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Revision of the Species Previously Associated with the Australian Scincid Lizard *Eulamprus tenuis*

ALLEN E. GREER

Australian Museum
PO Box A285, Sydney South, NSW 2000, Australia

ABSTRACT. *Eulamprus tenuis*, a moderate-sized, robust-limbed skink from the east coast of Australia, is shown to be a composite of five species, only three of which have available names. All five species are reviewed taxonomically and a resumé of their general natural history is provided.

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This is a review of the alpha taxonomy of the species either currently or recently confused with *Eulamprus tenuis*, a saxicolous/arboreal, shade-loving to crepuscular scincid lizard of the woodlands and forests of the east coast of Australia. The most recent review of the Australian herpetofauna recognises only one species with two subspecies (Cogger, 1986). However, there are five species, only three of which have names. This paper reviews this complex of species and describes the unnamed species.

Definitions and Abbreviations

Two scales systems require special definition for the purposes of this paper. Nuchal scales are all those transversely enlarged paravertebral scales behind the parietal scale which either touch the parietal or touch another enlarged paravertebral; the nuchal scale count is the total number of nuchal scales on both sides.

Subdigital lamellae are all those scales on the ventral

surface of the fourth toe of the pes counted between the claw and the level of the bifurcation of the third and fourth digits.

Abbreviations used are: AM – Australian Museum; MNHP – Museum National d'Histoire Naturelle, Paris; NP – National Park; NHRM – Naturhistoriska Riksmuseet, Stockholm; NS – not significant statistically at the .05 level; QM – Queensland Museum; QNPWS – Queensland National parks and Wildlife Service; SF – State Forest.

One, two or three asterisks indicates probability levels of .05, .01 and .001, respectively.

Table 1 is contained in the Appendix.

The Phylogenetic Relationships of the *Eulamprus tenuis* Complex

There is no particular reason to think that the species previously confused under the name *Eulamprus tenuis* are the closest living relatives of each other, apart from their general similarity. They show only three clearly

derived character states *vis à vis* the other members of their major lygosomine group, the *Sphenomorphus* group, and all characters – reduced auricular lobules, medially expanded palatal rami of the pterygoids, and ovoviviparity – occur in many other members of the *Sphenomorphus* group. In fact, the lack of derived characters may be telling us something equally interesting, i.e., that they are very generalised members of the *Sphenomorphus* group and hence perhaps not too dissimilar to the ancestor of this group. In this regard there are two additional features of their biology that are possibly also retained primitive behavioural characters: their relatively conspicuous arboreal/saxicolous habits and their at least partial diurnality. These habits contrast with the cryptozoic, semifossorial and crepuscular to nocturnal habits of many members of the *Sphenomorphus* group.

Recognising the *Eulamprus tenuis* complex as an assemblage of relatively primitive *Sphenomorphus* group species leaves unanswered the question of how to diagnose the contained species. The easy way might be to refer to a regional fauna (e.g., Cogger, 1986) for a ‘diagnosis’ of *E. tenuis*, at least amongst the Australian representatives of the *Sphenomorphus* group, and then diagnose the five species against each other. However, this would beg the question of a diagnosis against the rest of the group as a whole. Therefore, in order to put the species diagnoses on a more rigorous footing, a list of characters follows that will distinguish the *E. tenuis* complex from all other species in the group worldwide and then diagnose the species in the complex against each other. The characters that distinguish the complex are as follows (derived characters are marked by a solid diamond symbol): head scales generally unfragmented; supraoculars four, first two on each side contacted by frontal; frontoparietals distinct; lower eyelid scaly,

moveable; tertiary temporals contacting lower secondary temporal two; external ear opening relatively large, with only low auricular lobules anteriorly♦; postmental contacts first two infralabials on each side.

Size moderate (max. SVLs range 66-86 mm); limbs well developed, pentadactyl; body scales smooth, cycloid; subdigital lamellae smoothly rounded; supradigital scales in multiple rows except for last three scales which are single.

Presacral vertebrae 26; cervical vertebrae eight; phalanges in manus/pes: 2.3.4.5.3/2.3.4.5.4.

Postorbital bone present; parietal foramen present; premaxillary teeth 7-9; palatal rami of pterygoids medially expanded♦, and entering infraorbital vacuity.

Inguinal fat bodies present.

Peritoneum of body cavity dark.

Ovoviviparous♦.

Implicit in this extended taxonomic treatment of the *Eulamprus tenuis* complex is a belief that the genus *Eulamprus* is not a particularly stable taxonomic concept. The original concept of the genus included only *E. quoyii* and was proposed without a diagnosis (Fitzinger, 1843). A subsequent concept included all the ‘water skinks’ – *E. heatwolei*, *E. kosciuskoi*, *E. leuraensis*, *E. quoyii*, and *E. tympanum*, a group which while probably monophyletic (Shea & Peterson, 1985; Wells & Wellington, 1985; Greer, 1990) was not diagnosed when proposed (Wells & Wellington, 1984).

The current concept of *Eulamprus* includes the water skinks, the *E. tenuis* complex and *E. amplius*, *E. luteilateralis* and *E. murrayi* (Cogger, 1986; Greer, 1990) but has as its sole derived character ovoviviparity, a character which is not unique in the *Sphenomorphus* group. It would not be too surprising, therefore, if future work showed that *Eulamprus*, as now conceived, is polyphyletic.

Key to the Species of the *Eulamprus tenuis* Complex

1. Upper secondary temporal overlaps lower2
- Upper secondary temporal overlapped by lower4
2. Enlarged nuchals (total both sides) 2-10, mode 4-6; subdigital lamellae 17-23; nuchal area without dark midline streak; vomers distinct3
- Nuchals (total) 0-4, mode 2; subdigital lamellae 22-27; nuchal area often patterned with dark midline streak; vomers fused*E. tenuis*
3. Midbody scale rows 28-32; ground colour medium brown, dorsal pattern dark brown; wetter areas*E. brachysoma*
- Midbody scale rows 32-38; ground colour light brown, dorsal pattern medium brown; drier areas*E. sokosoma*

4. Paravertebral scales 55-64; nuchal area without dark
midline streak*E. martini*
- Paravertebral scales 69-74; nuchal area with dark
midline streak*E. frerei*

Eulamprus brachysoma (Lönnerberg & Andersson)

Fig.1

Lygosoma brachysoma Lönnerberg & Andersson, 1915: 5 (type locality - Atherton, Qld; holotype - NHRM 3211).

Material examined. All locations are in Queensland. AM 4722, R 5709, 47135-37 - Gayndah; R 2195-16 - Brisbane; R 9942, 9944, 11169-72, 47100-47103 - Lindeman Island; R 11097, 11720, 11724, 11726, 47229 - Hayman Island; R 13534-35, 19717 - Brampton Island, 32.2 km north-east of Mackay; R 16541 - Coen; R 17045 - Saint Ronans; R 21322 - 53.1 km south of Laura; R 26703 - Endeavour River, 14.5 km west, 3.2 km north of Cooktown; R 26829-30 - Big Tableland, 27.4 km south, 3.2 km east of Cooktown; R 38046-47 - Proserpine; R 45798-99, 49860 - Holbourne Island, near Bowen; R 45806 - Cairns; R 47224 - 2 km west of Ravenshoe; R 47225 - Trinity Bay between Hartleys Creek and Port Douglas; R 47226 - 3.2 km west of Snubby Creek, Millstream Falls District, Ravenshoe; R 47227-28 - Brumby Gully between Kuranda and Emerald Creek; R 49862 - Pine Islet; R 49863-64 - Edward Island; R 57773 - 24.2 km south of Stuart Creek south of Townsville; R 58933 - Ravenshoe; R 61598-600 - Arcadia Valley via Injune; R 62486 - forestry camp, Windsor Tableland; R 62744 - Dent Island; R 62745, 62747 - Eshelby Island; R 63017-24 - 11.9 km south-south-east of Springsure Post Office; R 63134 - 2.9 km north-north-east of the Gulf Highway via Kennedy Highway (40 Mile Scrub); R 86319 - approximately 10.9 km west of Mareeka Post Office by road; R 86320-21 - 16.4 km south-east of the Bruce Highway via Gilles Way, near Gordonvale; R 111595-96, 111604-05 - Crystal Cascades; R 111603, 111618-19 - Granite Gorge; R 111607 - Cape Cleveland; R 114039 - just south of Finch Hatton NP; R 120576, 122959 - Cape

Hillsborough.

QM J 1730, 1802-07, 1810-20, 1822-1825, 1826-1830 - North Queensland; 1732-36 - Cape York?; J 1831-1833 - Cardwell; J 3885, 5638 - Lindemann Island; J 3889, 3891-92 - Holbourne Island; J 10365 - Proserpine; J 11150 - Shiptons Flat; 49 km south of Cooktown; J 12130 - Tinaroo Dam, Atherton Tableland; J 15627 - Pine Mountain, Marlborough Station, north of Marlborough; J 15667 - Yebna Station, 80 km east of Injune; J 15741 - Coominglyah SF, near Monto; J 17835-36 - Shipton's Flat, 32.2-48.3 km south of Cooktown; J 19336-37 - Mount Molloy; J 20510, 20564 - Melville Range, Cape Melville; J 22665 - Big Tableland, approximately 32.2 km south-east of Cooktown; J 23536 - Curraghmore, Mitchell River Crossing; J 24525 - Watsonville; J 24953-54 - Burnett River, Goodnight Scrub; J 25210 - Home Rule Falls, south of Cooktown; J 25319 - Amos Bay; J 25565 - 15 km from Gordonvale, along Gillies Highway; J 25909-25914 - Arcadia Valley via Injune; J 26111 - Hinchinbrook Island; J 27087 - Mount Cook; J 27119 - Roberts Turnoff; J 28488-90 - Blackdown Tableland, Mimosa Creek; 31020, 31023, 31052 - 40 Mile Scrub, 64.4 km west of Mount Garnet; 32786, 32788 - site 13, Brandy Creek; 32787 - creek adjoining site 13, Brandy Creek; 33865, 33878, 33895-99, 33964 - Oaky Creek, adjoining site 10, Homevale; 33868, 33888, 33947 - site 10A, Homevale; 33972, 33974, 33976 - Hill 609, Homevale; 33989-33991 campsite, Finch Hatton NP; 34033 - site 9, Finch Hatton NP; 34065 - adjoining site 9, Finch Hatton NP; J 34094 - site 9A, Finch Hatton NP; J 36802 - Glenorina; J 36803 - Dunlow; 36804 - Emerald; J 37295 - Mount Coot-tha; J 38511 - Robinson Gorge area, Glenhaughton; J 38512 - Tommy Creek, Glenhaughton; J 38616-17 - Glenhaughton Creek, Robinson Gorge Road; J 38618-20 - Nathan Gorge; J 39166 - Byanda Station, 20 km north-north-west of Proston; J 39432 - Crystal Cascades, 12.5 km west of Cairns; J 39873-75 - Bakers Blue Mountain, 17 km west of Mount Molloy (900 m); J 40635 - Windsor Tableland, 26

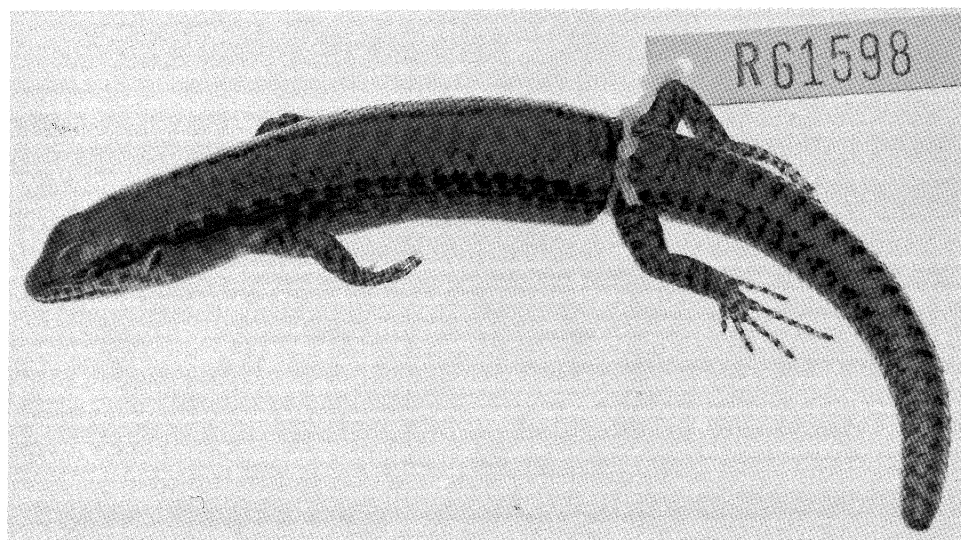


Fig.1. *Eulamprus brachysoma* (AM R 61598) from Arcadia Valley via Injune, Qld.

km north-north-west of Mount Carbine; J 41324-25 - Crystal Creek, Mount Spec; J 41974 - South Percy Island, Percy Isles; J 41982 - Table Mountain, 20 km south-west of Rockhampton; J 42083 - 7 km west of Chillagoe; J 42160 - Kroombit Tops; J 42410-11 - approximately 15 km east of Gayndah on Gayndah - Ban Ban Springs Road; J 42508 - Jourama Falls NP; J 42509 - Mount Spec NP; J 42510 - Mount Spec, Townsville; J 42511-12 - Little Crystal Creek, Mount Spec NP, Townsville; J 42514-15 - Blue Water Range, north of Townsville; J 42518 - Hervey Range, west of Townsville; J 42527 - locality unknown; J 44037 - Mareeba; J 44299 - Warang, White Mountains; J 44578 - "Glencoe"; J 44596 - "Cardigan"; J 44687-88 - "Spyglass"; J 44838 - "Powlathanga"; J 45388 - summit of Mount Mulligan; J 45565 - Granite Gorge via Mareeba; J 46297-301 - Carlisle Island; J 46747 - Fairybower Road, approximately 8 km west of Rockhampton.

QNPWS: RS 110 - Millstream Falls NP; R 174 - Lindeman Island; R 306 - Jamie Creek, Walsh River; R 576 - Brampton Island NP; R 633, 11004 - Cape Hillsborough NP; R 635, 751 - Eungella NP; N 11308 - Newry Island NP (near Seaforth); N 11877, 11900 - Cape Hillsborough NP; N 11921 - Smalleys Beach, Cape Hillsborough NP; N 11953-54; Long Island NP; N 12005 - Redbill Island; N 12078 - South Molle Island; N 17798 - Levers Plateau, near Lamington NP; N 25686 - Yarra-mulla Station; N 25829 - no data; N 36561, 36564 - Broadwater Creek NP boundary; N 54764 - Bathurst Head, near Princess Charlotte Bay; N 58406; Conway Headquarters, Conway NP; N 58450.

Diagnosis. Differs from other members of the *Eulamprus tenuis* complex in the following combination of characters: upper secondary temporal overlaps lower; transversely enlarged nuchal scales 2-10, mode 6; subdigital lamellae fourth toe 17-23; nuchal area without dark midline streak; midbody scale rows 28-32.

Distribution. On the mainland, from Coen on Cape York Peninsula south to Gayndah and possibly Brisbane (if the locality is correct for AM R 2915-16); occurring inland as far as just south-south-east of Springsure and offshore on continental islands from Hinchinbrook Island south to the Percy Isles (Fig.2).

The Coen record (AM R 16541) has been questioned on the grounds that subsequent extensive faunal surveys in the area have failed to reveal additional specimens (K. McDonald, *in litt.*). However, there is no basis to fault the data associated with the specimen.

Habitat. Moist woodland to closed shrubland and forest.

Habits. Arboreal and saxicolous; sometimes on man-made structures (e.g., cinder block structures); diurnal in shade (all observations based on K. McDonald personal communication and personal observation).

Reproduction. Ovoviviparous. Twenty four ovigerous or gravid females were found amongst the specimens examined. These ranged 52-74 mm SVL (mean = 64.6). For the 20 gravid females for which follicle number or litter size could be determined, there was a positive correlation between female size and

follicle number/litter size ($r = .58^{**}$); female size for these 20 specimens ranged 52-74 mm (mean = 64.9; $sd = 6.12$) and follicle number/litter size 2-5 (mean = 3.8; $sd = 0.95$).

Of the 13 gravid females with collection dates, those with enlarging follicles were collected in the period 6 June to 12 July (N = 4) and 18 April (N = 1), and those with oviducal young in the period 29 September to 12 December (N = 8). Relating these data to the seasons of north-eastern Queensland (the southernmost gravid female is from the vicinity of Springsure) suggests that

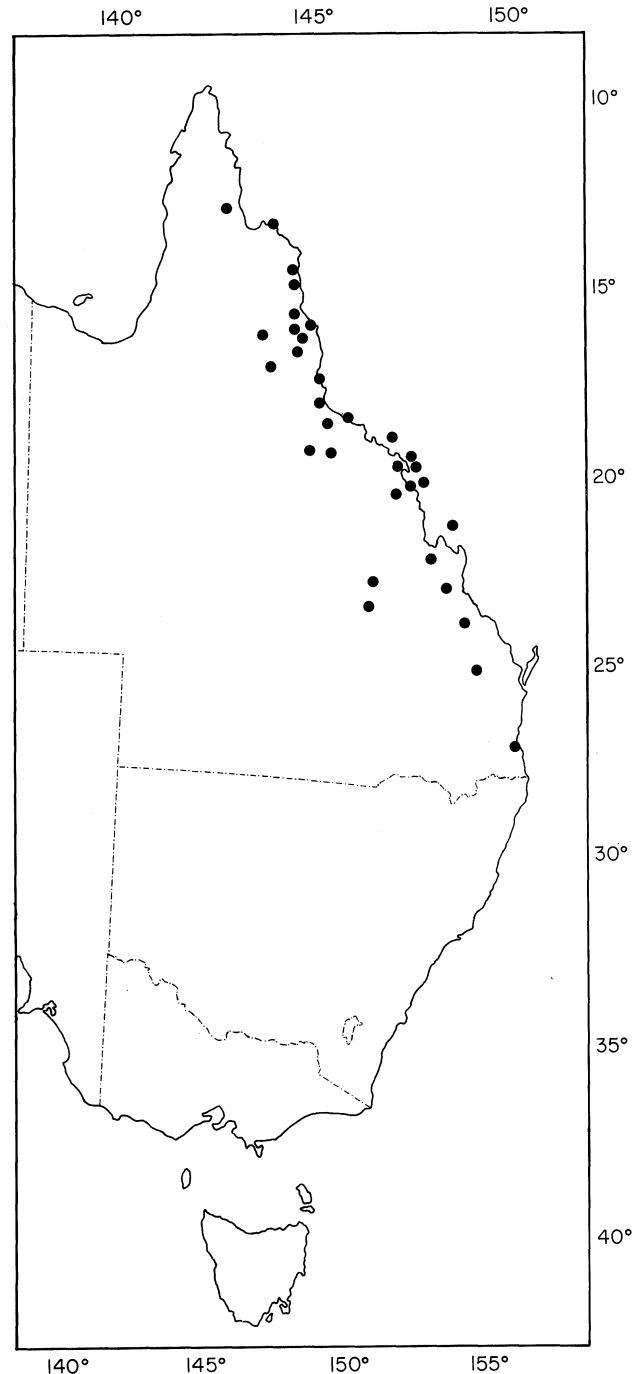


Fig.2. The distribution of *Eulamprus brachysoma*.

females carry yolking follicles in the late wet season to the late dry season and oviducal young in the late dry season to the early wet season. Birth probably occurs in the middle of the wet season.

Comparison with similar species. *Eulamprus brachysoma* is most similar to *E. sokosoma*, a species which occurs almost entirely within its general range. The surest way to tell the two species apart is on the midbody scale row count – *Eulamprus brachysoma* has 28-32 scale rows whereas *E. sokosoma* has 32-38 (only 4% of specimens have as few as 32). In addition *E. brachysoma* is generally darker and slightly more gracile whereas *E. sokosoma* is lighter and more robust, especially in the body. Ecologically, *E. brachysoma* appears to occur in slightly more mesic habitats while *E. sokosoma* occurs in slightly more xeric habitats.

Comment. I have been unsuccessful in borrowing the holotype of *Eulamprus brachysoma* (Lönnberg & Andersson, 1915; NHRM 3211), but I have been able to examine two photographs of the specimen taken by H.G. Cogger. There is no doubt that this specimen is a member of the widespread northern Queensland population delineated here.

Eulamprus martini (Wells & Wellington)

Figs 3,4

Concinnia martini Wells & Wellington, 1985: 26 (type locality - Yabba State Forest, 3.9 km south of Urbenville, NSW; holotype - AM R 116966).

Material examined. AM R 4050 - Nerang River, Qld; R 5029 - Nambor, Qld; R 8567 - Tweed River, NSW; R 8940 - Mount Tambourine, Qld; R 13120 - Tenterfield, NSW; R 16470, 16665 Yepoon, Qld; R 26128 - Biloela, Qld; R 26144 - Grafton District, NSW; R 29619 - Winterville Road, 6.4 km north of Dalmorton, NSW; R 29656 - Mount Norman, Wallangarra, Qld; R 30366 - Windohra, Qld; R 47105 - 78.9 km east of Glen Innes on Grafton Road, NSW; R 47106-07 - Obon River, 43.5 km north-east of Guyra, NSW; R 47108 - 8.1 km south-east of Bolivia, NSW; R 47109-11 - 11.3 km north of Deepwater on New England Highway, NSW; R 47112-17 - 11.3 km west-south-west of Tenterfield, NSW; R 47118-30 - 4.8 km south-west of Tenterfield, NSW; R 47131-

32, 47134 - 20.9 km south of Tenterfield, 14.5 km from Sandy Flat on Mount Speribo, NSW; R 47184-85, 47187-88 Coffs Harbour, NSW; R 47186 - Glenreigh, NSW; R 54725 - Kumbaingeri Sanctuary, Coffs Harbour; R 54851 - Merbin SF, Murwillumbah area, NSW; R 57772 - Tooloom Falls, NSW; R 58432-33 - Bungulla, NSW; R 58434 - Queen Marys Falls near Killarney, Qld; R 58435-39 - Wilsons Peak, Qld; R 58440 - 8.1 km from Landsborough on Nambour Road, Qld; R 58441-44 - Yandina, Qld; R 58445 - 16.1 km from Mount Tambour, Qld; R 58446 - Tambourine Mountain, Qld; R 58447 - 12.9 km from Canungra on Nerang Road, Qld; R 58448 - 8.1 km south of Grafton, NSW; R 58460 - 18.5 km from Nymboida on Tyringham Road, NSW; R 58461 - Tooloom Falls, NSW; R 58468 - 6.4 km north of Glenreigh, NSW; R 58469 - Glens Creek, 38.6 km west of Grafton, NSW; R 58470-71 - Tooloom

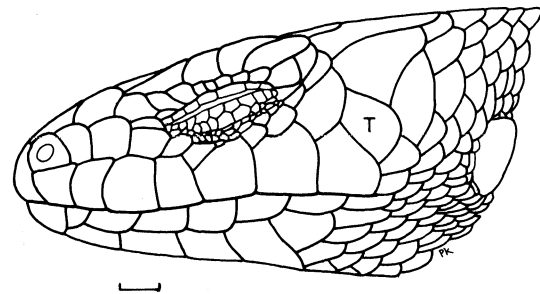
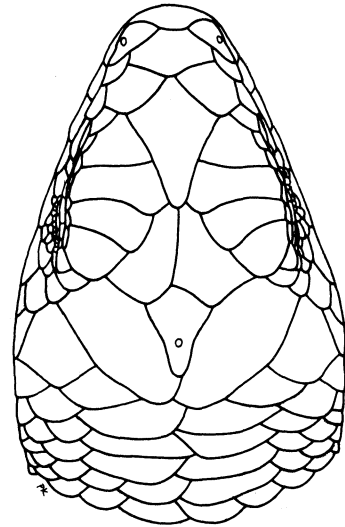


Fig.3. *Eulamprus martini* (AM R 86292). Note how the lower secondary temporal (T) overlaps the upper; compare Figures 7 and 11. Bar scale = 1 mm.

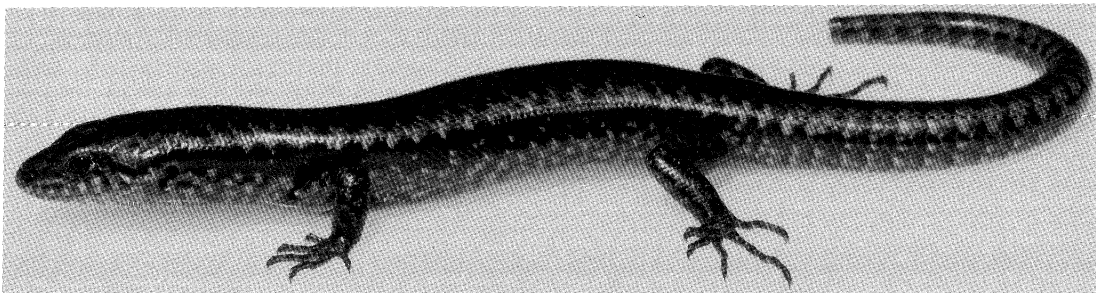


Fig.4. *Eulamprus martini* from Girard SF, north-north-west of Drake, NSW.

Falls, NSW; R 58472 - Battens Bight Creek, 41.8 km south of Casino, NSW; R 61597 - Conondale Range, Qld; R 61602 - Maleny, Qld; R 61603 - Boonoo Boonoo, NSW; R 61604 - Helidon, Qld; R 61605 - Jimna area, Qld; R 74027 - 18.5 km from Nymboida on Tyringham Road, NSW, R 86288-96 17.5 km south-west of Bolivia Post Office via New England Highway, NSW; R 86297-98 - Loop Lookout just north of Cougal, NSW; R 86299; 8.1 km west of Drake Post Office via Bruxner Highway, NSW; R 86300 - 30.0 km south of Whiporie by Road, NSW; R 86301-03 - Bowenja forestry office, Bowenja, Qld; R 92300 - 14 km north of Coffs Harbour

on Pacific Highway, NSW; R 96432 - 1 km west of Amiens, Qld; R 96438, 97167 - Wilsons Downfall, NSW; R 96833 - 250 m north of Lookout, Washpool Granite Preserve, NSW; R 96842-45 - Lookout area, Washpool Granite Preserve, NSW; R 96862, 96884, 96931 - 2.5 km north of Tin Ore Creek, north-west fire trail, Gibraltar Range NP, NSW; R 112291-92 - Bom Bom SF, NSW; R 113127 - Dyraaba Creek, 23 km west of Casino on road to Tenterfield, NSW; R 113359 - 1.0 km from Frenchville Road via Pilbeam Drive, base of Mount Archer, Rockhampton, Qld; R 114072-73 - approximately 22 km south-east of Tenterfield via Billyrimba Road, NSW; R 115531 - 20.0 km north-west Yangan, Qld; 116966 - Yabba SF, 3.9 km south of Urbenville, NSW (holotype of *S. martini*).

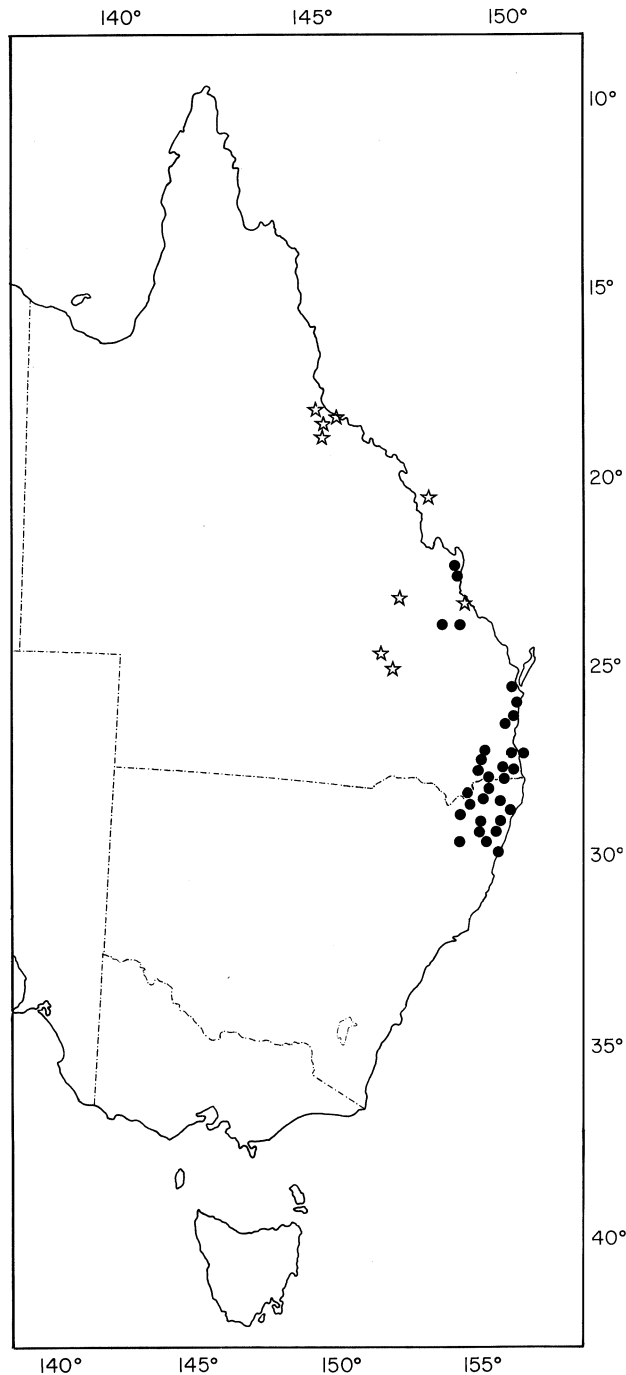


Fig.5. The distribution of *Eulamprus martini* (closed circles) and *E. sokosoma* (stars).

Queensland Museum (all localities in Queensland unless stated otherwise): J 1717-19, 1722-27, 1929 - Qld; J 1720 - Rockhampton; J 1809 - North Qld; J 1821 - North Qld; J 2420 - Brisbane district; J 2846 - Currumbin; J 2854 - Redbank Plains; J 4827, 17572 - Museum gardens, Brisbane; J 6578 - Annerley, Brisbane; J 7540 - Kangaroo Point, Brisbane; J 7924 - Qld Museum gardens; J 8107 - Eukey; J 8889-95 - Pyramid Creek, east of Wybera; J 10874 - Qld Museum, Brisbane; J 11044 - Acacia Ridge, Brisbane; J 11498 - Southport; J 12115 - 3 km north of Coulson; J 12116 - 7 km east of Coulson; J 12117 - Museum grounds, Brisbane; J 12118 - 6 km south of Ferndale; J 12120 - St Lucia, Brisbane; J 12121 - at top of Gwydir Highway, NSW; J 12122 - northern NSW; J 12127 - North Sydney, NSW; J 12128, 13926 - Wyberba; J 12129 - 5 km from Petrie, near Dohle's Rocks; J 12133, 12135-36 - Cedar Creek Falls, Mount Tamborine; J 12137 - 8 km east of Wyberba; J 13706 - Mount Roberts; J 13820 - NP; J 14140 - Mitchell River Mission, Magnificent Creek; J 14219-20 - Emu Vale; J 14248 - Swanfels; J 16792 - 1.6 km east of Tangalooma, Moreton Island; J 22181 - 10 km south-west of Point Lookout, N. Stradbroke Island; J 22312 - Mount Gravatt, Brisbane; J 22686 - Hamilton; J 23654 - Mount Cootha; J 23693 - Mount Glorious; J 24069 - Mount Nebo; J 25762 - The Lair, Limestone Ridge; J 29920 - Maleny; J 29939 - 3.2 km east of Lake Cookameera, Cooloola; J 30234 - near Missings Bridge, Tinana Creek; J 30544 - Upper Emu Creek at foot of Mount Superbus near Warwick; J 30771-72 - Jimna, Yabba Top Road; J 31523-25 - near Mount Flinders; J 31699 - Girraween NP; J 33969 - Hill 609, Homevale; J 34113 - Boonoo Boonoo Falls via Tenterfield, NSW; J 34963 - Turners Dip, near Picabeen, Tweed River Valley; J 35367 - 1.5 km south of "The Breadknife", Booloumba Creek, Conondale Ranges via Kenilworth; J 36932 - Conondale Range, Coonoon Gibber Creek; J 37181 - Rochdale SF; J 39301 - 36 km south of Gatton on Gatton - Warwick Road; J 39541-44 - Bauple SF via Gympie; J 39598 - Daisy Hill SF (R 215); J 40116, 40139 - Kroombit Tops (campsite 2nd causeway from logging huts on Ubobo Road); J 40135 - Kroombit Tops, approximately 1.5 km east of campsite); J 40136 - Kroombit Tops, northern escarpment, approximately 14 km north of logging huts; J 40357 - Girraween via Stanthorpe; J 41367 - Kelvin Grove; J 41553 - East Brisbane; J 42161, 47610 - Kroombit Tops; J 43955 - Upper Dry Creek, Kroombit Tops, 45 km south-south-west of Calliope; J 44287 - East Branch, Maranoa River near Warrang.

QNPWS (all localities in Queensland): RS 20 - Girraween NP; RS 59-60 Bauple SF; RS 80 - Harry Spring's Hut, Noosa River (near Lake Cootharaba); R 92 - Camp Milo, Cooloola SF; R 148 SF No. 958 Gundiah (part of Bauple SF); R 162 - Cunninghams Gap NP; R 192 - Burleigh Heads NP; R 250, 293 - Crows Nest NP; R 316 - Ravensbourne NP; R 370 -

Toolara SF; R 514, N 17110-11 - Girraween NP; N 17317 - Wilco Logging area, Bellthorpe SF; N 17320 - Sunday Creek SF; N 17666; Sandy Creek, Bellthorpe SF.

Diagnosis. Differs from all other members of the *Eulamprus tenuis* complex in the following combination of characters: upper secondary temporal overlapped by lower; paravertebral scales 55-64; nuchal area without dark midline streak.

Distribution. On the mainland from the Rockhampton–Yeppoon area in Queensland south to Coffs Harbour in New South Wales, inland as far as the Biloela area in Queensland and the area between Tenterfield and just north-east of Guyra in NSW; offshore known only from Moreton Island and North Stradbroke Island (Fig.5). The Sydney locality (QM J 12127) is assumed to be in error due to its grossly disjunct position.

Habitat. Vine thickets, open forest to woodland; also in clearings in these habitats. Probably only rarely, if ever, in closed forest. Occasionally on man-made structures (e.g., cement barbecue pits) and in houses (field notes associated with AM specimens; Czechura & Miles, 1983).

Habits. Arboreal and saxicolous, being found on logs and stumps and under exfoliating rock. Often out during the day.

Reproduction. Ovoviparous. The 23 ovigerous and gravid females found in the collections examined ranged 50 to 71 mm SVL (mean = 62.3; $sd = 4.52$) and had follicle number/litter sizes ranging 2 - 6 (mean = 3.5; $sd = 1.20$). There was no significant correlation between female size and follicle number and litter size

($r = .35$ NS).

Fifteen of the females, all with oviducal young, have dates of collection. Fourteen of these females came from south of 26°S; they were collected between 20 October and 6 February. The one female from north of 26°S (vicinity of Rockhampton) was collected 6 September. These data indicate that reproduction is coincident with summer at least in the southern part of the range but may begin earlier in the north.

Comparison with similar species. Only six skink taxa in Australia have the upper secondary temporal overlapped by the lower – some *Calyptotis* (*C. lepidorostrum*, *C. ruficauda*, *C. scutirostrum*), some *Coeranoscincus* (*C. frontalis*), *Ctenotus*, *Lerista*, *Notoscincus*, and two species of the *Eulamprus tenuis* complex (*E. martini*, *E. frerei*). The latter two species can be readily distinguished from the *Calyptotis* by their seven supralabials and two loreals versus six supralabials and one loreal; from the *Coeranoscincus* by their five digits instead of limblessness; from *Ctenotus* by their lack of well-developed auricular lobules, and from *Lerista* and *Notoscincus* by their scaly, as opposed to windowed or spectacled eyelids.

Eulamprus martini and *E. frerei* can be most readily distinguished by their paravertebral scale count (55-64 versus 69-74) and nuchal colour pattern (a series of paravertebral blotches versus a dark midline streak).

Eulamprus tenuis (Gray)

Fig.6

Tiliqua tenuis Gray, 1831: 71 (type locality - Australia; holotype - BMNH 1946.8.17.15).

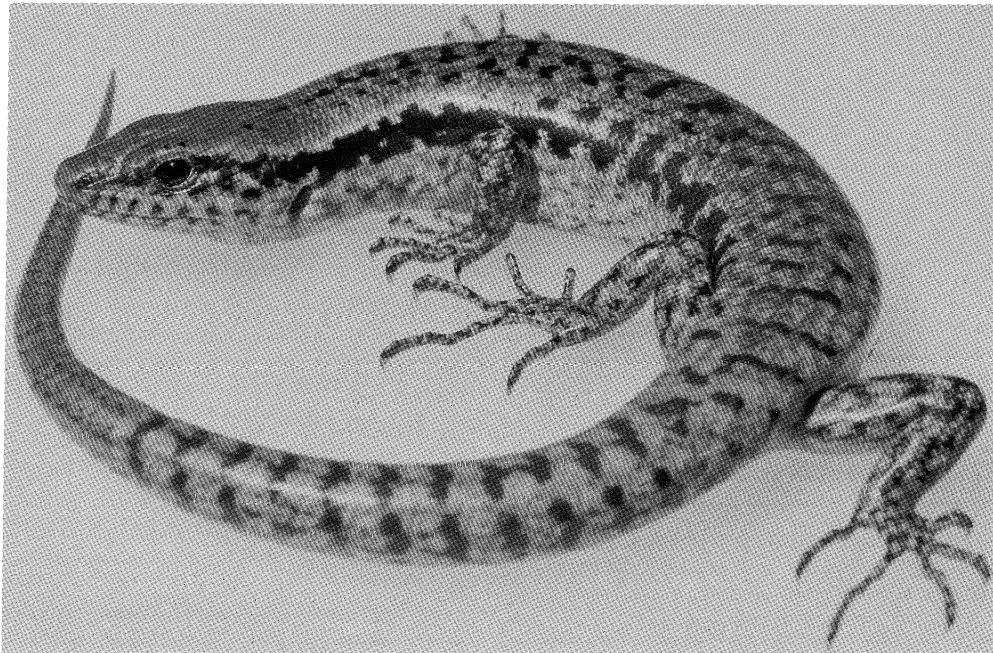


Fig.6. *Eulamprus tenuis* from Chichester State Forest, NSW.

Lygosoma erucata Duméril & Bibron, 1839: 726 (type locality - Australia; holotype - MNHP 7035).

Material examined. All localities are in New South Wales unless noted otherwise.

AM (all localities in NSW unless stated otherwise) R 1102 - Tumut; R 1135, 16115 - near Sydney; R 1911 - Penrith; R 2339 - Dobroyd; R 2999 - Hurstville; R 4001-02 - Guntawang; R 4003-5 - New South Wales; R 5955, 47200-05, 47209-11, 47214, 47217, 113126 - Sydney; R 6128, 47231 - Gerrigong; R 6279 - Gurravambi, near Macksville on Nambucca River; R 6471 - Clarence River; R 7253 - locality unknown; R 8391 - Hazelbrook; R 10930 - Canibewarea; R 11677 - Kaimkillenbrubru, Moola, Qld; R 14977 - Warrumbungle Mountains; R 15881 - Hammondville; R 19263 - Parramatta; R 19264 - Royal NP, Sydney; R 26014 - Connells Point, Georges River; 27359 - Childers District, Bundaberg, Qld; R 27556 - Baulkham Hills; R 27969, Hunters Hill; R 31823 - Watagan Mountains, Cessnock; R 32614 - Upper Allyn; R 41799 - Mosman; R 45303, 47218, 47220-22, 58119-20, 58122 - Earlwood; R 45807 - Balmoral; R 46046 - New Foundland SF, 16.1 km north of Woolgoolga; R 46050 - 8 km west of Douglas Park; R 47104 - Five Day Creek; R 47133 - 24 km north-east of Manilla-Retreat; 47206 - Silverwater, near Parramatta River; R 47207, 47213 - Greystanes; R 47208 - Pendle Hill; R 47212 - Baulkham Hills; R 47215 - Woronora Dam; R 47216 - Cremorne; R 47219 - Undercliff; R 47223 - Mosman; R 47230 - Mount Glorious, Qld; R 47652, 47663-65, 48102 - Bulburrin SF, Qld; R 47686, 47688-93, 48100 - Eurimbula via Miriam Vale (site 4A in rainforest survey); R 49865-67 - Lady Elliott Island, Qld; R 54280 - Murwillimbah; R 55548 - Milton; R 58118 - 2.4 km west of Putty Road on side road to Putty; R 58121 - 29 km south of Singleton on Putty Road; R 58123 - Neutral Bay; R 58431 - 2.4 km west of Appin; R 58452 - 7.4 km from Appin on Campbelltown Road; R 58453 - Three Rivers Station, Borambil; R 58454 - Elizabeth Bay, Sydney; R 58455 - near Asquith, Sydney; R 58456 - Concord, Sydney; R 58457-9, 58462, North Strathfield, Sydney; R 58460 - 18.5 km from Nymboida on Tyringham Road; R 58461 - Tooloom Falls; R 58463-64 Kilbride; R 58465, 58473; Warrabee, Sydney; R 58466 - O Bil Bil Creek, 16.1 km north-west of Mundubbera, Qld; R 58474 - Duffys Forest, Sydney; R 59995 - Austral; R 61593 - Conondale Range, Qld; R 61594-96 - Blackall Range, Qld; R 71977 - Doyalson; R 76040 - Castle Hill; R 80167 - Padstow Heights; R 81785 - Colou track from Putty Road; R 84988 - 2.3 km south-west of junction of Mosman and Boyne Roads, Bulburrin SF, Qld; R 86286-87 - 2.4 km west of Highway No. 69 along Putty Road; R 86358 - 11 km north of Wilberforce near Highway No. 69; R 93925, 103119 - Lower Portland; R 94968 - 8.7 km north, 9.5 km east of Bega; E 96444 - Mount Warning; R 96922 - Lionsville fire trail, 6 km north of the Sugarloaf, Washpool SF, R 97666 - 9.7 km north, 7 km east of Bega; R 98679 - Dundas (Sydney suburb); R 99457 - Bardwell Park; R 103171 - Waterfall; R 103220 - St Johns Park, 4.5 km west-north-west of Canley Vale; R 103221 - 6.5 km west of Fairfield; R 103330 - Warwick Farm, Sydney; R 103343 South Greystanes; R 104973 - Maroota SF; R 106546 - 2.5 km west-north-west of Castle Hill; R 106578 - 3 km north-east of Maraylya; R 106615 - Mumbulla SF, Bega; R 107249-50 - Gordon; R 107985 - Nepean Hall, Werombi Road, near Cobbitty; R 107988 - Rozell; R 111602 - Broken River, Eungella, Qld; R 111606 - Mount Glorious, Qld; R 115285 - Eungella, Qld; R 118639 - Gladesville, Sydney; R 120576 - Cape Hillsborough, Qld; R 130869 - Dome Mount area,

Yabba SF; R 130874 - Cambridge Plateau Flora Reserve, Richmond Range SF; R 130913 - Yabba SF

MNHP 7035 - Australia (holotype of *Lygosoma erucata*).

QM (all localities in Queensland unless stated otherwise): J1721 - South Ladevak ?; J 1728 - Qld; J 1808 - North Qld; J 2210 - Eidsvold; J 3028-29, 12119, 35398 - Mount Tamborine; J 3890 - Holbourne Island; J 4148 - Botanic Gardens, Rockhampton; J 4149 - Rockhampton; J 6233, 7926-27, 86301-31, 9598 - Brisbane; J 7925 - gardens, Brisbane; 8630-31, J 10527 - Toowoomba; J 12123-24 - Lady Elliott Island; J 12125 - 16 km south of Maryborough; J 12126 - North Sydney, NSW; J 12131-32 - Balmain, Sydney, NSW; J 15605 - Cordalba SF, 40 km south-west of Bundaberg; J 15879 - Muscum gardens, Brisbane; J 17573 - Muscum building, Brisbane; J 21998 - Mount Condeaux; J 23699 - Mount Glorious; J 23809 - SF 67, Bulburrin, via Lowmead; J 23827 - 3.5 km north of Lowmead; J 24073 - Dunwich, North Stradbroke Island; J 27306 - Maleny; J 27389-90 - Cooloola NP via Gympie; J 27728 - Cold Creek, via Imbil; J 27733 - Dingo Creek, via Traveston; J 27743 - Marys Creek, via Gympie; J 27756 - top of Blackbutt Range, Benarkin; J 28250, 28307 - Cooyar/Maidenwell Road; J 28357-58; 33624, 33632-33634 - Bulburrin SF; J 28790 - Hinchinbrook Island; J 30773 - Jimna, Yabba Top Road; J 31307 - Burnett Range via Tansey; J 31698 - Finch Hatton Gorge, Eungella NP; J 31844 - Glastonbury near Gympie; J 33603, 33677-78, 33680, 33696 - Site 1 A, Bulburrin SF; J 33625, 33633 - Bulburrin SF; J 33772 - adjoining site 5, Rundle Range; J 34067, 34074, 34083 - adjoining site 9, Finch Hatton NP J 34091 - site 9A, Finch Hatton, NP; J 34126 - 8.1 km north of Toowoomba; J 34302-04 - Mimosa Creek, Blackdown Tableland via Dingo; J 34323 - Qld Museum; J 35126 - SF, 1 km south of Broken River NP; J 35268 - Burgawan Minesite No. 13, east of Howard; J 35269, 35276 - Ferguson SF via Maryborough; J 35293 - Dundowran; J 36062 - Kauri Creek Inlet via Gympie; J 38621 - Nathan Gorge; J 38680 - "The Battery" via Glenhaughton; J 39106 - Churchill Mine Road, Maryborough; J 39183 - south-west end of Goodnight Scrub; J 39608-09 - Kroombit Tops SF, 30 km west-south-west of Nagoorin via Monto; J 39986, 39994 - Eurimbulah Beach, 32 km north-east of Miriamvale; J 41540 - Pine Creek Timber Reserve (102), south of "Turkey", Miriam Vale; J 42130 - Kroombit Tops, Upper Dry Creek; J 42194 - Worthington Creek, via Turkey Station via Miriamvale; J 46174 - Eungella schoolhouse.

QNPWS: R 161 - Cunninghams Gap NP; R 344-45 - Toolara SF (between Gympie and Tin Can Bay); R 379 - Girraween NP; N 11123 - Broken River, Eungella NP; N 11218 - Collaroy Pastoral Holding (south of Sarina); N 15899 - Eungella NP; N 17673 - Finch Hatton Gorge, Eungella NP.

Diagnosis. Differs from all other members of the *Eulamprus tenuis* complex in the following combination of characters: upper secondary temporal overlaps lower; transversely enlarged nuchals 0-4, mode 2; subdigital lamellae fourth toe 22-27; nuchal area often with dark midline streak.

Distribution. From Holbourne Island and the Eungella region in central eastern Queensland south to just north-east of Bega (Lunney & Barker, 1986) in south-eastern New South Wales; inland as far as the Warrumbungles and off the coast on Lady Elliott Island (Fig.9).

Habitat. Associated with forest in northern part of range (Czechura & Miles, 1983) and with woodland in southern part (personal observation); commensal of humans in some areas.

Habits. Arboreal and saxicolous; diurnal, crepuscular, and nocturnal; heliothermic but usually only in filtered or patchy sunlight.

Reproduction. Ovoviviparous. Females carrying yolking follicles or developing oviducal young range 70 to 84 mm (mean = 76.8; $sd = 3.82$; $N = 15$) SVL. Those with countable eggs or young range 70 to 84 mm (mean = 77.2; $sd = 3.75$; $N = 13$) and have litter sizes three to seven (mean = 5.4; $sd = 1.39$); there is no significant correlation between female size and follicle number/litter size in these females ($r = -0.14NS$).

Dates of collection are available for 11 gravid females collected in the area from Sydney to Brisbane. Four of these females have enlarged yolking follicles and were collected in the period late August to January. The one January animal, which represents a late date, was from the southernmost locality, Sydney. The remaining seven females carry developing young. These females were collected in the period September to late December. The one September animal, which represents an early date, is from the northernmost locality, Brisbane.

Variation. Some individuals in the relatively dense population in and around Taronga Park Zoo in Sydney are light brown to beige with little or no indication of pattern. They are indistinguishable morphologically from normally patterned individuals.

***Eulamprus sokosoma* n.sp.**

Figs 7-8

Type material. HOLOTYPE, QM J 27702 - Hencamp Creek,

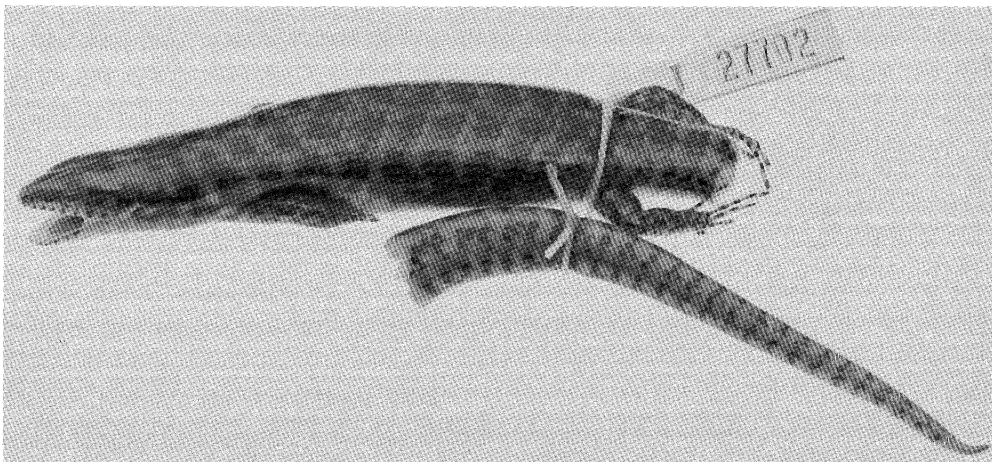


Fig.8. *Eulamprus sokosoma* (holotype QM J 27702) from Hencamp Creek 5 km north, 1 km east of Rollingstone, Qld.

5 km north, 1 km east of Rollingstone, Qld, 30 May 1976, F. Parker.

PARATYPES (all localities are in Queensland): AM R 49858 - Bailey Islet; R 49859, 49861 - Bay Rock, near Townsville; R 61601 - Arcadia Valley via Injune; R 86304-16, 113882-83 - 29.1 km west-south-west of Ross River Road

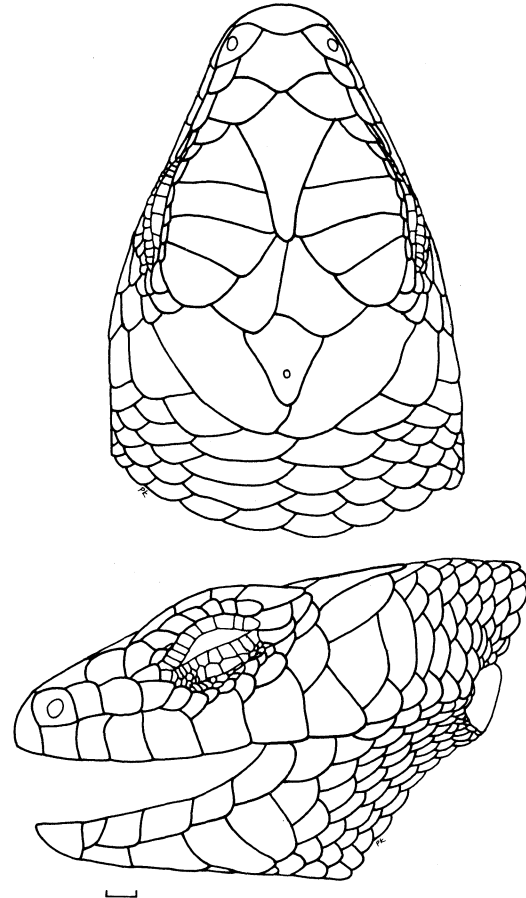


Fig.7. *Eulamprus sokosoma* n.sp. (AM R 86309) from the eastern slopes of the Harvey Range just west of Townsville, Qld. Bar scale = 1 mm.

(Townsville) via Harvey Range Road.

QM J 15668 - Yebna Station, 80 km east of Injune; J 25915 - Arcadia Valley via Injune; J 27622-23 - Hervey Range, 10 km south, 35 km west of Townsville; J 33843 - site 5A, Rundle Range; J 34209 - halfway up Blackdown Tableland escarpment, via Dingo; J 42506 - Many Peaks Ridge, Townsville Common; J 42513 - Blue Water Range, north of Townsville; J 42516-17 - Hervey Range west of Townsville; J 42526 - Fanning River Caves near Mingela.

QNPWS N 1787 - Taravale Road (behind Mount Spec NP); N 36821 - Hoven's Hole Cave entrance, Fanning River

Station.

Diagnosis. Differs from all other members of the *Eulamprus tenuis* complex in the following combination of characters: upper secondary temporal overlaps lower; transversely enlarged nuchal scales total 2-8, mode 4; subdigital lamellae (fourth toe) 19-23; nuchal area without dark midline streak; midbody scale rows 32-38.

Distribution. Known only from scattered localities in central eastern Queensland between the Townsville area in the north and the Injune area in the south (Fig.5).

Habitat. Closed vine thickets along east-facing gullies (Harvey Range).

Habits. Arboreal and saxicolous; retreating into crevices; diurnal; heliothermic in filtered or patchy sunlight.

Reproduction. Ovoviviparous. None of the three females (SVL = 52, 77 and 78 mm) collected 16 May 1976 at the Harvey Range locality were reproductively active but the two (SVL = 71-72 mm) collected here on 30 September 1985 carried, in one case, yolking follicles (too mashed to count) and in the other, four developing, oviducal young. These data indicate that female reproduction is curtailed during the mid-dry season but recommences toward the end of the dry season.

Details of holotype (QM J 27702). prefrontals narrowly separated; supraciliaries 8/8; presuboculars 2/2; supralabials 7/7, fifth subocular on both sides; nuchals 3/3 = 6; infralabials 6/6; longitudinal scale rows at midbody 32; paravertebral scales 62; subdigital lamellae on fourth toe 19/19; SVL 74mm; front limb length 19 mm; hind limb length 26 mm; tail length 87 mm of which 7 mm is regenerated; sex female.

Comparison with similar species. See comments under this section in the *Eulamprus brachysoma* account.

Etymology. From the Greek for stout (*sokos*) and body (*soma*) and alluding to the characteristically robust body of the species.

Eulamprus frerei n.sp.

Figs 10-11

Type material. HOLOTYPE, QM J 47985 - summit of Mount Bartle-Frere, Qld, J. Covacevich, 27 Oct. 1987. PARATYPE, QM J 39531 - Mount Bartle-Frere summit, Qld.

Diagnosis. Differs from all other members of the

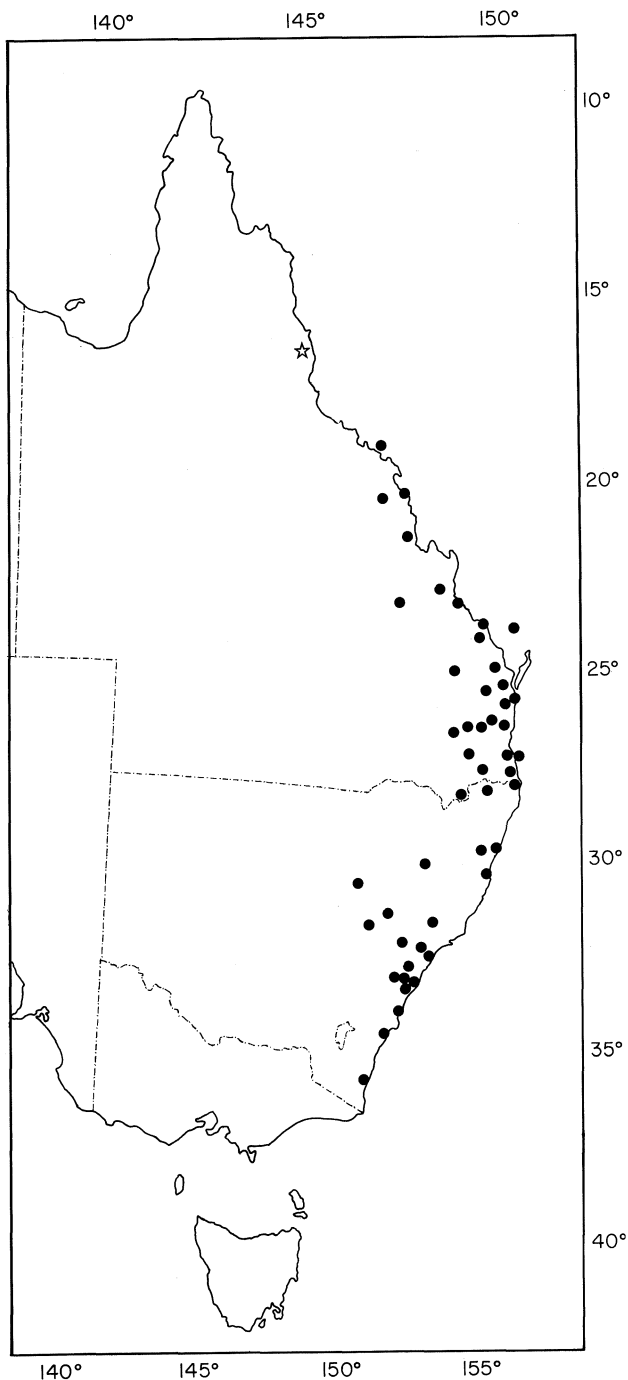


Fig.9. The distribution of *Eulamprus tenuis* (closed circles) and *E. frerei* (star).

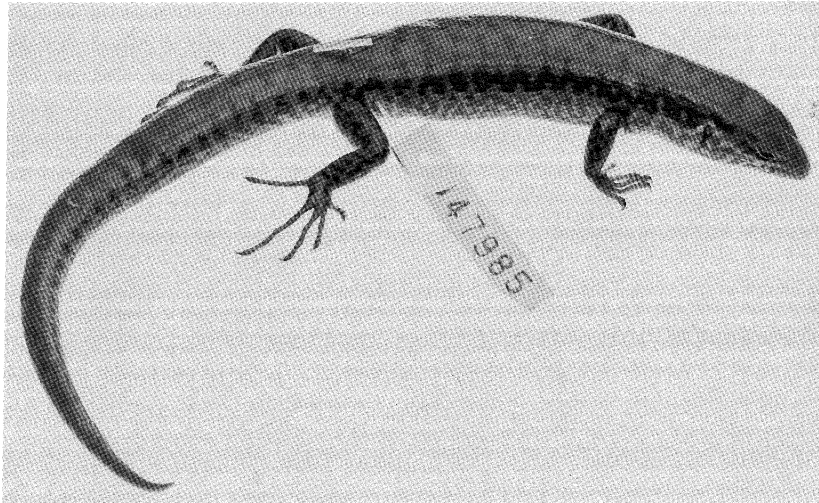


Fig.10. *Eulamprus frerei* n.sp. (holotype, QM J 47985) from Mount Bartle-Frere, Qld.

Eulamprus tenuis complex in having the upper secondary temporal overlapped by the lower and 69-74 paravertebral scales. The species also differs from all other members of the *E. tenuis* complex in having the dorsum uniform brown with contrasting finger-like crossbands from the dark brown to black dorsolateral stripe broken into mid-dorsal bands (holotype) or spots (paratype); other species have the dorsum grey to light brown with a series of dark bands along the paravertebral area or a more general dark mottling (Fig.10). It also seems to differ from other members of the *E. tenuis* complex in having the subdigital lamellae only lightly pigmented instead of usually heavily pigmented.

Distribution. Known only from the summit of Mount Bartle-Frere (Fig.9).

Habitat. The summit of Mount Bartle-Frere consists of large fields of granite boulders surrounded by dense rainforest; the area is cool to cold throughout the year and is frequently covered in mist (Covacevich, 1984).

Habits. The holotype was collected from the crevice of a dead tree at 1000 hours.

Reproduction. Nothing known.

Comment. This is the second apparent endemic to the summit of Bartle-Frere, the other being *Leiolopisma jigurru* Covacevich, 1984. These two species, along with *Calyptotis thorntonensis* from the top of Thornton Peak in north-eastern Queensland and *Pseudemoia palfreymani* from the island of Pedra Branca south of Tasmania, are the four most geographically restricted lizards in Australia.

Details of holotype (QM J 47985). Prefrontals slightly separated; supraciliaries 8/8; presuboculars 2/2;

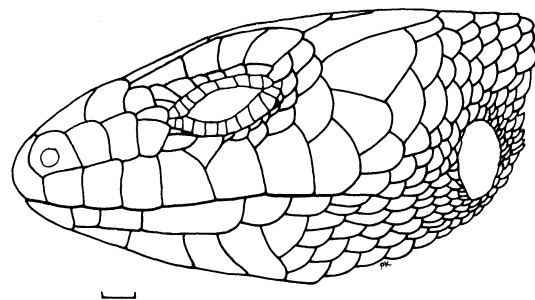
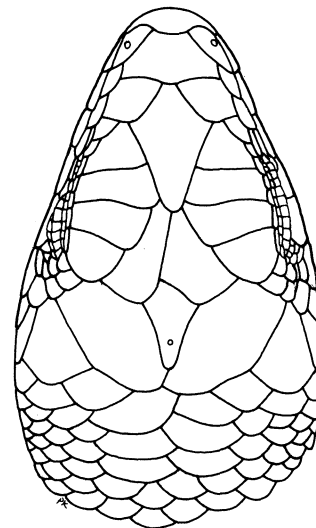


Fig.11. *Eulamprus frerei* n.sp. (holotype, QM J 47985) from Mount Bartle-Frere, Qld. Bar scale = 1 mm.

supralabials 7/7, 5th subocular on both sides; infralabials 6/6; subdigital lamellae on fourth toe 27/25; SVL 66 mm; front limb length 21 mm; hind limb length 30.5 mm; tail length 82 mm (tip only regenerated?); sex male.

Comparison with similar species. See this section under *Eulamprus martini*.

Etymology. Named after the type and only known locality of the species.

Comments on the Distribution of the Species in the *Eulamprus tenuis* Complex

All the species in the *Eulamprus tenuis* complex have the main parts of their contiguous distributions close to the mesic east coast (Figs 2, 5, 9). Inland populations are usually isolated and associated with slightly uplifted or dissected terrain where there are likely to be local pockets of more mesic habitat. Presumably these inland populations are relicts of a more generally mesic time in the past.

Although there is potential for several species to occur in broad sympatry, e.g., *Eulamprus brachysoma* and *E. sokosoma* in north-eastern Queensland; *E. brachysoma*, *E. martini* and *E. tenuis* in south-eastern Queensland; and *E. martini* and *E. tenuis* in far south-eastern Queensland and north-eastern New South Wales. The only records to date of local sympatry are for *E. martini* and *E. tenuis* in far south-eastern Queensland (Czechura & Miles, 1983). Here *E. martini* (as *E. brachysoma*, G. Czechura, *in litt.*) inhabits open forest and woodland whereas *E. tenuis* occupies dense eucalypt forest and rainforest.

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Table 1. Mensural and meristic characters for *Eulamprus tenuis* and the four species most similar to it. The species are ordered from left to right by increasing maximum size.

| Character | <i>E. frerei</i> | <i>E. martini</i> | <i>E. brachysoma</i> | <i>E. sokosoma</i> | <i>E. tenuis</i> |
|----------------------|------------------|-------------------|----------------------|--------------------|------------------|
| Midbody scale rows | | | | | |
| Range | 32-35 | 28-32 | 28-32 | 32-38 | 28-32 |
| Mean | 33.5 | 29.5 | 30.4 | 35.1 | 30.1 |
| SD | – | 1.19 | 1.25 | 1.48 | 1.07 |
| N | 2 | 20 | 25 | 30 | 31 |
| Paravertebral scales | | | | | |
| Range | 69-74 | 55-64 | 56-67 | 59-72 | 61-69 |
| Mean | 71.5 | 58.6 | 60.5 | 66.6 | 65.1 |
| SD | – | 2.80 | 2.98 | 3.50 | 3.11 |
| N | 2 | 17 | 20 | 30 | 12 |
| Subdigital lamellae | | | | | |
| Range | 24-27 | 18-24 | 17-23 | 19-23 | 22-27 |
| Mean | 25.5 | 20.7 | 20.0 | 21.1 | 23.6 |
| SD | – | 1.35 | 1.39 | 1.14 | 1.41 |
| N | 2 | 21 | 28 | 30 | 31 |
| SVL (mm) | | | | | |
| Range | 66 | 23-71 | 26-74 | 52-79 | 30-86 |
| N | 2 | 120 | 78 | 30 | 82 |
| TL/SVL (%) | | | | | |
| Range | – | 123-171 | 121-151 | – | 110-146 |
| N | 2 | 23 | 7 | 30 | 10 |
| Nuchals (total) | | | | | |
| Range | 6-7 | 0-8 | 2-10 | 2-8 | 0-4 |
| Mean | 6.5 | 5.2 | 6.0 | 4.7 | 2.2 |
| Mode | 6/7 | 6 | 6 | 4 | 2 |
| N | 2 | 61 | 66 | 27 | 59 |
| Premaxillary teeth | | | | | |
| 9 | – | 2 | 6 | 4 | 5 |
| 8 | 1 | 2 | 1 | – | – |
| 7 | – | 5 | – | – | – |
| Vomers (N) | | | | | |
| distinct | – | 10 | 5 | 2 | – |
| fused | 1 | – | – | – | 4 |