

Lioscincus maruia, A New Species of Lizard (Reptilia: Scincidae) from New Caledonia, Southwest Pacific¹

ROSS A. SADLIER,² ANTHONY H. WHITAKER,³ AND AARON M. BAUER⁴

ABSTRACT: A new species of scincid lizard, *Lioscincus maruia* Sadlier, Whitaker & Bauer, n. sp., is described from the central ranges of New Caledonia. It is a moderate-sized species of skink with a particularly long tail. It is known from only a single location in maquis shrubland and appears to be restricted to this habitat type. The species is considered vulnerable because of the restricted and fragmented nature of its habitat, and the potential for fire and mining activities to threaten that habitat type. In overall morphology *Lioscincus maruia* is most similar to *Lioscincus tillieri* Ineich & Sadlier, a species from maquis habitat in adjacent ranges to the south.

FIELD RESEARCH IN New Caledonia over the past 10 yr has greatly increased our knowledge of the diversity and distribution of the island's lizards. Most field research has been conducted in closed-forest habitat, the habitat type with the greatest diversity and richness of lizard species. Survey work in closed forest on Mt. Panié (300–1600+ m asl) and Mt. Aoupinié (500–1000+ m asl) has revealed a species richness of 13 and 17 species, respectively, or approximately 20 and 30%, respectively, of the island's total lizard fauna. Included in this estimate of total species richness for the island are six undescribed species of *Caledoniscincus*, all from closed-forest habitat. By contrast, the reptile fauna of maquis shrubland, a habitat that characterizes much of the southern ultramafic region of New Caledonia, has been poorly studied.

However, opportunistic collections made in maquis habitat suggest that this vegetation

type, although not as rich in total number of lizard species, does contain several that are either largely dependent upon or endemic to it. Field research over the past 5 yr has identified *Lioscincus tillieri* (Ineich and Sadlier 1991) as reliant on maquis habitat in the southern ultramafic region. During the course of survey work on Mé Adéo in the central ranges of New Caledonia, a new species of skink was collected from mid-altitude maquis habitat. This new species is very similar to *L. tillieri* in size and body proportions, coloration, and behavior. At the type locality it was found only in maquis habitat, and it most likely represents a second species of skink reliant on this habitat type.

MATERIALS AND METHODS

Specimen registration abbreviations are as follows: Australian Museum, Sydney (AMS); Museum National d'Histoire Naturelle Paris (MNHP).

Specimens were examined for the suite of characters listed below. Measurements: axilla to groin distance, measured from base of forelimb to base of hindlimb; forelimb to snout length, measured from tip of snout to axilla; hindlimb length, measured from groin to tip of fourth toe including nail; tail length, measured from caudal edge of anal scales to tip of tail, on complete original tails only.

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²Section of Herpetology, Australian Museum, 6 College Street, Sydney 2000, New South Wales, Australia.

³270 Thorpe-Orinoco Road, Orinoco, RD 1, Motueka 7161, New Zealand.

⁴Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085.

Measurements are expressed as percentages of snout to vent length (SVL).

Head scalation generally follows Taylor (1935); midbody scale rows, number of longitudinal scale rows around body counted midway between axilla and groin; paravertebral scales, number of scales in a paravertebral row from first scale posterior to parietal scale to last scale anterior to level of vent opening; fourth finger and toe scales, number of dorsal scales on fourth digit of foot and hand, distal scale contains claw and basal scale broadly contacts adjacent basal scale of third finger or toe; fourth finger and toe lamellae, number of ventral scales on fourth digit of foot and hand, distal scale contains claw and basal scale is last largely undivided scale at a point level with intersection of third and fourth digits. Bilaterally scoreable scalation characters were scored on both sides and the mean value used.

Specimens were X-rayed to assess the number of presacral and postsacral vertebrae, and phalanges of the manus and pes.

SYSTEMATICS

Over the past decade there has been a progressive dismantling of the polyphyletic genus *Leiopisma* Dumeril & Bibron, 1839 (see Sadlier 1986, Hutchinson et al. 1990). All Australian species previously included in *Leiopisma* have been assigned to a number of putatively monophyletic genera. The New Zealand species previously included in *Leiopisma* have been assigned to *Oligosoma* Girard, 1857 (Patterson and Daugherty 1995). The New Caledonian species left within *Leiopisma* by Sadlier (1986) were transferred to *Lioscincus* Bocage, 1873 by Bauer and Sadlier (1993), the next available generic name that could be used to accommodate this assemblage of New Caledonian species. As proposed by Bauer and Sadlier (1993), *Lioscincus* includes *L. steindachneri* Bocage (type species), *L. nigrofasciolatum* (Peters), *L. greeri* (Böhme), *L. novaecaledoniae* (Parker), and *L. tillieri* (Ineich and Sadlier), but remains an assemblage of generally primitive *Eugongylus* group (Greer 1979)

species currently not diagnosable by synapomorphies. Ultimately *Lioscincus* will probably comprise only the morphologically distinctive type species, *L. steindachneri*.

The new species of lizard described here is not readily assignable to any existing monophyletic genus. For this reason it is placed in *Lioscincus* pending further systematic work on the assemblage of New Caledonian species that are currently assigned to this genus. It is similar in appearance and behavior to *L. tillieri*, most notably in having an extremely long tail, keeled body scales, and a yellow ventral color.

Lioscincus maruia Sadlier, Whitaker & Bauer, n. sp.

Figures 1, 2

TYPE MATERIAL: Holotype: AMS R 149897, adult female, Mé Adéo, New Caledonia, 21° 28' S, 165° 36' E, collected 25 October 1996 by A. H. Whitaker. Paratypes: AMS R 149899, MNHP 1997.3327 (formerly AMS R 149898), same data as holotype; AMS R 149956–58, MNHP 1997.3328 (formerly AMS R 149959), same locality as holotype, collected 1 November 1997 by R. A. Sadlier and A. H. Whitaker.

ETYMOLOGY: The species is named for the Maruia Society, a New Zealand-based non-government conservation organization that has undertaken a number of conservation initiatives in the South Pacific region, including the survey work in Province Nord during which the species was discovered.

DIAGNOSIS: *Lioscincus maruia* is distinguished from the other species in the genus by the following combination of characters: (1) frontoparietals fused; (2) body scales weakly keeled; (3) midbody scale rows 38–40; (4) paravertebral scale rows 80–89; (5) lamellae under the fourth toe 35–41; (6) tail approximately 2.5 times longer than body.

One of the most distinctive features of *L. maruia* is its exceptionally long tail and keeled body scales. These two characters alone distinguish it from all other New Caledonian skinks with the exception of *L. tillieri* and the species of *Tropidoscincus*.

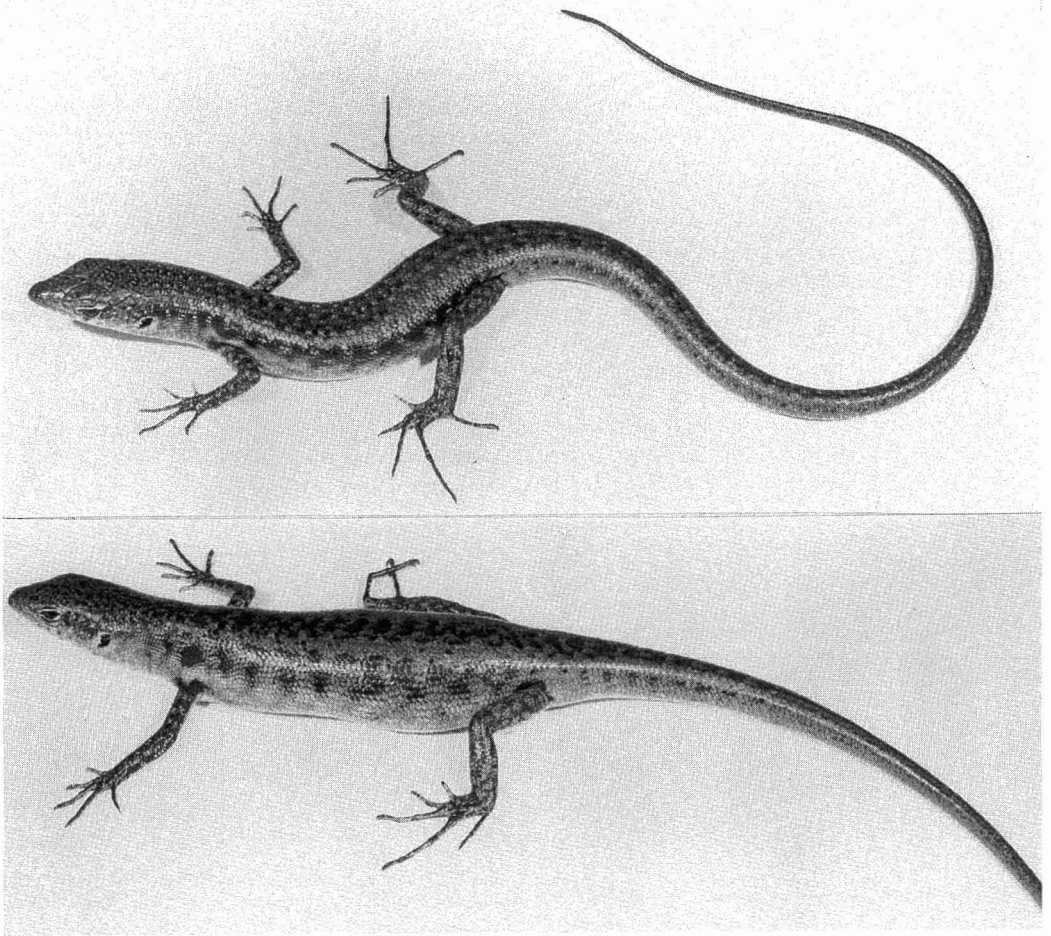


FIGURE 1. Male (top) and female (bottom) of *Lioscincus maruia*, n. sp.

DESCRIPTION: The species is known from seven adult specimens of 47–61 mm SVL. Unless stated otherwise measurements and meristics are for all seven specimens.

Measurements and proportions: Distance from axilla to groin 51.0–57.4% SVL (mean = 54.4); distance from forelimb to snout 39.3–43.1% SVL (mean = 41.1); hindlimb length 49.2–55.3% SVL (mean = 52.4); original tail 244.9% SVL ($n = 1$).

Scalation: Frontonasal broader than long ($W/L = 107.7$ – 139.5% , mean = 112.7 , $n = 6$); prefrontals moderately large, usually narrowly to moderately separated; frontal longer than wide ($W/L = 73$ – 84% , mean = 76.9); fronto-

parietals fused; interparietal distinct; parietals each bordered by a nuchal scale (occasionally divided) and single upper secondary temporal scale; primary temporal single; upper secondary temporal single; lower secondary temporal single; tertiary temporals two each side; postlabials two each side.

Nasals moderately large, moderately separated; supraciliaries usually seven (93%), rarely eight; upper labials seven; lower labials six; postmental contacting second lower labial; chin shields three, first pair in broad contact. Lower eyelid with an obvious, centrally located semitransparent disk, length approximately 35–40% (mean = 37, $n = 6$)

of total eye length. Ear opening moderately large and with 1–2, rarely 3 or 4 enlarged lobules anteriorly.

Body scales weakly keeled, usually three dorsally but increasing in number toward the nape; midbody scale rows 38–40 (mean = 39.3, SD = 0.95); paravertebral scales 80–89 (mean = 82.6, SD = 3.10). Scales on top of fourth finger 16–18 (mean = 16.9, SD = 0.45); lamellae beneath fourth finger 23–26 (mean = 24.6, SD = 1.07); scales on top of fourth toe 20–23 (mean = 21.8, SD = 0.64); lamellae beneath fourth toe 35–41 (mean = 38.2, SD = 1.95), broad.

Osteology: Premaxillary teeth 11 ($n = 2$); presacral vertebrae 29 ($n = 6$); postsacral vertebrae approximately 61–66 ($n = 2$); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively; two pairs of mesosternal ribs contacting mesosternum.

Color and pattern: Dorsal surface with a complex pattern of light and dark blotches arranged as follows: vertebral area (scale rows 1–2) with alternate light olive-gray and dark brown-black patches (2 scale width) from the nape to level of hindlimbs; paravertebral area (scale rows 3 and 4) olive brown, either largely unmarked and appearing as a poorly defined pale stripe or with some dark markings and tending to blend with adjacent vertebral and dorsolateral patterns; dorsolateral and upper lateral area (scale rows 5–8) black brown with scattered light flecks; mid-lower lateral area pale and with dark markings from adjacent upper lateral area extending transversely to form poorly defined dark ellipses; limbs a mottle of light and dark colors similar to those of the body and with a bold black patch above and behind the forelimbs; head brown, with numerous dark, pale-centered ocelli above and on the face; ventral surface pale, underside of head with gray-brown transverse bars on and adjacent to the chin shields, abdomen and chest unmarked, in life with a bold lemon yellow flush.

There is no obvious sexual dimorphism in color and pattern between the two adult males (47–48 mm SVL) and two similarly sized adult females (49–51 mm SVL). However, larger adult females showed some loss

of boldness and definition of the dark dorsal markings.

DETAILS OF HOLOTYPE: Adult male; 48 mm (SVL); distance from axilla to groin 26 mm; distance from forelimb to snout 20 mm; hindlimb length 26 mm; tail length 124 mm, regenerated. Midbody scales rows 40; paravertebral scale rows 89; dorsal scales of fourth finger 17/18; lamellae of fourth finger 25/24; dorsal scales of fourth toe 23/22; lamellae of fourth toe 39/38.

Comparison with Other Species

Within the New Caledonian skink fauna, *Lioscincus maruia* is most similar to *L. tillieri* and the species of *Tropidoscincus* in having fused frontoparietal scales, keeled body scales, an elevated number of paravertebral scale rows, and an extremely long tail. *Lioscincus maruia* lacks the derived mesosternal rib character of *Tropidoscincus* (three mesosternal ribs contacting the mesosternum versus two in most other *Eugongylus* group skinks) for inclusion in that genus.

It may be distinguished from *L. tillieri* by having three moderate keels on the scales of the body versus two strong keels; more numerous dorsal scales (paravertebral scales 80–89 versus 65–71); more lamellae under the fourth toe (35–41 versus 27–32); and a patterned versus unpatterned nape and head (small, dark, pale-centered ocelli versus relatively unmarked uniform brown).

Lioscincus maruia is dissimilar to the other four species of *Lioscincus*, which remain under a single generic name only for convenience. It can be differentiated from these species by having keeled versus smooth body scales and the following additional characters: from *L. steindachneri* by having more scales around the body (midbody scale rows 38–40 versus 34–36); more numerous dorsal scales (paravertebral scales 80–89 versus 57–60); and a patterned versus unpatterned nape and head (small, dark, pale-centered ocelli versus relatively unmarked uniform brown); from *L. nigrofasciolatum* and *L. greeri* by having fused versus paired frontoparietals; from *L. novaecaledoniae* by having more

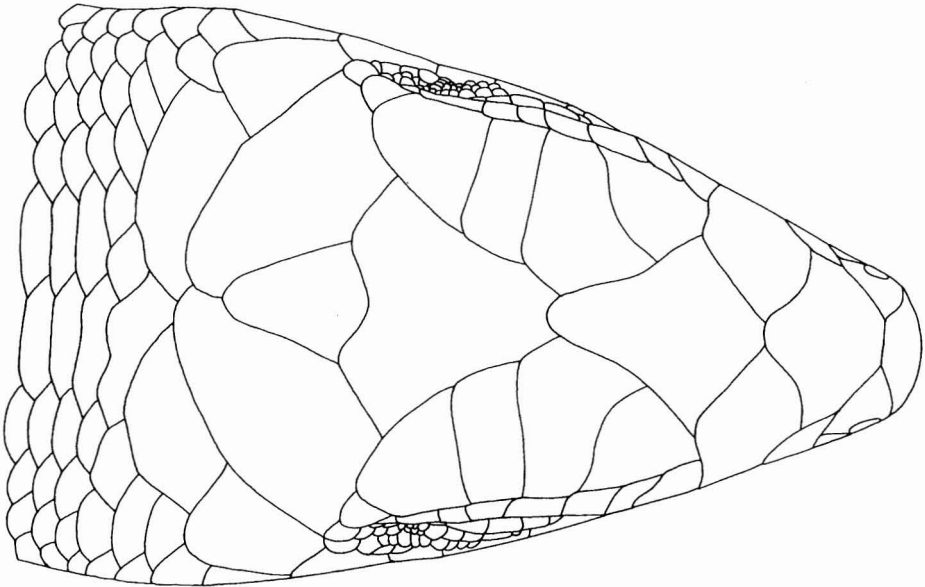
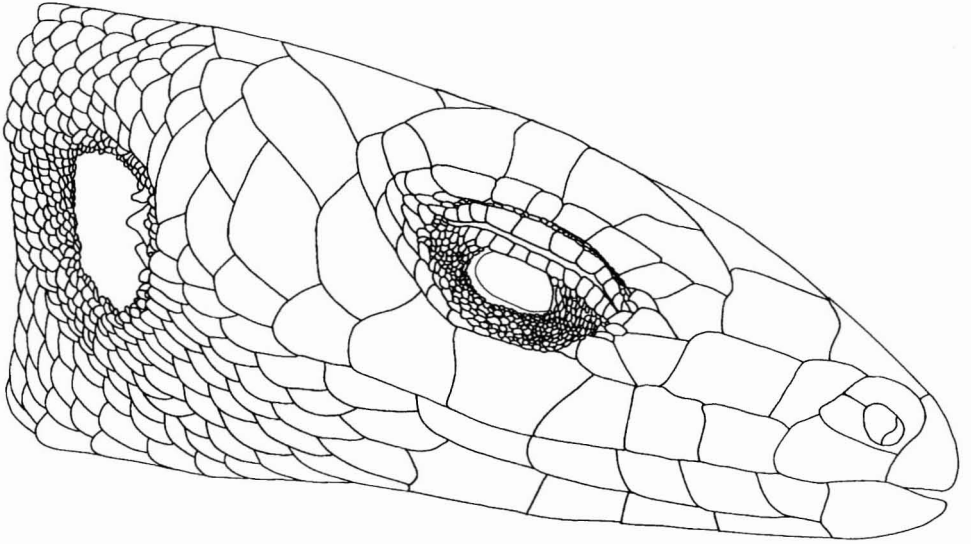


FIGURE 2. Lateral (*top*) and dorsal (*bottom*) views of the head of holotype of *Lioscincus maruia*, n. sp. (AMS R 149897).

scales around the body (midbody scale rows 38–40 versus 30–34); more numerous dorsal scales (paravertebral scales 80–89 versus 56–59); more lamellae under the fourth toe (35–41 versus 21–24); and a patterned versus unpatterned nape and head (small, dark, pale-centered ocelli versus relatively unmarked uniform brown).

Behavior

Several individuals of *L. maruia* were observed active during the midday to early afternoon hours. They were extremely wary and rarely ventured into the open once dis-

turbed. The remaining specimens observed or collected were found sheltering in several retreats: one was collected from a rock crevice; one from cracks in a roadside earth embankment; the remainder from beneath stones and debris at the side of the road.

When being photographed in a studio situation, *L. maruia*, while stationary, tilted its body away from the photographer, a trait very similar to that observed when *Lioscincus tillieri* was photographed (R.A.S., pers. obs.).

Adult females collected in late October to early November were gravid and contained two ($n = 2$) to three ($n = 1$) shelled oviductal eggs.

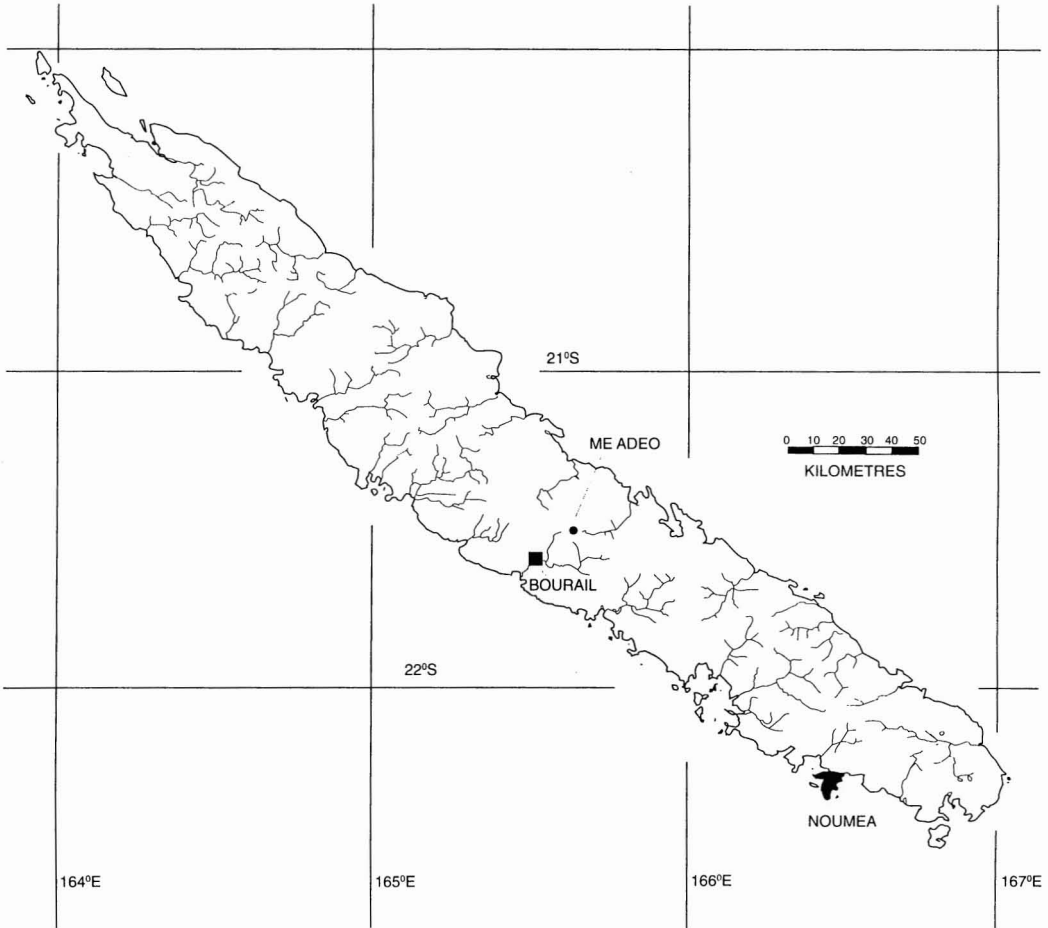


FIGURE 3. Type locality of *Lioscincus maruia*, n. sp. (closed circle) in the central ranges of New Caledonia.



FIGURE 4. Habitat at the type locality for *Lioscincus maruia*, n. sp., a road cutting through maquis on the lower slopes of Mé Adéo.

Distribution and Habitat

Known only from the type locality at Mé Adéo, a mountain in the central ranges of New Caledonia approximately 15 km north-east of the township of Bourail (Figure 3).

All specimens collected or observed were in maquis shrubland, a low vegetation association with sparse, scattered ground cover (Figure 4).

Conservation Status

Lioscincus maruia is restricted in range, being known only from a single location in mid-altitude maquis habitat in the central ranges, but it appears to be moderately abundant where it was found. *Lioscincus maruia* is the ecological equivalent to *L. tillieri* of the maquis shrubland in the extensive ultramafic area that covers much of southern New Caledonia. The two species are likely to be allopatric in distribution, with *L. maruia*

being restricted to the relatively small and disjunct areas of maquis in the central ranges.

Because of the restricted nature of its distribution, its apparent habitat specificity and the fragmented nature of this habitat in the central ranges, and the potential impact of fire and disturbance by mining activities on this habitat in the region, *L. maruia* is considered vulnerable to disturbance from human activities.

To fully assess the species' conservation status, field research in the maquis shrublands of the central ranges of New Caledonia is required to determine its distribution and reliance upon this habitat type.

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