A NEW SPECIES OF SCINCID LIZARD RELATED TO *LEIOLOPISMA ENTRECASTEAUXII*, FROM SOUTHEASTERN AUSTRALIA

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Summary

HUTCHINSON, M. N. & DONNELLAN, S. C. (1988) A new species of scincid lizard related to *Leiolopisma entrecasteauxii*, from southeastern Australia. *Trans. R. Soc. S. Aust.* **112**, 143-151, 30 November, 1988.

A scincid lizard, *Leiolopisma rawlinsoni* sp. nov., is described from southeastern Australia. It is confined to swampy habitats from sea level to subalpine elevations and is rare in collections. The new species belongs to the *L. baudini* species-complex, which also includes two other eastern species, *L. entrecastreauxii* Groups 1 and 2 (Donnellan & Hutchinson in press) and a southwestern species, *L. baudini* Greer, 1982.

KEY WORDS: Taxonomy, species-complex, *Leiolopisma*, Scincidae, Reptilia, distribution, ecology.

Introduction

Donnellan & Hutchinson (in press), using allozyme electrophoresis, showed that the eastern Australian skinks identified as *Leiolopisma entrecasteauxii* (Duméril & Bibron, 1839) included at least three distinct biological species. Morphological features appeared to correlate with the biochemical markers, and both the morphology and biochemistry suggested that the common ancestor of the three species had initially diverged into two entities. One consisted of a pair of species (*L. entrecasteauxii* Groups 1 and 2), between which morphological and electrophoretic divergence was slight, but which differed appreciably (five fixed genetic differences) from the third species (*L. entrecasteauxii* Group 3). Studies by Hutchinson & Donnellan (in prep.) indicate that the name *entrecasteauxii* belongs to one of the two closely related species; which one is still uncertain because of the overlap in morphological characters between Groups 1 and 2 plus the poor state of preservation of the type specimens. The morphology of the Group 3 skinks, particularly the light dorsolateral line centred on scale row 3, makes it clear that none of the available names presently synonymized with *L. entrecasteauxii* applies to these specimens, so that a new name is required for them.

The new species is especially similar in some respects to *L. baudini* of Western Australia. *L. baudini* was described from a single specimen which showed several scalation and colour pattern differences from *L. entrecasteauxii (s.l.)*, although it strongly resembled the eastern "species" and was regarded as its closest relative (Greer 1982). Since the holotype description was published, further specimens of *L. baudini* have been collected and work in progress (Hutchinson & Donnellan in prep.) will provide data on variation within this species. *L. baudini* and the new species share higher supraciliary and lower midbody scale row counts than are seen in *L. entrecasteauxii* Groups 1 and 2, but differ from each other in several other scalation and colour pattern features.

The new species, *L. baudini* and the two eastern species included in *L. entrecasteauxii (s.l.)* form a closely related group of species which we term the *L. baudini* species-complex.

Materials and Methods

Definition of head shields and methods for making scale counts follow Greer (1982). The positions of the longitudinal stripes are also as described by Greer, in terms of their position on one or more longitudinal scale rows. Scale rows are numbered on each side starting from the paravertebral row as row 1 and proceeding laterally. Scalation features occurring bilaterally, such as supraciliaries, upper and lower labials, presuboculars and subdigital lamellae, were counted on both sides, and mean and modal values therefore refer to the overall values for both sides. Measurements of preserved specimens were made using a steel ruler graduated to 0.5 mm. Snout-vent lengths (SVL) were measured to the nearest 1.0 mm, as were tail lengths (TL), while forelimb length (FLL) and hind limb length (HLL) were measured to the nearest 0.5 mm. Eye, palpebral disc and ear diameters were measured using a calibrated microscope eyepiece to the nearest 0.1 mm.

Females with snout-vent lengths equal to or longer than that of the smallest female in the population containing oviducal eggs or embryos were assumed to be sexually mature. Sexual maturity in males was judged by the presence of enlarged testes.

The following collections included specimens of the new species, or provided comparative material of the other species in the complex. Institutional abbreviations follow Leviton *et al.* (1985): Australian Museum, Sydney (AMS); Australian National

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† South Australian Museum, North Terrace, Adelaide, S. Aust. 5000.

Wildlife Collection, Canberra (ANWC); Author's collection, La Trobe University (MNH); Museum of Victoria, Melbourne (NMV); Queen Victoria Museum, Launceston (QVMT); South Australian Museum, Adelaide (SAMA); Tasmanian Museum, Hobart (TMH); Western Australian Museum, Perth (WAM).

TAXONOMY

The *Leiolopisma baudini* species-complex

The term "species-complex" is used here for the first time in relation to these lizards, although Greer (1982) had already pointed out some of the similarities which suggested a close relationship between *L. baudini* and the eastern species then known as *L. entrecasteauxii*. The complex consists of at least four species (Donnellan & Hutchinson in press), all members of the Australian viviparous *Leiolopisma* radiation (Greer 1982; Hutchinson *et al.* 1988).

The *L. baudini* species-complex belongs to the *Eugongylus* subgroup of the *Eugongylus* group (Greer 1979) within the subfamily Lygosominae, and has nine of the ten character states outlined by Greer (1979) as being diagnostic for the *Eugongylus* subgroup. The only exception to this concerns the palate, which varies between the typically alpha condition, with smoothly diverging medial margins of the pterygoids, to one with a marked development of posteromedially directed processes similar to the beta palate condition of the *Lampropholis* subgroup (MNH pers. obs.). *Leiolopisma* is a "grade" group of generalized, window-eyed *Eugongylus* group species. It is not demonstrably a natural group and is in need of revision. We use Greer's (1974) concept of *Leiolopisma* as modified by Sadlier (1986), differing from the latter author only in that, currently, we include *Pseudemoia* (*sensu* Rawlinson 1974b) within *Leiolopisma*.

Content: Leiolopisma baudini Greer, 1982; *L. entrecasteauxii* Group 1; *L. entrecasteauxii* Group 2; *L. rawlinsoni sp. nov.* It should be noted that Group 1 and Group 2 (Donnellan & Hutchinson in press) are assemblages which only partly correspond to the division of this species into Forms A and B (Pengilley 1972)[1].

Characteristics of the *L. baudini* species-complex

In inferring the evolutionary polarity of the character states discussed below, outgroup comparison, using the other Australian *Eugongylus* group taxa as the outgroup, has been the method used to identify plesiomorphic character states.

[1]PENGILLEY, R. (1972) Systematic relationships and ecology of some lygosomine lizards from southeastern Australia. Unpub. PhD thesis, Dept of Zoology, Australian National University, Canberra.

Within the *Eugongylus* subgroup, the *L. baudini* species-complex is characterized by the following combination of primitive and derived character states: a relatively deep, blunt head and a relatively deep body with moderate limbs (hind limb normally 30% to 40% of snout-vent length); paired fronto-parietals and distinct interparietal; supranasals and postnasals present or absent; large to moderately small midbody scales (in 23–36 rows); a very large transparent disc (diameter > 50% of eye diameter) in the moveable lower eyelid; upper temporal fenestra closed; 30 or fewer presacral vertebrae. The species are sexually dichromatic, with males developing areas of red pigmentation, and three (no data available for *L. baudini*) are viviparous.

Of these, four are synapomorphies: viviparity, a large palpebral disc, a closed upper temporal fenestra and sexual dichromatism. These four in combination are unique within the *Eugongylus* group, implying that the *L. baudini* species-complex is not only readily defined but also monophyletic.

Derived character states of the L. baudini *species-complex*

Large palpebral disc: A transparent palpebral disc is present in most *Eugongylus* group taxa. It is usually moderately sized, with a diameter about 40% of the eye length. In the *L. baudini* species-complex, the disc is markedly larger, 50–60% of the eye diameter. This large disc appears to be apomorphic with respect to the smaller disc seen in other taxa with movable eyelids, but plesiomorphic (and possibly immediately ancestral to) the state seen in ablepharine genera such as *Morethia* and *Cryptoblepharus*.

Dichromatism: Greer (1980, 1982) has commented on the presence of areas of red colouring present in some Australian *Leiolopisma* and related genera. In the *L. baudini* species-complex, as in some, but not all, of the other taxa with red pigmentation, the colour is limited to males. This sexual dichromatism reaches its most vivid development in late summer-autumn, when testis size is at a maximum and mating occurs. Whether the presence or absence of red pigment *per se* is plesiomorphic or apomorphic in the *Eugongylus* group is not clear. However, sexual dichromatism is relatively rare in this group of skinks and is probably apomorphic.

Viviparity: By far the most common mode of reproduction in the *Eugongylus* group is oviparity, and this is no doubt the plesiomorphic condition. Viviparity occurs only in some *Leiolopisma* species in Australia (Greer 1982), and in most *Leiolopisma* and all *Cyclodina* in New Zealand (Hardy 1977). Viviparity is therefore an apomorphic character state in the *L. baudini* species-complex. The

reproductive mode of *L. baudini* is not yet known. However, it appears to mate in autumn, as evidenced by enlarged testis size in males and fresh bite scars around the chest and shoulder area of females, and autumn mating is a characteristic of viviparous skinks in southeastern Australia (Smyth 1968; Rawlinson 1974a).

Upper temporal fenestra: This opening in the skull roof, bordered by the parietal and postfrontal in the *Eugongylus* group, is a plesiomorphy in skinks. The opening, when present, is reduced in the *Eugongylus* group, and in many taxa it is completely obliterated or no more than a pinhole. This apomorphic condition (completely closed or almost so) is present in the *L. baudini* species-complex.

Leiolopisma rawlinsoni sp. nov.
FIGS 1-4

Lygosoma (Liolepisma) entrecasteauxii (part) Lucas & Frost (1894).

Leiolopisma entrecasteauxii (part) Rawlinson (1967, 1971, 1975); Spellerberg (1972); Cogger (1975); Greer (1982); Cogger *et al.* (1983).

Leiolopisma entrecasteauxii Form A (part) Jenkins & Bartell (1980). [designation *ex* Pengilley (1972)[1]].

Leiolopisma entrecasteauxii Group 3 Donnellan & Hutchinson (in press).

Holotype: NMV D55450. Adult male. Mouth of Bunyip River (Main Drain) (38° 13' S; 145° 26' E), 6.5 km E Tooradin, Vic. Collected by P. Robertson on 21.vi.1981).

Diagnosis: Member of the *L. baudini* species-complex, characterized by strongly striped colour pattern completely lacking lighter or darker dorsal, lateral or caudal speckling, light dorsolateral line on scale row 3, and having dorsal and head scales with highly glossy surface.

Generally distinguished from other eastern species in complex (*L. entrecasteauxii* Groups 1 and 2) by position of light dorsolateral stripe on scale row 3 (rather than row 4, or 3 + 4), in normally having 6, rather than 5, supraciliaries, and by having fewer rows of midbody scales (mode 26, rather than 30). Most similar in these respects to *L. baudini* (*sensu* Hutchinson & Donnellan in prep.), from which it is distinguished by lacking partial or complete supranasal or postnasal scales and any trace of light dorsal or caudal flecks, and by mid-lateral white stripe continuing clear and straight-edged from groin to side of head, rather than becoming vague and wavy-edged anterior to axilla. Also distinguished from *L. baudini* by highly glossed dorsal scales, by having fewer subdigital lamellae (17–23, mean 19.0, versus 20–25, mean 22.3) and higher paravertebral scale counts (in males, 57–63, mean 59.6, versus 50–58, mean 54.1; in females 57–65, mean 62.2, versus 53–60, mean 57.6), and by its strict preference for densely vegetated swampy habitats.

Etymology: Named after Peter A. Rawlinson, Department of Zoology, La Trobe University, in recognition of his studies of the scincid lizard fauna of southeastern Australia.

Description of holotype: Moderate-sized with pentadactyl limbs overlapping when adpressed, snout relatively blunt, head and body deep and squarish in cross-section, and colour pattern

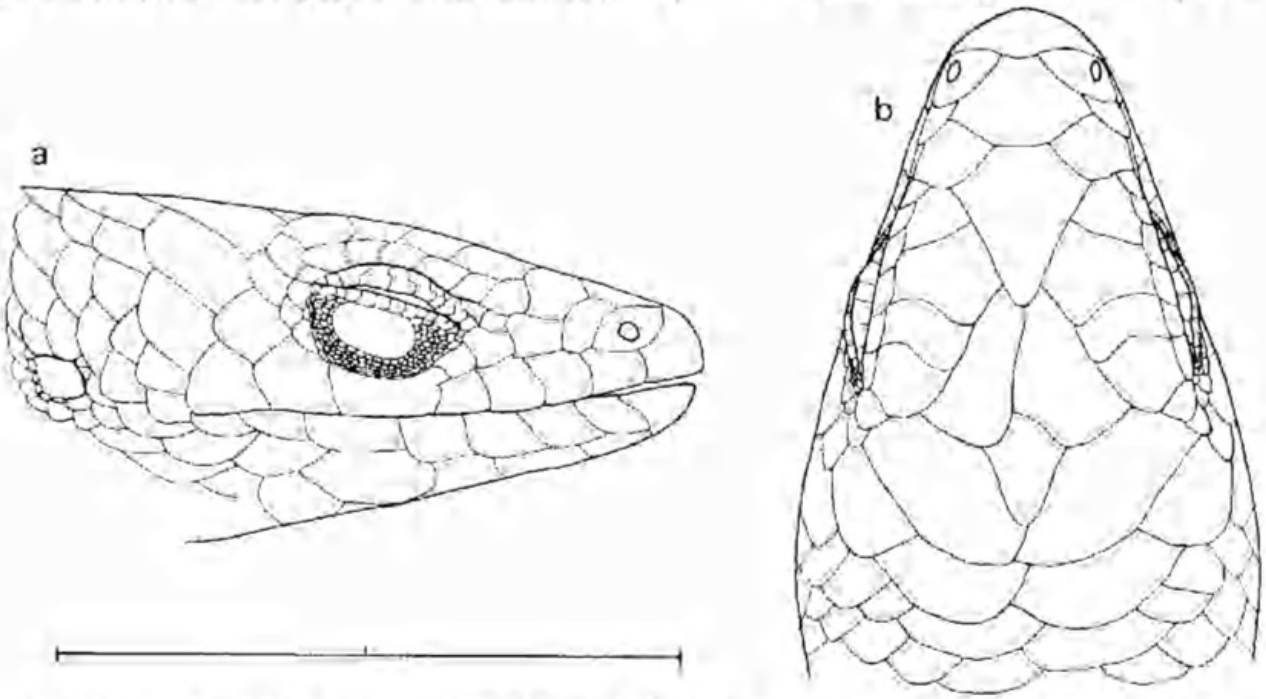

FIG 1. Holotype of *Leiolopisma rawlinsoni* sp. nov. (NMV D55450). Head scalation in (a) right lateral and (b) dorsal view. Scale bar = 10 mm.

consisting solely of longitudinal dark and light stripes. Hemipenis columnar (Greer 1979) not deeply bifurcated. Iris paler than pupil.

Midbody scales in 26 rows. Dorsal scales with three moderately strong keels, lateral scales more weakly tricarinate, trailing edges of dorsal and lateral scales angularly three-sided rather than smoothly rounded. Paravertebral scales 60. Mid-ventral scales (mental to preanal inclusive) 63. Preanals 10, median four distinctly enlarged. Palmar and plantar tubercles rounded. Subdigital lamellae smooth, undivided, 20 under fourth toe. Dorsal surface of digits covered by single row of scales. No trace of supranasals or postnasals. Width of rostral-frontonasal suture less than half width of frontonasal. Prefrontals well separated; frontal contacting frontonasal. Supraoculars 4, second largest; first and second contacting frontal. Frontoparietals paired. Interparietal distinct, almost as large as a frontoparietal. Parietals large, in contact behind interparietal. Each parietal bordered posterolaterally by upper secondary temporal and enlarged nuchal. Supraciliaries 6. Loreals 2, anterior taller than broad, posterior squarish. Preoculars 2, lower largest and undivided. One presubocular. Upper ciliaries 9, lower ciliaries 13. Large transparent disc in lower eyelid, bordered above by 4 (left) or 5 (right) lower ciliaries. Upper labials 7, fifth subocular. One primary and two secondary temporals. Lower labials 7. Postmental contacting first and second lower labials. Ear opening subcircular, without enlarged lobules.

Dimensions: SVL 53 mm, TL 91 mm (distal half regenerated), FLL 13.0 mm (25% of SVL), HLL 20.5 mm (39% of SVL). Head width 7.4 mm (14% of SVL). Length of eye 2.4 mm. Length of palpebral disc 1.4 mm (58% of eye length). Maximum diameter of ear opening 0.9 mm (38% of eye length).

Colour (in preservative): Dorsal surface of head, back, tail and limbs medium greyish olive. Straight-edged black vertebral stripe occupying medial third of two paravertebral scale rows (row 1 on each side), fading anteriorly on nuchal scales and posteriorly about 20 mm on to base of tail. Prominent, straight-edged white dorsolateral stripe along middle of scale row 3 on each side, bordered by black lines; stripe fading anteriorly to level of ear but still visible on head behind supraciliary scales. Clear white midlateral stripe, bordered by narrow black lines, along scale row 6 (intruding slightly on to row 5) from posterior margin of ear opening, above axilla to base of hind leg. Pale dorsolateral and pale midlateral stripes extending well on to tail, becoming progressively less well defined; upper lateral zone between these stripes dark brown, colour extending forward over temporals to eye, where it narrows and continues as dark loreal streak to naris. White midlateral stripe extending forward as thinner white line from upper margin of ear opening along upper labials to below eye. No trace of darker or lighter speckling on dorsal or lateral patterns. Top of head unmarked except for few dark smudges on supraoculars. Upper surfaces of limbs with dark flecks arranged longitudinally, forming weak lines. Lower cheeks and sides of neck weakly marbled with grey, otherwise ventral surfaces immaculate silvery white. Palmar and plantar surfaces and basal subdigital lamellae grey-white; distal subdigital lamellae brown.

Variation

Paratypes: AUSTRALIAN CAPITAL TERRITORY. (ANWC). R2980, Picadilly Circus. (NMV). D38218, Mt Ginini; D59874, Ginini Flats.

NEW SOUTH WALES. (NMV). D36966, 16 km N of Tin Mine Hut; D59873, Smiggin Holes; D59875-76, Round Mountain; D60875-76, Danlers Gap, Kosciusko National Park; D60873-74, Tooma Reservoir, Kosciusko National Park; D60877, Kiandra.

VICTORIA. (AMS). R15837, Healesville; R67484, Tolmie; R67574, Maroondah Hwy, 5 km S of Buxton; R81649, 4 km SSW of Woodside East; R91693, 9.1 km [road] S of Forge Creek; R97269, Gembrook State Forest. (NMV). D722, Western Port; D1852, Ringwood; D2392, Alexandra; D11711, Benambra; D34210, 4 km SW of Bemm River; D36964, Port Campbell; D37325, 4 km N of Whittlesea; D37492, Yan Yean; D37500, 4 km N of Darby River, Wilsons Promontory; D39918, "St Kilda Junction", Wilsons Promontory; D40191, French Island; D42059, high plains NE of Benambra; D47553, Davies Plains (NE of Benambra); D47608, 10 km NE of Benambra; D48409, Boneo; D48411, 7 km E of Stringybark Creek, Healesville; D48412-13, Yan Yean; D48943, Dennison Lake; D48948-49, Jack Smiths Lake [= Salt Lake]; D52700, 2.5 km E of Tooradin; D54525-26, saltmarsh between Tankerton and Tortoise Head, French Island; D55344-45, Cockatoo Creek, 1.5 km S of Yellingbo; D55388, Gembrook State Forest; D55448-49, mouth of Bunyip River, main drain, 6.5 km E of Tooradin; D56601, 4 km SSW of Woodside East; D56606, Bayles; D57035, 5.4 km N of Koetong; D59797-800, 4 km SSW of Woodside East; D59869-70, Deep Creek, 4 km E of Tooradin; D59871-72, 4 km SSW of Woodside East.

SOUTH AUSTRALIA. (SAMA). R17492, N of Mt Gambier (Dismal Swamp area); R23098, Boot Lagoon.

TASMANIA. (NMV). D12349, Cape Barren Island.

Referred Specimens: (AMS). R4174, R27008, Victoria, (no other data).

Scalation: Midbody scales in 23–30 rows (mean 26.6, mode 26, n = 61). Paravertebral scales 57–64 (mean 60.7, n = 51). Subdigital lamellae under fourth toe 17–23 (mean 19.0, n = 30). No supranasal or postnasal scales. Prefrontals nearly always separated (in contact in 4 out of 64, freq = 0.06). Supraciliaries 5–8 (mean 5.9, mode 6, n = 61). All have 7 (symmetrically) upper labials. Usually one presubocular, less frequently two similar-sized presubaculars present on one or both sides (mean 1.2, n = 30). Lower preocular and

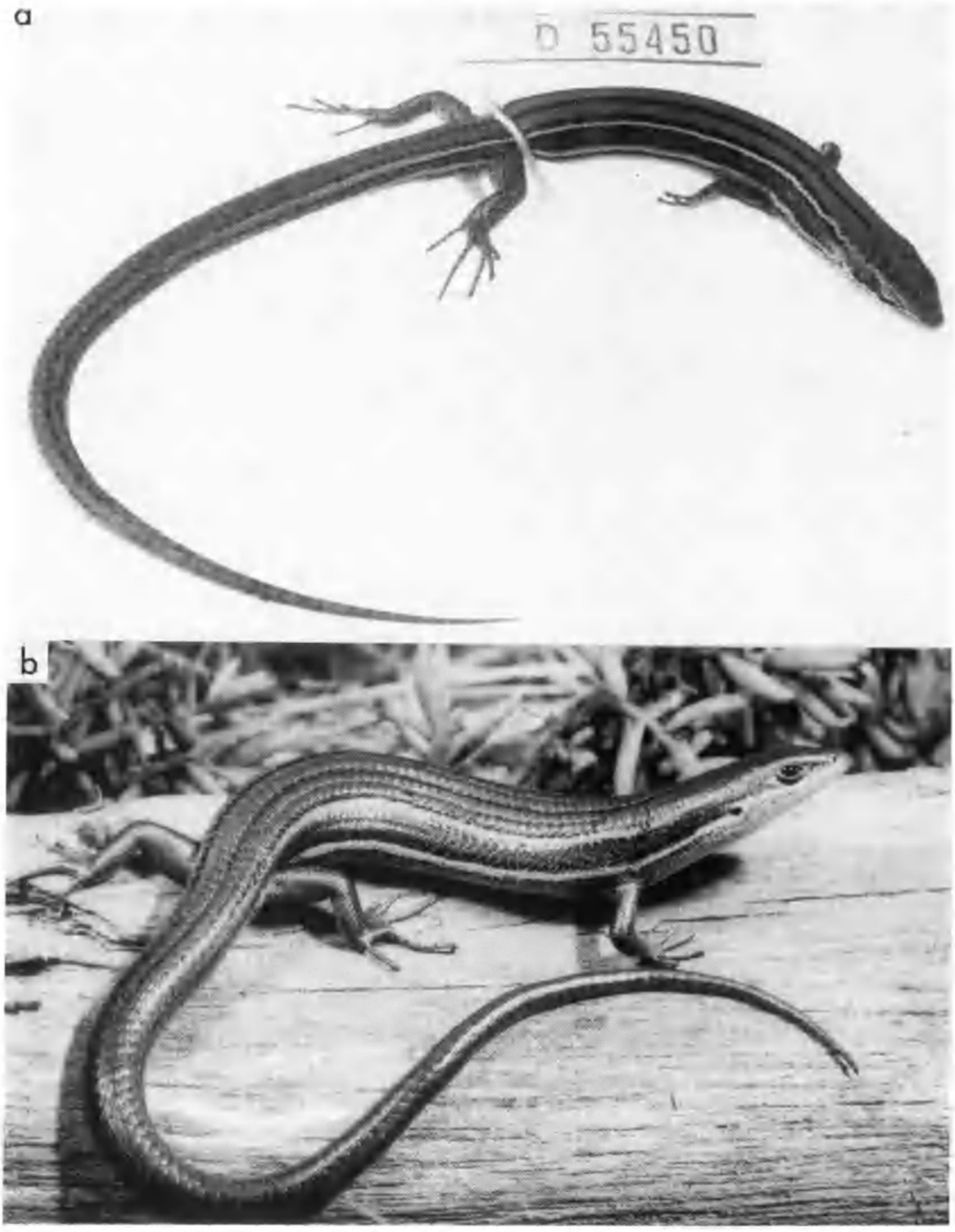

FIG. 2. (a) Holotype of *Leiolopisma rawlinsoni* sp. nov. (MNV D55450), as preserved. (b) Paratype NMV D55449 (adult female) from type locality, in life.

anterior loreal undivided in all specimens. Lower labials usually 7, sometimes 8 (mean 7.1, n = 30).

Dimensions: SVL of adult males 37-63 mm (mean 48.3, n = 25), of adult females 40-61 mm (mean 51.4, n = 22). Smallest juvenile 27 mm. HLL 30-40% of SVL, TL 157-185% of SVL (mean 172%, n = 8).

Colour (in preservative): Generally very similar to holotype. Ground colour often darker, vertebral stripe strong, faint or absent. Laterodorsal black lines may be well developed, running along junction between scale rows 1 and 2 on each side. Dorsolateral light stripe always runs down middle of scale row 3. White midlateral line generally centred on scale row 6, but often including upper part of row 7 for part of its length. In specimen with lowest midbody scale count (NMV D55345, MBSR=23) midlateral white stripe running down middle of row 5. No trace of light or dark speckling on any specimen. Paratype AMS R81649 (4 km SSW of Woodside East, Vic.) is illustrated by Greer (1982, Fig. 5).

Colour in life: Generally similar to colour in preservative, but usually more greenish. Scales with a very noticeable opalescent gloss. Belly cream to pale yellow. Breeding males may have weak orange midlateral stripe.

Sexual dimorphism: SVL of adult females on average is larger than that of males. Although largest specimen examined was male (NMV D48411, 63 mm SVL), most males were small, less than 50 mm SVL. Females appear to mature at slightly larger SVL (40 mm) than males (37 mm). Paravertebral scales significantly more numerous in females (57-65, mean 62.2) than in males (57-63, mean 59.3); $t_{43} = 4.73$, $p < .001$. Females with significantly shorter limbs; HLL in females ranges 29.5%-37.8% of SVL (mean 33.4, SD = 2.39), while males range 32.6%-40.0% (mean 36.6, SD 1.86); $t_{41} = 4.84$, $p < .001$. Larger SD in females because relative leg length appears to decrease as females grow larger, suggesting negative allometric growth of limbs. HLL dimorphism much less evident if only small adults considered; when comparison restricted to adults less than 50 mm SVL, mean value for females rises to 35.2 (SD = 1.95) while that for males remains the same (36.7, SD = 1.98); $t_{19} = 1.70$, $p > 0.1$. Sexual dichromatism does not appear to be well developed, in contrast to two other eastern members of the species-complex. W. Osborne (pers. comm.) has recorded breeding males with weak orange colouring in anterior part of midlateral white stripe, but males collected in southern Victoria in early summer showed no orange colour at all (MNH, pers. obs.), while red pigment also absent in others collected in June. No live colour data available for Victorian specimens collected during height of breeding season, February-April.

Distribution

L. rawlinsoni is restricted to southeastern Australia, and apparently occurs in several disjunct areas, in southeastern S.A., southwestern Victoria, south-central Victoria, alpine areas of northeastern Victoria through the Snowy Mountains of N.S.W. to the Brindabella Ranges on the N.S.W. - A.C.T. border, and Cape Barren Island in Bass Strait (Fig. 3). The status of several of the outlying populations is unknown since they are based on single specimens, from Port Campbell (SW Vic.), Cape Barren Island, and Bemm River (SE Vic.). The species is rare in collections, so that future range extensions (e.g. to Tasmania) or discovery of populations bridging apparent gaps are possibilities.

Geographic Variation

Colour pattern is very conservative, all specimens having a light to dark olive green to grey-brown dorsum with the dorsolateral white stripe on scale row 3. The major colour pattern variations consist of reduction or absence of the vertebral stripe, and the addition of a pair of black laterodorsal stripes, and the degree to which the upper lateral zone is pale centred. Geographic variation in colour does not appear to be much greater than local variation.

Variation in scalation is also minor. The principal geographic variation is the degree of carination of the dorsal scales, which is most pronounced in southern Victorian specimens, but greatly reduced or virtually absent in other populations. In all populations the modal midbody scale row count is 26, and only two specimens are known to exceed 28 (NMV D48943 from Dennison Lake and NMV D1852 from Ringwood have 30). Six supraciliaries is by far the most common count in most areas, but the three western-most specimens, from southeastern South Australia and Port Campbell, Victoria, have five supraciliaries.

Cranial Osteology

The skull (Fig. 4) conforms to the *Eugongylus* subgroup (Greer 1979) in having 11 premaxillary teeth, a completely closed Meckel's groove and the palatal rami of the palatines well developed and in broad medial contact. It is similar in most respects to that of the other members of the complex, with the upper temporal fenestra closed by expansion of the parietal, but differs from *L. entrecasteauxii* Group 1 and Group 2 in pterygoid structure. The latter two species show an angularity or process on the medial margins of the palatal rami of the ptery-

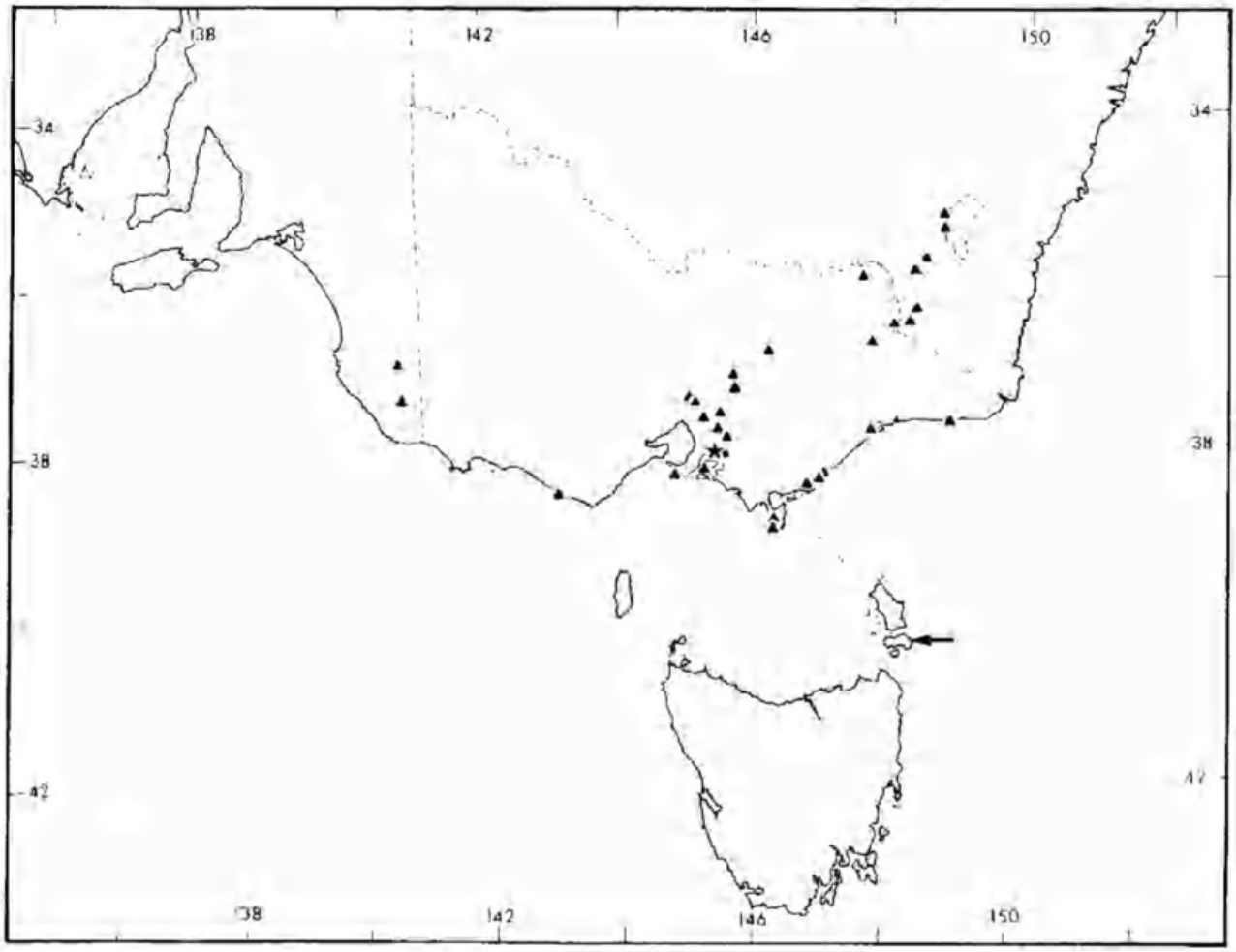

FIG. 3. Distribution of *Leiolopisma rawlinsoni* sp. nov. The star indicates the type locality, and the arrow, Cape Barren Island.

goids, in some specimens resembling the beta palatal processes of the *Lampropholis* subgroup (Greer 1979). The two specimens of *L. rawlinsoni* examined have little development of these processes. One of the two specimens examined shows a modest angularity of the medial margins, while the other has completely smooth, evenly diverging pterygoids as in the typical alpha palate.

Ecology and Reproduction

L. rawlinsoni is known entirely from localities characterized by the presence of very humid microenvironments. In southern Victoria, the species has been found in saltmarshes, boggy creek valleys, the margins of permanent lakes and swamps and in wet heathland, while at high altitudes in northeast Victoria and southeast N.S.W., it occurs in similar swampy habitats, including fens and sphagnum bogs. These habitats are usually densely vegetated at ground level, and the species apparently basks and forages largely within this cover. The swampy habitat preference of this species is reflected by the fact that most of the southern Victorian localities from which it has been collected have yielded specimens of *Egernia coventryi*, also known to be an obligate swamp/wet heathland species (Smales 1981; Schulz 1985). Similarly, at the high altitude localities, such as Davies Plains, Vic., and the Perisher area, N.S.W., *L. rawlinsoni* is syntopic with *Eulamprus kosciuskoi*, an alpine swamp specialist (Coventry & Robertson 1980).

Throughout its range, *L. rawlinsoni* is broadly sympatric with one or both of its close relatives, *L. entrecasteauxii* Group 1 and Group 2. At several localities (e.g. the Woodside area, Vic. and the Perisher area, N.S.W.), *L. rawlinsoni* and *L. entrecasteauxii* Group 2 are syntopic, while *L. entrecasteauxii* Group 1 has been collected within 1 km of *L. rawlinsoni* in the Perisher area and in the Yan Yean area north of Melbourne. Morphological data reinforce the electrophoretic evidence that there is no intergradation between these sympatric or adjacent populations.

The dense vegetation of the species' preferred habitat may explain one of the more striking aspects

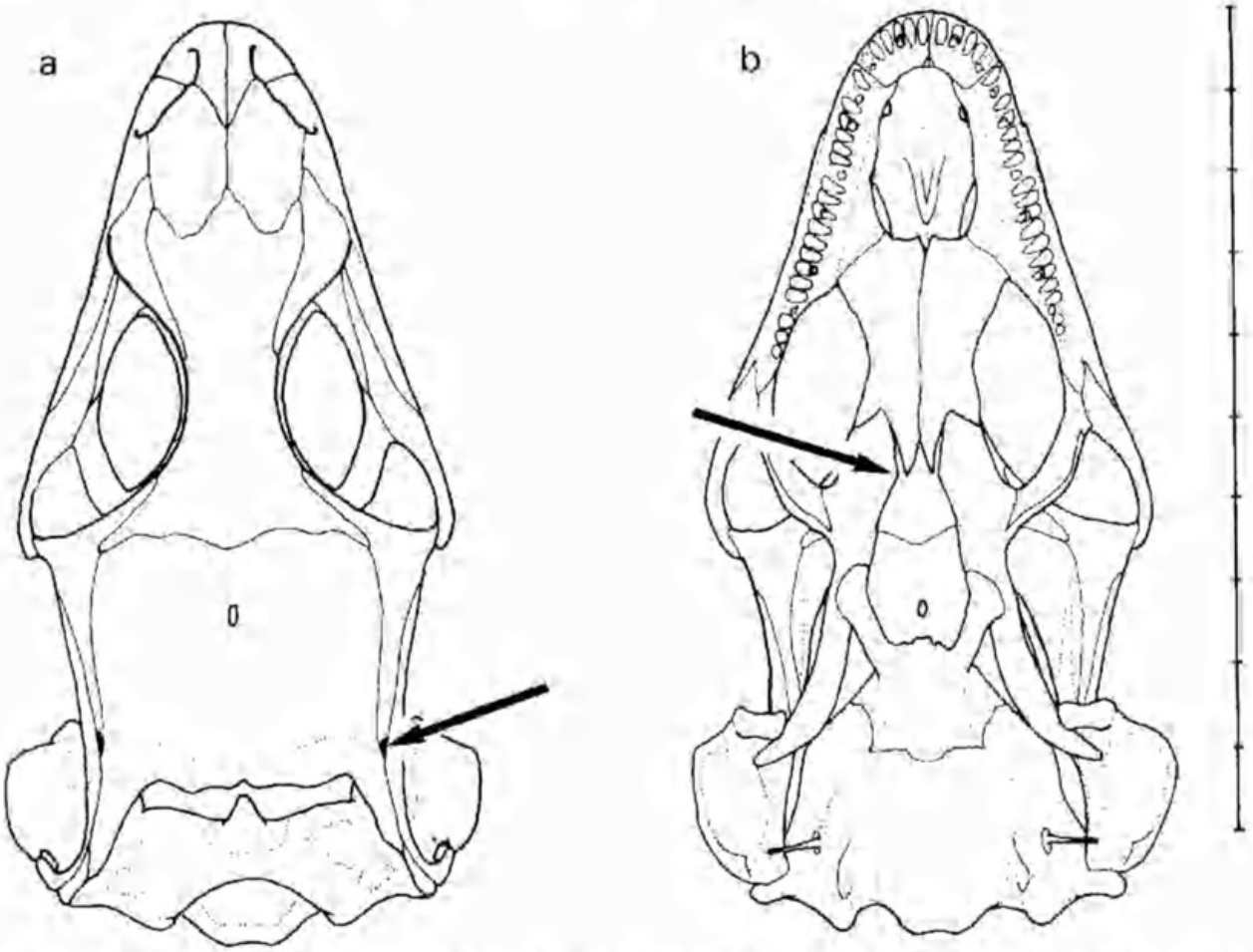

FIG. 4. Skull of *Leiolopisma rawlinsoni* sp. nov. in (a) dorsal view and (b) palatal view. Arrows point to (a) the position of the minute upper temporal fenestra and (b) the palatal rami of the pterygoids which show a slight angularity in this specimen. Specimen MNH No. 85/46, 4 km SSW of Woodside East, Vic. Scale bar = 10 mm.

of this skink: its relative rarity in collections. It is widely distributed through the well-collected southeast of Australia, where many other small species of skink have been collected in large numbers. The two near relatives of *L. rawlinsoni*, *L. entrecasteauxii* Group 1 and Group 2, are represented in southeastern museum collections by many hundreds of specimens, including long series from some sites, but these same collections have yielded only 64 specimens of *L. rawlinsoni*, with the greatest number from any one location being eight.

The species is viviparous, litter size ranging 4–8 (mean 5.6, n=13). Females with oviducal eggs or developing young have been collected as early as 15 October and as late as 28 January. As with the other eastern species, males show a peak in testicular size during late summer-autumn, and females ovulate in mid spring, so that overwintering of sperm by the females must occur.

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MUSTELICOLA ANTARCTICUS SP. NOV. (CESTODA: TRYPANORHYNCHA) FROM AUSTRALIAN ELASMOBRANCHS, AND A REASSESSMENT OF THE FAMILY MUSTELICOLIDAE DOLLFUS, 1969

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Summary

Mustelicola antarcticus sp. nov. is described from adult worms in the spiral valve of *Mustelus antarcticus* (Guenther) collected in coastal waters off Bicheno, Tasmania. Characters differentiating *M. antarcticus* from *M. woodsholei* Dollfus, 1969, the only other known species, are a much smaller ratio of pars bulbosa to pars vaginalis (1: 1.3 versus 1: 2.1), approximately twice as many testes per segment (av. 780 versus 3W), and reversed order of hook sizes 2(2') and 3(3') for the two species. The armature of *M. woodsholei* is completely described for the first time. As in *M. antarcticus,* it consists of a unique poeciloacanthous type consisting of three double chainettes and is most similar to members of the Lacistorhynchidae Guiart, 1927 and Callitetrarhynchinae Dollfus, 1942. Other new morphological features described are an hermaphroditic sac, pre-formed uterine pore, lack of true prebulbar organs, and origin of the retractor muscle in the anterior 113 of the bulb. The family Mustelicolidae is considered justified, based on unique features of the armature, scolex and genitalia, and is redefined accordingly.

KEY WORDS: Mustelicola, Cestoda, Trypanorhyncha, new species.