

## A New Genus and Species of Lizard (Reptilia: Scincidae) from New Caledonia, Southwest Pacific<sup>1</sup>

ROSS A. SADLIER<sup>2</sup> AND AARON M. BAUER<sup>3</sup>

**ABSTRACT:** An unusual new lygosomine skink, *Simiscincus aurantiacus* Sadlier & Bauer, n. sp., is described from a single specimen collected in southern New Caledonia. This species is a member of the *Eugongylus* group of skinks, but is not readily assignable to any known genus. It has a number of derived characteristics that serve to distinguish it, the most notable of which is the highest number of premaxillary teeth of any scincid. Although its relationships cannot, at present, be established unambiguously, it appears to share affinities with another monotypic endemic New Caledonian genus, *Graciliscincus*. The discovery of this species highlights the extreme diversity and endemism of the New Caledonian lizard fauna.

THE TERRESTRIAL HERPETOFAUNA of New Caledonia is extremely diverse and highly endemic (Bauer and Vindum 1990, Bauer and Sadlier 1993) and is dominated by carphodactylid geckos and lygosomine skinks of the *Eugongylus* group. Many of the New Caledonian lizards are apparently restricted to small regions of the island as a whole. Indeed, a recent review of the status of the lizard fauna of New Caledonia identified almost half the species either as moderately well known but restricted in distribution or as known from only a few specimens from one or a few localities (Bauer and Sadlier 1993). Among the latter are several morphologically bizarre lygosomine skink species, *Phoboscincus bocourti* (Brocchi), *Geoscincus haraldmeieri* (Böhme), and *Graciliscincus shonae* Sadlier, that show a number of unusual characteristics in scalation and body form and do not resemble any other species in the *Eugongylus* group of skinks (Sadlier 1986). Recent fieldwork has revealed the presence of another unusual New Caledonian skink known from only a single specimen. This lizard cannot be readily assigned to any existing group of species and is here described as the sole representative of a new genus.

*Simiscincus* Sadlier & Bauer, n. genus

TYPE SPECIES: *Simiscincus aurantiacus* Sadlier & Bauer, n. sp., here designated.

DIAGNOSIS: *Simiscincus* is diagnosed as a member of the *Eugongylus* group of skinks as defined by Greer (1979): the parietals meet behind the interparietal; the parietal is bordered along its posterior edge by an upper secondary temporal and transversely enlarged nuchal scale; medial preanal scales more or less subequal in size to and overlapped by more lateral preanals; and the scales on the dorsal surface of fourth toe are in a single row throughout the length of the digit.

*Simiscincus* can be distinguished from other genera in the *Eugongylus* group by the following unique combination of characters: depressed and elongate body form; supranasal present as a prenasal crease and postnasal suture; loreal single; lower eyelid with a semitransparent disk; ear opening lacking auricular lobules; paravertebral scales 99; premaxillary teeth 19; presacral vertebrae 29; atlantal arches fused to intercentrum.

ETYMOLOGY: The generic name *Simiscincus* is derived from a combination of the Latin *simus* for pug-nosed, referring to the broad, blunt snout characteristic of the type species of the genus, and the Latin *scincus* for scincid lizard.

<sup>1</sup> Manuscript accepted 29 August 1995.

<sup>2</sup> Section of Herpetology, Australian Museum, 6-8 College Street, Sydney 2000, NSW, Australia.

<sup>3</sup> Department of Biology, Villanova University, 800 Lancaster Avenue, Villanova, Pennsylvania 19085.

REMARKS: Greer (1979) regarded nine premaxillary teeth as primitive for lygosomine skinks, with conditions deviating from that, either higher or lower, considered derived. Among the Australasian lygosomines, the *Tiliqua* and *Sphenomorphus* groups characteristically have nine or fewer premaxillary teeth, whereas most genera in the *Eugongylus* group, including most New Caledonian skink genera, have 11 premaxillary teeth, which is here considered the primitive condition for the *Eugongylus* group. Certain genera within the *Eugongylus* group deviate from this primitive tooth condition, generally by having an elevated number of either 13 (the Australian genera *Lampropholis* and *Carlia* and the New Caledonian genus *Marmorosphax*) or 15 (the Australian genus *Lygisaurus*). *Simiscincus* is unique among the *Eugongylus* group of skinks in having an exceptionally high number of premaxillary teeth (19).

*Simiscincus* appears to be most closely related to the monotypic New Caledonian *Graciliscincus*. Both genera share a fusion of the atlantal arches to the intercentrum (A. Greer, pers. comm.), elongate bodies and markedly reduced limbs (hind limb length 20–25% of snout-vent length in *Graciliscincus*, 30% in *Simiscincus*), broad snouts characterized by wide frontonasal scales (more than twice as broad as long), and several other unusual features of head scalation including an enlarged nasal scale and moderately small and widely separated prefrontal scales. This suite of shared derived characters is highly suggestive, but an assessment of the relationships of all members of the *Eugongylus* group that share a fusion of the elements of the atlantal vertebrae (= *Pseudemoia* subgroup of Greer 1990) is required before a definitive determination of the relationships of *Simiscincus* can be made. It is interesting that both species have retained the primitive arrangement of paired frontoparietal shields.

In other aspects of their morphology, *Simiscincus* and *Graciliscincus* differ markedly, and in general *Simiscincus* appears to be the more primitive of the two. *Simiscincus* has a large ear opening, a condition considered primitive to the diminutive ear opening of *Graciliscincus*. *Simiscincus* has only 29 presacral vertebrae, whereas in *Graciliscincus*, with 36 presacral vertebrae, this character is highly derived. The elevated

number of 19 premaxillary teeth in *Simiscincus* is, however, clearly derived compared with the 13 premaxillary teeth in *Graciliscincus*.

*Simiscincus aurantiacus* Sadlier & Bauer, n. sp.

Figure 1, Plate I

TYPE MATERIAL: Holotype: Australian Museum (AM) R144356, male, Mount Koghiis (500 m asl), New Caledonia, 22° 10' S, 166° 30' E, collected by R. Sadlier, August 1994.

ETYMOLOGY: The name *aurantiacus* is derived from the New Latin adjective for orange and refers to the bright enamel orange ventral and lower lateral surfaces of this species (see Plate 1).

DIAGNOSIS: Species diagnosis same as for genus.

DESCRIPTION: Measurements and proportions: Body form elongate with limbs and digits small. Snout to vent length (SVL) 85 mm; distance from axilla to groin 49 mm (57.6% of SVL); distance from forelimb to snout 32 mm (37.6% of SVL); hind limb length 25.5 mm (30% of SVL).

Scalation (methodology follows Sadlier 1986): Frontonasal more than twice as broad as long (W/L = 225%); prefrontals moderately large and moderately separated; frontal nearly as broad as long (W/L = 88%); frontoparietals distinct; interparietal distinct; parietals each bordered by a single nuchal and upper secondary temporal scale; temporal scales fragmented, primary temporal single on right side, fragmented on left to form two equal-sized scales; upper and lower secondary temporals each single; tertiary temporals three on each side; two postlabials on each side.

Nasals large and moderately separated, each with a prenasal crease and postnasal suture; single loreal on either side, nearly twice as long as deep (W/L 62.5–70%), a small semilunar scale positioned anterodorsally on the right loreal partially separating contact between the loreal and nasal; upper and lower preoculars present; two anterior suboculars; six supraciliaries (third and fourth fused on right) or seven; seven upper

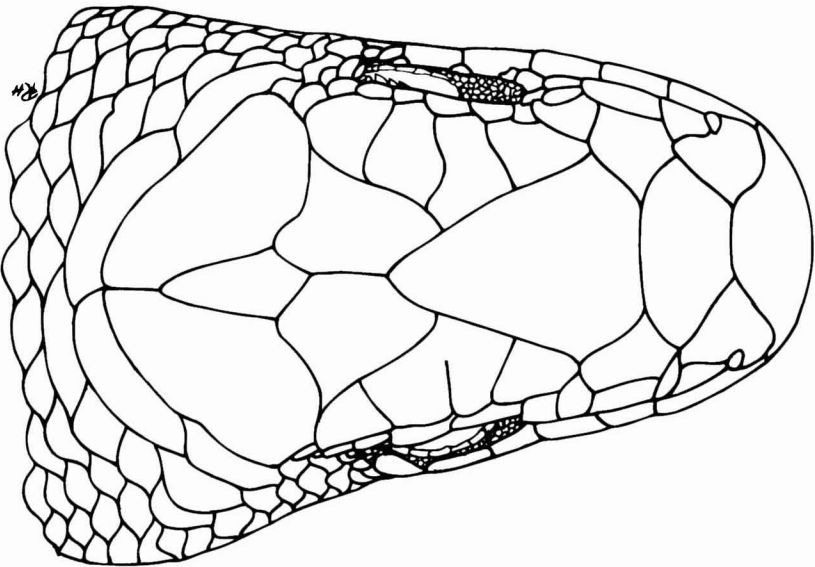
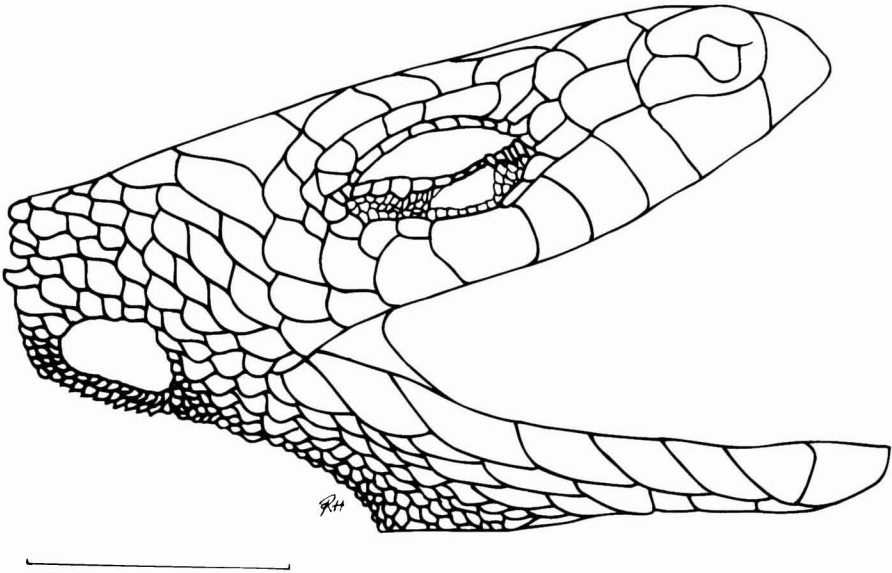


FIGURE 1. Lateral and dorsal views of the head of the holotype of *S. aurantiacus*, n. genus, n. sp. (scale bar = 5 mm).



FIGURE 2. Closed forest habitat on Mount Koghis in the vicinity of the type locality for *Simiscincus aurantiacus*, n. genus, n. sp.

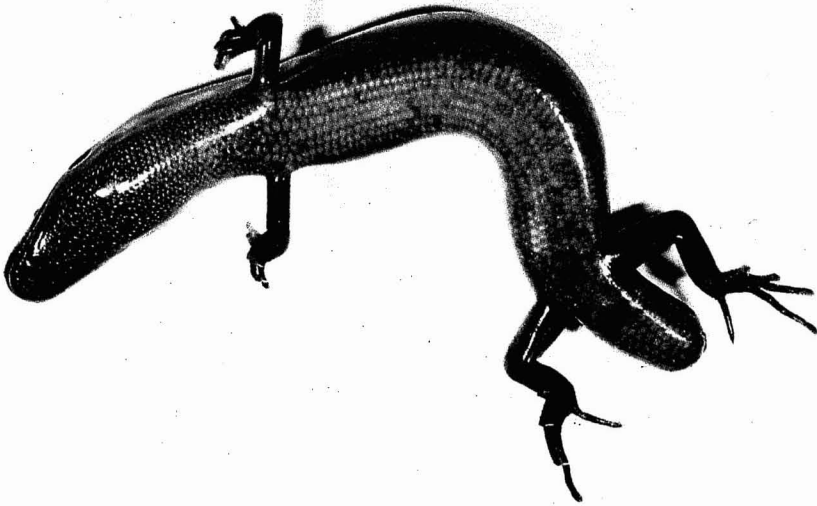


PLATE I. Holotype of *Simiscincus aurantiacus*, n. genus, n. sp., showing dorsal and lateral coloration (*above*) and ventral coloration and markings (*below*).

labials, last on either side divided obliquely to form two equal-sized scales as large as adjacent primary temporal and upper postlabials; six lower labials, postmental contacting first or second (at suture between first and second on left); two chin shields, first pair in broad contact.

Lower eyelid with an obvious, centrally located semitransparent disk, length ca. 45% of total eye length. Ear opening moderately large and lacking lobules, tympanum deeply recessed.

Body scales smooth, midbody scale rows 38; paravertebral scales (from parietals to opposite vent) 99. Nine scales on top of fourth finger; lamellae beneath fourth finger 12–13, basal portion of fingers joined with a webbing of skin that extends to the third basal scale when viewed from above; 13 scales on top of fourth toe; 27–28 broad lamellae beneath fourth toe.

Osteology: Premaxillary teeth 19; maxillary teeth 36–37; dentary teeth 47; presacral vertebrae 27; phalangeal formula for manus and pes 2.3.4.5.3 and 2.3.4.5.4, respectively.

Color and pattern: Dorsal surface mid-brown including dorsal scales of head. Dorsolateral region with a narrow (1–1.5 scales width) dirty cream to light brown stripe on scale rows 5 and 6 that continues posteriorly along the stump of the tail and anteriorly as a muted dusky band above the eye extending forward to contact the similarly colored rostral. This pale dorsolateral stripe is bordered along its inner margin by a narrow dark (black) stripe on scale row 4, this stripe being moderately well defined anteriorly but becoming poorly defined along the posterior half of the body. Lower lateral surface black uppermost, clearly defined from the lighter (orange in life) mid to lower lateral areas. Dark upper lateral stripe broadest anteriorly between forelimb and ear opening, continuing through to the eye and loreals to the posterior edge of the nasal. Upper labials mainly cream and contrasting boldly with the dark loreals and temporal scales behind the eye, and with a moderately bold dark edge to the lower margin, extending also around the base of the rostral. Ventral surface immaculate between fore and hind limbs (orange in life) and continuous in color with lower lateral surface, darker anterior of forelimbs and with dark speckling on chest and throat. Toe lamellae dark.

### *Distribution and Habitat*

The specimen was collected from beneath a small rock on a rocky hillslope in mid-altitude closed forest on Mount Koghis (Figure 2). Upon being uncovered, it moved quickly, with a sliding motion, through cracks and crevices in the soil beneath the rock. Mount Koghis is located ca. 15–20 km northeast of the New Caledonian capital of Nouméa, on the western edge of the southern block of the central mountain chain of the island. The area receives 1500–2000 mm of rain per annum and is characterized, as is most of the southern third of the island, by ultrabasic rocks (Sautter 1981). Although adjacent areas support the highly endemic maquis vegetation typical of southern New Caledonia, much of Mount Koghis supports climax humid forest with a canopy height of 30–35 m (Virot 1956, Schmidt 1981). On the rocky slope where the specimen of *Simiscincus aurantiacus* was captured, the canopy height was, however, considerably lower, because younger trees were dominant.

Locally sympatric skink species at the type locality of *S. aurantiacus* include the burrowing species *Nannoscincus mariei* (Bavay) and *Graciliscincus shonae*, the crepuscular species *Sigaloseps deplanchei* (Bavay) and *Marmorosphax tricolor* (Bavay), and the surface-active species *Caledoniscincus austrocaledonicus* (Bavay) and *Caledoniscincus atropunctatus* (Roux). The large skink *Phoboscincus garnieri* (Bavay) is also known from the forests near the type locality (Sadlier 1986). The New Caledonian endemic geckos *Bavayia sauvagii* (Boulenger), *B. septuiclavis* Sadlier, *Rhacodactylus auriculatus* (Bavay), *R. sarasinorum* Roux, and *R. leachianus* (Cuvier) have also been recorded from the area (Bauer and Vin-dum 1990).

### DISCUSSION

The area on Mount Koghis from which *Simiscincus aurantiacus* was collected is one of the most intensively surveyed in terms of number of visits over an extended period by us, either jointly or independently, over the past 10 yr. It is the same general area in which the single

paratype of *Graciliscincus shonae* was collected (by A.M.B.) in 1985. Conservatively, we estimate to have spent a minimum of 24 hr of collecting time on daytime searches in that area, yet only recently was *Simiscincus aurantiacus* discovered (in August 1994) or *Graciliscincus* recollected (in January 1995). These somewhat erratic results indicate that traditional log and rock turning techniques may not adequately or consistently sample certain elements of the reptile fauna. In contrast, the syntopic crepuscular species *Nannoscincus mariei* and the secretive species *Sigaloseps deplanchei* have been encountered commonly on all occasions.

The behavior of *S. aurantiacus* when it was uncovered indicated that this species uses existing tunnels through the subsoil. The species of *Nannoscincus* are another group of small burrowing skinks that inhabit moist, closed forest habitat. When they are uncovered, *Nannoscincus* species react with a swimming motion that pushes them through loose soil and leaf debris until they are covered, though they utilize existing cracks in the earth when those are encountered. Although observations on *S. aurantiacus* and *Graciliscincus* in the wild are limited, it seems as though there may be a correspondence between the morphology of the snout region in *S. aurantiacus* and *Nannoscincus* and the way in which they move through their subterranean environment.

The recent discovery of *S. aurantiacus* and additional specimens of *Graciliscincus* hints at a greater species diversity of these morphologically bizarre elements of the lizard fauna than previously recognized. These discoveries further highlight the importance of New Caledonia as an evolutionary center in the Southwest Pacific and indicate that our knowledge of the alpha level diversity of the island has not plateaued. If anything, prior assessments of the high levels of endemism and the uniqueness of the New Caledonian herpetofauna (Bauer 1988, Bauer and Vindum 1990, Bauer and Sadlier 1993) have been underestimates.

#### ACKNOWLEDGMENTS

We thank the New Caledonian authorities for permission to collect and conduct research in New Caledonia, particularly Monsieur M. Boulet, Le Chef du Service de l'Environnement et de la Gestion des Parcs et Reserves. Logistical support and encouragement was provided by Jean Chazeau of the ORSTOM Centre de Nouméa, and Alain Renevier and family. Robin Hill produced the illustration of the head shields of *S. aurantiacus*. Allen Greer reviewed the manuscript and David McAlpine advised on the construction of the generic and species names in this description. Special thanks are due to Peter Rowlands for his assistance and company in the field.

#### LITERATURE CITED

- BAUER, A. M. 1988. Reptiles and the biogeographic interpretation of New Caledonia. *Tuatara* 30:39–50.
- BAUER, A. M., and R. A. SADLIER. 1993. Systematics, biogeography and conservation of the lizards of New Caledonia. *Biodiv. Lett.* 1:107–122.
- BAUER, A. M., and J. V. VINDUM. 1990. A checklist and key to the herpetofauna of New Caledonia, with remarks on biogeography. *Proc. Calif. Acad. Sci.* 47:17–45.
- GREER, A. E. 1979. A phylogenetic subdivision of Australian skinks. *Rec. Aust. Mus.* 32:339–371.
- . 1990. The biology and evolution of Australian lizards. Surrey Beatty and Sons, Chipping Norton, New South Wales.
- SADLIER, R. A. 1986. A review of the scincid lizards of New Caledonia. *Rec. Aust. Mus.* 39:1–66.
- SAUTTER, G. (coord.). 1981. Atlas de la Nouvelle Calédonie et Dépendances. ORSTOM, Paris.
- SCHMIDT, M. 1981. Fleurs et plantes de Nouvelle-Calédonie. Éditions du Pacifique, Papeete.
- VIROT, R. 1956. La végétation canaque. *Mem. Mus. Natl. Hist. Nat.*, n.s., ser. B, 7:1–398.