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A Review of the Scincid Lizards of New Caledonia

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ABSTRACT. This monograph reviews the alpha taxonomy of the scincid lizards of New Caledonia (excluding the Loyalty Islands group). It also touches on the beta taxonomy of the species where possible but leaves much of this problem to a future review of phylogenetic relationships of the Lygosomine lineage of which New Caledonian species are a part. The following 10 genera including 24 species are recognized: *Geoscincus* n. gen.: *G. haraldmeieri* (Böhme); *Phoboscincus* Greer, 1974: *P. bocourti* (Brocchi), *P. garnieri* (Bavay); *Graciliscincus* n. gen.: *G. shonae* n. sp.; *Leiolopisma* Duméril & Bibron, 1839: *L. nigrofasciolatum* (Peters), *L. greeri* Böhme, *L. steindachneri* (Bocage), *L. novaecaledoniae* (Parker); *Tropidoscincus* Bocage, 1873: *T. variabilis* (Bavay), *T. aubrianus* Bocage, *T. rohssii* (Anderson); *Marmorosphax* n. gen.: *M. tricolor* (Bavay), *M. euryotis* (Werner); *Caledoniscincus* n. gen.: *C. austrocaledonicus* (Bavay), *C. atropunctatus* (Roux), *C. festivus* (Roux), *C. orestes* n. sp.; *Sigaloseps* n. gen.: *S. deplanchei* (Bavay); *Cryptoblepharus* Weigmann, 1834: *C. novocaedonicus* Mertens; *Nannoscincus* Günther, 1872: *N. mariei* (Bavay), *N. gracilis* (Bavay), *N. sleveni* (Loveridge), *N. rankini* n. sp., *N. greeri* n. sp. Most of the recognised species are endemic to the main island and most are confined to rainforest habitats. Some also occur on adjacent offshore islands. Generic accounts contain synonymies, diagnostic features and lists of species included. Keys are provided for monophyletic genera with more than two species. Species accounts contain data on synonymies, diagnostic features, types, morphology, habits, distribution, historical and taxonomic remarks, and specimens examined.

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The territory of New Caledonia is located in the south-west Pacific (19–23°S latitude and 163–168°E longitude), and consists of the large main island of approximately 16,000 square kilometres, the Isle of Pines, the Huon Islands and the Loyalty Islands. A chain of mountains extending along its centre effectively divides the main island into a moist east coast, thickly forested for most its length, and a relatively dry, sparsely wooded west coast. Habitats typical of those occurring along the east and northern coast, and on the eastern and western ranges are shown in Fig. 1.

The endemic taxa include all known species of *Geoscincus*, *Graciliscincus*, *Marmorosphax*, *Tropidoscincus*, *Sigaloseps*, all New Caledonian *Nannoscincus*, three of the four New Caledonian *Leiopisma* (*L. greeri*, *L. steindachneri*, *L. novocaledoniae*), and two of four of the currently recognised species of *Caledoniscincus* (*C. festivus*, *C. orestes*). Four species (*C. atropunctatus*, *C. austrocaledonicus*, *L. nigrofasciolatum*, *C. novocaledonicus*) in addition to being found on the main and offshore islands of New Caledonian also occur on islands of the Loyalty Island group, and one species (*C. atropunctatus*) is also recorded from Vanuatu.

Most species endemic to the main island are confined to rainforest habitat (except species of *Tropidoscincus*). Of the endemic taxa, four species (*T. rohssii*, *S. deplanchei*, *N. mariei*, *G. shonae*) occur largely in the south of the island over an area approximately covering that of the serpentine region of rock outcropping.

In 1978 the late Peter R. Rankin and I undertook fieldwork on the main island and made a large lizard

collection before Peter died in a collecting accident. One of the ultimate aims of making these collections was a revision of the lizard fauna of New Caledonia the first part of which is here presented as a monograph on the scincid lizards of the main and immediately adjacent offshore islands. This work is dedicated to the memory of Peter Rankin.

Abbreviations

Institutional acronyms used in this paper are given below.

AM	Australian Museum, Sydney
BM	British Museum (Natural History), London
CAS	California Academy of Sciences, San Francisco
MCZ	Museum of Comparative Zoology — Harvard University, Cambridge
MNHP	Muséum National d'Histoire Naturelle, Paris
MRHN	Institute Royal des Sciences Naturelles de Belgique, Brussels
NHMB	Naturhistorisches Museum, Basel
NHMG	Naturhistoriska Museet, Göteborg
QM	Queensland Museum, Brisbane
SMF	Natur-Museum und Forschungs-Institut, Senckenberg
ZFMK	Zoologisches Forschungsinstitut und Museum Alexander Koenig, Bonn
ZMB	Zoologisches Museum, Berlin

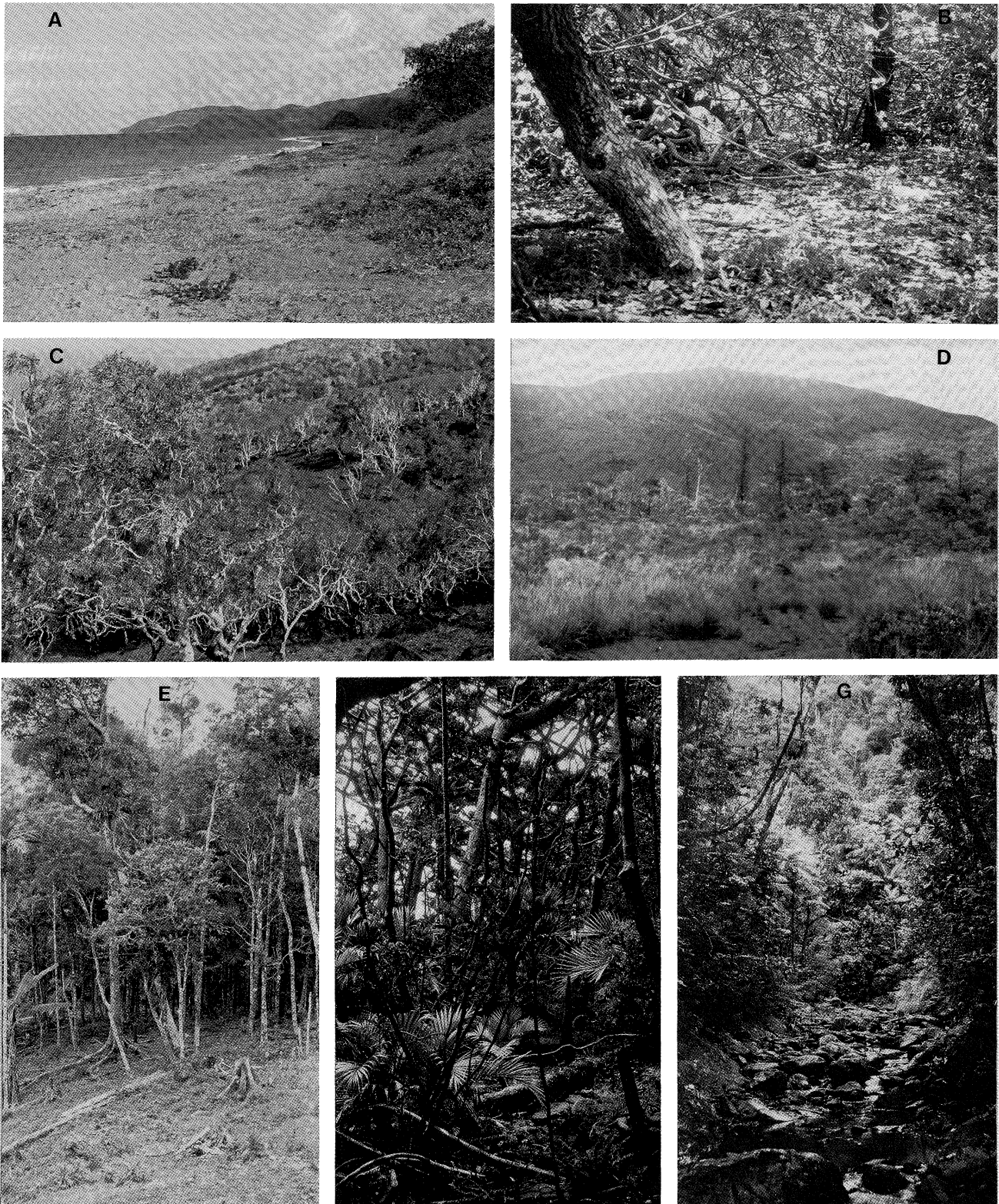


Fig. 1. Overview of some of the major habitats encountered on the New Caledonian mainland. **a.** Coastal landscape at Houaliou, typical of the mideastern and northern coastline of mainland New Caledonia. **b.** Coastal scrub backing beach front at Houaliou. **c.** Naeliu woodland on coastal hillslopes at Puebo. **d.** Heath and conifer scrub on the Plaine des Lacs. **e.** Lowland rainforest edge on coastal hillslope at Mt Dore, here bordered by a plantation clearing. **f.** Mountain stream passing through mid altitude rainforest (500 m) on Mt Aoupinie. **g.** Interior of mid to high altitude rainforest (900–1000 m) on Mt Panie.

Historical Resume

By 1900, Bavay (1869) and Bocage (1873b) had described nine of the currently recognized scincid lizards of New Caledonia, and Boulenger (1887) had collectively reviewed the described taxa while cataloguing specimens held in the British Museum. Aside from Roux's (1913) major review of the New Caledonian herpetofauna (which included several new taxa), subsequent taxonomic studies dealing with the scincid lizards of the island have generally been confined to describing new taxa as they became known. The taxonomic contributions of previous authors are given below in chronological order, and where appropriate comments on types are included.

Peters (1869) described *Lygosoma (Mocoa) nigrofasciolatum* from a single specimen, still in existence and lodged in the ZMB.

Bavay (1869) described eight new scincid lizard species. No types were listed and no indication given as to where the specimens on which the descriptions were based were lodged. For five of these taxa no types have been found and are here presumed lost (see species accounts for *P. garnieri*, *M. tricolor*, *L. nigrofasciolatum*, *C. austrocaledonicus* and *T. variabilis*). Specimens on which three Bavay taxa were based are lodged in the BM. These are labelled as having been presented by Bavay and coming from New Caledonia and were listed as types by Boulenger (1887) (see species accounts for *S. deplanchei*, *N. mariei* and *N. gracilis*).

Bocage (1873b) described three new lizard species from New Caledonia (see species accounts for *T. aubrianus*, *L. steindachneri* and *L. nigrofasciolatum*). No formal types were designated for Bocage's species but the specimens upon which the descriptions were based were lodged in the Lisbon Museum. These syntypes were later examined by Roux (1913) and compared with the specimens collected by Roux & Sarasin from New Caledonia. These and other specimens in the collection of Bocage were lost when the Lisbon Museum was destroyed by fire (18th March 1973).

Günther (1872) described four taxa from specimens purportedly obtained from the Feejee Islands' during the voyage of the *Curacoa* (see species accounts for *C. austrocaledonicus*, *S. deplanchei*, *N. mariei* and *N. gracilis*). Specimens on which these descriptions were based are lodged in the BM, and were listed as types of Günther's species by Boulenger (1887). None of these taxa have since been recorded from the Fiji Islands. The *Curacoa* also visited New Caledonia during its voyage and this is considered the more likely place of origin for the specimens on which Günther's species are based.

Brocchi (1876) described the large and unique *Eumeces bocourti* from a single specimen, now lodged in the MNHP.

Peters (1879) described *Saurosincus braconnieri* (= *Tropidoscincus aubrianus* Bocage) from a single subadult specimen in the ZMB.

Boulenger (1887) recognised only eight of the existing New Caledonian taxa, redescribing them from specimens in the BM (see species accounts for *L. nigrofasciolatum*, *M. tricolor*, *T. variabilis*, *C. austrocaledonicus*, *P. garnieri*, *S. deplanchei*, *N. mariei* and *N. gracilis*). No mention was made by Boulenger of *Tropidoscincus aubrianus* Bocage.

Andersson (1908) described *Lygosoma rohssii* from a series of 3 adults in the NHMG.

Werner (1909) described *Lygosoma euryotis* from a single specimen in the MRHN.

Roux (1913) reviewed the New Caledonian skinks and most of the existing taxa and synonyms previously recognized by Boulenger (1887) were redescribed. Of the taxa described since Boulenger's catalogue, Roux redescribed *Lygosoma euryotis* Werner from the type, and synonymized *Lygosoma rohssii* Andersson with *L. variabilis* Bavay. Several new taxa were described by Roux as subspecies of *Lygosoma austro-caledonicum*, the validity of which are discussed later. No types were designated by Roux for new taxa, but a list of localities for specimens collected by Roux & Sarasin was given. Roux did however list the types examined for a number of existing species, most importantly those of Bocage (1873b) with which Roux made direct comparisons to conspecific specimens in the collection of Roux & Sarasin.

Since Roux's revision few new taxa have been described. Parker (1926) described *Lygosoma (Leiolopisma) novaecaledoniae* from a single specimen in the BM; Mertens (1928) described *Cryptoblepharus boutonii novo-caledonicus* from specimens in the NHMB and SMF; Loveridge (1941) described *Lygosoma sleveni* from specimens in the MCZ (originally part of the Roux & Sarasin collection in the NHMB); Böhme described *Eugongylus haraldmeieri* (1976) and *Leiolopisma greeri* (1979) from recent collections made by Harold Meier; Kramer (1979) designated lectotypes for taxa described by Roux (1913) from the collections made by Roux & Sarasin and lodged in the NHMB: (see species accounts for *C. austrocaledonicus*, *C. atropunctatus* and *C. festivus*).

Natural history notes on New Caledonian scincids were provided by Meier (1979a,b) and Mertens (1964).

Systematics

Greer (1974) considered the New Caledonian scincid fauna to belong to the *Eugongylus* group of the subfamily Lygosominae. In reviewing the generic relationships of *Leiolopisma* and its relatives, Greer (1974) diagnosed monophyletic lineages for a number of associated genera including the endemic New Caledonian genus *Phoboscincus* Greer and widespread *Cryptoblepharus* Weigmann which has a single representative in New Caledonia. The remaining New Caledonian species recognized by Greer were largely incorporated into *Leiolopisma* Duméril & Bibron and *Anotis* Bavay.

Leiopisma as conceived by Greer at this time was a diverse assemblage of generally primitive species with a wide distribution incorporating Mauritius (Round Island), the eastern and southern Australian coasts, New Zealand, New Caledonia, and more recently Vanuatu and Fiji. The first step towards clarifying relationships between the species included in *Leiopisma* (sensu Greer) was to define species groupings where possible. The following groupings are now recognised by me for the New Caledonian species formerly assigned to *Leiopisma*, and include several new and resurrected taxa: 1) *Lygosoma nigrofasciolatum* Peters and *Leiopisma greeri* Böhme; 2) *Tropidolopisma variabilis* Bavay, *Tropidoscincus aubrianus* Bocage and *Lygosoma rohssii* Anderson; 3) *Lygosoma tricolor* Bavay and *Lygosoma euryotis* Werner; 4) *Lygosoma austro-caledonica* Bavay, *Lygosoma austro-caledonicum atropunctatum* Roux, *Lygosoma austro-caledonicum festivum* Roux and *Lygosoma orestes* n. sp.; 5) *Lygosoma deplanchei* Bavay is a monotypic group in the *Eugongylus* group, but further definition of relationships remains obscure. Members of groups 1–4 are diagnosed as each other's closest relatives by a suite of derived character states, but relationships between the groups are often unclear.

From these species groupings of New Caledonian *Leiopisma* the following generic reallocations are here proposed: *Tropidoscincus* Bocage for group 2; *Marmorosphax* n. gen. for group 3; *Caledoniscincus* n. gen. for group 4; *Sigaloseps* n. gen. for group 5. The following species are retained in *Leiopisma* pending a review of *Eugongylus* group systematics: *L. nigrofasciolatum*, *L. greeri*, *L. steindachneri*, *L. novaecaledoniae*.

Greer (1974) used *Anotis* (type species *Anotis mariei* Bavay, 1869) to encompass the Australian species *Saiphos maccoyi* Lucas & Frost and *Lygosoma graciloides* Lönnberg & Andersson, and the New Caledonian species *Anotis mariei* Bavay, *Lygosoma gracile* Bavay and *Lygosoma sleveni* Loveridge. For these same species the generic classification was later amended to *Nannoscincus* by Czechura (1981) on the basis of the observation by Cogger (1979) that *Anotis* was preoccupied. *Nannoscincus* is here restricted to the New Caledonian species and the Australian species *Saiphos maccoyi* Lucas & Frost. *Lygosoma graciloides* Lönnberg & Andersson is only distantly related to the group and awaits generic placement.

Materials and Methods

The generic classification presented here is based on diagnoses featuring single unique derived characters and/or unique combinations of shared derived character states, within the context of the phylogenetic subdivisions of the subfamily Lygosominae, as presented so far by Greer (1974, 1982).

Species accounts present synonymies of nomenclatural significance only and in most cases are based on examination of type material. Where

appropriate, lectotypes have been designated from syntype series. Where types are no longer extant, neotypes have been designated. This has been extended to junior synonyms where confusion with superficially similar taxa may arise. Neotype designations were required for *Lygosoma arborum*, *Tropidolopisma variabilis*, *Lygosoma tricolor* and *Lygosoma austro-caledonica*. The specimens upon which Bavay (1869) based descriptions of these species are apparently lost. Similar designations were needed for the Bocage (1873b) New Caledonian scincid types (*Lygosoma deplanchei*, *Lioscincus steindachneri*, *Tropidoscincus aubrianus*) lost when the Lisbon Museum was destroyed. Descriptions, line drawings and photographs of type material have been presented where possible. A general description of each species shows variation in features of morphology.

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

Scalation: those characters regarded as necessary to identify the species from one another, or that are unusual and may be of interest when related to specialized habits of certain species, are discussed.

Head: terms used (Figs 2, 3) generally follow Taylor (1935: 11) except for the shields bordering the anterior and lower edge of the orbit which follow Sadlier (1984).

Body: 'midbody scale rows' are the number of longitudinal scale rows around the body counted at a point midway between the axilla and groin;

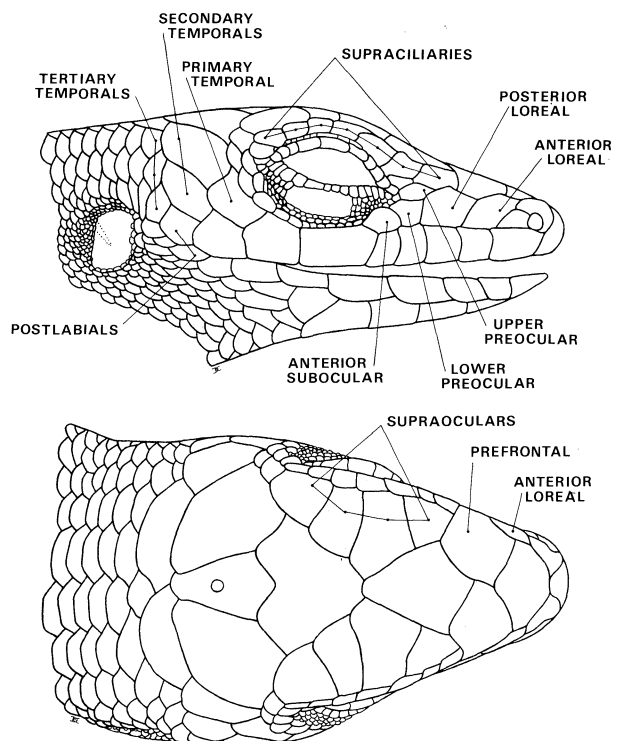


Fig. 2. Dorsal and lateral views of the head of ZMB 9702 (holotype of *Sauroscincus braconnieri* Peters), a specimen of *Tropidoscincus aubrianus* Bocage with some of the major headshields labelled.

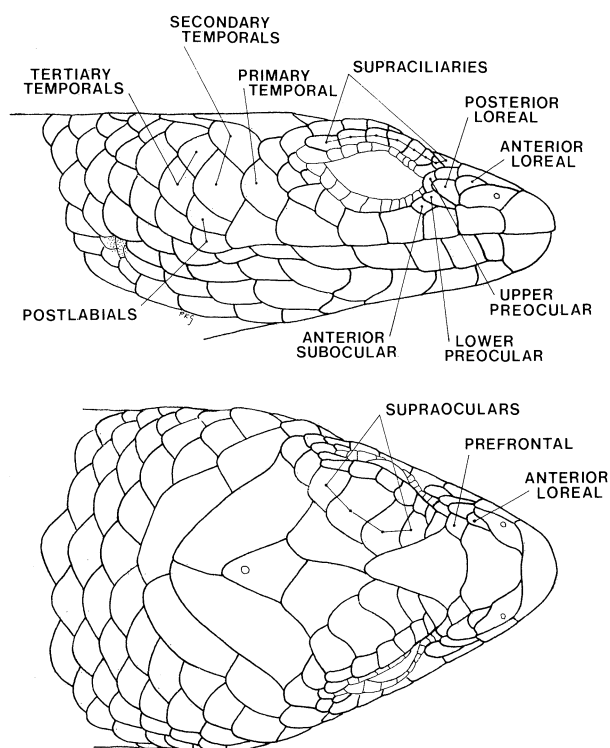


Fig. 3. Dorsal and lateral views of the head of NHMB 7232, a specimen of *Nannoscincus steveni* with some of the headshield configurations peculiar to *Nannoscincus* labelled.

'paravertebral' scales are the number of scales in a paravertebral row posterior to the parietals to a point opposite the anus.

Grid coordinates for specimen localities have been obtained from the official Standard Names Gazetteer for New Caledonia and Wallis and Futuna produced by the U.S. Board on Geographic Names (1974). Grid coordinates for localities were then compared with a 1/500000 Nouvelle Caledonie Map produced by Institut Géographique National, prior to plotting.

Geoscincus n. gen.

Type species. *Eugongylus haraldmeieri* Böhme, 1976: 248

Diagnosis. Supranasals absent; last upper labial greatly reduced and repositioned posteriorly; temporal and posterior head shields fragmented; parietals each bordered by 2 upper secondary temporals, single nuchal and internuchal; chinshields 2, second pair and postgenials separated from contact with lower labials by row of small lateral chin scales; auricular lobules absent; premaxillary teeth 6-9; large size (maximum SVL 112 mm).

Recognized species. *Geoscincus haraldmeieri* (Böhme, 1976).

Etymology. The name *Geoscincus* combines the Greek for earth (*geo*) with Neo-Latin for skink (*scincus*).

Remarks. Böhme (1976) thought *Eugongylus*

haraldmeieri bridged the differences between *Eugongylus* Fitzinger, *Tachygia* Mittleman and *Phoboscincus* Greer and synonymized the latter two genera with *Eugongylus*.

The suite of characters diagnosing *Eugongylus haraldmeieri* Böhme is unique and does not allow ready placement in recognized groups within the lygosomines. On this basis, Böhme's concept of *Eugongylus* is here rejected, and *Eugongylus haraldmeieri* Böhme placed in the monotypic genus *Geoscincus*.

Geoscincus haraldmeieri (Böhme)

Figs 4-7

Eugongylus haraldmeieri Böhme, 1976: 248.

Type material. HOLOTYPE: *Eugongylus haraldmeieri* Böhme, ZFMK 15888, adult male, SVL 112 mm (Figs 4, 5), Coula, (500 m), New Caledonia, 21°21'S 165°27'E. PARATYPE: ZFMK 15889, same locality as holotype.

Diagnosis. Same as genus.

Description. MEASUREMENTS: snout to vent length 88-112 mm (paratype and holotype respectively); distance from axilla to groin 55.4-56.2% of SVL (\bar{x} = 55.8, n = 2); distance from forelimb to snout 37.5-39.8% of SVL (\bar{x} = 38.6, n = 2); hindlimb length 32% of SVL (n = 2).

SCALATION: frontonasal broader than long (W/L 130-150%, \bar{x} = 140, n = 2); prefrontals large, narrowly separated; frontal longer than broad (W/L 69-71%, \bar{x} = 70, n = 2); frontoparietals distinct; interparietal distinct; parietals each bordered by 2 upper secondary temporals, a single nuchal and an internuchal scale; scales of temporal region forming an irregular pattern posterior to last enlarged upper labial (1 of Fig. 6) and possibly best interpreted as primary temporals 2 (3a and 3b of Fig. 6), upper secondary temporals 2 (4a and 4b of Fig. 6), lower secondary temporal usually divided (5a and 5b respectively of Fig. 6) or fused to form a single scale (right side of holotype), tertiary temporals 3 (6a, 6b and 6c of Fig. 6), and postlabials 2 (7a and 7b of Fig. 6).

Nasals narrowly to moderately separated; 2 loreals in a horizontal sequence, anterior nearly as deep as long, posterior longer than deep; anterior subocular single; supraciliaries 7, sixth large and intruding between third and fourth supraoculars, first failing to contact frontal; enlarged upper labials usually 6 (7 right side of holotype) with fifth usually subocular and considerably deeper than long, last upper labial (2 of Fig. 6) apparently squeezed out of position by shortening of snout; lower labials 6-7, first 2 contacting postmental; chinshields 2, first pair in moderate contact, second pair variably separated from lower labials by a single row of small intervening scales.

Lower eyelid scaled, contacting subocular upper labial.

Ear opening with no enlarged auricular lobules.

Body scales small, smooth; midbody scale rows 46-48 (\bar{x} = 47, sd = 1, n = 2) paravertebral scales 113-116

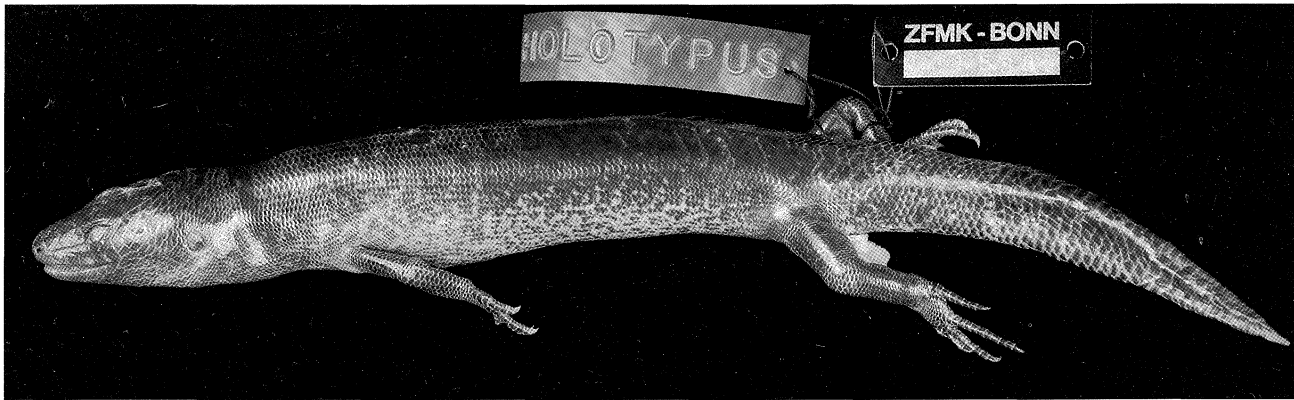


Fig. 4. ZFMK 15888, holotype of *Eugongylus haraldmeirei* Böhme.

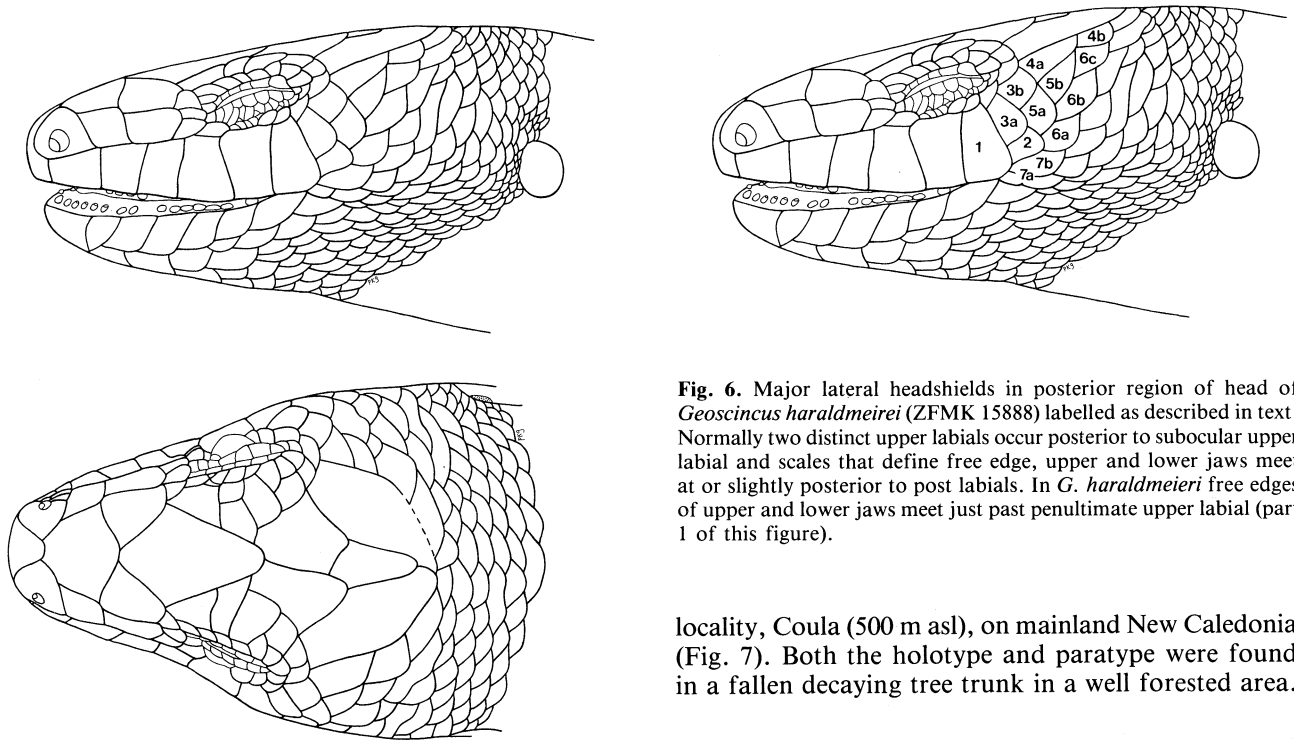


Fig. 5. Lateral and dorsal views of the head of ZFMK 15888, holotype of *Eugongylus haraldmeirei* Böhme.

(\bar{x} = 114.5, sd = 1.5, n = 2).

Lamellae beneath fourth toe 19.

OSTEOLOGY: premaxillary teeth 6 or 9; presacral vertebrae 29; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface grey to brown, head similar. Lateral surface grey with fine, sparse, white flecking most prominent lateroventrally and anteriorly. Limbs grey to brown above, becoming lighter beneath. Venter posterior of forelimbs grey-brown, anterior of forelimbs cream with a fine brown mottle (each scale in this region has a brown fleck).

Distribution and Habitats. Known only from the type

locality, Coula (500 m asl), on mainland New Caledonia (Fig. 7). Both the holotype and paratype were found in a fallen decaying tree trunk in a well forested area.

Genus *Phoboscincus* Greer

Phoboscincus Greer, 1974: 15 (type species *Eumeces bocourti* Brocchi, 1876, by original designation).

Diagnosis. Large (maximum SVL 200–275 mm) skinks; frontoparietals fused; teeth in anterior part of both upper and lower jaws sharply pointed, recurved and fang-like.

Recognized species. *Phoboscincus bocourti* (Brocchi, 1876); *Phoboscincus garnieri* (Bavay, 1869).

Phoboscincus bocourti (Brocchi)

Figs 8–10

Eumeces bocourti Brocchi, 1876: 95.

Type material. HOLOTYPE: MNHP 3029, *Eumeces bocourti* Brocchi (Figs 8, 9, 10).

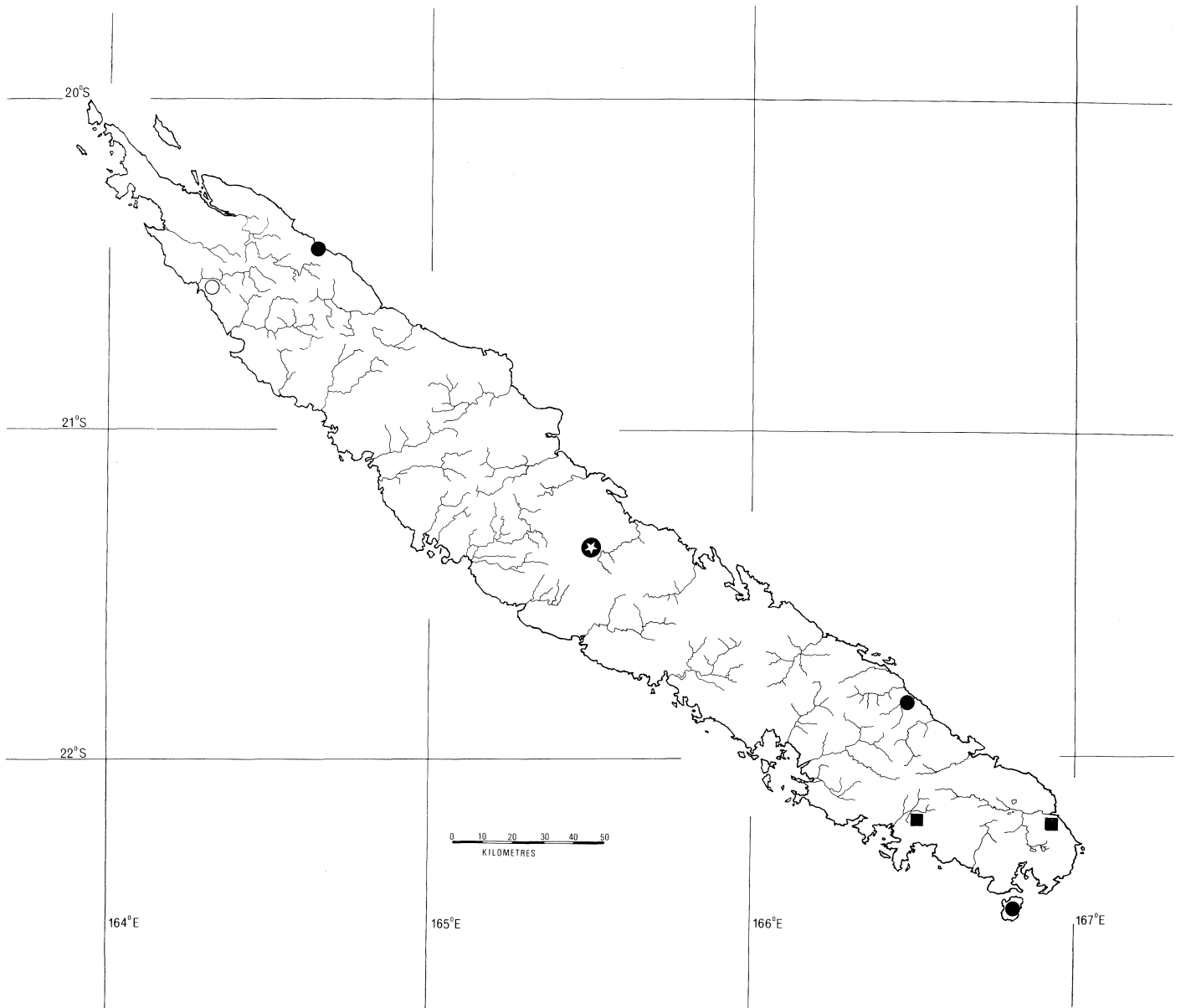


Fig. 7. Distribution of *Geoscincus haraldmeirei* (open star in closed circle), *Phoboscincus garnieri* (closed circle = specimen records, open circle = literature records) and *Graciliscincus* (closed square) in New Caledonia.



Fig. 8. MNHP 3029, holotype of *Eumeces bocourti* Brocchi.



Fig. 9. Closeup of the lateral view the of head of MNHP 3029 holotype of *Eumeces bocourti* Brocchi, showing depressed snout and massive jaw musculature.

Diagnosis. *Phoboscincus bocourti* is distinguished from the only other species in the genus, *Phoboscincus garnieri*, by: larger size (maximum SVL ca. 275 mm vs SVL 200 mm); more numerous scales at midbody (ca. 66 vs 32–34); supranasals narrowly separated (vs broadly contacting); uniformly dark colouration (vs colour pattern of broad, dark bands on a light background).

Description. *Phoboscincus bocourti* is a large skink known only from a single specimen.

MEASUREMENTS: SVL ca. 275 mm, preserved in an undulating curve; distance from axilla to groin 165 mm = 60% of SVL; distance from forelimb to snout 102 mm = 37.1% of SVL; hindlimb length 93 mm = 33.8% of SVL; tail length 270 mm (reproduced).

SCALATION: supranasals narrowly separated; frontonasal wider than long (W/L 140%); prefrontals moderately separated, extending laterally to contact third upper labial; frontal as broad as long (W/L 111%); frontoparietals fused; interparietal distinct; parietals each bordered by 2 enlarged upper secondary temporals and a single nuchal only marginally larger than adjacent scales of nape; primary temporal and lower secondary temporal fragmented, appearing as numerous similarly sized scales.

Nasals widely separated; anterior loreal as deep as combined nasal and supranasal depth, excluded from contact with posterior loreal by venterolateral extension of prefrontal to contact third upper labial; posterior loreal as deep as anterior loreal (alternatively viewed as the third loreal in a horizontal sequence of which the second has been incorporated into prefrontal); anterior

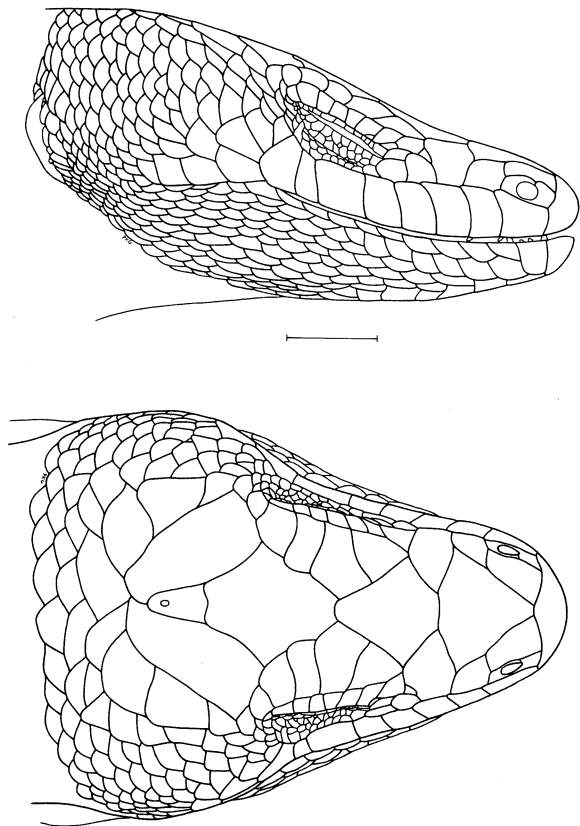


Fig. 10. Lateral and dorsal views of the head of MNHP 3029, holotype of *Eumeces bocourti* Brocchi.

subocular single, small, only marginally larger than surrounding scales of lower eyelid; supraciliaries 7; upper labials 8/9, last divided by a diagonal suture and penultimate on right divided to give an extra labial, sixth subocular both sides and contacting the lower eyelid; lower labials 9/10, first 2 contacting postmental; chinshields 3, first pair meeting medially, second and third pairs separated from labials by 1 or more intervening rows of smaller scales.

Lower eyelid scaled, contacting subocular upper labial.

Ear opening with 3 obtuse, enlarged auricular lobules anteriorly.

Body scales smooth, small; midbody scale rows ca. 66.

Lamellae beneath fourth toe 31/33.

OSTEOLOGY: presacral vertebrae 30; phalangeal formula for manus and pes 2.3.4.?.? and 2.3.4.5.4., respectively.

Distribution. New Caledonia.

***Phoboscincus garnieri* (Bavay)**

Figs 7, 11–13

Eumeces garnieri Bavay, 1869: 15.

Type material. NEOTYPE: *Eumeces garnieri* Bavay, BM 1860.3.18.18, here designated, adult male, SVL ca. 200 mm (Figs 11, 13).

Additional material examined. NHMB 7136, Outbache, 20°26'S 164°38'E; NHMB 7137-38, Ngoi Tal, 21°49'S 166°36'E; NHMB 7139, Quenepee, Lifou, Loyalty Islands; BM 1926.9.17.61, 1926.9.17.16, New Caledonia.

Diagnosis. *Phoboscincus garnieri* is distinguished from the only other species in the genus, *Phoboscincus bocourti*, by: smaller size (maximum SVL 200 mm vs ca. 275 mm); fewer scales at midbody (32–34 vs ca. 66) supranasals broadly contacting (vs narrowly separated); colour pattern featuring broad, dark transverse bands on a light background (vs uniformly dark).

Description. This description is based on seven adult specimens.

MEASUREMENTS: maximum SVL ca. 200 mm; distance from axilla to groin 54.5–55.2% of SVL

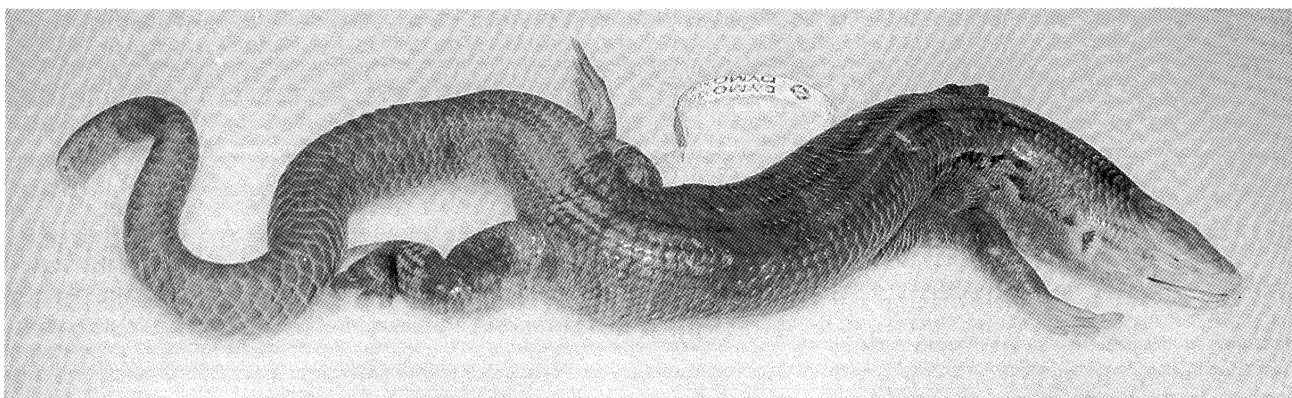


Fig. 11. BM 1860.3.18.18, neotype of *Eumeces garnieri* Bavay.

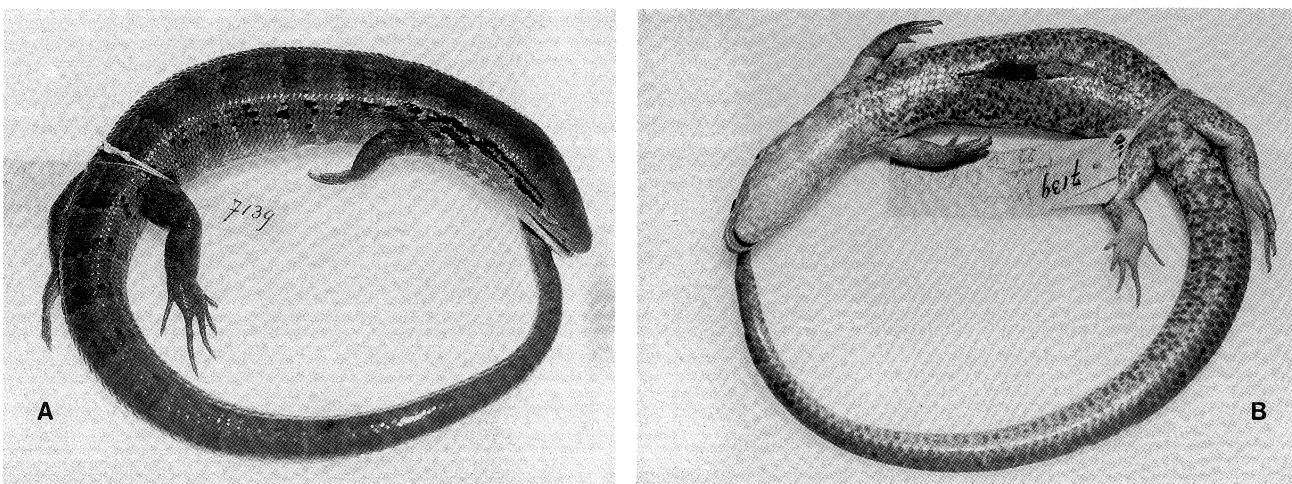


Fig. 12. NHMB 7139, a specimen of *Phoboscincus garnieri* (Bavay) showing the distinctive dorsal bands (a), and dark ventral markings (b) of this species.

(\bar{x} = 54.9, n = 6); hindlimb length 35.9–42.2% of SVL (\bar{x} = 38, n = 7); tail length 204% of SVL (n = 1).

SCALATION: supranasals in broad contact medially; frontonasal broader than long (W/L 117.3–154.8%, \bar{x} = 129.6, n = 6); prefrontals large, moderately to widely separated; frontal longer than broad (W/L 77.8–90.9%, \bar{x} = 84.2, n = 6); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporals usually 2 (92.8%), rarely a single larger scale; upper secondary temporal single; scales of temporal region posterior to primary temporals and divided last upper labial fragmented.

Nasals widely separated; 2 loreals in a horizontal sequence, anterior as deep as nasal and supranasal combined, posterior broad as deep; anterior subocular single; supraciliaries 6(61.5%, n = 7)–7; upper labials 8 with sixth subocular and contacting lower eyelid; lower labials 6(70%, n = 5)–7, first 2 contacting postmental; chinshields 2, first pair moderately narrowly separated (71.4%, n = 6) or in point contact, all chinshields contacting lower labials but anterior half of post genial only contacting lower labials.

Lower eyelid scaly, central scales markedly larger than those at perimeter and resembling a large opaque disc divided by median sutures.

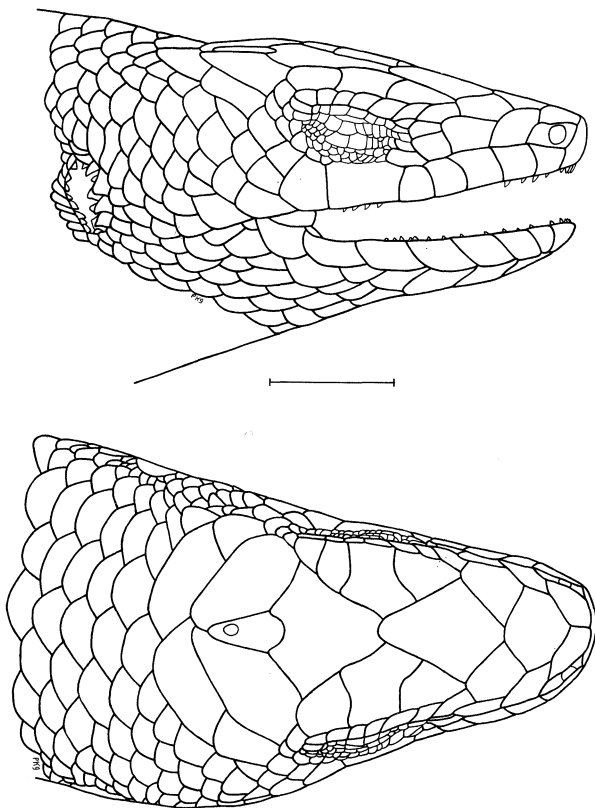


Fig. 13. Lateral and dorsal views of the head of BM 1860.3.18.18, neotype of *Eumeces garnieri* Bavay.

Ear opening with 1–4, usually 3 (92.8%, n = 7), acute auricular lobules anteriorly.

Body scales smooth to faintly striate; midbody scale rows 32–34 (\bar{x} = 32.6, sd = 0.9, n = 7); paravertebral scales 74–83 (\bar{x} = 79, sd = 2.6, n = 7).

Lamellae beneath fourth toe 23–27 (\bar{x} = 24.2, sd = 1.2, n = 7).

OSTEOLOGY: premaxillary teeth 10(33%, n = 3)–11; maxillary teeth 21–25 (\bar{x} = 23, sd = 1.5, n = 3); dentary teeth 24–30 (\bar{x} = 28.5, sd = 2.3, n = 3); presacral vertebrae 29 (n = 6); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface grey with a series of broad brown bands, often extending laterally but becoming poorly defined. Black temporal streak of variable width extending from eye posteriorly along dorsolateral surface to just past forelimb, breaking into series of longitudinally aligned dark dashes along dorsum. Venter white with prominent dark flecking posterior to forelimb; throat and chin less intensely marked in specimens from Lifou and Ngoy Tal; sparse dark flecks over most of venter, throat and tail in specimen from Outbache.

Distribution and habitats. *Phoboscincus garnieri* is sporadically distributed on mainland New Caledonia and offshore islands (Fig. 7), and also occurs on Lifou and possibly Ouvea Islands in the Loyalty Islands group.

Neither Bavay or Roux (1913) give an account of the habits of this species. I observed a large lizard I believe to be *P. garnieri* at Koumac Caves in far north-west New Caledonia. The single individual was on a hillslope of scattered limestone boulders with moderately thick woodland. When disturbed it sought refuge beneath a rock outcrop, and later climbed a small tree.

Reproduction. Two females collected by Roux & Sarasin contained 5(2/3) and 8(4/4) enlarged, yolked ovarian follicles.

Remarks. Bavay (1869) described *Eumeces garnieri* from material from the island of “Ouen” off the southern coast of New Caledonia, (approximately 22°25’ S 166°49’ E). Only one set of measurements are in the original description and Bavay makes no mention of other specimens, apart from the observation of a large skink at Mouli on Ouvea Island in the Loyalty Islands group.

The description of Bavay and redescription by Boulenger (1887) of this species are in close agreement, differing only in the condition of the lower eyelid. Bavay describes “a transparent lower eyelid showing a disc not covered but surrounded by small scales”, while Boulenger clearly describes the lower eyelid as scaly. BM 1860.3.18.18 almost certainly provided the basis for Boulenger’s description and clearly has the lower eyelid scaled. The only discrepancy between this specimen and Boulenger’s redescription being length of the tail (an incomplete tail 300 mm long in description, while BM 1860.3.18.18 has an incomplete tail only 220 mm long).

In describing *Lygosoma garnieri* (Bavay) Boulenger (1887) incorrectly placed *Eumeces bocourti* Brocchi in

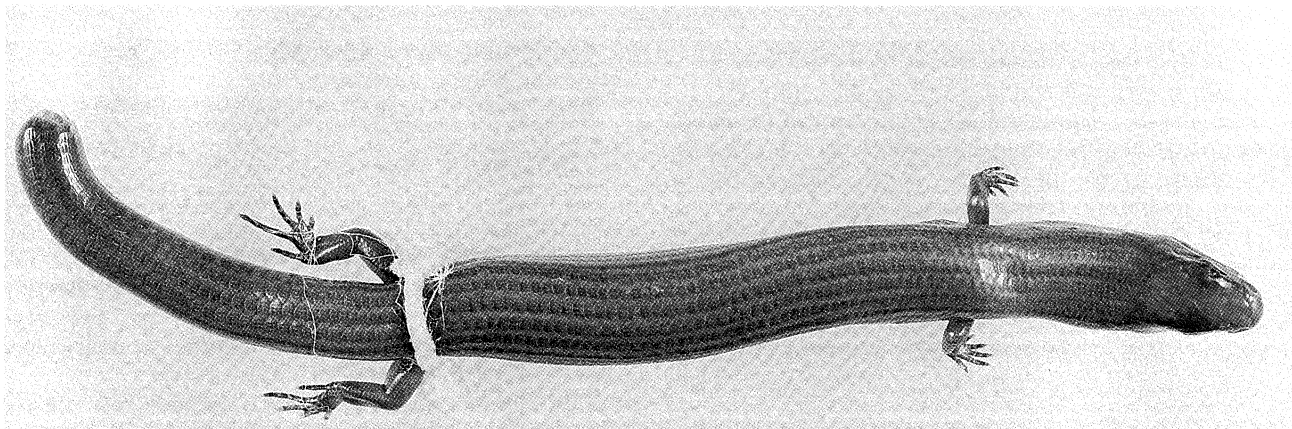


Fig. 14. AM R78143, holotype of *Graciliscincus shonae* n. gen., n. sp.

its synonymy. Roux (1913) later recognized *E. bocourti* Brocchi as distinct.

Graciliscincus n. gen.

Type species. *Graciliscincus shonae* n.sp., designated hereby.

Diagnosis. *Graciliscincus* can be distinguished from other genera in the *Eugongylus* group by the following combination of characters: depressed and elongate body form; supranasals absent; prefrontals small and widely separated; upper labials 5, third subocular; postmental contacting first lower labial only; lower eyelid with semi-transparent disc; ear opening minute; presacral vertebrae 36.

Etymology. The name *Graciliscincus* is derived from the Latin *gracilis* and *scincus*.

Remarks. Loss of phalanges on the digits of limbs and increase in postsacral vertebrae number are features often associated with a burrowing, semi-fossorial habit in skinks and have evolved independently in the *Sphenomorphus*, *Eugongylus* and *Egernia* groups in the Pacific region. *Graciliscincus shonae* is readily diagnosed as a member of the *Eugongylus* group of the scincid subfamily Lygosominae (Greer, 1979). It is unusual within the *Eugongylus* group in combining a high number of presacral vertebral (36) with a primitive phalangeal formula.

Graciliscincus shonae n. sp.

Figs 7, 14–16

Type material. HOLOTYPE: AM R78143, male, 4 km along the Mt Gouemba road from turnoff 3 km south of La Fause Yate Bridge, New Caledonia, 22°09'S 166°54'E, collected by R. Sadlier & P. Rankin, 27 Dec 1978 (Figs 14, 15). PARATYPE: CAS 159576, Mt Koghis (ca. 600 m) collected by A. Bauer, 28 Dec 1985.

Etymology. The species is named for Shona Sadlier.

Diagnosis. Species diagnosis same as for genus.

Description. Body form elongate with limbs and digits small, original part of tail stout. Known only from the types.

MEASUREMENTS: snout to vent length 37.5(holotype)–42(paratype) mm; distance from axilla to groin 64–65.5% of SVL (\bar{x} = 64.7, n = 2); distance from forelimb to snout 32–33.3% of SVL \bar{x} = 32.6, n = 2); hindlimb length 20–25% of SVL (\bar{x} = 22.5, n = 2); tail length 125% of SVL for regenerated tail of paratype.

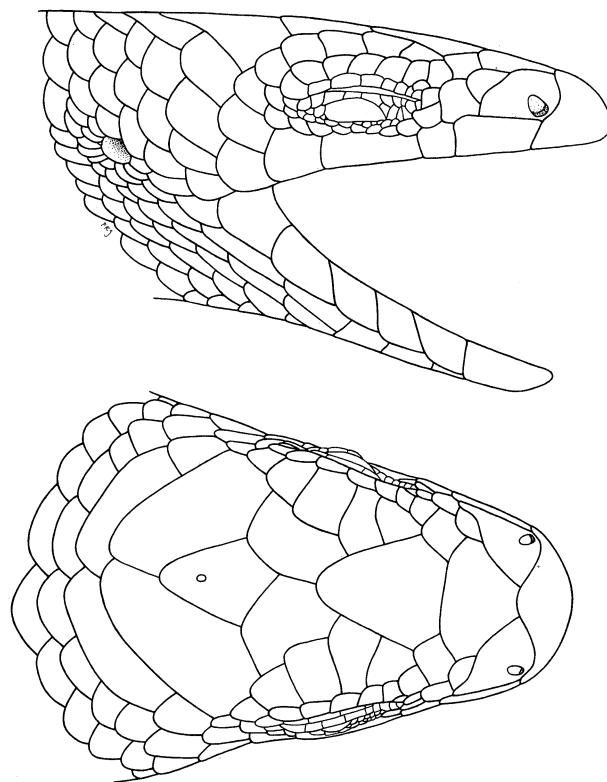


Fig. 15. Lateral and dorsal views of the head of AM R78143, holotype of *Graciliscincus shonae* n. gen., n. sp.

SCALATION: frontonasal nearly twice as broad as long (W/L 187.5–190.5%, \bar{x} = 189, n = 2) prefrontals small and widely separated; frontal near or as broad as long (W/L = 90–100%, \bar{x} = 95%, n = 2); frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals each single; tertiary temporals 2.

Nasals large and moderately separated; anterior loreal semilunar, positioned on posterodorsal margin of nasal and failing to contact upper labials; posterior loreal as broad as deep, contacting nasal anteriorly; anterior suboculars 2; supraciliaries 6; upper labials 5, variable in length, first and third twice as wide as second, third subocular and contacting lower eyelid; postlabials 2; lower labials 5, postmental contacting first lower labial only; chinshields 2, first pair in broad contact.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 50% of total eye length.

Ear opening small, circular and lacking enlarged auricular lobules.



Fig. 16. Mid altitude rainforest (300 m) beside road on low saddle on Mt Gouemba, type locality for *Graciliscincus shonae*.

Body scales smooth, scales of tail with 3 strong striations; midbody scale rows 22; paravertebral scales 76–80 (\bar{x} = 78, sd = 2, n = 2).

Lamellae beneath fourth toe flattish and poorly differentiated from one another.

OSTEOLOGY: premaxillary teeth 13; maxillary teeth 23–24 (\bar{x} = 23.5, sd = 0.5, n = 2); dentary teeth 28–29 (\bar{x} = 28.5, sd = 0.5, n = 2); presacral vertebrae 36; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface midbrown with fine, dark longitudinal stripes extending from nape to tail tip (stripes consist of darker central section of each scale flanked by lighter brown); head dark brown with greyish tinge to supraocular, upper labial, rostral and nasal scales. Lateral surface similar to dorsal but lighter overall; no distinct demarcation of dorsal and lateral surfaces. Venter pale, each scale with fine brown spotting medially, more intense on lower labials to appear grey-brown.

Distribution and habitats. The only records for this species are from single specimens on either side of the southern part of the mainland (Fig. 7).

The specimen from Mt Gouemba was collected during cool weather from a patch of rainforest in a gully ca. 300–350 m (Fig. 16). It was under a small stone on the forest floor.

Genus *Leiolopisma* Duméril & Bibron

Leiolopisma Duméril & Bibron, 1839: 742 (type species *Scincus telfairi* Desjardin, 1831).

Eulepis Fitzinger, 1843: 22 (type species *Lygosoma duperreyi* Duméril & Bibron, 1839).

Cyclodina Girard, 1857: 195 (type species *Cyclodina aenea* Girard, 1857).

Hombromia Girard, 1857: 196 (type species *Hombromia fasciolaris* Girard, 1857).

Oligosoma Girard 1857: 196 (type species *Lygosomella aestuosa* Girard, 1857 = *Leiolopisma smithi*).

Lioscincus Bocage, 1873b: 228 (type species *Lioscincus steindachneri* Bocage, 1873).

Diagnosis. *Leiolopisma* is more an assemblage of generally primitive *Eugongylus* group species rather than a defineable group of related species. The species here included in *Leiolopisma* all lack distinct supranasal scales. This is the single derived character state for the genus.

Recognized species. The genus contains 39 known species: *L. telfairi* from Mauritius; 13 Australian species (see Cogger, 1986); 20 New Zealand species (see Gill, 1986); a single Fijian species (Zug, 1985); and four New Caledonian species. The four New Caledonian species are: *Leiolopisma nigrofasciolatum* (Peters), *Leiolopisma greeri* Böhme, *Leiolopisma steindachneri* (Bocage) and *Leiolopisma novaecaledoniae* (Parker).

Remarks. *Lygosoma nigrofasciolatum* Peters and *Leiolopisma greeri* Böhme are diagnosed as each other's nearest relatives by sharing a suite of derived character states, the distribution of which among other generally

primitive species in the *Eugongylus* group has yet to be determined. For this reason, these two species are retained in *Leiolopisma*. Similarly, *Lioscincus steindachneri* Bocage and *Lygosoma novaecaledoniae* Parker, two generally primitive species with no obvious affinities to other species in the *Eugongylus* group of Greer (1974), are retained in *Leiolopisma*. While realizing the artificial nature of grouping these New Caledonian species into *Leiolopisma*, it is a matter of necessity to provide these species with some generic allocation. *Leiolopisma* at this time best serves this purpose. Should *Eulepis* Fitzinger, 1843, and *Cyclodina* Girard, 1857, be diagnosed and recognized as monophyletic lineages, so too should *Leiolopisma* Duméril & Bibron, 1839, be recognized as a monotypic genus restricted to its sole living representative *L. telfairi* Desjardin. *Oligosoma* Girard, 1857, would then be the available generic name for the residue of generally primitive skinks with a moveable lower eyelid containing a semi-transparent disc, and lacking supranasals.

Leiolopisma nigrofasciolatum species group

Diagnosis. Body scales smooth; last upper labial divided by an oblique suture; posterior chinshields separated from contact with labials by 1–2 rows of smaller intervening scales.

Recognised species. *Leiolopisma nigrofasciolatum* (Peters, 1869), *Leiolopisma greeri* Böhme, 1979.

Leiolopisma nigrofasciolatum (Peters).

Figs 17–22

Lygosoma (Mococa) nigrofasciolatum Peters, 1869: 435.

Lygosoma arborum Bavay, 1869: 19.

Lygosoma deplanchei Bocage, 1873b: 229.

Type material. HOLOTYPE: *Lygosoma nigrofasciolatum* Peters, single specimen ZMB 6444, adult male, SVL 98 mm (Figs 18, 19), New Caledonia. NEOTYPES: *Lygosoma arborum* Bavay, AM R78029, here designated, adult male, SVL 100 mm (Fig. 20), Mouac Island off Poum, New Caledonia, 20°13'S 164°00'E. *Lygosoma deplanchei* Bocage, NHMB 7168, here designated, adult female, SVL 92 mm (Fig. 21), Outbache, New Caledonia, 20°26'S 164°38'E.

Additional material examined. AM R78027, 78028, Mouac Island off Poum, 20°13'S 164°00'E; AM R77969-70, Poum, 20°14'S 164°02'E; ABO, 20°17'S 164°26'E; NHMB 7161-62, 7164-66, 7169-70, Outbache, 20°26'S 164°38'E; AM R78050, Koumac Caves ca. 9 km east Koumac, 20°33'S 164°21'E; NHMB 7178, Toa, 20°33'S 164°48'E; NHMB 7163, Heinghene, 20°41'S 164°56'E; NHMB 7171-72, Kone, 21°04'S 164°52'E; AM R77686, 2 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77602-05, Houailou airstrip, 21°16'S 165°37'E; NHMB 7177, Ni, 21°26'S 165°29'E; NHMB 7174-75, Canala, 21°32'S 165°57'E; AM R78249, 78282, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E; NHMB 7179, Brinor; NHMB 7180-1 Corala-Boreare.

Diagnosis. *Leiolopisma nigrofasciolatum* is distinguished from the only other species in the species group, *Leiolopisma greeri*, by: more paravertebral scales (82–96 vs 74); more lamellae beneath the fourth toe (28–34 vs 24–27); prefrontals moderately separated-point contact vs contacting narrowly.

Description. This description is based on four juvenile-subadults and 28 adult specimens (holotype and two hatchlings are not included in the analysis of measurements and scalation).

MEASUREMENTS: from our collection of this species made in December 1978, the smallest apparently reproductively viable individuals were two females 73 and 77 mm SVL. From this data, juvenile-subadult (33–67 mm) and adult (73–108 mm) size classes are defined.

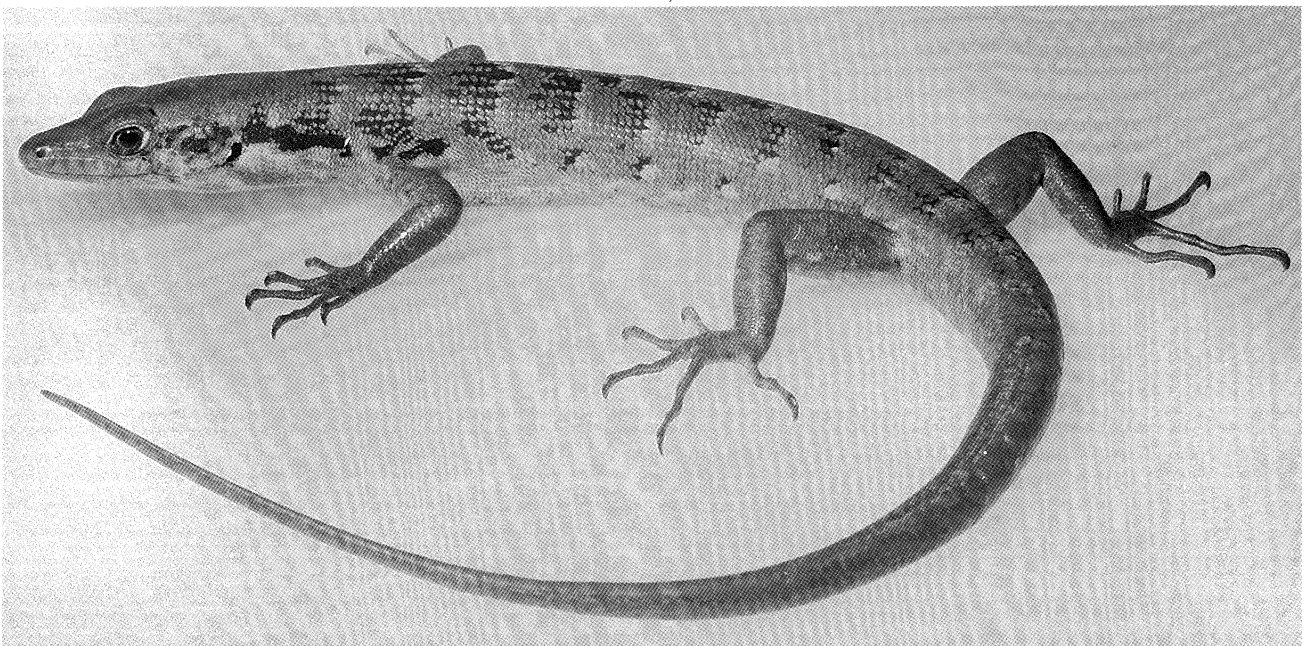


Fig. 17. *Leiolopisma nigrofasciolatum* (Peters) from Houailou airstrip, New Caledonia.

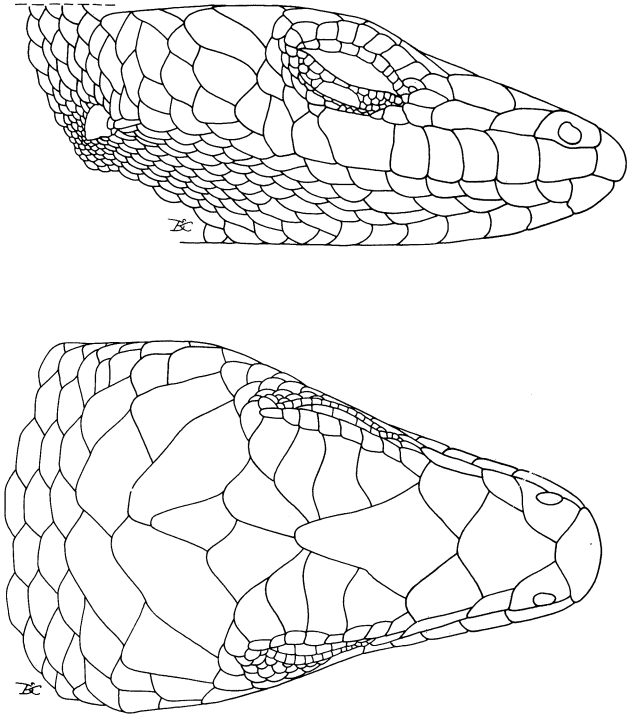


Fig. 18. Lateral and dorsal views of the head of ZMB 6444, holotype of *Lygosoma nigrofasciolatum* Peters.

Only adults are included in the following body measurements.

Maximum SVL 108 mm; distance from axilla to groin 50–60.7% of SVL (\bar{x} = 55.6, n = 28); hindlimb length 37–48.9% of SVL (\bar{x} = 42.4, n = 27); tail length ca. 146.3–179.1% of SVL (\bar{x} = 162.6, n = 13).

SCALATION: frontonasal as broad or broader than long (W/L 100–122%, \bar{x} = 112, n = 30); prefrontals large, usually moderately-narrowly separated (84.4%, n = 30) occasionally in point contact; frontal longer than broad (W/L 59–81%, \bar{x} = 68%, n = 30); frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporals 2 (though division of penultimate upper labial may give appearance of third primary temporal); upper and lower secondary temporals single, though division of last upper labial may give appearance of second lower secondary temporal; tertiary temporals 2, occasionally fused to give a single deep, slender scale (20%).

Nasals narrowly to moderately separated, occasionally with a crease from top of naris posteroventrally towards nasoloreal suture (crease sometimes appearing as a definite postnasal suture accompanied by considerable fragmentation of posterodorsal part of nasal scale; 2 loreals in a horizontal sequence, anterior twice as long as deep, posterior more than twice as long as deep and equal in depth to anterior loreal; anterior suboculars 1–2, second



Fig. 19. ZMB 6444, holotype of *Lygosoma nigrofasciolatum* Peters.

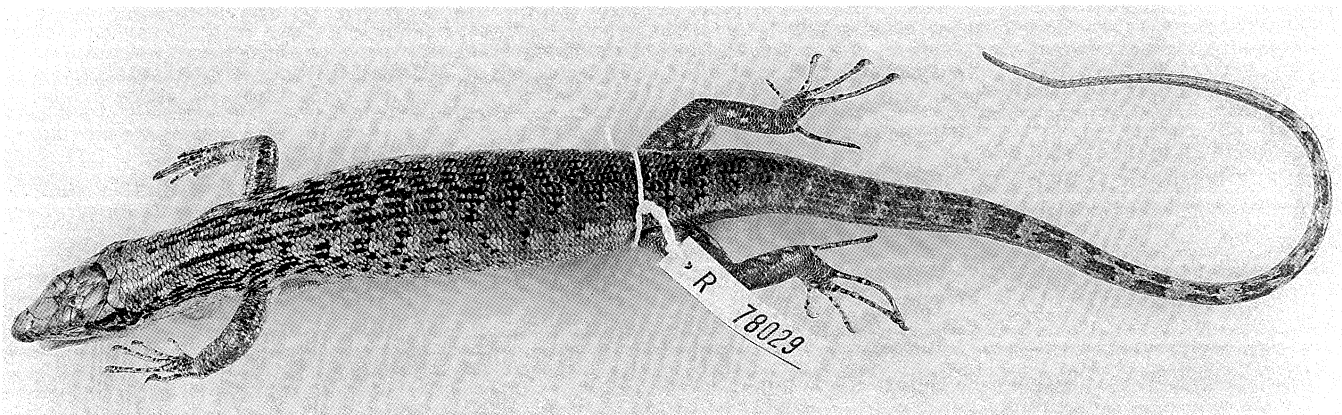


Fig. 20. AM R78029, neotype of *Lygosoma arborum* Bavay.

if present usually considerably smaller; supraciliaries usually 8 (91%, $n = 32$) rarely 7, 9 or 10; upper labials 8 (48.4%, $n = 31$)–9 with sixth or seventh respectively subocular and contacting lower eyelid; penultimate upper labial often (53.6%, $n = 14$) divided by an oblique suture, last upper labial divided by an oblique suture, sometimes further fragmented to give 3 or 4 similar sized scales; postlabials usually 2 (63.3%, $n = 30$), each moderately deep and slender but often (26.7%) with lower subdivided by an oblique suture and occasionally (10%) fragmented so as to be indistinguishable; lower labials usually 7 (56.2%, $n = 32$)–8 (39%), rarely 6 or 9, first 2 usually contacting postmental; chinshields 4–5, first pair in broad contact and second pair usually in moderate contact, first pair also usually in partial contact with lower labials but all posterior chinshields separated from lower labials by 1–2 rows of smaller scales.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 30–44% of total eye length ($\bar{x} = 36.7$, $n = 31$).

Ear opening with 2–3 enlarged obtuse lobules anteriorly, uppermost largest, and numerous small rounded lobules on upper, lower and posterior edges.

Body scales smooth; midbody scale rows 36–42 ($\bar{x} = 38.2$, $sd = 1.4$, $n = 32$); paravertebral scales 82–96 ($\bar{x} = 89$, $sd = 3.9$, $n = 32$).

Lamellae beneath fourth toe 28–34 ($\bar{x} = 30.8$, $sd = 1.6$, $n = 30$).

OSTEOLOGY: premaxillary teeth 11 (66.6%, $n = 12$)–10; maxillary teeth 17–20 ($\bar{x} = 17.8$, $sd = 0.8$, $n = 12$); dentary teeth 21–25 ($\bar{x} = 23.3$, $sd = 1.1$, $n = 11$); presacral vertebrae 29 ($n = 8$); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface midbrown with greyish tinge and indistinct light and dark flecks randomly distributed anteriorly, but with dark flecks forming roughly transversely aligned bars posteriorly; dark longitudinal bar on nape in most individuals, sometimes extending to middorsum; head coppery brown, usually without light and dark flecking, dark edging may occur along scale sutures of most major head shields, lower labials with or without dark spotting. Dorsolateral surface with broad, dark streak extending from eye posteriorly over ear and continuing a variable distance towards forelimb, sometimes incorporating light flecks resulting in loss of continuity of dark band. Lateral surface similar to dorsal, but usually without dark transverse bars, and tending to become paler ventrally. Fore and hindlimbs similar to dorsum, either uniform brown or with varying degrees of light and dark markings. Venter immaculate, in life lime green as is underside of tail, limbs and soles of feet.

Some individuals nearly patternless, more or less

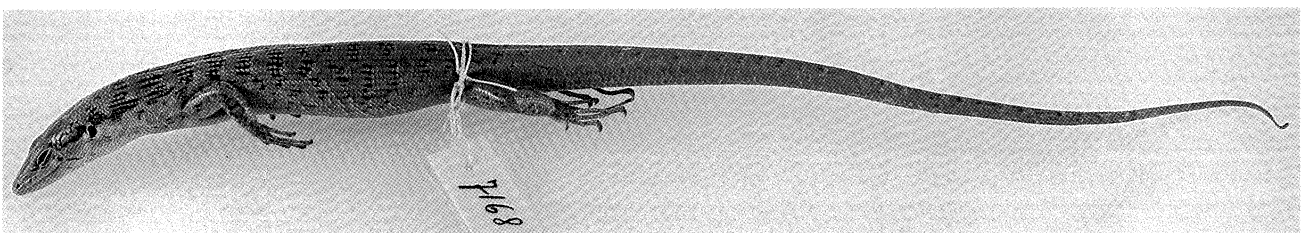


Fig. 21. NHMB 7168, neotype of *Lygosoma deplanchei* Bocage.

uniform midbrown above with occasional light or dark markings about forelimb.

Distribution and habitats. *Leiopisma nigrofasciolatum* occurs over most of mainland New Caledonia on the coast, highlands (500+ m on Mt Aoupinie), and offshore islands (Isle Mouac off Poum) (Fig. 22). Roux (1913) also records this species from all three of Loyalty Islands.

Leiopisma nigrofasciolatum is aboreal in habit and is usually encountered in open habitat such as low coastal scrub (Fig. 1a, b) and the edges of forest clearings at all altitudes. However, two specimens were taken from rock crevices in moderately tall but open woodland just north of Pueblo (Fig. 1c), on the north-east coast.

Reproduction. *Leiopisma nigrofasciolatum* is oviparous. One adult female (94 mm SVL) contained a total of seven shelled oviducal eggs (4/3). Two eggs from a clutch laid by a captive held specimen hatched in late February 1979. The young measured 34 and 33

mm SVL with bodyweights of 0.54 and 0.55 grams, respectively.

Remarks. The type of *Lygosoma (Mocoa) nigrofasciolatum* (ZMB 6444) agrees reasonably well with Peter's (1869) description and confirms the presence of distinct frontoparietals, a feature of scalation which readily distinguishes this species from the superficially similar *Emoia samoense* of nearby Pacific islands. The descriptions of *Lygosoma arborum* Bavay and *Lygosoma deplanchei* Bocage are sufficient to indicate these species are conspecific with *Lygosoma (Mocoa) nigrofasciolatum* Peters, but neotypes have been designated (above) to stabilize the names.

***Leiopisma greeri* Böhme**

Figs 22–24

Leiopisma greeri Böhme, 1979: 140.

Type material. HOLOTYPE: *Leiopisma greeri* Böhme, ZFMK 25456, adult female, SVL 61 mm (Figs 23, 24),

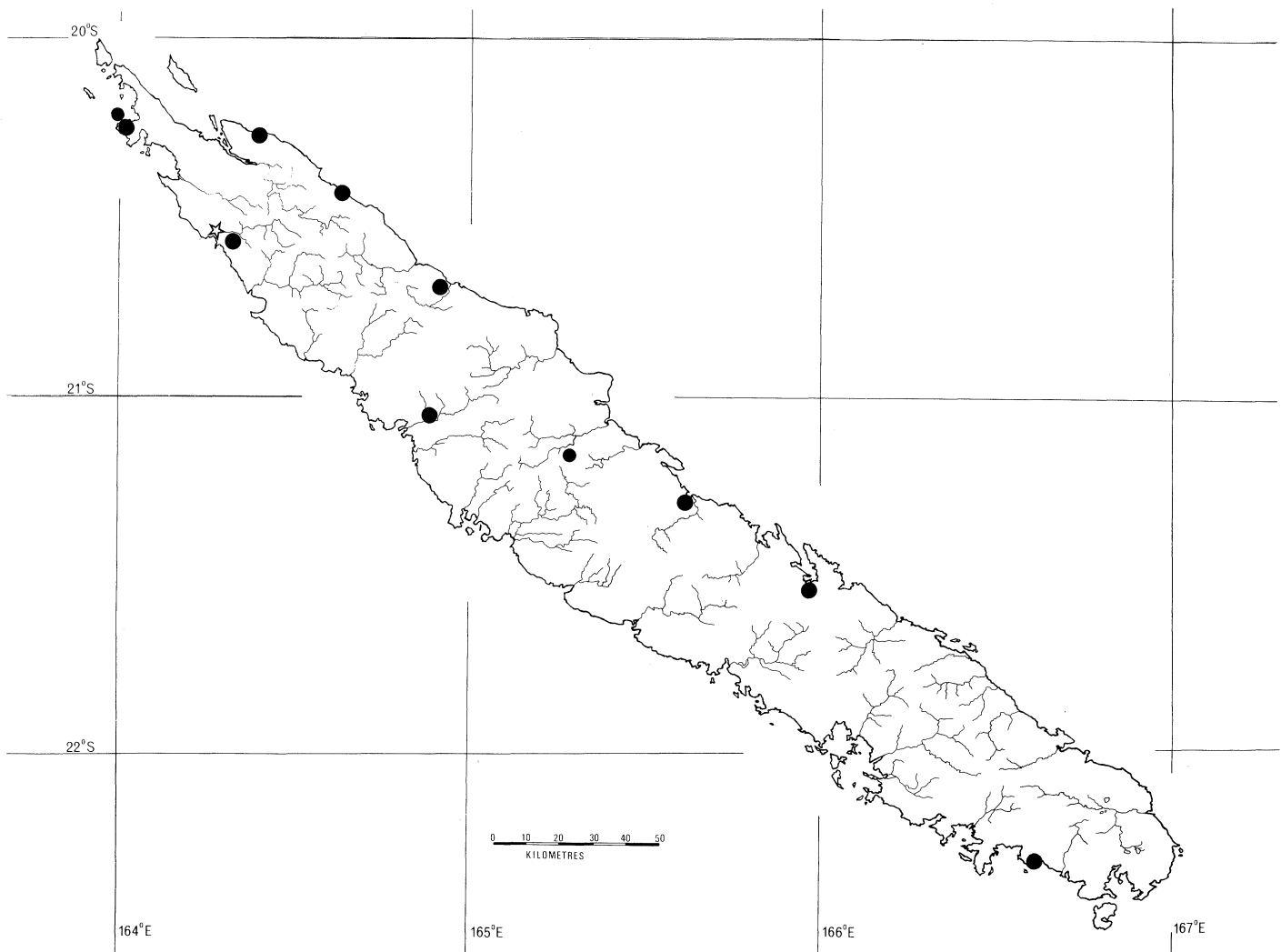


Fig. 22. Distribution of *Leiopisma nigrofasciolatum* (closed circle) and *Leiopisma greeri* (open star) in New Caledonia.

Koumac, New Caledonia, 20°34'S 164°17'E.

Diagnosis. *Leiolopisma greeri* can be distinguished from the only other species in the *Leiolopisma nigrofasciolatum* species group, *Leiolopisma nigrofasciolatum*, by: fewer paravertebral scales (74 vs 82–96); fewer lamellae beneath the fourth toe (24–27 vs 28–34); prefrontals contacting narrowly vs moderately separated–point contact.

Description. This description is based on the holotype ZFMK 25456.

MEASUREMENTS: SVL 61 mm; distance from axilla to groin 52.4% of SVL; hindlimb length 43.4% of SVL; tail length 120.5% of SVL, (regenerated).

SCALATION: frontonasal broad as long posteriorly (W/L 100%), considerably narrower anteriorly; prefrontals large, in narrow contact; frontal longer than broad (W/L 67%); frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporals 2–3; upper and lower secondary temporals single; tertiary temporals fragmented, not readily discernable.

Nasals narrowly separated; 2 loreals in a horizontal sequence, posterior more elongate and less deep than anterior; anterior subocular single; supraciliaries 7/7; upper labials 8/8, with sixth subocular and contacting lower eyelid, last upper labial divided (giving appearance of an extra lower secondary temporal); postlabials indistinguishable; lower labials 7/6, first 2 contacting postmental; chinshields 4/3, those posterior to first pair partially to wholly separated from contact with lower labials by 1–2 rows of small scales.

Lower eyelid with an obvious, centrally located semi-transparent disc, length approximately 40% of total eye length.

Ear opening with 1–2 enlarged, white auricular lobules anteriorly, uppermost large and obtuse.

Body scales smooth; midbody scale rows 34; paravertebral scales 74.

Lamellae beneath fourth toe 24–27.

OSTEOLOGY: presacral vertebrae 29; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

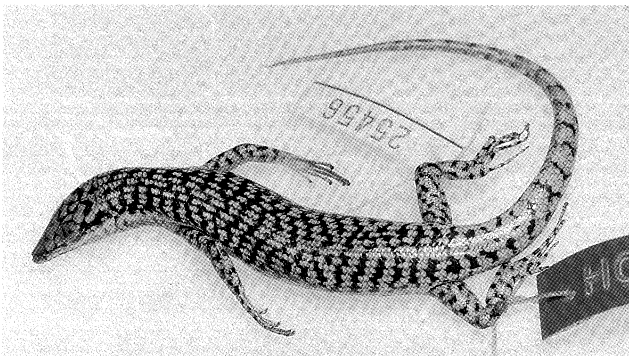


Fig. 23. ZFMK 25456, holotype of *Leiolopisma greeri* Böhme.

COLOUR AND PATTERN (in alcohol): dorsal and lateral surfaces with a pattern of thin, alternate black and cream transverse bars. Broad, pale midlateral stripe extending from upper labials through ear and over forelimb to groin. Tail mottled black and cream. Lower lateral surface mottled black and cream with dark spotting predominate and appearing as a continuation of dorsal and upper lateral colour. Venter immaculate white.

Distribution and habitats. *Leiolopisma greeri* is known only from the region of Koumac (20°34'S 164°17'E), in the north-west of mainland New Caledonia (Fig. 22). The type was collected from a "freshly fallen tree in montane forest" (Böhme, 1979).

Reproduction. *Leiolopisma greeri* is oviparous. Meier (1979a) records the type laying two eggs (7 x 3 mm) in January 1979. Size of young at birth was 30 mm SVL.

Remarks. *Leiolopisma greeri* first appeared (unnamed) in an article by Meier (1979a) who discussed the habits of this undescribed species in the field and in captivity.

Böhme (1979), in describing *Leiolopisma greeri*, draws attention to the problem of determining relationships within *Leiolopisma*. He refers to convergence in features of overall morphology between *Marmorosphax tricolor* and certain *Sphenomorphus* groups members, and between members of *Tropidoscincus* and the *Leiolopisma nigrofasciolatum*

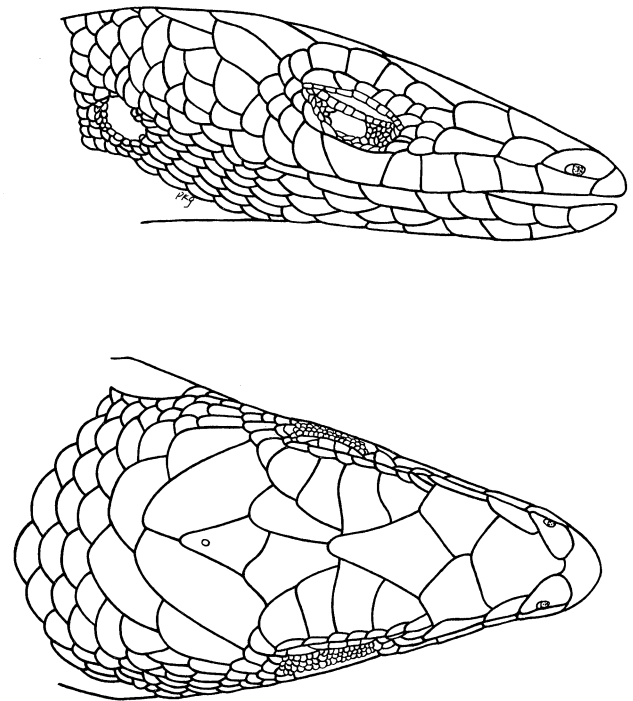


Fig. 24. Lateral and dorsal views of the head of ZFMK 25456, holotype of *Leiolopisma greeri* Böhme.

species group with certain species of *Emoia*. While Böhme regards *L. greeri* as “corresponding to the ecomorphotype of *L. nigrofasciolatum* and *L. variabile*” and that of “its close intrageneric relationships nothing can yet be said”, I believe the suite of derived character states in the diagnosis for members of the *L. nigrofasciolatum* species group serves to establish *L. nigrofasciolatum* and *L. greeri* as sister species.

Leiolopisma steindachneri (Bocage)

Figs 25–27, 29

Lioscincus steindachneri Bocage 1873b: 228.

Type material. NEOTYPE: *Lioscincus steindachneri* Bocage, NHMB 7450, here designated, adult female, SVL 87.5 mm (Figs 26, 27), from Mt Panie (500 m), New Caledonia, 20°36'S 164°46'E.

Additional material examined. NHMB 7470, Porari–Balade (200 m), 20°21'S 164°21'E; NHMB 7449, 7454–65, Mt Ignami (700 m), 20°28'S 164°36'E; NHMB 7466–69, Mt Panie (500 m), 20°36'S 164°46'E; AM R77723–28, 77800, creek crossing 1 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E.

Diagnosis. *Leiolopisma steindachneri* can be distinguished from all other New Caledonian members of the genus by the following combination of characters: frontoparietals fused; supranasals and post nasal suture generally absent; anterior loreal a small semilunar scale

separated from contact with labials; ear lobules very small, barely distinguishable from surrounding small, blunt conical scales of upper, lower and posterior edges of ear opening; dorsal scales smooth.

Description. The basis of this description are 6 juvenile-subadult and 7 adult specimens.

MEASUREMENTS: the specimens we collected in December 1978 were assignable to juvenile (39–45 mm SVL) and adult (77–88.5 mm SVL) size classes, those collected by Roux & Sarasin in June and July 1911 to juvenile (35–45 mm SVL) and subadult (50.5–56 mm SVL) size classes, and two large adults of 86 and 102 mm SVL. Unless otherwise stated, only adults are included in the following body measurements.

Maximum SVL 102 mm; distance from axilla to groin 52.6–59.9% of SVL (\bar{x} = 56.3, n = 7); hindlimb length 42.9–49.4% of SVL (\bar{x} = 45.9, n = 7); tail length of 2 subadults 172–178.6% of SVL, (\bar{x} = 174.7, n = 2).

SCALATION: frontonasal usually slightly wider than long (W/L 94.3–137.5%, \bar{x} = 111.5, n = 13); prefrontals large, narrowly to moderately separated; frontal longer than broad (W/L 61.5–69.3%, \bar{x} = 65.4, n = 13); supraocular scales irregularly fragmented in certain individuals; frontoparietals fused, some individuals with a short median suture posteriorly; interparietal distinct; parietals each bordered by a fragmented nuchal and upper secondary temporal scale; nuchals divided to give up to 4 distinct scales, not noticeably larger than adjacent dorsals, bordering parietals between upper

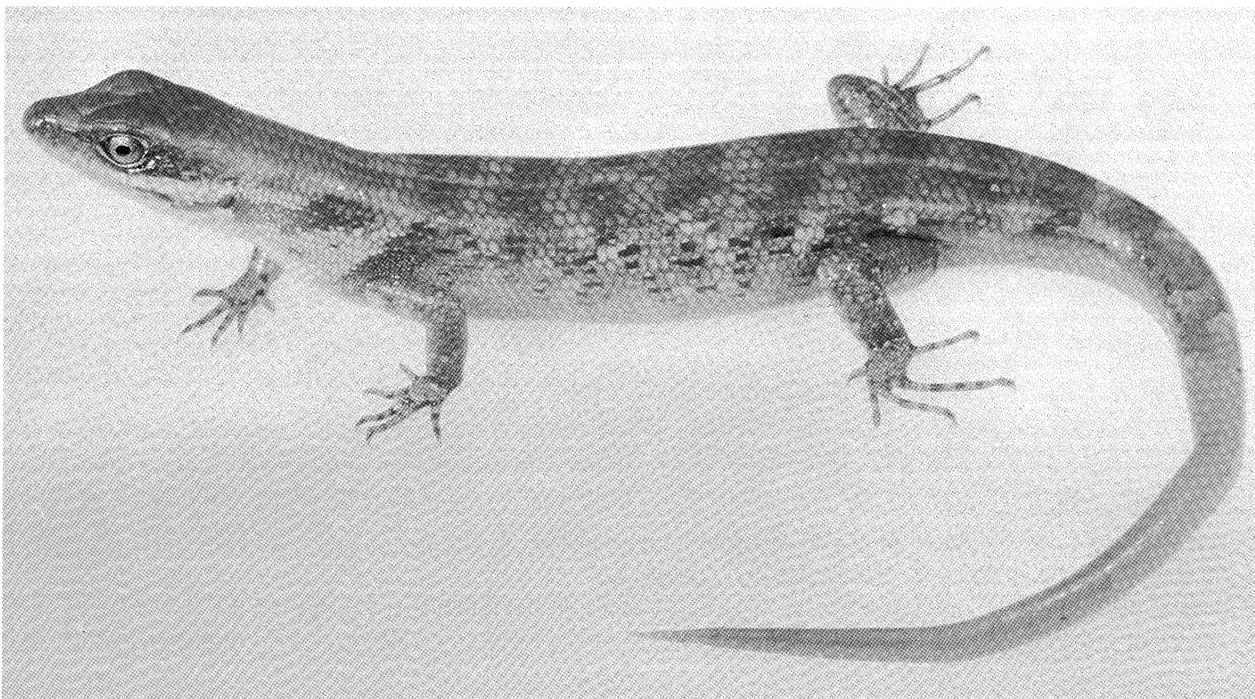


Fig. 25. *Leiolopisma steindachneri* (Bocage) from near Mt Aoupinie forestry camp (500 m), New Caledonia.

secondary temporals, inner most pair in moderate to broad contact or separated by an azygous dorsal scale which usually contacts the parietal narrowly [hence the internuchal scale described by Roux (1913)]; primary temporal usually single, occasionally divided to give 2 equal sized scales; upper secondary temporal usually single, occasionally fragmented anterodorsally producing an additional small scale bordering the parietal; lower secondary temporal usually single, occasionally divided; tertiary temporals 2.

Nasals widely separated, postnasal suture usually absent though a crease from naris to nasoloreal suture may be present (in one individual this forms a distinct suture); anterior loreal semilunar, positioned on posterodorsal margin of nasal and usually failing to contact upper labials (86%, $n=13$), infrequently extending its lower edge to contact labials, posterior loreal nearly twice as long as deep, usually (86%, $n=13$) contacting both semilunar anterior loreal and nasal anteriorly (though contact with nasal is excluded when anterior loreal projects down to contact upper labials); anterior subocular scales 2–3, subequal; supraciliaries 7 (88.5%, $n=13$)–8; upper labials 7, with fourth and fifth subocular, but only fifth contacting lower eyelid; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3, first pair in broad contact, last pair divided longitudinally.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 27.7–46.1% of total eye length ($\bar{x}=35.4$, $n=12$).

Ear opening with 2–4 small conical lobules anteriorly.

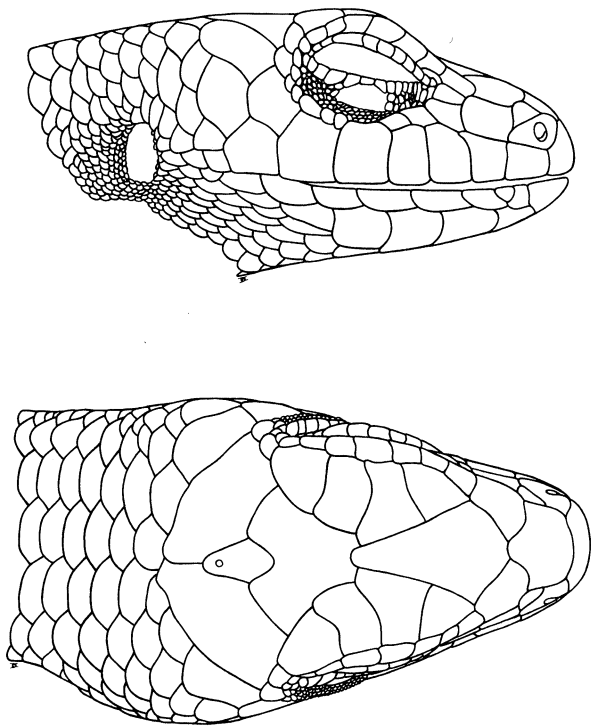


Fig. 26. Lateral and dorsal views of the head of NHMB 7450, neotype of *Lioscincus steindachneri* Bocage.

Body scales smooth, midbody scale rows 34–36 ($\bar{x}=35.7$, $sd=0.7$, $n=13$); paravertebral scales 57–60 ($\bar{x}=58.1$, $sd=1.1$, $n=13$).

Lamellae beneath fourth toe 37–47 ($\bar{x}=42$, $sd=2.6$, $n=12$).

OSTEOLOGY: premaxillary teeth 11 ($n=3$); maxillary teeth 25–28 ($\bar{x}=27.2$, $sd=1.1$, $n=3$); dentary teeth 29–32 ($\bar{x}=30.6$, $sd=1$, $n=3$); presacral vertebrae 29; postsacral vertebrae 50–53 ($\bar{x}=51$, $sd=1.2$, $n=4$); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4 respectively.

COLOUR AND PATTERN: dorsal surface with a series of broad, alternate dark and light transverse bars from nape to basal part of tail; dark bands broadest at dorsolateral edge to give an overall hourglass shape, dark brown and with each scale having a longitudinally aligned black median fleck; lighter interspaces broadly elliptical, nearly enclosed by darker bands, light brown with finer grey to white flecking in region between fore and hindlimbs; head brown above, unmarked. Lateral surface between fore and hindlimbs a continuation of dorsal pattern with dark transverse bars irregular and broken, and light brown to grey flecking on interspaces; forelimb region with a broad black bar extending obliquely from axilla posterolaterally, and a second broad black bar extending posteriorly from supralabials through to ear opening, thence broadening and passing parallel to dark bar from axilla; side of head with a white stripe from subocular upper labial to just above ear opening, partially bordering black bar between jaw and ear, upper labials anterior to eye brown, between white upper labial stripe and top of head dark brown-black. Venter white, medially and occasionally ventrolaterally with a series of transverse grey blotches (continuations of light lateral interspaces); chest and throat spotted with grey. Limbs light brown with random light and dark flecking.

This colour description is based on a series collected in 1978 on Mt Aoupinie on the central ranges. A large series collected by Roux & Sarasin from Mt Ignambi on the north coast ranges differ in that the posterior broad black bar in the region of the forelimb is absent, and the broad black band anterior to that does not continue past level of ear opening.

Distribution and habitats. *Leiopisima steindachneri* is recorded from the north-east highlands of mainland New Caledonia (Fig. 29).

Roux & Sarasin recorded *L. steindachneri* from moist areas of mountains. Our specimens were from beneath stones at the side of a creek running through thick rainforest ca. 500 m (Fig. 1f). In this habitat, *L. steindachneri* was syntopic with *Marmorosphax tricolor*.

Reproduction. The three adult females collected in December 1978 (SVL 77–88.5 mm) contained 4–8 moderate to large yolked ovarian follicles.

Remarks. The description of *Lioscincus steindachneri* by Bocage (1873b) was based on a single specimen (total

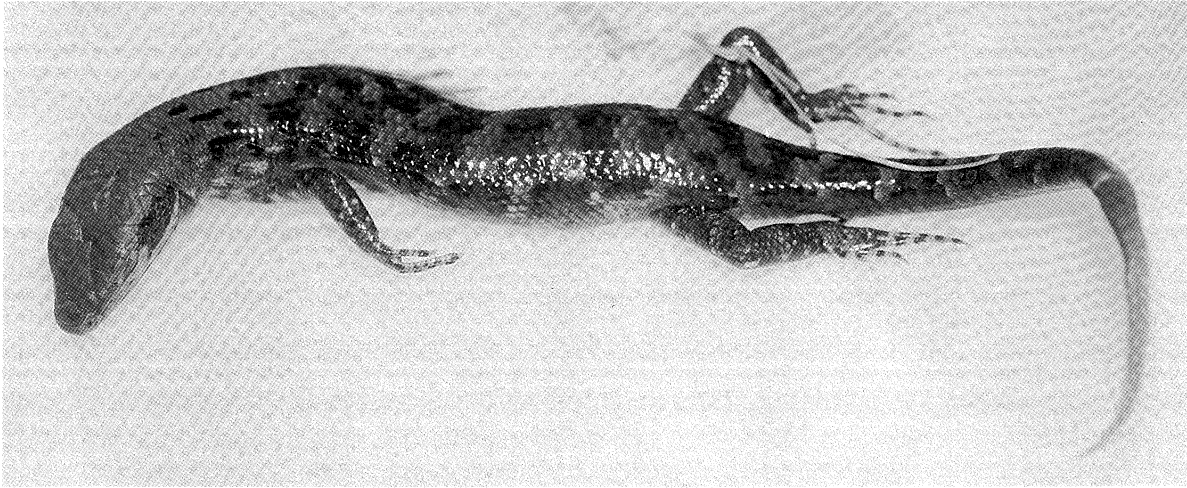


Fig. 27. NHMB 7450, neotype of *Lioscincus steindachneri* Bocage.

length of 197 mm of which the incomplete tail was 110 mm) noted to be in poor condition. The type of *Lioscincus steindachneri* Bocage lodged in the Museum at Lisbon is no longer in existence. As Roux (1913) had examined this specimen and found it to be conspecific with those collected by Roux & Sarasin, a neotype from the collection of Roux & Sarasin has been designated (above) to stabilize the name.

Leiopisma novaecaledoniae (Parker)

Figs 28–31

Lygosoma (*Leiopisma*) *novaecaledoniae* Parker, 1926: 493.

Type material. HOLOTYPE: *Lygosoma* (*Leiopisma*) *novaecaledoniae* Parker, BM 1946.8.16.15, adult female, SVL 61 mm (Figs 28, 30), upper Houailou River, New Caledonia

Additional material examined. AM R90454, 3 km north of Oue Camme River; AM R77722, creek crossing 1 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08' S 165°21' E; AM R78349, Houailou airstrip, 21°16' S 165°37' E; ZFMK 25480, 27661, La Foa, 21°43' S 165°52' E.

Diagnosis. *Leiopisma novaecaledoniae* can be distinguished from all other New Caledonian members of the genus by the following combination of characters: frontoparietals fused; supranasals or postnasal suture absent; tertiary temporals fused; subdigital lamellae broad, flat and pale basally, with distal third of fourth toe markedly compressed.

Description. This description is based on five adult specimens.

MEASUREMENTS: maximum SVL 68 mm; distance from axilla to groin 55.4–64.7% of SVL (\bar{x} = 58.8, n = 5); hindlimb length 39–43.8% of SVL (\bar{x} = 41.3, n = 4); tail length ca. 183.7–224.6% of SVL (\bar{x} = 202.8, n = 3).

SCALATION: frontonasal slightly broader than long

(W/L 108.9–129%, \bar{x} = 119, n = 4); prefrontals large, narrowly separated or in point contact; frontal longer than broad (W/L 76.2–80.5%, \bar{x} = 78%, n = 4); frontoparietals fused (paired in AM R77722); interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals fused to form a single scale.

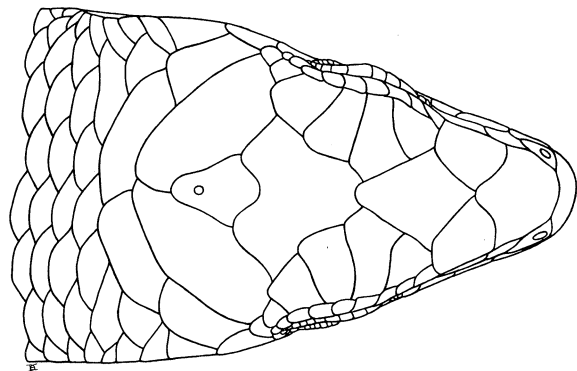
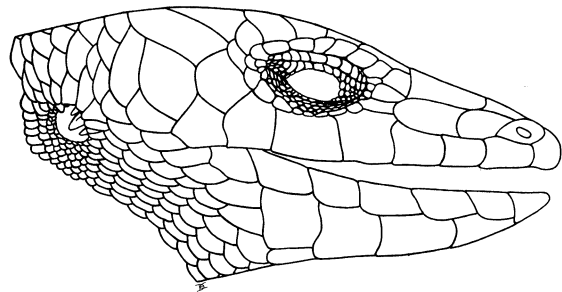


Fig. 28. Lateral and dorsal views of the head of BM 1946.8.16.15, holotype of *Lygosoma novaecaledoniae* Parker.

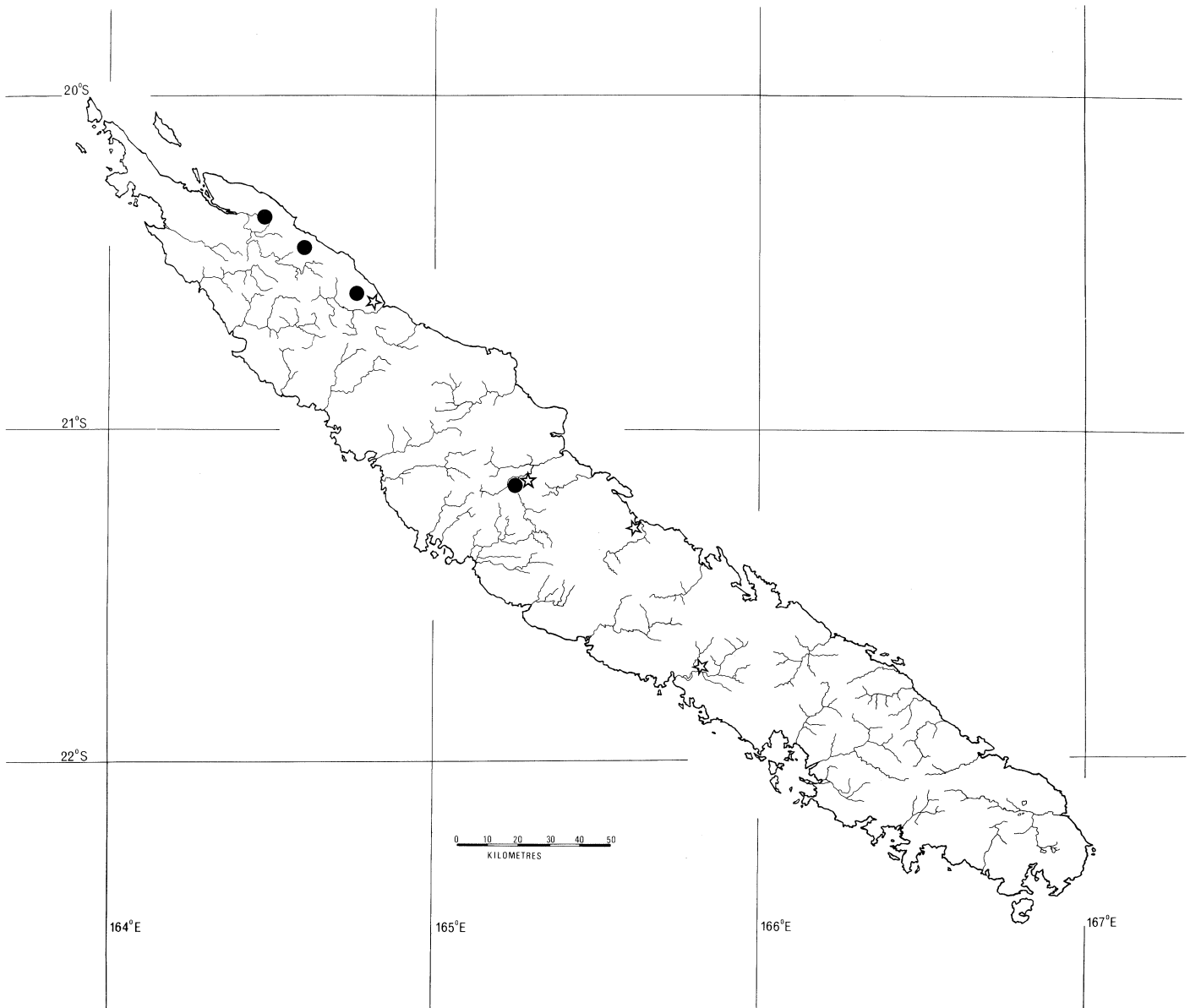


Fig. 29. Distribution of *Leiolopisma steindachneri* (closed circle) and *Leiolopisma novaecaledoniae* (open star) in New Caledonia.

Nasals widely separated; 2 loreals in a horizontal sequence, anterior near as long as deep, posterior longer than deep and shallower than anterior loreal; anterior suboculars 2–3, anteriormost large, remainder markedly smaller; supraciliaries usually 7 (70%, $n=5$), occasionally 6 or 8; upper labials usually 7 (70%, $n=5$) with fifth subocular and contacting lower eyelid, occasionally 8 with sixth subocular; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 40–49.1% of eye length ($\bar{x}=46.1$, $n=4$).

Ear opening with a single large obtuse lobule and up to 2 small acute lobules anteriorly.

Body scales tri- to quadricarinate on dorsal to midlateral surface, each dorsal keel interrupting posteriormost edge of scale, number of keels increasing

to 5 or 6 towards nape as scales progressively broaden; midbody scale rows 30–34 ($\bar{x}=31.8$, $sd=1.2$, $n=6$); paravertebral scales 56–59 ($\bar{x}=57.7$, $sd=1.2$, $n=6$).

Lamellae beneath fourth toe 21–24 ($\bar{x}=22.1$, $sd=0.9$, $n=6$), broad, flat and pale with no obvious callus over basal two thirds of digit, considerably narrower over distal third.

OSTEOLOGY: premaxillary teeth 11(80%, $n=5$)–12; maxillary teeth 23–29 ($\bar{x}=26.3$, $sd=2$, $n=5$); dentary teeth 29–35 ($\bar{x}=31.3$, $sd=1.8$, $n=5$); presacral vertebrae 29 ($n=5$); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: (in alcohol) dorsal surface brown with a tan to russet tinge; prominent pale hip stripe posteriorly, extending laterally at base of tail; tail with numerous pale flecks above. Lateral surface light brown, mottled with fine light and dark flecks. Hindlimbs above same as dorsum, underneath with a

brown mottle. Venter posterior of forelimbs white with irregular brown spotting ventrolaterally, tending to form transversely aligned bars posteriorly approaching hindlimbs; throat white, lower labials and chinshields dark edged; tail with heavy irregular mottle of light and dark flecks beneath.

In life, lateral surface with a pinkish flush; ventral spotting russet brown; soles of feet and subdigital lamellae light yellow; oral mucosa striking deep blue; iris yellow. Meier (1979a) presents a colour photograph of a live specimen of *L. novaecaledoniae*.

Distribution and habitats. *Leiopisma novaecaledoniae* is known from five widespread localities on mainland New Caledonia north of ca.

21°50'S (Fig. 29). It occurs in a range of habitats, having been recorded from the edge of moist coastal vine thickets (Fig. 1a,b), and from rocks and boulders bordering lowland and highland streams passing through rainforest (Fig. 1f). Parker (1926) notes that a field tag attached to the holotype indicates it was beaten from a tree.

Reproduction. *Leiopisma novaecaledoniae* is oviparous: ZFMK 25480 (67.5 mm SVL) and BM 1946.8.16.15 (67.5 mm SVL) both contain four (2/2) enlarged-yolked ovarian follicles; AM R78349 (ca. 51 mm SVL) collected December 1978 contains shelled oviducal eggs but is in such a poor state of preservation that clutch size could not be determined.

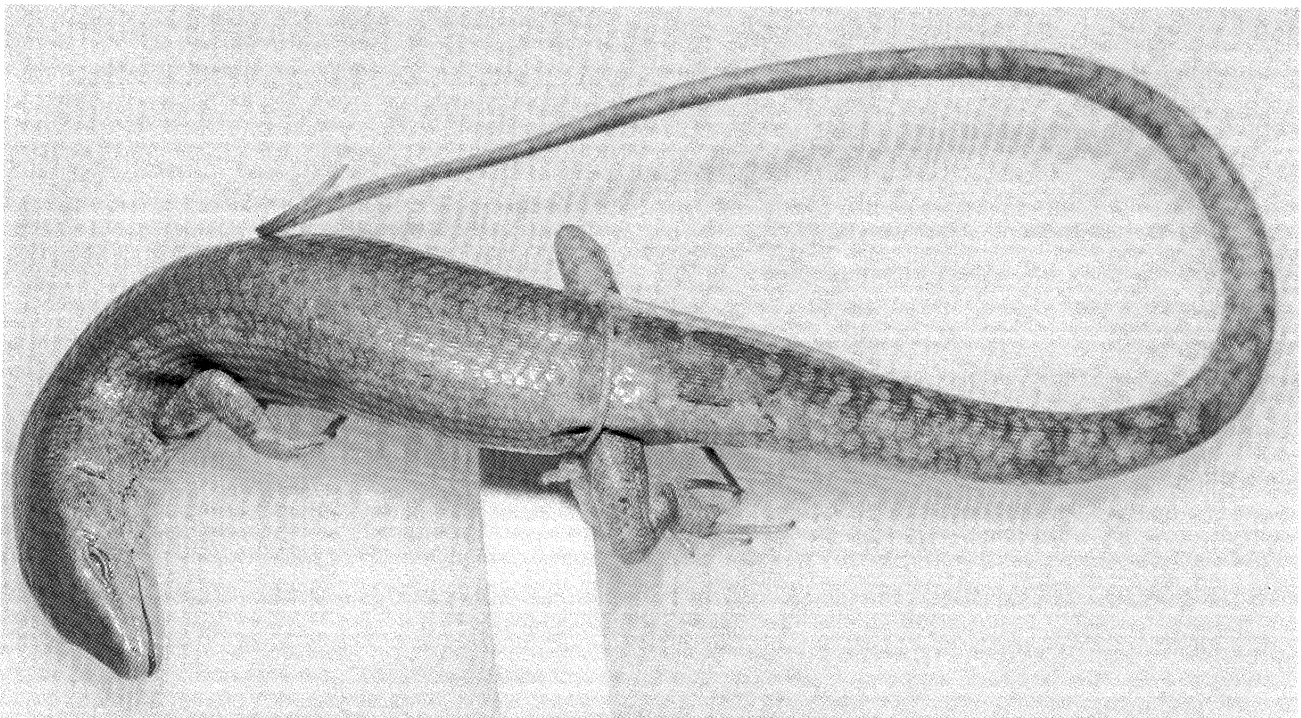


Fig. 30. BM 1946.8.16.15, holotype of *Lygosoma novae-caledoniae* Parker.



Fig. 31. ZFMK 25408, a specimen of *Leiopisma novaecaledoniae* (Parker) showing the dorsal colouration (a), and distinctive dark ventral spotting (b) of this species.

Genus *Tropidoscincus* Bocage, 1873

Tropidoscincus Bocage, 1873b: 230 (type species *Tropidoscincus aubrianus*).
Sauroscincus Peters, 1879: 149 (type species *Sauroscincus braconnieri*).

Diagnosis. *Tropidoscincus* is a member of the *Eugongylus* group of Greer (1979). It can be distinguished from all other genera in that group by the following combination of characters: frontoparietals fused to form a single scale; supranasals absent but a prominent postnasal suture present; lower eyelid with an obvious, centrally located semi-transparent disc; ear opening large but with moderately small lobules anteriorly; three pairs of mesosternal ribs contacting mesosternum.

Recognized Species. *Tropidoscincus variabilis* (Bavay, 1869); *Tropidoscincus aubrianus* Bocage, 1873b; *Tropidoscincus rohssii* (Andersson, 1908).

Key to Species of *Tropidoscincus*

- 1. Scales on posterior aspect of thighs overlapping and evenly decreasing in size ventrally. 2
- Scales on posterior aspect of thighs small and juxtaposed, sharply demarcated from large overlapping scales on dorsum of thigh.
 *Tropidoscincus variabilis*

- 2. Midbody scale rows 32–34.
 *Tropidoscincus aubrianus*
- Midbody scale rows 36–40.
 *Tropidoscincus rohssii*

***Tropidoscincus variabilis* (Bavay)**
 Figs 32–34

Tropidolopisma variabilis Bavay, 1869: 26.

Type material. NEOTYPE: *Tropidoscincus variabilis* Bavay, AM R77875, here designated, adult male, SVL 95 mm (Fig. 32, 33), Mt Panie (750 m), New Caledonia, 20°33'S 164°45'E.

Additional material examined. NHMB 19105, Diahot Tal und Col Poraries, 20°17'S 164°18'E; AM R77904, 4 km south of Pueblo, 20°25'S 164°37'E; NHMB 7403, 7402, 7406, 7411, 19109, Outbache, 20°26'S 164°38'E; NHMB 7412, Mt Igmambi (600 m), 20°28'S 164°36'E; NHMB 7404, 7414-16, 19107, Tao, 20°33'S 164°48'E; AM R77889, Mt Panie (200 m), 20°33'S 164°45'E; NHMB 7423, Mt Panie (700 m), 20°33'S 164°45'E; AM R77822, Kavatch forestry camp, 20°42'S 164°50'E; AM R77685, 2 km north-east of Mt Aoupinie forestry camp by road (550 m), 21°08'S 165°21'E; AM R77720, 1 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77655, Mt Aoupinie forestry camp (500 m), 21°09'S 165°21'E; NHMB 7407, 7417, 19104, Mt Canala (700 m) 21°35'S 165°56'E.

Diagnosis. *Tropidoscincus variabilis* can be distinguished from both *Tropidoscincus aubrianus* and *Tropidoscincus rohssii* by the scales on the posterior

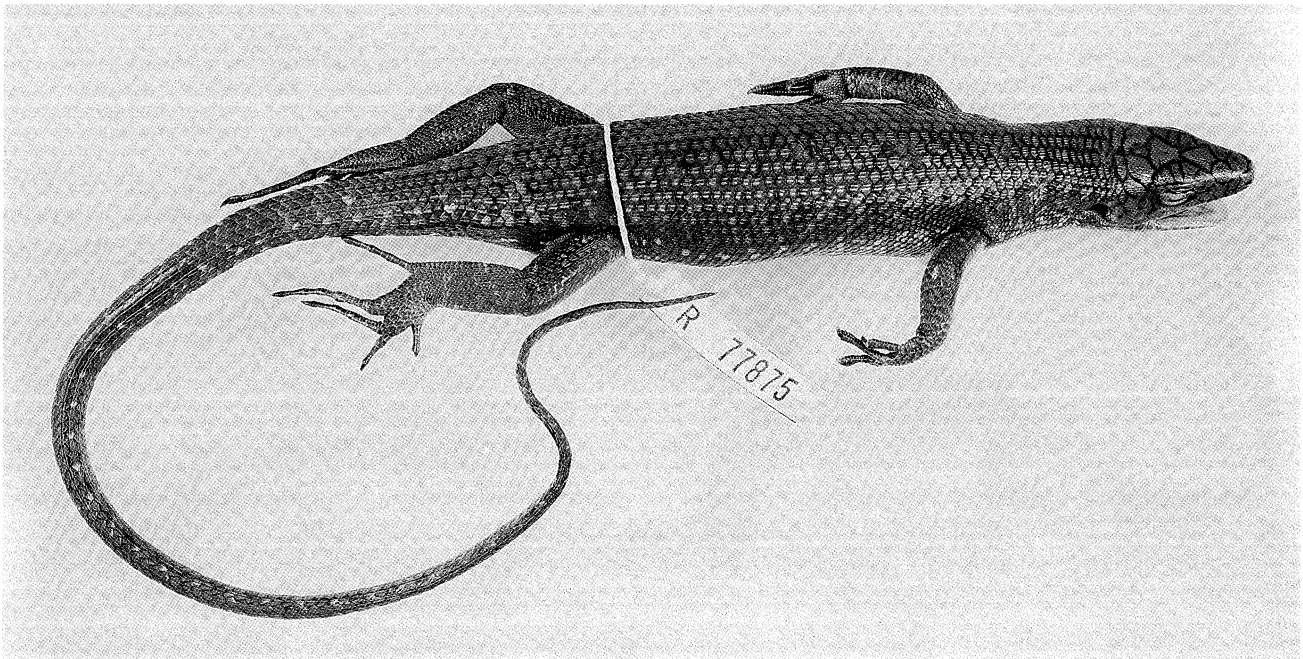


Fig. 32. AM R77875, neotype of *Tropidolopisma variabilis* Bavay.

aspect of the thighs being small, juxtaposed, and sharply demarcated from large overlapping scales on dorsum of thigh, whereas *T. aubrianus* and *T. rohssii* have the scales on the posterior aspect of the thighs overlapping and evenly decreasing in size ventrally. *Tropidoscincus variabilis* is further distinguished from *T. aubrianus* by possessing more midbody scale rows (36–40 vs 32–34); fewer paravertebral scales (49–58 vs 58–62); more premaxillary teeth (11 vs 9); juveniles with pale dorsolateral stripe extending only to middorsum vs full length of dorsum to level of hindlimbs in juvenile *T. aubrianus*.

Tropidoscincus variabilis further differs from *T. rohssii* by its generally larger adult body size (maximum SVL 95 mm vs 78 mm).

Description. This description is based on nine juvenile-subadult and 12 adult specimens.

MEASUREMENTS: only adults 66 mm SVL and over i.e. those individuals with full adult colouration, are included in the body measurements.

Maximum SVL 95 mm; distance from axilla to groin 46.9–56.9% of SVL (\bar{x} = 51.8, n = 12); hindlimb length 54.3–63.6% of SVL (\bar{x} = 58.2, n = 12); tail length 240.3% of SVL (n = 1).

SCALATION: frontonasal broad as long (W/L 108.1–150, \bar{x} = 128.4, n = 21); prefrontals large, usually in point contact or narrowly separated (76.2%, n = 21), rarely more widely separated (19%) or broadly contacting; frontal longer than broad (W/L 67.5–81%,

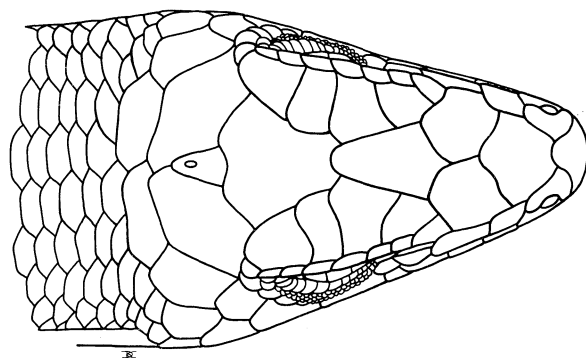
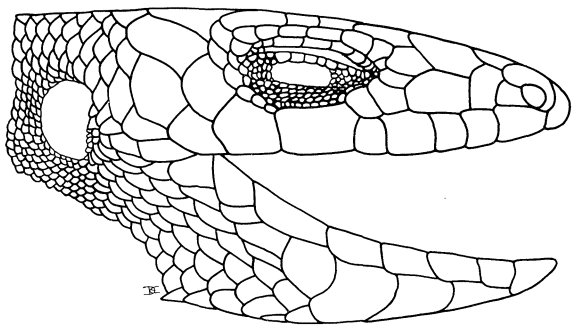


Fig. 33. Lateral and dorsal views of the head of AM R77875, neotype of *Tropidolopisma variabilis* Bavay.

\bar{x} = 72.1, n = 21); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2, rarely 3.

Nasals moderately to widely separated; postnasal suture from top of naris posteriorly to nasoloreal suture, partially dividing nasal to form a postnasal scale; 2 loreals in horizontal sequence, anterior slightly deeper than long, posterior as deep but longer than anterior; anterior subocular usually single (98%, n = 21) and large, rarely followed by a smaller scale; supraciliaries 7 (85.7%, n = 21), rarely 8 (9.5%) or 6; upper labials usually 8 (87.8%, n = 21) with sixth subocular and contacting lower eyelid, rarely 7 (7.3%) or 9 with fifth or seventh respectively subocular; postlabials 2; lower labials usually 6 (74.4%, n = 21), first 2 contacting postmental, less frequently 5 (10.3%) or 7; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious, centrally located, semi-transparent disc, length 36.8–50% of total eye length (\bar{x} = 41.9, n = 17).

Ear opening with usually 2 (14.3%, n = 21)–3 (71%), rarely 4 or 5, moderately enlarged lobules anteriorly, and numerous small near conical lobules on upper, lower and posterior edges.

Body scales dorsally and laterally tricarinate, each keel interrupting posteriormost edge of scale, number of keels increasing to 5 or 6 towards nape as scales progressively broaden; scales over dorsum of tail tricarinate basally, bicarinate distally; midbody scale rows 36–40 (\bar{x} = 37, sd = 1.6, n = 21); paravertebral scales 49–58 (\bar{x} = 53.3, sd = 2.1, n = 21).

Hindlimbs with bi- and tricarinate scales anterodorsally, scales on posterior aspect of thighs small and juxtaposed, sharply demarcated from large overlapping scales on dorsum of thighs; lamellae beneath fourth toe 36–48 (\bar{x} = 40.9, sd = 3.1, n = 20).

OSTEOLOGY: premaxillary teeth 11 (n = 4); maxillary teeth 28–31 (\bar{x} = 29.7, sd = 1.1, n = 4); dentary teeth 34–39 (\bar{x} = 36.5, sd = 1.8, n = 4); presacral vertebrae 29 (n = 6); postsacral vertebrae 60–62 (n = 2); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: marked ontogenetic change from juvenile to adult involves progressive loss of prominent pale dorsolateral and midlateral striping. Colouration descriptions are therefore given for juvenile, subadult and adult phases.

a) Juvenile (31–49 mm SVL). Dorsal surface olive-brown, head darker. Pale dorsolateral stripe (yellow in life) from snout through supraciliaries to just past level of forelimbs, thence fading at middorsum to disappear completely by level of hindlimb. Lateral surface darker than dorsal, obscuring dark postauricular patch which becomes progressively prominent in more mature individuals. Pale midlateral stripe (yellow in life) extending from upper labials posteriorly through to base of ear opening, over forelimb, and along body, prominent to groin in small juveniles but tending to fade

from midbody to groin in larger juveniles. Tail olive-brown with a series of white spots laterally.

b) Subadults (57–65 mm SVL). Dorsal and lateral surface olive-brown, lateral slightly darker, difference between two surfaces less marked than in juveniles; dark postauricular patch brown-black, obvious. Pale dorsolateral stripe less distinct than in juveniles but still extending to forelimb. Pale midlateral stripe extending only to middorsum.

c) Adults (66–94 mm). Dorsum olive-brown overall, head darker with some black spotting above and facially. Mid to lower lateral surfaces slightly lighter than dorsal, particularly about forelimb; dark postauricular patch brown-black, prominent. Pale dorsolateral and midlateral stripes absent, but a midlateral series of cream spots extends from fore to hindlimb and along original portion of tail. Limbs brown with darker flecks. Live adult male specimen (SVL 95 mm) had a bright orange venter posterior to level of ear, ventral surface of tail and hindlimbs duller orange; flanks russet merging lateroventrally with bright

orange venter. This colouration was not observed in any of the 3 adult female specimens (SVL 67–88 mm) we collected.

Distribution and habitats. *Tropidoscincus variabilis* is recorded from the north and central east coast and highlands of mainland New Caledonia (Fig. 34). However considering the wide range of habitats from which this species has been collected its apparent absence from the north and central west coasts may be a reflection of inadequate collecting in these regions.

Tropidoscincus variabilis inhabits naueliu woodland (Fig. 1c), coastal scrub (Fig. 1b), lowland rainforest edges, and highland forest clearings (to 700 m). Rankin's field notes also record a number of individuals along the narrow track passing through dense 1–2 metre scrub on an exposed ridge at Mt Panie (700–900 m). *Tropidoscincus variabilis* is sympatric with *T. aubrianus* at Houaliou: both species were observed active by day in isolated sunlit patches in and at the edge of low dense scrub (Fig. 1a,b).

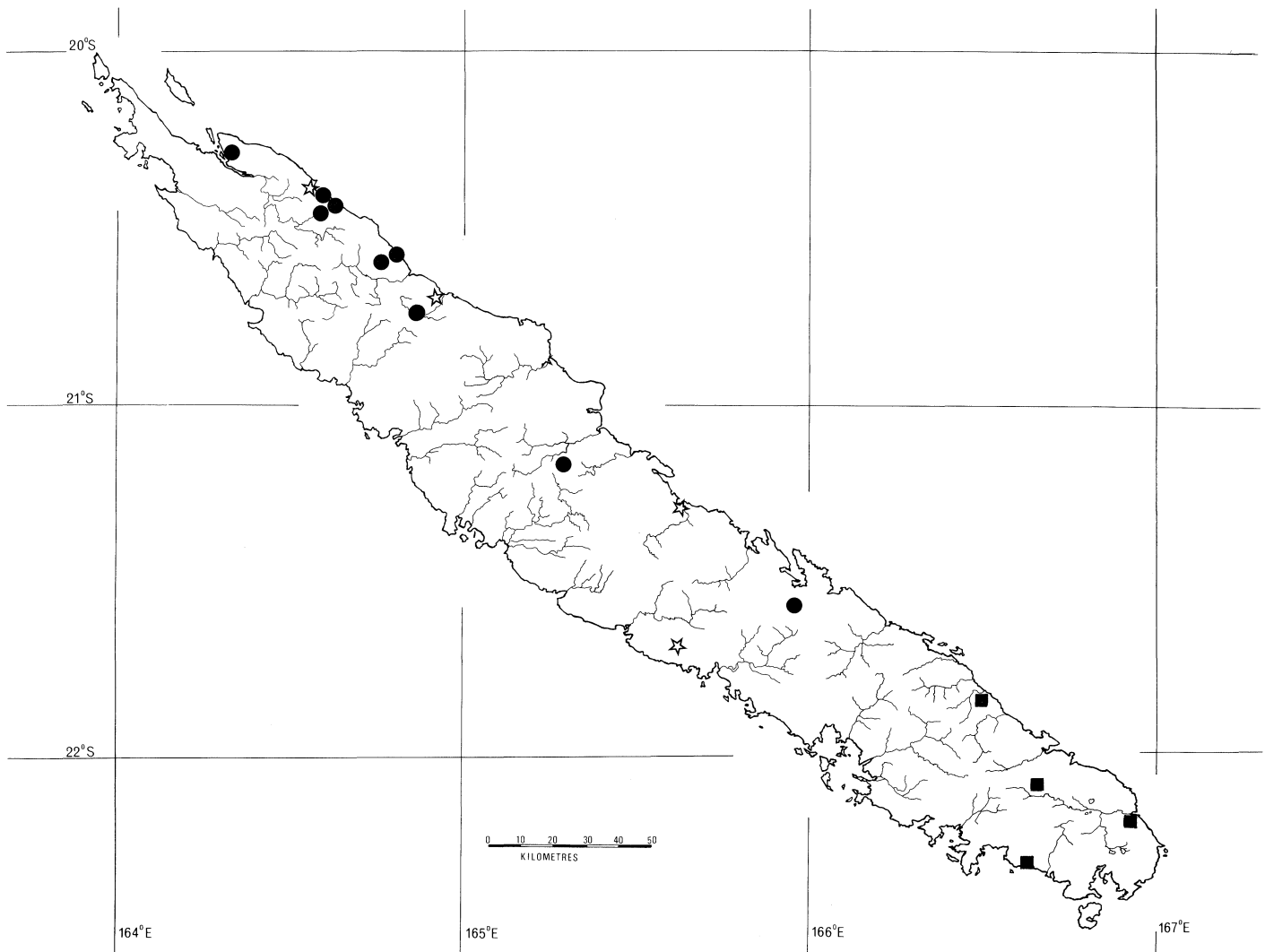


Fig. 34. Distribution of the genus *Tropidoscincus* in New Caledonia: *T. variabilis* (closed circle); *T. aubrianus* (open star); *T. rohssii* (closed square).

Reproduction. Adult females of 88 and 79 mm SVL collected in December 1978 had 2 and 3 enlarged yolked ovarian follicles respectively.

Remarks. Bavay (1869) presumably described *Tropidolopisma variabilis* from more than one specimen as he discussed variability in certain features of scalation and colouration, but only gave dimensions for a single adult individual (30 cm total length).

Bocage (1873) in describing *Tropidoscincus aubrianus* and several other new taxa from New Caledonia was apparently unaware of Bavay's (1869) work. However, in a later review of the New Caledonian reptiles Bocage (1881) recognized *Tropidolopisma variabilis* Bavay and placed *Tropidoscincus aubrianus* Bocage into its synonymy.

Boulenger (1887) redescribed *Lygosoma variabile* (Bavay) from the type of *Sauroscincus braconnieri* Peters which Boulenger incorrectly synonymised with *L. variabilis* (Bavay).

Roux (1913) recognized both *Tropidolopisma variabilis* Bavay and *Tropidoscincus aubrianus* Bocage by redescribing firstly *Lygosoma variabile* and then the subspecies *Lygosoma variabile aubryanum*. It is also of interest to note that Roux interpreted the type description of *Tropidolopisma variabilis* Bavay as possibly also including specimens of *Tropidoscincus aubrianus* Bocage. Roux regarded part of the variability in colouration described by Bavay (1869) for adult specimens of *Tropidolopisma variabilis* (i.e. "generally the ground colour is olive green on top and sometimes mottled and of a dirty grey shade, with an uninterrupted

double line made up of brown spots starting at the ear and spreading to the tail") as referable to *Tropidoscincus aubrianus* Bocage.

Tropidoscincus aubrianus Bocage

Figs 34–38

Tropidoscincus aubrianus Bocage, 1873b: 230.
Sauroscincus braconnieri Peters, 1879: 149.

Type material. NEOTYPE: *Tropidoscincus aubrianus* Bocage, NHMB 7424, here designated, adult (sex indeterminate), SVL 107 mm (Figs 36, 37), Pouebo, New Caledonia, 21°21'S 164°29'E. HOLOTYPE: *Sauroscincus braconnieri* Peters, ZMB 9702, juvenile SVL 55 mm (Fig. 36), New Caledonia.

Additional material examined. NHMB 7405, Heinghene, 20°41'S 164°56'E; NHMB 7425, Tiouaka Tal, 20°52'S 165°16'E; AM R78112, Houailou airstrip, 21°16'S 165°37'E; AM R77519-20, La Font Poya, 9 km north-west of Moindou on Bourail road, 21°32'S 165°28'E; NHMB 7426, Brinor.

Diagnosis. *Tropidoscincus aubrianus* can be distinguished from *Tropidoscincus variabilis* by possessing fewer midbody scale rows (32–34 vs 36–40); more paravertebral scales (58–62 vs 49–58); scales on posterior aspect of the thighs overlapping and evenly decreasing in size ventrally whereas *T. variabilis* has the scales on posterior aspect of the thighs small, juxtaposed, and sharply demarcated from large overlapping scales on dorsum of thigh.

Tropidoscincus aubrianus can be distinguished from

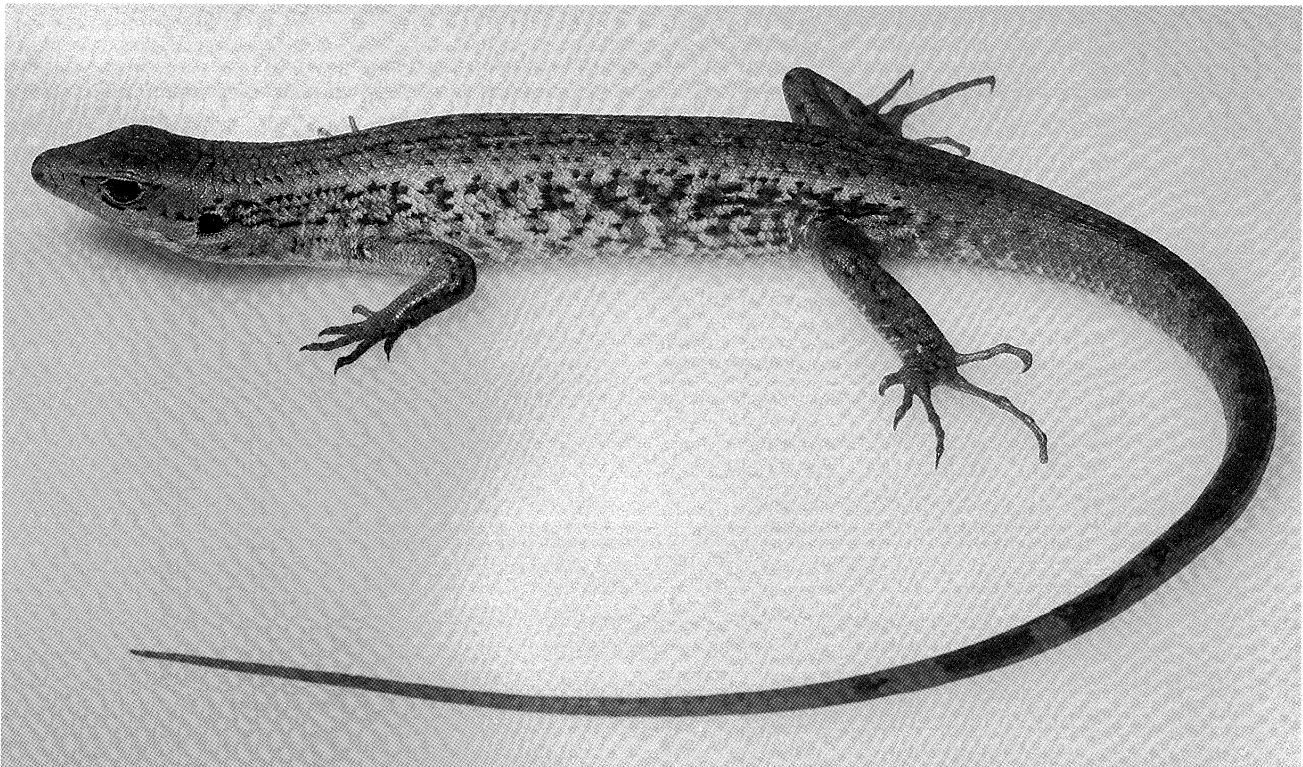


Fig. 35. *Tropidoscincus aubrianus* from La Font Poya, New Caledonia.

Tropidoscincus rohssii by possessing fewer midbody scale rows (32–34 vs 36–40); more paravertebral scales (58–62 vs 49–56); fewer lamellae under fourth toe (32–41 vs 34–46).

Juvenile *Tropidoscincus aubrianus* can be distinguished from juveniles of both *Tropidoscincus variabilis* and *Tropidoscincus rohssii* by the pale dorsolateral stripe being prominent in *T. aubrianus* posteriorly to level of the hindlimb instead of fading by middorsum (juvenile *T. rohssii* and *T. variabilis*).

Description. This description is based on three juvenile-subadult and five adult specimens.

MEASUREMENTS: only adults 96 mm SVL and over, i.e. those individuals with full adult colouration are

included in the body measurements.

Maximum SVL 121.5 mm; distance from axilla to groin 55.2–58% of SVL (\bar{x} = 56.6, n = 5); hindlimb length 48.3–53% of SVL (\bar{x} = 50.4, n = 4); tail length 180.4% of SVL (n = 1).

SCALATION: frontonasal broader than long (W/L 104.2–151.5, \bar{x} = 126.6, n = 7); prefrontals large, narrowly separated or in point to narrow contact (85.7%, n = 7), rarely in moderate to broad contact; frontal longer than broad (W/L 61–76.9%, \bar{x} = 66.9%, n = 7); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately to widely separated; postnasal suture from top of naris posteriorly to nasoloreal suture, partially dividing nasal scale to form postnasal scale; 2 loreals in a horizontal sequence, anterior slightly deeper than long, posterior as deep but longer than anterior; anterior subocular single; supraciliaries 7; upper labials usually 8 (85.7%, n = 7) with sixth subocular and contacting lower eyelid, rarely 9 with seventh subocular; postlabials 2; lower labials usually 6 (71.4%, n = 7), first 2 contacting postmental, less frequently 7 (21.4%) or 5; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 38.6–45.5% of eye length (\bar{x} = 41.4, n = 6).

Ear opening with 2 (25%, n = 7), 3 (37.5%), 4 (31.3%) or rarely 5 moderately enlarged rounded lobules anteriorly and numerous small rounded lobules on upper, lower and posterior edges.

Body scales tricarinate dorsally to midlaterally in most age classes, each keel interrupting posterior edge of scale, less striate on larger individuals, number of keels increasing to 5 or 6 towards nape as scales progressively broaden; scales over dorsum of tail tricarinate basally, bicarinate distally; midbody scale rows 32–34 (\bar{x} = 33.4, sd = 0.9, n = 7); paravertebral scales 58–62 (\bar{x} = 60, sd = 1.4, n = 7).

Hindlimbs with bi- and tricarinate scales anterodorsally, posteriorly with weakly keeled overlapping scales; lamellae beneath fourth toe 32–41

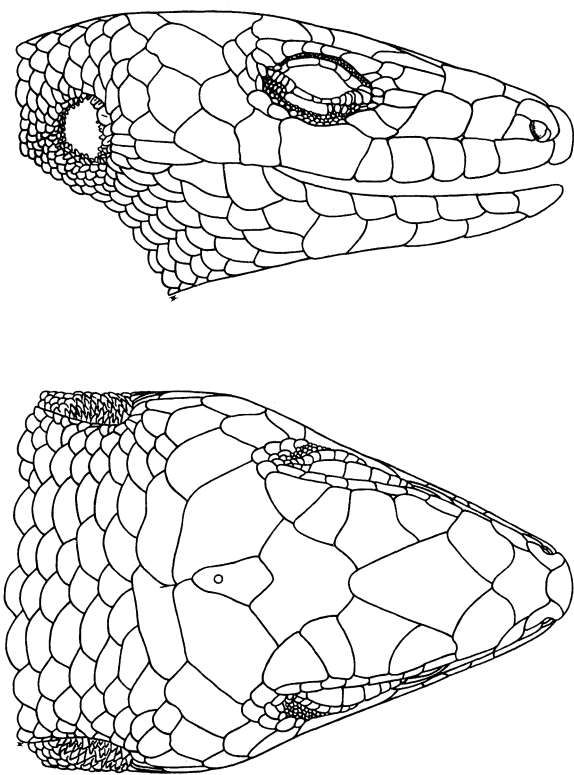


Fig. 36. Lateral and dorsal view of the head of NHMB 7424, neotype of *Tropidoscincus aubrianus* Bocage.

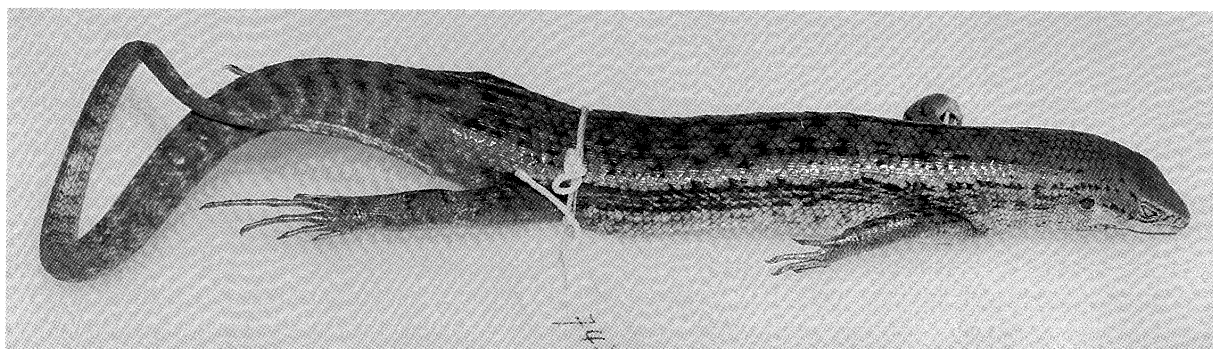


Fig. 37. NHMB 7424, neotype of *Tropidoscincus aubrianus* Bocage.

(\bar{x} = 35.6, sd = 2.3, n = 7).

OSTEOLOGY: premaxillary teeth 9 (n = 2); maxillary teeth 25–26 (n = 2); dentary teeth 32–34 (n = 2); presacral vertebrae 29 (n = 7); postsacral vertebrae 59–60 (n = 2); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: marked ontogenetic changes in colouration occur in this species. Juveniles possess distinctive pale dorsolateral and midlateral stripes and paravertebral patterns which disappear with maturity, hence description of colouration is divided into juvenile, subadult and adult sections.

a) Juvenile (54–55 mm SVL, n = 2). Dorsal surface brown with faint olive tinge and dark longitudinally aligned flecks paravertebrally; head brown, unmarked. Pale dorsolateral stripe cream, prominent and extending from naris posteriorly to just past level of hindlimb. Lateral surface dark brown uppermost with alternate light and dark flecking along dorsolateral border; pale midlateral stripe cream, prominent and extending from labials posteriorly through base of ear opening and over forelimb to level of hindlimb. Tail overall brown with darker bands laterally not fully encircling tail.

b) Subadult (single specimen 68 mm SVL). Dorsal surface brown with prominent dark paravertebral flecking. Pale dorsolateral stripe cream, extending from naris to just past level of forelimbs. Lateral surface with pale midlateral stripe confined to labials and side of head, not discernable beyond ear opening; upper lateral surface a broken mottle of dark brown with lighter flecks, clearly differentiated anteriorly by light dorsolateral stripe.

c) Adults (SVL 96–107 mm). Dorsal surface with broad dark paravertebral stripes or series of dark flecks, extending from nape to coalesce just past hindlimbs, and thereby enclosing lighter vertebral zone; large adults (SVL 116–121.5 mm) show progressive loss of

paravertebral striping which merges with lighter vertebral stripe. Upper lateral surface mid brown, well defined from laterodorsal zone above. Tail predominately light brown.

Live adult male (121.5 mm SVL) had orange flush ventrally posterior of forelimbs, most prominent about vent; pinkish grey flush beneath tail.

Distribution and habitats. *Tropidoscincus aubrianus* occurs in the north-east, central east, and central west of mainland New Caledonia (Fig. 34). It inhabits open woodland of lowland hills on the west coast, and edge of coastal vine thicket at Houailou on the east coast (Fig. 1a,b).

Remarks. Bocage (1873) described *Tropidoscincus aubrianus* (n. gen., n. sp.) from two specimens (an adult 28 cm total length, a juvenile 9 cm total length with a broad white midlateral stripe). Bocage did not refer to Bavay's (1869) description of *Tropidolopisma variabilis*. It seems Bocage was initially unaware of Bavay's prior work but in a later series of short notes on the New Caledonian herpetofauna Bocage (1881) placed *Tropidoscincus aubrianus* in the synonymy of *Tropidolopisma variabilis* Bavay.

In redescribing *Lygosoma variable*, Roux (1913) also examined one of the specimens described as *Tropidoscincus aubrianus* by Bocage (adult specimen only) and *Sauroscincus braconneri* by Peters, and subsequently recognised *T. aubrianus* Bocage as a subspecies of *L. variable*, and *S. braconneri* Peters as a synonym of the nominate form of *L. variable*. Roux comments that specimens referable to *Lygosoma variable aubryanum* were possibly used by Bavay (1869) in describing *Tropidolopisma variabilis* Bavay. However this inference of a composite type series for *T. variabilis* Bavay by Roux was based on the original description of *T. variabilis* (see *T. variable* — remarks) rather than examination of Bavay's material. Roux also states that

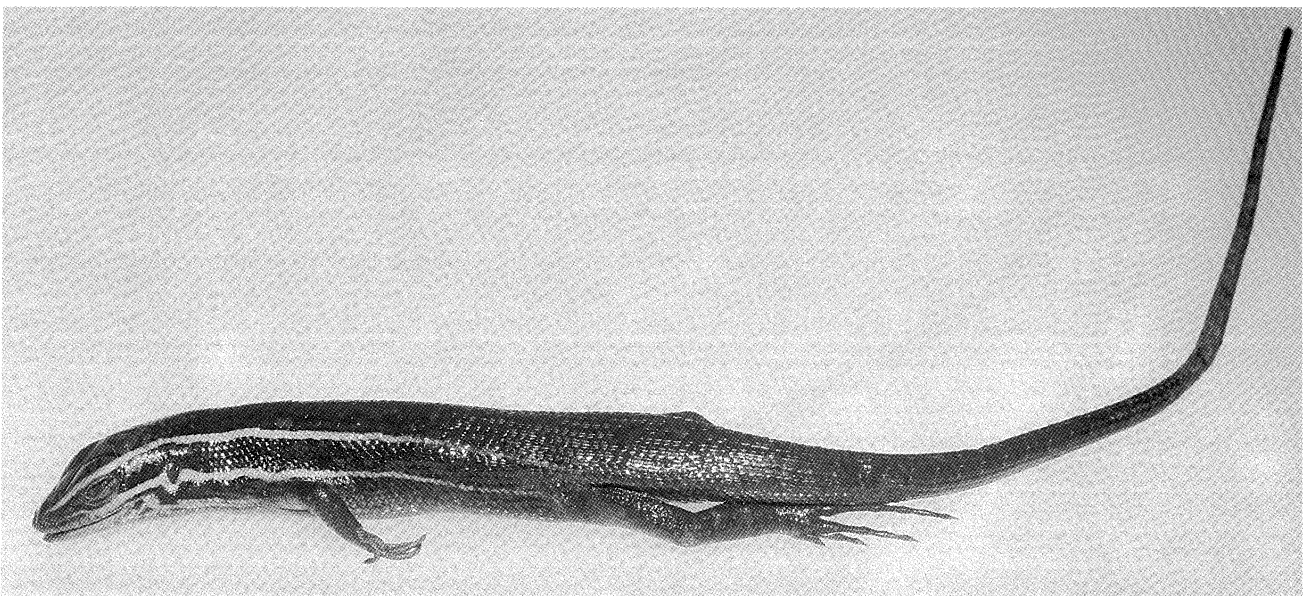


Fig. 38. ZMB 9702, holotype of *Sauroscincus braconneri* Peters.

the adult specimen described by Bocage as *Tropidoscincus aubrianus* conforms to the three adult females in the collections made by Roux & Sarasin in 1911.

The type of *Sauroscincus braconnieri* Peters has been examined. Boulenger (1887) and Roux (1913) are here considered incorrect in placing it in the synonymy of *Lygosoma variable*. The colouration of this specimen (ZMB 9702) is similar to a juvenile (NHMB 7405, SVL 54 mm) collected by Roux & Sarasin from Heinghene, and in which pale dorsolateral and midlateral stripes both continue to the level of the hindlimb. Both the type of *Sauroscincus braconnieri* Peters and juvenile specimen collected by Roux & Sarasin (NHMB 7405, but not mentioned by Roux in the description of *Lygosoma variable aubryanum*) have 34 midbody scale rows. These features of colouration and scalation serve to separate juvenile *Tropidoscincus aubrianus* from its congeners. *Sauroscincus braconnieri* Peters is here considered a synonym of *Tropidoscincus aubrianus*.

Tropidoscincus rohssii (Andersson)

Figs 34, 39–41

Lygosoma rohssii Andersson, 1908: 4.

Type material. LECTOTYPE: *Lygosoma rohssii* Andersson,

here designated, largest of 3 syntypes NHMG 994, adult male, SVL 80 mm (Figs 39, 40), New Caledonia.

Additional material examined. NHMB 7408-09, 7418-19, 19106, 19108, Ngoi Tal (200 m), 21°49'S 166°36'E; AM R116031-35, La Riviere Bleu, 22°06'S 166°40'E; NHMB 7410 and 7420, Yate, 7421, Mt Yate (600 m), AM R78231, La Fause Yate bridge, 22°09'S 166°54'E; AM R78219, base of Mt Gouemba road, near Yate, 22°10'S 166°57'E; AM R78245, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E; NHMB 7422-23, Plaine des Lacs (200 m); NHMG 994 (remaining 2 specimens of syntype series), New Caledonia.

Diagnosis. *Tropidoscincus rohssii* can be distinguished from *T. variabilis* by its generally smaller adult body size (maximum SVL 78 mm vs 95 mm), and scales on the posterior aspect of thighs overlapping and evenly decreasing in size ventrally whereas *T. variabilis* has the scales on posterior aspect of thighs small, juxtaposed, and sharply demarkated from large overlapping scales on dorsum of thigh.

Tropidoscincus rohssii is distinguished from *T. aubrianus* by possessing more midbody scale rows (36–40 vs 32–34); fewer paravertebral scales (49–56 vs 58–62); more lamellae beneath the fourth toe (34–40 vs 32–41); more pronounced dorsal keels; more premaxillary teeth (11 vs 9); pale dorsolateral stripes in juvenile *T. rohssii* prominent anteriorly thence tending

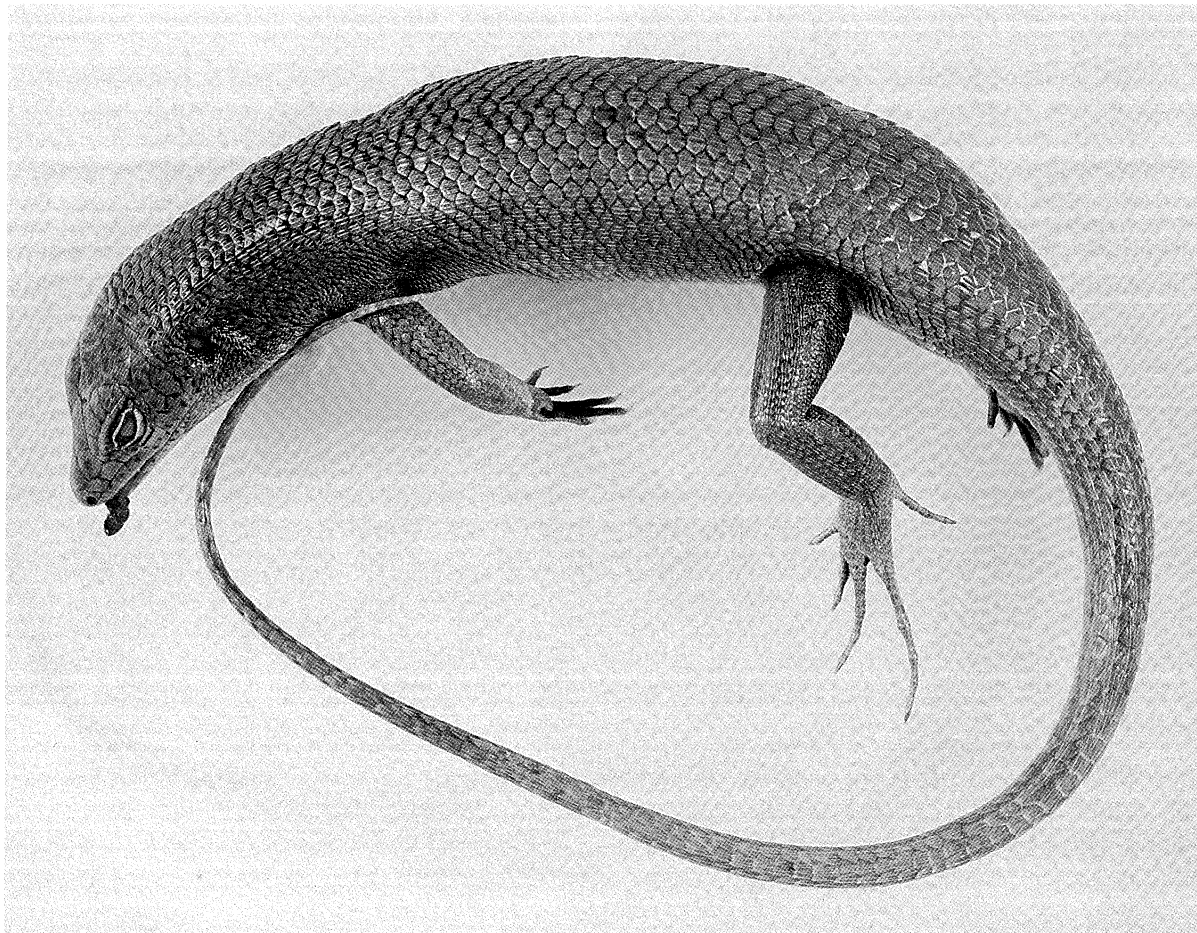


Fig. 39. Lectotype of *Lygosoma rohssii* Andersson, largest of 3 syntypes.

to fade by middorsum whereas the pale dorsolateral stripe is prominent from naris to level of hindlimb in juvenile *T. aubrianus*.

Description. This description is based on six juvenile-subadult and 11 adult specimens.

MEASUREMENTS: only adults 64 mm SVL and over,

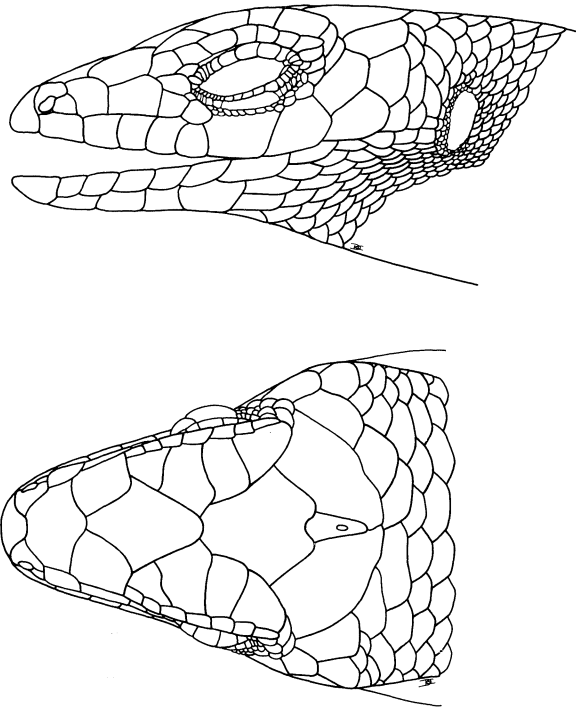


Fig. 40. Lateral and dorsal views of the head of the lectotype of *Lygosoma rohssii* Andersson, largest of 3 syntypes.

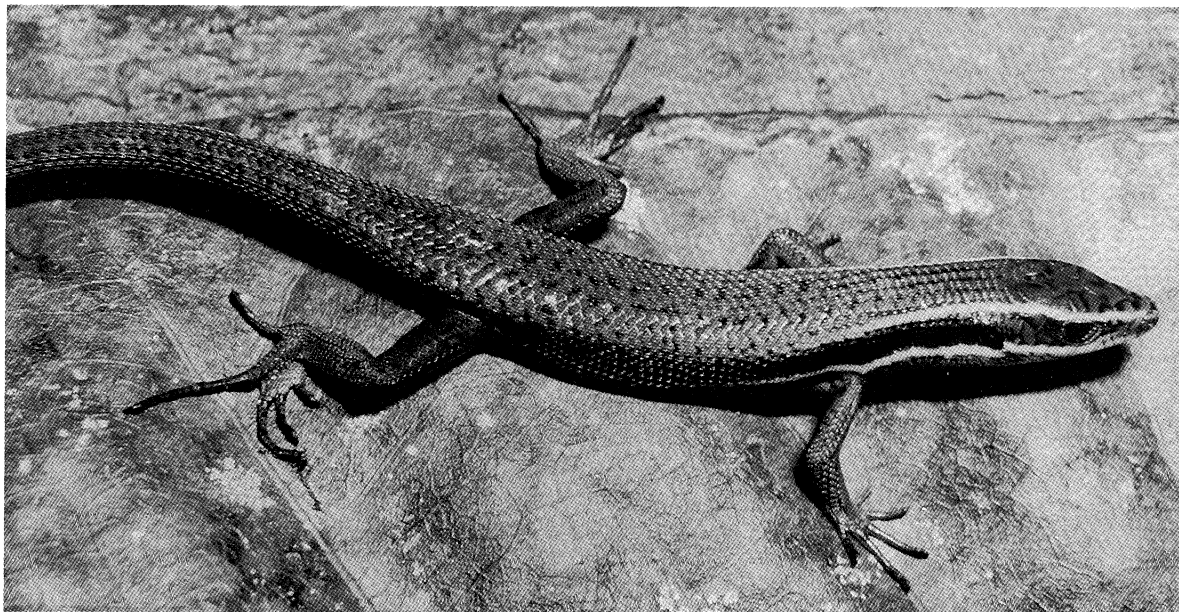


Fig. 41. *Tropidoscincus rohssii* from La Riviere Bleu showing the pale dorsolateral and lateral striping present on juveniles of this species.

ie. those individuals with full adult colouration, are included in the body measurements.

Maximum SVL 78 mm; distance from axilla to groin 42.5–53.7% of SVL (\bar{x} = 49.2, n = 11); hindlimb length 54.5–64.2% of SVL (\bar{x} = 58.5, n = 11); tail length 251.8% of SVL (n = 1).

SCALATION: frontonasal broad as long (W/L 120–142.8, \bar{x} = 130.5, n = 14); prefrontals large, usually in point contact or narrowly separated (92.9%, n = 14), rarely more widely separated; frontal longer than broad (W/L 66.6–78.3%, \bar{x} = 76, n = 14); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2, rarely fused to form a single scale.

Nasals moderately to widely separated; postnasal suture from top of naris posteriorly to nasoloreal suture, partially dividing nasal scale to form a postnasal scale; 2 loreals in horizontal sequence, anterior square and slightly deeper than long, posterior as deep but longer than anterior; anterior subocular single; supraciliaries 7 (96.4%, n = 14), rarely 8; upper labials usually 8 (89.3%, n = 14) with sixth subocular and contacting lower eyelid, rarely 7 (7.1%) or 9 with fifth or seventh subocular respectively; postlabials 2; lower labials usually 6 (60.7%, n = 14), first 2 contacting postmental, less frequently 5 (21.4%) or 7; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 37.2–45.5% of total eye length (\bar{x} = 41.8, n = 12).

Ear opening with 3 (50%, n = 14)–4 (46.4%), rarely 5, moderately enlarged rounded lobules anteriorly and numerous small rounded lobules on upper, lower and posterior edges.

Body scales dorsally and laterally tricarinate, each keel interrupting posteriormost edge of scale, number of keels increasing to 5 or 6 towards nape as scales progressively broaden; midbody scale rows 36–40 (\bar{x} = 37.4, sd = 1.4, n = 14); paravertebral scales 49–56 (\bar{x} = 52.9, sd = 2, n = 13).

Hindlimbs with bi- and tricarinate scales anterodorsally, scales on posterior aspect of thighs overlapping and evenly decreasing in size ventrally; lamellae beneath fourth toe 34–46 (\bar{x} = 39.5, sd = 2.4, n = 14).

OSTEOLOGY: premaxillary teeth 11 (n = 2); maxillary teeth 25–28 (\bar{x} = 26.2, sd = 1.3, n = 2); dentary teeth 30–33 (\bar{x} = 31.5, sd = 1.1, n = 2); presacral vertebrae 29 (n = 7); postsacral vertebrae 60–62 (n = 2); phalangeal formula for manus and pes 2.3.4.5.3. and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: very similar to *T. variabilis* and featuring same ontogenetic loss of prominent pale dorsolateral and midlateral striping from juvenile to adult.

Distribution and habitats. The majority of records for *Tropidoscincus rohssii* are from the southern, western and eastern coasts of mainland New Caledonia (Fig. 34). Roux & Sarasin also recorded it from the Plaine de Lacs region (Fig. 1d).

Tropidoscincus rohssii inhabits open forest and lowland rainforest edges (Fig. 1e).

Remarks. Andersson's concept of *Lygosoma variabile* (Bavay) was based entirely on features of juveniles of that species (small and with pale "longitudinal streaks") and therefore the diagnostic features Andersson proposed to differentiate *Lygosoma rohssii* were typical also for adult *Tropidoscincus variabilis* (Bavay).

Marmorosphax n. gen.

Type species. *Lygosoma tricolor* Bavay, 1869: 17.

Diagnosis. *Marmorosphax* can be distinguished from all other genera in the *Eugongylus* group of Greer (1979) by the following combination of characters: frontoparietals fused; supranasal scale or postnasal suture absent; anterior loreal either contacting upper labials narrowly (*M. euryotis*) or present as a semilunar scale failing to contact upper labials (*M. tricolor*); subocular scale row complete; lower eyelid with an obvious, centrally located semi-transparent disc; ear lobules very small, barely distinguishable from small, blunt conical scales around upper, lower and posterior edges of ear opening; premaxillary teeth 13.

Recognized species. *Marmorosphax tricolor* (Bavay, 1869); *Marmorosphax euryotis* (Werner, 1909).

Etymology. The name *Marmorosphax* combines the Greek for marbled (*marmoros*) and throat (*sphax*) to describe the distinctive dark and light pattern present on the throat of both species in the genus.

Remarks. *Marmorosphax tricolor* (Bavay) is well represented in Museum collections and reasonably well

documented in morphology and to a lesser degree behaviour (Roux 1913). By contrast, the only other species in the genus, *Marmorosphax euryotis*, is poorly represented in Museum collections and virtually nothing is known of its distribution or habits. *Lygosoma euryotis* Werner is included in *Marmorosphax* because it shares the diagnostic adult features of the genus. Unfortunately it is not known if it also shares the male ontogenetic colour change of the type species and if it has the peculiar, habits and habitat preference of this species.

Marmorosphax tricolor (Bavay)

Figs 42–46

Lygosoma tricolor Bavay, 1869: 17.

Type material. NEOTYPE: *Lygosoma tricolor* Bavay, AM R77750, here designated, adult male, SVL 53 mm (Figs 43, 44), summit of Mt Aoupinie (1086 m), New Caledonia, 21°11'S 165°16'E.

Additional material examined. NHMB 7427-28, Mt Ignambi (700 m), 20°28'S 164°36'E; AM R77848-52 (300–500 m), 77860-63 (500–600 m), 77865-69 (200–300 m), 77876 (710 m), 77890-91 (770 m), Mt Panie, 20°33'S 164°45'E; AM R77807-08, creek behind Kavatch forestry camp, 20°42'S 164°50'E; AM R77612-37, 77678-83, 77765-70, Mt Aoupinie forestry camp (500 m), 21°09'S 165°20'E; AM R77693-98 2 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77699-706, 77788-99, 1 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77729-31, 3 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°07'S 165°22'E; AM R77747-49, 77751-54, summit of Mt Aoupinie (1086 m), 21°11'S 165°16'E; AM R77764, 6 km from summit of Mt Aoupinie by road (800 m), 21°11'S 165°16'E; NHMB 7438-39, Boreare, 21°22'S 165°57'E; AM R77532-40, 21 km north-west of Poya intersection on Bourail to Heinghene Road, 21°24'S 165°26'E; NHMB 7443-45, La Foa (100 m), 21°43'S 165°49'E; NHMB 7431-33, Mt Canala (700 m), 21°32'S 165°57'E; NHMB 7436-37, Negropo, 21°32'S 165°54'E; AM R78133, 78149, base of Mt Gouemba road, near Yate, 22°10'S 166°57'E; QM J44006, Mt Koghis (400 m), 22°10'S 166°32'E; QM J43999, Foret Thy Reserve (150 m).

Diagnosis. *Marmorosphax tricolor* can be distinguished from the only other species in the genus, *Marmorosphax euryotis*, by: each parietal bordered by a single upper secondary temporal and single nuchal (vs bordered by a single upper secondary temporal and several more or less uniformly sized scales not noticeably larger than dorsal scales of nape); more midbody scale rows (36–42 vs 32); more paravertebral scales (63–75 vs 52–55).

Description. The measurements and scalation for this description are based on a sample of 10 subadult and 60 adult (including neotype) specimens from Mt Aoupinie, and colouration on all specimens examined.

MEASUREMENTS: males begin to develop features of colouration distinct from adult females around a size 50 mm SVL. The smallest reproductively active females also are of this size. Only those specimens of 50 mm

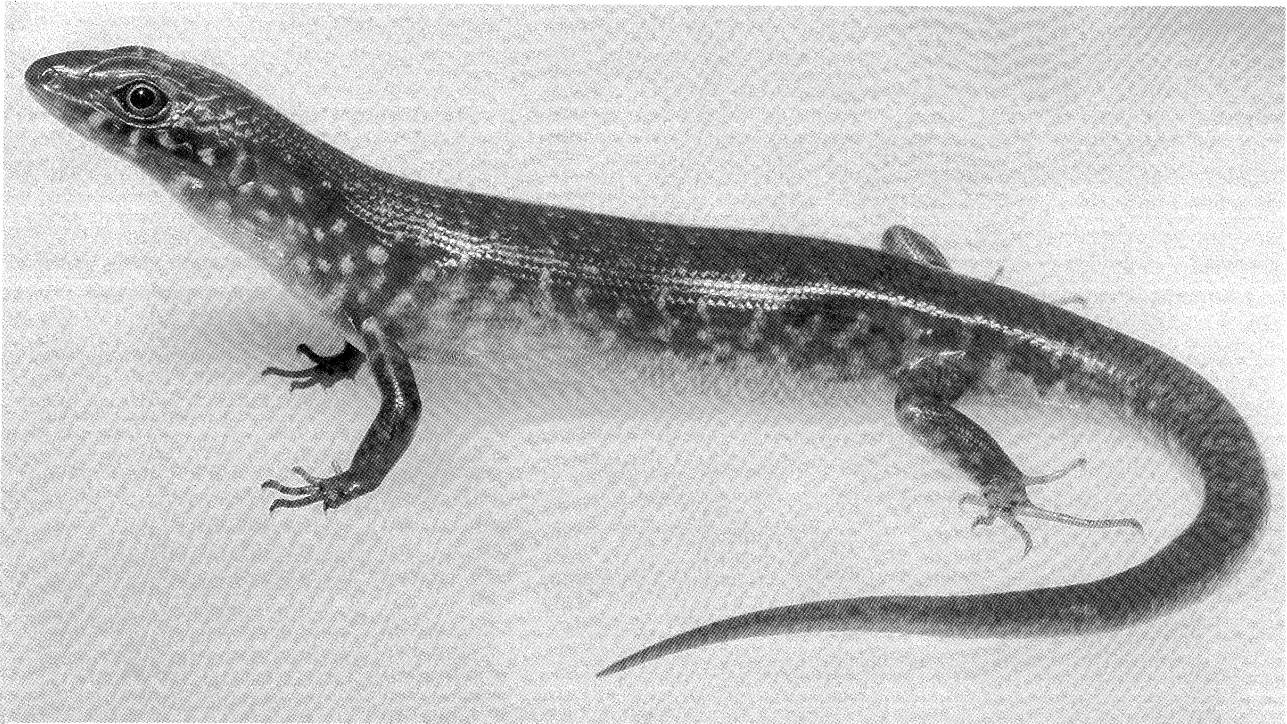


Fig. 42. *Marmorosphax tricolor* from Mt Aoupinie forestry camp (500 m), New Caledonia.

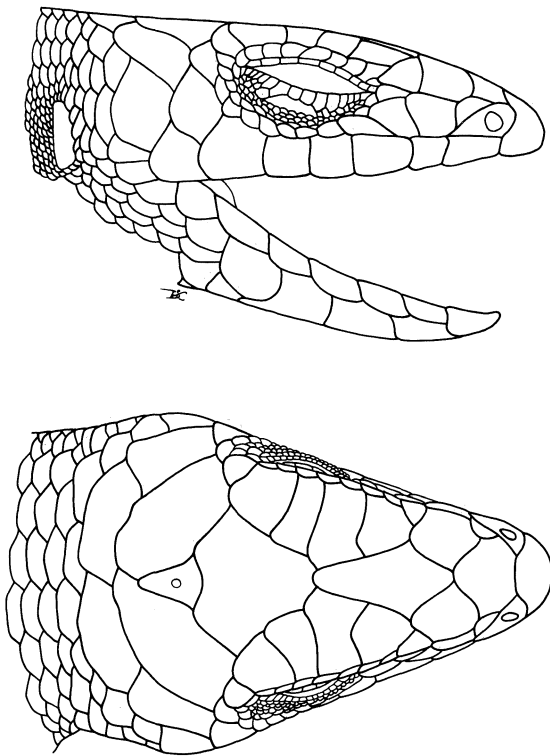


Fig. 43. Lateral and dorsal views of the head of AM R77750, neotype of *Lygosoma tricolor* Bavay.

SVL and over are included in the following body measurements.

Maximum SVL 66 mm; distance from axilla to groin 46.7–64.7% of SVL (\bar{x} = 54.7, n = 60); hindlimb length 37.1–50% of SVL (\bar{x} = 43.7, n = 58); tail length ca. 114–163.5% of SVL, (\bar{x} = 141.2, n = 25).

SCALATION: frontonasal broader than long (W/L 112.5–140.9%, \bar{x} = 125.4, n = 64); prefrontals large, usually narrowly separated (71.4%, n = 65), less frequently moderately separated (4.2%) or in point contact; frontal longer than broad (W/L 60–74.5%, \bar{x} = 66.9, n = 63); frontoparietals fused; interparietal distinct; parietals each bordered by a nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals widely separated; anterior loreal a semilunar scale positioned on posterodorsal margin of nasal and failing to contact upper labials; posterior loreal as long as deep, and anteriorly contacting both semilunar anterior loreal and nasal; supraciliaries usually 8 (84.3%, n = 67) occasionally 7 (3.7%) or 9; upper labials 7 (99.2%, n = 67) with fifth subocular, rarely 6 or 8, with fourth or sixth respectively subocular but separated from lower eyelid by a complete row of subocular scales; lower labials 6 (94%, n = 67) rarely 5 or 7, first 2 contacting postmental; chinshields 3, first pair in broad contact, third pair divided.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 32.7–42% of total eye length (\bar{x} = 37.8, n = 60).

Ear opening with no obvious enlarged lobules at the edges.

Body scales with 3–5 fine keels dorsally and 3–4 weaker keels laterally, failing to interrupt posterior edge of scale; midbody scale rows 36–42 (\bar{x} = 39.9, sd = 1.4, n = 70); paravertebral scales 63–75 (\bar{x} = 68.9, sd = 2.7, n = 69).

Lamellae beneath fourth toe 26–33 (\bar{x} = 30, sd = 1.4, for n = 66).

OSTEOLOGY: premaxillary teeth 13 (96.5%, n = 28),

rarely 12 or 14; maxillary teeth 23–28 (\bar{x} = 25.7, sd = 1.3, n = 30); dentary teeth 27–34 (\bar{x} = 30.6, sd = 1.5, n = 22); presacral vertebrae 29; postsacral vertebrae 44–45 (n = 2); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: marked sexual dimorphism in adults, the most obvious features being: females darker on dorsal and lateral surfaces than males; females with dorsal and lateral colouration sharply demarcated (gradual change in males); intense contrast

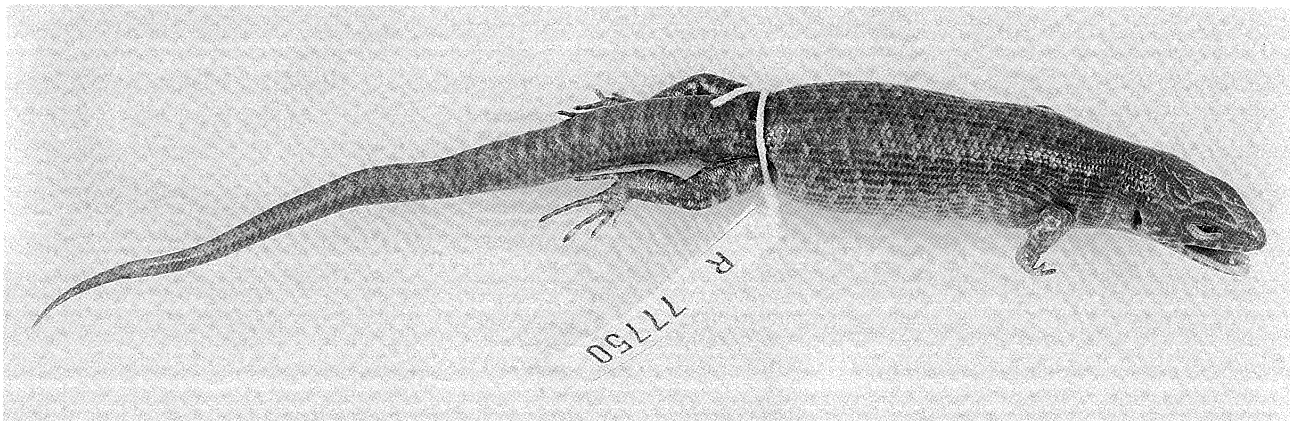


Fig. 44. AM R77750, neotype of *Lygosoma tricolor* Bavay.

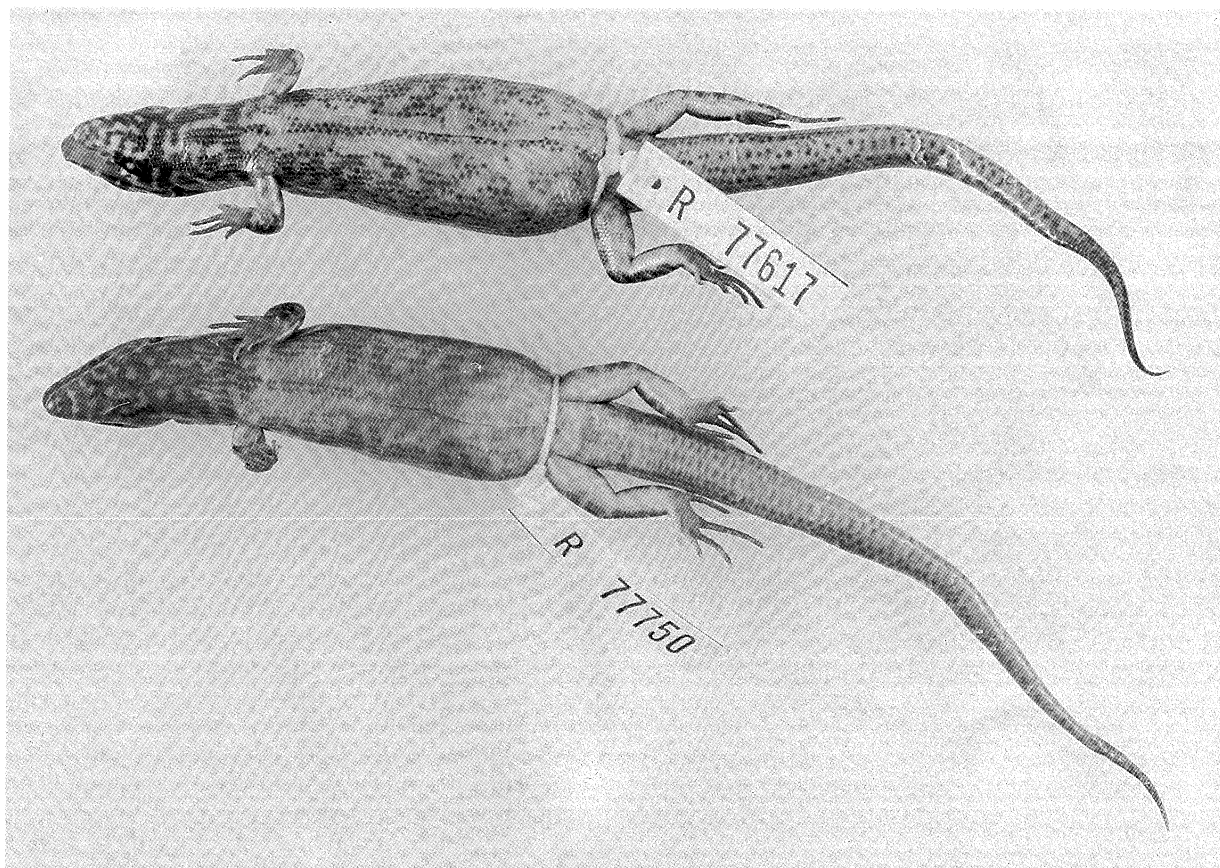


Fig. 45. AM R77750 an adult male, and AM R77617 an adult female of *Marmorosphax tricolor* showing sexual dimorphism in venter colouration.

between light and dark areas on throat in females (diffuse contrast in males).

Venter posterior of forelimb in both sexes either immaculate white or variably dark flecked with several intermediate stages, occasionally also with dark transverse bars and/or a longitudinally aligned bar at mid venter; females overall more heavily marked ventrally.

a) Adult males. Dorsal surface light to mid brown, comprising a mixture of light and dark flecks, continuing onto upper lateral surface with white flecks tending to form spots, thence paling over remainder of lateral surface. Throat a diffuse mottle of grey and dull cream blotches (Fig. 45a).

b) Adult females. Dorsal surface dark brown, sharply demarcated from dark brown-black upper lateral surface, most prominent anterior to forelimb. Mid to lower lateral surface grey-brown; white spotting to lateral surface distinct anteriorly, tending to be obscure posteriorly. Throat a mottle of black and grey blotches, boldly contrasting and sharply defined (Fig. 45b).

c) Subadults and Juveniles. Similar to adult females. Of 29 subadult and juvenile specimens examined four showed some degree of intermediacy between adult male and female colour pattern. Two subadult males (SVL 52–53 mm) tended towards female colour pattern having bold throat markings but poorly defined upper lateral markings more typical of adult males. Two subadult males (SVL 50–51 mm) tended towards the adult male colour pattern but had throat and upper lateral marking well defined and more boldly contrasting than usual in adult males.

Distribution and habitats. *Marmorosphax tricolor* has been recorded largely from the central and east coast highlands of mainland New Caledonia, and also from La Foa on the west coast (Fig. 46). It inhabits the interior of closed rainforest habitat (Figs 1f,g). Individuals were collected from beneath rocks and logs on forest floor, and beneath similar debris at recently cleared (logged) sites surrounded by forest. Although common in this sheltered habitat it was only observed

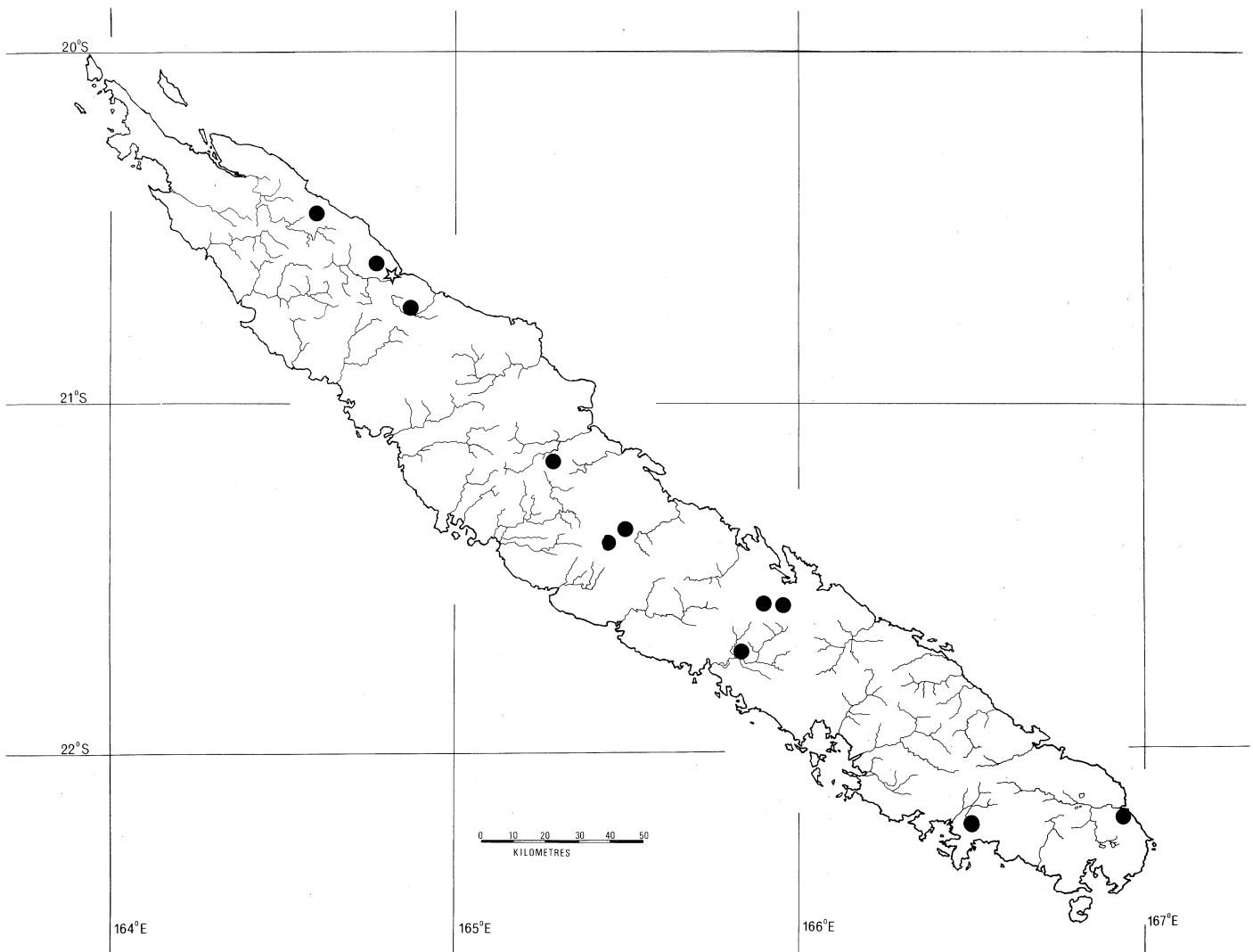


Fig. 46. Distribution of the genus *Marmorosphax* in New Caledonia: *M. tricolor* (closed circles); *M. euryotis* (open star).

active during completely overcast conditions with mist and fine rain. At one locality beside a flowing creek, in heavy rain but moderately warm conditions, individuals were very active when uncovered and showed no hesitation in entering the water.

Reproduction. *Marmorosphax tricolor* is viviparous. A female (61.1 mm SVL) held in captivity produced four live young in late January 1979 all of approximately 25 mm SVL.

Adult females (50.5–60 mm SVL) from series collected in December 1978 from localities on the east coast contained 1–5 embryos. Litter size increased with female SVL (larger females > 59 mm SVL, mode of 3 and 4, $n=13$ vs smaller females < 59 mm SVL mode of 3, $n=22$).

Remarks. Boulenger (1887) incorrectly placed *Lioscincus steindachneri* Bocage in the synonymy of *Lygosoma tricolor* Bavay. Roux (1913) later recognized *L. steindachneri* Bocage as distinct.

Marmorosphax euryotis (Werner)

Figs 46–48

Lygosoma euryotis Werner 1909: 271.

Type material. HOLOTYPE: *Lygosoma euryotis* Werner, MRNH 822, SVL 34 mm (Figs 47, 48), Isle of Pines, New Caledonia.

Additional material examined. QM J37441, Ouaième via Hienghene, 20°37'S 164°51'E.

Diagnosis. *Marmorosphax euryotis* can be distinguished from the only other species in the genus, *Marmorosphax tricolor*, by: each parietal bordered by several more or less uniform sized scales not noticeably larger than dorsal scales (vs bordered by a single upper secondary temporal and single nuchal); fewer midbody scale rows (32 vs 36–42); fewer paravertebral scales (52–55 vs 63–75).

Description. MEASUREMENTS: maximum SVL 40 mm; distance from axilla to groin 50–51.8% of SVL ($\bar{x}=50.9$, $n=2$); hindlimb length 44.1–44.4% of SVL ($\bar{x}=44.2$, $n=2$).

SCALATION: frontonasal broader than long (W/L 125–142.8%, $\bar{x}=133.9$, $n=2$); prefrontals moderately large, moderately separated; frontal longer than wide

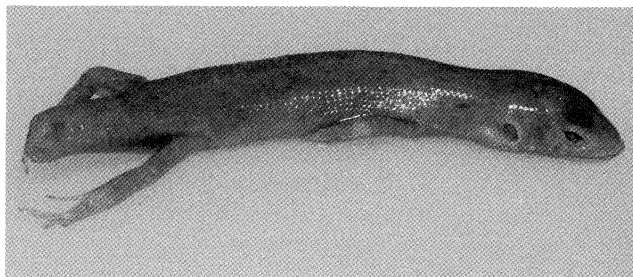


Fig. 47. MRNH 822, holotype of *Lygosoma euryotis* Werner.

(W/L 78.4–80%, $\bar{x}=79.2$, $n=2$); frontoparietals fused; interparietal distinct; parietals each bordered by 2 more or less equally sized nuchal scales and a single upper secondary temporal; nuchal scales bordering parietal no larger than surrounding dorsal scales, and with either of inner nuchal scales only narrowly contacting parietal; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals widely separated; anterior loreal narrow, deep as nasal (except right side of J.37441 where it is semilunar and very narrowly separated from first upper labial thereby allowing narrow contact between posterior loreal and nasal); posterior loreal almost as long as deep, noticeably shallower than anterior loreal; supraciliaries 7; upper labials 7 with fifth subocular, separated from lower eyelid by complete subocular row; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3, first pair in broad contact.

Lower eyelid with obvious, centrally located semi-transparent disc, length approximately 45–48.9% eye length.

Ear opening with up to 3 slightly enlarged conical lobules anteriorly, recessed behind scales bordering anterior margin of ear, remainder of ear margin with small conical lobules.

Dorsal and upper lateral body scales with 3 keels, rarely interrupting posterior edge of scale, tending instead to produce a wavy edge, number of keels increasing towards nape but becoming less pronounced;

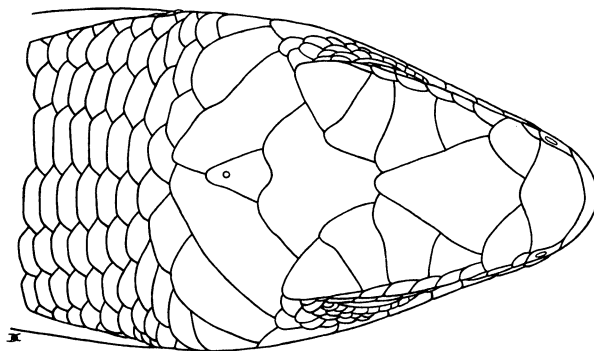
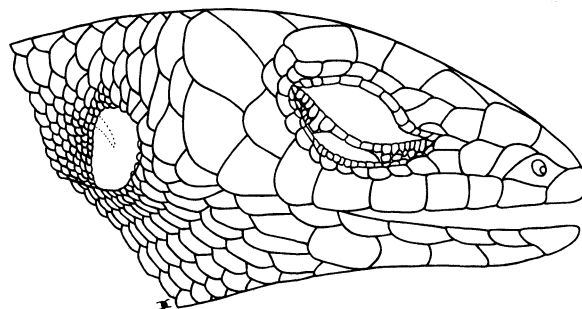


Fig. 48. Lateral and dorsal views of the head of MRNH 822, holotype of *Lygosoma euryotis* Werner.

midbody scale rows ca. 30–32 (n=2); paravertebral scales 52–55 (n=2).

Lamellae beneath fourth toe 31–35 (n=2).

OSTEOLOGY: premaxillary teeth 13 (n=1); maxillary teeth 22–23 (n=1); dentary teeth 25 (n=1); presacral vertebrae 29 (n=1); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: Werner (1909) describes the type as “bright reddish-brown, with very obscure lighter dashes in longitudinal rows, flanks of anterior half of body with darker spots. Shields above the lips dark edged. Underneath yellowish, throat and chest sparsely dark flecked, chest with darker (more red-brown) median longitudinal lines”. The holotype is now completely bleached, colour and pattern are unable to be distinguished. The more recent specimen (QM J37441), in alcohol has the dorsal surface brown with randomly scattered fine pale flecks, and a single row of pale spots laterodorsally from midway between level of ear and forelimb to regenerated basal portion of tail; head mottled light and dark. Pale dorsolateral stripe cream, extending from naris to rear of eye thence posteriorly along body and regenerated portion of tail, bordered below by fine black stripe which is most prominent anteriorly to a level just past forelimb, and which contacts its partner anteriorly across rostral. Lateral surface brown with fine dark and light flecks uppermost, becoming dark grey with irregular pale blotches on lower lateral surface approaching venter. Fore and hindlimbs mottled of light and dark brown. Venter pale white with scattered grey flecking on outer edges of throat.

Distribution and habitats. North-east coast of mainland New Caledonian and Isle of Pines (Fig. 46).

Caledoniscincus n. gen.

Type species. *Lygosoma austro-caledonica* Bavay, 1869: 21.

Diagnosis. *Caledoniscincus* is a member of the *Eugongylus* group of Greer (1979), it can be distinguished from all other genera in that group by the following combination of characters: frontoparietals fused; prefrontals moderate in size, usually well separated; supranasal or postnasal suture generally absent; lower eyelid with an obvious, centrally located semi-transparent disc; ear lobules moderately small; altantal arch fused to intercentrum; hemipenes deeply bifurcate; colour pattern features adult females retaining juvenile colouration but adult males changing tone and delineation of dorsal and lateral colouration.

Recognized species. *Caledoniscincus austrocaledonicus* (Bavay, 1869); *Caledoniscincus atropunctatus* (Roux, 1913); *Caledoniscincus festivus* (Roux, 1913); *Caledoniscincus orestes* n. sp.

Etymology. The name *Caledoniscincus* combines latin for Caledonia (*Caledonius*) with skink (*scincus*). Species in the genus are largely confined to New Caledonia, and

are widespread with one or more species occurring in most habitats.

Remarks. Species included in *Caledoniscincus* are moderately small to moderately large skinks very similar in overall morphology. All share the following characteristics of colouration and pattern: marked sexual dimorphism in adults with juveniles, subadults of both sexes and adult females similar in colour pattern; dorsal and lateral surfaces of adult females well delineated and in strong contrast, adult males distinctively coloured and patterned but with dorsal and lateral surfaces similar in colour and, unless defined by a pale laterodorsal stripe, tending to grade in colour and pattern rather than sharply delineated at dorsolateral edge.

All species of *Caledoniscincus* apart from *C. orestes* occur throughout most of mainland New Caledonia. *Caledoniscincus austrocaledonicus* and *C. atropunctatus* also occur in the Loyalty Islands, and *C. atropunctatus* also in Vanuatu.

Key to species of *Caledoniscincus*

1. Tail with distinct, dark, transversely aligned chevrons. 2
—Tail lacking dark chevrons; maximum SVL 53 mm. *C. atropunctatus*
2. Dorsum with either vertebral or lateral pale striping or both. 3
—Dorsum without pale vertebral or lateral striping; large species, maximum SVL 66 mm. *C. festivus*
3. Dorsum with pale vertebral stripe only; large species, maximum SVL 65mm; restricted to Mt Panie. *C. n. sp.*
—Dorsum with either pale vertebral or lateral stripes, or both; maximum SVL 55 mm; widespread over most of New Caledonia mainland and Loyalty Islands. *C. austrocaledonicus*

Caledoniscincus austrocaledonicus (Bavay)

Figs 49–55

Lygosoma austro-caledonica Bavay, 1869: 21.

Euprepes haplorhinus Günther, 1872: 419.

Lygosoma austro-caledonicum dorsovittatum Roux, 1913: 118.

Leiopisma dorsovittatum bodoi Borner, 1980: 8.

Type material. NEOTYPE: *Lygosoma austro-caledonica* Bavay, AM R77757, here designated, adult female, SVL 54.5 mm (Figs 51, 52), 4 km from summit of Mt Aoupinie by road, New Caledonia, 21°11'S 165°16'E. Colour and pattern typical of adult females from northern and central populations, but with pale vertebral stripe faint but obvious. HOLOTYPE: *Euprepes haplorhinus* Günther, BM 1946.8.13.45, most

probably female, SVL 50.5 mm (Fig. 53), New Caledonia. Colour and pattern typical of adult females from northern and central populations. LECTOTYPE: *Lygosoma austrocaledonicum dorsovittatum* Roux, NHMB 7330, adult male, SVL 49.5 mm (Fig. 54), Heinghene, New Caledonia, 20°42'S 164°55'E. Colour and pattern typical of adult males from northern and central populations. NHMB registration tag reads "venter, sides and feet orange underneath".

Additional material examined. AM R77922, 77924-35, 77938, 77940-41, 77963-66, Berniers backyard at Poum, 20°14'S 164°02'E; AM R77971-80, 77982, Poum rubbish tip, 20°14'S 164°04'E; AM R77983-87, Poum, 20°14'S 165°02'E; AM R77905, 77908-14, 21 km north of Pueblo on coast road, 20°17'S 164°26'E; NHMB 7251-54, 16870, 16884, 16898, 19071, 19078, Outbache, 20°26'S 164°38'E; AM R77900, beach below gendarmarie, Heinghene, 20°42'S

164°55'E; AM R77809-14, creek behind Kavatch forestry camp, 20°42'S 164°50'E; AM R77839, 14 km south of Heinghene River bridge, 20°43'S 165°05'E; NHMB 7326-27, 7261-62, 16075, 16855, 19081, Kone, 21°04'S 164°52'E; AM R77642-49, 77651-52, Mt Aoupinie forestry camp (500 m), 21°09'S 165°21'E; AM R77689-90, 77692, old campsite 2 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77784-87, AM R77707, 77709-13, 77715-16, creek crossing 1 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77735, 5 km north-east of Mt Aoupinie forestry camp by road, 21°07'S 165°22'E; AM R77737-41, 77744, 77755-56, summit of Mt Aoupinie (1086 m), 21°11'S 165°16'E; AM R77759-63, 6 km from summit of Mt Aoupinie by road, 21°11'S 165°16'E; AM R77601, 2 km north of Houailou airstrip, 21°14'S 165°37'E; AM R77545-59, Houailou airstrip,

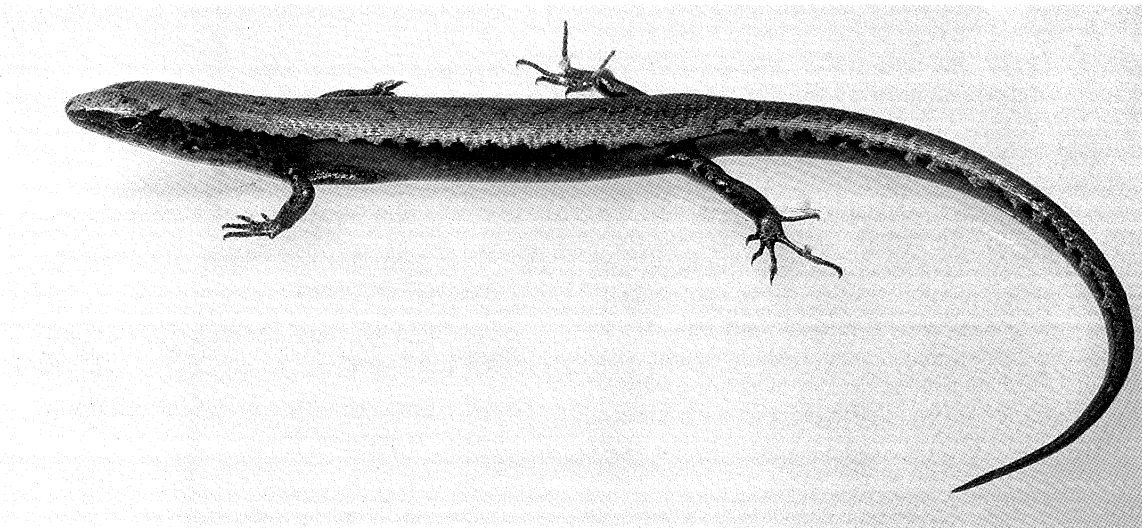


Fig. 49. *Caledoniscincus austrocaledonicum* from Kuto, Isle of Pines.

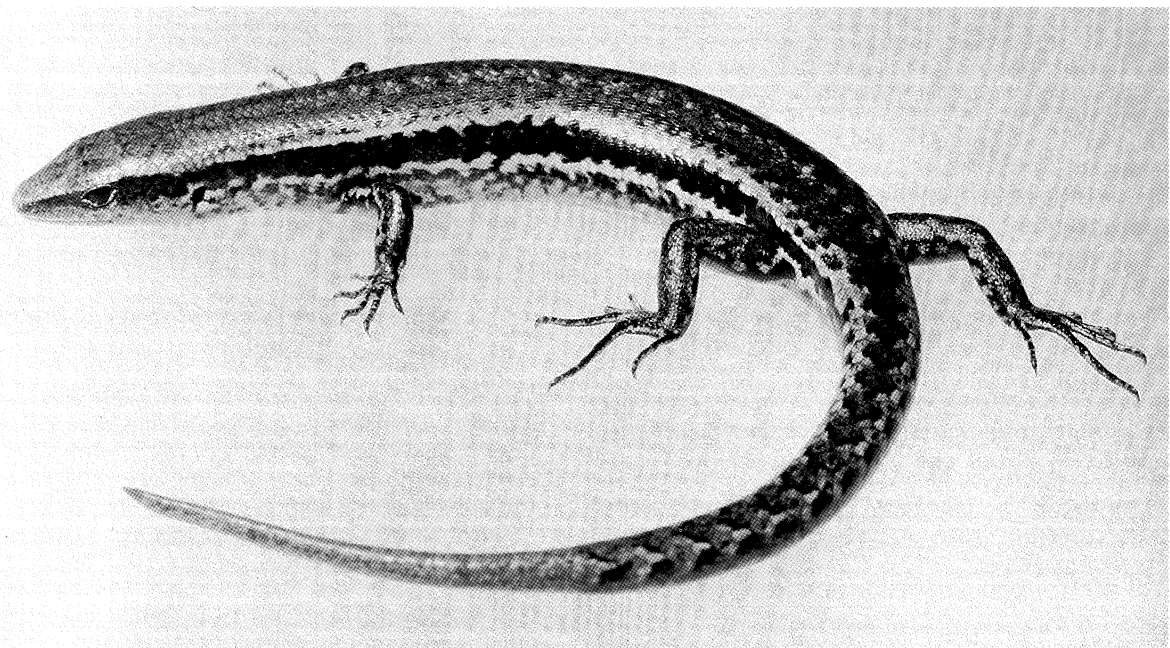


Fig. 50. *Caledoniscincus austrocaledonicum* from Heinghene.

21°16'S 165°37'E; AM R77529-31, 4 km north of junction of Poya Road, on Bourail - Houailou road, 21°29'S 165°28'E; AM R77521-23, La Font Poya, 9 km north-west of Moindu on Bourail road, 21°32'S 165°28'E; NHMB 7338, 7342, 7265-77, 16850, 17004, 18949, 19069, Mt Kanala (700 m), 21°35'S 165°56'E; QM J43992, Mt Rembai (700-900 m), 21°36'S 165°51'E; AM R78107-10, Uitoe near Tontouta, 22°05'S 166°08'E; AM R78237, 13 km west of Carenage turn

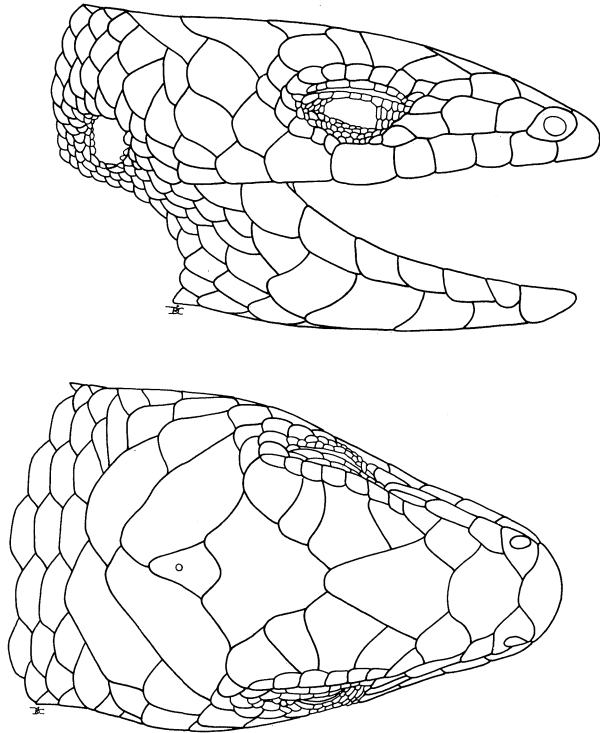


Fig. 51. Lateral and dorsal views of the head of AM R77757, neotype of *Lygosoma austrocaledonica* Bavay.

off on Noumea to Yate road, 22°09'S 166°45'E; AM R78144, 4 km up the Mt Gouemba road, near Yate (300-350 m), 22°09'S 166°54'E; AM R78145, 77147, 78160, 78162, 78165-68, 78170-71, 78173-77, 78179, 78183, 78185-87, 78189, 78192-93, base of Mt Gouemba road, near Yate, 22°10'S 166°57'E; AM R78230, beach front 3 km south of La Fausse Yate bridge, 22°10'S 166°57'E; AM R78250-60, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E; AM R77407-10, 77414-18, 77420-21, 77428-45, 77448-53, Rue de Captain Ferraud, Faubourg Blanchot, Noumea, 22°18'S 166°27'E; AM R77401, 77403-06, 77456-59, 77461-63, 77465-71, 77473-75, 77477-80, 77482-84, 77486, 77488, 77490-94, 77496-504, Mt Coffyn, 22°18'S 166°27'E; AM R116047-48, Porc-Epic Island off Noumea, 22°19'S 166°36'E; AM R110289-93, Redika Island off Noumea, 22°31'S 166°37'E; QM J44002-03, Foret Thy Reserve (150 m).

Loyalty Islands: NHMB 7296-99, 7357-58, 16854, Fayoue, Ouvéa Island, 20°39'S 166°32'E; NHMB 7283-90, Kepeneé, Lifou Island; NHMB 7291-92, 7354-56, 19079, Nathalo, Lifou Island, 20°47'S 167°16'E; NHMB 7272-78, 7347-49, 16883, 19070, 19077, 19083, Netche, Mare Island, 21°29'S 167°51'E.

Diagnosis. *Caledoniscincus austrocaledonicus* can be distinguished from all other species in the genus by the following combination of features in colouration and size: tail with distinctive, dark, transversely aligned chevrons; dorsum with either vertebral or lateral pale stripes, or both.

In size, *C. austrocaledonicus* (maximum SVL 55 mm) is similar only to *Caledoniscincus atropunctatus* (maximum SVL 53 mm); *Caledoniscincus festivus* (maximum SVL 66.5 mm) and *Caledoniscincus orestes* (maximum SVL 65 mm) being much larger.

Description. The measurements and scalation for this description are based on 88 adult specimens from two northern localities in the vicinity of Poum ($n = 26$) and Mt Aoupinie ($n = 37$), and two southern localities in the

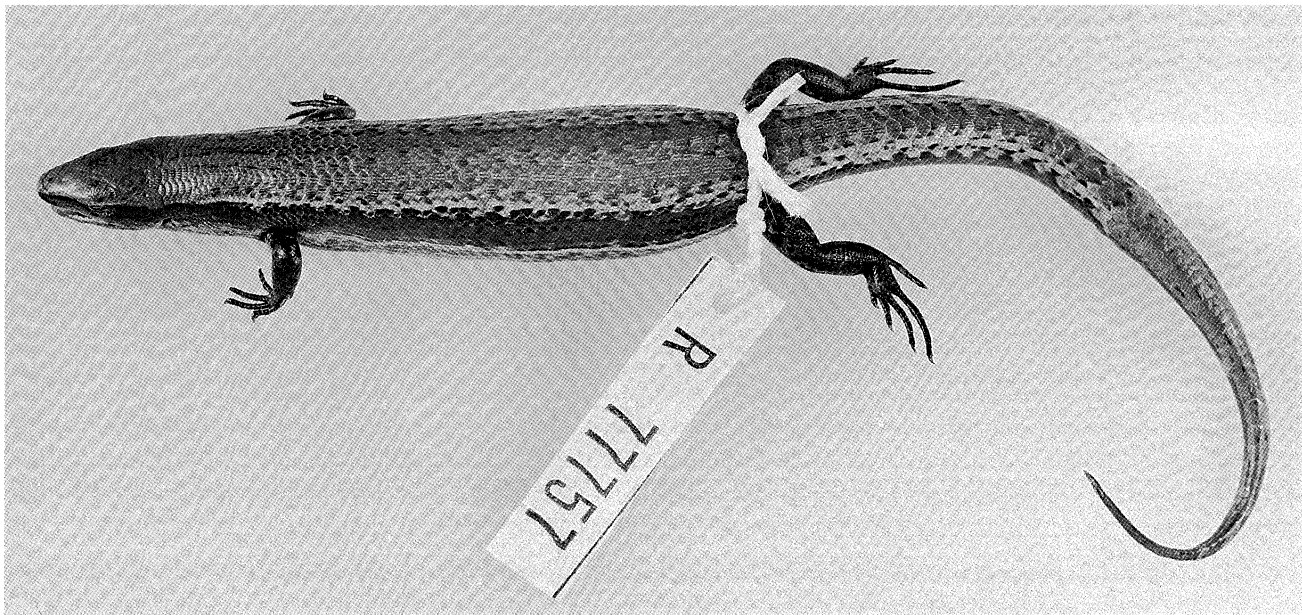


Fig. 52. AM R77757, neotype of *Lygosoma austrocaledonica* Bavay.

vicinity of Yate (n = 17) and Mt Dore (n = 8).

MEASUREMENTS: males begin to develop features of colouration distinct from adult females around a size 40 mm SVL (slightly larger in Mt Aoupinie highland sample at 43 mm SVL). The smallest apparently reproductively active females occur around a size of 37 mm SVL (again slightly larger in Mt Aoupinie highland sample at 45 mm SVL). Only males of 40 mm SVL and over, and females 37 mm SVL and over are included in the following body measurements.

Maximum size 55 mm SVL; distance from axilla to groin 54.1–62.8% of SVL (\bar{x} = 58.7, n = 88); hindlimb length 32.7–44.2% of SVL (\bar{x} = 39.3, n = 88); tail length ca. 126.4–188.1% of SVL (\bar{x} = 155.4, n = 11).

SCALATION: frontonasal broader than long (sample from vicinity of Poum: W/L 112–140%, \bar{x} = 127.9, n = 23); prefrontals moderate in size, widely separated; frontal near as broad as long (sample from vicinity of Poum: W/L 75–94.6%, \bar{x} = 83.1, n = 23); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately to widely separated, postnasal crease variably present (51.1% bothsides, 14.9% one side only, n = 47) or absent; 2 loreals in a horizontal sequence, anterior noticeably deeper than long,

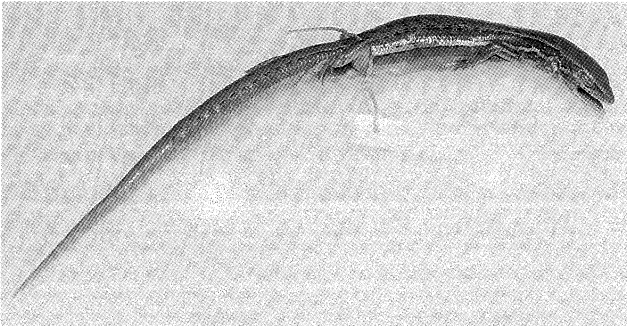


Fig. 53. BM 1946.8.13.15, holotype of *Eurepes haplorhinus* Günther.



Fig. 54. NHMB 7330, lectotype of *Lygosoma austro-caledonicum dorsovittatum* Roux.

posterior longer than deep and shallower than anterior; anterior subocular usually 2 (85.6%, n = 88), anteriormost large and followed by a smaller scale, sometimes a single large scale; supraciliaries usually 7 (97.1%, n = 87); upper labials usually 7 (98.3%, n = 87) with fifth subocular and contacting lower eyelid; postlabials 2; lower labials usually 6 (96.5%, n = 87), first 2 contacting postmental; chinshields 3.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 37.9–50% of total eye length (sample from vicinity of Poum: \bar{x} = 44%, n = 24).

Ear opening with 2 (35.4%, n = 85)–3 (51%), rarely 1 or 4, enlarged auricular lobules anteriorly and numerous blunt conical scales around upper, lower and posterior edges.

Body scales of dorsal and lateral surfaces tricarinate, each keel usually interrupting posteriormost edge of scale, number of keels increasing towards nape; midbody scale rows 28–34 (\bar{x} = 30.3, sd = 1.3, n = 88); paravertebral scales 56–68 (\bar{x} = 61.3, sd = 2.3, n = 88).

Lamellae beneath fourth toe 23–33 (\bar{x} = 27.6, sd = 1.9, n = 88).

OSTEOLOGY: premaxillary teeth 11 (90.9%, n = 11), or 10; maxillary teeth 19–26 (\bar{x} = 23.8, sd = 2.7, n = 11); dentary teeth 23–32 (\bar{x} = 28.7, sd = 2.7, n = 11); presacral vertebrae 29; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: *Caledoniscincus austrocaledonicus* is highly variable in colour pattern with distinct sexual dimorphism and geographic variation in patterns present. The most obvious difference between the sexes is clear demarcation between dorsal and lateral surfaces in adult females whereas in adult males these surfaces are similar in colour and tend towards a gradation in pattern unless clearly defined by a pale but rough-edged laterodorsal stripe.

Variation in both sexes in tone of dorsal colour, width and boldness of pale vertebral and laterodorsal stripes, and presence of pale midlateral stripe roughly aids in the recognition of two geographically distinct

populations: one in the northern and central part of the main island (i.e. Poum, Koumac and Mt Aoupinie) and the other in the south (i.e. Yate and Mt Dore). Intermediate populations occur at Mt Kanala where males are typical of southern form and females a composite of northern-central and southern forms, and at Noumea where both northern-central and southern male and female forms occur. The pale midlateral stripe is the feature in which this pattern of geographic variation is most obvious.

a) Adult males. Dorsal surface mid to dark brown with pale flecks; distinct pale vertebral stripe grey-brown, rough-edged and variably defined, extending from nape to middle of body before breaking posteriorly into a series of poorly connected elongate blotches; head usually lighter than dorsum, with coppery flush and variably with a dark brown-black longitudinal streak on rostral (most common in southern form); pale laterodorsal stripe light grey-brown, rough-edged and variably defined, broad and distinct from lateral surface in northern and central populations, narrow and

indistinct in southern populations. Lateral surface mid to dark brown, usually with pale midlateral stripe white and distinct. Tail mid to dark brown dorsomedially, broken into a series of interconnecting blotches; laterodorsal and upper lateral surface predominately grey-brown; remainder of lateral surface of tail mid to dark brown with chevrons of that colour intruding into lighter grey-brown upper surface. Venter (in life) cream anterior of forelimbs, generally orange, sometimes orange-yellow posteriorly.

b) Adult females. Dorsal surface light to mid brown, occasionally grey in northern and central populations, mid to dark brown in southern populations; pale vertebral stripe light brown to grey (lighter than adjacent dorsal), usually distinct, occasionally indistinguishable in individuals with light grey dorsal surface in northern populations (17% indistinct for Poum); pale laterodorsal stripe light brown to grey (same as vertebral stripe if present), broad with smooth dorsolateral edge distinct from lateral surface in northern and central populations, grey-brown and smooth edged but in poor

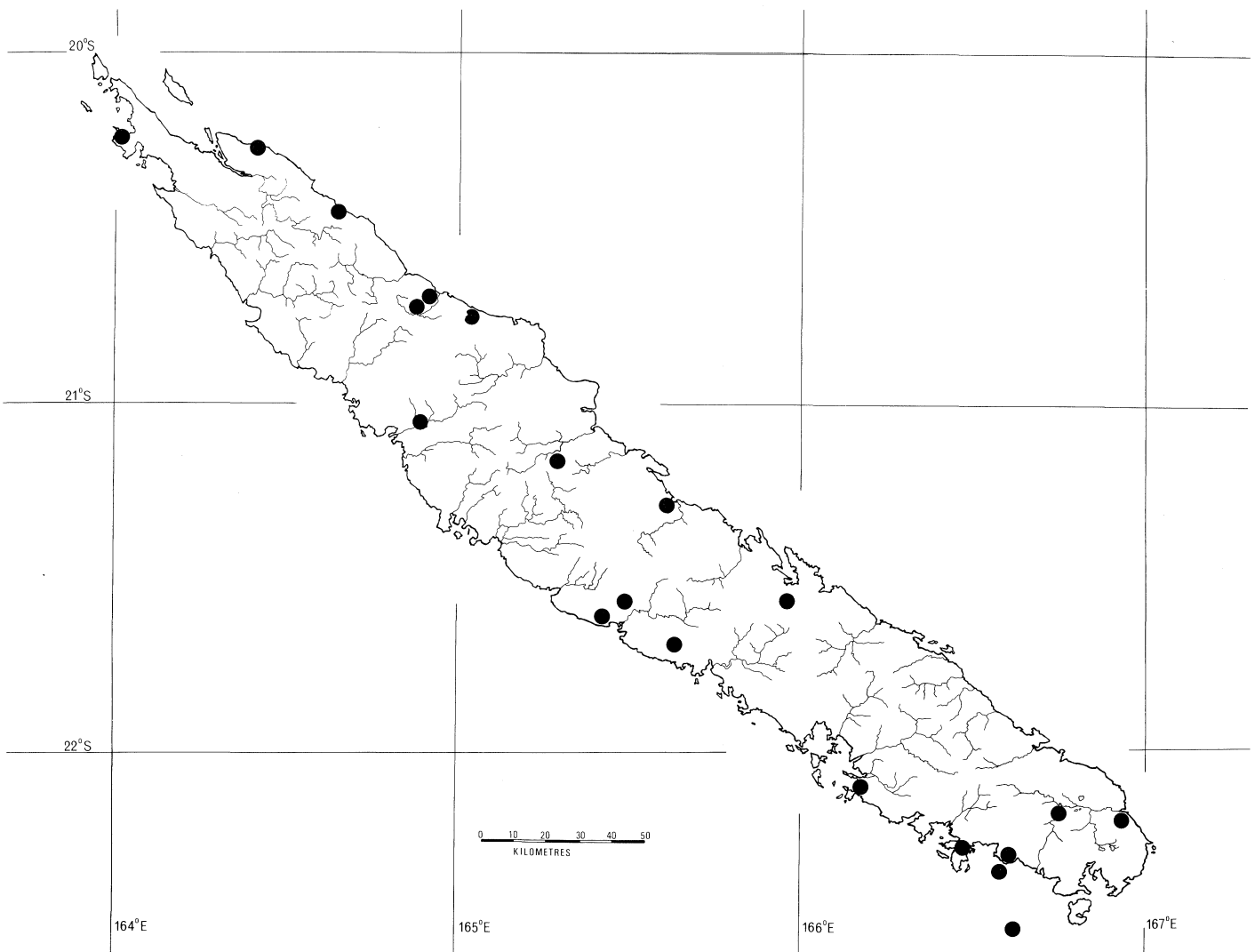


Fig. 55. Distribution of *Caledoniscincus austrocaledonicus* (closed circles) in New Caledonia.

contrast to dorsal and lateral surface in southern populations. Lateral surface mid to dark brown; pale midlateral stripe white, usually present in northern and central populations and defining a dark upper lateral from lighter lower lateral surface; rough and broken posteriorly in both sexes from Koumac; variably present in Kanala population occurring either poorly or prominently in some individuals; usually absent from southern populations, upper and lower lateral colouration a gradation. Tail as for adult males. Venter (in life) cream anterior to forelimbs, yellow-cream posteriorly, rarely bolder orange.

Distribution and habitats. *Caledoniscincus austrocaledonicus* is widely distributed over a variety of habitats on mainland New Caledonia (Fig. 55). It also occurs on a number of offshore islands including the Isle of Pines off the south-western corner of the main island (described as new subspecies *Leiolopisma dorsovittatum bodoi* by Börner 1980). Roux (1913) also recorded this species from all the Loyalty Islands. Reference to this species in a key to lizards of islands of New Hebrides is considered to be a mistake for *Caledoniscincus atropunctatus*.

Caledoniscincus austrocaledonicus inhabits low elevation open scrub and woodland (Fig. 1b,c), lowland and highland rainforest borders (Fig. 1e), and highland heath. In forest edge habitat; *C. austrocaledonicus* is syntopic with *Caledoniscincus festivus* and *C. atropunctatus*, the latter two species rarely being observed in more open habitat.

Reproduction. *Caledoniscincus austrocaledonicus* is oviparous, producing 1–5 eggs. Clutch size in high altitude areas (i.e. Mt Aoupinie range = 2–5, mode 3, $n = 12$) is greater than lowland locations (i.e. Noumea, Yate, Poum range = 1–4, mode 2, $n = 27$). Reproductively active females from the highlands are larger (SVL range 44.5–54.5, $\bar{x} = 50$, $n = 13$) than those from the lowlands (SVL range 37–50, $\bar{x} = 42.5$, $n = 30$).

Remarks. The description by Bavay (1869) recognizing two forms (Varieties A and B) of *Lygosoma austro-caledonica* indicates that the material was composite.

Boulenger (1887) redescribed *Lygosoma austro-caledonicum* Bavay, correctly placing *Euprepes haplorhinus* Günther in its synonymy.

Roux (1913) redescribed *Lygosoma austro-caledonicum* restricting it to Variety A (part) of Bavay, noting females greatly outnumbered males. Roux also described *Lygosoma austro-caledonicum dorsovittatum* n. subsp., and noted that this form also agreed in part with Bavay's Variety A, but that the material on which the description of this subspecies was based were mostly male.

Börner's (1980) recognition of *Lygosoma austro-caledonicum dorsovittatum* Roux as a full species by describing *Leiolopisma dorsovittatum bodoi* n. subsp. is unjustified as Roux's subspecies is based on males of *Lygosoma austro-caledonica* Bavay, 1869. Specimens described by Börner and those in the Australian Museum

collection from the Isle of Pines fall within the range of variation observed for southern mainland and island populations of *Caledoniscincus austrocaledonicus*.

Caledoniscincus atropunctatus (Roux)

Figs 56–59

Lygosoma austro-caledonicum atropunctatum Roux 1913: 117.

Type material. LECTOTYPE: *Lygosoma austro-caledonicum atropunctatum*, NHMB 7308, adult male, SVL 49 mm (Figs 57, 58), Outbache, New Caledonia, 20°26'S 164°38'E.

Additional material examined. AM R77921, 77923, 77936, 77954, 77962, 77789–90, Poum, 20°14'S 164°02'E; NHMB 7603, Pam, 20°15'S 164°18'E; NHMB 7307, 7309–11, 19019, 19034, 19037, Outbache, 20°26'S 164°38'E; NHMB 7312, Toa, 20°33'S 164°48'E; AM R78069, Koumac Caves 9 km east of Koumac, 20°33'S 164°21'E; NHMB 7314, 19003, 19015, 19023, 19030, Kone, 21°04'S 164°52'E; AM R77732, 3 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°07'S 165°22'E; AM R77573–94, Houailou airstrip, 21°16'S 165°37'E; AM R77524–28, 4 km north of junction of Poya road on Bourail to Houailou road, 21°29'S 165°28'E; NHMB 7315, Canala, 31°32'S 165°57'E; NHMB 7321, Negopo Tal, 21°32'S 165°54'E; NHMB 19029, Bourail, 21°34'S 165°29'E; NHMB 7316, 19028, Mt Kanala (700 m), 21°35'S 165°56'E; NHMB 7317, La Foa, 21°43'S 165°49'E; NHMB 7318–19, 19010, 19025, Ngoy Tal (200 m), 21°49'S 166°36'E; AM R116037–38, La Riviere Bleu, 22°06'S 166°40'E; AM R78229, beachfront 3 km south of La Fausse Yate bridge, 22°10'S 166°57'E; AM R78261–81, 2 km west of Plum turn off on Mt Dore road, 22°17'S 166°37'E; AM R77339–400, 77439, Noumea, 22°18'S 166°27'E.

Lifou Island, Loyalty Islands: NHMB 7324, 19014, Nathalo 20°47'S 167°16'E; NHMB 7324, Kepenee.

Diagnosis. *Caledoniscincus atropunctatus* can be distinguished from all other species in the genus by the following combination of colour features: tail with dorsal and lateral surfaces each more or less uniform i.e. without dark chevrons; dorsum with dorsal and lateral surfaces each more or less uniform, pale vertebral or lateral stripes lacking; snout uniform, dark midrostral streak always lacking.

In size, *C. atropunctatus* (maximum SVL 53 mm) is similar only to *C. austrocaledonicus* (maximum SVL 55 mm), the species *C. festivus* (maximum SVL 66.5 mm) and *C. orestes* (maximum SVL 65 mm) being much larger.

Description. The measurements and scalation for this description are based on 39 adult specimens from the vicinity of Houailou ($n = 19$) and vicinity of Mt Dore ($n = 20$).

MEASUREMENTS: males begin to develop features of colouration distinct from adult females around a size 40 mm SVL. The smallest apparently reproductively active females occur around a size of 38 mm SVL. Only males 40 mm SVL and over, and females 38 mm SVL and over are included in the following body measurements.

Maximum SVL of 53 mm; distance from axilla to groin 50–61.6% of SVL ($\bar{x} = 57.3$, $n = 39$); hindlimb

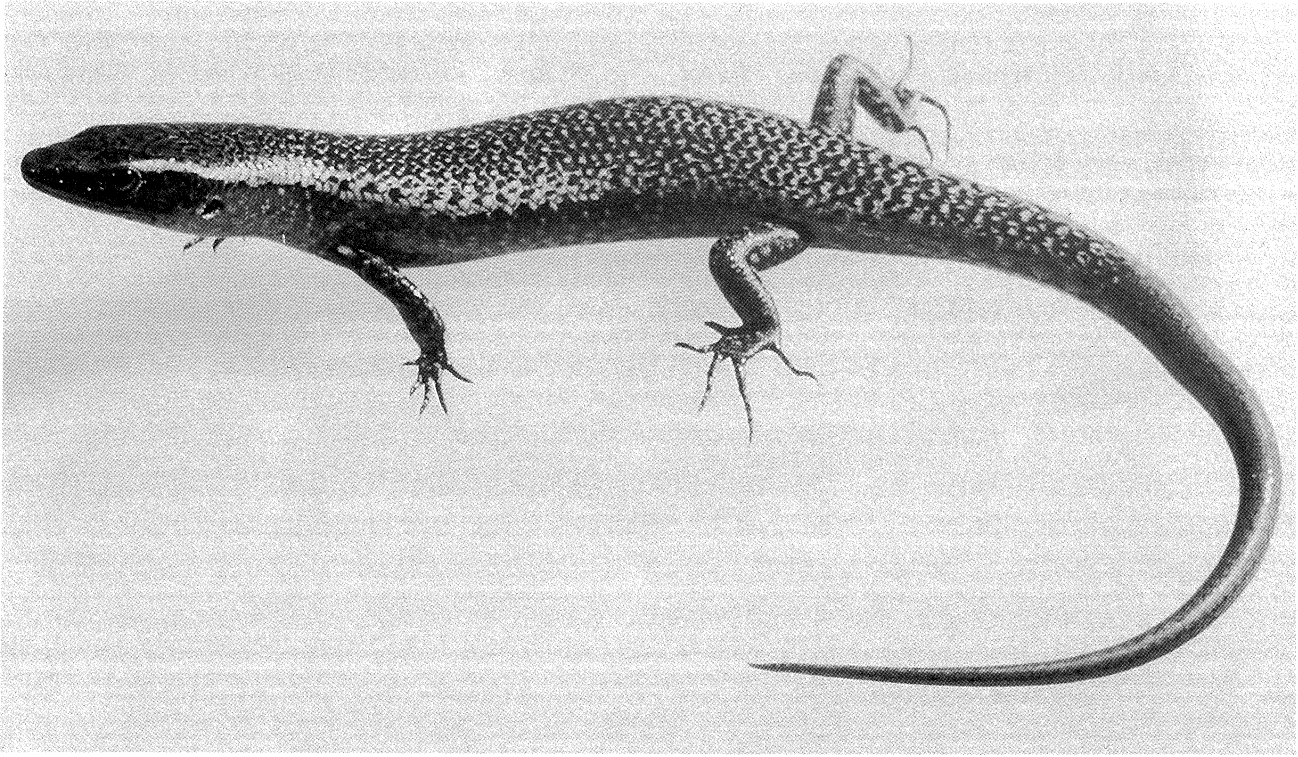


Fig. 56. *Caledoniscincus atropunctatus* from near Yate, New Caledonia.

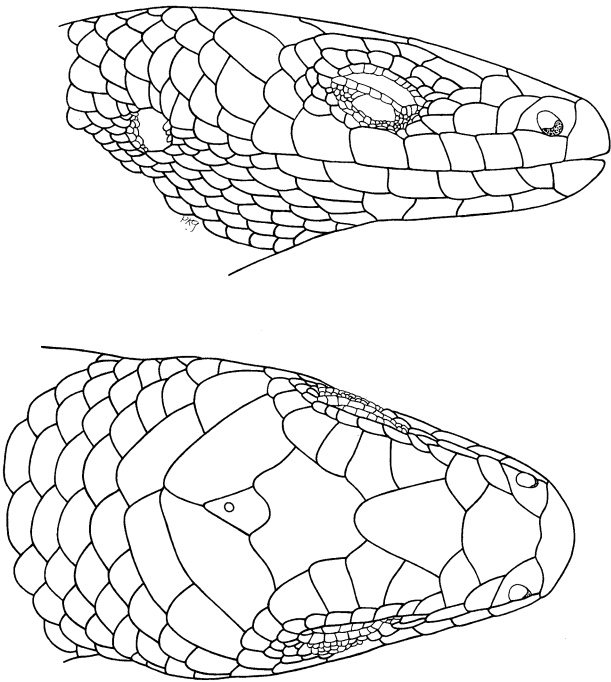


Fig. 57. Lateral and dorsal views of the head of NHMB 7308, lectotype of *Lygosoma austro-caledonicum atropunctatum* Roux.

length 30.2–39.2% of SVL (\bar{x} = 34.1, n = 39) tail length ca. 142.5–151.3% of SVL (\bar{x} = 149.8, n = 5).

SCALATION: frontonasal broader than long (W/L 142.9–188.9%, \bar{x} = 161.5, n = 20); prefrontals moderate in size, widely separated; frontal near as broad as long (W/L 80.7–107%, \bar{x} = 88.9, n = 20); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single, tertiary temporals 2.

Nasals moderately to widely separated, postnasal crease variably present (60% both sides, 15.4% 1 side only, n = 39), or absent; 2 loreals in a horizontal sequence, anterior noticeably deeper than long, posterior longer than deep and shallower than anterior; anterior suboculars usually only a single large scale (73.1%, n = 39), otherwise followed by 1–2 much smaller scales; supraciliaries usually 7 (97.4%, n = 39), rarely 8; upper labials 7, with fifth subocular and contacting lower eyelid; postlabials 2; lower labials usually 6 (94.9%, n = 39), rarely 5, first 2 contacting postmental; chinshields 3.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 38.2–71.4 of total eye length (\bar{x} = 48%, n = 20).

Ear opening with 2(42.3%, n = 37)–3(47.4%), rarely 4, enlarged auricular lobules anteriorly, and numerous blunt conical scales around upper, lower and posterior edges.

Body scales of dorsal and lateral surfaces tricarinate, each keel usually interrupting posteriormost edge of scale, number of keels increasing towards nape; midbody scale rows 28–32 (\bar{x} = 29.6, sd = 0.9, n = 39); paravertebral scales 51–60 (\bar{x} = 55.9, sd = 2.2, n = 39).

Lamellae beneath fourth toe 23–30 (\bar{x} = 25.7, sd = 1.6, n = 39).

OSTEOLOGY: premaxillary teeth 11 (87.5%, n = 16), or 10; maxillary teeth 22–29 (\bar{x} = 25.1, sd = 2, n = 16); dentary teeth 29–35 (\bar{x} = 32.4, sd = 1.8, n = 16);

presacral vertebrae 29 (87%, n = 23), rarely 30 (8.7%) or 28; postsacral vertebrae 49–51 (n = 2); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: there is marked sexual dimorphism in colour and pattern in adults of *Caledoniscincus atropunctatus*.

a) Adult males. Dorsal and lateral colour and pattern poorly demarcated. Dorsal surface of body and tail dark brown with numerous fine light cream flecks; head

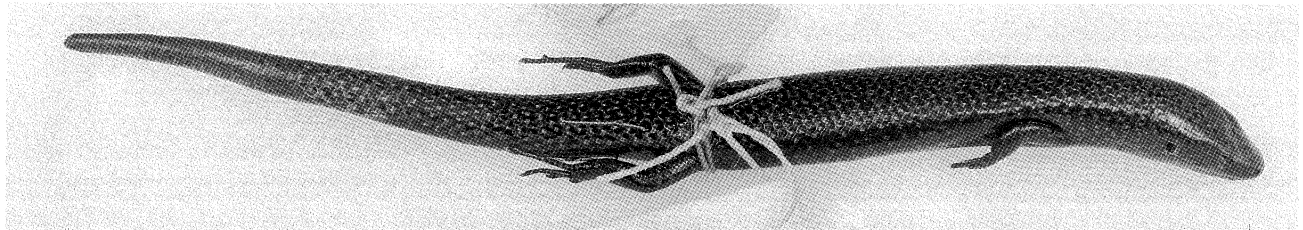


Fig. 58. NHMB 7308, lectotype of *Lygosoma austro-caledonicum atropunctatum* Roux.

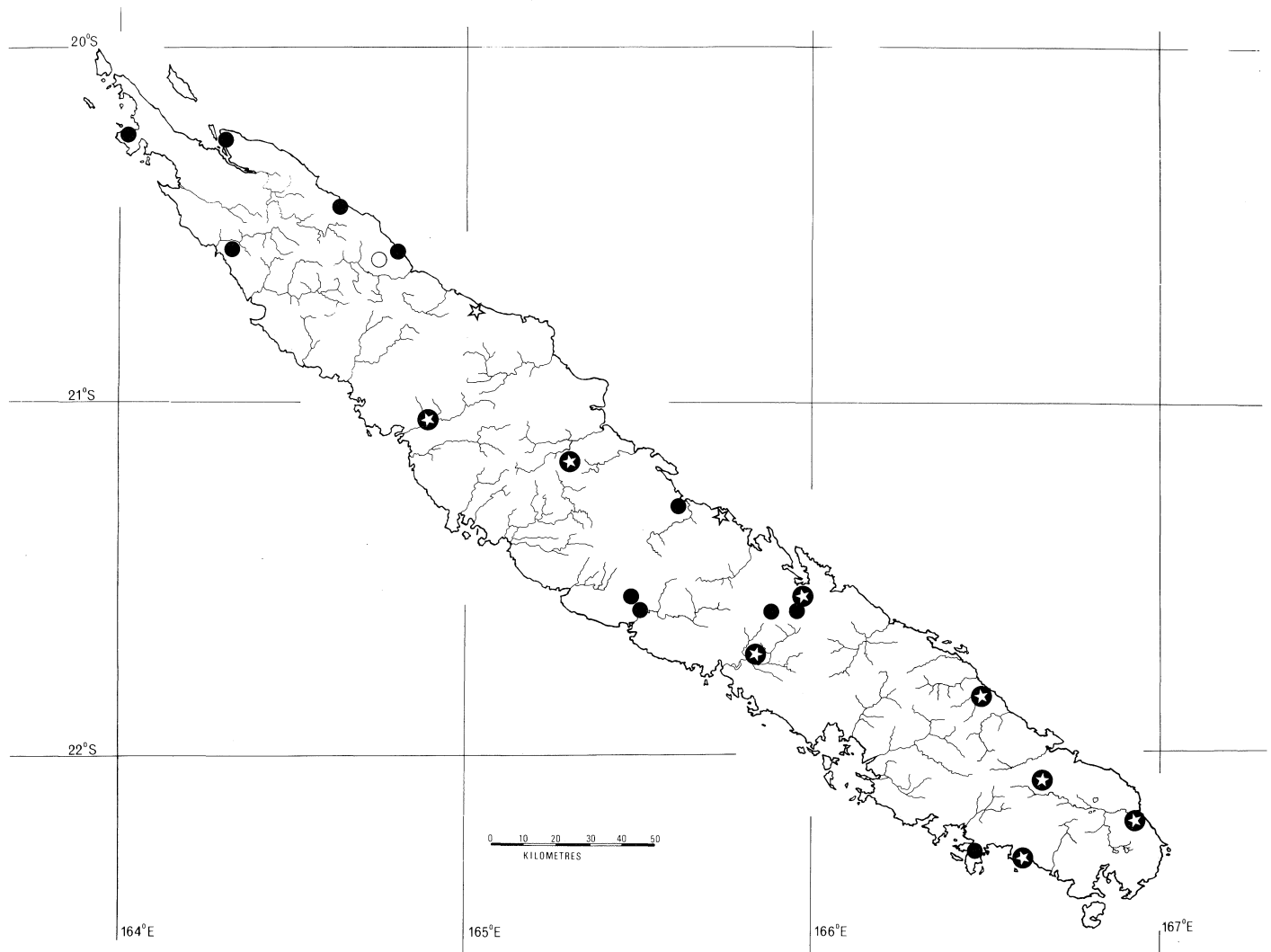


Fig. 59. Distribution of *Caledoniscincus atropunctatus* (closed circles), *Caledoniscincus festivus* (open star), both *C. festivus* and *C. atropunctatus* from same locality (open star in closed circle), and *Caledoniscincus orestes* n. sp. (open circle) in New Caledonia.

brown with dark brown-black spots and overall coppery tinge, dark midrostral streak absent. Pale dorsolateral stripe extending from posterior corner of eye to just past forelimbs, upper edge obscure, lower edge distinct and contrasting with darker lateral surface. Lateral surface dark brown with a coppery tinge anterior to forelimbs in some specimens, and with sparse light flecking anteriorly and dorsolaterally; colour of lateral surface tending to be lighter ventrolaterally, but some specimens retaining dark tone throughout the body depth. Tail a continuation of dorsal and lateral colour and pattern, lacking dark dorsal or lateral chevrons characteristic of other *Caledoniscincus*. Fore and hindlimbs with similar dorsal and lateral colour and differentiation as dorsum.

b) Adult females. Dorsal surface mid brown with fine dark flecking either uniformly scattered or restricted to middorsum; nape and head with copperish suffusion; rostral lacking dark midrostral streak. Pale dorsolateral stripe faint, light brown, only present anteriorly. Lateral surface dark charcoal-black, more or less uniform in intensity but tending to become lighter ventrolaterally. Tail similar in colour and pattern to the dorsal and lateral surfaces, no dark chevrons present. Fore and hindlimbs dark overall.

c) Subadults and juveniles. Subadult males and females (30–37 mm SVL) indistinguishable, both sexes having the female colour pattern. Smallest readily distinguished specimen with adult male pattern 40 mm SVL. Juvenile pattern slightly different to subadult, uniform light brown on dorsal surface, and lacking dark flecking or copper tinge anteriorly.

d) Colour in Life. Unlike other *Caledoniscincus*, adult *C. atropunctatus* lack ventral colouration of orange, yellow or pink, tending to be dirty cream to white.

Distribution and habitats. *Caledoniscincus atropunctatus* is distributed over most of mainland New Caledonia. It is also recorded from Lifou Island in the Loyalty Islands group and Vanuatu.

Caledoniscincus atropunctatus is most common in dense lowland forest but also inhabits coastal scrub (Fig. 1a,b) and mid altitude rainforest on Mt Kanala (700 m) and on Mt Aoupinie (ca. 400 m) (Fig. 1f). At lowland forest edge habitat *C. atropunctatus* is syntopic with both *C. austrocaledonicus* and *C. festivus*. Within forested lowland gullies *C. atropunctatus* and *C. festivus* are syntopic whereas *C. austrocaledonicus* rarely enters

closed forest, preferring more open habitat.

Reproduction. *Caledoniscincus atropunctatus* is oviparous with clutch size of 2–3 eggs. The smallest specimen with shelled oviducal eggs was 40 mm SVL while the smallest specimen with enlarged yolked ovarian follicles was 38.5 mm SVL.

Remarks. Roux's (1913) *Lygosoma austrocaledonicum atropunctatum* n. subsp. was based on Bavay's (1869) 'Variety B' of *Lygosoma austrocaledonica*.

Caledoniscincus festivus (Roux)

Figs 59–63

Lygosoma austrocaledonicum intermedium Roux 1913: 119.
Lygosoma austrocaledonicum festivum Roux 1913: 120.

Type material. LECTOTYPES: *Lygosoma austrocaledonicum festivum* Roux, NHMB 7366, adult female, SVL 59.5 mm (Figs 61, 62), Canala, New Caledonia, 21°32'S 165°57'E. *Lygosoma austrocaledonicum intermedium* Roux, NHMB 7362, adult male, SVL 61 mm (Fig. 63), Ciu (300 m), New Caledonia, 21°34'S 165°58'E.

Additional material examined. AMR 77840, 14 km south of Heinghene River Bridge, 20°43'S 165°05'E; NHMB 7363-64, Kone, 21°04'S 164°52'E; AM R77676, Mt Aoupinie forestry camp (500 m), 21°09'S 165°20'E; NHMB 7368, Nio (300 m), 21°20'S 165°43'E; NHMB 7359-60, Canala, 21°32'S 165°57'E; NHMB 7367, Ciu (300 m), 21°34'S 165°58'E; NHMB 7365, La Foa (100 m), 21°43'S 165°49'E; NHMB 7371-73, Ngoy Tal, 21°49'S 166°36'E; AM R116036, La Riviere Bleu, 22°06'S 166°40'E; NHMB 7375-76, Yate, 22°09'S 166°54'E; AM R78214-15, 78217-18, base of Mt Gouemba road, near Yate, 22°10'S 166°57'E; AM R78239-44, 78346-47, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E; NHMB 7361, 7369-70, Corinde.

Diagnosis. *Caledoniscincus festivus* can be distinguished from all other species in the genus by the following combination of colour features: tail with a row of distinctive dark chevrons; dorsal and lateral surfaces each more or less uniform, pale vertebral or lateral stripes lacking; snout with dark vertical midrostral streak.

In size, *C. festivus* (maximum SVL 66.5 mm) is approached only by *C. orestes* (maximum SVL 65 mm), the species *C. austrocaledonicus* (maximum SVL 55 mm) and *C. atropunctatus* (maximum SVL 53 mm) being much smaller.

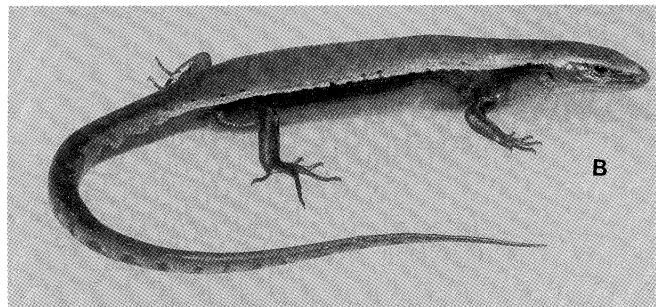
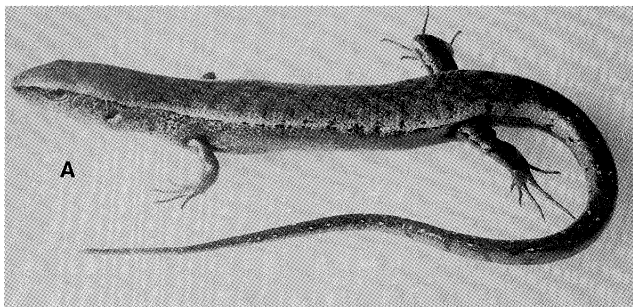


Fig. 60. *Caledoniscincus festivus* male (a) from Mt Aoupinie Forestry camp (500 m) and *C. festivus* female (b) from La Riviere Bleu.

Description. This description is based on 26 adult (including types), one subadult and four juvenile specimens.

MEASUREMENTS: males begin to develop features of colouration distinct from adult females at 61 mm SVL (smallest adult male). The smallest apparently reproductively active female was 56 mm SVL. Only males 61 mm SVL and over, and females 56 mm SVL and over are included in the body measurements.

Maximum SVL 66.5 mm; distance from axilla to groin 53.8–62.2% of SVL (\bar{x} = 58.7, n = 26); hindlimb length 35–41.8% of SVL (\bar{x} = 37.4, n = 26); tail length ca. 142.6–180.3% of SVL (\bar{x} = 160.3, n = 4).

SCALATION: frontonasal broader than long (W/L 139.6–158.5%, \bar{x} = 148.1, n = 10); prefrontals moderate

in size, widely separated; frontal near as broad as long (W/L 82.5–93.3%, \bar{x} = 88, n = 10); frontoparietals fused; interparietals distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately to widely separated, postnasal crease variably present (33% both sides, 22.3% one side only, n = 27), or absent; 2 loreals in a horizontal sequence, anterior noticeably deeper than long, posterior longer than deep and shallower than anterior; anterior suboculars usually 2 (84%, n = 31), anteriormost large and followed by a smaller scale, sometimes a single large scale; supraciliaries 7; upper labials 7, with fifth subocular and contacting lower eyelid; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3.

Lower eyelid with an obvious, centrally located semi-transparent disc, length 36.6–55% of total eye length (\bar{x} = 44.2%, n = 28).

Ear opening with 2 (60%, n = 25)–3 (32%), rarely 4, enlarged auricular lobules anteriorly, and numerous blunt conical scales around upper, lower and posterior edges.

Body scales of dorsal and lateral surfaces tricarinate, each keel usually interrupting posteriormost edge of scale in males, weaker in females, number of keels increasing towards nape; midbody scale rows 32–34 (\bar{x} = 32.9, sd = 1, n = 31); paravertebral scales 60–66 (\bar{x} = 61.9, sd = 1.3, n = 31).

Lamellae beneath fourth toe 24–31 (\bar{x} = 26.5, sd = 1.4, n = 29).

OSTEOLOGY: premaxillary teeth 11 (87.5%, n = 8) or 12; maxillary teeth 17–23 (\bar{x} = 19.3, sd = 1.7, n = 8); dentary teeth 20–26 (\bar{x} = 23.6, sd = 2, n = 8); presacral vertebrae usually 29 (90%, n = 10), rarely 28; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: there is marked sexual dimorphism in colour and pattern between adults of *Caledoniscincus festivus*. The most obvious differences are: clear demarcation between dorsal and lateral surfaces in females vs a graduation in colour in males; monochromatic dorsal and lateral colouration in

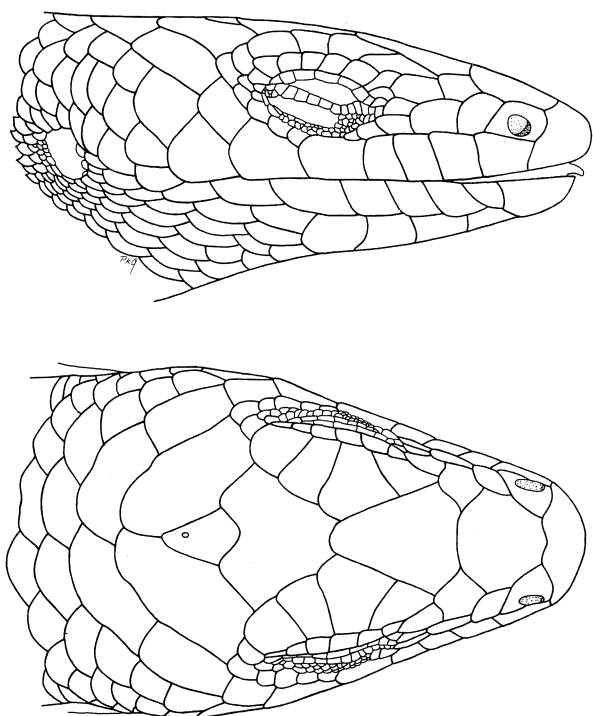


Fig. 61. Lateral and dorsal views of the head of NHMB 7366, lectotype of *Lygosoma austro-caledonicum festivum* Roux.

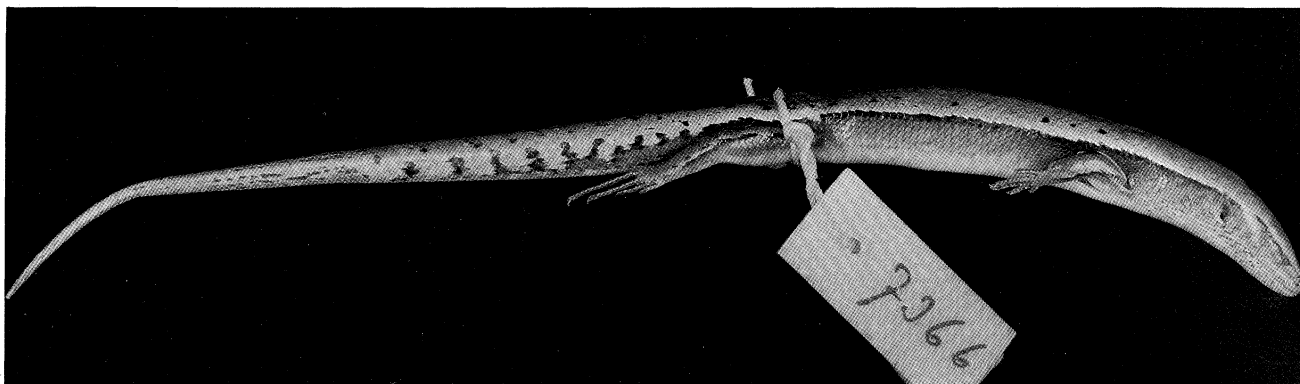


Fig. 62. NHMB 7366, lectotype of *Lygosoma austro-caledonicum festivum* Roux.

females vs polychromatic colouration in males.

a) Adult males. Dorsal surface mid brown with fine white flecks; light laterodorsal stripe, grey, continuing onto tail; head mid brown, rostral usually with a prominent black, vertical streak. Delineation of dorsal and lateral surfaces rough-edged but obvious. Lateral surface a gradation from dark to lighter brown approaching venter, and with irregular white flecks most prominent in region of forelimb; side of head dark brown with numerous pale flecks, distinct from uniform mid brown dorsal colour. Tail mid brown dorsomedially; laterodorsal and upper lateral surface predominately grey; remainder of lateral surface mid brown with chevrons of that colour intruding into lighter grey upper surface. Venter cream, lateral throat and chin shields with fine black flecks. Fore and hindlimbs with similar colour and demarcation as body.

b) Adult females. Dorsal surface uniform mid brown to light grey, usually with fine, longitudinally aligned dark flecks on laterodorsal surface; head similar. Pale narrow dorsolateral line extending from naris to just past hindlimbs. Lateral surface a gradation from dark smokey black uppermost to dark grey approaching the venter. Tail similar to adult males but with dorsal and laterodorsal colours sometimes indistinct, and dark lateral chevrons less pronounced. Fore and hindlimbs similar in colouration and demarcation to body. Otherwise as for adult males.

c) Subadults. Typical adult female colour pattern (single male SVL 39 mm).

d) Juveniles (series of four from Mt Dore and Mt Gouemba). Dorsal surface light grey with brown tinge to posterior half of body. Lateral surface uniform dark

brown delineated from dorsal surface by fine black line extending from naris to just past level of hindlimbs, fading on tail; side of head lighter than rest of lateral surface. Venter pale with some dark flecking on throat and chest scales.

Juvenile *C. festivum* are readily distinguished from juveniles of other *Caledoniscincus* species by their larger size, more robust appearance, sharply contrasting uniform dark lateral and lighter dorsal colouration, and prominent dark midrostral streak.

e) Colour in Life. Adult male and female individuals from Mt Dore with a yellow flush to venter from level of forelimb to end of tail, anterior to forelimbs pinkish with fine dark flecking.

Distribution and habitats. *Caledoniscincus festivus* is recorded from the mid and southern east coast and highlands, and sporadically on the west coast (Fig. 59) of the New Caledonian mainland. It has not been recorded from the far north of the main island (as was noted by Roux).

Caledoniscincus festivus inhabits densely forested lowland gullies, cleared edges of lowland rainforest, and highland rainforest edge habitat (Mt Aoupine 500 m, Fig. 1f). Individuals were generally observed at the edge of the forest (syntopically with *C. austrocaledonicus* and *C. atropunctatus* in the lowlands and with *C. austrocaledonicus* in the highlands) or in small sunlit patches on the forest floor.

Reproduction. *Caledoniscincus festivus* is oviparous with a clutch size of 4–6. Shelled oviducal eggs were found in specimens in Roux's collection made in August 1911, and enlarged ovarian eggs in our collection made in December 1978.



Fig. 63. NHMB 7362, lectotype of *Lygosoma austro-caledonicum intermedium* Roux.

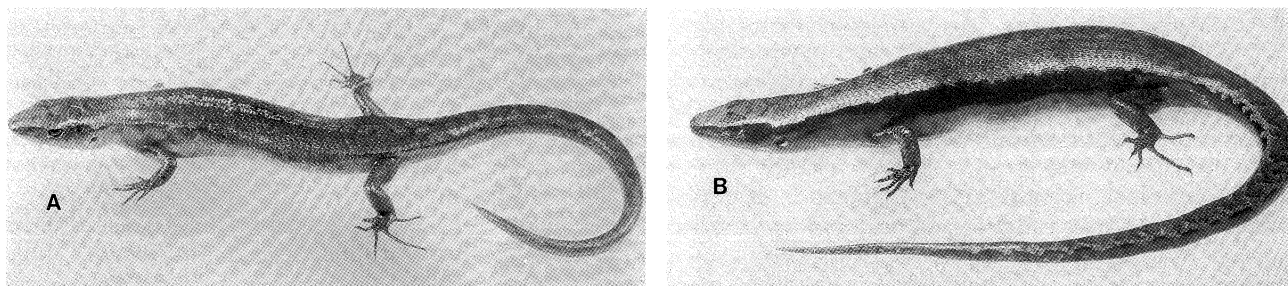


Fig. 64. *Caledoniscincus orestes* n. sp. male (a) and female (b) from near the summit of Mt Panie (1400 m), New Caledonia.

Caledoniscincus orestes n. sp.

Figs 60, 64–67

Type Material. HOLOTYPE: AM R77882, adult male, SVL 60 mm, Mt Panie (c.a. 900–930 m), New Caledonia, 20°33' S 164°45' S, collected by R. Sadlier & P. Rankin, 17 Dec 1978 (Figs 65, 66). PARATYPES: All specimens collected from Mt Panie: AM R77878 (760 m); AM R77881, 77883 (900–930 m); AM R77879, 77884–87 (1400 m); NHMB 7343–44 (500 m).

Diagnosis. *Caledoniscincus orestes* can be distinguished from all other species in the genus by the following combination of features in colour and size: tail with distinctive dark chevrons; dorsum with pale vertebral stripe; snout with dark midrostral streak.

In size, *C. orestes* (maximum SVL 65 mm) is approached only by *C. festivus* (maximum SVL 66.5 mm): the species *C. austrocaledonicus* (maximum SVL 55 mm) and *C. atropunctatus* (maximum SVL 53 mm) being much smaller.

Etymology. *Orestes* is the Latin word for mountain climber and alludes to the high altitudes inhabited by the species.

Description. This description is based on eight adult, two subadult and two juvenile specimens from Mt Aoupinie.

MEASUREMENTS: males begin to develop features of colouration distinct from adult females around a size of 55 mm SVL. Only individuals of 55 mm SVL and over are included in the following body measurement.

Maximum SVL 65 mm; distance from axilla to groin 58.6–64.9% of SVL (\bar{x} = 60.2, n = 8); hindlimb length, 30.9–37.6% of SVL (\bar{x} = 34.7, n = 8); tail length ca. 130.8–135% of SVL (\bar{x} = 132.3, n = 3).

SCALATION: frontonasal broader than long (W/L 137.8–169.4%, \bar{x} = 153.6, n = 8); prefrontals moderate in size, widely separated; frontal near as broad as long (W/L 78.6–91.7%, \bar{x} = 85.4, n = 8); frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately to widely separated, postnasal crease variably present; 2 loreals in a horizontal sequence, anterior noticeably deeper than long, posterior longer than deep and shallower than anterior; anterior suboculars usually 2 (85%, n = 10), anteriormost large and followed by a smaller scale,

occasionally followed by 2 smaller scales or present as a single large scale; supraciliaries 7; upper labials 7, with fifth subocular and contacting lower eyelid; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3.

Lower eyelid with obvious, centrally located semi-transparent disc, length 44–51.2% of total eye length (\bar{x} = 46.5, n = 7).

Ear opening with usually 3 (83.3%, n = 9), occasionally 2 or 4, enlarged auricular lobules anteriorly, and numerous blunt conical scales around upper, lower and posterior edges.

Body scales of dorsal and lateral surfaces tricarinate, each keel usually interrupting posteriormost edge in

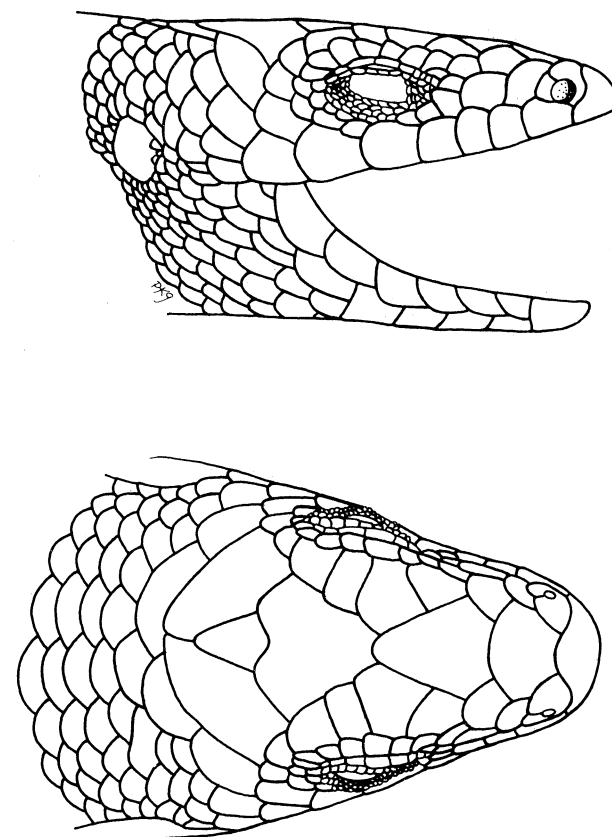


Fig. 65. Lateral and dorsal views of the head of AM R77882, holotype of *Caledoniscincus orestes* n. sp.

males, weaker in females, number of keels increasing towards nape; midbody scale rows 32–34 (\bar{x} = 32.9, sd = 0.9, n = 12); paravertebral scales 56–63 (\bar{x} = 58.7, sd = 1.9, n = 12).

Lamellae beneath fourth toe 24–28 (\bar{x} = 25.2, sd = 1.3, n = 12).

OSTEOLOGY: premaxillary teeth 11 (50%, n = 6), 12 (16.7%) or 13; maxillary teeth 25–31 (\bar{x} = 27.6, sd = 1.9, n = 5); dentary teeth 33–38 (\bar{x} = 35.1, sd = 1.7, n = 5); presacral vertebrae 29 (50%, n = 6) or 30; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: adults of both sexes similar in colour on dorsal surface; marked sexual dimorphism occurs in intensity of colour distinguishing dorsal and lateral surfaces.

a) Adult males. Dorsal surface dark brown with scattered light flecks; vertebral stripe light brown to grey, prominent over most its length from nape to just past hindlimbs, sometimes broken into series of more or less elongate blotches; head and nape lighter with coppery flush, continuous laterally onto face and side of neck anterior to forelimb; midrostral streak of snout dark and prominent with broad lower edge. Dorsolateral

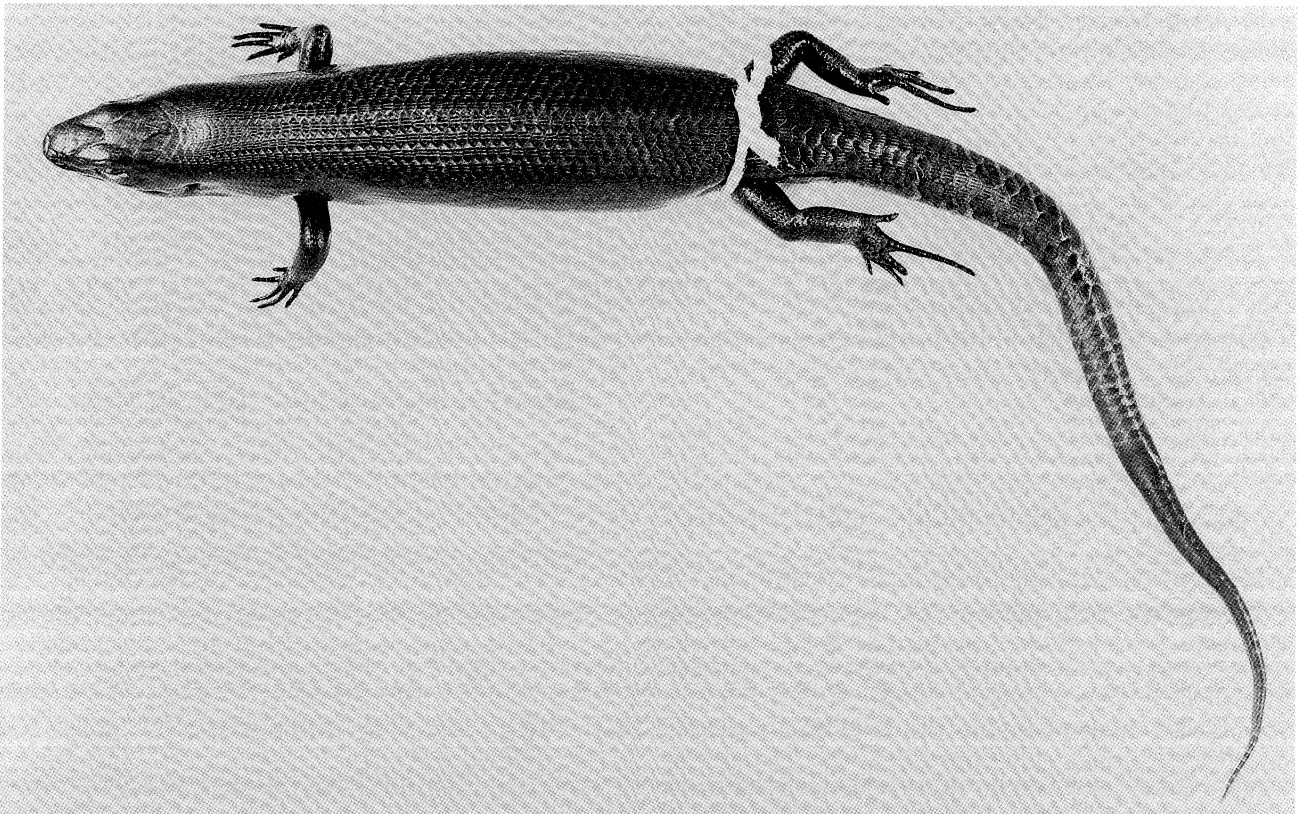


Fig. 66. AM R77882, holotype of *Caledoniscincus orestes* n. sp.

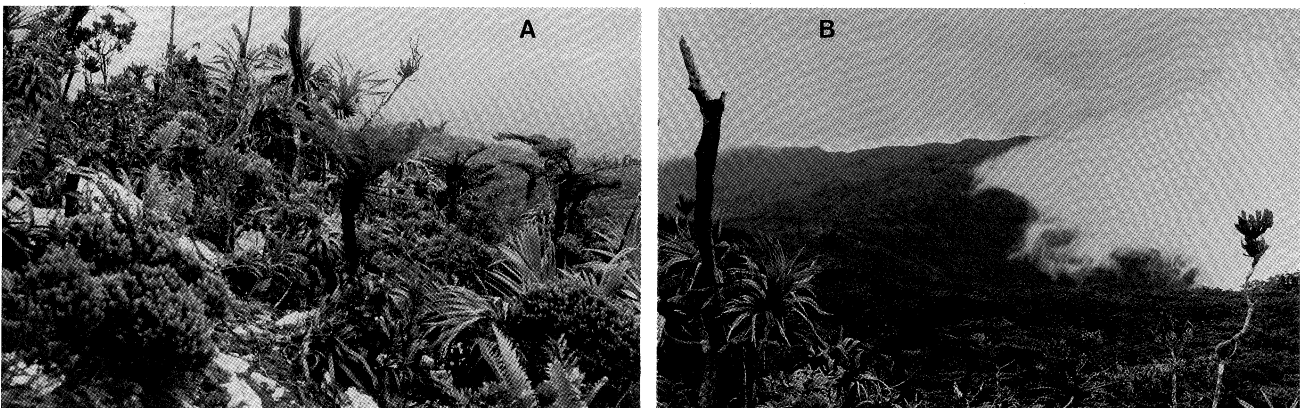


Fig. 67. High altitude rainforest (1400 m) on Mt Panie showing (a) the quartz outcrop at the type locality of *Caledoniscincus orestes*, and (b) the surrounding, mist-enshrouded ridges at this elevation.

stripe fine, black, extending posteriorly from rostral to just past hindlimbs, prominent anteriorly and sharply contrasting with lighter brown dorsal and lateral surface. Lateral surface mid to light brown becoming pale brown ventrolaterally; contrast between dorsal and lateral surfaces less marked than in females. Tail mid to dark brown dorsomedially, usually present as a series of large broadly contacting chevrons; laterodorsal and upper lateral surface predominately light grey; remainder of tail mid to dark brown with fine dark chevrons intruding onto lighter grey upper surface. Fore and hindlimbs with colour and demarcation of pattern similar to dorsal and lateral surfaces of body.

b) Adult females. Dorsal surface similar to adult males. Lateral surface uniform smokey black with a faint coppery flush anterior to forelimbs, sharply contrasting with dorsal surface. Fine black dorsolateral line (as described for males) obscured over most its length by dark lateral colour.

c) Subadult. Similar to adult females, but pale vertebral stripe indistinct (AM R77881).

d) Juveniles. Similar to adult females but more lightly coloured dorsally (mid to light brown) with no obvious pale vertebral stripe (AM R77886-7).

Change from juvenile to adult colouration apparently accomplished by overall darkening of dorsum except along vertebral line.

e) Colour in Life. Adults with yellow ventral flush from level of forelimbs posteriorly to end of tail; anterior of forelimbs russet and continuing over face. Subadult with dull pinkish flush to throat, remainder of venter yellow.

Iris dark, but still noticeably lighter than pupil.

Distribution and habitat. All AM specimens of *Caledoniscincus orestes* were collected along the track to the summit of Mt Panie (Fig. 59) in the north-east of mainland New Caledonia. Most were from the vicinity of a small quartz outcrop at 1400 m (Fig. 67), on an exposed ridge with a vegetation cover of very low heath. Other individuals were observed basking alongside the track at lower altitudes and samples were collected at 900–930 and 760 m. The habitat at lower altitudes was a low, dense, single story of palms, broadleaves, pandanus and ferns.

The two paratypes (NHMB 7243-4) collected by Roux & Sarasin in 1913 were recorded as coming from 500 m on Mt Panie.

Reproduction. Two gravid females of 61 and 65 mm SVL collected 17 December 1978 contained 5 (2/3) and 8 (4/4) shelled oviducal eggs respectively.

Sigaloseps n. gen.

Type species. *Lygosoma deplanchei* Bavay, 1869:

Diagnosis. *Sigaloseps* is a member of the *Eugongylus* group of Greer (1974), it can be distinguished from all other genera in that group by the following combination of characters: frontoparietals fused; supranasals and or postnasal sutures absent; ear lobules very small, blunt

and rounded, recessed below edge of surrounding body scales; atlantal arches fused to intercentrum; body scales smooth.

Recognized species. *Sigaloseps deplanchei* (Bavay, 1869).

Etymology. The name *Sigaloseps* combines the Greek for glossy or shiny (*sigaloeis*) with that for lizard (*seps*). The sole species in the genus is smooth-scaled and apparently restricted to the serpentine area of southern New Caledonia. The generic name *Sigaloseps* alludes to both the smooth body scales of this skink and shiny glossy nature of the mica rich rock type that is termed 'serpentine'.

Sigaloseps deplanchei (Bavay)

Figs 68–71

Lygosoma deplanchei Bavay, 1869: 23.

Hinulia tetragonurus Günther, 1872: 420.

Type material. LECTOTYPE: *Lygosoma deplanchei* Bavay, BM 86.9.16.1, here designated, sex indeterminate, SVL 42 mm (Fig. 69), 1 of 2 original syntypes BM 86.9.16.1-2 from New Caledonia. HOLOTYPE: *Hinulia tetragonurus* Günther, BM 71.4.16.42, male, SVL 44 mm (Fig. 70), recorded from "Feejee Islands" in type description (Günther 1892), later amended to "New Caledonia" in BM catalogue.

Additional material examined. NHMB 7195-97, Ngoi Tal, 21°49'S 166°36'E; NHMB 7198-7201, 7205-06, AM R6672, Yate, 22°09'S 166°54'E; QM J43994-95, Mt Koghis, 22°10'S 162°32'E; AM R78246-7, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E.

Diagnosis. Species diagnosis same as for genus.

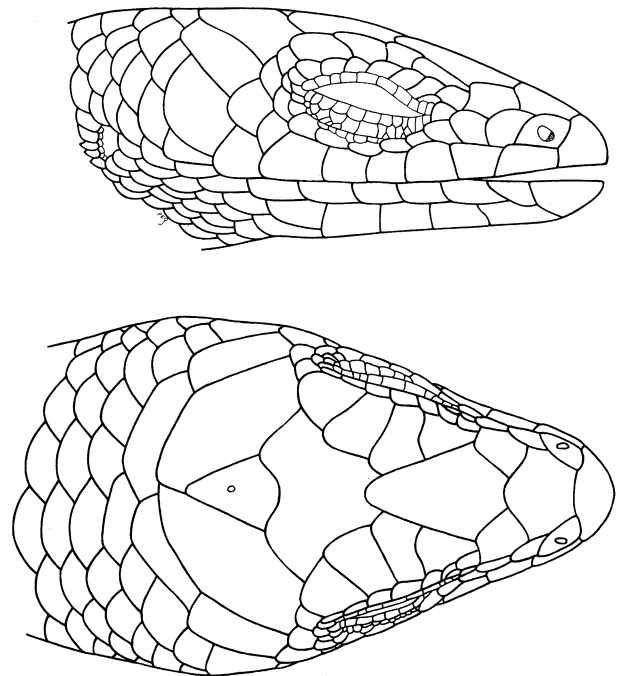


Fig. 68. Lateral and dorsal views of the head of NHMB 7195, a specimen of *Sigaloseps deplanchei* (Bavay).

Description. This description is based on 14 adult (including lectotype of *L. deplanchei* Bavay and holotype of *H. tetragonurus* Günther) and two subadult specimens.

MEASUREMENTS: Only adults 36 mm SVL and over are included in the body measurements. Maximum SVL of 44 mm; distance from axilla to groin 50.6–59.2% of SVL (\bar{x} = 55.2, n = 16); hindlimb length 29.5–36% of SVL (\bar{x} = 32.3, n = 16); tail length 120% of SVL (n = 2).

SCALATION: frontonasal broader than long (W/L 112–136%, \bar{x} = 125.6, n = 10); prefrontals large, moderately to widely separated; frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals widely separated; 2 loreals in a horizontal sequence; supraciliaries usually 7 (87.5%, n = 16), rarely 6; upper labials usually 7 (96.9%, n = 16), rarely 6, with fifth or fourth subocular respectively, separated from lower eyelid by a complete subocular scale row; postlabials 2; lower labials 6, first 2 contacting postmental; chinshields 3 each side, first pair in broad contact.

Lower eyelid variably scaly or with centrally located, undivided semi-translucent window. Most specimens from Ngoy Tal on the east coast of New Caledonia with

lower eyelid fragmented by sutures dividing it into a number of opaque scales, largest located centrally, and becoming progressively smaller peripherally. Single specimen from Ngoy Tal and all but one from Yate (also on the east coast) with a more obvious opaque window in lower eyelid divided by one or more longitudinal sutures and surrounded by smaller granular shaped scales (condition for types BM 86.9.16.1 and BM 71.4.16.42). Single specimen from Yate lacking longitudinal sutures, and appearing more as a moderately large centrally located opaque disc. Specimens from Mt Dore and Mt Koghis on the west coast usually (80%, n = 5) with an obvious centrally located semi-transparent disc 30% of eye length, less frequently divided anteriorly or posteriorly by one or more longitudinal sutures.

Ear opening with 2 (64.5%, n = 16), 3 (22.6%), rarely 4 small, acute anterior lobules, and a number of small rounded lobules on posterior and lower edges.

Body scales smooth; midbody scale rows 24–28 (\bar{x} = 26.5, sd = 1.1, n = 16); paravertebral scales 47–58 (\bar{x} = 51, sd = 2.6, n = 16).

Lamellae beneath fourth toe 22–27 (\bar{x} = 24.7, sd = 1.4, n = 15).

OSTEOLOGY: premaxillary teeth 10(50%, n = 2)–11; maxillary teeth 24–25 (n = 2); dentary teeth 25–28 (n = 2); presacral vertebrae 29 (n = 9); postsacral

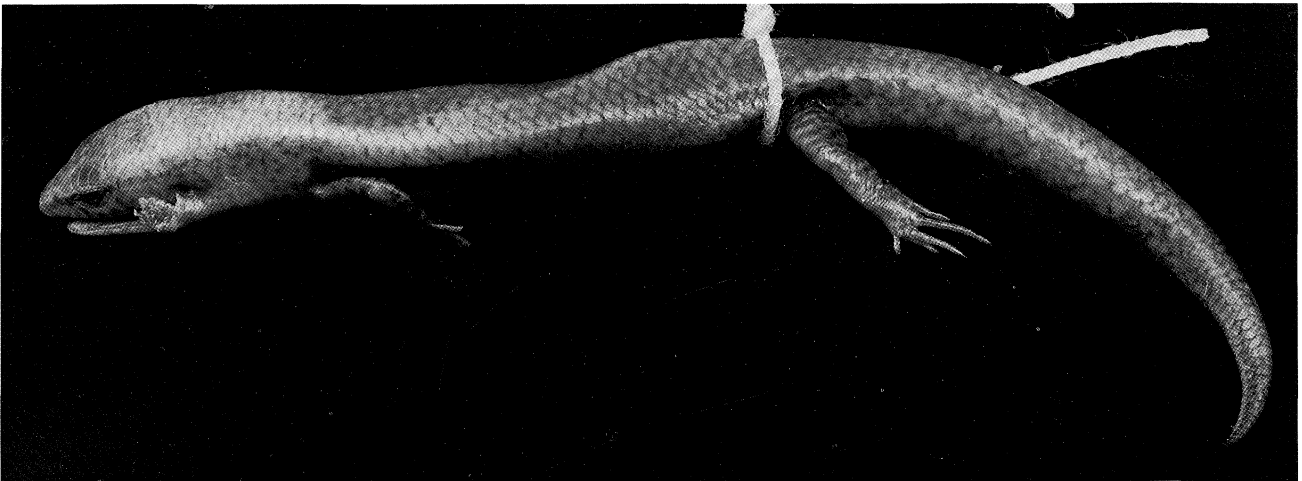


Fig. 69. BM 86.9.16.1, lectotype of *Lygosoma deplanchei* Bavay.



Fig. 70. BM 71.4.16.42, holotype of *Hinulia tetragonurus* Günther.

vertebrae 37 ($n = 1$); phalangeal formula for manus and pes 2.3.4.5.3. and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface mid to dark brown, occasionally (east coast specimens) with scattered darker flecks longitudinally aligned to give 2 parallel vertebral lines. Lateral surface light to mid brown (paler than dorsal surface) between fore and hind limbs, with (east coast specimens) or without (west coast) numerous dark flecks uppermost; anterior to forelimb tan with dark flecking over side of head (east coast) or with dark flecks uppermost (appearing darker than dorsal surface and varying in intensity), including a dark streak facially from nare to anterior corner of eye; upper and lower labials each with a dark median streak (west coast specimens). Limbs as for dorsum but with numerous fine dark flecks. Venter dull white, in life (2 specimens from Mt Dore on west coast) orange from level of forelimbs to level of tail, yellowish below tail, anterior to forelimbs reddish orange to pinkish flush. Iris pale brown.

Distribution and habitats. Roux noted this species has

only been recorded from the serpentine area in the south of mainland New Caledonia and never from the northern part of the island. This observation is here supported (Fig. 71). Roux's material was collected on the east coast at Valle Ngoi (200 m) and in the vicinity of Yate. Recent material has been collected in lowland rainforest on the west coast at Mt Dore and Mt Koghis.

The two individuals of *S. deplanchei* observed at Mt Dore were active at mid morning on the surface of thick leaf litter overlying a labyrinth of broken rock, but appeared reluctant to enter direct sunlight.

Remarks. Bavay's (1869) description of *Lygosoma deplanchei* lists measurements of a single specimen, but two syntypes (BM 86.9.16.1-2) exist and Bavay refers also to having encountered this species in at least three different habitats.

For this species, Bavay described a lower eyelid with a transparent disc. In the BM syntypes the lower eyelid is scaled. However, Bavay also described a transparent disc in the lower eyelid for *Anotis mariei* Bavay and *Lygosoma gracilis* Bavay, but these are here regarded

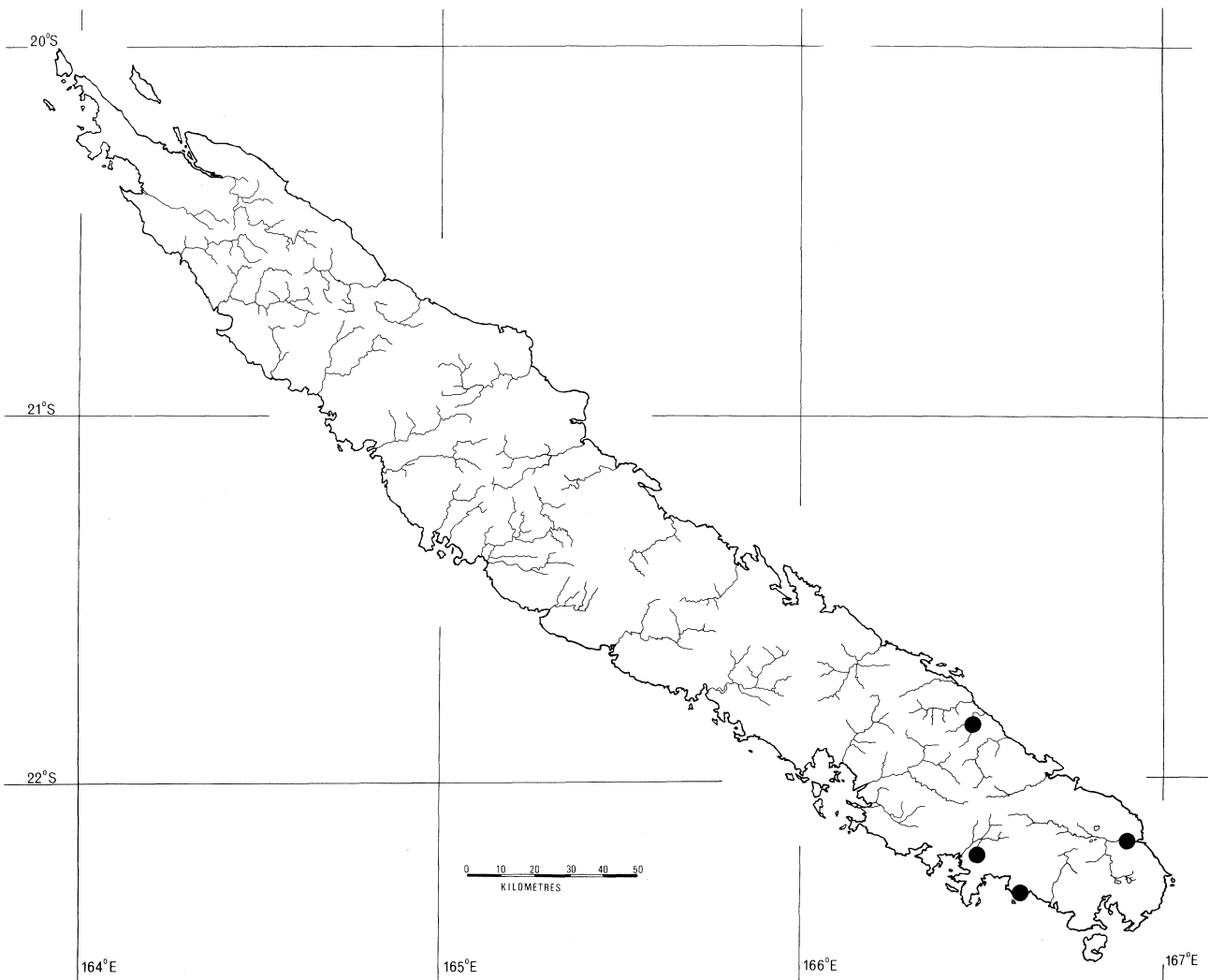


Fig. 71. Distribution of *Sigaloseps deplanchei* in New Caledonia.

as scaled, i.e. traversed by fine longitudinal sutures. The discrepancy between Bavay's type material and description of the lower eyelid of this taxon may be more a matter of interpretation, although *S. deplanchei* from the west coast usually have an undivided semi-transparent disc in the lower eyelid.

Boulenger (1887) and Roux (1913) both redescribed *Lygosoma deplanchei* Bavay, and correctly placed *Hinulia tetragonurus* Günther in its synonymy.

Genus *Cryptoblepharus* Wiegmann

Cryptoblepharus Wiegmann, 1834: 12 (type species *Cryptoblepharus poeciliopleurus* Wiegmann).

Diagnosis. Small skinks, maximum SVL approximately 50 mm; head and body depressed in form; frontoparietals fused; supranasals generally absent; lower eyelid ablepharine; atlantal arches fused to intercentrum.

Recognized species. Greer (1974) listed a single species with 36 subspecies. Most of these taxa are now recognized as distinct species. Storr (1976) has since described the Australian species *C. carnabyi* and *C. megastictus*, and Covacevich & Ingram (1978) *C. fuhni*.

Cryptoblepharus novocaledonicus Mertens

Figs 72-74

Ablepharus peronii Bavay, 1869: 31.

Cryptoblepharus boutonii novo-caledonicus Mertens, 1928: 88.

Type material. HOLOTYPE: SMF 15520. Not examined but topotypic material from the vicinity of Hienghene is included in the specimens examined here.

Material examined. AM R78008-26, Mouac Island off Poupou, 20°13'S 164°00'E; NHMB 7213-16, Pam, 20°15'S 164°18'E; AM R77915, 21 km north of Poupou on coast road, 20°17'S 164°26'E; AM R77916-20, beach front 9 km north of Hienghene, 20°38'S 160°53'E; AM R77897-902, beach below gendarmerie at Hienghene, 20°42'S 164°55'E; NHMB 7217-18, 7220-22, Hienghene, 20°41'S 164°56'E; AM R78220-28, beach front 3 km south of La Fausse Yate bridge, 22°10'S 166°57'E; AM R77508-18, 78094-106, Anse de Kuendu, Isle Nou, 22°15'S 166°23'E; AM R78289-303, 2 km west of Plum turnoff on Mt Dore road, 22°17'S 166°37'E; AM R110208, Porc-Epic Island, 22°19'S 166°36'E; AM R110211-19, Petit Mato Island off Noumea, 22°32'S 166°46'E; AM R110220-21, Grand Mato Island off Noumea, 22°33'S 166°48'E.

Description. This description is based on 65 adult specimens.

MEASUREMENTS: maximum SVL 43 mm; distance from axilla to groin 48.5–58.5% of SVL (\bar{x} = 53.8, n = 65); hindlimb length 40–54.7% of SVL (\bar{x} = 45.7, n = 64); tail length ca. 142.1–151.5% of SVL (\bar{x} = 146.8%, n = 2).

SCALATION: frontonasal broader than long (W/L 111.1–150%, \bar{x} = 130.8, n = 63); frontal almost as broad to slightly broader than long (W/L 77.7–121%, \bar{x} = 97, n = 63); prefrontals large, usually in moderate to broad contact (89.2%, n = 65) (fused medially in one individual), rarely in narrow to point contact only; frontoparietal and interparietal fused to form a single

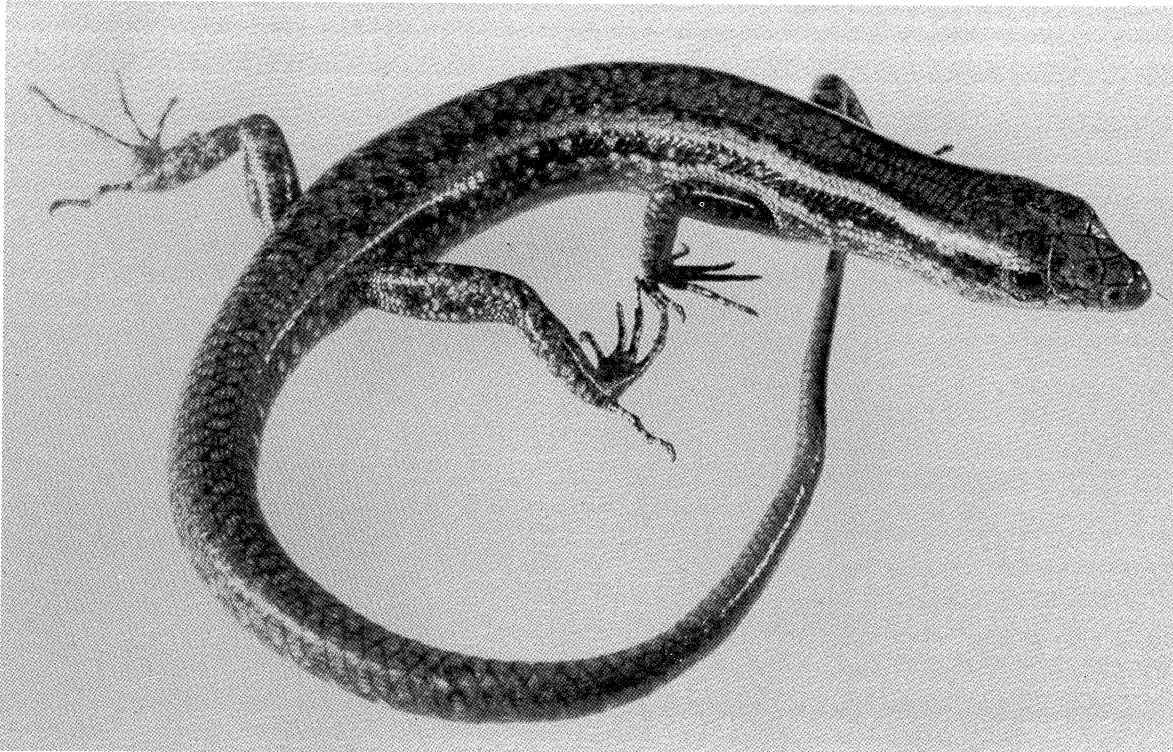


Fig. 72. *Cryptoblepharus novocaledonicus* from Isle Mouac.

scale; parietals each bordered by a single enlarged nuchal and upper temporal scale.

Nasals moderately to widely separated, with moderate to prominent postnasal crease (95.4%, $n = 65$), rarely a distinct supranasal; 2 loreals in a horizontal sequence, anterior near as deep as broad, posterior broader than deep and shallower than anterior loreal; anterior subocular single; upper labials 7 (92.1%, $n = 65$), with fifth subocular and contacting lower eyelid, rarely 6 (2.4%) or 8 with fourth and sixth respectively subocular; last upper labial occasionally divided (10.4%) by an oblique transverse suture; primary temporal single; upper and lower secondary temporals single; tertiary temporals fused to form a single, elongate scale; postlabials 2; lower labials usually 6 (90.5%, $n = 65$), rarely 5 (1.6%), 7 (7.1%) or 8, first 2 contacting postmental; chinshields 3, first pair in moderate to broad contact.

Lower eyelid largely a clear disc nearly completely covering eye, surrounded on lower, anterior and posterior edges by small granular scales, bordered

uppermost by several distinct, enlarged upper palpebrals.

Ear opening with numerous small, blunt, lobules around edges, largely obscured by overlapping scales anteriorly.

Body scales smooth; midbody scale rows 22–26 ($\bar{x} = 23.8$, $sd = 1$, $n = 65$); paravertebral scales 52–62 ($\bar{x} = 55.7$, $sd = 2.1$, $n = 65$).

Lamellae beneath fourth toe 18–25 ($\bar{x} = 21.1$, $sd = 1.6$, $n = 65$).

OSTEOLOGY: presacral vertebrae 27; postsacral vertebrae ca. 44 ($n = 1$); phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

COLOUR AND PATTERN: dorsal surface light to mid brown, always with a concentration of dark brown to black flecks along laterodorsal area (most prominent anteriorly), darker coloured individuals sometimes also with darker flecks extending over remainder of posterior part of dorsum; head light to mid brown similar to dorsal base colour, but with a copperish tinge and darker flecks and edging to sutures. Pale dorsolateral

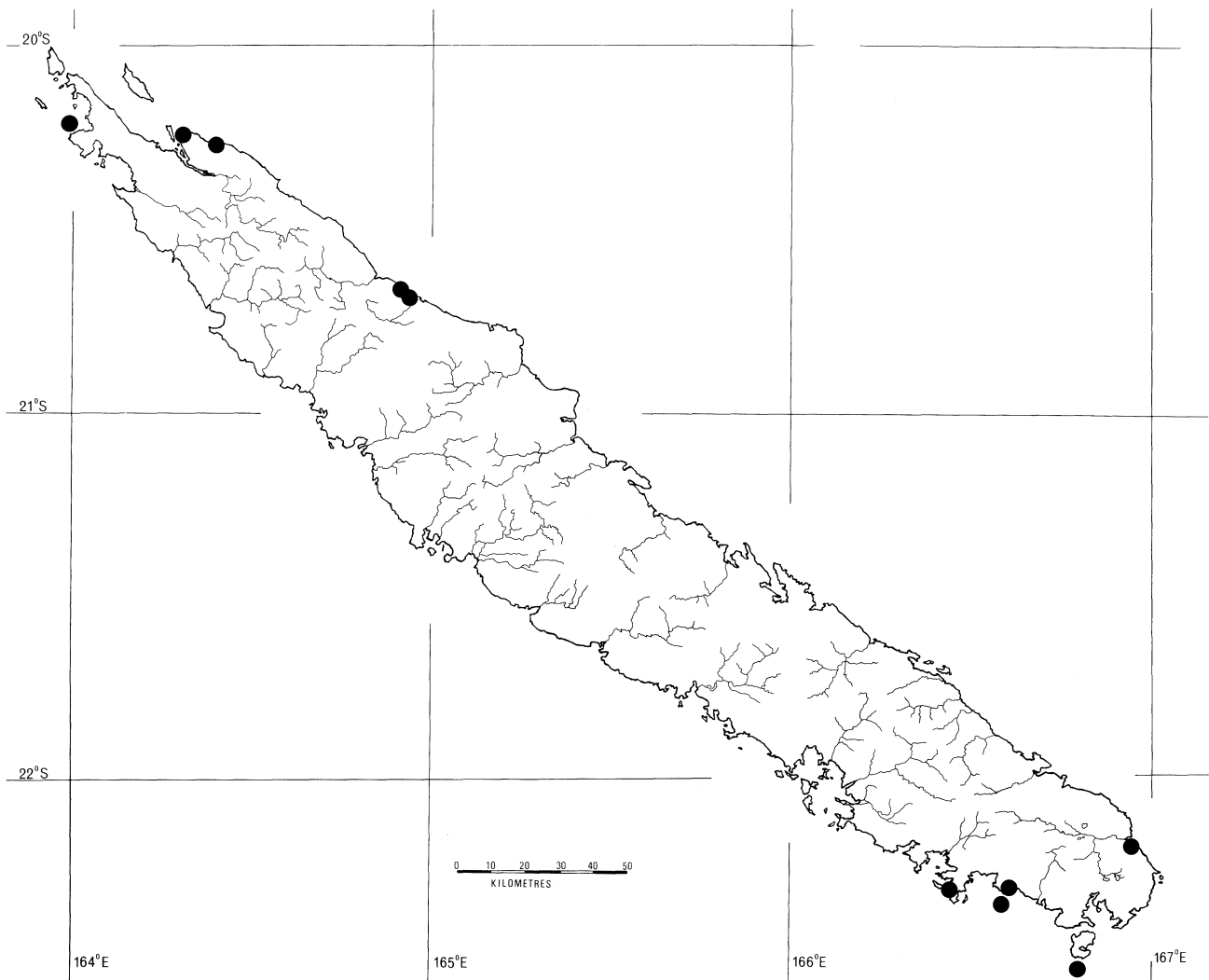


Fig. 73. Distribution of *Cryptoblepharus novocaledonicus* (closed circle) in New Caledonia.

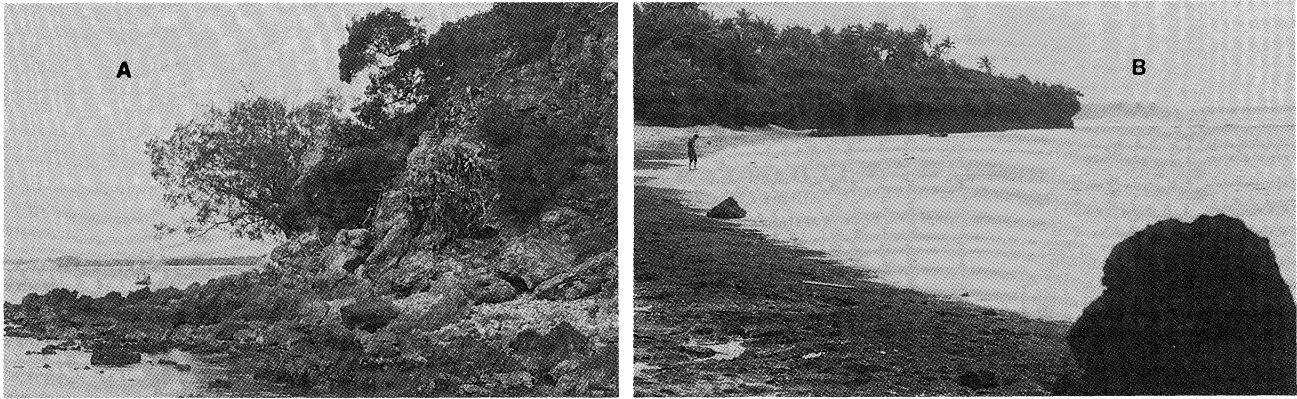


Fig. 74. Coastal rock outcroppings inhabited by *Cryptoblepharus novocaledonicus* on the (a) north coast in vicinity of Poum, and (b) south-east coast limestone outcropping near Yate.

stripe cream with an olive tinge, well defined anteriorly to midbody, tending to become obscure posteriorly. Lateral surface dark brown to black (same as laterodorsal markings), uppermost with obvious pale spotting for entire length, tending to become less well defined and generally lighter approaching hindlimbs; mid to lower lateral surfaces light to mid brown (usually same as dorsal surface) with light flecking overall and dark flecks more obvious on lower lateral surface, thus appearing as a poorly defined pale midlateral stripe extending from level of ear to hindlimb in boldly marked individuals. Limbs similar to dorsal surface above, unmarked below; soles of feet cream with brown calli anteriorly; lamellae cream with black blotching and brown calli for most of digit length, tending to lack calli distally. Venter pale, without markings.

Distribution and habitats. *Cryptoblepharus novocaledonicus* is recorded from a number of localities on the east, north-west and south-west coasts of the New Caledonian mainland, and islands off the north and south-west coasts (Fig. 73). Roux (1913) also records the species from Mare Island in the Loyalty Islands group. The apparent absence of *C. novocaledonicus* from most of the west coast is most likely lack of collecting in this region. This species would be expected to occur in suitable coastal habitat on this part of the mainland as well as other offshore islands.

On the coast, *C. novocaledonicus* inhabits rocky beach front habitat (Fig. 74) where it is usually observed active amongst boulders or on rock ledges around headlands.

Reproduction. *Cryptoblepharus novocaledonicus* is oviparous; two eggs are produced, one in each oviduct.

Genus *Nannoscincus* Günther

Anotis Bavay, 1869: 29 (type species *Anotis mariei*, Bavay, 1869).

Nannoscincus Günther, 1872: 421 (type species *Nannoscincus fuscus*, Günther, 1872 = *Nannoscincus mariei*).

Diagnosis. *Nannoscincus* is a member of the *Eugongylus* group of Greer (1979). It can be

distinguished from all other genera in that subgroup by the following combination of characters: small size (maximum SVL less than 50 mm) and body form elongate with limbs failing to meet when adpressed; supranasals absent; prefrontals absent, or diminutive and widely separated; upper labials 6, fourth subocular and contacting granules of lower eyelid; single pair of enlarged nuchals; ear opening greatly reduced or absent; phalangeal formula of forelimbs 2.3.4.4.3 for *N. maccoyi*, *N. greeri*, *N. rankini* and *N. mariei*, or further reduced to 2.3.3.3.2 in *N. gracilis* and 0.3.3.3.2 in *N. sleveni*.

Recognized species. *Nannoscincus mariei* (Bavay, 1869); *N. gracilis* (Bavay, 1869); *N. maccoyi* (Lucas & Frost, 1894); *N. sleveni* (Loveridge, 1941); *N. rankini* n. sp. and *N. greeri* n. sp.

Remarks. Czechura (1981), in reviewing the status of *Lygosoma graciloides* Lönnberg & Andersson, 1913, confirmed Cogger's (1979) suggestion that the generic name *Anotis* Bavay, 1869, was preoccupied by *Anotis* Rafinesque, 1815, and that the next available generic name for the type species *mariei* is *Nannoscincus* Günther, 1872.

Key to Species of New Caledonian *Nannoscincus*

1. Ear opening small but discernable; first supraciliary contacts frontal; colour dichromatic with light dorsal and dark lateral surfaces well defined. 2
- Ear opening absent, external ear completely scaled over; first supraciliary usually separated from frontal; colour dark with little definition between lateral and dorsal surfaces. *N. mariei*
2. Lower eyelid scaly; frontoparietals distinct. 3
- Lower eyelid with a distinct semi-translucent central area; frontoparietals fused. 4

- 3. Forelimb pentadactyl. *N. gracilis*
 —Forelimb tetradactyl. *N. sleveni*
- 4. Phalangeal formula for pes 2.3.4.5.4.
 *N. greeri*
 —Phalangeal formula for pes 2.3.4.4.3.
 *N. rankini*

***Nannoscincus mariei* (Bavay)**
 Figs 75–80

Anotis mariei Bavay, 1869: 29.

Nannoscincus fuscus Günther, 1872: 421.

Type material. LECTOTYPE: *Anotis mariei* Bavay, BM 1946.8.17.79, here designated, SVL 33.5 mm (Fig. 75). One of two original syntypes BM 1946.8.17.79-80 both from New Caledonia. HOLOTYPE: *Nannoscincus fuscus* Günther, BM 1946.8.16.16, SVL 35.5 mm, (Fig. 77), recorded as from “Feejee Islands” in type description, later amended to “New Caledonia” in BM catalogue.

Additional material examined. NHMB 7228, 7230-31, Ngoi Tal (700 m), 21°49' S 166°36' E; QM J43998, Mt Dzumac (700 m), 22°03' S 166°28' E; NHMB 7223, BM 1926.9.17.55, MCZ 112223, Mt Mou, 22°04' S 166°21' E; ZFMK 25455, north-east of Noumea; NHMB 7224-27, Yate, 22°09' S 166°54' E; AM R78142, 4 km up the Mt Gouemba road (300–350 m), near Yate, 22°09' S 166°54' E; CAS 158358-62, QM J44004-05 (400 m), Mt Koghis, 22°19' S 166°32' E; MCZ 46173, Yahoue Valley near Noumea, 22°12' S 166°30' E; MCZ 92393, Noumea, 22°16' S 166°27' E; MCZ 19605, Ngoi Valley; QM J43999, Foret Thy Reserve (150 m).

Diagnosis. *Nannoscincus mariei* can be distinguished from all other members of the genus by the following

combination of characters: frontoparietals distinct; loreal single; ear opening absent; lower eyelid scaly; forelimbs pentadactyle; phalangeal formula for manus 2.3.4.4.3; phalangeal formula for pes 2.3.4.4.3; little distinction between dark dorsal and lateral colour.

This species is further distinguished from all other *Nannoscincus* by having a distinctive sheath-like scale on distal tips of digits (Fig. 78).

Description. This description is based on 14 adult specimens (including lectotype of *A. mariei* Bavay and holotype of *N. fuscus* Günther).

MEASUREMENTS: maximum SVL 37.5 mm; distance from axilla to groin 60–67.1% of SVL (\bar{x} = 63, n = 12); hindlimb length 17.9–23.2% of SVL (\bar{x} = 21.5, n = 12); tail length 88.5–101.5% of SVL (\bar{x} = 94.3, n = 7).

SCALATION: frontonasal broader than long (W/L 130.4–183.8%, \bar{x} = 149.4, n = 12); prefrontals very small, moderately to widely separated (NHMB 7226 absent both sides); frontal narrow and long; frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately separated, usually contacting first upper labial only (76.2%, n = 12), occasionally in narrow to point contact with second upper labial; loreal single, deep as nasal; anterior subocular single; supraciliaries usually 7 (83.3%, n = 12), 8 (12.5%) or 6, first usually failing to contact frontal (77.8%); upper labials usually 6 (91.7%, n = 12) with fourth subocular, rarely 7 with fifth subocular; postlabials 2; lower labials



Fig. 75. BM 1946.8.17.79, lectotype of *Anotis mariei* Bavay.

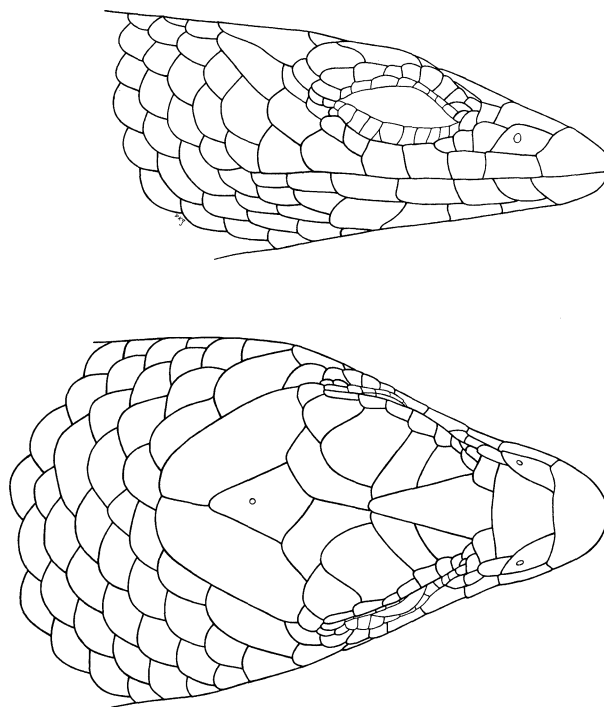


Fig. 76. Lateral and dorsal views of the head of NHMB 7224, a specimen of *Nannoscincus mariei* (Bavay).

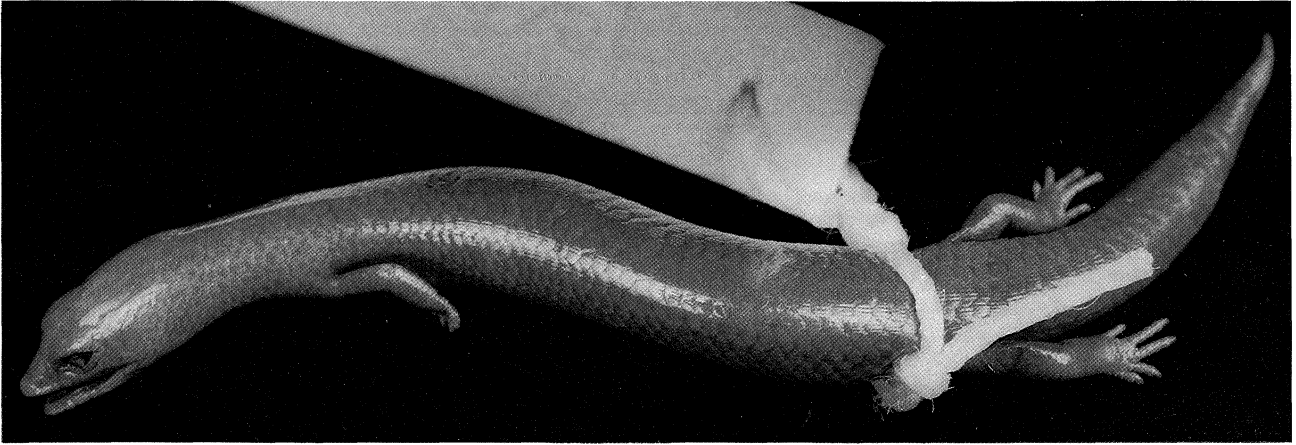


Fig. 77. BM 1946.8.16.16, holotype of *Nannoscincus fuscus* Günther.

5, first 2 in contact with postmental; chinshields 3.

Lower eyelid scaled, appearing as a large smooth opaque shield with fine longitudinal sutures running from upper palpebral rim to near base, and with band of fine granulated scales about anterior, posterior and ventral margin.

External ear opening absent.

Dorsal body scales usually with 4 fine striations, laterals more or less smooth; midbody scale rows 18–22 ($\bar{x} = 20$, $sd = 1.5$, $n = 14$); paravertebral scales 49–56 ($\bar{x} = 52.2$, $sd = 1.7$, $n = 12$).

Lamellae beneath fourth toe 10–13 ($\bar{x} = 11.1$, $sd = 0.9$, $n = 12$), often fragmented basally; distal tip of each digit with a distinctive, enlarged sheath-like scale (Fig. 78) within which the claw apparently retracts, i.e., claws barely visible in some individuals (apparently almost fully withdrawn) to short and blunt but moderately obvious in others.

OSTEOLOGY: premaxillary teeth 11 ($n = 2$); maxillary teeth 18–19 ($\bar{x} = 18.5$, $sd = 0.5$, $n = 2$); dentary teeth 21–24 ($\bar{x} = 23$, $sd = 1.2$, $n = 2$); presacral vertebrae

29–31 ($\bar{x} = 30.4$, $sd = 0.7$, $n = 7$); postsacral vertebrae 31 ($n = 1$); phalangeal formula for manus and pes 2.3.4.4.3 and 2.3.4.4.3, respectively.

COLOUR AND PATTERN: in alcohol dark brown all over, slightly lighter on lateral and ventral surfaces. Both Roux (1913) and Bavay (1869) make reference to a series of dorsal lines consisting of numerous dark flecks longitudinally aligned, this condition sometimes extending laterally.

Comments on lower eyelid morphology in *Nannoscincus*. Bavay's syntypes of *Anotis mariei* and *Lygosoma gracilis* agree with his description (1869) and the redescriptions of Boulenger (1887) and Roux (1913) in all but the condition of the lower eyelid, which Bavay and Boulenger describe as transparent over part of its surface, and to which Roux makes no reference. Günther (1872) describes the lower eyelid of *Nannoscincus fuscus* as being scaled, but makes no mention of this feature in the description of *Mococa micropus*.

The lower eyelid of *N. mariei*, *N. gracilis* and *N. sleveni* is distinguished as scaly by: lacking a row of

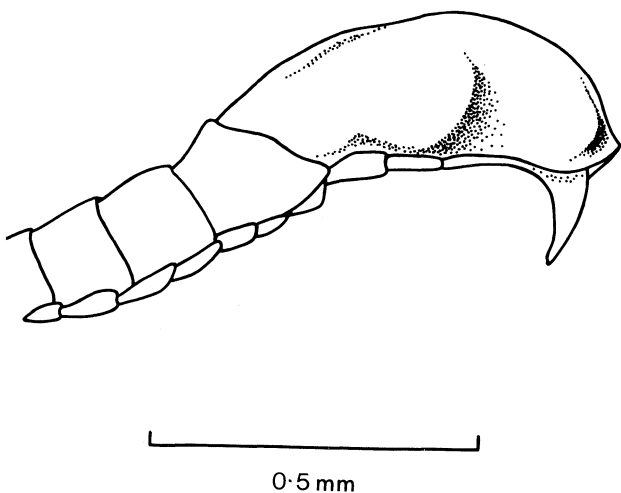


Fig. 78. Distal tip of the fourth digit of hindlimb of *Nannoscincus mariei* (AM R78142) showing enlarged sheathing scale and claw.

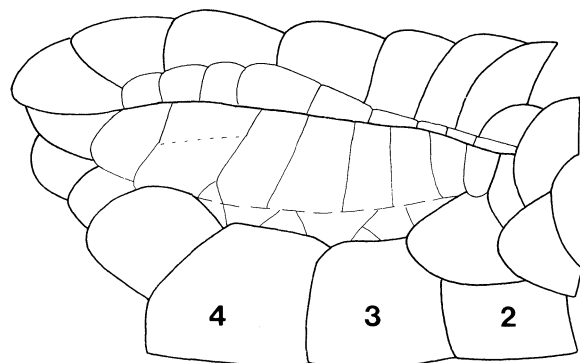


Fig. 79. Details of the scaled lower eyelid typical of *N. mariei*, *N. sleveni* and *N. gracilis* (AM R77717, *N. gracilis* pictured; upper labials numbered, 2 is anteriormost figured). Note lack of sutures uppermost failing to define palpebral rim.

distinct palpebral scales above, having instead a dark palpebral rim in obvious contrast to flatter opaque sector of eyelid immediately below; having the palpebral rim and sector of lower eyelid below palpebral rim divided by fine sutures, giving a series of adjacent rectangular scales higher than wide and bordered at the lower edge by smaller raised granules (Fig. 79). Sutures may be positioned anteriorly or posteriorly to centre of eyelid, appearing as a large central scale bordered by smaller scales. In extreme cases median sutures may be absent or so far displaced as to resemble an opaque windowed lower eyelid.

Distribution and habitats. *Nannoscincus mariei* is confined to the southern section of mainland New Caledonia (Fig. 80).

Bavay (1869) describes this species as living in montane forests in very shady and humid places, under stones partly buried in mud near streams. Roux (1913) describes it as occurring from the edge of the sea to mountains, living under rocks on the forest floor. The

single specimen from our collection (AM R78142) was found on Mt Gouemba (c.a. 560 m) south of Yate on the east coast, under a rock in a rainforest thicket of a small gully (Fig. 18).

Remarks. Both Boulenger (1887) and Roux (1913) redescribed *Lygosoma mariae* (Bavay), and correctly placed *Nannoscincus fuscus* Günther in its synonymy.

Nannoscincus gracilis (Bavay)

Figs 79–84

Lygosoma gracilis Bavay, 1869: 24.

Mocoo micropus Günther, 1872: 420.

Type material. LECTOTYPES: *Lygosoma gracilis* Bavay, BM 1946.8.17.64, here designated, SVL 33 mm, 4 instead of 5 digits on right hand, second digit reduced to a stump. One of two original syntypes, BM 1946.8.17.63–64, both from New Caledonia. *Mocoo micropus* Günther, lectotype BM 1946.8.16.80 here designated, SVL 33 mm. One of two original syntypes, BM 1946.8.16.80–81, recorded as from “Feejee

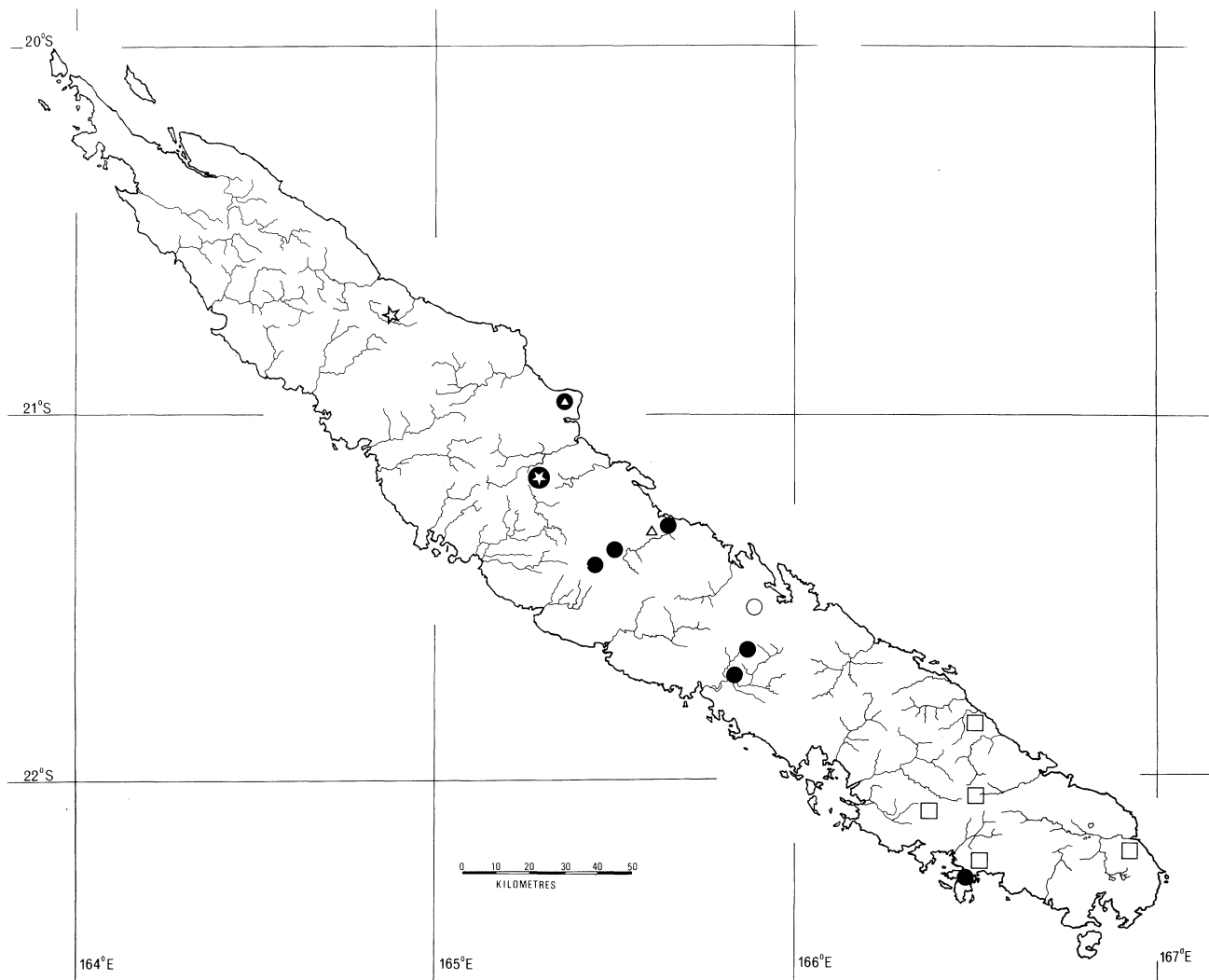


Fig. 80. Distribution of the genus *Nannoscincus* in New Caledonia: *N. gracilis* (closed circle); *N. sleveni* (open circle); *N. rankini* (open star); *N. rankini* and *N. gracilis* from same immediate area (open star in closed circle); *N. greeri* (open triangle); *N. greeri* and *N. gracilis* from same immediate area (open triangle in closed circle); *N. mariei* (open square).

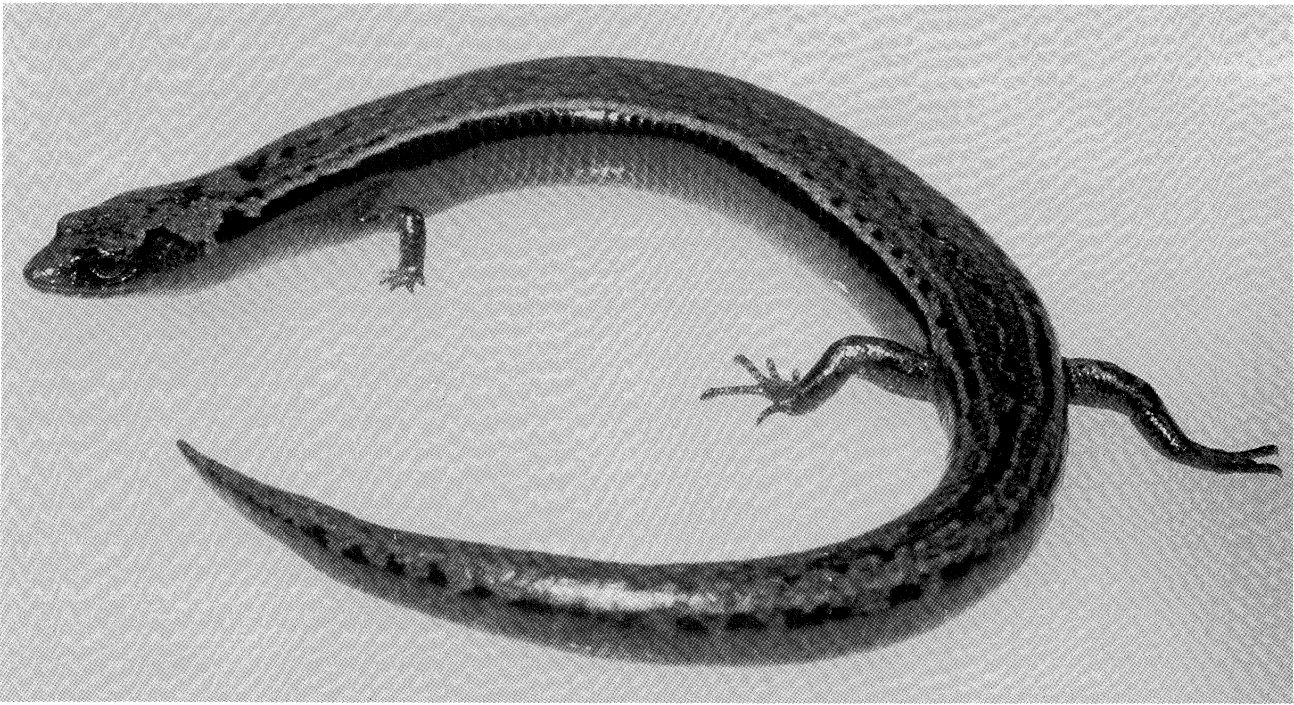


Fig. 81. *Nannoscincus gracilis* from Mt Aoupinie forestry camp (500 m), New Caledonia.

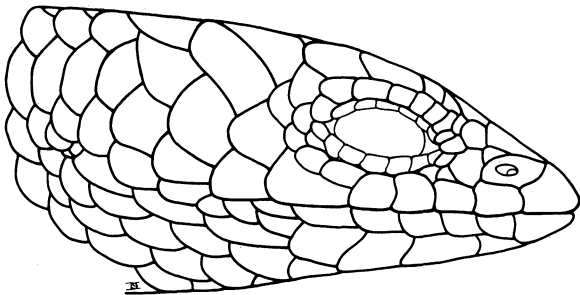
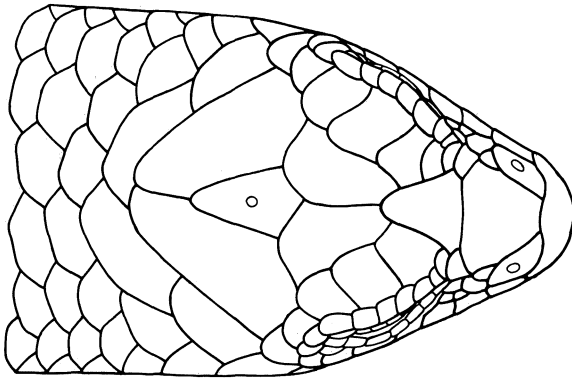


Fig. 82. Lateral and dorsal views of the head of BM 1946.8.17.64, lectotype of *Lygosoma gracile* Bavay.

Islands” in type description, later amended to “New Caledonia” in BM catalogue.

Additional material examined. CAS 157685-89 (east slope), 158522-23 (northeast slope), Mt Koyaboa, Poindimie, 20°56'S 165°20'E; AM R77733, 3 km north-east of Mt Aoupinie forestry camp by road, 21°07'S 165°22'E; AM R77688, 2 km north-east of Mt Aoupinie forestry camp by road (500 m), 21°08'S 165°21'E; AM R77717-19, AM R77783, 1 km north-east of Mt Aoupinie forestry camp (500 m), 21°08'S 165°21'E; AM R77656-57, AM R77771, Mt Aoupinie forestry camp (500 m), 21°08'S 165°21'E; AM R77745-46, summit of Mt Aoupinie (1086 m), 21°11'S 165°16'E; ZFMK 25439, Houailou, 21°17'S 165°37'E; BM 1926.9.17.57, Houailou Valley; AM R77541-42, 2 km north of Poya road junction on Bourail to Houailou road, 21°24'S 165°26'E; NHMB 7241, Boreare (200 m), 21°22'S 165°28'E; QM J43996-97, Col d' Amieu forest station (400 m), 21°37'S 165°48'E; NHMB 7243-45, La Foa (100 m), 21°43'S 165°49'E; AM R77454, Fambourg Blanchot, Noumea, 20°18'S 166°27'E; QM J44001, Foret Thy Reserve (150 m).

Diagnosis. *Nannoscincus gracilis* can be distinguished from all other members of the genus by possessing the following combination of characters: frontoparietals distinct; anterior and posterior loreal present; ear opening minute; lower eyelid scaly; forelimbs pentadactyl; phalangeal formula for manus 2.3.3.3.2; phalangeal formula for pes 2.3.4.4.3; dorsal colour distinctly lighter than lateral colour.

Description. This description is based on 26 adult specimens (from those listed above, but not including CAS 157685-89, CAS 158522-23 and BM 1926.9.17.57).

MEASUREMENTS: maximum SVL 49 mm; distance from axilla to groin 62–70.4% of SVL (\bar{x} = 67.2, n = 24); hindlimb length 16.6–23.3% of SVL (\bar{x} = 19.5,

n=25); tail length ca. 73.5–89.5% of SVL (\bar{x} = 80, n=4).

SCALATION: frontonasal broader than long (W/L 133.3–175.6%, \bar{x} = 150.7, n=14); prefrontals very small, widely separated; frontal slightly longer than wide (W/L 65.8–93.7%, \bar{x} = 75.8, n=13); frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately separated, broadly contacting first upper labial; anterior loreal usually present as a semilunar scale on posterodorsal margin of nasal failing to contact upper labials (91.7%, n=24), occasionally extending its lower edge to contact upper labials; posterior loreal wide dorsally and narrow basally, usually contacting upper labials basally (60.4%, n=24) and anterior loreal and nasal (when anterior loreal fails to contact labials) anteriorly; lower preocular large and elongate, occupying area below and adjacent to posterior loreal and extending anteriorly to contact either first upper labial only, or first upper labial and nasal (33.3%, n=24 when both posterior and anterior loreals are excluded from contact with upper labials); anterior subocular usually single (92.7%, n=21), occasionally followed by smaller scale; supraciliaries 7 (94.2%, n=26), with first narrow and contacting frontal, rarely 6; upper labials usually 6 (88.5%, n=26)

with fourth subocular, occasionally 7 with fifth subocular; postlabials 2; lower labials 6, first 2 in contact with postmental; chinshields 3, first pair in broad contact.

Lower eyelid scaled, a large smooth opaque shield with fine longitudinal sutures running from palpebral rim to near base, and with a band of fine granulated scales about anterior, posterior and ventral margin (in a large number of specimens examined the lower eyelid is fixed down in position leaving only palpebral rim and uppermost section of eyelid in view, therefore the condition of lower eyelid could not be determined). The syntypes of both *Lygosoma gracilis* and *Mococa micropus* have the median sutures lost to produce an off-centre and larger than normal opaque shield.

Ear opening extremely small, lacking auricular lobules, and partially hidden by over lapping anterior scale.

Dorsal scales usually with 3 fine striations or smooth, lateral scales usually with 2 weak striations or smooth; midbody scale rows 20–26 (\bar{x} = 22.7, sd = 1.6, n=26); paravertebral scales 53–65 (\bar{x} = 59.7, sd = 2.9, n=26).

Lamellae beneath fourth toe 9–14 (\bar{x} = 11.3, sd = 1.2, n=26).

OSTEOLOGY: premaxillary teeth 11 (n=5); maxillary teeth 25–26 (\bar{x} = 25.2, sd = 0.4, n=5); dentary teeth 32–34 (\bar{x} = 33.6, sd = 0.8, n=5); presacral vertebrae 33–34 (\bar{x} = 33.5, sd = 0.5, n=17); postsacral vertebrae

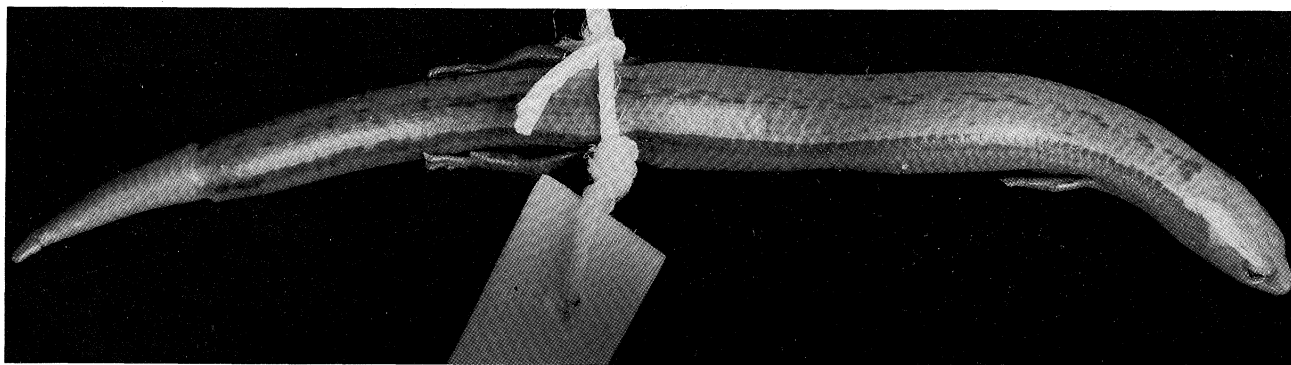


Fig. 83. BM 1946.8.17.64, lectotype of *Lygosoma gracile* Bavay.

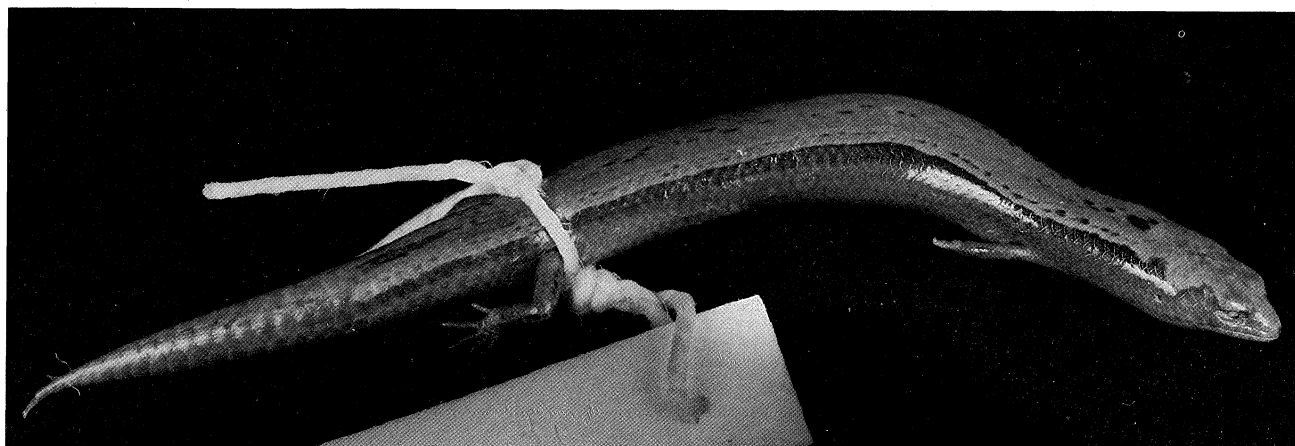


Fig. 84. BM 1946.8.16.80, lectotype of *Mococa micropus* Günther.

36 (n=1); phalangeal formula for manus and pes 2.3.3.3.2 and 2.3.4.4.3, respectively.

COLOUR AND PATTERN: dorsal surface light brown with several dark, longitudinally aligned blotches on nape, reduced posteriorly to a series of fine flecks forming a faint vertebral stripe extending posteriorly to basal part of tail. Dorsolateral stripe fine, dark and defining dorsal and lateral surfaces, extending posteriorly from eye to be deeply inflected over tympanic region, continuing past level of hindlimbs and along tail as a series of dark elongate blotches. Lateral surface grading from mid to light brown from upper to lower, tending towards grey near venter. Side of head dark brown, rostral with black midrostral streak. Venter pale with light brown centre to each scale; lower labials and chinshields brown-edged.

Variation in dorsal and lateral colour occurs with some individuals being lighter or darker than described.

Distribution and habitats. *Nannoscincus gracilis* occurs mainly in rainforest regions of the central coast and mountains of mainland New Caledonia.

Bavay (1869) records this species from sandy forest near the coast. Roux's (1913) records were from localities also near the coast and to 700 m. AM specimens were collected from under and in rotting logs in rainforest, and occasionally under small stones. It was also recorded from dry scrub of suburban Noumea on the west coast (Fig. 80).

Reproduction. All AM female specimens collected December 1978, were gravid, having 1–3 yolked ovarian follicles or fully shelled oviducal eggs. Presence of shelled eggs indicate this species is probably oviparous.

Remarks. Both Boulenger (1887) and Roux (1913) redescribed *Lygosoma gracile* Bavay, correctly placing *Mococa micropus* Günther in its synonymy.

Nannoscincus sleveni (Loveridge)

Figs 79–81, 85, 86

Lygosoma sleveni Loveridge, 1941: 193.

Type material. HOLOTYPE: *Lygosoma sleveni* Loveridge, MCZ 9295, SVL 41 mm; TL 29 mm regenerated, colour and pattern with overall greenish tinge (artifact of preservative).

Additional material examined. NHMB 7239-40, Negropo Tal (100 m), 21°32'S 165°54'E; NHMB 7232-33, NHMB 7236-38, AM R6665, Mt Kanala (700 m), 21°35'S 165°56'E.

Diagnosis. *Nannoscincus sleveni* can be distinguished from all other members of the genus by the following combination of characters: frontoparietals distinct; anterior and posterior loreals present; ear opening minute; lower eyelid scaly; forelimbs tetradactyl,

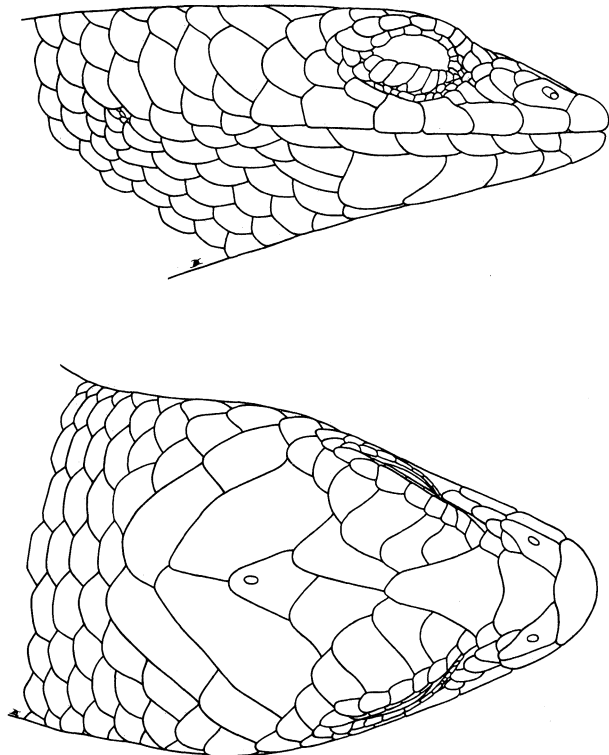


Fig. 85. Lateral and dorsal views of the head of MCZ 9295, holotype of *Lygosoma sleveni* Loveridge.

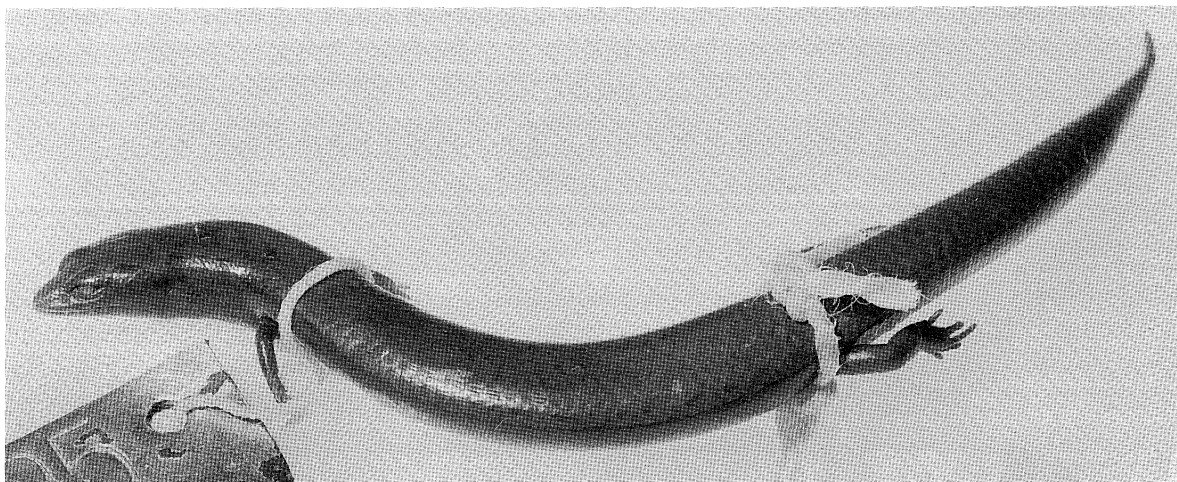


Fig. 86. MCZ 9295, holotype of *Lygosoma sleveni* Loveridge.

phalangeal formula for manus 0.3.3.3.2; phalangeal formula for pes 2.3.4.4.3; dorsal colour distinctly lighter than lateral colour.

Description. MEASUREMENTS: maximum SVL 43 mm; distance from axilla to groin 62–65% of SVL (\bar{x} = 63.4, n = 6); hindlimb length 20.5–22.2% of SVL (\bar{x} = 21.7, n = 6); tail length ca. 82.5–96.4% of SVL (\bar{x} = 88, n = 3).

SCALATION: head shield configuration similar to *N. gracilis*; frontonasal broader than long (W/L 118.2–156%, \bar{x} = 140.2, n = 5), prefrontals very small, widely separated; frontal slightly longer than wide; frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately separated, contacting first upper labial only; anterior loreal a semilunar scale positioned on posterodorsal margin of nasal, failing to contact upper labials; posterior loreal wide dorsally and narrow basally, usually contacting first upper labials basally and anterior loreal and nasal anteriorly; lower preocular large and elongate, occasionally extending forward to contact first upper labial and nasal (14.3%, n = 6), thereby excluding both anterior and posterior loreals from contact with upper labials; upper labials usually 6 (83.3%, n = 6) with fourth subocular, occasionally 7 with fifth subocular; postlabials 2; lower labials 6, first 2 usually in contact with postmental, holotype with postmental contacting first lower labial only.

Dorsal scales with 3 fine striations; midbody scale rows 22–26 (\bar{x} = 24, sd = 1.6, n = 6); paravertebral scales 57–64 (\bar{x} = 60.3, sd = 2.6, n = 6).

Lamellae beneath fourth toe 11–13 (\bar{x} = 12.2, sd = 0.6, n = 6).

OSTEOLOGY: presacral vertebrae 31–34 (\bar{x} = 32.2, sd = 0.9, n = 6); phalangeal formula for manus and pes 0.3.3.3.2 and 2.3.4.4.3, respectively.

Distribution. *Nannoscincus sleveni* is known only from two localities on the south-east coast of mainland

New Caledonia: Negropo Tal (100 m) and Mt Kanala (700 m) (Fig. 80).

Remarks. Loveridge (1941) described *Lygosoma sleveni* from specimens collected by Roux & Sarasin in 1911 and previously identified by Roux in 1913 as *Lygosoma gracile*. He differentiated it from *Nannoscincus gracilis* on the basis of four digits on the forelimbs instead of five, and 22–26 vs 20 midbody scale rows. Only the first of these diagnostic characters is consistent; *N. gracilis* examined in this study possess 20–24 midbody scale rows.

Nannoscincus rankini n. sp.

Figs 80, 87–89

Type material. HOLOTYPE: AM R77736, adult male from summit of Mt Aoupinie (1086 m), New Caledonia, 21°11'S 165°16'E, collected by R. Sadlier & P. Rankin, 14 Dec 1978. PARATYPE: AM R77814, Kavatch forestry camp, New Caledonia, 20°42'S 164°50'E, collected by R. Sadlier & P. Rankin, 16 Dec 1978.

Diagnosis. *Nannoscincus rankini* can be distinguished from all other members of the genus by the following combination of characters: frontoparietals fused; loreal single; ear opening minute; lower eyelid with semi-translucent window; forelimbs pentadactyl; phalangeal formula for manus 2.3.4.4.3; phalangeal formula for pes 2.3.4.4.3; dorsal colour distinctly lighter than lateral colour.

Etymology. Named for my friend Peter Rankin who died due to an accident while we were collecting reptiles in New Caledonia.

Description. MEASUREMENTS: maximum SVL 37.5 mm; distance from axilla to groin 62.7–63.5% of SVL (\bar{x} = 63.1, n = 2); forelimb to snout length 32–32.4% of SVL (\bar{x} = 32.2, n = 2); hindlimb length 20–24% of SVL (\bar{x} = 22, n = 2); tail length ca. 83.8% of SVL (n = 1).

SCALATION: frontonasal broader than long (W/L 164.7–176.5%, \bar{x} = 170.6, n = 2); prefrontals very small



Fig. 87. *Nannoscincus rankini* n. sp. (holotype) from near the summit of Mt Aoupinie, New Caledonia.

and widely separated (holotype) or absent (left absent in AM R77814); frontal short, almost as long as wide; frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately separated, contacting first upper labial only; loreal single, broader above than at base, in moderate to narrow contact with first and second upper labial; anterior subocular single; supraciliaries 7, first contacting frontal; upper labials 6 with fourth subocular and contacting lower eyelid; postlabials 2; lower labials 5, first 2 contacting postmental; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious, centrally located semi-translucent window, 37.5–39.3% (\bar{x} = 38.4, n = 2) of eye length, palpebral scale row distinct.

Ear opening extremely small, circular and lacking auricular lobules.

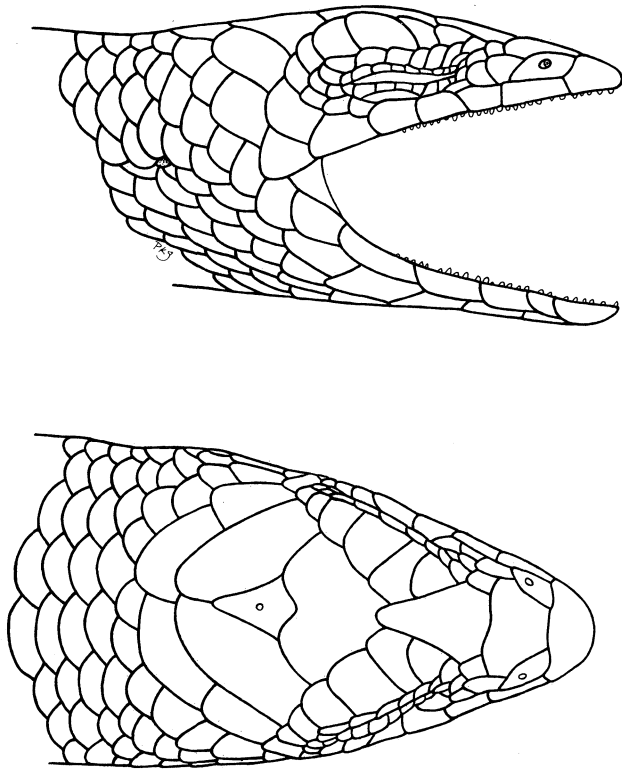


Fig. 88. Lateral and dorsal views of the head of AM R77736, holotype of *Nannoscincus rankini* n. sp.

Dorsal scales smooth (AM R77814) or with 3–4 fine striations (holotype), laterals smooth or with progressively weaker striations; midbody scale rows 22–24 (\bar{x} = 23, sd = 1, n = 2); paravertebral scales 49–52 (\bar{x} = 50.5, sd = 1.5, n = 2).

Lamellae beneath fourth toe 12–14 (n = 2).

OSTEOLOGY: premaxillary teeth 11 (n = 2); maxillary teeth 23–25 (\bar{x} = 23.7, sd = 0.9, n = 2); dentary teeth 28–29 (\bar{x} = 28.7, sd = 0.5, n = 2); presacral vertebrae 29–30 (\bar{x} = 29.5, sd = 0.5, n = 2); phalangeal formula for manus and pes 2.3.4.4.3 and 2.3.4.4.3 (n = 2), respectively.

COLOUR AND PATTERN: dorsal surface either mid brown with faint but continuous darker vertebral stripe extending from nape posteriorly to just past hindlimbs, thence fading into darker dorsal colour of tail (holotype), or light brown-grey above with a single, dark blotch on nape (AM R77814). Dorsolateral stripe fine, dark and defining the dorsal and lateral surfaces, extending from posterior canthus of eye to be deeply inflected over tympanic region, then broadening and continuing posteriorly past level of hindlimbs and along tail. Lateral surface dark brown, paling to light brown ventrolaterally. Side of head dark brown, passing onto supraocular area on top of head; rostral brown with a faint, dark midrostral streak. Venter pale and immaculate (holotype), or with faint brown spotting (AM R77814); lower labials brown, chinshields with fine brown spotting.

Distribution and habitats. *Nannoscincus rankini* is known from only two locations on mainland New Caledonia, one on the central highlands, the other on the north-east coast (Fig. 80).

Known habitat preferences differ markedly. The holotype was collected beneath a rock on the roadside at summit of Mt Aoupinie (1086 metres asl) in low heath, whereas AM R77814 was taken from beneath a small rock alongside a creek flowing through hillside rainforest adjacent to the Heinghene River near sea level. *Nannoscincus rankini* is syntopic with *N. gracilis* at Mt Aoupinie.

Nannoscincus greeri n. sp.

Figs 80, 90–91

Type Material. HOLOTYPE: CAS 159606, adult from lower east slope of Mt Koyaboa, Poindimie, ca. 20°56' S 165°20' E, collected by A. Bauer, 1 Jan 1986. PARATYPES: CAS 159607, same collection data as holotype; CAS 158524–26, north-east slope of Mt Koyaboa, Poindimie, 20°56' S 165°20' E, collected

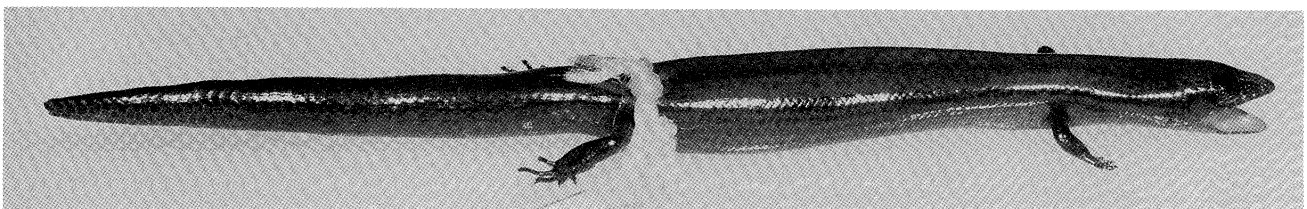


Fig. 89. AM R77736, holotype of *Nannoscincus rankini* n. sp.

A. Bauer & L. Wishmey 1-2 June 1985; MCZ 112224, Houailou valley, collected P.D. Montague.

Diagnosis. *Nannoscincus greeri* can be distinguished from all other members of the genus by the following combination of characters: frontoparietals fused; loreal single; ear opening minute; lower eyelid with a semi-translucent window; forelimbs pentadactyl; phalangeal formula for manus 2.3.4.4.3; phalangeal formula for pes 2.3.4.5.4; dorsal colour distinctly lighter than lateral colour.

Etymology. Named for Dr Allen Greer (AM) for his contributions to scincid lizard systematics, particularly the Australian and Pacific fauna, and continuous encouragement and assistance throughout the duration of the research and preparation for this revision of the New Caledonian skinks.

Description. *Nannoscincus greeri* is very similar to *Nannoscincus rankini* in superficial morphology, and

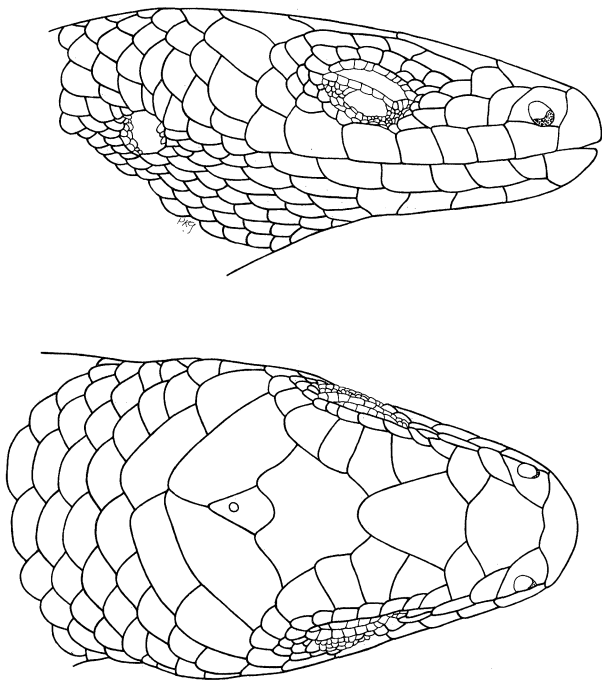


Fig. 90. Lateral and dorsal views of the head of CAS 159606, holotype of *Nannoscincus greeri* n. sp.

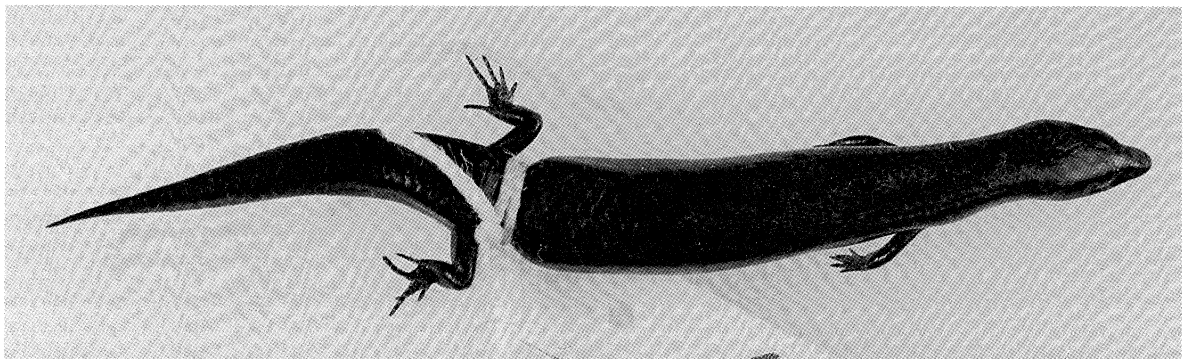


Fig. 91. CAS 159606, holotype of *Nannoscincus greeri* n. sp.

differs from the latter mainly in having a primitive phalangeal formula for the pes (2.3.4.5.4 vs 2.3.4.4.3).

MEASUREMENTS: maximum SVL 33.5 mm; distance from axilla to groin 59.7-63.8% of SVL (\bar{x} = 61.2, n = 6); forelimb to snout length 34.8-42.6% of SVL (\bar{x} = 37.5, n = 6); hindlimb length 24.2-26.6% of SVL (\bar{x} = 25.3, n = 6).

SCALATION: frontonasal broader than long (W/L 133.3-165.8%, \bar{x} = 155, n = 5); prefrontals usually absent (75%, n = 6), anterior suture fused to frontonasal, when present very small and widely separated; frontal short almost as long as wide; frontoparietals fused; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal; primary temporal single; upper and lower secondary temporals single; tertiary temporals 2.

Nasals moderately separated contacting first upper labial only; loreal single, broader above than at base, in moderate to narrow contact with first and second upper labial; anterior subocular single; supraciliaries 7, first contacting frontal; upper labials 6, with fourth subocular and contacting lower eyelid; postlabials 2; lower labials 5, first 2 contacting postmental; chinshields 3, first pair in broad contact.

Lower eyelid with an obvious centrally located semi-translucent window 39.5-48.7% (\bar{x} = 44.2, n = 5) of eye length, palpebral scale row distinct.

Ear opening extremely small, lacking auricular lobules.

Dorsal scales usually with 3 fine striations, lateral scales usually with 2 weak striations; midbody scale rows 24 (n = 6); paravertebral scales 48-52 (\bar{x} = 50, sd = 1.6, n = 4).

Lamellae beneath fourth toe 15-18 (\bar{x} = 16.6, sd = 1, n = 4).

OSTEOLOGY: no specimens were preserved with the mouth open, dentition was unable to be assessed; presacral vertebrae 29 (n = 6); phalangeal formula for manus and pes 2.3.4.4.3 and 2.3.4.5.4 (n = 6), respectively.

COLOUR AND PATTERN: dorsal surface light to mid brown with some dark flecking anteriorly, particularly on the nape where it encloses a paler (same as dorsal surface) blotch, and on remainder of body as a dark fleck to the median 2 vertebral scale rows, thereby

enclosing a light (same as remainder of dorsal surface), narrow mid vertebral line. Dorsolateral line dark brown, most complete anteriorly and inflected over tympanic region, remainder irregular and broken over most its length, appearing as a single series of bold, dark flecks. Lateral surface light to mid brown (same as dorsal surface) but with each scale having a moderately broad dark fleck forming series of fine, dark longitudinally aligned lines. Side of head dark brown-black, passing onto supraocular region on top of head; temporal and labial regions with pale flecks or spots; rostral with a poorly defined dark midrostral streak or blotch. Venter pale with light to mid brown spotting confined to outer edges and tail.

Distribution. *Nannoscincus greeri* is known from only two locations on the central and northern east coast of mainland New Caledonia (Fig. 80). The habitat preference for this species is unknown.

ACKNOWLEDGEMENTS. A.E. Greer and H.G. Cogger of the Australian Museum provided help and encouragement to undertake this review of the New Caledonian lizard fauna from the initial field trip through to the submission of this first manuscript.

Many people assisted the late Peter Rankin and myself while on our field trip to New Caledonia. I would particularly like to thank Dimitri and Heliane Ignatieff; Patrik, Gislene and Jean Claude Ignatieff; Yvon and Beth Dubois; and Lucien Baumier for accommodating us in Noumea. Paul Bourret and Philippe Bouchet, stationed at O.R.S.T.O.M. in Noumea in 1978, were extremely helpful; their local knowledge made access to a number of remote areas possible. I also thank the Eaux et Forêts for permission to traverse and collect in areas under their control.

P.A. Koshland did the artwork for Figs. 5, 10, 13, 15, 24, 57, 61, 65, 68, 76, 79, 82, 88.

D. Kent did the artwork for Figs. 2, 3, 6, 18, 26, 28, 33, 36, 38, 40, 43, 48, 51, 78, 85, 90.

H.G. Cogger provided photograph 41.

A.E. Greer provided photographs 17, 35, 42, 49, 50, 60b, 81.

J. Fields and K. Lowe provided photographs 4, 8, 9, 14, 19, 20, 21, 32, 39, 44, 45, 52, 54, 58, 62, 63, 66, 69, 70, 75, 77, 83, 84, 89, 91.

T. Goh, A. Thomas and F. Burns typed this manuscript.

Aaron Bauer generously loaned me certain specimens in his recent New Caledonian reptile collection for incorporation into this paper.

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