

The Scincid Lizard Genus *Marmorosphax* (Reptilia: Scincidae) from New Caledonia in the Southwest Pacific: Description of a New Species Restricted to High-Altitude Forest in Province Sud¹

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ABSTRACT: A new species of lizard in the genus *Marmorosphax* is described from between 900 and 1100 m on Mt. Ouin in the south of New Caledonia. It is the second species of skink discovered in recent times that is restricted to high-altitude habitats in that region of the island. The new species is similar to *Marmorosphax tricolor* (Bavay), but is more gracile in appearance and shows subtle differences in coloration and scalation. The conservation status of this species is assessed. Because of its apparently restricted distribution and habitat preference, it is of particular conservation concern and is here regarded as potentially vulnerable.

THE SCINCID LIZARD fauna of New Caledonia is extremely rich and diverse. Field research over the past 5 yr in particular has resulted in the discovery of a number of new taxa. Some of the recently described species are very distinctive. The species *Lacertoides pardalis* Sadlier, Shea & Bauer, 1997 and *Simiscincus aurentiacus* Sadlier & Bauer, 1997, both discovered in 1995, were so unusual they could not be placed in any existing genus. The majority of new species, however, have been recognized by a combination of field and laboratory research, often undertaken over a number of years. Using both morphological and genetic criteria, six new species of skinks in the genus *Caledoniscincus* were recently described from closed forest in the central and northern regions of the island (Sadlier et al. 1999). Nearly all have allopatric distributions and either are known from only a

few localities or are restricted to discrete geographical areas. Some of these recently described *Caledoniscincus* are clearly distinct from each other, but others could be regarded as cryptic species in which genetic criteria play a major role in their recognition. A similar scenario is seen in the diminutive burrowing scincid genus *Nannoscincus*, where several new allopatric species await description. It is possible that the diversity of species now being recognized from the central and northern regions of the island reflects historical changes to the rain forest habitat on which all these species are reliant.

The south of New Caledonia, as defined by the extensive ultramafic block that covers much of the south of the island, also contains a suite of taxa clearly restricted to that region. Subtle geographic variation in morphology in the species *Sigaloseps deplanchei* (Bavay) (Sadlier and Bauer 1999) and *Nannoscincus mariei* (Bavay) (Sadlier, Bauer, and Whitaker, unpubl. data), both endemic to the south of the island, has been recorded, and two species restricted to high-altitude habitats around 1000 m above sea level (asl) have been discovered in recent times.

Investigation of high-altitude habitats in New Caledonia in 1995 resulted in the discovery of a new species of *Sigaloseps* from Mt. Mou and Mt. Ouin (Sadlier and Bauer

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1999) and a new species of *Marmorosphax* from Mt. Ouin, described here as *Marmorosphax montana*, n. sp. This new species is known from only four specimens collected on two separate occasions. It is regionally sympatric with the only other member of the genus, *Marmorosphax tricolor* (Bavay).

MATERIALS AND METHODS

ACRONYMS: Specimen abbreviations are prefixed as follows: Australian Museum, Sydney (AMS); Muséum National d'Histoire Naturelle, Paris (MNHN); Queensland Museum (QM).

MEASUREMENTS: The following characters were scored for each specimen where possible: snout to vent length, measured from tip of snout to caudal edge of anal scales; axilla to groin distance, measured from middle of base of the forelimb to middle of base of hindlimb; forelimb to snout length, measured from tip of snout to middle of base of forelimb; hindlimb length, measured from middle of base of hindlimb to tip of fourth toe including nail; tail length, measured from caudal edge of anal scales to tip of tail, on complete original tails only. Body measurements are expressed as percentages of snout to vent length (SVL) in the taxon account.

SCALATION: Head scalation generally follows Taylor (1935), as described and figured by Sadlier (1986); for characters used in Table 1 the abbreviation is given in parentheses: midbody scale rows, number of longitudinal scale rows around body counted midway between axilla and groin; paravertebral scales, number of scales in a paravertebral row from first scale posterior to parietal scale to last scale at the level of vent opening; fourth finger (FFS) and toe (FTS) scales, number of dorsal scales on fourth digit of hand and foot, distal scale contains claw and basal scale broadly contacts adjacent basal scale of third finger or toe; fourth finger (FFL) and toe (FTL) lamellae, number of ventral scales on fourth digit of hand and foot, distal scale contains claw and basal scale is last largely undivided scale at a point level with

intersection of third and fourth digits. Bilaterally scoreable scalation characters were scored on both sides and the mean value used; in the holotype description these values are presented as left/right values.

OSTEOLOGY: Specimens were X-rayed for counting the number of presacral and post-sacral vertebrae.

SPECIES ACCOUNT

Marmorosphax montana Sadlier & Bauer, n. sp.

Figures 1–2

TYPE MATERIAL: Holotype: MNHN 1998.0466 (formerly AMS R150733), Mt. Ouin, south face, 22° 00' 34" S, 166° 27' 26" E, 1050–1150 m asl (R. A. Sadlier, A. M. Bauer, and S. A. Smith, 13 February 1997). Paratypes: AMS R148021, Mt. Ouin, south face, 22° 00' 51" S, 166° 27' 38" E, 800–900 m asl (R. A. Sadlier and G. M. Shea, 26 September 1995); R148025, same location as holotype (R. A. Sadlier and G. M. Shea, 26 September 1995); R150732, same location, collectors, and date as holotype.

ADDITIONAL MATERIAL EXAMINED: AMS R125825–826, R125859, R125863, R125866, R125868–873, R144326–335, R146284, R146543–545, R146590, R147835–841, all from Mt. Koghis (500 m asl), 22° 10' S, 166° 30' E; R151339, saddle between Mt. Ouin and Mt. Dzumac, 22° 01' S, 166° 28' E; QM J43987, Mt. Dzumac, 22° 03' S, 166° 28' E; MNHN 5397, holotype of *Lygosoma tricolor* Bavay.

ETYMOLOGY: The species epithet is from the Latin *montanus*, meaning “pertaining to mountains.” The name alludes to the occurrence of the species at high elevation on Mt. Ouin.

DIAGNOSIS: *Marmorosphax montana* is diagnosed as a member of this genus by possessing the following suite of derived character states: frontoparietals fused; supranasal scale or postnasal suture absent; anterior lor-

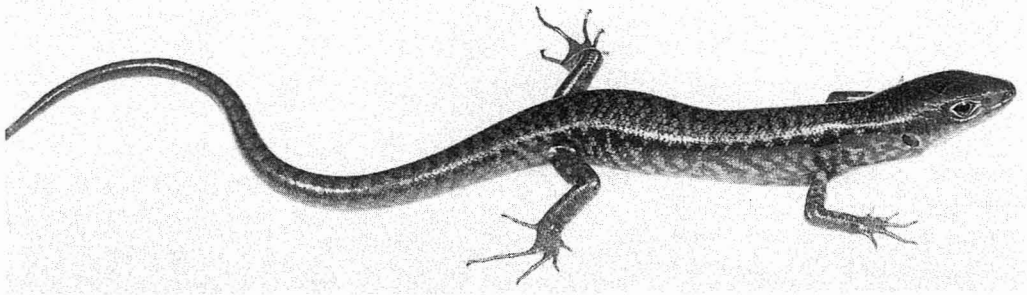


FIGURE 1. Holotype of *Marmorosphax montana*, n. sp. (MNHN 1998.0466), an adult female.

eal present as a semilunar scale failing to contact the upper labials; subocular scale row complete; lower eyelid with an obvious semi-transparent disk; third pair of chin shields separated by five scales; ear lobules very small, barely distinguishable from small, blunt conical scales around upper, lower, and posterior edges of ear opening; modal number of premaxillary teeth >11 (usually 13). This suite of characters distinguishes the species of *Marmorosphax* from all other genera in the *Eugongylus* group as defined by Greer (1979).

The genus *Marmorosphax* Sadlier is here recognized as containing only two taxa, the type species *Marmorosphax tricolor* and the species described below as *Marmorosphax montana*. In proposing the genus, Sadlier (1986) also included the species *Lygosoma euryotis* Werner, at that time known only from two specimens. Examination of recent collections of this species shows that *L. euryotis* is not congeneric with either *M. tricolor* or *M. montana*. The atlantal arches of *L. euryotis* are fused to the intercentrum, a characteristic that places it in the *Pseudemoia* group of Greer (1989), whereas these elements are separate in *M. tricolor* and *M. montana* (A. E. Greer, pers. comm.). Further, *L. euryotis* is oviparous, whereas *M. tricolor* is known to bear live young. Details of our research on *L. euryotis* will be presented elsewhere, but clearly indicate that the species should not be included in *Marmorosphax*. *Lygosoma euryotis* Werner is here treated as incertae sedis pending further research into its generic relationships.

The type series of *Marmorosphax montana* was compared with a sample of 33 *M. tricolor* from nearby Mt. Koghis, two regionally sympatric specimens from Mt. Dzumac, and the holotype of *Lygosoma tricolor* Bavay. *Marmorosphax montana* can be distinguished from *M. tricolor* by its longer digits on the forelimb and hindlimb as expressed by more scales on the dorsal surface of the fourth finger (12–14 versus 10–12) and toe (19–21 versus 16–18), and on average more lamellae beneath the fourth finger (20–22 versus 16–21) and toe (38–41 versus 30–39) (Table 1). In coloration the female *M. montana* has poorly defined dark throat markings and the side of the head is brown with obscure pale markings on the labials, whereas the female *M. tricolor* has bold dark throat markings and the side of the head is dark brown to black with bold, pale markings on the labials.

DESCRIPTION: The species is described from four adults (three males and one female) and is based on all specimens unless otherwise indicated.

Measurements: Size 51–58 mm SVL; distance from axilla to groin 50.9–52.7% SVL (mean = 51.6); distance from forelimb to snout 41.4–43.6% SVL (mean = 42.5); hindlimb length 47.1–50.9% SVL (mean = 48.8); tail length of individual with most complete tail 144.8% SVL.

Scalation: Frontonasal broader than long; prefrontals narrowly to moderately separated; frontal longer than wide; frontoparietals fused; interparietal distinct; parietals

TABLE 1

DIFFERENCES IN NUMBER OF FOURTH FINGER (FFS) AND TOE (FTS) SCALES, AND FOURTH FINGER (FFL) AND TOE (FTL) LAMELLAE BETWEEN *Marmorosphax montana* AND *Marmorosphax tricolor*

CHARACTER	PARAMETER	<i>M. montana</i>	<i>M. tricolor</i> MT. KOGHIS	<i>M. tricolor</i> MT. DZUMAC	<i>M. tricolor</i> HOLOTYPE
FFS	Range	12–14	10–12	12	–
	Mean \pm SD	13.5 \pm 0.75	11.3 \pm 0.56	12.0	
	<i>n</i>	4	33	2	
FFL	Range	20–22	16–21	18–19	–
	Mean \pm SD	21.1 \pm 0.85	18.7 \pm 0.95	18.5	
	<i>n</i>	4	33	2	
FTS	Range	19–21	16–18	16–17	16
	Mean \pm SD	19.4 \pm 0.75	17.15 \pm 0.79	16.5 \pm 0.71	
	<i>n</i>	4	33	2	1
FTL	Range	38–41	30–39	32–35	34–35
	Mean \pm SD	39.2 \pm 1.04	34.3 \pm 1.81	33.7 \pm 1.77	34.5
	<i>n</i>	4	33	2	1

each bordered by a nuchal scale and upper secondary temporal scale; primary temporal single; upper secondary temporal single; lower secondary temporal single; tertiary temporals two; postlabials two; nasals moderately large, moderately to widely separated; anterior loreal a semilunar scale positioned on posterodorsal margin of nasal and failing to contact upper labials; supraciliaries 8 (87.5%) or 9; upper labials 8 (87.5%) with sixth subocular or 7 with fifth subocular, separated from lower eyelid by a complete row of subocular scales; lower labials 6, first two contacting postmental; large chin shields 3, members of first pair in broad contact, members of second pair separated by one scale, members of third pair divided such that five scales separate those members bordering the labials, all chin scales flush with lower labials.

Lower eyelid with an obvious, centrally located, semitransparent disk. Ear opening moderately large, 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 36–40 (mean = 38.0, SD = 1.63); paravertebral scales 72–73 (mean = 72.3, SD = 0.58, *n* = 3); scales on top of fourth finger 12–14 (mean = 12.9, SD = 0.75); lamellae beneath fourth finger 20–22 (mean =

21.1, SD = 0.85); scales on top of fourth toe 19–21 (mean = 19.4, SD = 0.75); lamellae beneath fourth toe 38–41 (mean = 39.2, SD = 1.04), smooth.

OSTEOLOGY: Premaxillary teeth 12 (*n* = 2) to 13 (*n* = 1); presacral vertebrae 29; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively; 2 pairs of mesosternal ribs contacting mesosternum.

COLOR AND PATTERN: Males: dorsal surface light brown with scattered darker markings, variable in extent and definition, being either poorly defined (R148021), evenly distributed (R150732), or composing more than 50% of dorsal coloration (R148025) and forming narrow transversely aligned bars; lateral surface a continuation of light brown dorsal color uppermost and with scattered, obscure pale blotches along the body between fore and hindlimbs, overall color becoming progressively lighter approaching ventrolateral margin; head dark (similar in tone to dark dorsal coloration of body), head shields along vertebral axis (frontonasal, prefrontal, frontal, frontoparietal, and interparietal) with a marbling of both lighter and darker dorsal colors; ventral surface between fore and hindlimbs cream with a few scattered pale brown blotches near ventrolateral margin, throat and chest anterior of forelimbs

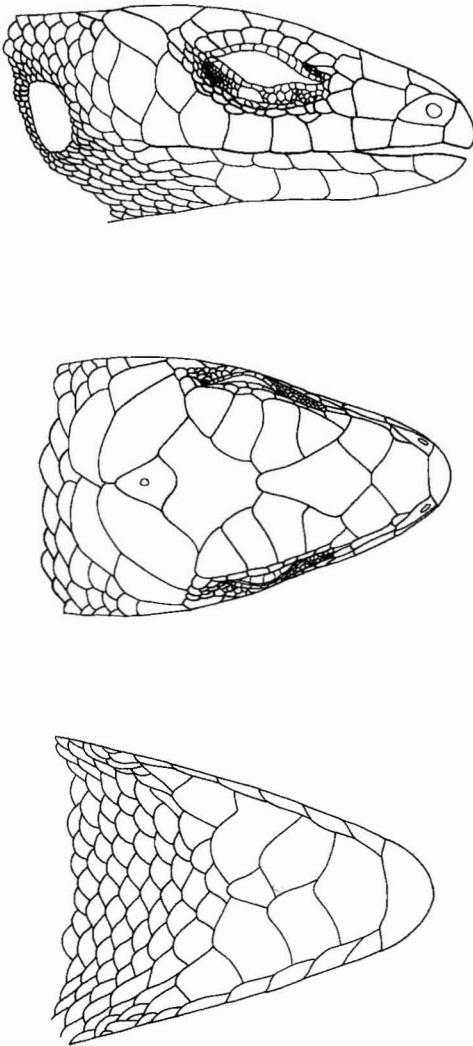


FIGURE 2. Lateral, dorsal, and ventral views of the head of holotype of *Marmorosphax montana*, n. sp. (MNHN 1998.0466).

with light brown markings on each scale and an overall mid-brown wash to chin shields, varying in intensity between individuals.

Female: dorsal surface of body and tail mid-brown with an overall golden flush, and numerous dark markings that form a reticulate pattern of narrow, irregular, and merging black transverse bars; dorsal pattern extending onto upper lateral surface; head

brown, duller than dorsal color and with dark markings over frontoparietal and interparietal scales. Lateral surface with dark blotches over a pale background; dark markings merging to form broad, oblique, transverse bars between fore and hindlimbs, and a marbled pattern between forelimbs and ear opening; side of head similar in color to dorsal surface of head and with only obscure markings, rim of eye cream. Ventral surface cream with scattered dark markings medially between fore and hindlimbs, faint dark markings on the chest tending to be continuous with dark transverse lateral markings, and similar dark markings on the throat.

DETAILS OF HOLOTYPE: Adult female: size 51 mm SVL; distance from axilla to groin 26 mm; distance from forelimb to snout 22 mm; hindlimb length 24 mm; tail length 80 mm, regenerated.

Midbody scale rows 36; paravertebral scale rows 72; dorsal scales of fourth finger 13/14; lamellae of fourth finger 22/21; dorsal scales of fourth toe 19/19; lamellae of fourth toe 40/39.

DISTRIBUTION AND BIOLOGY: High-altitude closed forest near the summit of Mt. Ouin (900–1100 m asl) in southern New Caledonia (Figures 3, 4). Three specimens were located under piles of fallen rocks and wet earth at the edge of a track cutting through forest near the summit, and one from beneath a rock on an overgrown track adjacent to hillside forest at approximately 900 m asl.

CONSERVATION STATUS: *Marmorosphax montana* is known only from high-altitude, moist, closed-forest habitat. It was not recorded from high-altitude forest habitat on nearby Mt. Mou, the only other forested site above 900 m asl collected by the authors in the southern ranges. The small patch of forest from which *M. montana* is recorded is traversed by numerous tracks along its flanks and near the ridgetop, presumably to facilitate mining exploration. Mining in southern New Caledonia at elevations approaching 1000 m asl is currently limited. However, if

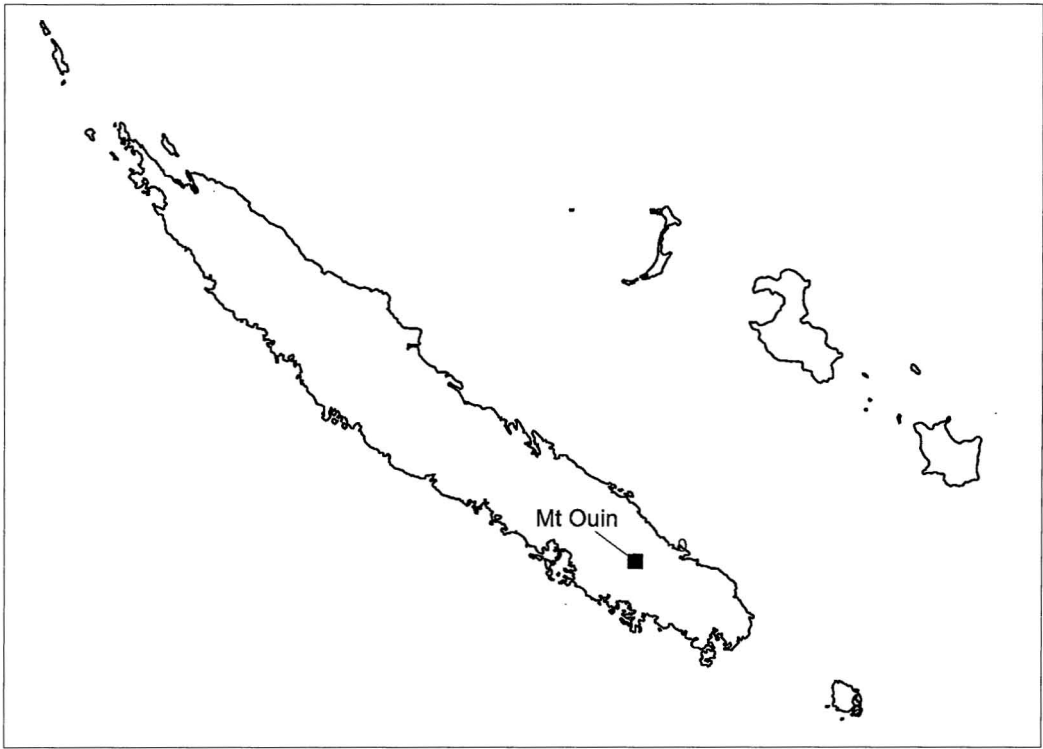


FIGURE 3. Distribution of *Marmorosphax montana*, n. sp. (closed square) in southern New Caledonia.

it is proposed in areas where *M. montana* is likely to occur, such activity is likely to have a negative impact on this or other reptile species restricted to high-altitude habitat in the region.

Because of its restricted distribution and apparently restricted habitat preferences, *M. montana* would conservatively be regarded as Vulnerable:D2 under the current IUCN (1996) classification system (very small population or very restricted distribution; population is susceptible; area of occupancy <100 km² or number of locations <5). Because the potential distribution of *M. montana* is likely to consist only of scattered, relictual, high-elevation populations between 900 and 1200 m asl, human activity in the region that threatens its preferred habitat would place the species in a higher category of risk. A further consideration is that its

known occurrence lies outside designated fauna reserves.

Field research to further determine the distribution of the species is required before its conservation status and the likely impact of development on the species can be determined with certainty.

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FIGURE 4. Western face of Mt. Ouin showing closed-forest habitat at 900–1000 m asl.

(Figure 2). Glenn Shea and Sarah Smith assisted with fieldwork.

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