

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Cogger, Harold G., 1975. New lizards of the genus *Pseudothecadactylus* (Lacertilia: Gekkonidae) from Arnhem Land and northwestern Australia. *Records of the Australian Museum* 30(3): 87–97. [13 October 1975].

doi:10.3853/j.0067-1975.30.1975.401

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

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NEW LIZARDS OF THE GENUS *PSEUDOTHECADACTYLUS* (LACERTILIA: GEKKONIDAE) FROM ARNHAM LAND AND NORTHWESTERN AUSTRALIA

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The Australian Museum

SUMMARY

A new species and a new subspecies of the gekkonid lizard genus *Pseudothecadactylus* Brongersma are described from the western escarpment of Arnhem Land and the Kimberley region of Western Australia respectively.

The genus *Pseudothecadactylus* was previously monotypic, and the characteristics, habits, distribution and relationships of the new forms and of *P. australis* Günther are discussed briefly.

INTRODUCTION

Brongersma (1934) erected the genus *Torresia* to accommodate the large and distinctive gecko *Thecadactylus australis* Günther from the islands of Torres Strait. Longman subsequently pointed out that Brongersma's *Torresia* was preoccupied by *Torresia* Castelnau, 1875 (Pisces: Labridae), as a result of which Brongersma (1936) renamed his genus *Pseudothecadactylus*. This genus has remained monotypic since it was first described as *Torresia*.

In February, 1972, a series of specimens of a large new gecko was collected by B. L. Bolton and D. Lindner of the Forestry, Fisheries, National Parks and Wildlife Branch, Department of the Northern Territory, from Deaf Adder Creek, a tributary of Nourlangie Creek on the western escarpment of Arnhem Land.

Subsequently, additional specimens have been found at various localities along and adjacent to the Arnhem Land escarpment, while Dr Glen M. Storr has kindly permitted me to examine and describe specimens representing a distinctive race from near Port Warrender, Western Australia.

These distinctive geckos are clearly congeneric with *Pseudothecadactylus australis*, and are described below. The zoogeographic implications of their discovery, and a re-assessment of the distribution and status of *P. australis*, are also discussed. Measurements were made according to the criteria of Kluge (1967).

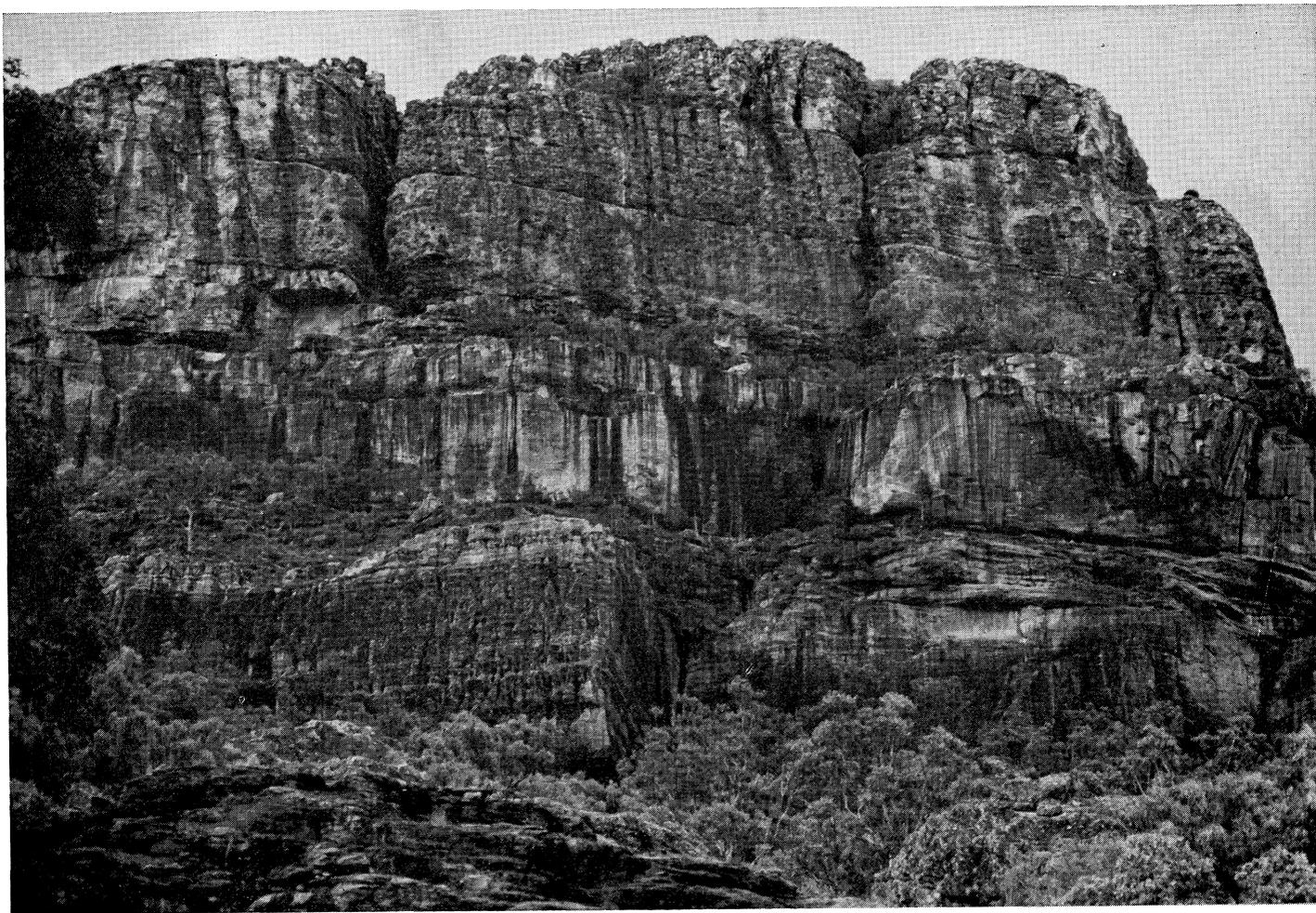


Fig. 1.—Habitat of *Pseudothecadactylus lindneri lindneri*, Mt Brockman Range, Arnhem Land, Northern Territory.

Except for the apparent absence of preanal pores in the males of one of the new subspecies, these new geckos conform in most respects to Kluge's (1967) detailed redefinition of the genus *Pseudothecadactylus*.

The species is named in honour of Mr David Lindner who, during the past decade, has done much to advance our knowledge of the composition, distribution and ecology of the fauna of the Northern Territory.

Pseudothecadactylus lindneri sp. nov.

Holotype: R38734 in the Australian Museum, an adult male collected by H. G. Cogger and D. Lindner from the vicinity of Koongarra Mining Camp, Mt Brockman Range, Northern Territory (latitude 12° 51' S., longitude 132° 52' E.) on 6th March, 1973.

Paratypes (24): R39522, R39895, R40283, Cannon Hill, in 12° 22' S., 132° 56' E.; R39493, R39975, R39992, Nourlangie Rock, Mt Brockman Range, in 12° 52' S., 132° 48' E.; R38730-3, R38735, R38945-6, near Koongarra Mining Camp, Mt Brockman Range, in 12° 53' S., 132° 50' E.; R37126-7, R37129-33, R39496-7, R39520-1, Deaf Adder Creek, in approx. 13° 05' S., 132° 55' E. All of the above localities are associated with the western escarpment of Arnhem Land, Northern Territory.

Diagnosis: *Pseudothecadactylus lindneri*, together with its congener *P. australis*, may be distinguished from all other Australian gekkonids by the combination of (1) underside of digits with a continuous and subequal series of enlarged lamellae, divided medially, and (2) a small terminal claw arising from the edge of the digital expansion (except for the inner digit, which is clawless) and which is at least partly retractile in the distal median groove. *P. lindneri* may be distinguished from *P. australis* by the reduced development or absence of preanal pores in the males (well-developed and conspicuous in *australis*); ear-opening large, at least six times as large as the nostril (as large as or slightly larger than the nostril in *australis*); scales of snout small, 20-25 scales along a median line between the rostral and a line joining the anterior edges of the eyes (large in *australis*, about 10 scales along a median line between rostral and eyes); rostral undivided, much broader than high (almost completely divided and not much broader than high in *australis*); males with 2-4 postanal tubercles on each side (a single flat tubercle on each side in *australis*); colour pattern (figs 2, 4, and 6). Diagnostic differences between the two subspecies of *P. lindneri* are cited on page 93.

Description of Holotype (Fig. 2): An adult male with a snout-vent length of 101.5 mm and a complete but reproduced tail measuring 77 mm. Orbital diameter: 6.5 mm. Eye to ear length: 9.6 mm. Head length: 28.0 mm. Head width: 21.5 mm. Axilla-groin: 44 mm. Forelimb length: 35 mm. Hindlimb length: 45 mm. Ear-opening vertically elliptic: 3.4 mm x 1.0 mm.

The head is broad and noticeably triangular in shape when viewed from above. The scales of the head are small, juxtaposed and more or less hexagonal, numbering about 38 between the supraciliaries along a line joining the centres of the eyes; the supraorbitals, interorbitals and scales on the snout are subequal, except for the enlarged labials, rostral, nasal and internasal scales. Rostral about 1½ times as broad as deep, without any indication of a groove or crease. The

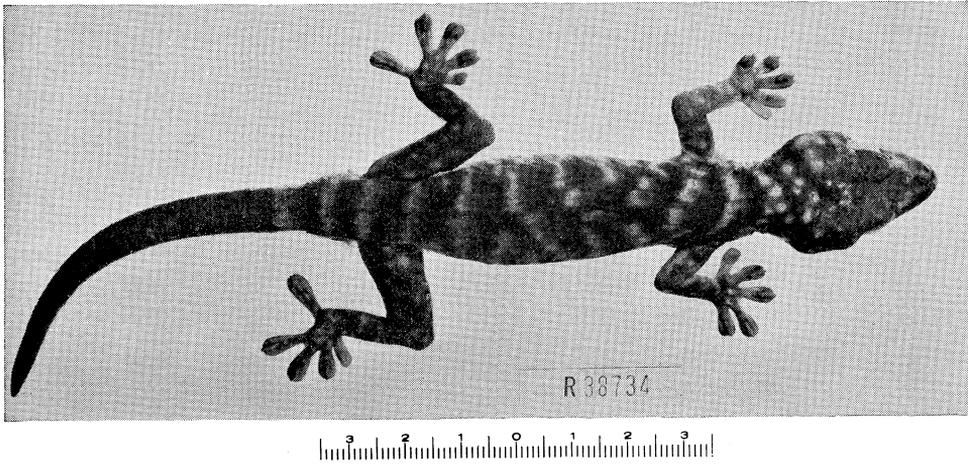


Fig. 2.—Dorsal view of holotype of *P. l. lindneri*.

nostril is narrowly separated from the rostral by an anterior nasal and (on the right side only) a minute supernumerary scale, and is in contact with the first supralabial. Above and behind it is surrounded by four or five moderately enlarged nasal scales, while there is an irregular series of internasal scales which are significantly larger than the other scales on the snout. About 18–20 loreals. Eleven enlarged supralabials and twelve infralabials on each side. Mental roughly triangular, only slightly longer than broad. A series of enlarged scales bordering the mental and anterior infralabials.

Scales on body and limbs small, flat, juxtaposed, and homogeneous, the ventrals nearly twice the size of the dorsals. Approximately 120 scales around the middle of the body. Preanal pores present but poorly developed; indeed, each of the 11 pores is visible only under high magnification as a minute opening in a preanal scale. The pores are arranged in three transverse rows of adjacent scales; the first row consists of 7 pores, the second row of 3 pores and a single pore in the third row.

Postanal region swollen, covered below by a series of enlarged scales and with a ventro-laterally placed pair of enlarged postanal tubercles or cloacal spurs on each side.

Tail long, slender, round in section, and covered by small, flat homogeneous scales except for the terminal subcaudals which are modified to form pilose lamellae (*sensu* Kluge, 1967).

The digits are strongly dilated with two continuous rows of broad, subequal transverse lamellae (fig. 3a). The inner digit of each is clawless, but in the others there is a moderate claw arising from the distal end of each digit and which appears to be at least partly retractile in the median terminal groove. The claw of each digit arises from a long high sheath which itself arises from the base of the digit and is fused along its length with the upper surface of the digit (Brongersma, 1934, figs 5–7). Fourth toe with sixteen pairs of pilose lamellae.

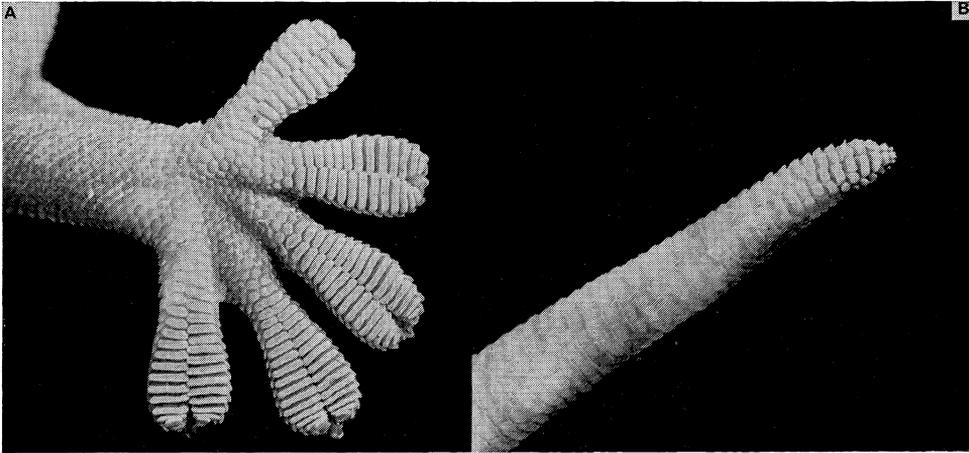


Fig. 3.—a. Lower surface of foot of *Pseudothecadactylus l. lindneri*.

b. Lower surface of tail of *P. l. lindneri*, showing pilose terminal lamellae.

Colour (in alcohol): Light creamish white with obscure dark brown reticulations on the head, body and limbs, with a tendency to form irregular broad dark brown cross-bands. Tail purplish-brown with one narrow white cross-band on the base. Ventral surfaces immaculate white.

Living specimens are purplish-brown with a series of irregular light white or cream transverse cross-bands and spots on the body (fig. 4, top). Original tails have subequal alternate cross-bands of dark purplish-brown and yellow. Limbs and head above with irregular cream-coloured flecks, and darker brown variegations. Ventral surface white or, more frequently, very lightly pigmented with purplish-brown, especially on the limbs, throat and tail. Iris bright yellow or reddish orange.

Variation: Little variation in scalation or colour pattern was observed in the paratype series. The largest specimen has a snout-vent length of 107 mm, while the following dimensions are expressed as percentages of snout-vent length: tail length 68.5–98.8 (mean 83.3); head length 26.8–28.4 (mean 27.7); head width 20.6–22.3 (mean 21.4); axilla-groin 40.3–48.2 (mean 44.3); forelimb length 33.0–40.0 (mean 35.9); hindlimb length 42.0–51.1 (mean 46.3); eye-ear 9.1–10.0 (mean 9.5); orbital diameter 6.2–7.1 (mean 6.5).

Mid-body scale rows 111–130 (mean 121.4), interorbitals 32–38 (mean 35.1), preanal pores 6–13 (mean 8.7).

Although pores are obscurely present in the holotype, only in one paratype (R39496) are the pores reasonably well-developed. In this specimen the protruding exudate from each pore clearly marks its position, so that a single curved, median transverse series of seven pores is present about seventeen scales anterior to the vent. In the remaining paratype males the pores are obscure to microscopic, numbering from two (R40283) to thirteen (R38732); in this specimen one scale has two pores.

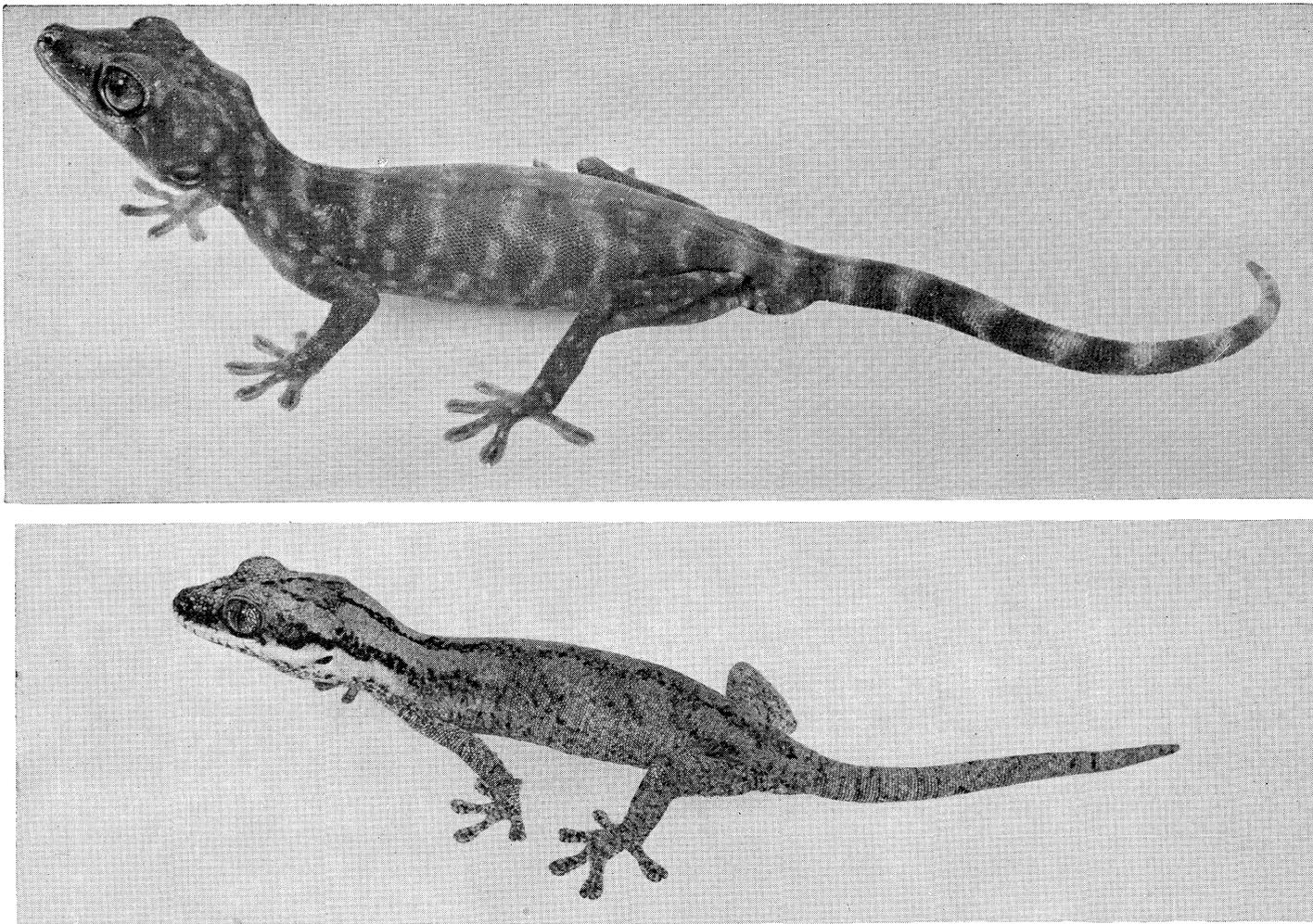


Fig. 4.—*Top*: Living specimen of *Pseudothecadactylus l. lindneri* from the type locality.
Bottom: Living specimen of *Pseudothecadactylus australis*.

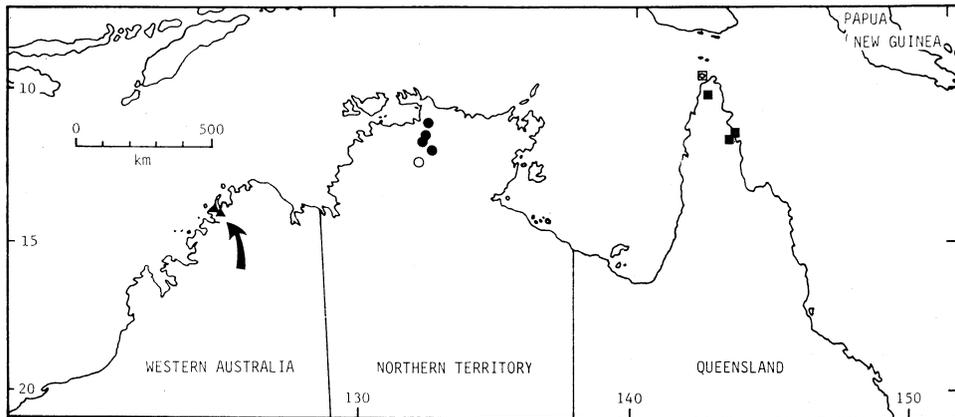


Fig. 5.—Distribution of species of *Pseudothecadactylus*. Solid symbols: specimens examined; open symbols: literature records or unconfirmed sightings.

- □ *Pseudothecadactylus australis*
- ○ *Pseudothecadactylus lindneri lindneri*
- ▲ *Pseudothecadactylus lindneri cavaticus*

Distribution: Specimens have been seen or collected from various localities associated with the western escarpment of Arnhem Land (see list of paratypes). All known records for *Pseudothecadactylus* are plotted in figure 5.

Pseudothecadactylus lindneri cavaticus subsp. nov.

Holotype: R43176 in the Western Australian Museum, an adult male collected by L. A. Smith and R. E. Johnstone near Mitchell River Falls, approximately 25 km southwest of Crystal Head, Port Warrender, Western Australia (approx. 14° 40' S., 125° 42' E.) on 14th January, 1973.

Paratypes: R43175 (adult female) and R43137 (subadult male) in the Western Australian Museum; the former with the same data as the holotype, the latter from Surveyors Pool, Mitchell Plateau (in 14° 40' S., 125° 44' E.), approximately 15 km southwest of Crystal Head, Port Warrender, Western Australia, collected by L. A. Smith and R. E. Johnstone on 17th February, 1973.

Diagnosis: Distinguished from the nominate subspecies by its possession of moderately heterogeneous dorsal and lateral scales (homogeneous in *Pseudothecadactylus l. lindneri*) and its colour pattern (see fig. 6). In all specimens of *P. l. lindneri* so far examined, the rostral is excluded from the nostril, whereas the three types of *P. l. cavaticus* each has the rostral narrowly contacting the nostril (narrowly separated on one side in WAM R43137).



Fig. 6.—Dorsal view of holotype of *P. l. cavaticus*.

Description of Holotype (fig. 6): An adult male with a snout-vent length of 115 mm and a complete but reproduced tail measuring 76 mm. Orbital diameter: 7.2 mm. Eye to ear length: 102 mm. Head length: 31.9 mm. Head width: 23.8 mm. Axilla-groin: 52 mm. Forelimb length: 39 mm. Hindlimb length: approximately 50 mm. Ear-opening vertically elliptic, 5.4 x 2.4 mm.

Similar in most respects to the holotype of *Pseudothecadactylus lindneri lindneri*, except that the rostral narrowly contacts the nostril, while the dorsal and dorso-lateral scales are moderately heterogeneous (fig. 6). The largest dorso-laterals are distinctly tubercular and about twice as large as the mid-dorsals, while the latter are scarcely larger than the lower laterals.

There are about 38 scales between the supraciliaries along a line joining the centres of the eyes, while there are approximately 119 scales around the middle of the body. There are about 20–22 loreals, 11 enlarged supralabials and 12 infra-labials on each side, and two moderately-enlarged flat postanal tubercles on each side of the swollen postanal region. There are 19 pairs of enlarged, pilose lamellae under the fourth toe. Although some preanal scales have faint depressions, there are no indications of preanal pores.

In alcohol, the top of the head is marbled with dark purplish-brown and pale, drab vinaceous-brown. The body has a series of six or seven irregular, pale drab vinaceous-brown cross-bands alternating with subequal cross-bands of dark purplish-brown. The paler bands tend to have darker centres. Limbs above marbled with the two colours. Venter white. Tail dark brown with lighter flecks.

Variation: Only the female paratype possesses an original tail, on which seven or eight irregular dark brown cross-bands alternate with about nine irregular, somewhat wider pale brown to cream cross-bands while the terminal twelve to fourteen distal subcaudal scale rows possess pilose surfaces. The dimensions and scalation (of the adult female and subadult male paratypes respectively) are as follows, all dimensions but snout-vent length expressed as percentages of snout-vent length: Snout-vent length 106 mm, 88 mm; tail length 92.4, 65.9; head length 29.1, 29.1; axilla-groin 39.6, 43.2; forelimb length 34.9, 36.4; hindlimb length 48.1, 51.1; eye-ear 10.5, 10.2; orbital diameter 5.7, 6.2. Mid-body scale rows approx. 114, approx. 104; interorbitals approx. 35, approx. 33. The subadult male also lacks preanal pores.

DISCUSSION

Brongersma (1934) diagnosed those features differentiating *Pseudothecadactylus* (as *Torresia*) from *Thecadactylus*; similarities between these two genera are doubtless superficial and the result of convergence. Kluge (1967) has shown that whereas *Thecadactylus* is a gekkonine genus, *Pseudothecadactylus* clearly belongs in the subfamily Diplodactylinae. The characteristics of the present species confirm the diplodactyline affinities of the genus, although there are superficial similarities between *Pseudothecadactylus* and some species of the gekkonine genus *Gekko*.

Preanal pores are poorly-developed or absent in *Pseudothecadactylus lindneri*. However, in *P. australis* there is a distinctive triangular patch of preanal pores in the males (the number could not be ascertained in the specimens examined as a

patch of skin, including pores, has been removed from each male). The only diplodactyline genera in which preanal pores may be present in some species but not in others are *Oedura* and *Diplodactylus*. Hence *Pseudothecadactylus* is the only member of the Kluge's (1967) tribe Carphodactylini in which there is inter-specific variation in the presence or absence of pores.

Except for the absence or poor development of preanal pores in the males, the new species conforms closely to Kluge's (1967) detailed redefinition of *Pseudothecadactylus*. The skull is distinctly ornamented on the snout. The nasal process of the premaxilla is not short and very wide as described by Kluge, but moderate, being decidedly longer than broad. In the three skeletal preparations examined the premaxillae are paired and the maxilla and prefrontal are broadly in contact. The lateral and medial infraorbital processes of the prefrontal are well developed. The number of scleral ossicles ranged from thirty-five to thirty-six. The jugal is approximately three to four times longer than wide, and is extensively overlapped by the infraorbital processes. The clavicles are considerably dilated, thin, and with large fenestrae. Kluge (1967) describes the interclavicle of *P. australis* as moderate, with a small posterolaterally directed process widely separated from the clavicle; in *P. lindneri* the interclavicle is shield-shaped with either one or two lateral processes on each side. In one of the skeletal preparations examined there is an abnormal arrangement on the lizard's left side whereby a process projects from the rear edge of the clavicle to articulate with the inter-clavicle. There are three sternal ribs on each side (Kluge cites two on each side for *P. australis*), two xiphisternal (mesosternal of Kluge) ribs on each side and no xiphisternal extension. Poststernals number 12, with the anterior pairs almost meeting along the midline. The phalangeal formulae are 2.3.4.5.3. (hand) and 2.3.4.5.4. (foot). These features, together with those external morphological ones described above, leave little doubt that *lindneri* is correctly associated with *australis* in the genus *Pseudothecadactylus*.

Although the tail of *P. lindneri* is virtually identical in form and structure to that of *P. australis*, it is only moderately prehensile, as is also said to be the case in *P. australis* (Kluge, 1967). The terminal subcaudals, especially of original tails, are modified to form lamellae in *P. lindneri* (fig. 3b).

The original series of specimens of *P. l. lindneri* were taken ". . . under overhanging boulders in drizzly weather between 2000 and 2100 hours in typical Kombolgie sandstone of the western Arnhem Land plateau" (D. Lindner, *pers. comm.*). Subsequently, specimens were taken in similar habitats (*viz.* among caves, crevices, overhangs and massive boulders) under a variety of climatic conditions at Cannon Hill, Nourlangie Rock and Koongarra (Mt Brockman Range) and the Deaf Adder Creek gorge. The gecko consistently proved to be most active and abundant in showery or drizzly weather. The characteristic habitat is shown in fig. 1. Several gravid females each contained two well-developed eggs.

Little is known of the habits or ecology of *P. australis*. Indeed the only habitat data available are those for several specimens collected in Cape York Peninsula by the 1948 Archbold Expedition of the American Museum of Natural History. Each specimen was collected at night while the collectors were spotlighting for mammals (H. Van Deusen *pers. comm.*). A series of specimens was taken by P. Webber and E. Cameron (*pers. comm.*) on Prince of Wales Island, Torres Strait, in February, 1975; these were found associated with paperbark swamps on the northwestern side of the island.

The geckos were found in hollows in the upright trunks and limbs of *Melaleuca cajuputi*, principally associated with the transition zone between stands of bloodwoods (*Eucalyptus polycarpa*) and the paperbark swamps in which *Melaleuca viridiflora* was dominant.

P. australis is vocal, and most specimens were located during the day when they responded to the presence of a collector with a low, prolonged, grating call.

Known locality records for both *P. australis* and *P. lindneri* are plotted in fig. 5, in which their restricted and widely separated ranges are indicated.

The limited total range of the genus, its habitat specificity, its disjunct distribution and high degree of morphological differentiation of its two component species and, finally, the strong differentiation of the genus, morphologically, from other diplodactyline genera, all suggest that:

- (a) the members of the genus are ecologically highly specialized;
- (b) the present total range is now more restricted than it once was (i.e. the two component species may be regarded as relict forms);
- (c) the genus is phyletically "old" within the *Diplodactylinae*; and
- (d) the geographical origin of the genus was probably within the limits of its present range.

ACKNOWLEDGMENTS

I am grateful to Miss A. G. C. Grandison, Dr Glen M. Storr and Dr Richard G. Zweifel for permitting me to examine specimens in their charge.

Field work in Arnhem Land has been generously supported by the Director and Trustees of the Australian Museum, by the CSIRO Division of Wildlife Research, through its Chief, Dr H. J. Frith, and by the Director and staff of the Forestry, Fisheries, National Parks and Wildlife Branch, Department of the Northern Territory. I am grateful to Messrs David Lindner, John Calaby, Ian Mason, Tony Wolfe and Paul Webber for their advice and assistance in the field.

REFERENCES

- Brongersma, L. D., 1934. IX. Contributions to Indo-Australian Herpetology. *Zool. Meded.*, 17: 176.
- , 1936. Herpetological Note XIII. *Zool. Meded.*, 19: 136.
- Kluge, A. G., 1967. Systematics, Phylogeny, and Zoogeography of the Lizard Genus *Diplodactylus* Gray (Gekkonidae). *Aust. J. Zool.*, 15: 1007-1108.