

# Revision of the Bearded Dragons (Lacertilia: Agamidae) of Western Australia with Notes on the Dismemberment of the Genus *Amphibolurus*

G.M. Storr\*

## Abstract

A new genus, *Pogona*, is proposed for the *Amphibolurus barbatus* species-group. In Western Australia it consists of *P. minor minor* (Sternfeld), *P. minor minima* (Loveridge), *P. minor mitchelli* (Badham), *P. microlepidota* (Glauert) and *P. nullarbor* (Badham). These taxa are described and keyed. The remaining species of *Amphibolurus* are transferred to *Tympanocryptis*, *Gemmatophora* and *Ctenophorus*.

## Introduction

In preparation for a handbook on the dragon lizards of Western Australia I have had to look hard at the genera of Australian Agamidae in current usage, most of which have remained unchanged in concept for a century.

If small or compact genera like *Chlamydosaurus*, *Caimanops* and *Diporiphora* are recognized, it becomes necessary to split the large and highly diversified *Amphibolurus* of authors and to restrict *Amphibolurus* Wagler to its type species *A. muricatus* (Shaw) and to the species most closely related to it, including the three usually placed in *Lophognathus* Gray. The merger of *Amphibolurus* and *Lophognathus* has already been proposed by Houston (1978), but the inclusion within *Amphibolurus* of numerous other lizards is no longer tenable.

I believe that the closest relatives of *Amphibolurus* (*sensu stricto*) are *Chlamydosaurus*, *Caimanops* and *Diporiphora*, which share with it the location of pores in the perforation of an enlarged femoral or pre-anal scale. If one includes the *Amphibolurus barbatus*, *A. decresii*, *A. maculatus*, *A. caudicinctus*, *A. reticulatus* and other species-groups in *Amphibolurus*, one must also include within it *Diporiphora*, *Caimanops* and *Chlamydosaurus*, the last of which (having priority) would become the name of the enlarged genus. Such a genus would not only be inappropriately named but intolerably diverse.

The purpose of this paper is to begin the dismemberment of *Amphibolurus* (*sensu lato*) by proposing a new genus for the *barbatus* species-group and to revise its Western Australian representatives. Badham's (1976) revision was based on

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\* Department of Ornithology and Herpetology, Western Australian Museum, Francis Street, Perth, Western Australia 6000.

only a small part of the available material, and it has become necessary to amend some of her concepts. The present paper is based solely on specimens in the Western Australian Museum (R suffix omitted from registration numbers). Descriptions of coloration are based on preserved material.

The rest of *Amphibolurus* is distributed among three genera as follows. The *A. adalaidensis* group (of Storr 1977) is transferred to the genus *Tympanocryptis*. *A. muricatus*, *A. nobbi* and the genus *Lophognathus* are merged under the oldest available name, *Gemmatophora*. The remaining species, comprising the *A. maculatus*, *A. reticulatus* and *A. decresii* groups (of Storr 1965, Storr 1966 and Houston 1978 respectively) and *A. caudicinctus*, *A. scutulatus*, *A. mckenziei* and *A. cristatus* are transferred to the genus *Ctenophorus*, restored from the synonymy of *Amphibolurus*. These genera are now so changed in content that it becomes necessary to redefine them.

#### *Tympanocryptis* Peters, 1864

Small, short-legged, short-tailed agamids with body moderately to strongly depressed; dorsals markedly heterogeneous (small scales intermixed with large spinose scales); tympanum wholly, partly or not covered by scales; femoral and pre-anal pores few in number, each located between 3-5 scales, usually present in males only, and with alignment of pre-anal pores (when more than one present) transverse or directed slightly back towards midline.

*Gemmatophora* Kaup, 1827 (including *Amphibolurus* Wagler, 1830 and *Lophognathus* Gray, 1842)

Moderately large agamids with body slightly compressed to slightly depressed; scales mostly keeled; tympanum exposed; femoral and pre-anal pores few in number, each perforating an enlarged scale, and with alignment of pre-anal pores (when more than one present) directed back towards midline.

#### *Ctenophorus* Fitzinger, 1843

Very small to moderately large agamids with body slightly compressed to strongly depressed; tympanum exposed (except in *C. maculosus*); a series of enlarged tectiform scales sweeping up in a flat S-curve from below eye to above ear; and mostly with (1) dorsals small, their keels directed back towards midline; (2) numerous femoral and pre-anal pores, each located between 4 scales (anterior usually largest); (3) alignment of pre-anal pores directed forwards towards midline; and (4) black markings on breast and throat of males.

This dismemberment of *Amphibolurus* is in broad agreement with the views expressed by Witten (1982) on the phylogeny of Australian agamids. As only two of the numerous species hitherto placed in *Amphibolurus* will remain in that genus, I do not believe that the name is worth conserving against the older but forgotten name *Gemmatophora*.

## Systematics

### Genus *Pogona* gen. nov.

#### Type Species

*Agama barbata* Cuvier, 1829, Règne Animal (second edition) 2: 35.

#### Other Species and Subspecies

*Amphibolurus barbatus microlepidotus* Glauert, 1952; *A. b. minimus* Loveridge, 1933; *A. b. minor* Sternfeld, 1919; *A. mitchelli* Badham, 1976; *A. nullarbor* Badham, 1976; and *A. vitticeps* Ahl, 1926.

#### Diagnosis

Moderately large to very large, stout, more or less depressed agamid lizards with rows and zones of spines on head and body, including a transverse series of spines on occiput. Further distinguishable from *Amphibolurus (sensu stricto)* by pores located in notch at rear of enlarged femoral and pre-anal scales, and from other *Amphibolurus (sensu lato)* by alignment of pre-anal pores backwards towards midline.

#### Description

Head triangular, usually considerably narrower than long (about as wide as long in *P. vitticeps* and *P. minor mitchelli*). Body slightly to strongly depressed. Limbs and tail shorter than usual in agamids. Nostril located below sharp canthus rostralis. Tympanum distinct. Spiny scapular fold continuous with gular fold. Pores located in notch at rear of enlarged scales and counted only on one side of specimens: femoral pores 2-7, scattered along proximal half to three-quarters of thigh; pre-anal pores 1-5 (mostly 2 or 3), confined to outer part of pelvic region, their alignment orientated backwards towards midline.

Scales very variable in size but almost wholly keeled, rugose, mucronate or spinose. Occipital scales much smaller than those on rest of head. Scales on strip down centre of back much larger than ordinary scales on side of back, which are very small and intermixed with scattered spines. Elsewhere spines restricted to (1) discrete zones, namely those at ventrolateral rear of head (continuous in *P. nullarbor*, *P. barbata* and *P. vitticeps* with smaller but erectile spinose scales across throat — the 'beard') and 1-7 rows of spines along dorsoventral angle of body, and (2) sharply defined series of single spines: transverse series across occiput, longitudinal series above ear (absent in *P. barbata*), curving series around lateroposterior angle on top of head (terminating in transverse nuchal series), and longitudinal series on each side of nape (only present in *P. barbata*, *P. nullarbor* and western and southern *P. minor*).

Coloration generally dull, with dorsal and ventral pattern slightly to moderately developed in juveniles but tending to disappear with age.

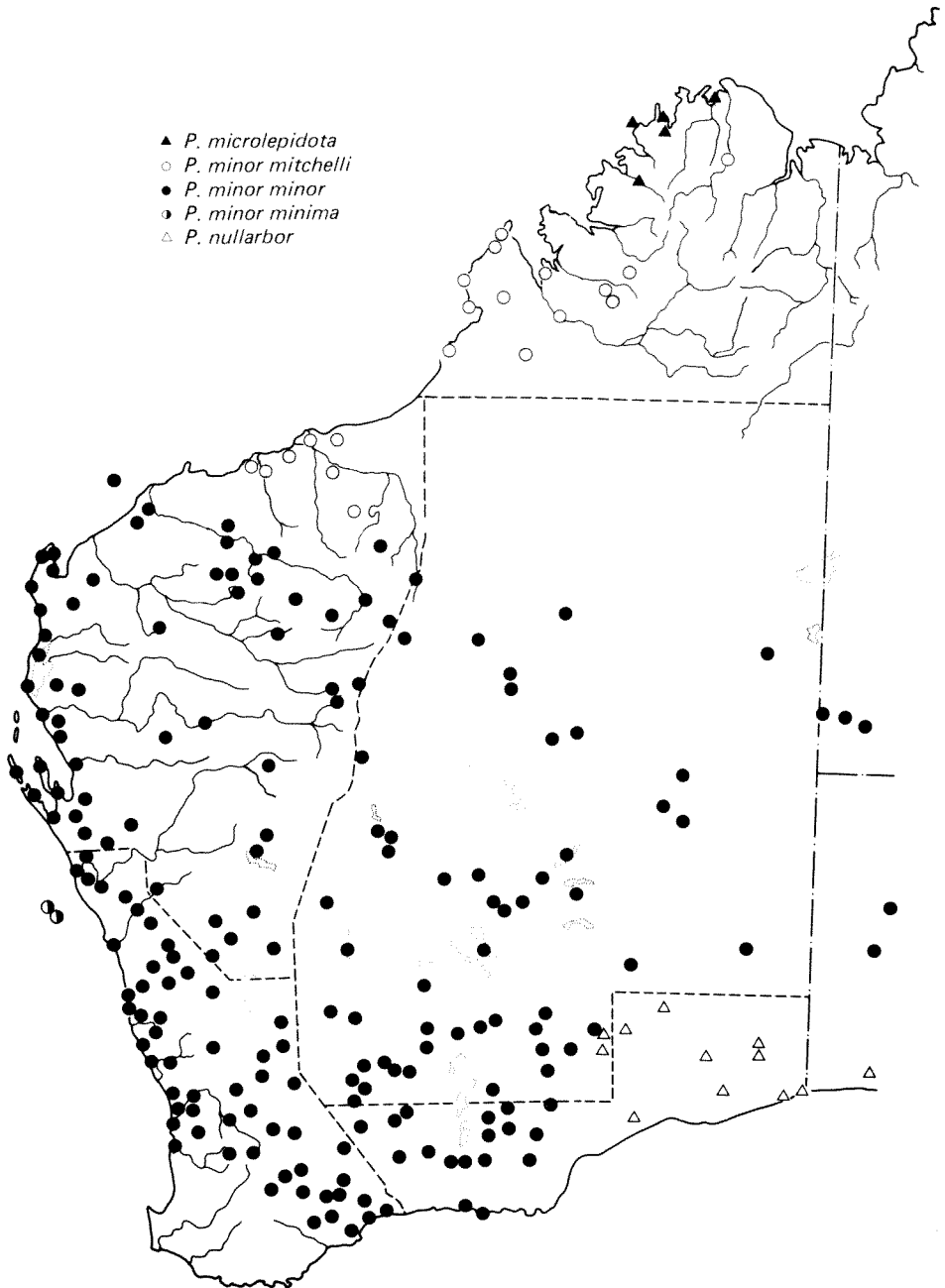


Figure 1 Map of Western Australia showing location of specimens of *Pogona*.

**Distribution**

Greater part of Australia but not north-east of Western Australia, north of Northern Territory, far north of Queensland, or Tasmania.

**Derivation of Name**

From Greek *pogon* (beard).

**Key to Western Species and Subspecies of *Pogona***

- 1 Body not very wide or greatly depressed; dorsoventral angle of body bearing one (occasionally two) series of small, uniformly erect spines (not much larger than those of rest of back) . . . . . 2
- Body very wide and greatly depressed; dorsoventral angle of body bearing 3-8 contiguous series of large spines pointing in various directions . . . . . 4
- 2 Head longer than wide; dorsal coloration predominantly greyish; spines of transverse occipital series usually weak and not contiguous; a longitudinal series of spines usually present on each side of nape . . . . . 3
- Head as wide as long; dorsal coloration predominantly yellowish-brown or orange-brown; spines of transverse occipital series usually strong and contiguous; no longitudinal series of nuchal spines . . . . . *P. minor mitchelli*
- 3 Widespread in Western Australia; hindleg 47-72% of SVL . . . . . *P. minor minor*
- Confined to the Houtman Abrolhos; hindleg 60-77% of SVL . . . . . *P. minor minima*
- 4 On each side of nape a longitudinal series of spines; conspicuous narrow white bands across back; confined to the Nullarbor Plain . . . . . *P. nullarbor*
- On each side of nape two circular clusters of spines (outer larger); dorsal pattern inconspicuous; confined to north-west Kimberley . . . . . *P. microlepidota*

***Pogona minor minor* (Sternfeld, 1919)**

*Amphibolurus barbatus minor* Sternfeld, 1919, Senckenbergiana 1: 78. Hermannsburg, N.T.

**Diagnosis**

A moderately small *Pogona* with a single series of small erect spines along dorsoventral angle of body, distinguishable from *P. minor minima* by its much

shorter appendages and from *P. minor mitchelli* by its greyish coloration, narrower head and weaker spines (specially those of transverse occipital series).

### Description

Snout-vent length (mm): 34-149 (N 670, mean 94.9). Length of appendages (% SVL): foreleg 33-51 (N 654, mean 41.1), hindleg 47-72 (N 642, mean 59.2), tail 138-229 (N 644, mean 179). Upper labials 12-19 (N 234, mean 15.4). Lamellae under fourth toe 16-29 (N 234, mean 22.8). Femoral pores 2-7 (N 210, mean 3.8) on each side. Pre-anal pores 1-4 (N 211, mean 2.3) on each side.

Transverse series of occipital spines meeting longitudinal series of supra-auricular spines at right angle and curving continuously forwards towards midline; occipital spines small and not contiguous. On each side of nape a longitudinal series of 2-6 spines, well separated from series of higher spines curving around rear of head behind ear. 'Beard' consisting only of large spines on ventrolateral surface of rear of lower jaw.

Upper surfaces moderately dark to very dark brownish-grey, indistinctly and variably marked with paler brownish-grey: a longitudinal streak on each side of neck, often continuous with a series of large, longitudinally elongate, paravertebral



Figure 2 A *Pogona minor minor* from Mt Bruce, W.A., photographed by R.E. Johnstone.



blotches, opposite to those of other side of body and usually connected to them by a narrow transverse band; less frequently irregular, pale greyish, narrow transverse bands on outer dorsum (these bands sometimes dominating pattern and extending right across back). Tail indistinctly banded with pale greyish-brown. A large black spot usually present on side of neck in juveniles, occasionally persisting in adults. Throat often wholly or partly black or dark grey. Venter and under base of tail grey to whitish, with or without more or less distinct ocelli (whitish, longitudinally elongate, elliptical spots with dark lateral edges).

### Distribution

Much of Western Australia north to the southern Pilbara, Little Sandy Desert and Gibson Desert, including Barrow, Dirk Hartog and Salutation Is, but not the far south-west (south of Pinjarra, Wickiepin, Ongerup and the Gairdner River) (see Figure 1). Also south-west of Northern Territory and west of South Australia.

### Geographic Variation

Some of the foregoing description applies only to southern populations. Northwards and north-eastwards the lizards become larger, less greyish and more brownish, and the longitudinal series of spines on side of nape become shorter, then obliquely orientated (anteriorly diverging from midline), and finally a circular cluster of spines (as in *P. minor mitchelli*) at end of transverse series of nuchal spines. These changes take place further south in the interior than on the west coast. The lining of the mouth is yellow in the south, white north of the lower Murchison.

### Material

#### *North-West Division (W.A.)*

Barrow I. (27731, 28668, 47350, 48862, 56692, 78232-3); 15 km SW Mardie Roadhouse (68295); Yarraloola (50049); Tambrey (20078-9) and 16 km S (27732); Yardie Creek HS (52931, 53325); Exmouth (49245); 26 km N Learmonth (25639) and 5 km S (19570); 3 km S Exmouth Gulf HS (22656); near Yardie Creek watercourse (61046, 61213, 61419); Koor-darrie (30366); 11 km NE Yanrey (19376); Mt Brockman (74919); Hamersley (74927); Wittenoom (19567); Mulga Downs (74874); 7 km ENE Kurrana Well (74082); Mt Bruce (69679); Mt Tom Price (31004); Ningaloo (16867-71, 16874); Junction Well, Oakover River (42231); Ethel Creek (45274); 15 km W Marrilla (63799); 14 km N Cardabia (32602); 14 km SW The Governor (64825-7); Mt Newman (25174, 30920-1); Jiggalong (13333, 25168); Turee Creek (17687); Ullawarra (19568); Warroora (8163, 32581); 20 km ENE Gnaraloo (32611) and 5 km SE (71560); Boologooro (27730, 29998, 78246-7); Quobba (21615, 32619); Point Quobba (17315-6, 41634); 10 km SE Mardathuna (71446); Kumarina Mine (22741-2, 23952); 13 km SSW Kumarina Roadhouse (73007); 32 km N Beyonde (23937); Carnarvon (13556, 13692); Callagiddy (37890-1, 40672-3, 40695, 43995); Landor (24829, 40672); Glenburgh (28378-9); 56 km SE Carnarvon (54883-4); Trillbar (21288); Wooramel (54947); Dirk Hartog I. (42340, 45881, 57095, 58887); Peron (41635, 53744, 54622, 57598); 10 km NE Denham (54882); Woodleigh (48016); Mileura (19569); 4 km S Useless Loop (54620-1); 8 km S Nanga (55177); Overlander (29965-7); Hamelin Pool (59013) and 11 km E (55014, 71082); 24 km NW Carrarang (55151-2); False Entrance Well (55099); Monkietarra Well (41801); Editarra Well (54617);

7 km S Carrarang (54746) and 10 km SE (54618); Salutation I. (25773); Tamala (23853) and 8 km NE (18600) and 43 km ENE (23877) and 19 km S (64423-4); Coburn (64437); 36 km NW Cooloomia (66390); Cue (730) and 34 km N (28877); 5-13 km W Mungawolagudi Claypan (60635, 60639-40); 30-40 km SE Nerren Nerren (59619, 59635, 60636) and 31 km SW (64316); 12 km E Tallering Peak (52860-2); 8 km N Kirkalocka (54505); 40 km SE Yalgoo (22944); Fields Find (23812); 29 km ENE Paynes Find (37737); Rothsay State Forest (29612); Pindabunna (12617).

*Eastern Division (W.A.)*

64 km W Windy Corner (45275); Bobbymia (23°45'S, 120°50'E) (51044); Durba Spring (51943); Lake Anec (57070); 145 km N Carnegie (40601-2, 40607, 40610) and 130 km N (36712) and 120 km N (40613); 75 km WSW Everard Junction (60096); 5 km W Mt William Lambert (26889); 14 km N Cunyu (25275); 8 km W Yelma (21106); 13 km S Warburton Range (15140) and 70 km SSW (41586); Skipper Knob (22115); Albion Downs (19787); 20 km SE Mt Keith (62841-2); Kathleen Valley (27218, 37783); Altona (30940); 10 km SSE Banjarnam (66030, 69439, 74783); Lake Throssell (46643); 7 km NNW Erlistoun (62843); 11 km E Yamarna (53664); 18 km ESE Point Sunday (53350) and 40 km E (53566); 7-8 km W Point Salvation (79155-64); 24 km NE Laverton (16521) and 24 km ENE (79165-76); 24 km ENE Yuinmery (66064, 69018-9, 74674) and 7 km E (74715); 4 km N Mt Elvire (73413) and 13 km S (73423); Blue Hill (64823); 6-7 km NNW Mt Linden (65870, 65973, 72776-7) and 10 km SSE (65893); Linden (46628); Iltoon Rockhole (19593); Plumridge Lakes (48713, 48723); Comet Vale (66289) and 2-12 km NE (65669-70, 65786, 65809, 65831, 65846, 72607, 72627, 72641, 72657); Goongarrie National Park (72567, 72572); Mt Manning Range (73325, 73327, 73375, 73383); Mt Jackson (67020) and 18 km S (76024); 14-15 km NE Bungalbin Hill (67098, 67102, 67117, 72109, 72126) and 15 km N (76187) and 12 km N (76205) and 5 km N (67136); 8 km S Yindi (73804); Queen Victoria Spring (12969, 19588, 48661); Streich Mound (58711); near Yowie Rockhole (70894, 70898, 73224-5); 3-5 km SW Black Flag (73257, 73270); Bulong (4207); 10 km NE Cundeelee (21679-82); Kanandah (40686, 41616); Kitchener (19589-70); Zanthus (26519) and 7 km W (32677); Coolgardie (17857-8) and 52 km SSE (58092); 20 km S Woolgangie (71748, 71790) and 43 km SE (71782); Boorabbin (21705); 11 km E Karalee (30691) and 29 km S (33998); near Buningonia Spring (65523, 72465, 72480-1, 72510, 72513, 72584); 29 km S Yellowdine (37916); 21 km ENE Toomey Hills (71835) and 15-16 km E (71815, 71858); 30 km NW Heartbreak Ridge (65420, 65469, 65481) and 30 km N (72420) and 30 km NE (74496) and 20 km N (65386); Split Rock (37815).

*South-West Division (W.A.)*

10 km WNW Gee Gie O/C (39910); 7 km NE Carollgouda Well (34043); Mt Curious (33453); Murchison House (59675); Kalbarri National Park (18591, 33494, 33501, 33517-8, 33687, 33766, 33785, 33833, 33860-2, 33876-7, 34657, 37607, 37632, 71092-3, 78293); Ajana (29626) and 30 km N (33603, 33613, 33658); Binnu (25957); 25-32 km NE Yuna (26494), 56961, 57543, 57587); East Yuna Reserve (48118-9, 49914, 49921, 57552-3); Mullewa (22291); Wilroy (57712); Geraldton (31076-7); Gutha (2822, 78257-8); 16 km S Greenough River mouth (66229); Greenough (71926); Morawa (76235); 20 km SE Dongara (72912); 6 km NE Arrino (45697); Caron (22874-5, 22991, 24783-4); Carnamah (22877-8); 16 km N Eneabba (71994-5) and 5 km SSE (70719); 16 km N Coorow (29968) and 13 km W (13165) and 32 km W (41224); 6-7 km N Leeman (71939, 72917); Stockyard Gully (26741-2); 8 km SSW Marchagee (67432); Green Head (42591) and 5 km E (48455, 48498, 49056, 49058) and 16 km E (73000); near Mt Peron (48413-4, 48424, 49019, 49026, 49136-7, 49212); near Padbury (48483, 49026, 49057, 49114); near Mt Lesueur (48439-40, 48825); Jurien Bay (12688) and 7-16 km NE (19571, 29206-7, 30473-6); 20 km NE Dalwallinu (58214); 25 km



NNE Badgingarra (67425); Badgingarra National Park (68814-8, 68826, 68836-45, 68854-84); 42-48 km N Beacon (48365, 48395-6) and 47 km ENE (44257); Wialki (19586); Moondon (13294); 24 km N Cataby Brook (49211); Tombstone Rocks (19572); Wongan Hills (50227); Mukinbudin (32044); Lancelin (19573) and 16 km N (17699); Ledge Point (19574); Moore River National Park (59401, 59418-9); Trayning Reserve (45977); 32 km S Trayning (53727); 29 km N Kellerberrin (52294) and 25 km N (56657) and 17 km NW (49201); 13 km SE Merredin (56000); Cunderdin (19582); Neerabup National Park (62366); Quinns Rocks (30047); Burns Beach (19575, 28356, 59307, 59510); 'Red Hill Road' (29818); Mussel Pool (51534); Warbrook (12859); Sorrento (41802, 46200); Midland (4552); Bellevue (2799, 22298); Mundaring (2815); Boya (29054); Mt Yokine (19250); Wembley Downs (23917); City Beach (34650); Floreat Park (26515, 28957, 29391-2, 34574); Mt Lawley (4175); Maylands (42); Redcliffe (21220); Gooseberry Hill (4508); Kings Park (19576, 30179); Crawley (19577); South Perth (44, 368); Bentley (29720); 3 km W Kalamunda (21834) and 10 km E (17131, 21280, 21873); Piesse Brook (24087); Badjaling Reserve (52426-31); near Quairading (2481); Dangin (19591); Lesmurdie (19578-80); Wilson (32020); Bull Creek (19594); Booragoon (47716); Melville (26758); White Gum Valley (3385); O'Connor (19951); Canning Vale (52654-5); Coolbellup (66236); Spearwood (2795); Jandakot (60056-8, 60061-4, 60073-5, 60514-5, 62127-43, 62582-4, 62884); Kelmscott (19047, 51429); Roleystone (21871-2); Beverley (22851); Naval Base (57529); Bendering Reserve (43410), 43441, 43676, 52594, 52596, 57338, 67519); near Corrigin (28902); 3 km SE Mt Vincent (68115); Mandurah (21870); Pinjarra (31988); Lake Varley (21219); 25 km E Yornaning (50198); Dryandra State Forest (62239); North Tarin Rock Reserve (44437); Lake Grace Reserve (43825-6); Kukerin (6102); 29 km SE Newdegate (47607-8); Dongolocking Reserve (49620-3, 49728-9); '8 km SW Collie' (19581); Lake Chinocup (43466-70); 27 km E Pingrup (39861-3, 45299); Lake Magenta Reserve (39950); 32 km W Ravensthorpe (44870) and 26 km W (44865); Jerramungup (14493); 10 km SE Ongerup (42622); Culham Inlet (78181); 4 km W Hopetoun (56064); East Mt Barren (78228); near Woolberrup (41147); Dempster Inlet (38998-9); lower Gairdner River (52090); 'Cape Leeuwin' (299, 12784, 29984).

#### *Eucla Division (W.A.)*

Near McDermid Rock (65262, 65269, 65287, 65291, 74240, 74293); between McDermid Rock and Lake Cronin (65278); North Ironcap (71172); near Lake Cronin (65097, 65099, 65100, 65160, 68007, 68028, 68032, 68037, 68052, 74104, 74218); 8 km WNW Forrestania (71180); Frazer Range (54770-1); 30 km NNE Balladonia Hotel (46606); 20 km E Jyndabinbin Rockhole (62360) and 27 km E (62359); 38-40 km ESE Norseman (57920, 57951); 42 km ENE Clear Streak Well (59756) and 8 km N (59587-8, 59861-2); Charlina Rock (57967) and 18 km NNE (59871); 10 km SE Mt Newmont (59757-8); Frank Hann National Park (78342); Peak Charles (56884); Salmon Gums (30790) and 20 km E (22653) and 60 km E (62361, 62364-5); Esperance (19587) and 32 km E (21994) Cape LeGrand National Park (41945, 67753).

#### *Northern Territory*

Docker River (45201, 45206); 16 km E Lasseters Cave (34197-8); Armstrong Creek (34182); Ayers Rock (46634-5).

#### *South Australia*

250 km N Cook (34536) and 160 km N (31858-9); Everard (24511).

*Pogona minor minima* (Loveridge, 1933)

*Amphibolurus barbatus minimus* Loveridge, 1933, Proc. New Engl. zool. Club 13: 69. West Wallabi I., W.A.

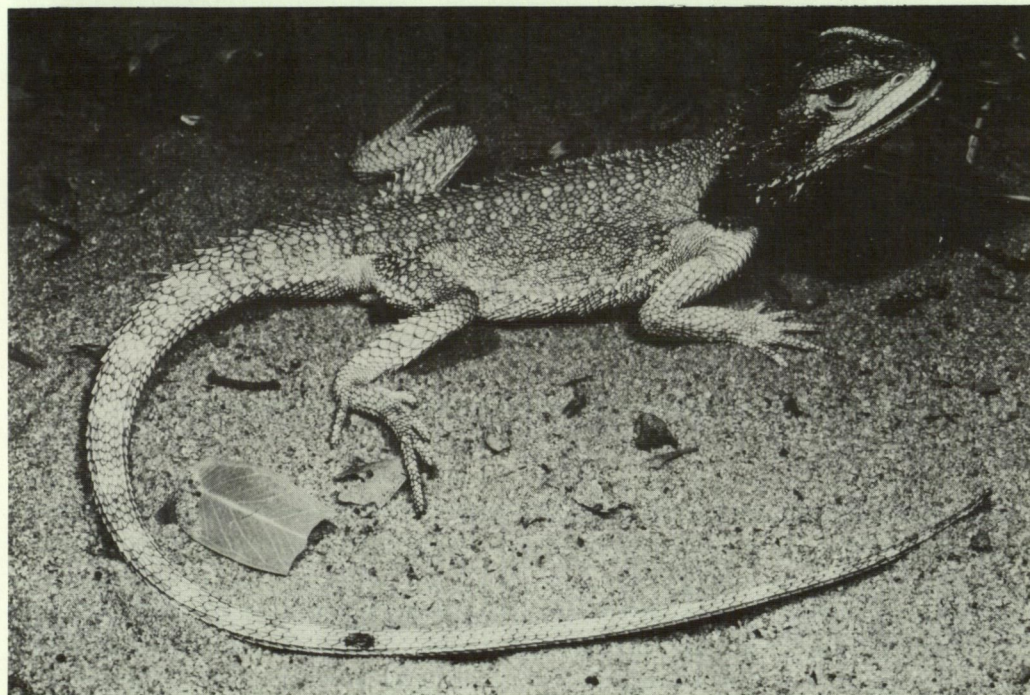
**Diagnosis**

A small, relatively slender, long-limbed *Pogona*, similar in all respects to *P. minor minor* of the opposite mainland except for its longer appendages and more numerous subdigital lamellae.

**Description**

Snout-vent length (mm): 39-115 (N 82, mean 90.9). Length of appendages (% SVL): foreleg 42-54 (N 81, mean 47.0), hindleg 60-77 (N 81, mean 69.2), tail 175-246 (N 74, mean 203). Upper labials 12-17 (N 81, mean 14.7). Lamellae under fourth toe 20-31 (N 80, mean 25.3). Femoral pores 2-6 (N 68, mean 4.1) on each side. Pre-anal pores 2-5 (N 68, mean 2.6) on each side.

Scalation and coloration as in southern *P. m. minor*.



**Figure 3** A *Pogona minor minima* from North I., Houtman Abrolhos, W.A., photographed by P. Griffin.

## Distribution

The larger and more northerly islands (North, East Wallabi and West Wallabi) of the Houtman Abrolhos, off the midwest coast of Western Australia (see Figure 1).

## Material

### *South-West Division (W.A.)*

North I. (47815-8); East Wallabi I. (19547-62, 21846, 30183-9, 30201, 46554, 47826-7, 78249); West Wallabi I. (19501-46, 29496-7, 57996).

### *Pogona minor mitchelli* (Badham, 1976)

*Amphibolurus mitchelli* Badham, 1976, Aust. J. Zool. 24: 435. Derby, W.A.

## Diagnosis

A moderately large *Pogona*, distinguishable from *P. m. minor* by its brighter coloration (more brownish, less greyish), greater size, wider head, stronger contrast between scales in front of and behind transverse series of occipital spines, and lack of longitudinal series of spines on side of nape.

## Description

Snout-vent length (mm): 37-163 (N 63, mean 109.6). Length of appendages (% SVL): foreleg 36-46 (N 62, mean 39.6), hindleg 49-64 (N 60, mean 54.6), tail 143-205 (N 58, mean 170). Upper labials 14-19 (N 53, mean 15.9). Lamellae under fourth toe 17-25 (N 54, mean 20.8). Femoral pores 4-6 (N 49, mean 4.3) on each side. Pre-anal pores 2-4 (N 49, mean 2.5) on each side.

Transverse series of occipital spines meeting longitudinal series of supra-auricular spines at less than a right angle, and only curving forwards near midline; spines usually stronger and more contiguous than in other subspecies of *P. minor*. Scales behind occipital spines smaller than in other subspecies, with a greater step down from plane of occipital scales to plane of nuchal scales. Longitudinal series of nuchal spines of other subspecies reduced in *mitchelli* (as in northernmost *P. minor minor*) to a small cluster of spines continuous with transverse series of nuchal spines. Cluster of spines on scapular fold larger than in other subspecies. Lateral scales at rear of throat (continuous with 'beard') larger and more spinose than in other subspecies.

Dorsal ground colour yellowish-brown, orange-brown or greyish-brown. Dorsal and ventral pattern in juveniles not so marked as in other subspecies and seldom persisting in adults.

## Distribution

Arid and semi-arid north-western Western Australia, i.e. western Kimberley and northern Pilbara south to the Port Hedland and Marble Bar districts (see Figure 1).



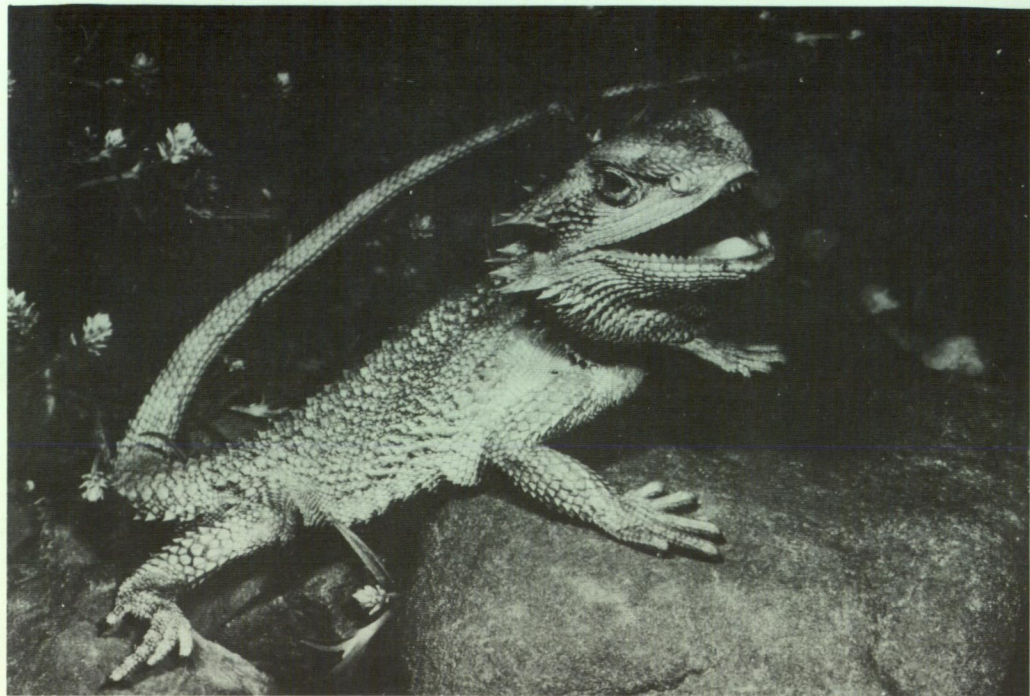


Figure 4 A *Pogona minor mitchelli*, photographed by P. Griffin.

#### Remarks

Badham (1976) treated *mitchelli* as a full species. However it hybridizes with *P. m. minor* in southern Pilbara, but the narrowness of the hybrid zone (less than 200 km wide) permits the recognition of two mainland subspecies of *P. minor*.

#### Material

##### *Kimberley Division (W.A.)*

Drysdale River National Park (15°16'S, 126°43'E) (50696); Lombadina (46416) and 6 km S (60911); Martins Well (16°34'S, 122°51'E) (58527, 28532); Pender Bay (58524-5); Coulomb Point (40246-7, 58526); Point Torment (60916); Inglis Gap (27727); Derby (15182-4, 15823, 26828-30, 31037, 33624, 49986) and 24 km SSE (32166, 32189); 10 km WNW Mt North (70527) and 3 km SSW (70534); 5 km NNW Mt Percy (70655-6); 24 km E Deep Creek (68983); Broome (14109, 14135*a-i*, 58857-8); Mt Anderson (32196-8); Edgar Ranges (53999, 54011, 54070); Injudinah Creek (27723); LaGrange (3445, 13067, 46489); Cape Bossut (40536).

##### *North-West Division (W.A.)*

DeGrey (2116, 73038); Great Northern Highway, 63 km ENE of DeGrey River crossing (46068); 25 km ESE Port Hedland (46498); Mundabullangana (19556) and 23 km SE (19377); 70 km N Marble Bar (40860); Mt Edgar (13066, 45758-60).



*Pogona microlepidota* (Glauert, 1952)

*Amphibolurus barbatus microlepidotus* Glauert, 1952, West. Aust. Nat. 3: 168. Drysdale River Mission [Pago], W.A.

**Diagnosis**

A large *Pogona* with relatively small and narrow head and wide and strongly depressed body. Further distinguishable from *P. minor* by its 3-5 rows of large spines (rather than one row of small spines) along dorsoventral angle of body.

**Description**

Snout-vent length (mm): 93-180 (N 13, mean 148.7). Length of appendages (% SVL): foreleg 38-45 (N 13, mean 42.5), hindleg 59-71 (N 13, mean 65.7), tail 181-212 (N 13, mean 198). Upper labials 15-19 (N 13, mean 17.0). Lamellae under fourth toe 20-23 (N 13, mean 21.3). Femoral pores 3-5 (N 13, mean 3.8) on each side. Pre-anal pores 2-3 (N 13, mean 2.1) on each side.



Figure 5 A *Pogona microlepidota* from Crystal Head, W.A., photographed by R.E. Johnstone.

Transverse series of occipital spines well separated from longitudinal series of high supra-auricular spines; a single central occipital spine and 1-3 outer spines moderately large, remainder small. At back of nape a small circular cluster of spines close to midline; further out (in same position as in *P. minor mitchelli*) a larger, higher, oblique cluster of spines narrowly separated from transverse series of nuchal spines (posterior sector of series of high spines curving around rear of head behind ear). 'Beard' a little better developed than in *P. minor* and extending further on to ventral surface of throat. Small cluster of spines on scapular fold; parallel to and behind fold a short series of spines.

Dorsal ground colour dull yellowish-brown, becoming more greyish-brown towards middle of back. Little evidence of dorsal pattern apart from a tendency for yellowish brown and greyish-brown to be disposed in vague, narrow, alternating transverse bands of each colour. Side of rear of head (especially streak through temple) and side of neck blackish-grey. Tail greyish-brown, narrowly banded with pale dull yellowish-brown. Lower surfaces brownish-white occasionally spotted with grey.

### Distribution

Far north of Western Australia, i.e. subhumid north-west Kimberley from Napier Broome Bay south-west to the Prince Regent River (see Figure 1).

### Material

#### *Kimberley Division (W.A.)*

Pago (951-2, syntypes); Kalumburu (27728-9, 34075, 74943); near Crystal Head (14°30'S, 125°47'E) (43028, 56232); Mitchell Plateau (14°53'S, 125°49'E) (44258); Bigge I. (57108); Prince Regent River National Park (46847, 46962, 47246).

### *Pogona nullarbor* (Badham, 1976)

*Amphibolurus nullarbor* Badham, 1976, Aust. J. Zool. 24: 440. 16 km NW Naretha, W.A.

### Diagnosis

A moderately large, short-snouted, short-tailed *Pogona* with wide, strongly depressed body. Further distinguishable from *P. minor* by 3-7 rows of large spines (rather than a single row of small spines) along dorsoventral angle of body, pale narrow transverse dorsal bands, and smooth mucronate (rather than keeled) ventrals.

### Description

Snout-vent length (mm): 51-141 (N 16, mean 121.7). Length of appendages (% SVL): foreleg 34-43 (N 16, mean 38.7), hindleg 51-62 (N 16, mean 56.6), tail 122-160 (N 15, mean 138). Upper labials 14-20 (N 16, mean 16.7). Lamellae



under fourth toe 17-23 (N 16, mean 19.3). Femoral pores 3-5 (N 15, mean 3.9) on each side. Pre-anal pores 2-3 (N 15, mean 2.3) on each side.

Transverse series of occipital spines curving forwards towards midline, its alignment forming acute angle with that of short series of low supra-auricular spines; occipital spines small and not contiguous. On side of nape a longitudinal series of 3-6 spines (as in southern and western *P. minor* but weaker), separated from series of high spines curving around rear of head behind ear. 'Beard' weak but extending (as a band of narrow, elongate, strongly mucronate scales) right across throat. Cluster of spines on scapular fold small.

Dorsal ground colour reddish-brown, orange-brown or greyish-brown. Six or 7 narrow creamy-white cross-bands on neck and back; pale bands on tail wider and darker. Throat greyish or whitish, marked with 3 or 4 hollow chevrons, the smaller inside the larger. Ventral surfaces as in *P. minor*, i.e. greyish in juveniles with ocelli (longitudinally elongate, whitish spots laterally edged with greyish brown), whitish in adults and marked with short longitudinal greyish-brown streaks (sides of obsolete ocelli).

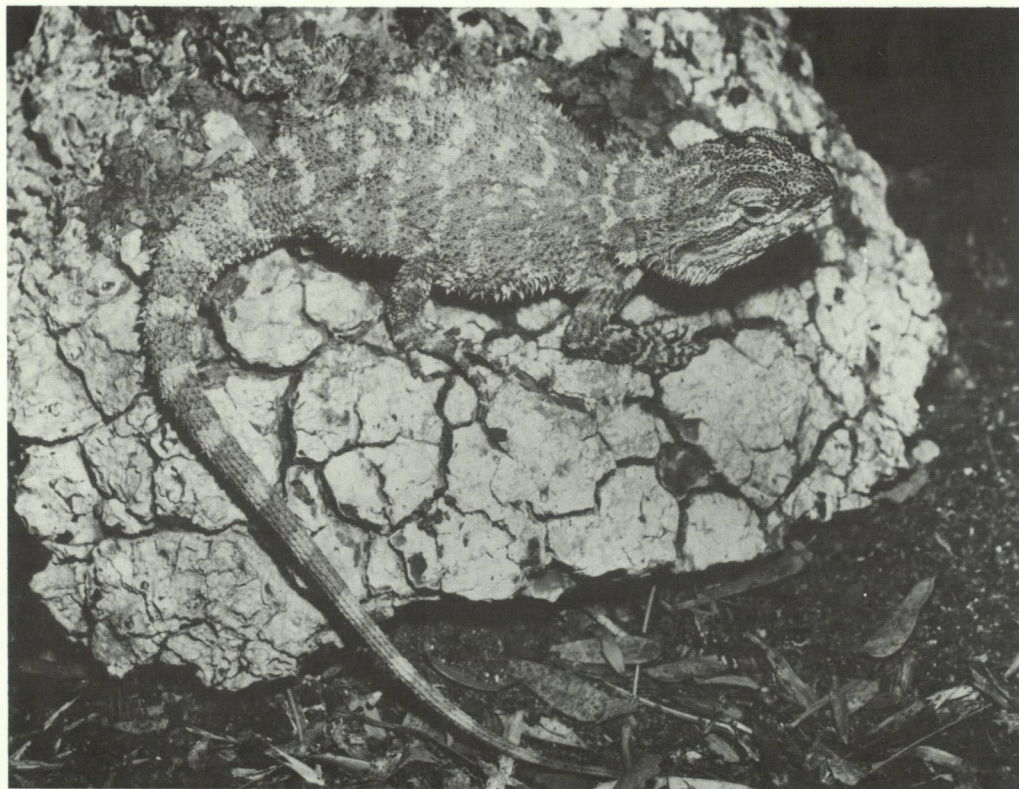


Figure 6 A *Pogona nullarbor* from Madura, W.A., photographed by R.E. Johnstone.



## Distribution

The Nullarbor Plain of arid south-eastern Western Australia and western South Australia (see Figure 1).

## Material

### *Eastern Division (W.A.)*

Kanandah (37789); Naretha (19592, 48172) and 16 km NW (29667, holotype).

### *Eucla Division (W.A.)*

112 km NNE Rawlinna (31964-5); 16 km W Seemore Downs (39055); 16 km S Loongana (29486); Forrest (16888, 16896) and 24 km S (41632); Wilson Bluff (28127); 40 km SW Eucla (66449); 33 km NE Madura (28901); Cocklebidy (24655).

### *South Australia*

75 km S Cook (31620).

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## GUIDE TO AUTHORS

### Subject Matter

Reviews and papers reporting results of research in all branches of natural science and human studies will be considered for publication. However, emphasis is placed on studies pertaining to Western Australia. Material must be original and not have been published elsewhere.

### Presentation

Authors are advised to follow the layout and style in the most recent issue of the *Rec. West. Aust. Mus.* including headings, tables, illustrations and references.

The title should be concise, informative and contain key words necessary for retrieval by modern searching techniques. Names of new taxa must not be included. An abridged title (not exceeding 50 letter spaces) should be included for use as a running head.

An abstract must be given, summarizing the scope of the work and principal findings. It should normally not exceed 2% of the paper and should be suitable for reprinting in reference periodicals. Contrary to Recommendation 23 of the International Code of Zoological Nomenclature it may include names of new taxa.

Footnotes are to be avoided, except in papers dealing with historical subjects.

The International System of units should be used.

Numbers should be spelled out from one to nine in descriptive text; figures used for 10 or more. For associated groups, figures should be used consistently, e.g. 5 to 10, not five to 10.

Spelling should follow the *Concise Oxford Dictionary*.

Systematic papers must conform with the International Codes of Botanical and Zoological Nomenclature and, as far as possible, with their recommendations.

Synonymies should be given in the short form (taxon, author, date, page) and the full reference cited at the end of the paper.

### Manuscripts

The original and two copies of manuscripts should be submitted to the Publications Officer, Western Australian Museum, Francis Street, Perth, Western Australia 6000. They must be in double-spaced typescript on A4 sheets. All margins should be at least 30 mm wide. Tables plus headings and legends to illustrations should be typed on separate pages. The desired positions for insertion of tables and illustrations in the text should be indicated in pencil. Tables should be numbered consecutively, have headings which make them understandable without reference to the text, and be referred to in the text.

Drawings must be suitable for direct photographic reproduction. Photographs must be submitted as high quality black and white prints. The original and two copies (the latter at desired reproduction size) of all illustrations are required with figure numbers lightly pencilled on the back. Lettering on them must be of appropriate size for reduction, if this will be necessary. Scale must be indicated, preferably on the illustration. All illustrations, whether line drawings or photographs, should be numbered in sequence and referred to as 'Figure/s' in the text. Each must have a brief, fully self-explanatory caption.

In papers dealing with historical subjects references may be cited as footnotes. In all other papers references must be cited in the text by author and date and all must be listed alphabetically at the end of the paper. The names of journals are abbreviated according to *World List of Scientific Periodicals*. The use of 'unpublished data' or 'personal communication' is discouraged.

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