Supralabials six; first largest. Superciliaries seven, first larger than first supraocular, expanded on lateral surface of head. Eyelid with palpebral disc formed by three or four scales. Temporal region covered with slightly keeled, juxtaposed scales, larger than granules of lateral surface of neck. Ear opening bordered by series of small granules; tympanum distinct. Dorsal head scales mostly smooth, flat, with weak longitudinal striations (absent on frontonasal). Side of neck covered with conical, sometimes keeled granules.

Mental broad, wider than long. First pair of genials smallest, second largest, both in contact medially and with infralabials. Third pair of chin shields intermediate in size, in contact with infralabials and separated medially by two elongate scutes. Five scutes on each side between third pair of chin shields and gulars; diagonally oriented, symmetric, flat. Infralabials five; first and second largest, subequal. Gulars in seven transverse rows, most scales in anteriormost row smooth, slightly rounded, grading in posterior rows to lanceolate and slightly keeled. Collar fold indistinct, concealing small granules

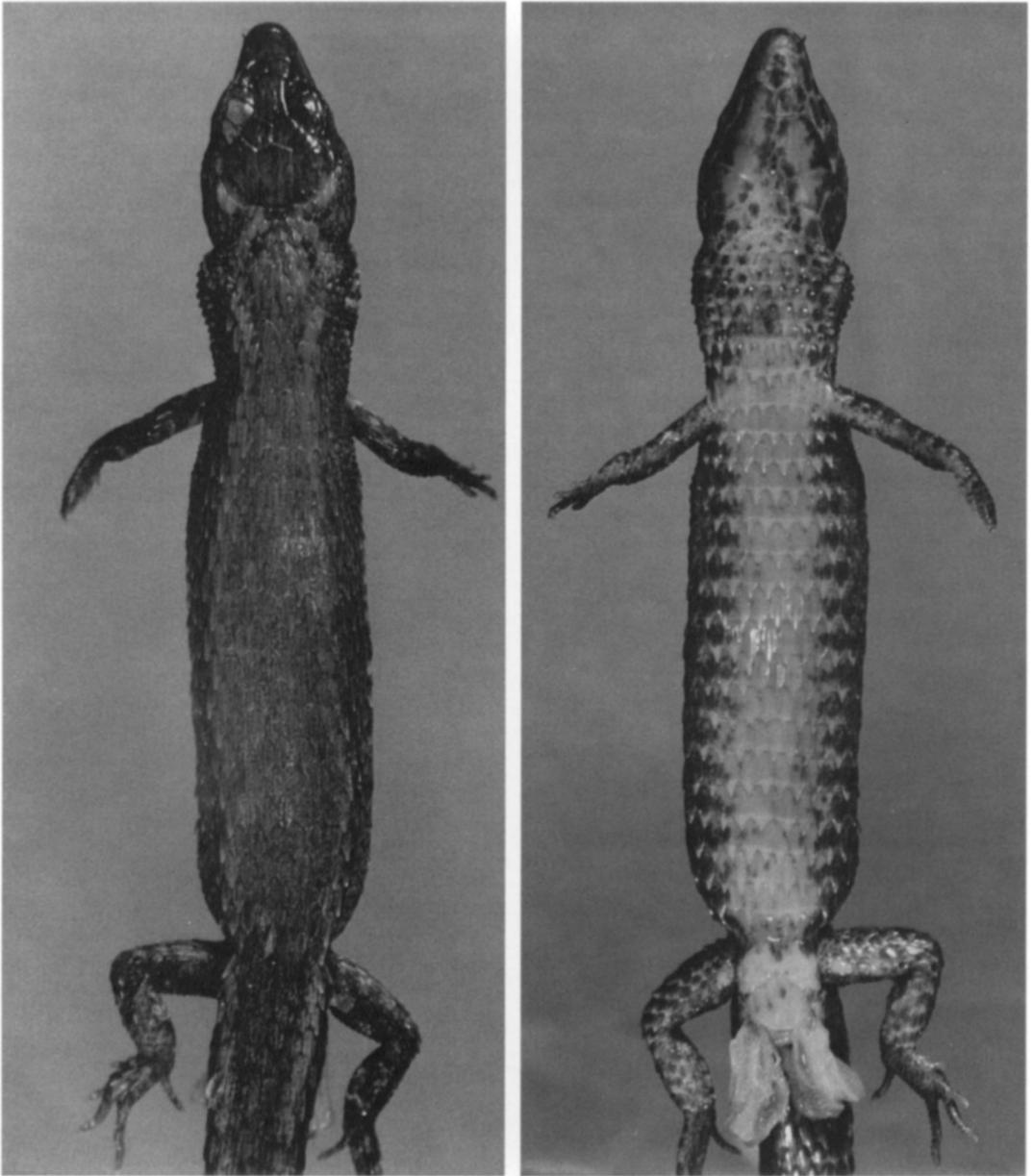


FIG. 2.—Dorsal and ventral views of the holotype of *Leposoma nanodactylus* (MZUSP 66.474, adult male).

laterally. Interbrachial region with 10 scales identical to ventrals.

Dorsal scales large, strongly keeled, mucronate, imbricate, becoming laterally juxtaposed at midbody, in 33 regular transverse rows between interparietal and posterior level of hind limbs. Lateral scales resemble dorsals; grade into ventrals ex-

cept for an area with small granules above arm level. Distinct granular area in groin. Scales around midbody 27. Ventrals lanceolate, slightly keeled, strongly mucronate, imbricate, in 18 regular transverse and diagonal rows from interbrachials (included) to preanals. Posterior margin of vent with five scales; central and parame-

dial scales largest. Transverse series of six lanceolate, mucronate, weakly keeled scales anterior to vent scales. Preanal pores four, two on each side; total femoral pores six.

Scales of tail in complete rings, more regular ventrally; dorsal and lateral tail scales more strongly keeled and wider than ventral scales.

Limb scales keeled and imbricate, except on ventral surface of brachium and on posterior surface of thigh which are granular. Palmar and plantar surfaces with small, conical granules. Subdigital lamellae mostly double, seven on Finger IV and 10 on Toe IV. Fingers and toes clawed, with the following relative sizes: $1 < 2 = 5 < 3 < 4$ and $1 < 2 < 5 < 3 < 4$, respectively. First finger reduced, lacking subdigital lamellae.

Dorsal surface of body and tail light brown. A dorsolateral light stripe one-half to one scale wide extends from neck to base of tail. Flanks and lateral surface of tail slightly darker than dorsum; a few small light spots on neck, above arm, ventrolaterally, in groin. Inconspicuous, irregular dark brown line two scales wide beneath dorsolateral light stripe extends from the arm onto tail. Dorsum of head light brown with dark brown reticulations. Sides of head (except temporal region) dark brown to black with irregular yellow spots concentrated in sutures between labials. Temporal region light brown with dark brown reticulum. Ventral surface of head and neck yellowish cream irregularly mottled with black; dark spots concentrated on genials. Venter of body cream mid-ventrally; ventrolaterally dark brown with irregular light spots. Ventral tail mostly dark brown; irregularly mottled with light spots near the base. Limbs dark brown dorsally mottled with yellow; ventrally yellowish with small dark spots.

Hemipenis bilobed (everted at preservation), lobes short. Sulcus spermaticus medial, bifurcating centripetally towards the apex of each lobe. Right and left lobes symmetrical with two conspicuous longitudinal rows of 18–22 enlarged spines on the apex of W-shaped and apparently naked flounces.

Snout–vent length 34 mm; tail 35 mm, regenerated.

Etymology.—The specific name is a noun in apposition and refers to the small digits of this species.

Distribution and ecology.—The type locality (Fazenda Unacau) is a large farm in the remaining Atlantic rainforests of Bahia where the forest has been selectively cut to accommodate cacao groves. The relief is pronounced and primary forest still remains on the hills, where small to large streams are also frequent. Annual precipitation reaches 2000 mm without conspicuous seasonality (Nimer, 1979). The primary forest is composed of high trees, reaching up to 40 m. In cacao groves, the leaf litter is abundant and formed predominantly by cacao leaves. Large emergent trees (up to 30 m and over approximately 80 cm diameter at breast height) have been preserved to shade the cacao plants.

The holotype of *Leposoma nanodactylus* was collected when searching among the leaves of a clump of large bromeliads. The bromeliads had been cut from a height of 8 m above ground where they had been fixed to the trunk of a tree. The specimen of *L. nanodactylus* was collected in the leaf litter along with two specimens of the frog *Phyllodytes kautski* and a specimen of *Leptotyphlops salgueiroi*. Although the frogs and the snake were found in the bromeliads, it could not be ascertained whether the lizard was originally among the leaf litter or simply entered the leaf litter from the bromeliads after they were cut down. Although >30 similar bromeliad clumps were cut down and searched in the same way, additional specimens of *Leposoma* were not found. However, a series of 10 specimens of *Leposoma scincoides* was collected while they were foraging among the leaf litter in the same area, either in the primary forest or in the cacao groves.

Although intensive surveys have been performed along the Atlantic forests of eastern Brazil, where several samples of *Leposoma scincoides* were collected, *L. nanodactylus* was obtained only at the type locality (Fig. 3).

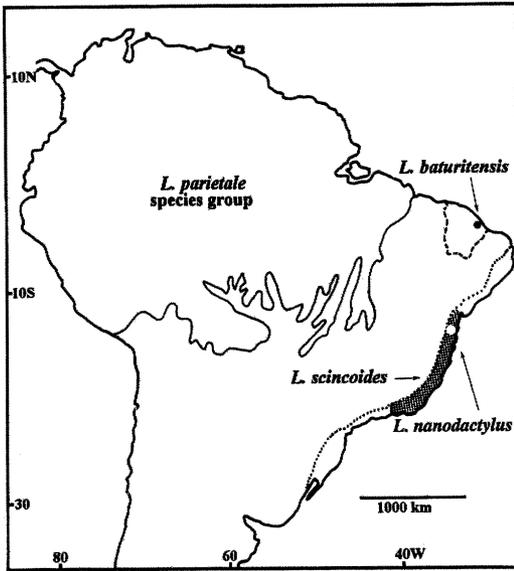


FIG. 3.—Approximate distribution of *Leposoma scincoides* (stippled area), the *L. parietale* group in South America, *L. baturitensis* (black dot), and *Leposoma nanodactylus* (white dot); the dashed line shows the approximate limits of the Atlantic forest according to Ab'Saber (1977).

DISCUSSION

We still lack enough data to consider properly the phylogenetic relationships of *Leposoma*. *Amapasaurus*, a monotypic genus described from Serra do Navio, State of Amapá, Brazil, resembles *Leposoma* so closely that its exclusion from *Leposoma* can render the genus paraphyletic. Unfortunately, the only three specimens of *Amapasaurus tetradactylus* known are in such bad shape that additional specimens are needed in order to re-evaluate the status of this species (Avila-Pires, 1995). In a similar vein, although the species of *Leposoma* can be separated by similarity in the very distinctive *scincoides* and *parietale* species groups mainly based on the arrangement of the dorsal scales, it is unclear whether or not these groups are monophyletic. Considering this, the suggestions below regarding relationships are based on overall similarity.

Sexual dimorphism in ventral color is present in all species of *Leposoma*. Excepting *L. baturitensis* and *L. nanodactylus*, the belly is uniformly red-orange in

adult males and cream in females. *Leposoma baturitensis* is the only species in which males are almost black ventrally. The presence of dark brown to black pigmentation in the lateral portion of the venter of the holotype of *Leposoma nanodactylus* suggests that sexual dichromatism could be present in this species and indicates a possible relationship with *L. baturitensis*. The presence of weak striations on the dorsal scutes of the head in *L. baturitensis* and *L. nanodactylus*, compared to the strongly striated head scutes in all other species of *Leposoma*, reinforces the argument.

The absence of *Leposoma* from north of Salvador, State of Bahia, to the State of Rio Grande do Norte, where the Atlantic forest disappears, remains puzzling. Its absence from this area is even more intriguing considering the occurrence of *L. baturitensis* in a relictual forest in the semi-arid Caatingas of the State of Ceará.

RESUMO

Uma nova espécie de *Leposoma* é descrita para a mata atlântica do sul da Bahia, Brasil. A nova espécie apresenta frontonasal inteira, escamas dorsais alongadas, ventrais lanceoladas em fileiras transversais e diagonais e grânulos cônicos nos lados do pescoço. Ela difere de todas as demais espécies do gênero por apresentar as contagens mais baixas de poros femorais (6) e de lamelas do quarto dedo e artelho (7 e 10, respectivamente). A nova espécie é sinotópica com *Leposoma scincoides*.

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- (Rio Tapajós): MZUSP 52.519, 52.521, 53.643. *Roraima*: Apiaú: MZUSP 67.730; Ilha de Maracá: MZUSP 79.306.
- Leposoma parietale*.—BRAZIL: Amazonas: Acanauí: MZUSP 47.212; Lago Miuá: MZUSP 17.314. Rondônia: Nova Brasília: MZUSP 62.330; Nova Colina: MZUSP 62.168; Nova Esperança: MZUSP 62.336; Santa Bárbara: MZUSP 64.606. ECUADOR: Pastaza: Rio Bobonaza: MZUSP 9277. PERU: Loreto: Estirón: MZUSP 13.931-13.933; Moropón: MZUSP 28.292-28.294, 28.303, 39.436; Yanamono: MZUSP 28.352.
- Leposoma percarinatum*.—BRAZIL: Amazonas: Manaus: MZUSP 40.825, 52.421; Manaus (INPA/WWF reserves): MZUSP 66.146-66.147, 66.350. Pará: Aveiro: MZUSP 19.998; Cachoeira do Limão (Rio Tapajós): MZUSP 53686; Oriximiná: MZUSP 77.193; Taboleiro Leonardo (Rio Trombetas): MZUSP 52.617, 53.809-53.812; Uruá (Rio Tapajós): MZUSP 52.520; Vaiquem-Quer: 78.216-78.217. Rondônia: Santa Bárbara: MZUSP 64.607-64.612. Roraima: Apiaú: MZUSP 66.971-66.972, 68.878; Ilha de Maracá: MZUSP 66.705-66.706; Mucajaí: MZUSP 68.917; Santa Maria do Boiaçu: 73.303-73.305.

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APPENDIX I

Specimens Examined

Leposoma baturitensis.—BRAZIL: Ceará: Serra de Baturité: Pacoti (Sítio Barbosa): MZUSP 79.378; Pacoti (Sítio São Gonçalo do Freire): MZUSP 79.379; Guaramiranga (Sítio Arábia): UFC 1948; Guaramiranga (Sítio São José): UFC 1951-1953.

Leposoma guianense.—BRAZIL: Amapá: Serra do Navio: MZUSP 3493, 7690, 17.005, 17.544-17.545, 78.174, 78.177, 78.183, 78.186, 78.189-78.190; Vila Nova: MZUSP 78.176. Amazonas: Manaus: MZUSP 51.296, 51.615, 56.786, 56.856, 57.086, 57.330-57.333. Pará: As Pedras: MZUSP 53.707-53.719; Cachoeira do Limão (Rio Tapajós): MZUSP 53.685; Oriximiná: MZUSP 12.538, 13.189, 24.537, 31.387, 31.664-31.665, 35.321-35.333; Poção: MZUSP 77.483; Taboleiro Leonardo (Rio Trombetas): MZUSP 53.798-53.719, 54.359, 54.469-54.470; Uruá

Leposoma scincoides.—BRAZIL: Bahia: Cumuruxatiba: MZUSP 59.191; Ilhéus: MZUSP 8982, 57.287; Ilhéus (Rio da Fortuna): MNRJ 2127-2128, 2570; Ilhéus (Fazenda Santa Rita): MNRJ 2125; Ilhéus (Fazenda Almada): MNRJ 2569; Ilhéus (Fazenda Pirataquicé): MNRJ 3050-3052; Ilhéus (Rio do Braço): MNRJ 2126; Ilhéus MNRJ field number 86.7735-86.7739; Itabuna: MZUSP 78.715-78.717, 78.795-78.802, ZUEC 910. Porto Seguro: MZUSP 79.545, 79.564, UFPB field number 86.6011; 15 km N Porto Seguro: MZUSP 66.349; São José do Macuco (Fazenda Unacau): MZUSP 66.464-66.473; Uruçuca: MZUSP 13.444-13.445. Espírito Santo: Linhares: MZUSP 39.580, 57.285-57.286; Porto Cachoeiro: MZUSP 3002; Santa Tereza: MNRJ 1720, MZUSP 17.440, 57.252, 57.288-57.289, 57.292, 79.565, SPCS 36, 111, ZUEC 760. Rio de Janeiro: Terezópolis: MNRJ 1721, SPCS 455-456.

Leposoma southi.—COSTA RICA: Suretka (Dix-aola river): MZUSP 49.175.