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A NEW SPECIES OF *LAMPROPHOLIS*
(LACERTILIA: SCINCIDAE)
FROM THE RAINFORESTS
OF NORTHEASTERN QUEENSLAND

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INTRODUCTION

Although the rainforests of northeastern Queensland have been greatly reduced over the last few thousand years by both natural and human factors, they still account for a disproportionately large amount of the organic diversity for which Australia is famous. We are still discovering the extent of the diversity of rainforests, but sceptics might well wonder whether we will understand this diversity even to the extent of having a simple species list, let alone an appreciation of its origin and maintenance, before the rainforests disappear as recognisable habitats.

We present here a description of a new species of skink of the genus *Lampropholis* that is apparently endemic to the largest block of rainforest anywhere in Australia, namely, the block between Cooktown and Townsville in northeastern Queensland. As an indication

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of how poorly known the rainforest fauna of this area is, it can be noted that the new species is often locally very abundant and that it is known to occur in at least two localities — Crystal Cascades southwest of Cairns and the Curtain Fig Tree on the Atherton Tableland — which are visited, at least on some days, by literally hundreds of people. Despite this, the first specimen was not discovered until 1961, and the second did not come to light until 1971.

The new species of *Lampropholis* differs from all its congeners in having four fingers instead of five. For this reason we name the species

Lampropholis tetradactyla New Species

Figs. 1-2

HOLOTYPE. — Queensland Museum J 29853: Vicinity of Smoko Creek at the Kennedy - Kirrama road, Kirrama State Forest, north-eastern Queensland. Collected on 8 June 1976 by Allen and Phlyp Greer.

PARATYPES. — All localities are in northeastern Queensland.

Australian Museum R 57801: Lake Barrine, Atherton Tableland; R 61300: Milla Milla, January 1977; R 63876 - 63889: approx. 2.2 km S.W. Yungaburra P.O. (vicinity of the Curtain Fig Tree), 10 July 1977; R 63894: approx. 1.8 km S.W. Yungaburra P.O., 10 July 1977; R 64122 - 64135: same data as holotype; R 64136 - 64138: Yuccabine Creek at the Kennedy - Kirrama road, Kirrama State Forest, 9 June 1976; R 64139 - 64145: vicinity of Crystal Cascades, S.W. of Cairns, 14 June 1976; R 64146: between 2 - 3 km S.E. of the Barron River bridge at Kuranda via the Kennedy Hwy., 26 June 1976; R 64147: 1.4 km W. of the Kauri Creek picnic area, Danbulla State Forest, 29 June 1976; R 64148: vicinity of Crystal Cascades, approx. 12.5 km W.S.W. of the Cairns G.P.O., 17 July 1976; R 64149: 2.7 km N. of the Kennedy Hwy., near Kuranda via the Black Mt. road, 18 July 1976; R 64150 - 64151: approx. 6 miles (airline) N.E. of Kuranda, 18 July 1976; R 64152 - 64154: 2.6 km S. of the Barron River bridge (south of Atherton) via the Kennedy Hwy., 28 July 1976; R 77600: the Loop Picnic Site, Mt. Spec. National Park, 1 June 1977.

Queensland Museum J 24814: Sugar Cane Creek, approx. 7 km due west of South Mission Beach, 4 October 1974; J 28183 - 28186: Paluma, near Townsville, 1976.

Museum of Vertebrate Zoology 74777: Lake Eacham, Atherton Tablelands, 19 Dec. 1961.

University of Michigan Museum of Zoology 132467 (comprising five specimens bearing A.G.K. field tags 222 - 226): approx. 14 miles W. of Kennedy, at or near Smoko Creek, Kirrama State Forest, approx. 600 m elev., 24 - 27 August 1971.

DIAGNOSIS. — The new species is a member of the genus *Lampropholis* (sensu Greer 1974), but it is easily distinguished from all other known members of this genus in having only four fingers instead of five and in being relatively small (maximum SVL = 33 mm versus 41 mm for the next largest form — an undescribed species from north-eastern Queensland most closely related to *L. delicata*).

DESCRIPTION. — In general aspect, *tetradactyla* is a small light to dark russet brown skink with a slightly truncated, depressed snout; slender front and rear legs, and a tail that is only slightly longer than the head and body.

Rostral very much wider than long, almost entirely exposed in dorsal view, forming a very broad, but shallow, anteriorly curving suture with frontonasal; frontonasal wider than long; prefrontals large, but separated medially; frontal considerably longer than wide, narrowing sharply posteriorly; supraoculars four, first two in contact with frontal; frontoparietals distinct, each slightly longer than interparietal; interparietal distinct, with a parietal eye spot just posterior of centre; parietals in broad contact behind interparietal; each parietal bordered along its posterolateral edge by a relatively wide anterior nuchal and two temporals, the anteriormost of which is identifiable as an upper secondary.

Nasal trapezoidal to rectangular in shape, widely separated from its fellow; nostril centrally located in nasal; anterior loreal generally deeper than long and touching supralabials but sometimes restricted to a small dorsal crescent-shaped scale and separated from supralabials or, rarely, totally absent; posterior loreal large; suboculars small, in a complete series below eye; supraciliaries 7 - 8 (mode = 7); lower eyelid scaly and moveable with a translucent window dorsally and small, equal sized, scales elsewhere; primary temporal single, secondary temporals two, subequal; supralabials six, fourth subocular; infralabials six, first very small; mental wider than long; postmental about as long as wide, in contact with first two infralabials on each side and followed by a pair of chin scales in medial contact; external ear opening small, slightly oval in shape, the long axis dipping slightly anteriorly; auditory meatus larger than external ear opening. (Fig. 1).

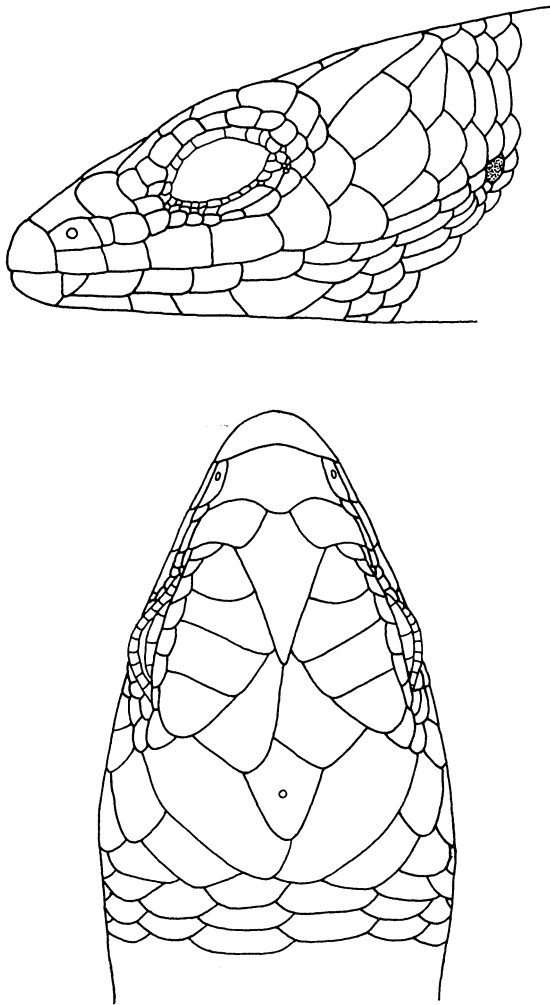


FIGURE 1. Dorsal and lateral views of the head of the holotype of *Lampropholis tetradactyla* (Qld Mus. J 29853).

Body scales smooth, in 22-26 ($\bar{X} = 23.1$, $N = 55$) longitudinal rows at midbody; paravertebral scales equal to or slightly wider than the more lateral scales at midbody but widening appreciably, but not abruptly, over the nuchal area, 48-54 ($\bar{X} = 50.9$, $N = 48$) when counted between the posterior edges of the thighs and the parietals; medial pair of preanals wider than more lateral preanals; medial row of subcaudal scales considerably wider than more lateral rows;

supradigital scales in a single row; subdigital lamellae with a medial groove, 15-18 (\bar{X} = 16.3, N = 53) on fourth toe.

Snout - vent length 17-33 mm; tail length 1.08-1.34 times SVL (N = 27); front leg .24-.30 times and rear leg .33-.38 times SVL (N = 15), respectively; front leg tetradactyl, rear leg pentadactyl.

COLOUR. - In preservative, the dorsum varies from light to dark brown and is usually patterned with a few dark longitudinal dashes on the neck and shoulders and along the dorsolateral line. The sides may be the same colour as the dorsum but are usually darker. There is usually a very subtle but distinct black W-shaped mark on the head extending from the posterior corner of each eye across the frontoparietals. The centre of each labial is usually dark and the sutures are light. The venter is generally immaculate, but small dark spots may occur sporadically along the sides of the throat and in two or three rows along the underside of the tail. There is a very small, but quite conspicuous, white spot highlighted by a dark background at the posterior base of the thigh (Fig. 2).

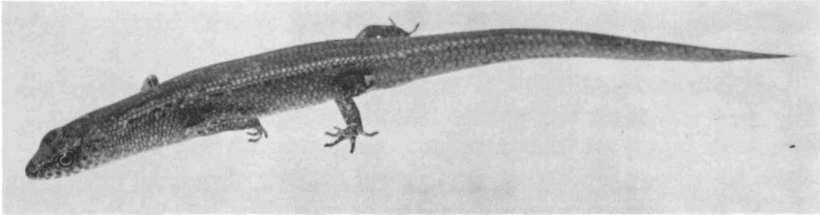


FIGURE 2. Photograph of a specimen of *Lampropholis tetradactyla* from 2.2 km S.W. of Yungaburra P.O., Qld. Note the white spot at the posterior base of the thigh.

In life, most large specimens have a lemon yellow wash over the venter which extends from the level of the front legs posteriorly onto the tail. This colour is usually most intense over the posterior part of the body, the undersides of the rear legs and over the base of the tail. In a sample of 38 specimens, all males of SVL 27 mm and larger had yellow venters (N = 14) and most, but not all, females of SVL 29 mm and larger had yellow venters (N = 12).

DISTRIBUTION. - The species is known only from the coast and ranges of northeastern Queensland between the area just north of Kuranda and the area just northwest of Townsville (Fig. 3).

Altitudinally, the species ranges from near sea level, e.g., near Sugar Cane Creek (Q.M. J 24814) to between approx. 760-840 metres (2500-2750 ft.) at several localities on the Atherton Tableland.

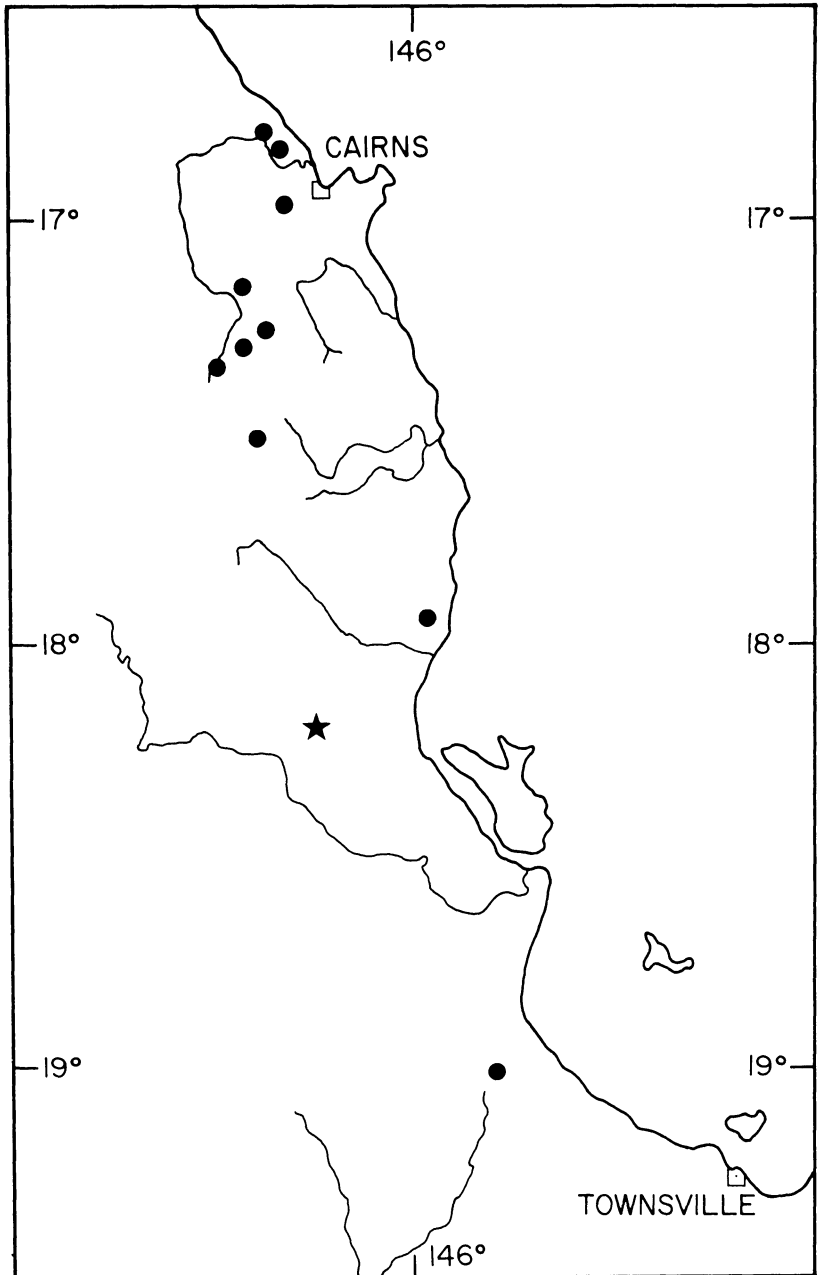


FIGURE 3. Map showing the known distribution of *Lampropholis tetradactyla*. The type locality is represented by a star. One symbol may cover more than one locality.

VARIATION. — Differences in two characters are evident between the southern population of *tetradactyla* as represented by the Sugar Cane Creek, Kirrama State Forest and Paluma animals (the three southernmost localities in Fig. 3) and the northern populations as represented by the remaining animals. Analysis shows that the southern population has both a higher number of longitudinal scale rows at midbody ($t = 8.90$, $P < .001$) and a higher number of scales in the paravertebral rows ($t = 5.94$, $P < .001$) (Table 1).

TABLE 1. A COMPARISON OF VARIATION IN CERTAIN LOCATIONS IN THE NORTHERN AND SOUTHERN POPULATIONS OF *Lampropholis Tetradactyla*. See text for details and discussion.

Character	Northern Population	Southern Population
Midbody Scale Rows		
Range	22 - 24	23 - 26
\bar{X}	22.4	24.0
s.d.	.76	.61
s.e.		
\bar{X}	.28	.24
.05		
Mode	22	24
N	31	28
Paravertebral Scales		
Range	48 - 52	50 - 54
\bar{X}	50.2	52.1
s.d.	1.15	1.13
s.e.		
\bar{X}	.43	.50
.05		
N	30	22
Subdigital Lamellae (4th toe)		
Range	15 - 18	15 - 18
\bar{X}	16.3	16.4
s.d.	1.08	.93
s.e.		
\bar{X}	.40	.37
.05		
N	30	27
Frequency with which anterior loreal is separated from supralabials	8/34 = .24	10/22 = .45

There is no significant difference between the two populations, however, in either the frequency with which the anterior loreal fails to reach the supralabials ($X^2 = 2.94$, $P > .05$) or the number of subdigital lamellae on the fourth toe (Table 1).

HABITAT. — We have collected 54 of the 63 known specimens of *tetradactyla*, and unless stated otherwise the following notes are based on our experiences with these animals.

All but one of the localities where we have found *tetradactyla* have been in well developed rainforest. The one exception was in a regenerating rainforest with emergent Hoop Pines just south of the town of Atherton. Mr. Paul Webber however informs us that he has collected the species in a large grassy clearing in rainforest near Kuranda.

The animals have been found almost invariably by day under rocks and logs and in leaf litter, but at one locality — Crystal Cascades just S.W. of Cairns — a few individuals were spotted on the damp surface near the falls in the early morning between 9:00-10:00 AM (mid-June) when the sun was well up but the canyon through which the cascades fall was still in deep shadow. At several localities we've found *tetradactyla* in very moist situations, e.g., the spray zone of falls, the very moist parts of creek beds, and the discharge areas from road drains. These habits and habitats imply that *tetradactyla* is one of the most cryptozoic and mesic adapted of the nonburrowing Australian skinks.

REPRODUCTION. — All but eight of the 63 specimens of *tetradactyla* have been collected in the months of June (28), July (22) or August (5). We have examined the gonads of all these specimens and can report that none of the 26 sexable females, including the 15 with SVLs of 29 mm or larger (the minimum size at which females show the yellow ventral colour which may be an indication of sexual maturity), were gravid with either enlarged (yolky) ovarian eggs or oviducal eggs. It would appear that at least as far as females are concerned, reproductive activity is at a low point during the months of June, July and August. This result is in keeping with that of Wilhoft (1963) who found that reproductive activity in the females of another skink species associated with rainforests in northeastern Queensland — *Carlia rhomboidalis* — was at a low point in the period of April through August. This period coincides approximately with the end of the wet season and the beginning of the dry season in northeastern Queensland.

It is interesting to note, however, that many of the larger specimens of *tetradactyla* of both sexes collected in the June - August period had very large abdominal fat bodies. These may have been indicative of the impending breeding season.

We have found only two gravid females. One of these (A.M. R 61300) measures 31 mm SVL and contains a single enlarged ovum in each ovary. This specimen was collected in January during what is approximately the middle of the wet season in northeastern Queensland. The second gravid female (Q.M. J 28183) measures 32 mm SVL and contains a single thickly shelled egg in each oviduct. The eggs of this female indicate that the species is oviparous as is every other species of *Lampropholis* for which the mode of reproduction is known (N = 5, Greer, pers. obs.).

RELATIONSHIPS. — There are two easily recognizable subgroups within the genus *Lampropholis*. One of these, which may be called the *challengeri* group, has the fourth supralabial below the centre of the eye, the frontoparietals distinct, the dorsal ground colour usually fawn or rich reddish brown, and usually a distinct light spot or ocellus at the posterior base of the thigh. This group includes *challengeri*, *mustelina*, *tetradactyla* and at least two undescribed species.

The other group, which may be called the *delicata* group, has the fifth supralabial below the center of the eye, the frontoparietals fused, the dorsal ground colour generally greyish brown, and no white spot at the posterior base of the thigh. This group includes *delicata*, *guichenoti* and at least four other undescribed species.

Both groups range widely along the east coast of Australia, but ecologically, the *challengeri* group seems to prefer slightly more mesic habitats than the *delicata* group. All members of the *challengeri* group, for example, are associated with rainforest, wet sclerophyll or moist dry sclerophyll forest and they usually occur in the heart of these habitats. Members of the *delicata* group, in contrast, are usually associated with sclerophyll forest or openings in rainforest.

These general habitat differences are also reflected in Spellerberg's (1972) experimental work on critical temperatures. He found, for example, that summer caught *delicata* and *guichenoti* both had higher critical thermal maxima (\bar{X} = 40.8 and 42.0°C, respectively) and lower critical thermal minima (\bar{X} = 4.7 and 3.2°C, respectively) than *mustelina* (\bar{X} = 38.6 and 6.5°C). Thus *delicata* and *guichenoti* which occur in more open habitats which are presumably thermally variable seem to tolerate thermal extremes better than *mustelina* which occurs in more closed habitats which are presumably more thermally equable.

Within the *challengeri* group, *tetradactyla*'s closest relative is probably a small undescribed species (Fig. 4) restricted to the rainforests of central east and northeast Queensland between Eungella National Park just west of Mackay and Thornton Peak just north of Daintree. This species is commonly identified as *challengeri*, but it differs from true *challengeri* of southeastern Queensland and northeastern New South Wales in several characters (see below).

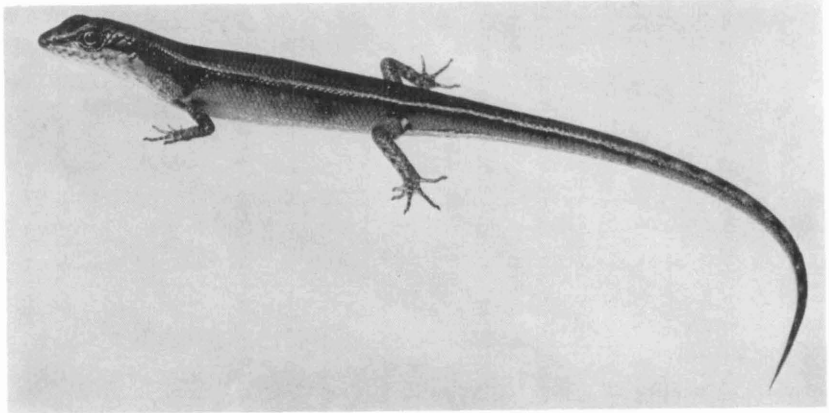


FIGURE 4. Photograph of a specimen of an undescribed species of *Lampropholis* from northeastern Queensland, which is probably the closest living relative of *L. tetradactyla*. The species is commonly misidentified as *L. challengeri*. It is called "northern *challengeri*" in the text of this paper.

Tetradactyla and this "northern *challengeri*" share at least four characters which are either of uncertain phylogenetic polarity or derived within the *challengeri* group. None of these characters are shared with any other species in the group.

1. Small size. — The SVL of the largest *tetradactyla* is 33 mm (N = 59) and the SVL of the largest "northern *challengeri*" is 46 mm (N = 44). The maximum SVL of the next largest species (*mustelina*) is approximately 62 mm (N = 187). It is uncertain as yet what the approximate size of the common ancestor of the *challengeri* group may have been, but in that *tetradactyla* is the sixth smallest species of Australian skink known from five or more specimens (Greer, pers. obs.), its small size is in all likelihood derived within the *challengeri* group.
2. Number of premaxillary teeth. — *Tetradactyla* and "northern *challengeri*" generally have a total of 13-14 premaxillary teeth (mode = 13), whereas all other species in the *challengeri* group

have 11 premaxillary teeth. Eleven premaxillary teeth is probably primitive in the major group of skinks of which *Lampropholis* is a member and within this group numbers larger than 11 are probably derived (Greer 1979).

3. Scales bordering the posterolateral edge of the parietal. — *Tetradactyla* and “northern *challengeri*” both usually have a nuchal and two temporal scales bordering the posterolateral edge of each parietal scale (Fig. 1), whereas all other members of the *challengeri* group have only a nuchal and one temporal bordering each parietal. This latter condition is probably primitive in the major group of skinks of which *Lampropholis* is a member (Greer 1979) and the condition in *tetradactyla* and “northern *challengeri*” is therefore probably derived. This condition is almost certainly secondarily derived, however, in that it is similar to what appears to be the primitive condition for the subfamily (Lygosominae) of which *Lampropholis* is a member (Greer 1979).
4. Grooved subdigital lamellae. — *Tetradactyla* and “northern *challengeri*” both have a medial groove in most of the subdigital lamellae whereas all other *Lampropholis* have most of the subdigital lamellae smoothly rounded. Medially grooved lamellae are extremely rare in skinks and do not occur in any of the more generally primitive representatives of the major group of skinks of which *Lampropholis* is a member, e.g., *Eugongylus* and *Leiopisma*, hence such lamellae are probably derived within *Lampropholis*.

A comparison of *tetradactyla* and “northern *challengeri*” in the two characters in which they differ and for which a reliable inference as to phylogenetic polarity may be made, i.e., size and the number of toes on the front foot, indicates that *tetradactyla*, with its extremely small size and four toes, is the more derived species.

Finally, it is worth noting that *tetradactyla*, and “northern *challengeri*” occur together at many localities but that in most cases of sympatry *tetradactyla* is by far the more common species.

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