

Diagnosis of the *Lerista bipes* species-group (Lacertilia: Scincidae), with a description of a new species and an updated diagnosis of the genus

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Abstract

The *bipes* species-group of *Lerista* is diagnosed; its most significant feature is a reduction in the number of cervical vertebrae from eight to seven. A new species in the group is described as *L. praefrontalis*; it is unique in the group in having retained prefrontal scales and in having lost one phalange in the fourth toe of the pes. An updated key is provided for the *bipes* group. The genus *Lerista* is rediagnosed *vis-à-vis* the *Sphenomorphus* group of lygosomine skinks.

Introduction

The genus *Lerista* is a species-rich group of small to medium-sized sand-swimming, lygosomine skinks occurring in the arid and semi-arid areas of mainland Australia wherever there are sandy substrates. Forty-five species are known at present and many of these have only been described recently; presumably many more await discovery.

Within *Lerista*, there is a group of eight species that share a very distinctive morphology and are associated with areas of fine, loosely consolidated sand substrates — mainly dunes. The group has not been recognised before and the purpose of this paper is to diagnose this group and describe a new species in it. An existing, informal name, '*bipes* species-group', is used for the group, but it should be noted that its use here differs by being more restrictive than in previous usage (Storr 1972; Storr *et al.* 1981).

Lerista bipes species-group

Diagnosis

The *bipes* species-group differs from all other *Lerista* (*sensu* Greer 1967 and Storr 1972, 1976) in the following combination of derived (*vis-à-vis* other *Lerista*) character states: nasals slightly enlarged; frontoparietals fused to each other and to interparietal; preocular single; presuboculars absent; supraciliaries 0 + 2; primary temporal contacts parietal broadly.

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Snout region of skull constricted at premaxillary — maxillary suture; pre- and postfrontals meet above orbit.

Front limb reduced to basal nubbin of humerus, not visible externally; rear limb didactyl, phalanges reduced to 0.0.3.5.0 or less, metatarsals 1 and 2 absent; third distal tarsal fused to astragalus.

Venter lacks colour.

Presacral vertebrae ≥ 41 ; postsacral vertebrae ≤ 43 ; cervical vertebrae seven.

Sternal ribs two, from eighth and ninth vertebrae; mesosternum absent; complete inscriptional chevrons ≥ 8 .

The reduction of the cervical vertebrae from eight to seven is especially significant in identifying the *bipes* group as monophyletic because it is not known to occur elsewhere in the family except in the African scincine lineage *Melanoseps* — *Typhlacontias* — *Scolecoseps* — *Feylinia*, in the African lygosomine *Eumecia*, and in the Australian lygosomine *Anomalopus brevicollis*.

Remarks

The following seven described species of *Lerista* show this combination of character states or states derived from them: *bipes* (Fischer, 1882); *greeri* Storr, 1982; *griffini* Storr, 1982; *ips* Storr, 1980; *labialis* Storr, 1972; *simillima* Storr, 1984b and *vermicularis* Storr, 1982. For identification aids for these species see Storr (1984b) and Storr *et al.* (1981).

The group occurs throughout arid and semi-arid Australia in areas of fine, loosely consolidated sand. The group's centre of abundance is in north-western Australia.

The relationships of the *bipes* group as conceived here are unclear. Previously, members of this group have been allied with the species *connivens*, *humphriesi*, *nichollsi*, *onsloviana*, *praepedita* and *uniduo* (Storr, 1972, 1984a; Storr *et al.*, 1981). However, the derived character states recognised to date for this expanded group ('no fore-legs and never more than two toes; snout flat and very protrusive' — Storr *et al.* 1981) are neither extensive nor unusual and even an expanded comprehensive diagnosis such as that given above for the *bipes* group would only consist of modifications common in many sand-swimming lineages; there are no unique or unusual character states such as the reduced number of cervical vertebrae which diagnoses the *bipes* group (*sensu stricto*). This extended concept of the *bipes* group, therefore, may well represent a polyphyletic assemblage of sand-swimmers.

Among the species previously associated with the *bipes* group (*sensu stricto*), four share an unusual character which may be indicative of their close relationship: *connivens*, *nichollsi*, *onsloviana* and *uniduo* all have very loosely attached scales. These 'tear-away scales', which may be a predator-escape device, occur otherwise in skinks only in a few *Ctenotus*. Recently Storr (1984a) recognised these *Lerista* species as the *nichollsi* group but the diagnosis comprised only primitive character states (possession of prefrontals and a forelimb groove).

Perhaps tear-away scales are more indicative of the monophyly of the *nichollsi* complex. The wider relationships of this group, like those of the *bipes* group, remain to be discovered.

Lerista praefrontalis sp. nov.

Figures 1 and 2

Holotype

Western Australian Museum R 80580: King Hall Island, WA; 16°05'S, 123°25'E; Fisheries and Wildlife Department expedition; 27 June 1982; 'in litter among sand at base of cliff'.

Diagnosis

Differs from all other members of the *bipes* species group (*sensu stricto*) in each of the following characters: prefrontals distinct, and phalanges of fourth toe of pes four instead of five.

Description

Snout depressed and projecting, lower jaw countersunk; rostral scale crescentic anteriorly and trilobed posteriorly with medial lobe attaining level of nostril and narrowing contacting frontonasal, and two lateral lobes almost reaching level of posterior edge of nasal; supranasals absent; frontonasal trapezoidal, slightly wider than long, smoothly rounded on posterior lobe; prefrontals present, separated, each divided obliquely; frontal longer than wide, broadly and smoothly rounded posteriorly; supraoculars three, first two on each side contacting frontal, first one reaching orbit; frontoparietals and interparietal fused into a single scale with a clear area just posterior of centre through which parietal eye is evident; parietals meeting behind fused frontoparietal-interparietal; pairs of transversely enlarged nuchals two.

Nasal shaped like bishop's hat, with medial apex tilted forward and nostril just behind anterior suture at level of 'hat's' bulge; loreals two, posterior fused to single preocular; supraciliaries two, first projecting medially between second and third supraoculars; suboculars represented by only two postsuboculars; postocular single; lower eyelid movable with clear window; primary temporal single, large, in broad contact with parietal; secondary temporals two, upper much larger than and overlapped by lower; supralabials five, third subocular; postsupralabial single; external ear opening very small.

Mental with little dorsal upturning; infralabials five; postmental single, in contact with first two infralabials on each side; enlarged pairs of chin scales three, members of first two pairs separated by one scale row, members of third pair by three scale rows.

Longitudinal scale rows at midbody 20; paravertebral scales 99; subdigital lamellae of largest (fourth primitively) toe 8-9.

The *Lerista bipes* species-group

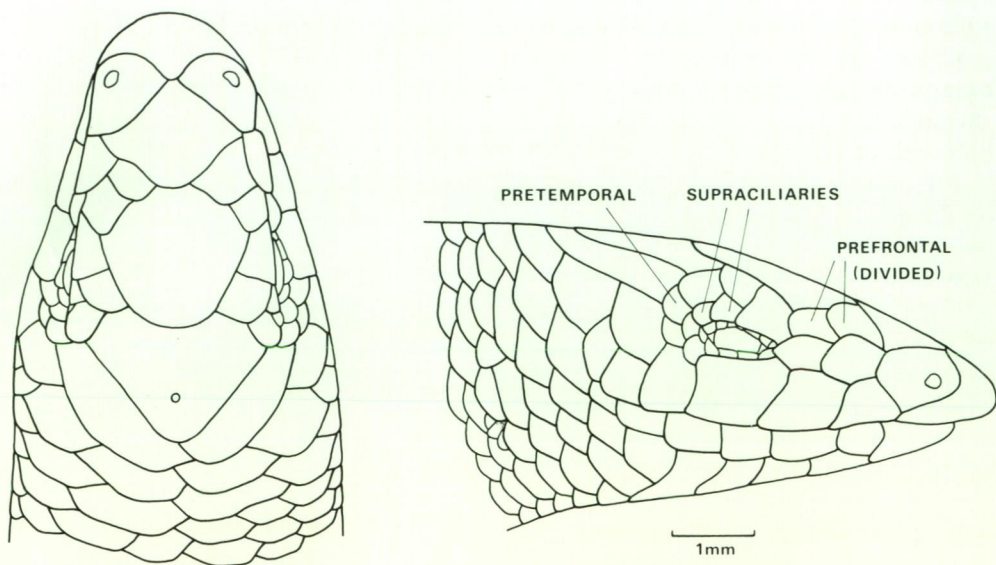


Figure 1 Head of the holotype of *Lerista praefrontalis* (WAM R 80580).

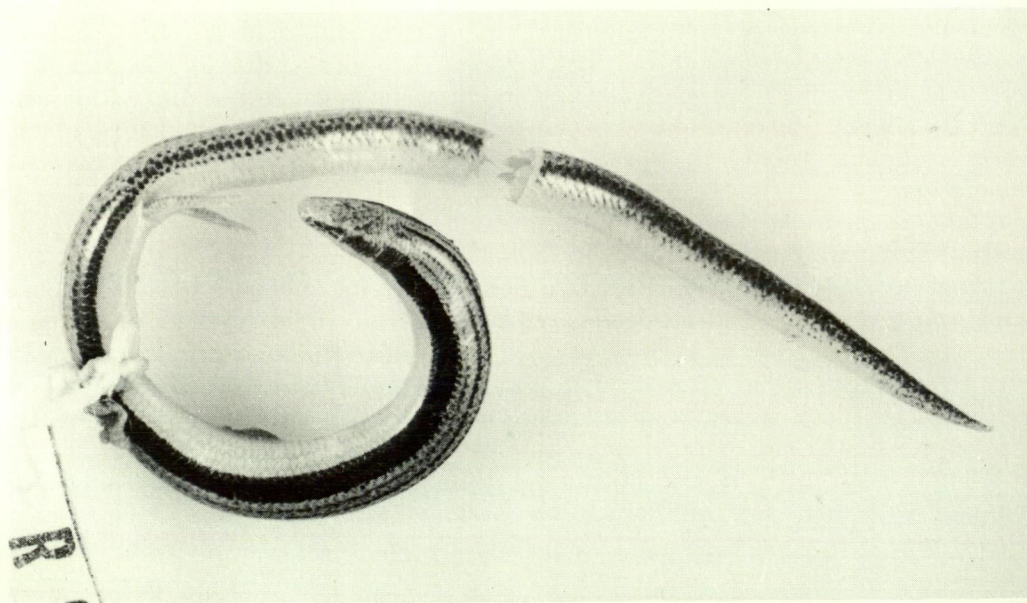


Figure 2 Photograph of the holotype of *Lerista praefrontalis* (WAM R 80580).

Snout-vent length 67 mm; no external trace of front limbs; rear limbs didactyl, 11.9 per cent of SVL; tail 58 mm, 16 mm of which is regenerated.

Colour in preservative sandy beige above with a dark brown lateral stripe extending from canthus to base of tail and a row of dark brown dashes running through centre of each paravertebral row from neck on to base of tail; opalescent below dark lateral stripe.

Presacral vertebrae 45; sternal ribs two; complete inscriptional chevrons 10; phalangeal formula of pes: 0.0.3.4.0/0.0.2.4.0 (i.e. bilaterally asymmetric).

Distribution

Only known from a single specimen from King Hall Island in the Kimberley of Western Australia.

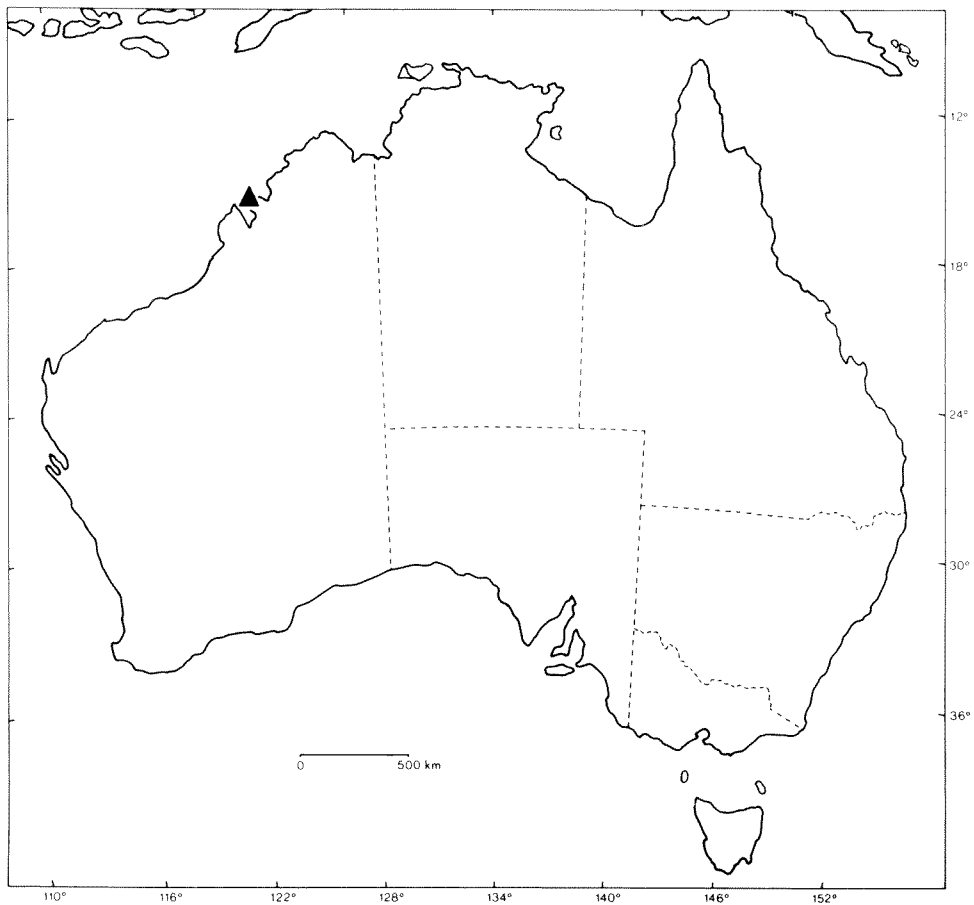


Figure 3 Map showing the distribution of *Lerista praefrontalis* (dark triangle).

Etymology

The species name derives from the unique retention of the prefrontals within the *bipes* species-group.

Key to the species of the *Lerista bipes* species-group

- 1 Prefrontals present, distinct *praefrontalis*
 Prefrontals fused to loreal or absent 2
- 2 Supralabials six, fourth subocular 3
 Supralabials five, third subocular 5
- 3 Supraoculars three 4
 Supraoculars two 7
- 4 Supraciliaries present *greeri*
 Supraciliaries absent *ips*¹
- 5 Preocular distinct *bipes*
 Preocular fused to posterior loreal 6
- 6 Supraoculars three, first two contact frontal; supraciliaries
 present; lower secondary temporal present *griffini*
 Supraoculars two, first only contacts frontal; supraciliaries
 absent; lower secondary temporal absent *vermicularis*
- 7 Two supraoculars contact frontal *simillima*
 One supraocular contacts frontal *labialis*

Diagnosis of the genus *Lerista*

Recent morphological surveys of the species of *Lerista* using x-rays and cleared and double-stained specimens, plus a better understanding of character state polarities in skinks in general, permits a more comprehensive diagnosis of *Lerista* than available previously (Greer 1967, Storr 1972 and 1976).

The genus *Lerista* is a member of the *Sphenomorphus* group (*sensu* Greer 1979) of lygosomine skinks (*sensu* Greer 1986) but differs from all other members of that group in the following combination of derived character states: prefrontals separated; lower eyelid with clear window; lower secondary temporal overlaps upper; external ear opening small, without projections.

¹I interpret Storr's (1980) single supraciliary in *ips* as the third supraocular; compare this scale in *ips* with the scale of similar size and position in *labialis* which Storr (1972) calls a supraocular.

Premaxillary teeth ≤ 7 ; postorbital absent; vomers fused; pterygoid teeth absent; palatal rami of pterygoids squared off, in medial contact; process from ectopterygoids excluding palatal rami of pterygoid from infraorbital vacuity.

Presacral vertebrae ≥ 31 .

Visceral fat bodies absent; parietal peritoneum lacking pigment.

For a list of included species see Cogger *et al.* (1983) and Storr (1984a-b, 1985).

Acknowledgements

G.M. Storr originally recognised *Lerista praefrontalis* as new and at my request generously allowed me to describe it and hence use the description to publish my diagnosis of both the *bipes* species-group and the genus *Lerista*; P. Kendrick and G.M. Storr critically read the manuscript, and D. Kent did the artwork and typing.

References

- Cogger, H.G., Cameron, E.E. and Cogger, H.M. (1983). *Zoological Catalogue of Australia. Vol. 1. Amphibia and Reptilia*. Bureau of Fauna and Flora, Canberra; 313 pp.
- Fischer, J.G. (1982). Herpetologische Bemerkungen. *Arch. Naturgesch.* 48: 281-302.
- Greer, A.E. (1967). A new generic arrangement for some Australian scincid lizards. *Breviora* No. 267: 1-19.
- Greer, A.E. (1979). A phylogenetic subdivision of Australian skinks. *Rec. Aust. Mus.* 32: 339-371.
- Greer, A.E. (1986). Lygosomine (Scincidae) monophyly: a third, corroborating character and a reply to critics. *J. Herp.* 20: 123-126.
- Storr, G.M. (1972). The genus *Lerista* (Lacertilia, Scincidae) in Western Australia. *J. Proc. R. Soc. West. Aust.* 54: 59-75.
- Storr, G.M. (1976). Revisionary notes on the *Lerista* (Lacertilia, Scincidae) of Western Australia. *Rec. West. Aust. Mus.* 4: 241-256.
- Storr, G.M. (1980). A new *Lerista* and two new *Ctenotus* (Lacertilia: Scincidae) from Western Australia. *Rec. West. Aust. Mus.* 8: 441-447.
- Storr, G.M. (1982). Four new *Lerista* (Lacertilia: Scincidae) from Western Australia and South Australia. *Rec. West. Aust. Mus.* 10: 1-9.
- Storr, G.M. (1984a). Revision of the *Lerista nichollsi* complex (Lacertilia: Scincidae). *Rec. West. Aust. Mus.* 11: 109-118.
- Storr, G.M. (1984b). A new *Lerista* (Lacertilia: Scincidae) from Western Australia. *Rec. West. Aust. Mus.* 12: 307-316.
- Storr, G.M. (1985). Revision of *Lerista frosti* and allied species (Lacertilia: Scincidae). *Rec. West. Aust. Mus.* 12: 307-316.
- Storr, G.M., Smith, L.A. and Johnstone, R.E. (1981). *Lizards of Western Australia. I. Skinks*. Univ. Western Australia Press, Perth; 200 pp.