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THE HERPETOFAUNA OF THE CAPE PROVINCE, SOUTH AFRICA: NEW DISTRIBUTION RECORDS AND ZOOGEOGRAPHY

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ABSTRACT

Numerous new distribution records are given for 19 amphibian, 3 tortoise, 32 lizard, and 15 snake species and subspecies in the Cape Province, particularly in the eastern and central karroid regions. Many species are shown to have much wider distributions than previously believed. The importance of the mountains of the inland escarpment as a refugium for temperate species, the presence of isolated populations of western arid species in the karroid valleys of the northern Cape Fold Mountains, and the possible vicariant effects caused by sea level fluctuations on species inhabiting the southern Cape coastal plain, are briefly discussed.

INTRODUCTION

Despite having been settled by Europeans for over 150 years, the Eastern Cape has remained herpetologically poorly known. This is despite four major Provincial Museums in the region, as well as the presence of two of South Africa's foremost herpetologists, ie. F. W. FitzSimons (Port Elizabeth Museum and Snake Park) and John Hewitt (Albany Museum). During various surveys and collecting trips by the author in the last ten years, numerous new and interesting range extensions of the commoner species have accumulated. Many of these have been incorporated informally in the production of the small general distribution maps that accompany species descriptions in the recent field guide to southern African reptiles (Branch, 1988a). A few new snake localities were also incorporated into the updated distribution maps in Broadley (1983). These are now formally documented here, along with a number of amphibian records and additional notes on rare species that have also been discovered. Many of the frog and toad records stem from the extensive surveys carried out by John Greig whilst stationed in Grahamstown (1971-3).

The taxonomic status of certain genera in the region are currently under investigation, eg. *Tropidosaura* and *Afroedura*, and the *Pachydactylus maculatus-oculatus*, *Pseudocordulus microlepidotus*, *Bradypodion taeniobrochum* and *Bitis inornata* species-complexes. New distributions concerning these groups will accompany the publication of their taxonomic revisions (Branch *in prep.*). In addition, some new distribution data for certain groups has been presented elsewhere; eg. Cape *Tetradactylus*, Branch (1990a); *Bufo vertebralis*, Braack, Boycott and Branch (1990). Reviews of the herpetofauna of certain southern National Parks, eg. the Addo Elephant NP (Branch and Braack, 1987), the Tsitsikama Coastal and Forest NP (Branch and Hanekom, 1987), and the Karoo NP (Branch and Braack, 1989) also include new distribution data. A preliminary, and now somewhat out of date, analysis of the distribution and diversity of the Eastern Cape herpetofauna (upto 1983) was given elsewhere (Branch, 1988b).

Herpetological collections in the Cape Provincial museums are currently in the process of being consolidated and rationalized. Most have been, or are due to be, incorporated into the Port Elizabeth Museum collection. So far these include the total herpetological collections of the Kafferian Museum (King Williams Town), the chelonian and amphibain collections of the Albany Museum in Grahamstown, and some of the herpetological collection of the Chief Directorate of Nature and Environmental Conservation (Jonkershoek) (CDNEC). The remainder of the herpetological collections at these institutes will be consolidated into the PEM collection at a future date. Catalogue numbers of voucher specimens in the Port Elizabeth Museum collection are; PEM A = Amphibia; PEM R = Reptilia. Where relevant, the old museum prefixes for specimens incorporated into the PEM collection are included. The original catalogue numbers (AM) are given for Albany Museum specimens still in the process of being re-accessioned into the PEM herpetological collection,

The accompanying maps display only the distribution of the new localities listed below. They should be compared and integrated with the detailed maps or localities giving the total distribution of species in southern Africa; i.e. lizards (FitzSimons, 1943), snakes (Broadley, 1983), tortoises (Greig and Burdett, 1976); amphibians (Poynton, 1964); or specific maps for taxa having been recently reviewed, eg. *Chondrodactylus, Ptenopus* (Haacke, 1975, 1976), *Pachydactylus rugosus* (McLachlan, 1979), *Nucras tessellata* (Broadley, 1972), *Pyxicephalus adspersus* (Parry, 1982), etc. In a few cases sight records or unconfirmed reports are included, although they are unsupported by voucher specimens. They are marked with half-symbols on the maps. They should not be used in unqualified distribution maps or ranges, and serve only as aids to future workers for possible localities in which the species may be found.

As an aid to stimulating the assistance of farmers and of focusing effort during field work, a display poster was displayed at the 1983 Beaufort West Agricultural Show at the stand of the Karoo National Park. It included colour photographs of a number of secretive and interesting Karoo reptiles and amphibians, including the bullfrog (*Pyxicephalus adspersus*), giant ground gecko (*Chondrodactylus angulifer*), Namaqua chamaeleon (*Chamaeleo namaquensis*), Namib tiger snake (*Telescopus beetzi*) and Fisk's house snake (*Lamprophis fiskii*). Farmers were asked to give their farm address and note which, if any, of the species displayed occurred on their properties. The response was very encouraging, and a number of new localities were recorded and are listed in the following accounts. In a number of cases we have managed to subsequently confirm the presence of the species on the farms noted. All the species are very distinctive and are unlikely to be confused with other species, even by inexperienced herpetologists.

CLASS: AMPHIBIA
ORDER: ANURA
Family: Bufonidae

Bufo angusticeps **Map 1**

Additional material: PEM A 718, summit of Swartberg, 9 km E of Swartberg Pass, beside forestry jeep track beneath Oliewenberg (3322AC), alt. 1500m, W. R. Branch and M. Smale, under large TMS slab in mountain fynbos (with *Tropidosaura gularis*), 31 October 1979. PEM A 362, 1 km N ski club road, Matroosberg (3319BD), W. R. Branch and J. Greig, 16 September 1979.

Comments: Poynton (1964) records the sand toad from the southwestern Cape, extending inland to De Doorns and along the southern Cape coast to Mossel Bay. Visser (1979) extended the species north along the western Cape coast to Saldanha. The new localities represent considerable range extensions inland in the southern Cape Fold Mountains (100km N Mossel Bay), and extend the species further north in the western Cape Fold Mountains. They also represent a new altitude record for the species, as well as extending its habitat into mountain fynbos.

Bufo amatolica **Map 1**

Additional material: PEM A 497, 1 km past junction Cathcart - Seymour road, Hogsback, Amataola Mountains (3226DB), alt. 1450m, W. R. Branch and R. Barnard, 1 March 1981, in grassland seepage area. PEM A 511, top of Katberg Pass, Didima Range, Winterberg (3226BC), alt. 1400m, W. R. Branch and R. Barnard, 23 March 1981, under scattered rocks in marshy seepage area on summit grassland. PEM A 1062 (KWT 535), Seymour, Fort Beaufort (3226DB), alt. 1450m, 4 February 1973, J. C. Greig and C. Stuart, under soil surface at edge of stone. PEM A 1419 (KWT D28), Hogsback (3226DB), 8 August 1985, C. K. Skead. AM 790-91, Katberg Pass (3226BC), 3 November 1973, J. C. Greig. AM 1095, Amatola Mountains (3227CA), mid-December 1973, J. C. Greig. Additional, un-catalogued specimens were collected at Fenella Falls Farm, Winterberg (3226AD), 3-4 March 1984, W. R. Branch, under rotting pine logs in montane grassland.

Comments: Poynton (1964), when raising *amatolica* to specific status, gave only the type locality, i.e. Amatola Mountains (3226DB). The new material extends the species range, although it is still restricted to the Winterberg (of which the Amatolas form the southern edge). The discovery of both *B. amatolica* and *B. gariepensis* in sympatry (and indeed even in microsympatry, under the same rock together on Didima Ridge, Katberg) confirms Poynton's treatment of the taxa.

Bufo gariepensis **Map 2**

Additional material: Eastern Cape field trip, W. R. Branch and M. Smale, 22 October - 2 November 1979. PEM A 715, Rubridge kloof, north Graaff Reinet (3124DC), 25 October 1979. PEM A 724, 3 km N Farm Doornplaats, north Graaff Reinet (3224AB), 26 October 1979, under stone on shale outcrop by stream. PEM A 708-13, Farm Quaggasdrift, Koueveldberg, Murreysburg District (3224AA), 27 October 1979, under shale slabs on earth next to stream seepage area. PEM A 714, Farm Moddersfontein, Nuweveldberg (3222BA), 27 October 1979. PEM A 716-17, 2.5 km W Farm Abrahamspoort, Nuweveldberg (3222BA), 28 October 1979.

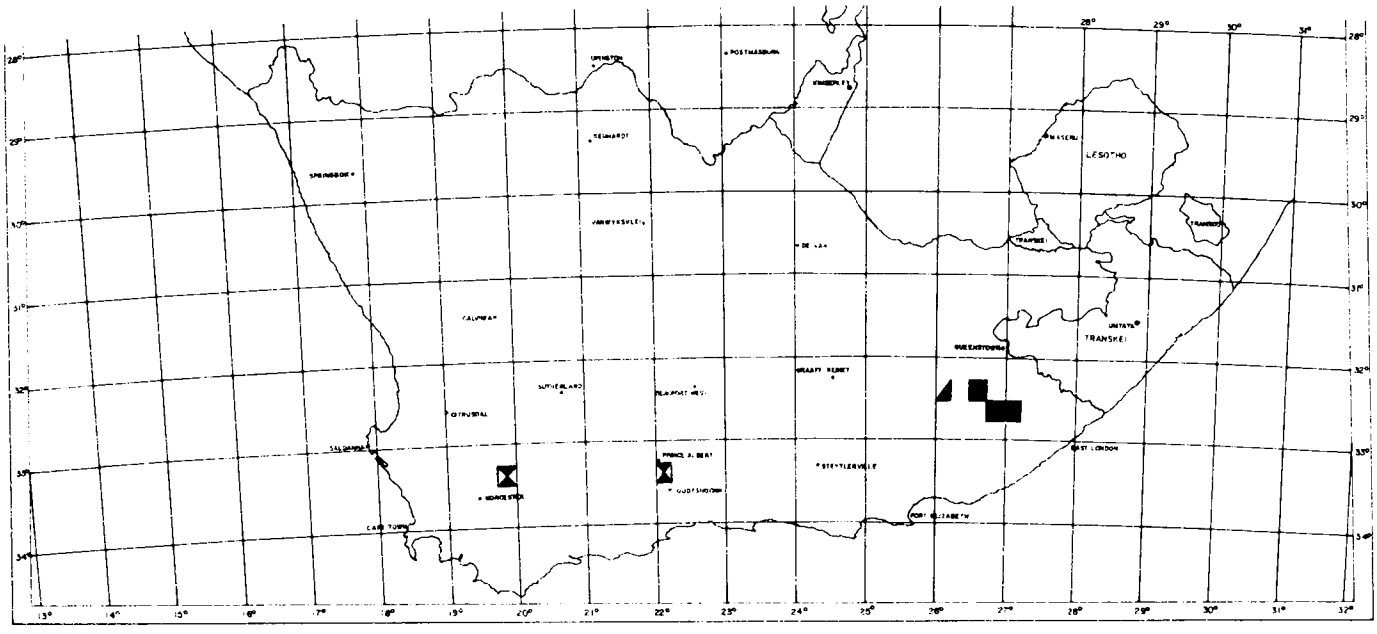
Field trip by W. R. Branch and W. Moholo to Transkei Drakensberg (17-24 November 1980): PEM A 432-40, Rama's Gate border post, Transkei Drakensberg (3028BB), alt. 2390, 19 November 1980. PEM A 417, 427-9, Quaqa's Nek border post, Transkei Drakensberg (3028BA), alt. 2050m, 21 November 1980.

Field trip by W. R. Branch and R. Barnard to the northeastern Cape (1-12 March 1981): PEM A 509-10, Farm Rockford, Elandsberg (3226BD), alt. 1450m, 1 March 1981, under slabs of granite on top of dome beside Tay River. PEM A 520-21, top of Otto du Plessis Pass, Cape Drakensberg (3127BA), alt. 2100m, 3 March 1981. PEM A 477, 515-19), plateau of Cape, Drakensberg, Otto du Plessis Pass, (3127BA), alt. 2100m, 4 March 1981, grazed grassland with ericoid scrub and scattered rock outcrops. PEM A 478, 1 km S motel at top of Barkley Pass (3127BB), alt. 1250m, 4 March 1981, TMS outcrops in grazed grassland. PEM A 476, 485, Naude's Nek at junction of road to Scobell's Kop, Cape Drakensberg (3028CC), alt. 2600m, 4 March 1981, TMS outcrops in grazed grassland. PEM A 471-3, 475, 481, 7.5 km S Dooimanskrans, Naude's Nek, Cape Drakensberg (3028CA), alt. 2650m, 5 March 1981, N-facing slopes with ericoid vegetation and scattered sandstone boulders. PEM A 480, upper reaches of Bell River, 1 km S road to Lehana's Pass, Naude's Nek (3028CA), alt. 2550m, 5 March 1981. PEM A 474, 2 km from Bamboeskloof Station, Lady Grey District (3027CA), alt. 1600m, 6 March 1981. PEM A 479, 484, Farm Boshofskraal, Smut's Pass, Stormsberg (3126BD), alt. 1850m, 8 March 1981. PEM A 469, 482-83, Farm Vereeniging, Bamboesberg (3126CA), alt. 1850m, 9 March 1981. PEM A 470, Farm Goedmoed, Hofmeyer District (3125DB), alt. 1350m, 9 March 1981.

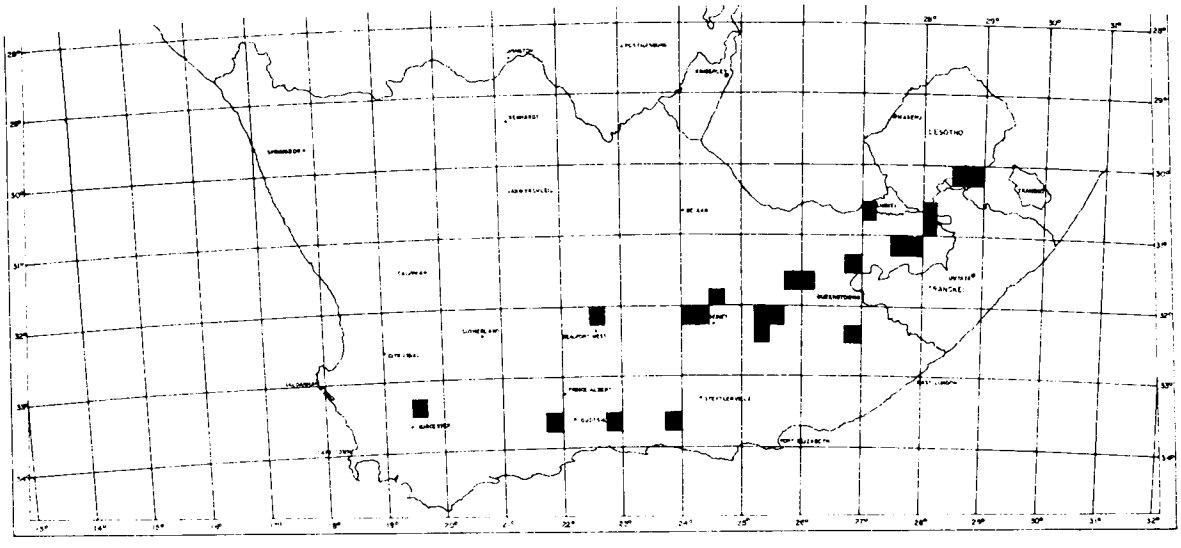
Other records: PEM A 530-31, Studtis, Baviaanskloof (3323DB), 31 March 1982, W. R. Branch. PEM A 767-69, Elandsvlagte, Kammanasieberg (3322DB), 1 November 1979, I. Horne. PEM A 583-85, 33°38'15"S, 22°45'20"E, Kammanasieberg (3322DB), 1 November 1979, I. Horne. PEM A 561, vicinity of ski club hut, Matroosberg (3319BC), 29 October 1982, W. R. Branch and R. C. Boycott. PEM A 668, Cradock, Eastern Cape (3225BA), J. Grobelaar. PEM A 742, 744-48, Swaershoek, Kranskop road, Mountain Zebra NP, Cradock (3225AD), 17 June 1980. PEM A 749-50, Rooiplaat, Mountain Zebra NP, Cradock (3225AD), 17 June 1980. PEM A 544, Mountain Zebra NP, Cradock (3225AB), 2 July 1982, W. R. Branch. PEM A 1286-90 (D135-139), Cradock (3225BA), October 1951, C. J. Skead. PEM A 533-34, New Bethesda, Cape (3124DC), 23 June 1982, W. R. Branch, under stones in river bed. PEM A 1517-18, Farm St Olive's, Ouberg, Graaff Reinet District (3224AB), May 1986, K. McCabe. AM 269, Farm Happy Valley, Cathcart District, 8 December 1972, J. C. Greig. PEM A 1730, Gamka Nature Reserve, Oudtshoorn District (3321DB), 1 June 1989, R. Alladyce. PEM A 1732, 3 km S Oatlands siding, Klipplaat District (3224CD), 1 November, W. R. Branch.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

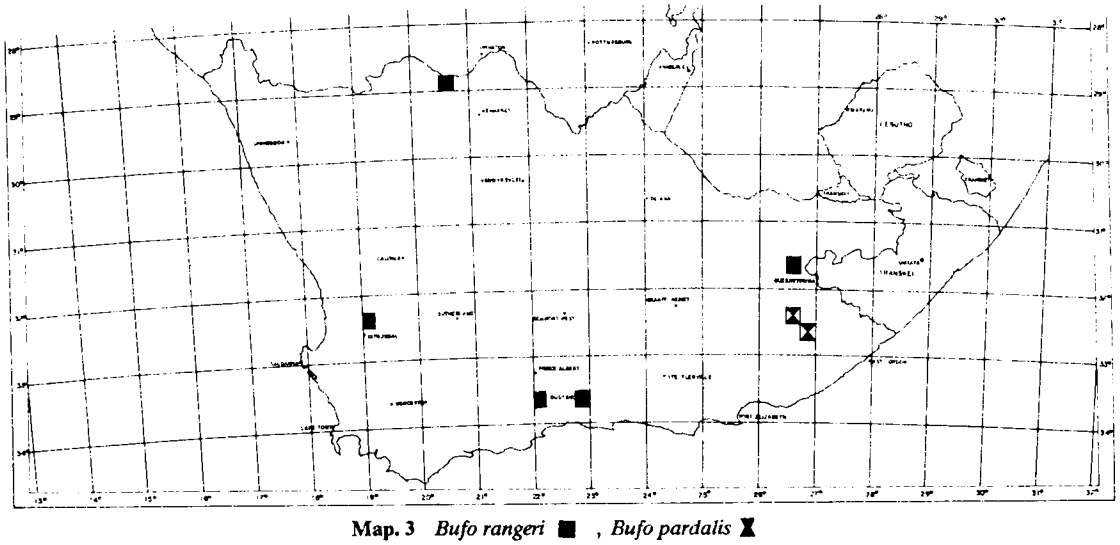
Comments: Poynton (1964) records the Karoo toad from almost throughout the Cape Province, but with large gaps in the central Karoo, southwestern Cape and eastern Cape coastal regions. The new material fills in some of the gap in the central Karoo, with



Map. 1 *Bufo angusticeps* ⧗ , *Bufo amatolica* ■



Map. 2 *Bufo gariepensis* ■



Map. 3 *Bufo rangeri* ■ , *Bufo pardalis* ⧗

additional records for the summit plateaus of the eastern Cape Fold Mountains. Branch and Braack (1989) comment on the problematic taxonomic status of the *nubicolus* 'ecomorph' that appears to be restricted to the montane grassland of the Drakensberg and inland escarpment mountains.

Bufo rangeri **Map 3**

Additional material: PEM A 366-67, in rubbish dump outside Kakamas (2820DC), 19 September 1980, W. R. Branch, under stone near seepage from small dam. PEM A 562, saddle of Mannetjiesberg, Kamannasieberg (3322DB), 6 November 1982, W. R. Branch and R. C. Boycott. PEM R 1522, Algeria forestry station, Cedarberg Sate Forest (3219AC), 30 October 1986, W. R. Branch, at pond in forester's garden. AM 14, Wuppertal, Clanwilliam District (3219AC), 28 June 1972, J. C. Greig. AM 274, Farm Lynedoch, Bedford District (3226CA), 5 December 1972, J. C. Greig. AM 306, Farm Weltevrede, Hofmeyer District (3126DA), 8 December 1972, J. C. Greig. PEM A 954: 2 km N Oudtshoorn (3322CB), 8 March 1983, W. R. Branch, on road at night.

Comments: Poynton (1964) considered this species to be restricted to the southern and eastern regions of the subcontinent, extending west as far as Kimberley District in the north and along the southern Cape coastal regions to the SW Cape. The distribution map in Passmore and Carruthers (1979) shows an isolated record from the vicinity of Augrabies, but gives no further details. The Kakamas specimens confirm this finding, and are the first formally documented for the lower Orange River. The Cedarberg toad extends the species' range in the western Cape 110 km further north from Ceres (Poynton, 1964), whilst the Kammanasieberg toad extends the species' range into the inland Cape Fold Mountains, and the Oudtshoorn record into the Little Karoo.

Bufo pardalis **Map 3**

Additional material: AM 267, Amatola Mountains, 32°41'59"S, 26°53'20"E (3226DB), 8 December 1972, J. C. Greig (sympatric with *Bufo rangeri*, AM 268). PEM A 1611, Katberg Hotel, Katberg Pass, Fort Beaufort District (3226BC), October 1985, W. R. Branch, on lawn on rainy night with *Bufo rangeri* (which was not collected).

Comments: The leopard toad has a curiously disjuct distribution, with isolated populations in the E Transvaal, Natal Midlands, SW Cape and E Cape. Lambiris (in Branch *et al.*, 1989) has commented that these may be taxonomically distinct, and the subject is under investigation. The range in the E. Cape is here extended inland to the Amatola Mountains, in what may be a relict population.

Bufo vertebralis **Map 4**

Additional material: PEM A 751-53, Swaershoek, Kranzkop, Mountain Zebra NP, Cradock (3225AD), 17 June 1980. PEM A 754, below Hartebespoort dam, Rooiplaat ridge, Mountain Zebra NP, Cradock (3225AB), 17 June 1980. AM 548, 32°03'08"S,25°19'55"E, Cradock District (3225AB), 20 April 1973, J. C. Greig. AM 554, 32°01'23"S,25°10'34"E, Cradock District (3225AA), 20 April 1973, J. C. Greig. AM 556, 31°59'36"S,25°06'53"E, Cradock District (3125CC), 20 April 1973, J. C. Greig. AM 557, 31°58'54"S, 25°05'44"E, Cradock District (3125CC), 20 April 1973, J. C. Greig. AM 1146, Farm Grassridge, near Visrivier Station (3125CD), 11 April 1974, J. C. Greig. AM 1205, 1208, 1210, near Visrivier Station (3125CD), 28 November 1974, J. C. Greig. AM 1223, 1227, S of Middelburg (3125CA), 28 November 1974, J. C. Greig.

Additional specimens from the vicinity of the Karoo National Park, Beaufort West, have been described elsewhere (Braack, Boycott and Branch, 1990). They now represent the south-western limit for the species.

Comments: Poynton (1964) records the pygmy toad from a few localities in the eastern Karoo, reaching its eastern limit at Victoria West, and its southern limit at Halesowen, just south of Cradock. The new records confirm its presence in the eastern karroid regions.

Capensibufo tradouwi **Map 4**

Additional material: A 306, Geelhoutboomsberg, Outenikwaberg, George District (3322CD), 22 March 1980, W. Bond, in soil it in pine forest with dense fynbos understorey. PEM A 330, same locality as previous, 23 March 1980, W. R. Branch. PEM A 364, same locality and collector as previous, August 1980. PEM A 572, Buffelsdrift, near Kammanasie River (3322DB), 18 December 1981, R. C. Boycott. PEM A 1743, Elandsvlaakte, Kammanasieberg (3322DA), 1 October 1982, W. R. Branch, under clay slip by road. PEM A 1778, road upto Mannetjiesberg, Kammanasieberg (3322DA), 5 November 1982, W. R. Branch and R. C. Boycott.

Comments: These specimens extend the range of the Cape mountain toad 162 km further east along the coastal mountains, from the type locality of Tradouws Pass. The first records for the Kammanasieberg now form the eastern limit of the species' known range.

Microhylidae

Breviceps verrucosus **Map. 5**

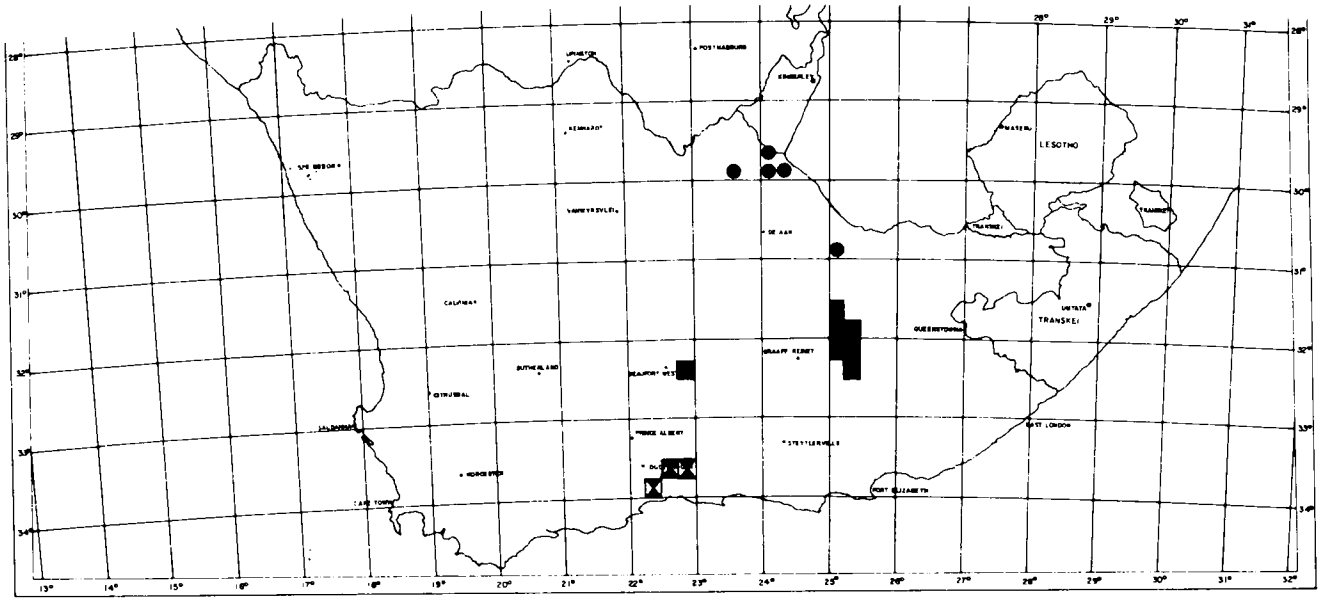
Additional material: PEM A 514, top of Otto du Plessis Pass, Cape Drakensberg (3127BA), alt. 2100m, 10 March 1981, W. R. Branch and R. Barnard, under small boulder in roadise ridge. PEM A 1285 (KWT D235), Yellowwoods, near King Williams Town (3227CD), 15 October 1965, J. Banks.

Comments: The rain frog from Otto du Plessis Pass is the first for the Cape Drakensberg, and geographically intermediate between *B. verrucosus* and its close-relative *B. maculatus*. Lambiris (1988) discusses the taxonomy of this complex, which is in need of revision but which awaits additional material. In 1980, additional specimens were collected at Ntabana Forest Station, Transkei (3028DD) and Rama's Gate, Transkei (3028BB), but unfortunately both were subsequently lost. It is thus impossible to assign the specimens to either *verrucosus* or *maculatus*. I record the localities simply to guide future researchers to suitable localities.

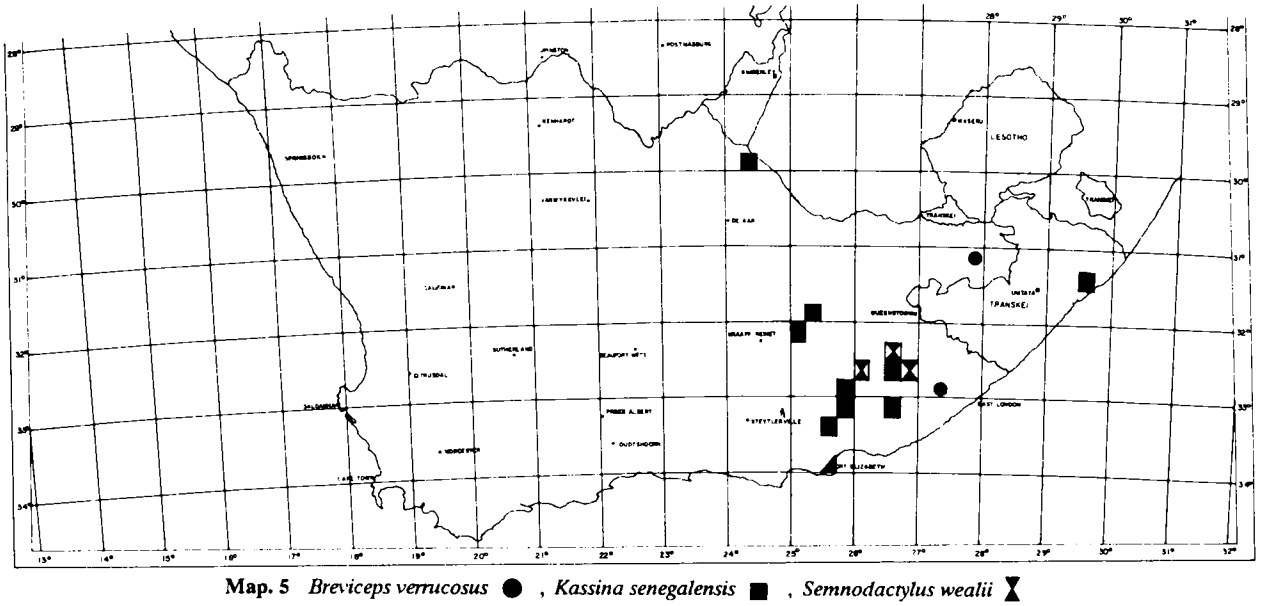
Hyperoliidae

Kassina senegalensis **Map 5**

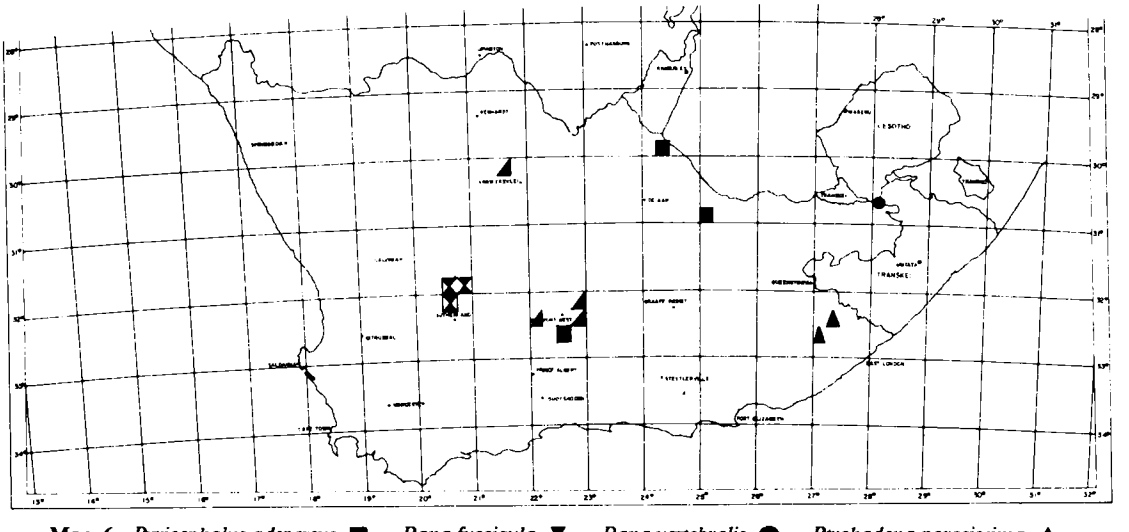
Additional material: PEM A 676-83, Bird Hide Dam at rest Camp, Addo Elephant National Park (3325BC), W. R. Branch and M. Smale, 21 October 1979, 8 adults calling in edge of dam among reeds. AM 206, Fort Brown (3326BA), 23 November 1972, J. C. Greig. AM 553, 32°01'37"S, 25°11'16"E, Cradock District (3225AA), 20 April 1973, J. C. Greig. AM 789, 33°30'49"S,26°42'35"E (3326DA), 3 November 1973, J. C. Greig. AM 1013, E of Kraankuil (2924DC), 11 December 1973, J. C. Greig.



Map. 4 *Bufo vertebralis* ■ , *Capensibufo tradouwi* ⧗ , *Cacosternum boettgeri* ●



Map. 5 *Breviceps verrucosus* ● , *Kassina senegalensis* ■ , *Semnodactylus wealii* ⧗



Map. 6 *Pyxicephalus adspersus* ■ , *Rana fuscigula* ⧗ , *Rana vertebralis* ● , *Ptychadena porosissima* ▲

AM 1022, 1028, 1050, 1147, near Visrivier Station (3125CD), 12 and 19 December 1973, J. C. Greig. AM 1259, S Seldon (3325BB), 21 November 1975, J. C. Greig. AM 1267, near Middleton Station (3225DD), 21 November 1975, J. C. Greig.

The species has also been heard calling at ponds in Port Elizabeth, but no voucher specimens are avaialble.

Comments: Poynton (1964) recorded the western limit of the bubbling kassina as Grahamstown. This is now extended a further 137.5 km west along the Cape coastal belt. Greig's specimens from Cradock and adjacent regions also expands the species range into the NE Cape.

Semnodactylus wealii **Map 5**

Additional material: PEM A 486, Devil's Bellows Nek, Umtwakazi Mountains (3226BC), alt. 1600m, 10 March 1981, W. R. Branch and R. Barnard, under vegetation on sandstone outcrop. PEM A 266, Bedford, Eastern Cape (3226CA), 12 December 1979, J. Pringle. AM 773, 32°30'59"S,26°56'04"E, near Hogsback (3226DB), 27 November 1972, J. C. Greig. AM 792, Katberg Pass (3226BC), 3 November 1973, J. C. Greig.

Comments: First records for the Winterberg range, in the inland mountains of the Cape escarpment.

Ranidae

Cacosternum boettgeri **Map. 4**

Additional material: AM 1001, Strydenburg (2923DC), 10 December 1973, J. C. Greig. AM 1004, Hopetown (2924CA), 11 December 1973, J. C. Greig. AM 1006, near Kraankuil (2924CC), 11 December 1973, J. C. Greig. AM 1012, 1014, E of Kraankuil (2924CD), 11 December 1973, J. C. Greig. AM 1016, Arundel (3025CC), 12 December 1973, J. C. Greig.

Comments: These new records fill in some the large gap for the northern Karoo shown in Poynton's (1964) map. The species appears to be distributed throughout the Karoo.

Phrynobatrachus ukingensis mababiensis

Additional material: AM 398-401, Lusikisiki District, Transkei (3129BC), J. C. Greig.

Comments: The Lusikisiki specimens are the first for the northern Transkei, and help fill some of the gap between Natal and the isolated record at Qolora (Poynton, 1964).

Pyxicephalus adspersus **Map 6**

Additional material: AM 1011, E of Kraankuil (2924CD), 11 December 1973, J. C. Greig. AM 1015 (tadpoles), Arundel (3025CC), 12 December 1973, J. C. Greig. PEM A 1777, Farm Tulpleegte, Beaufort West District (3222DA), January 1986, W. R. Branch and H. H. Braack, numerous metamorphosing froglets from vlei margins.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Unconfirmed sight records given by farmers during the 1983 Beaufort West Agricultural Show include the farms: Vleifontein (?), Hottentos Rivier (?), The Vale (3222BB), Lower Plaatdoorns (3222BD), Grantham (3222AC) and South Lemoenfontein (?).

Comments: This material extends the bullfrog's range into the northern Karoo, and suggests that this giant, yet secretive frog may be widely distributed throughout the arid regions of the Cape. Poynton (1964) and Parry (1982) record only a single locality for the bullfrog within the Karoo, ie. Beaufort West. The closest additional records listed are at Port Elizabeth and Queenstown. Recently Baard (1987) has recorded the species from near Van Wyksvlei (3021BA). The Beaufort West specimens and verbal reports in dicate that the species is widely distributed through the southern plain of the Karoo.

Ptychadena porosissima **Map 6**

Additional material: PEM A 1328-32, 1349-50 (KWM D 154-160), Cathcart (3227AD), 7 January 1965, M and C Louw, in narrow stream below homestead. PEM A 1327, 1346-48 (KWM D150-55), Pirie trout hatchery, Albany (3227CA), 2 January 1965, L and K. Franenstein, in shallow pools in stream in forest above hatchery.

Comments: The Cathcart record extends the species range in the Eastern Cape approximately 40 km further inland from Hogsback (Poynton, 1964), whilst the Pirie records confirm the southern limit for the species.

Ptychadena oxyrhynchus

Additional material: AM 161, southern Transkei coast, 31°54'15"S, 28°55'46"E (3128DD), 4 November 1972, J. C. Greig.

Comments: An additional record at the southern extremity of the range of this tropical species.

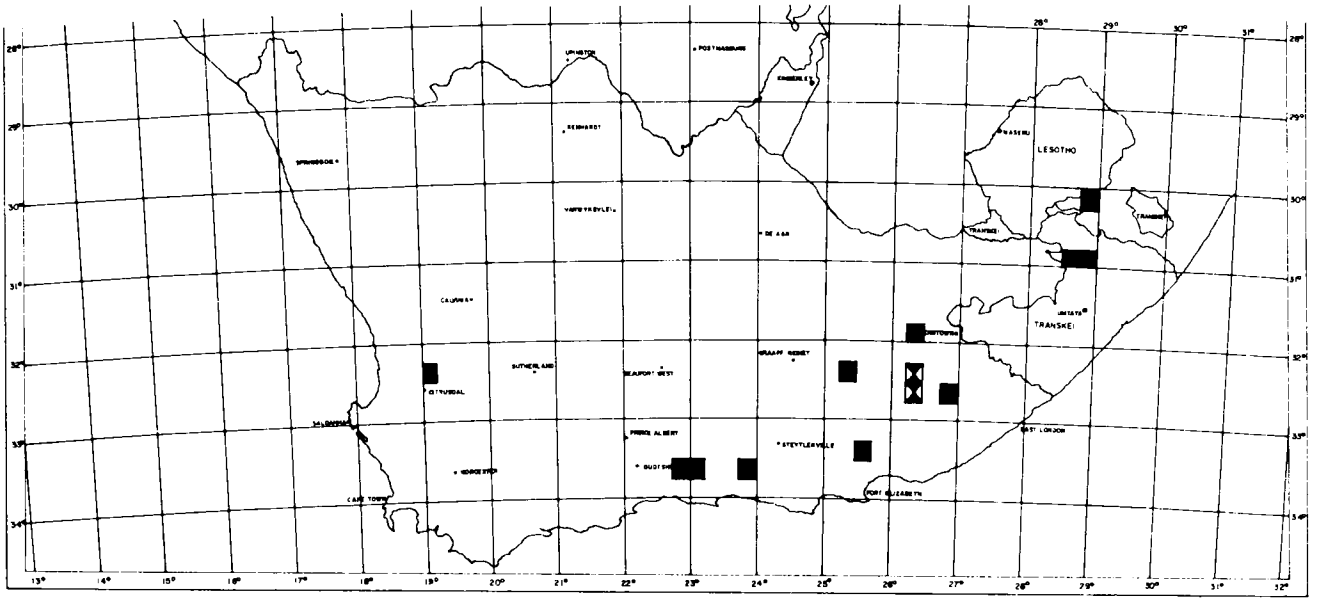
Rana fuscigula **Map 6**

Additional material: AM 25, 20 km N Sutherland (3220BA), 14 September 1972, J. C. Greig. Am 29, Farm Good Hope, between Sutherland and Williston (3120DC), 12 September 1972, J. C. Greig. AM 31, 15 km NE Carnarvon, 12 September 1972, J. C. Greig. AM 1000, 31°46'11"S,20°47'59"E (3120DD), 9 December 1973, J. C. Greig.

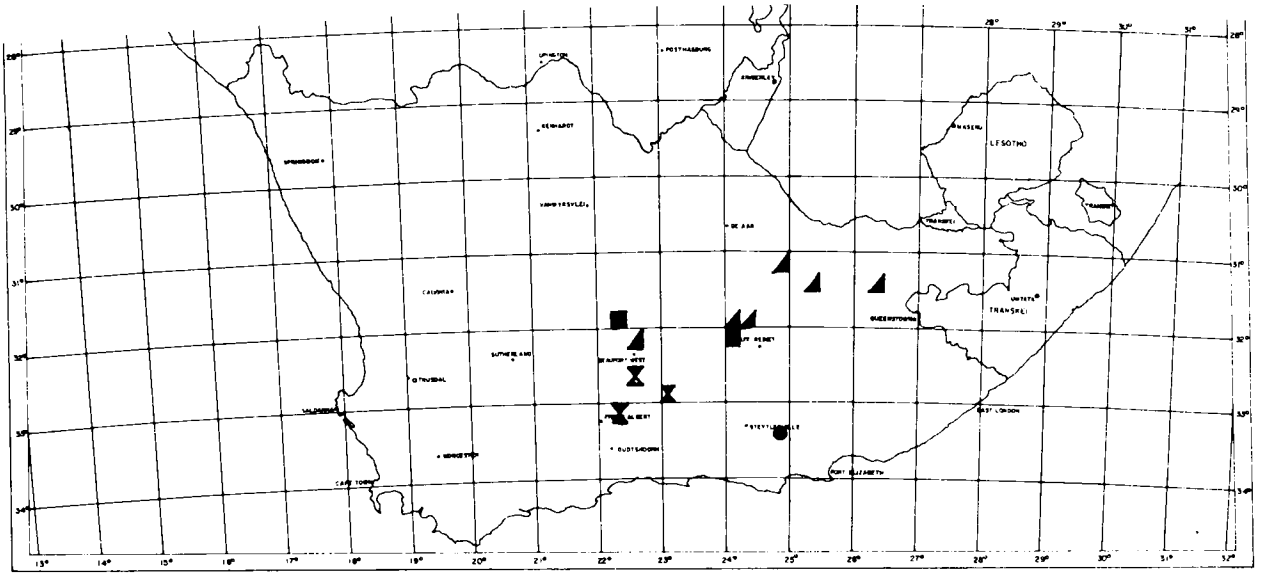
Comment: The material fills in some of the gap shown in Poynton's (1964) map for the western Karoo. The species is probably distributed throughout the region where permanent water is found.

Rana vertebralis **Map. 6**

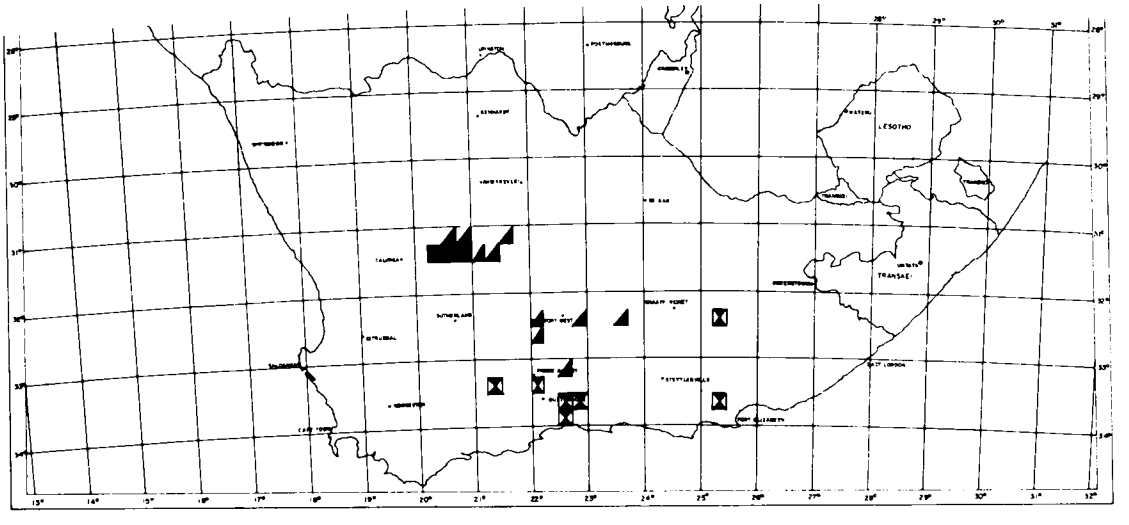
Additional material: PEM A 489-92, upper reaches of the Bell River, Naude's Nek (3028CA), alt. 2500m, 5 March 1981, W. R. Branch and R. Barnard, very large spawn-filled female (SV 145 mm) swimming in deepish (60 cm) water; 2 subadults in shallow (2cm) water covering gravel bank.



Map. 7 *Strongylopus grayii* ■ , *Strongylopus fasciatus* ⧗



Map. 8 *Chersina angulata* ⧗ , *Homopus femoralis* ■ ,*Homopus boulengeri* ●



Map. 9 *Chondrodactylus a. angulifer* ■ , *Pachydactylus geitje* ⧗

Comments: Poynton (1964) notes that the range is restricted to the Drakensberg and Lesotho highlands, with a single locality in the NE Cape (3027DA). The new material confirms the presence of the species in the Cape Province, and slightly extends its range along the southern perimeter of the Cape Drakensberg.

Strongylopus grayii grayii **Map 7**

Additional material: Field trip by W. R. Branch and W. Moholo to Transkei Drakensberg (17-24 November 1980): PEM A 408-14, Ntabane Forest Reserve, Transkei (3028DD), alt. 1000m, 18 November 1980, calling in seepage areas (males with distinct yellow throats). PEM A 441-5, Rama's Gate border post, Transkei Drakensberg (3028BB), alt. 2390, 20 November 1980, calling at night in seepage areas in montane grassland with exposed sandstone bedrock; males with yellow throats; a pair in amplexus. PEM A 424, 466-50, Etwa Forest Reserve, Transkei (3028DC), alt. 1680, 23 November 1980, granite ridge in grazed grassland.

Other material: PEM A 729, northen region of Suurberg Pass, Suurberg (3325BC), 23 October 1979, W. R. Branch and M. Smale, in shallow pond with *Cacosternum boettgeri*. PEM A 532, Studtis, Baviaanskloof (3323DB), 31 March 1982, W. R Branch.PEM A 539-41, 16-17 km S Studtis into Kouga Mountains (7 km from head of Moerdenaars kloof) (3323DB), 1 April 1982, W. R. Branch and R. C. Boycott. PEM A 139-40, Kammannasieberg (3323CA), I. Horne, 8 August 1979. PEM A 141-48, Elandsvlake, Kammannasieberg (3322DB), I. Horne, 15 August 1979. PEM A 776, same locality and collector, 1 November 1979. PEM A 112, Bankberg, Mountain Zebra NP, Cradock District ((3225AD), 18 October 1976. AM 16, Wuppertal, Clanwilliam District (3219AC), 29 June 1972, J. C. Greig. AM 49, Hogsback Forestry Station, Amatola Mountains (3226DB), 10 October 1972, J. C. Greig. AM 286, 31°49'15"S,26°15'40"E, Tarkastad District (3126CD), 7 December 1972, J. C. Greig.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comment: Although Poynton (1964) gives no specific localities for the Karoo and few for the inland mountains of the Eastern Cape, the clicking stream frog is now shown to be common in the inland escarpment mountains and regions of higher rainfall. Channing (1986) described a new frog species, *Strongylopus springbokensis*, from Namaqualand, reaching its southern limit in the Kannies mountains. It may be more widely distributed in the western Karoo.

Strongylopus fasciatus fasciatus **Map 7**

Additional material: AM 47, Hogsback Forestry Station, Amatola Mountains (3226DB), 10 October 1972, J. C. Greig. AM 181, Komkhulu (3226DB), 28 September 1972, J. C. Greig. AM 317, 32°22'28"S,26°19'58"E, Winterberg (3226AD), 6 December 1972, J. C. Greig.

Comments: Additional records from the Amatola Mountains, the limit of its inland penetration in the Eastern Cape.

CLASS: REPTILIA
ORDER: CHELONII
SUBORDER: CRYPTODIRA
Family: Testudinidae
Subfamily: Testudininae

Chersina angulata **Map 8**

Additional material: Farm Middelkraal, 14 km NW Reitbron (3223CC), 25 September 1980, W. R. Branch, DOR specimen, too damaged to collect. PEM R 4593, Farm Lombardskraal, 20 km SW of Beaufort West (3222DA), H. Braack.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: Greig and Burdett (1976) show only a single record for the angulate tortoise in the Karoo at Beaufort West (3222BC) and Haagner (1989) add a new record from an adjacent quarter-degree grid square. The Reitbron and Lombardskraal records show that it is more widely distributed in the southern Karoo, and this is supported by reports of the species at Tierberg, 25 km E of Prince Albert (3322AB) (S. Dean, *pers. comm.*)

H. femoralis **Map 8**

Additional material: PEM R 3836, 1 km before Loxton - Beaufort West road junction (3122CD), 5 March 1983, W. R. Branch. PEM R 1791, Buffelsrivier near Karringsmelkkloof, Murraysburg District (3224AA), 27 October 1979, W. R. Branch M. Smale, juvenile under slab on earth at top of shale outcrop.

The following specimens have been collected, but released after their identity was confirmed: 2 km E of Abrahamspoort, Nuweveldberg (3222BA), alt. 1600m, 28 October 1979, W. R. Branch and M. Smale; Farm Rocklyn, Molteno District (3126AD), alt 1700m, 9 March 1981, W. R. Branch and R. Barnard; Farm Krugerskraal, Compassberg (3124CD), 20 October 1983, W. R. Branch; junction Loxton - Beaufort West road (3122CD), 5 March 1983; Farm Bloubos, Middelburg District (3125AD), 2 March 1983, W. R. Branch; Farm Tweedale, 10 km N. Noupoort (3124BB), 3 March 1983; Farm Enslin's Rus, Compassberg (3124CC), 4 March 1983.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: Greig and Burdett (1976) show a disjunct distribution for the Greater padloper, with the main distribution occuring in the northeastern Cape and the Orange Free State (with a western limit of 3124AC) and isolated records in the western Karoo (3220BC, 3221AB, BA and CA). These specimens fill in the gap in Greig and Burdett's (1976) map, and the species is probably found in montane grassland all along the broken escarpment edge to Sutherland.

Homopus boulengeri **Map. 8**

Additional material: PEM R 5038, S slopes Saltpans Nek, Klein Winterhoekberg (3324BD), 22 April 1987, W. R. Branch.

Comments: A slight southern extension of the species' range (Greig and Burdett, 1976).

ORDER: SQUAMATA
SUBORDER: LACERTILIA
INFRAORDER: GEKKOTA
Family: Gekkonidae
Subfamily: Gekkoninae

Chondrodactylus angulifer angulifer **Map 9**

Additional material: PEM R 4399, 10km W of Williston (3120BD), 11 November 1983, W. R. Branch, DOR. PEM R 4703, 33 km W Williston (3120BC), 21 November 1984, W. R. Branch, DOR. PEM R 4777, 40 km W Williston (3120AD), 12 November 1983, W. R. Branch, DOR.

During night drives on the Carnarvon - Calvinia and Beaufort West - Aberdeen roads, this species was relatively common. Few specimens were retained (usually only road casualties), and in addition to the above, we have sight records for; 17 km W Carnarvon (3121BB), 42 km W Carnarvon (3121BA), 11 km W Williston (3120BD), 38 km W Williston (3120BC), 55 W Williston (3120AD), 70 km W Aberdeen (3223BC), 52, 53 and 56 km W Carnarvon (3121BA), 79 km W Carnarvon (3121AD), 4km E Williston (3120BD), and 15 km E Williston (3121AC).

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989). Unconfirmed sight records given by farmers during the 1983 Beaufort West Agricultural Show include the farms: Leeukuil (3222BD), Koppieskraal, Prince Albert District (3322BA), Vleifontein (?), De Krans (?), Hottentos Rivier (?), Lombardskraal (3222DA), Skilpadfontein (?), Rooiwal (?), and Grantham (3222AC).

Comments: These specimens show that the giant ground gecko is relatively common in the western Karoo, with isolated records from the southern Karoo.

P. geitje **Map 9**

Additional material: Field trip to Kammanasieberg, W. R. Branch and R. C. Boycott, 5-8 November 1982. PEM R 3584-85, 3627, 3635-37, saddle of Mannetjiesberg, Kammanasieberg (3322DB), alt. 1600m, 6-7 November 1982, north-facing slope with low mountain fynbos and scattered flat TMS slabs. PEM R 4747, Stompdrift, Olifants Rivier, Oudtshoorn District (3322DA), alt. 615m, 15 May 1984, J. Vlok. PEM R 4755-56, Waterkloof, Swartberg State Forest (3321AD), 21 July 1977, R. C. Boycott. PEM R 3317-18, Pramkop, Mountain Zebra National Park, Cradock District (3225AD), 4 December 1981, W. R. Branch. PEM R 3211-12, Farm Dassie Mountain View, 25 km N Uitenhage (3325CB), 29 November 1981, W. R. Branch, in rotting *Euphoribia* stem. PEM R 3516-17, Lakes Research Station, Rondevlei, Wilderness (3322DC), 31 July 1976 and 8 May 1982, N. G. Palmer. PEM R 1822, N slopes of Swartberg Pass, 2-3 km N of Gammkakloof turn-off (3322AC), 30 October 1979, W. R. Branch. PEM R 3926, near Farm Hoekplaas, Uniondale District (3322DB), 12 September 1981, W. R. Branch.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: FitzSimons (1943) records the species (as *P. ocellatus*) from the western, south-western and south-eastern Cape, reaching its eastern limits at Beaufort West and Swartberg Pass. He also lists a specimen from Naaupoort (presumably that north of Middelburg) without further comment. This contradicts his range, and it must be considered circumspect. The additional material shows that the species extends into the E Cape, via the Cape Fold Mountains, and also occurs in isolated populations in rock outcrops in montane grassland of the inland escarpment.

P. serval purcelli **Map 10**

Additional material: PEM R 4775, 4780, 40 km W Williston (3120AD), 11-12 November 1983, in rock outcrops beside road, W. R. Branch. PEM R 4673, Bruinrante, 3-4 km S Prince Alfred - Willowmore road crossing main road Meringspoort - Beaufort West (3322BA), 30 June 1987, W. R. Branch and W. D. Duellman, in small outcrops of vertical Dwyka tillite in karroid veld. PEM R 4500-03, same locality as above, 13 October 1987, W. R. Branch. PEM R 4525, 10 km west Farm Lustfontein, Reitbron District (3322BB), 14 October 1987, W. R. Branch, in cracks in metamorphosed shale. PEM 4526-28, 2 km west Farm Lustfontein, Reitbron District (3323AA), 14 October 1987, W. R. Branch, in cracks in metamorphosed shale. PEM R 4858-62, Farm Vleikop, Wolweboslaagte (3323AB), 4 May 1989, W. R, Branch, in Dwyka tillite outcrop. PEM R 3693, 3707, 33° 16'S 22° 37'E, northern slopes Droekloofberg (3322BC), 19-20 May 1981, G. J. Breytenbach, in Bokkerveld Series rock in *Aloe-Rhus-Olea* veld.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: FitzSimons (1943) considered this taxon (as *P. purcelli*) to be restricted to the western Karoo, reaching its southern and eastern limit at Touws River and Beaufort West, respectively. McLachlan and Spence (1966), treated it as a subspecies of *P. serval* but listed no additional specimens. The additional material extends the range well into the southern Karoo plain, and it is possible that it may be found further east in association with shale and tillite outcrops around Lake Mentz and Waterford.

Pachydactylus namaquensis **Map 10**

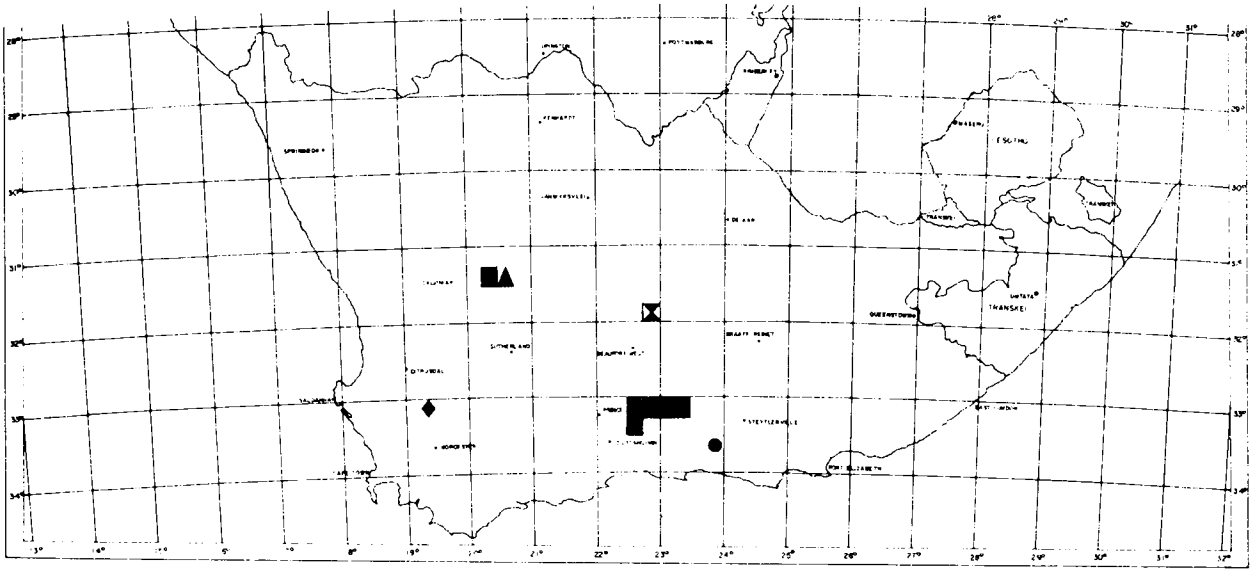
Additional material: PEM R 3854, W end of Brandersberg towards Aasvoelberg, 30 km W Three Sisters (3122DD), 5 March 1983, W. R. Branch, in horizontal rock cracks.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

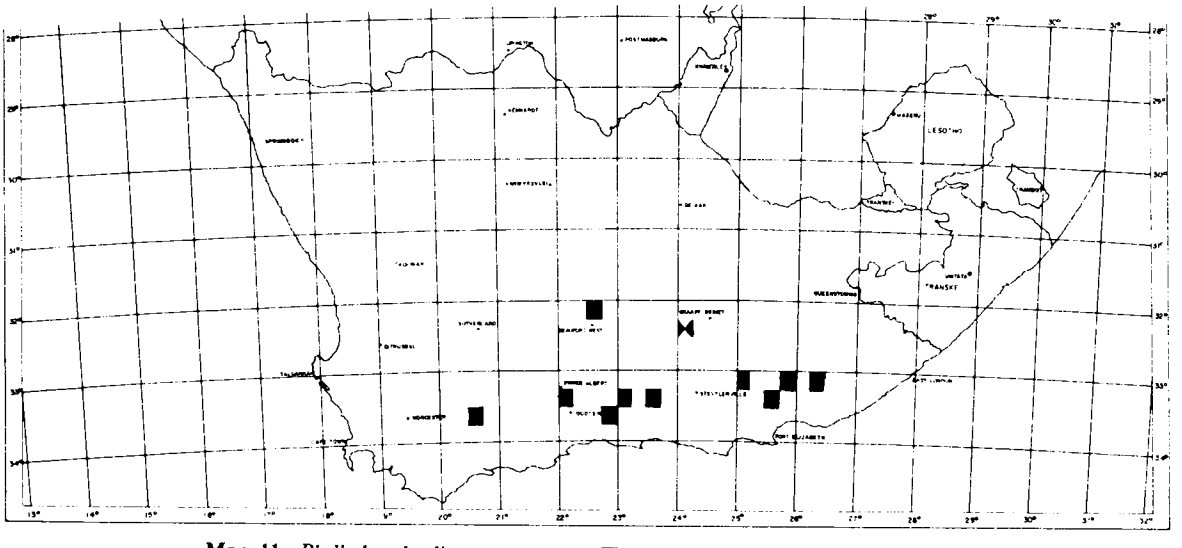
Comments: The main distribution of the Namaqua thick-toed gecko occurs in Great and Little Namaqualand, with isolated (relict) populations on the Nuweveldberg (including the Aasvoelberg specimen) and Langeberg (Boycott, 1990). Their taxonomic status needs investigation.

Pachydactylus capensis capensis **Map. 10**

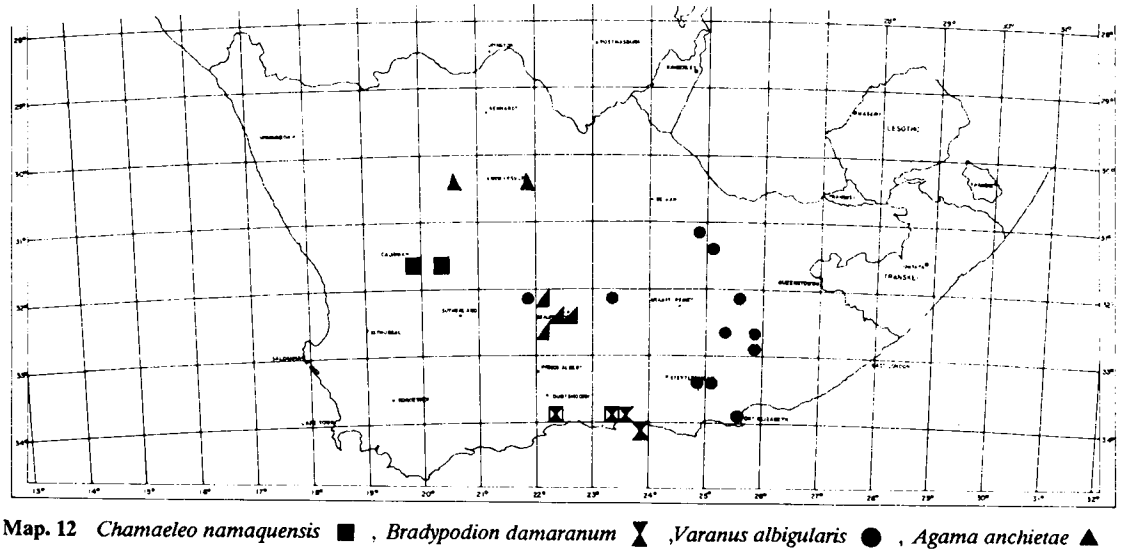
Additional material: PEM R 3667, Studtis, Baviaanskloof (3323DB), March 1980, P. W. de Kock.



Map. 10 *Pachydactylus serval purcelli* ■ , *Pachydactylus namaquensis* ⧗ ,*Pachydactylus rugosus rugosus* ▲ *Pachydactylus rugosus formosus* ♦ , *Pachydactlus capensis capensis* ●



Map. 11 *Phyllodactylus lineatus* complex ■ , *Ptenopus garrulus maculatus* ⧗



Map. 12 *Chamaeleo namaquensis* ■ , *Bradypodion damaranum* ⧗ ,*Varanus albigularis* ● , *Agama anchietae* ▲

Comments: The taxonomy of this wide-spread species remains confused. FitzSimons (1943) records no specimens from the southern Karoo, except for Port Elizabeth (which must be considered very doubtful). The Studtis specimen is the first for the karroid valleys of the Cape Fold Mountains.

Pachydactylus rugosus rugosus **Map 10**

Additional material: PEM R 4773, 16 km W of Williston (3120BC), 11 November 1983, W. R. Branch, crossing road at night (22h39) near a dry river course with numerous *Acacia karroo*.

Comments: McLachlan (1979) revised the group. His nearest records for the typical race are from the lower Orange River Valley (250 km to the north); the southern race *P. r. formosus* occurs in the Bokkerveld mountains, 162 km to the west. Further specimens of typical *rugosus* from the western Karoo may necessitate a re-appraisal of McLachlan's (1979) conclusions.

Pachydactylus rugosus formosus **Map 10**

Additional material: PEM R 4824, E slopes of Skuweberg, Prince Alfred Hamlet District (3312AB), 27 October 1986, W. R. Branch and C. McCartney, in horizontal crack in roadside rocks.

Comments: This record represents a slight eastern extension in the range of this subspecies (McLachlan, 1979).

Phyllodactylus lineatus **Map 11**

Additional material: Eastern Cape field trip, W. R. Branch and M. Smale, 22 October - 2 November 1979. PEM R 1849-52, 1727, northern slopes of the Suurberg, 1.5 km S of Suurberg turn-off (3325BC), 22 October 1979, in horizontal cracks in TMS; PEM R 1843, 1854-55, 2 km E of Abrahamspoort, Nuweveldberg (3222BA), alt. 1600m, 28 October 1979; PEM R 1839-42, 2.5 km W of Abrahamspoort, Nuweveldberg (3222BA), alt. 1800m, 28 October 1979; PEM R 1826-31, 1835-37, 2.5 km N turn-off to Gamkaskloof, Swartberg Pass, Swartberg (3322AC), alt. 1400m, 30 October 1979; PEM R 1825, 1832-34, 1838, Gamkakloof turn-off, Swartberg Pass, Swartberg (3322AC), alt. 1400m, 31 October 1979; PEM R 1823-24, Farm Adamskraal, Nuwekloof Pass, Baviaanskloof (3323BC), alt. 1100m, 2 November 1979, in Table Mountain sandstone outcrop in karroid fynbos.

Field trip to Kammanasieberg, W. R. Branch and R. C. Boycott, 5-8 November 1982. PEM R 3618-26, 3591, saddle of Mannetjiesberg, Kammanasieberg (3322DB), alt. 1600m, 6-7 November 1982, north-facing slope with low mountain fynbos and scattered flat TMS slabs.

PEM R 1854-56, 3 km E Farm Olievenfontein, Suurberg (3325BC), 28 November 1979, W. R. Branch. PEM R 3182, Farm Hoekplaas, northern slopes Kammanasieberg, Uniondale District (3322DB), alt. 800m, 9 December 1981, W. R. Branch, in small outcrop of vertical tillite/shale in karroid fynbos. PEM R 3609, Shale outcrop (Klapperkop) overlooking Oliphants River, Uniondale District (3323AC), 30 September 1982, W. R. Branch, under flake at top of outcrop. PEM R 3807, Farm Vaalwater, N end Nuwekloof, Willowmore District (3323BC), 10 March 1983, W. R. Branch. PEM R 4849-53, Gamkakloof turn-off, Swartberg Pass (3322AC), April 1988, W. R. Branch and S. Spawls. PEM R 4910-4, same locality, 9 March 1983, W. R. Branch. PEM R 5026, SW shore Lake Mentz (3325AA), 28 January 1990, W. R. Branch, in rock shale outcrop. PEM R 661-2, 664-5, 667-8, Farm Hounslow, Piggot's Bridge, NW Grahamstown (3326AB), 22 August 1979, W. R. Branch and R. C. Boycott. PEM R 4926, Arynsburg Nature Reserve, Littel Karoo (3320DA), M. Burger, in sandstone rock cracks.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The taxonomy of this species remains confused. FitzSimons (1943) and Loveridge (1947) both recognise three races. Typical *P. l. lineatus* is found from Saldahna and Ceres north to Little Namaqualand, where it is replaced by *P. l. rupicolus*. FitzSimons (1943) lists both races from Pakhuis Pass, and his other localities for the two subspecies overlap considerably; ie. *lineatus* reaching as far north as Port Nolloth and *rupicolus* as far south as Matjiesfontein. *P. l. essexi* was known to both FitzSimons and Loveridge only from the type locality, Farm Hounslow near Grahamstown, represented here by fresh topotypic material. A modern taxonomic re-appraisal of the species is required. Ecological differences between the small, terrestrial *lineatus* and larger, rupicolous *rupicolus*, suggest that the latter may deserve specific status. *Essexi* appears closely related to *rupicolus*, from which it may no longer be separable.

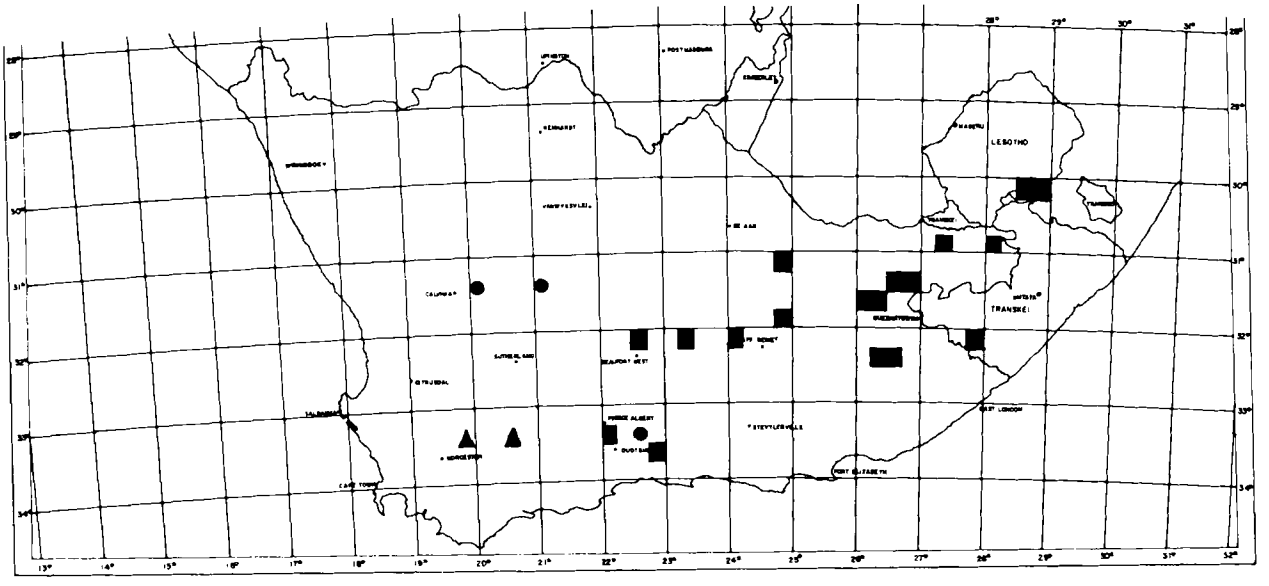
The new material fills in the huge distribution gap between *essexi* and *rupicolus*. The species is now known to occur in the western mountains of the inland escarpment and the eastern Cape Fold Mountains. Its niche of the rupicolous forms (sheltering under exfoliating rock flakes) appears to be occupied by geckos of the *Afroedura karrocia* complex in the eastern escarpment mountains, by the marbled leaf-toed gecko (*Phyllodactylus porphyreus*) in the southwestern Cape, and *Pachydactylus serval purcelli* in the rock outcrops of the drier Karoo plains.

Ptenopus garrulus maculatus **Map 11**

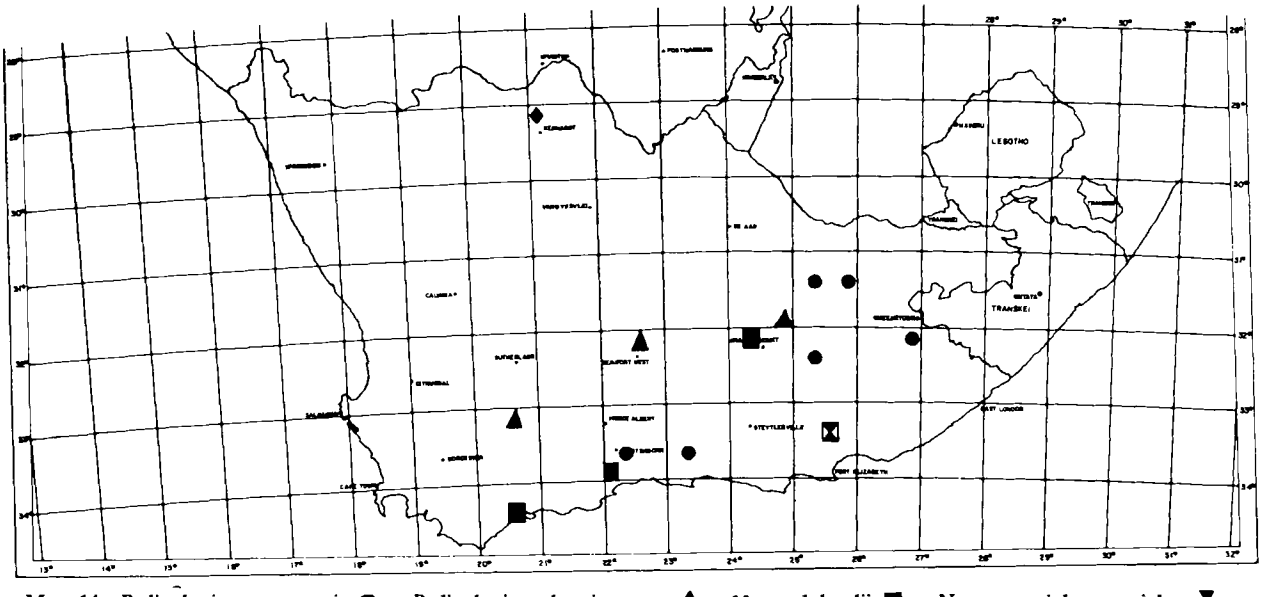
Additional material: PEM R 4659, 10 km W Aberdeen (3224AC), 14 November 1983, W. R. Branch, LOR.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

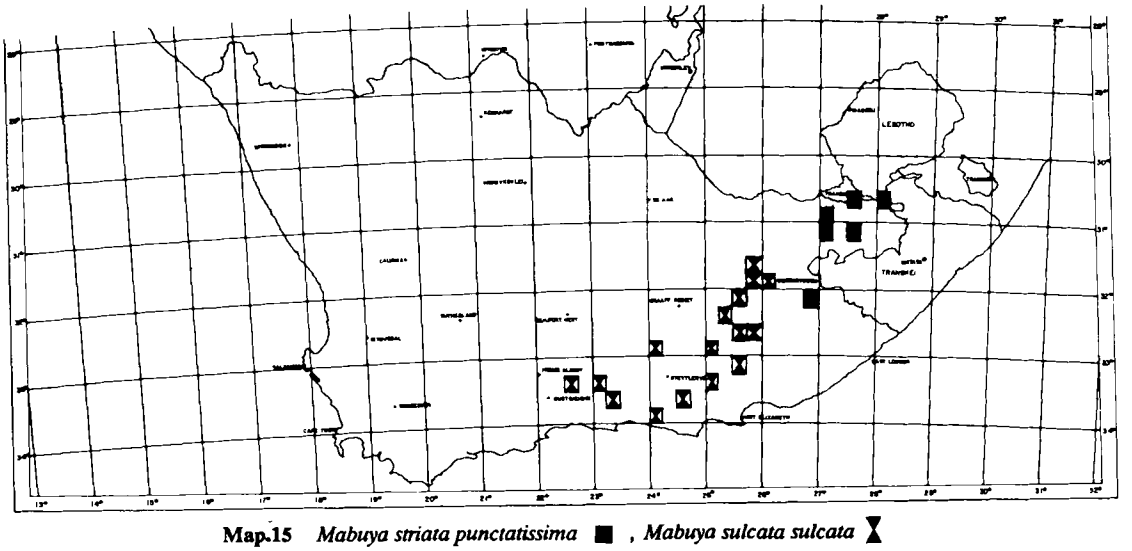
Comments: Haacke (1975) recorded only a single record from the Karoo (Adendorp, 3224BC) which he considered as "....so far removed from all other known records, that is is viewed with suspicion". However, this record is now validated by the Aberdeen specimen. The barking gecko is also relatively common in the Karoo National Park, although it is restricted to regions of deep alluvial sand along the river courses of the lower plains. These specimens represent a range extension of approximately 300 km due south of Prieska. Oelofsen and Vorster (1976) recorded an isolated record from Calitzdorp in the Little Karoo, and also commented that they had a report of vocalising burrowing geckos at Prince Albert.



Map. 13 *Pedioplanis burchelli* ■ , *Meroles suborbitalis* ● , *Meroles knoxii* ▲



Map. 14 *Pedioplanis namaquensis* ● , *Pedioplanis undata inornata* ♦ , *Nucras lalandii* ■ , *Nucras taeniolata taeniolata* ⧗



Map.15 *Mabuya striata punctatissima* ■ , *Mabuya sulcata sulcata* ⧗

INFRAORDER: IGUANIA

Family: Chamaeleonidae

Subfamily: Chamaeleoninae

Chamaeleo (Chamaelco) namaquensis **Map 12**

Additional material: PEM R 4699, 10 km from Farm Nuwerus, Calvinia District (3120CB), 21 November 1984, W. R. Branch and R. C. Boycott. PEM R 4700, 15 km S of Calvinia road, along dirt road to Middelpos (3119DB), 21 November 1984, W. R. Branch and R. C. Boycott.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989). Unconfirmed sight records given by farmers during the 1983 Beaufort West Agricultural Show include: Vleifontein (?), Elandsfontein (3222BD), De Krans (?), Hottentos Rivier (?), Lombardskraal (3222DA), Skilpadfontein (?), Marceaux (3222AA), Rooiwal (?), and Grantham (3222AC).

Comments: FitzSimons (1943) lists Worcester, Sutherland District, and Carnarvon among the southern limits for this impressive, terrestrial chamaeleon. Burrage (1973) in his ecological study of the species adds no further details. The new material gives more specific localities for the species in the western Karoo.

Bradypodion damaranum **Map 12**

Additional material: PEM R 37 33°58'43"S, 22°16'12"E, George District (3322CD), 22 August 1979. PEM R 1924, 33°57'21"S, 23°09'19"E, Prince Alfred's Pass (3323CD), 22 August 1979. PEM R 4864, Warden's garden, Tsitsikama Coastal Nationaol Park (3423BB), January 1987. PEM R 4888, Big Tree, Tsitsikama Forest National Park (3423BB), 23 February 1982, W. R. Branch, 3 subadults (one collected) from 3-4 m hgh in understory. PEM R 1926, Gouna Forestry Station, Jonkersberg (3323CC), 16 January 1980, J. Koen. PEM R 2505, Diepwalle Forestry Station, Prince Alfred's Pass (3323CC), 18 October 1980, J. Koen.

Comments: FitzSimons (1943) lists only two localities for the Knysna dwarf chamaeleon (Knysna and Avontuur). It is in fact found throughout the cool, temperate forests of the southern Cape from near Mossel Bay to Storms River Mouth in the Tsitsikama National Parks (Branch and Hanekom, 1987). It has adapted well to urban gardens and has even been translocated to Port Elizabeth in association with nursery plants, although it has not become established.

Subfamily Agamidae

See Frost and Etheridge (1989) for recent changes in the familial relationships of Iguanian lizards, and the placement of agamas in a subfamily within the Chamaeleonidae.

Agama anchietae **Map. 12**

Additional material: PEM R 411-12, Brandvlei (3020BC), October 1954. PEM R 413, Van Wyk's Vlei (3021BD), 23 October 1960.

Comments: The Van Wyk's Vlei record confirms the southern boundary known to FitzSimons (1943), whilst the Brandvlei specimens slightly extend the western boundary at the southern limit.

INFRAORDER: ANGUIMORPHA

Family: Varanidae

Varanus albigularis **Map 12**

Additional material: PEM R 3519, Swartkops sewage works, Port Elizabeth (3325DC), 15 October 1982, W. R. Branch. PEM R 2706, Daggasboernek, 50 km S Cradock (3225DB), 15 September 1980, W. R. Branch, DOR (hemipenes collected). PEM R 2707, Perdepoort, Klein Winterhoekberg (3325AC), 10 July 1980, W. R. Branch, basking at entrance to winter retreat. Other specimens, found DOR during field trips (and measured, sexed, and their gut contents collected) include: Oukloof Pass, Nuweveldberg, 60 km west of Beaufort West (3221BB), 13 November 1983; 30 km SW Murraysburg on road to Beaufort West (3223AB), 21 October 1983; 10km N Rosmead on road to Steynsburg (3125AC), 2 March 1983; Farm Tweedale, 10 km N Noupoort (3124BB), 3 March 1983; 20km S Cookhouse (3225DD), 25 October 1988; Cookhouse (3225DB), 25 October 1988; 10 km S Cradock (3225BA), 25 October 1988. A subadult, LOR, 5 km W Wolwefontein (3324BD), 11 October 1984.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: Although FitzSimons (1943) states that the rock leguaan occurs throughout southern Africa (except for the Cape and Namibian coastal areas), it is in fact absent from the whole of the western Cape. The only records in the central and western Karoo occur along the escarpment edge. Hendey (1981) notes *Varanus* remains (vertebrae; specific identity not determined) from the Quartzose Sand Member deposits in the Laangebaanweg area in the Western Cape, that date from the early Pliocene transgression (provisionaly dated to 5 million years BP. This is currently out of the range of both varanid species found in the subcontinent and their identity should be determined.

INFRAORDER: SCINCOMORPHA

Family: Lacertidae

Meroles suborbitalis **Map 13**

Additional material: PEM R 4702, 30 km W Williston towards Calvinia (3120BC), 21 November 1984, W. R. Branch. PEM R 4754, 82 km W Williston to Calvinia (3120AC), 27 October 1983, W. R. Branch. PEM R 3694-96, 33° 16'S 22° 37'E, northern slopes of Droekloofberg (3322BC), 20 May 1981, G. J. Breytenbach, in alluvial sand flats with 10% succulent cover, two specimens were excavated 40 cm deep from rodent burrows.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The southern limits given by FitzSimons (1943) are Williston and Victoria West. In one direction the new material extends the range towards the western Cape coast, albeit still above the escarpment, whilst the Droekloofberg specimens are a considerable range extension (110 km) to the southern margin of the Karoo.

Meroles knoxii **Map 13.**

Additional material: PEM R 529, Ceres turn off from N1, S. Cape (3319BC), 15 September 1979, R. C. Boycott. PEM R, Arynsburg Nature Reserve, Little Karoo (3320BC), M. Burger.

Comments: Both specimens represent an eastern extension of the species' range, and the Arynsburg record is the first for the Little Karoo.

Pedioplanis burchelli **Map 13**

Additional material: Eastern Cape field trip, W. R. Branch and M. Smale, 22 October - 2 November 1979. PEM R 1801, Wadpasberg Pass, Sneeuberg (3124DD), 25 October 1979, sandstone ridge in montane grassland, bordering stream. PEM R 1798-99, Buffelsrivier near Karringsmelkkloof, Murraysburg District (3224AA), 27 October 1979, shot running among slabs on top of shale outcrop. PEM R 1802, Farm Modderfontein, Nuweveldberg (3222BA), 28 October 1979. PEM R 1800 Farm Maijiesvlei, Nuweveldberg (3222BA), 28 October 1979. PEM R 1805, Gamkakloof turn-off Swartberg Pass, Swartberg (3322AC), 31 October 1979. PEM R 1792-93, 9-11 km east along summit jeep track from Swartberg Pass (3322AC), 31 October 1979. PEM R 1803, 1808, saddle Mannetjieberg, Kammanasieberg (3322DB), in mountain fynbos with scattered TMS outcrops.

Field trip by W. R. Branch and W. Moholo to Transkei Drakensberg (17-24 November 1980): PEM R 2573, 2630-32, 2638-2644, Rama's Gate border gate, Transkei Drakensberg (3028BB), alt. 2390m, 19 November 1980, montane grassland and exposed sandstone bedrock. PEM R 2574, 10 km from Rama's Gate into Lesotho towards Sehlabathebe National Park (3028BB), 20 November 1980, montane grassland with scattered boulders. PEM R 2572, 2.5 km S of Rama's Gate, Transkei Drakensberg (3028BB), alt. 2350m, 21 November 1980, small sandstone boulders in grazed montane grassland with ericoid scrub. PEM R 2571, 7 km S of Rama's Gate, Transkei Drakensberg (3028BB), alt. 2000m, 21 November 1980, small sandstone boulders in grazed montane grassland with proteoid scrub. PEM R 2567-70, Quacha's Nek border post, Transkei Drakensberg (3028BA), alt. 2050m, 21 November 1980, large areas exposed sandstone bedrock in grazed montane grassland. PEM R 2682-84, Tsomo, Transkei (3227BB), 25 November 1979, low sandstone outcrop bordering river in heavily grazed grassland.

Field trip by W. R. Branch and R. Barnard to the northeastern Cape (1-12 March 1981): PEM R 3026, junction of road to Scobell's Nek, Naude's Nek, Cape Drakensberg (3028CC), alt. 2600m, 4 March 1981, rolling montane grassland with scattered TMS outcrops. PEM R 3036, near Farm Nantes, 10 km S Motkop railway station (3027CD), alt. 1850m, 7 March 1981, under large slab (with small soft-shelled egg) of Witteberg sandstone. PEM R 3037, Farm Boshofskraal, Smut's Pass, Stormsberg (3126BD), alt. 1850m, 8 March 1979, small outcrops of sandstone in grazed veld. PEM R 3017-19, 3023, 3 km E Farm Klipkraal, Stormsberg (3126BC), alt. 1800m, 8 March 1979, eroded bedrock sandstone in grazed veld bordering small pan. PEM R 3020-21, 3024-5, 3027-8, 3030-35, 2 km SW Farm Romansfontein, Bamboesberg (3126CB), alt. 1800m, 9 March 1981, emergent sandstone bedrock with scattered slabs and sandy soil. PEM R 3016, Farm Vereeniging, slopes of Bamboesberg (3126CA), alt. 1850m, 9 March 1981, NW facing contour sandstone outcrops in grazed veld. PEM R 3014, 3029, 3058, Didima Range, top of Katberg Pass (3226BC), alt. 1400m, 10-11 March 1981, marshy seepage zone with scattered rock. PEM R 3022, Farm Progress, Winterberg (3226AD), alt. 1900m, 12 March 1981, N-facing contour outcrops of sandstone in restioid grassland.

Other records: PEM R 1803, plateau of Kammanasieberg, 1 November 1979. PEM R 1808, saddle Mannetjiesberg, Kammanasieberg (3322DB), 31 January 1979. PEM R 3482, Elandsvlakte, Kammanasieberg (3322DB), 1 October 1982, W. R. Branch. PEM R 3562-3564, meterological station, plateau Kammanasieberg (3322DB), 7 November 1982, W. R. Branch. PEM R 3573, 3579, Saddle Mannetjieberg, Kammanasieberg (3322DB), 6-8 November 1982, W. R. Branch. PEM R 3772, Noupoort (3124BB), 3 March 1983, W. R. Branch. PEM R 4387, 4389-90, Farm Palmeitfontein, near Aberdeen, Camdebooberg (3223AB), 12 December 1983, W. R. Branch.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: FitzSimons (1943) notes that the species extends from the Cedarberg, through the Cape Fold Mountains and Eastern Cape, to Lesotho. However, he lists relatively few specimens and there is a large gap through the eastern Cape Fold Mountains from Bredasdorp to Grahamstown, and only Beaufort West is listed within the Karoo. The new material shows that Burchell's sand lizard is relatively common and is found throughout this apparant gap, albeit restricted to the montane grassland of the inland escarpment, or mountain fynbos of the Cape Fold Mountain summits.

Pedioplanis laticeps **Map. 14**

Additional material: PEM R 1797, summit of Molteno Pass, Nuweveldberg (3222BA), 29 October 1979, W. R. Branch and M. Smale. PEM R 1804, summit Lootsberg Pass, Graaff Reinet District (3124DD), 25 October 1979, W. R. Branch and M. Smale.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989). Three specimens were also collected 1 km N Matjiesfontein (3320BA), 28 February 1990, W. R. Branch and E. N. Arnold, running in karroid transitional veld (to be deposited in the British Museum (Natural History) collection).

Comment: Burrage (1978) records large numbers of this species (as *Eremias capensis*) from localities on the western Cape coast; eg. Papendorp (13 specimens), Hondeklipbaai (11), Kleinsee (12). However a recent trip to these localities (3-6 March 1990) failed to locate this species at any of the localities (Branch and Arnold, *unpub. obs.*). Burrgae (1978) also recorded the western three-striped skink (*Mabuya occidentalis*) as very common at Hondeklipbaai (12 specimens), Swartlintjies (8) and Kleinsee (9), but again we were unable to confirm the presence of the species at these localities.

Whilst documenting these records as considerable new range extensions for both species, Burrage (1978) stated that the voucher specimens were to be deposited in the South African Museum

herpetological collection. However, these specimens cannot now be located and they were never accessioned (Cherry, *pers. comm.*). Surprisingly, Burrage (1978) does not report the presence of *Mabuya variegata*, which is exceptionally common in the coastal regions north from Hondeklipbaai. Similarly *Meroles knoxii* is also common at Papendorp and Hondeklipbaai, although not listed by Burrage (1978).

We are able to explain these discrepancies only by assuming that Burrage mistook *Meroles knoxii* for *Pedioplanis laticeps* (the former does have only a very small lateral fringe to the toes, unlike most other *Meroles*, and can easily key out to *Pedioplanis* (= *Eremias*) in FitzSimons (1943) key) and *Mabuya variegata* for *Mabuya occidentalis*. In the absence of voucher specimens this problem can only be resolved by the collection of fresh material. In the meantime it is recommended that the records for *Pedioplanis laticeps* and *Mabuya occidentalis* from the western Cape coastal region be rejected. As presently understood *Pedioplanis laticeps* is restricted to the western Karoo from Matjiesfontein to Steinkop, and as far east as Hanover. There is a single published record for Warmbad in southern Namibia (Mertens, 1955).

Pedioplanis namaquensis **Map 14**

Additional material: PEM R 2458, between tributaries of the Keer River, Elandsvlake, Kammanasieberg (3322DB), 29 September 1980, R. C. Boycott, running on forestry track in fynbos vegetation. PEM R 3238, 19-20 km into Moordenaarskloof, northern slopes of Kouga Mountains (3323DB), 1 March 1982, W. R. Branch. PEM R 3832, Farm Pilgrim Rest, Steynsburg District (3125BD), 2 March 1983, W. R. Branch. PEM R 3774, 4902-03, on sandy flats around picnic site, Mountain Zebra National Park, Cradock (3225AD), 2 March 1983, W. R. Branch. PEM R 3773, Farm Bloubos, Middelburg District (3125AD), 2 March 1983, W. R. Branch. PEM R 3899-91, Whittlesea (3226BB), 4 February 1973, J. C. Greig and C. Stuart, two adults and one hatchling (20.5 mm SVL).

Comments: The Kammanasieberg and Kouga records are the first for the Cape Fold Mountains and mountain fynbos. The Kammanasieberg specimen shows a number of atypical features, i.e. a) absence of a tympanic shield on both sides; b) only minimal contact of the supranasals behind the rostral; and c) 11-12 granular scales in front of the paired supraoculars, and 9-12 behind. The taxonomic significance of these features can only be assessed when further material is available. FitzSimons (1943) gives the range of the species as extending into the Eastern Cape, with records from Cradock and Schoombie. He also lists a record from Matatiele in the Natal Underberg, although this conflicts with his stated range. Bourquin (1989) does not the list the species in his checklist of the Natal herpetofauna. The Whittlesea and Steynsburg records thus form the eastern limit for the species.

Pedioplanis undata inornata **Map 14**

Additional material: PEM R 4283, Kokkerboom forest, Kenhardt (2921AA), 16 October 1984, W. R. Branch.

Comments: One of the southern limits for this race. Listed as far south as Prieska by FitzSimons (1943).

Nucras lalandii **Map 14**

Additional material: PEM R 4294, Farm St Olive's, Ouberg, Graaff Reinet District (3224AB), May 1986, K. McCabe, under stone in grassland. PEM R 1939, upper tributary of Palmeit River, Mossel Bay (3322CC), 10 February 1980, G. Le Roux. PEM R 4576, lower S slopes of Potberg near Wydgelee, De Hoop Nature Reserve (3420BC), 15 October 1983, J. Vlok, in hole in sandy soil.

Comments: The De Hoop record is a considerable western range extension (250 km) along the Cape coastal belt, with the Mossel Bay specimen forming an intermediate record from the previous western limit at Knysna (Boulenger, 1910). The specimen from Ouberg, the first for the Sneeuberg, also extends this secretive, but attractive, species west along the escarpment mountains.

Nucras taeniolata taeniolata **Map 14**

Additional material: PEM R 3432, 3436, 3466, 4856-7, Addo Elephant National Park, Algoa Basin (3325BC), 14 October 1981 and 20 July 1981, W. R. Branch.

Comments: Broadley (1972) knew the taxon from only two localities in the Albany District of the Eastern Cape, i.e. Grahamstown and Bushman's River. The Addo specimens, although still restricted to the vicinity of the Algoa Basin, extend the subspecies slightly further west.

Family: Scincidae

Subfamily: Lygosomatiinae

Mabuya striata punctatissima **Map 15**

Additional material: PEM R 2933, top of Otto du Plessis Pass, (3127BA), alt. 2100m, 3 March 1981; PEM R 2929-2930, 2936, upper reaches of Bell River, Naude's Nek (3028CA), alt. 2500m, 5 March 1981; PEM R 2925, 5 km N Lundin's Nek (3027DA), alt. 1850m, 6 March 1981; PEM R 2932, 2.5 km E Telle Junction, Transkei (3027DA), alt. 1600m, 6 March 1981; PEM R 2924, Farm Ono-West, Kraai River valley (3027CC), alt. 1650m, 7 March 1981; PEM R 2928, 2931, 6 km N Farm Mooi Uitsig, Roussoux District (3127AA), alt. 1500m, 7 March 1981; PEM R 2934-2935, western slopes Tsitsikama Peak, near Sada (3226BB), alt. 1200m, scattered sandstone slabs in grazed veld, 10 March 1981.

Comments: FitzSimons (1943) and Broadley (1977) note that this subspecies extends into the northeastern Cape, eg. Aliwal North (3026DA), Ugie (3128AA), and Indwe(3127AD). Numerous additional specimens collected in the northeastern Cape confirm this, and also extend the species' range 95 km SW to Sada from Indwe.

Mabuya homalocephala smithii **Map 16**

Additional material: Field trip by W. R. Branch and R. Barnard to the northeastern Cape (1-12 March 1981): PEM R 2909-2912, 2914, Farm Rockford, Elandsberg (3226BD), alt. 1450m, large rock outcrop bordering Tay River, 2 March 1981; PEM R 2913, 6 km N Farm Mooi Uitsig, Roussoux District (3127AA), alt. 1500m, 7 March 1981; PEM R 2902, Fm Kransfontein, Wasbankspruit, 6 km N Roussoux (3127AB), alt. 1550m, 7 March 1981; PEM R 2906, Farm Helena, 15 km S Jamestown (3126BB), alt. 1650m, 8 March 1981; PEM R 2907, Tiger Ridge, Dordrecht District (3126BD), alt. 1700,

8 March 1981; PEM R 2915, Farm Rocklyn, Molteno District (3126AD), alt. 1700m, 9 March 1981; PEM R 2901, 2908, Farm Vereeniging, NW facing slopes of Bamboesberge (3126CA), alt. 1850m, 9 March 1981; PEM R 2905, 1 km W Farm Doyle, Krom River valley (3226BD), alt. 1500m, 11 March 1981; PEM R 2903, Farm Bushmans Kranz, Bushmans Kranz Range, Katberg (3226BC), alt. 1300m, 11 March 1981. PEM R 3141-42, 4904-6, Pramkop, Mountain Zebra Nat. Pk, Cradock District (3225AD), 11 March 1981 and 1 March 1983, W. R. Branch.

PEM R 3235, Diepnekkloof, Baviaanskloof Mountains, Studtis District, 3323DB, W. R. Branch and R. C. Boycott, 31 March 1982. PEM R 2411, Witnekpas, Middelberg District (3125CA), 15 September 1980, W. R, Branch. PEM R 4411-12, Cedarberg, above Algeria Forestry Station, in Engelmaskloof between summit and Crystal Pool (3219AC), 29 October 1986, W. R. Branch. PEM R 4413, at Forestry station near Gamkakloof turn-off, Swartberg Pass, Swartberg (3322AC), 26 October 1986, W. R. Branch. PEM R 3751 (KWT 355), Cathcart (3227AC), 26 November 1972, J. C. Greig and C. S. Stuart. PEM R 1023, 2 km from N end Prince Alfred's Pass (3323CC), 4 February 1980, W. R. Branch, in shale bank bordering road. PEM R 1455-56, 2 km past Farm Bergplaas, Kleinplaat District (3323DC), 22 April 1980, W. R. Branch. PEM R 4385, Farm Palmeitfontein, near Aberdeen, Camdebooberg (3223AB), 12 December 1983, W. R. Branch. PEM R 3682, Ruitersbos River, Oudtshoorn (3322CC), July 1981, G. Le Roux. PEM R 1777, Farm Honeygrove, Between Somerset East and Cradock (3225AD), 24 October 1979, W. R. Branch. PEM R 1778, Rubridge Kloof, Graaff Reinet District (3124DC), 26 October 1979, W. R. Branch. PEM R 1779, Cattle grid dam, Suurberg Pass (3325BC), 22 October 1979, W. R. Branch. PEM R 1766, Buffelsrivier near Karringsmelkkloof, Murraysburg District (3224AA), 27 October 1979, W. R. Branch and M. Smale. A specimen was shot (but subsequently lost) basking on a large rock near a *Pseudocordylus microlepidotus* at Witkransnek, Middleburg District (3125CA), 2 March 1983, W. R. Branch.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The taxonomy of the species is confused. FitzSimons (1943) considers the subspecies to extend along the Southern and Eastern Cape coastal regions, from Swellendam to East London, extending inland to the Swartberg in the west and Pirie in the east. De Waal (1978) listed a specimen from Spitzkop, near Zastron in the OFS (3027AA) which considerably extended the species in land. Numerous fresh material has been discovered in the inland mountains of the Eastern Cape. It is now known to be widely distributed in the mountains of the inland escarpment and the Cape Fold Mountains, where it shows a preference for rock piles along well-vegetated water courses. The status of the four dscribed races (*peringeuyi, depressa, smithii* and typical *homalocephala*) should be reassessed.

Mabuya sulcata sulcata **Map 15**

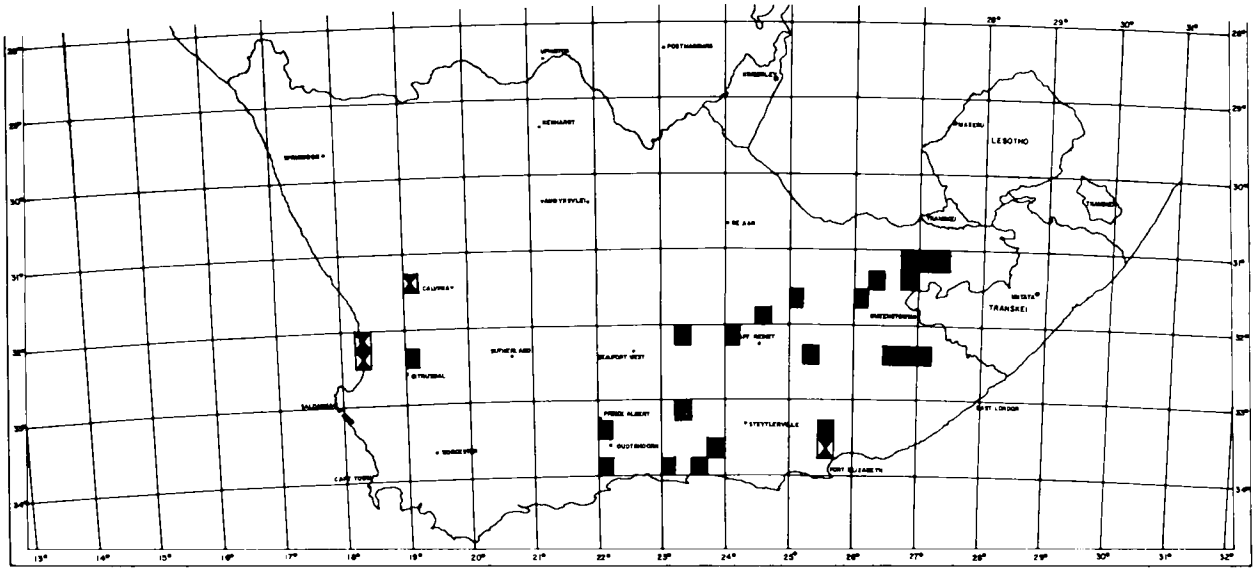
Additional material: PEM R 2279-80, N end Perdepoort, Kleinwinterhoekberg (3325AC), 10 July 1980, W. R. Branch, in rock crack on large TMS outcrop. PEM R 3233-34, 3.5 km W Farm Kleinplaas, Baviaanskloof Pass (3324DA), 31 March 1982, W. R. Branch. PEM R 3239-40, Beako's Nek, Moerdenaarskloof, Kouga Mountains (3324CC), 1 April 1982, W. R. Branch. PEM R 3245, Wilgekloof, Kouga Mountains (3324CC), 2 April 1982, W. R. Branch. PEM R 3475, Kromlaagte Road, Uniondale (3323CA), 30 September 1982, W. R. Branch. PEM R 3476, Klapperkop, overlooking Oliphants River (3323AC), 30 September 1982, W. R. Branch. PEM R 3673, 3699-701, 33°16'S, 22°37'E, northern slopes of Droekloofberg, Klaarstroom District (3322BC), 19-20 May 1981. PEM R 4341, 5 km S Oatlands Station, Klipplaat District (3224CC), 19 November 1984, W. R. Branch. PEM R 1781, rocky gorge, 2 km N TV tower, Suurgerg (3325BA), 23 October 1979, W. R. Branch. PEM R 3237, 1.5 km from forestry station, Kouga Mys. (3324CC), 1 April 1982, W. R. Branch and R. C. Boycott. PEM R 3092, S end Rossouwspoort, Jansenville District (3225CC), 29 November 1981, W. R. Branch. PEM R 2916, 2918, 2923, 3 km NE Farm Dagbreek, Hofmeyer District (3125DD), 9 March 1981, W. R. Branch. PEM R 2917, 3 km NE Hofmeyer (3125DB), 9 March 1981, W. R. Branch. PEM R 2919, 2921-22, Farm Goedmoed, Hofmeyer District (3125DB), 8 March 1981, W. R. Branch. PEM R 2920, 2 km NNE Farm Elandsrivier, Tarkastad District (3126CC), 9 March 1981, W. R. Branch. PEM R 2422, Daggasboernek, Somerset East District (3225DB), 15 September 1980, W. R. Branch. PEM R 3096-98, Tarka Pass, Mortimer District (3225CC), 29 November 1981, W. R. Branch. PEM R 3106-9, 8 km S Cradock (3225BA), 30 November 1981, W. R. Branch. PEM R 3155, Rooiplaat, Mountain Zebra National Park, Cradock (3225AD), 30 November 1981, W. R. Branch.

Comments: The southern limits for the species listed in FitzSimons (1943) are Willowmore, Jansenville and Graaff Reinet. The specimens listed above all increase the southern penetration of the species into the karroid valleys of the eastern Cape Fold Mountains. The eastern boundary of the species is more vague. FitzSimons (1943) lists Cradock, Colesburg and Rouwville. De Waal (1978) considered the latter record doubtful and noted no new recent records in the Orange Free State east of 26°E. The Hofmeyer and Tarkastad records appear to form the SE limit of the species in the Cape Province.

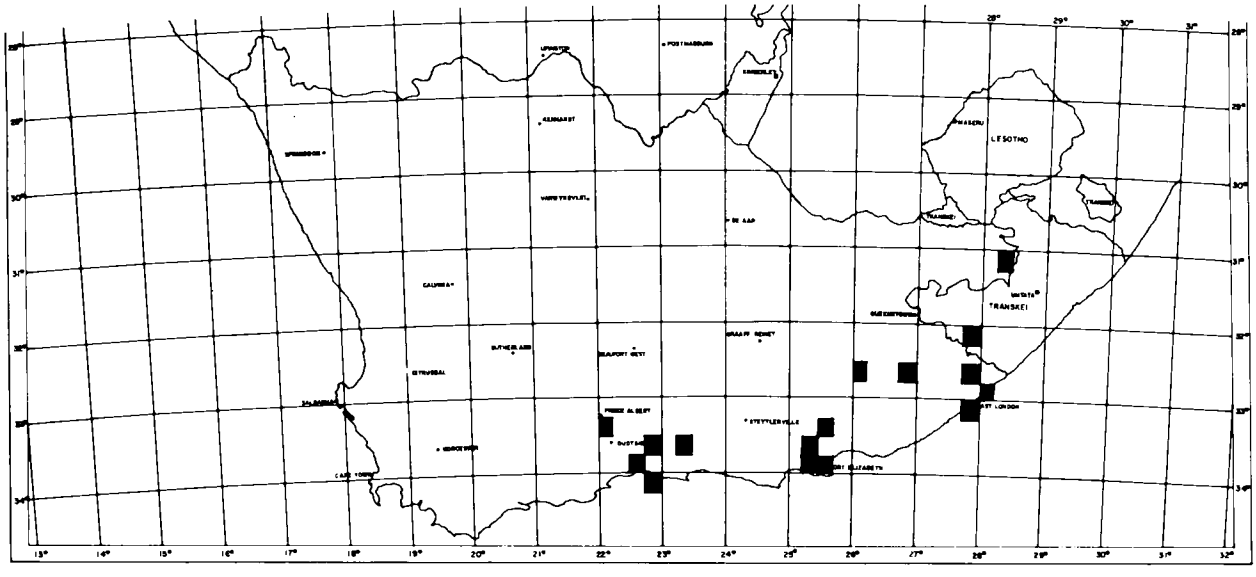
Scelotes caffer **Map 16**

Additional material: PEM R 2182, Lambert's Bay (3218AB), October 1954, G. McLachlan. PEM R 2183-85, 5 km from Elandsbaai, Western Cape (3218AD), 7 October 1961, G. McLachlan and J. Spence. PEM R 4872, Dead Man's Gulch, Sundays River, Addo District (3325DA), July 1988, W. R. Branch, in apron of dead leaves on stem of recumbant *Aloe striata*. PEM R 4998 (CDNEC 10048), Oorlogskloof Nature Reserve, Calvinia (3119AC), 18 May 1989, W. Pretorius.

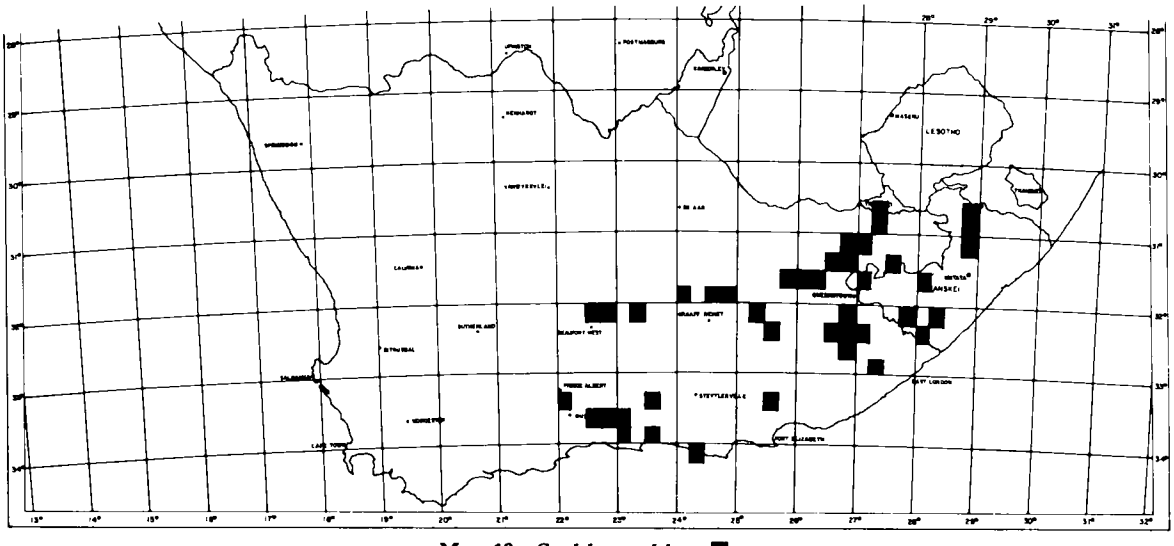
Comments: This poorly known dwarf burrowing skink has a peculiarly disjunct distribution in the Cape. It was known to FitzSimons (1943) from the E Cape, near Matjiesfontein, and Garies in Little Namaqualand. The new records extend the range into the Algoa Basin, to the W Cape coastal region, and to Calvinia.



Map. 16 *Mabuya homalocephala* ■ , *Scelotes caffer* ⧗



Map. 17 *Chamaesura anguina* ■



Map. 18 *Cordylus cordylus* ■

Family: Cordylidae

Subfamily: Cordylinae

Chamaesaura anguina **Map 17**

Additional material: PEM R 3599, eastern slope of Mannetjieberg saddle, Kammanasieberg (3322DB), 8 November 1982, W. R. Branch and R. C. Boycott. PEM R 3445, Rondevlei, Wilderness (3322DC), 26 November 1981, N. G. Palmer. PEM R 3633, Veld and vlei camp site, Sedgefield (3422BB), 31 October 1982, J. Williams. PEM R 3654, Twee River, southern slopes of Kouga Mountains (3323CB), 22 October 1982, R. C. Boycott, swimming across pool in stream. PEM R 3902, Komga (3227DB), 26 January 1973, J. C. Greig and C. Stuart. PEM R 3942, Salem (3226DB), 2 February 1973, J. C. Greig and C. Stuart. PEM R 1790, N slopes of Swartberg Pass, 2-3 km N of Gammkakloof turn-off (3322AC), 30 October 1979, J. Breytenbach. PEM R 2359, Bedford, Eastern Cape (3226CA), August 1980, Mr Hockley. PEM R 576, Slagboom, Suurberg (3325BC), 31 January 1954, G. McLachlan. PEM R 577-81, 2150, Port Elizabeth (3325DC). PEM R 582, Thorny Park, East London (3327BB), 25 June 1948, J. P. Whittington. PEM R 1452, St Albans Prison, Port Elizabeth District (3325CD). PEM R 2148, Maclear (3128AB), H. Shaw. PEM R 2149, Uitenhage (3325CB). PEM R 3813, 3902, Komga (3227BB). PEM R 4134, Bakfontein, Kweligha, East London District (3228CC).

Comments: Localities for the Cape listed in FitzSimons (1943) are for the most part restricted to the southern Cape coastal belt; the only inland record is Worcester. The new records extend the species into the inland ranges of the Cape Fold Mountains, and confirm that the species probably extends throughout these mountains, in a similar fashion to *Tetradactylus tetradactylus* (Branch, 1990b). However, it has not yet been recorded from the inland escarpment.

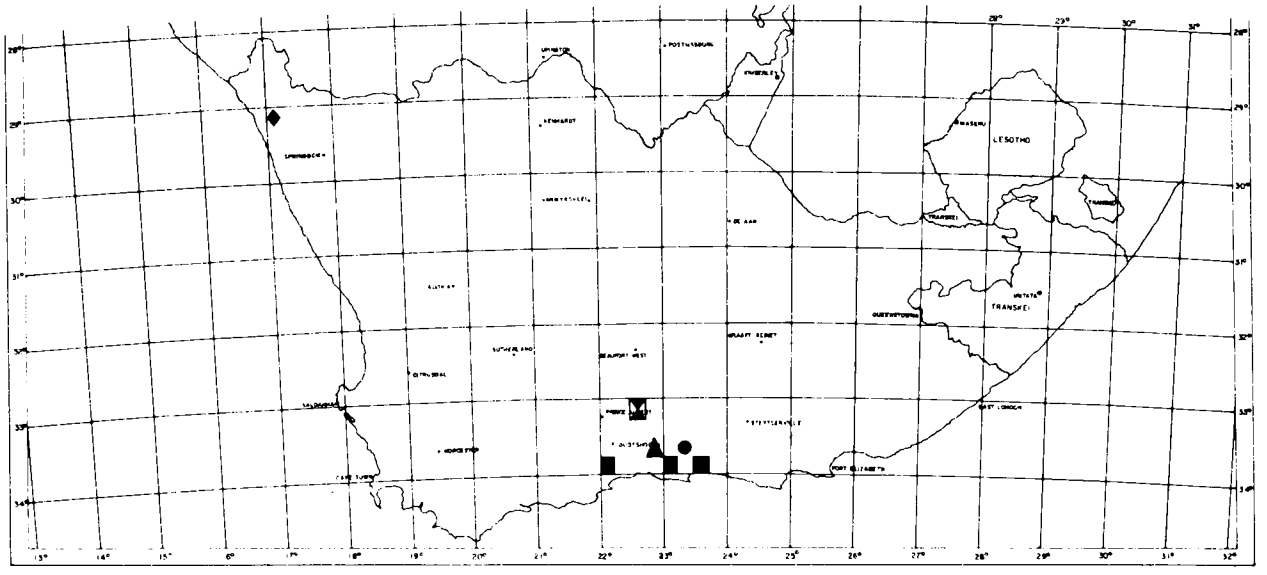
Cordylus cordylus **Map 18**

Additional material: Eastern Cape field trip, W. R. Branch and M. Smale, 22 October - 2 November 1979. PEM R 1712-15, 3 km N Suurberg Inn, Suurberg (3325BC), 22 October 1979. PEM R 1644-45, 1674, 1677, 1700-05, Wadpasberg Pass, Sneeuberg (3124DD), 25 October 1979. PEM R 1638-39, 1681-82, 1698-99, Rubridgekloof, Sneeuberg (3124DC), 26 October 1979. PEM R 1663, top Deyager's Pass, Nuweveldberg (3222BB), 27 October 1979. PEM R 1635-37, 1646-52, 1655-59, 1664-67, 1675-76, 1983, 1695-96, Nuweveldberg plateau in vicinity of Molteno Pass, Beaufort West District (3222BA), 27-28 October 1979. PEM R 1679-80, 1689, 1692, summit of Swartberg Pass, vicinity of Forestry Station (3322AC), 30 October 1979. PEM R 1688, 1690, 1716-19, 9 km E along jeep track to Meiringspoort, Swartberg summit (3322AC). 31 October 1979. PEM R 1660-61, 1672-73, 1684-87, saddle of Mannetjiesberg, Kammanasieberg (3322DB), 1 November 1979.

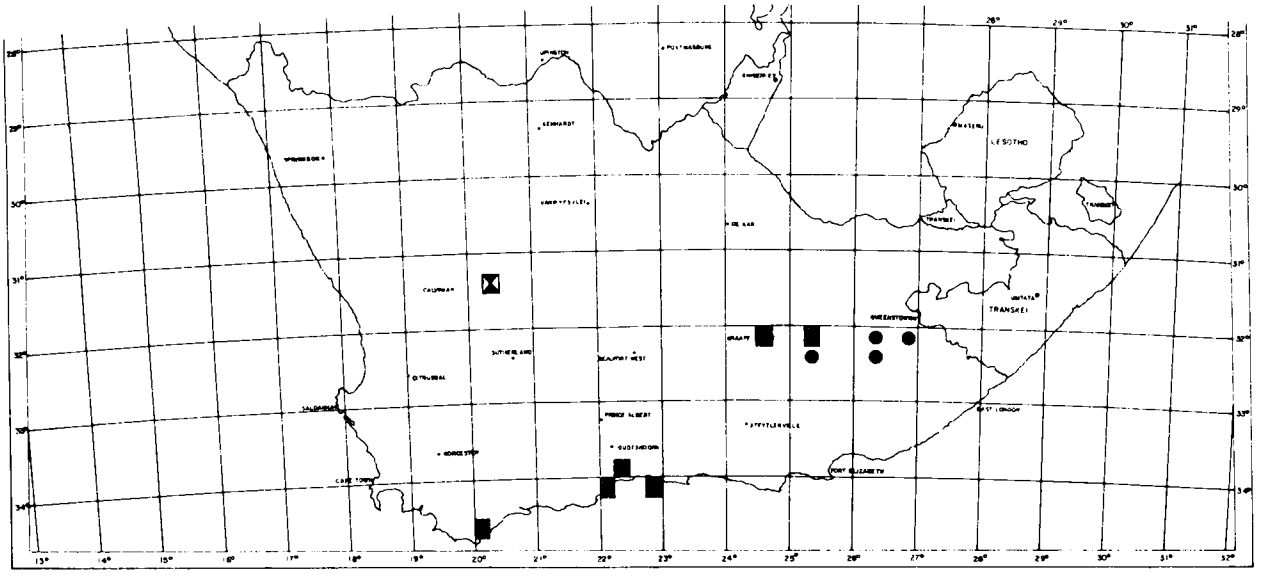
Field trip by W. R. Branch and W. Moholo to Transkei Drakensberg (17-24 November 1980): PEM R 2557, 12 NE King Williams Town (3227CD), alt. 550m, 17 November 1980. PEM R 2593-94, Kwa Mdanga village, near Kentani, Transkei (3228AC), alt. 450m, 17 November 1980. PEM R 2556, 2607, 2670, 3 km ESE Butterworth, Transkei (3228AC), 18 November 1980. PEM R 2566, 2558-61, 2619-21, 12 km NE Indutwa, Transkei (3228AB), alt. 800m, 18 November 1980. PEM R 2562-63, 1 km N Tsitsi River, Qumbu District, Transkei (3128BB), alt. 850m, 18 November 1980. PEM R 2637, 2671-74, Buffalo's Nek, Ku Mgann Mountains, Transkei (3028DD), alt. 1700m, 19 November 1980. PEM R2564-65, near Kwa Palani, 2-3km from Kinira River, Transkei (3028DB), alt. 1200m, 19 November 1980. PEM R 2629, 1 km E Engcobo, Transkei (3128CA), alt. 8900m, 24 November 1980. PEM R 2636, 5 km NW Tsomo, Transkei (3227BB), alt. 1050m, 24 November 1980. PEM R 2645-50, 2681, southern bank Tsomo River, Transkei (3227BB), alt. 900m, 25 November 1980. PEM R 2602-4, 3-4 km E Hebehebe, Transkei (3227BB), alt. 850m, 25 November 1980.

Field trip by W. R. Branch and R. Barnard to the northeastern Cape (1-12 March 1981): PEM R 2749, Hogsback, Amatola Mountains (3226DB), alt. 1450m, 1 March 1981. PEM R 2712, 2717, 2727, 2721, 2730, 2735, 2740, 2750, 2755, Farm Rockland, Elandsberg (3226BD), alt. 1450m, 2 March 1981, large granite outcrop bordering Tay River. PEM R 2762, 8 km SW Cathcart (3227AC), 2 March 1981. 5 km N Ladt Freye, Transkei (3127CA), alt. 1050m, 3 March 1981, low dolerite ridge. PEM R 2732-33, 2744-45, Top of Mount Arthur Range, 20 km N Lady Freye (3127CA), alt. 1300m, 3 March 1981. PEM R 2731, 2742, 6 km N Dyobhundaka Store, My Artur Range, Transkei (3127CA), alt. 1350m, 3 March 1981. PEM R 2753, Farm Ramsay, 3 km S Otto du Plessis Pass, Cape Drakensberg (3127BC), alt. 1500m, 3 March 1981. PEM R 2769, crest Joubert's Pass, Witteberg, Lady Grey District (3027CB), alt. 2300m, 6 March 1981. PEM R2770, 2772, near Farm Nantes, 10km S Motkop Station (3027CD), alt. 1850m, 6 March 1981. PEM R 6 km N Farm Mooi Uitsig, Roussoux District (3127AA), alt. 1500m, 6 March 1981. PEM R 2734, 1 km S Jamestown (3126BB), alt. 1550m, 8 March 1981. PEM R 2715, 2739, 2748, 2763, Farm Boshofskraal, Smuts Pass, Stormsberg (3126BD), alt. 1850m, 8 March 1981. PEM R 2714, 2718-20, 2722, 2724, 2757, 2764, 2766, 2773, 3 km E Farm Klipkraal, Stormsberg (3126BC), alt. 1800m, 8 March 1981. PEM R 2728, top of Penhoek Pass (3126BC), alt. 1900m, 8 March 1981. PEM R 2713, 2716, 2725-26, 2729, 2738, 2743, 2746, 2751, 2756, Farm Romansfontein, Bamboesberg (3126CB), alt. 1800m, 9 March 1981. PEM R 2723, Farm Vereeniging, slopes Bamboesberg (3126CA), alt. 1850m, 9 March 1981. PEM R 2759, Farm Kikvorskuil, Hofmeyer District (3125DB), alt. 1350m, 10 March 1981. PEM R 2754, 4 km N Table Farm, Cathcart District (3227AC), alt. 1250m, 11 March 1981. PEM R 2747, 2752, 2755, 2 km W Farm Goshen, Cathcart District (3227AC), alt. 1100m, 11 March 1981. PEM R 2741, western slopes Tsitsikama Peak, near Sada (3226BB), alt. 1200m, 11 March 1981. 2826-30, Devil's Bellow Nek, Didima Range, Katberg (3226BC), alt. 1400m, 11 March 1981.

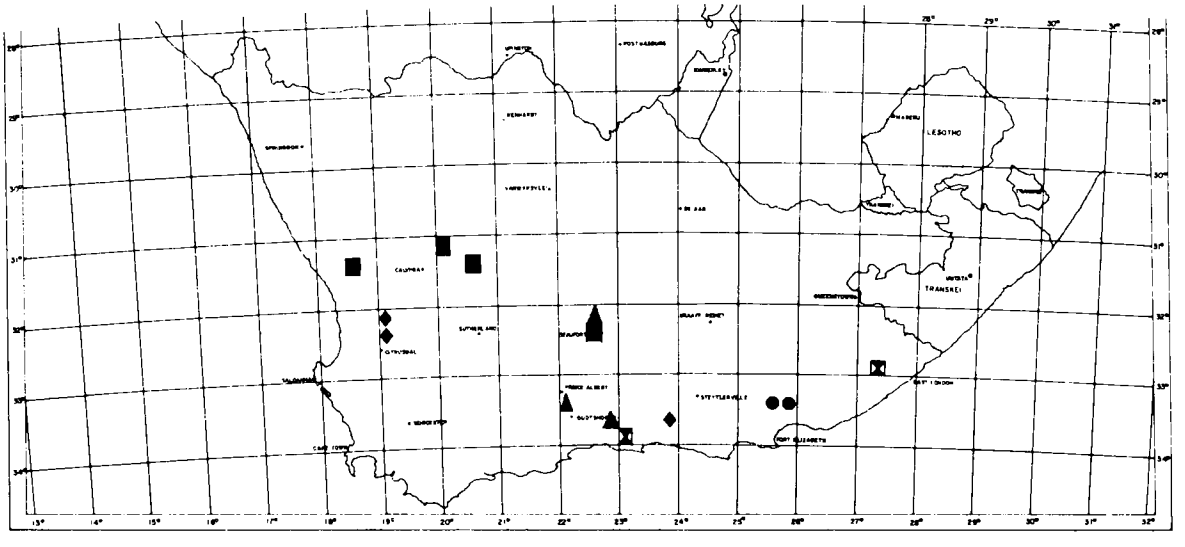
PEM R 1457-64, 2 km past Farm Bergplaas, Kleinplaat District (3323DC), 22 April 1980, W. R. Branch. PEM R 3183-84, Farm Hoekplaas, northern slopes of Kammanasieberg, Uniondale District (3322DB), 9 December 1981, W. R. Branch, vertical Dwyka tillite. PEM R 3188, near Buffelsklip, northern slopes of Kammananasieberg, Uniondale District (3322DB), 9 December 1981, W. R. Branch. PEM R 1403-04, 1497, 1505, top of Prince Alfred's Pass (3323CC), 25 April 1980, W. R. Branch. PEM R 3328, Farm Bloemfontein, Tarka Pass near Mortimer, Cradock District (3225BC), alt. 1100m, 30 November 1981, W. R. Branch. PEM R 3114, 3117-20, 3152, Pramkop, Maountain Zebra Nat. Pk., Cradock District (3225AB), 30 November 1981, W. R. Branch. PEM R 3474, roadside cutting, Kromlaagte, Uniondale District



Map. 19 *Cordylus minor* ⧗ , *Cordylus coeruleopunctatus* ■ , *Cordylus polyzonus* ● , *Cordylus lawrenci* ♦ , *Pseudocordylus capensis* ▲



Map. 20 *Leptotyphlops nigricans nigricans* ● , *Typhlops schinzi* ⧗ , *Lycophidion capense capense* ■



Map. 21 *Lycodonomorphus rufulus* ♦ , *Lamprophis guttatus* ▲ , *Lamprophis fuscus* ●
Amplorhinus multimaculatus ⧗ , *Dipsina multimaculata* ■

(3323CA), 30 September 1982, W. R. Branch. PEM R 3478, Elandsvlakte, Kammanasieberg (3322DA), 30 September 1982, W. R. Branch. PEM R 3556, 3611-14, saddle Mannetjiesberg, Kammanasieberg (3322DB), 8 November 1982, W. R. Branch and R. C. Boycott. PEM R 3800, Farm Vaalwater, Nuwekloof (3323BC), 10 March 1983, W. R. Branch. PEM R 3805, Farm Elinsrus, Compasberg (3124CC), 4 March 1983, W. R. Branch. PEM R 4289, 4384, Farm Palmeitfontein, near Aberdeen, Camdebooberg (3223AB), 12 December 1983, W. R. Branch. PEM R 4404-05, mouth of Tsitsikama River (3424AB), 12 June 1986, W. R. Branch.

Comments: FitzSimons (1943) states that the species is found throughout the southern Cape coastal regions, from the Western Province to Eastern Griqualand. However, this is only partially correct, as it is not present on coastal rocks from Mossel Bay to the Tsitsikama River, being excluded by *Cordylus coeruleopunctatus*. On rocks of the southern slopes of the coastal Cape Fold Mountains (Outeniekwaberg and Tsitsikammaberg) the two species are rarely found together, and *C. cordylus* replaces *C. coeruleopunctatus* on the summits and upper slopes.

Within the Karoo, FitzSimons (1943) lists only two localities, i.e., Rhenosterkop near Beaufort West (3222BB) and Steynsburg (3125BD). The new material shows that the species is widely distributed in the rocky montane grassland of the inland escarpment mountains, from the Hamtamsberg near Van Rhynsdorp to the upper slopes (but not the summit) of the Transkei Drakensberg. It is also found on the summits of the Cape Fold Mountains, and coastal rocks from Saldana Bay to East London, with the exception of the region from Mossel Bay to Witelsbos. The species reverts to binomials following the elevation of *minor* (Mouton and van Wyk, 1989) and *niger* (Mouton and van Wyk, 1990) to specific status.

Cordylus minor **Map 19**

Additional material: PEM R 4668-72, Bruinrante, next to main road to Meringspoort from Beaufort West (3322BA), 30 June 1987, W. R. Branch and W. D. Duellman, in small outcrops of vertical Dwyka tillite in karroid veld (with *Cordylus polyzonus* and *Pachydactylus serval*). PEM R 4504-07, same locality as above, 13 October 1987, W. R. Branch.

Comments: FitzSimons (1943) lists only the type locality, ie. Matjiesfontein. Mouton and van Wyk (1989) raised the taxon to specific status and extended the range to Prince Albert. The Bruinrante population is the furthest east that the species has been recorded. All the records come from isolated outcrops of Dwyka tillite along the northern, karroid slopes of the inland Cape Fold Mountains. It is found in sympatry with *Cordylus polyzonus* but not with *C. cordylus*. It may yet be found in eastern tillite outcrops to near Lake Mentz, and perhaps even within the Little Karoo.

Cordylus coeruleopunctatus **Map 19**

Additional material: PEM R 1048, 1054, 1402, 1555, 2 km from N end Prince Alfred's Pass (3323CC), 4 February 1980, W. R. Branch, in shale bank bordering road. PEM R 1932, upper tributary of Palmeit River, Mossel Bay (3322CC), 10 February 1980, G. Le Roux. PEM R 1041-44, Lottering River at roadbridge by old main road (3323DC), 8 February 1980, W. R. Branch. PEM R 1388, Swart River, George District (3322DC), 31 March 1979, W. R. Branch. PEM R 1389, Wilderness (3322DC), 7 April 1979, W. R. Branch. PEM R 1441, 6 km past Bergplaas towards Kleinplaats (3322DC), 22 April 1980, W. R. Branch. PEM R 1923, Saarsveld Forestry College, George (3322DC), 15 February 1980. PEM R 1933, Geelhoutboomberg, George (3322CD), 28 November 1979, W. R. Branch. PEM R 1336, Witelsbos Forestry Station (3324CC), 6 October 1979, R. C. Boycott. PEM R 3311-12, Nature's Valley, Otter Trail (3323CC), 26 February 1986, W. R. Branch. PEM R 1384-85, 1387, Bloukrans Pass (3323DC), April 1979, W. R. Branch.

Comments: FitzSimons (1943) notes that this small, gracile cordylid is restricted to the southern slopes of the Attaqua and Outeniqua Mountains, and gives an eastern limit of Storms River Mouth (3423BB). The species is now shown to extend considerably further inland into the Outeniqua Mountains. It has also been collected as far east as Witelbos.

Cordylus polyzonus **Map. 19**

Additional material: PEM R 3632, Twee Rivier, S. slopes Kouga Mts. (3323CB), 22 October 1982, R. C. Boycott.

Comments: First record for the karroid valleys of the eastern Cape Fold Mountains.

Cordylus lawrenci **Map. 19**

Additional material: PEM R 5039-43, lower slopes of Vyfteinmyl se berg, just N Farm Gemsbokvlei, 8 km N of Port Nolloth-Steinkop road (2917AA), 6 March 1990, W. R. Branch and E. N. Arnold.

Comments: The type locality of this poorly known and restricted species is Lekkersing, Richtersveld. This new locality may correspond to the only other published locality, i.e. "Port Nolloth: 26 km E on high hills." (Visser, 1979).

Pseudocordylus capensis capensis **Map 19**

Additional material: PEM R 628-632, upper slopes of Kammanasieberg in saddle between Buffelsberg and Mannetjiesberg (3322DB), W. R. Branch and M. Smale, 1 November 1979, in roadside rocks; R 3545-3550, same locality as above, W. R. Branch and R. Boycott, 8 November 1982.

Comments: The new material is the first record for the inland ranges of the Cape Fold Mountains and the most easterly record for the species, extending the range 82km east of Robinson's Pass. They are provisionally assigned to the typical race, although the status of the new population and that of *P. c. robertsi* requires re-investigation. The graceful crag lizard is found in scattered populations throught the western Cape Fold Mountains. A northern race (*P. c. robertsi*) is found on the Bokkeveldberg and Gifberg, north of Clanwilliam. FitzSimons (1943) records the most eastern record (as *Cordylus c. capensis*) as Robinson's Pass (3322CC).

SUBORDER: SERPENTES
INFRAORDER: SCOLECOPHIDIA
Family: Typhlopidae
Subfamily: Typhlopinae

Typhlops schinzi **Map 20**
Additional material: PEM R 4379, near Farm Rooivlei, 85 km from Williston to Calvinia (3120AD), 27 October 1983, J. Hurter, LOR.

Comments: Broadley (1983) contains a single record for the north-western Karoo from the vicinity of Copperton (3022CC). The Rooivlei specimen lies some 275 km SW of Copperton, and over 350 km S of records from Little Namaqualand.

Family: Leptotyphlopidae
Leptotyphlops nigricans nigricans **Map 20**
Additional material: PEM R 3040-41, 3 km ENE Farm Austrey, Winterberg (3226AD), 11 March 1981, W. R. Branch andR. Barnard. PEM R 3045, 4 km N Table Farm, Cathcart District, Winterberg (3226BB), 10 March 1981, W. R. Branch and R. Barnard. PEM R 3046, Farm New Haven, Intaba Etsola, near Cathcart, Winterberg (3226AB), 12 March 1981, W. R. Branch and R. Barnard. PEM R 3308, Pramkop, Mountain Zebra National Park, Cradock District (3225AD), 4 December 1981, W. R. Branch, under stone in montane grassland; gravid with 3 eggs.

Comments: The Pramkop specimen extends the range 87.5 km west from Tarkastad into the Karoo. The other specimens confirm that the species is relatively common on the Winterberg range.

INFRAORDER: CAENOPHIDIA
Family: Colubridae
Subfamily: Boaedontinae
Tribe: Boaedontini
Lycodonomorphus rufulus **Map. 21**
Additional material: PEM R 3924 (KWT 557), Pakhuis Pass, Cedarberg (3219AA), 28 January 1972, J. C. Greig and C. Stuart, stunned whilst electro-fishing in small stream. PEM R 3231, Farm Sewefontein, Baviaanskloof (3323DB), 31 March 1982, R. C. Boycott. PEM R 5017, waterfall above Algeria Forestry Station, Cedarberg (3219AC), February 1990, J. van Deventer.

Comments: An additional record for the Cedarberg, the northern limit of the species in the Western Cape. The Kouga specimen comes from the inland eastern Cape Fold Mountains, from which few specimens have previously been recorded. The Algeria specimen has an unusual dark olive ventrum.

Lamprophis guttatus **Map. 21**
Additional material: PEM R 1726, Top of Molteno Pass, Beaufort West District (3222BA), alt. 1550m, W. R. Branch and M. Smale, 29 Oct 1979, under large slab of sandstone in montane grassland. Another specimen was collected on the upper slopes of the Kammanasieberg (3322DB), 6 November 1982, W. R. Branch and R. C. Boycott, but subsequently escaped and was thus not preserved. PEM R 5044, summit Swartberg, 2 km W Swartberg Pass to Gamka (3322AC), 25 February 1990, W. R. Branch and E. N. Arnold.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

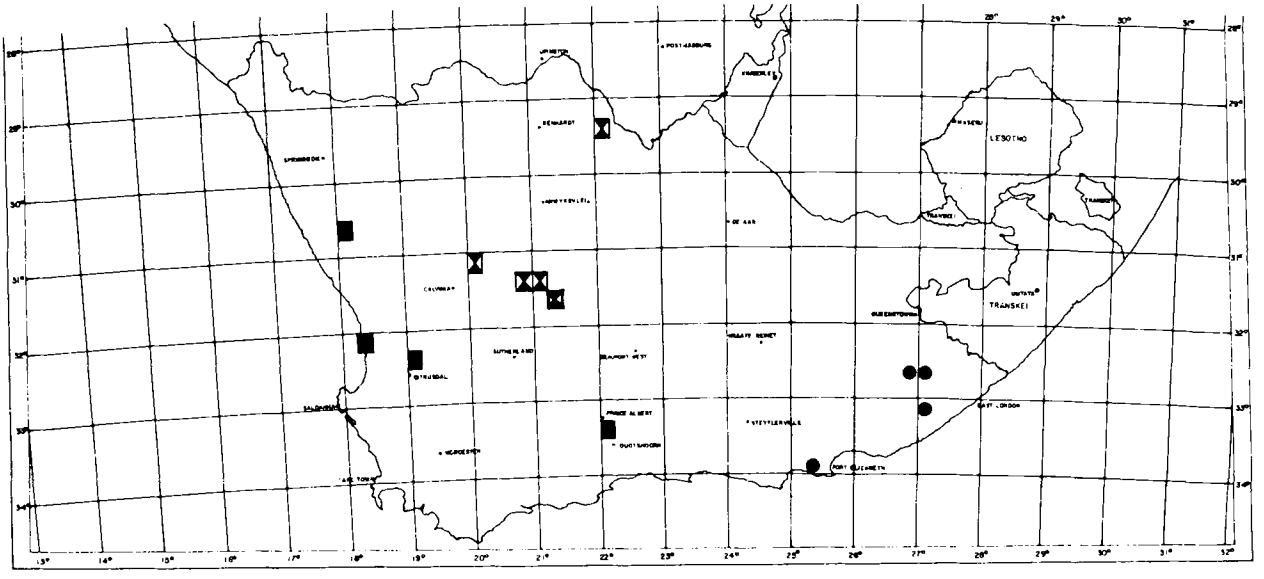
Comments: Within the Cape Province, the spotted house snake is known only from scattered localities within the southern Karoo, extending through Namaqualand and the eastern Cape (Broadley, 1983). It is usually considered to be rare, but this is more a consequence of its secretive, nocturnal habits. Surveys within the Mountain Zebra Nat. Pk and Karoo Nat. Pk have shown it to be a relatively common species. The new records represents the southernmost records for the species and the first for the eastern Cape Fold Mountains.

Lamprophis fuscus **Map 21**
Additional material: PEM R 172, Round Hill turn-off, Suurberg Pass (3325BC), 22 October 1979, W. R. Branch, in termite nest. PEM R 173, 4 km N Suurberg Inn, Suurberg Pass (3325BD), August 1979, W. R. Branch, in termite nest.

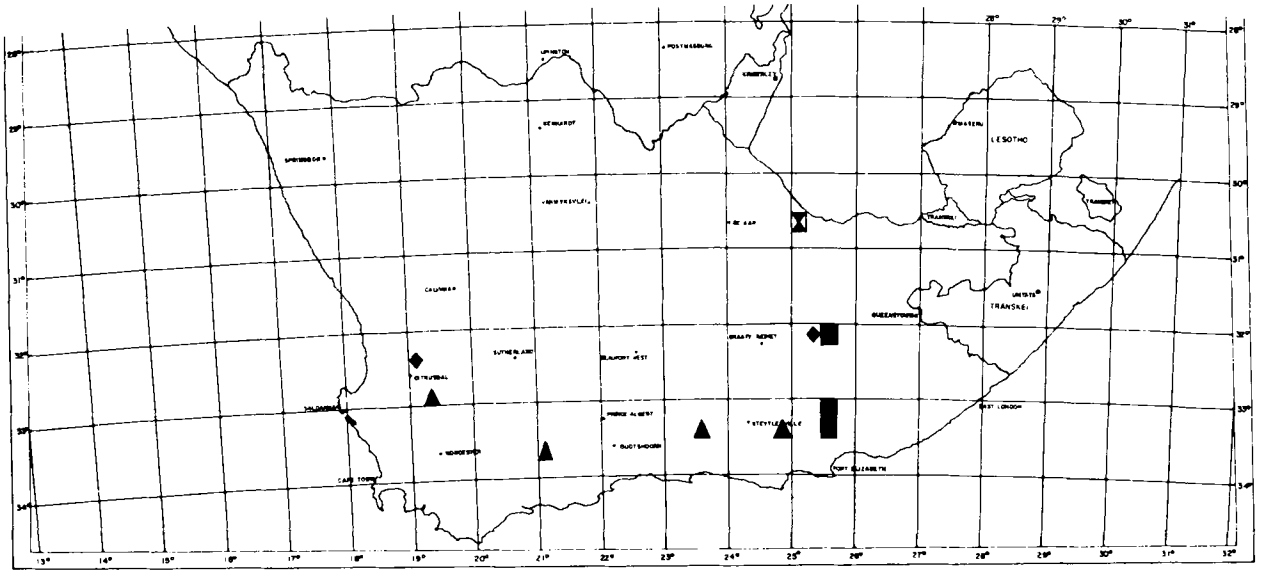
Comments: Additional records for this secretive and gentle snake.

Lycophidion capense capense **Map 20**
Additional material: PEM R 4446, west bank of Vanryneveldpas Dam, Graaff Reinet (3224BA), 20 October 1983, J. Hurter, with *Typhlops lalandei* under dolerite boulder on deep soil. PEM R 811, Doornhoek Dam, Mt Zebra National Park, Cradock District (3225AB), 29 October 1979, J. H. Grobler, with *Mabuya capensis* in gut. PEM R 4748, DOR on southern end of Robinson's Pass just N Brandweg (3422AA), May 1988, W. R. Branch and S. Spawls. PEM R 1945, Camferskloof, Outiniquaberg, George (3322CD), 15 October 1979, J. Mather, with *Mabuya capensis* in gut. PEM R 3448, Sedgefield, southern Cape (3422BB), 22 March 1982, N. G. Palmer. PEM R 4781, 15 km N of Cape Aghulas (3420CC), April 1983, J. Hurter, DOR with *Mabuya capensis* in gut.

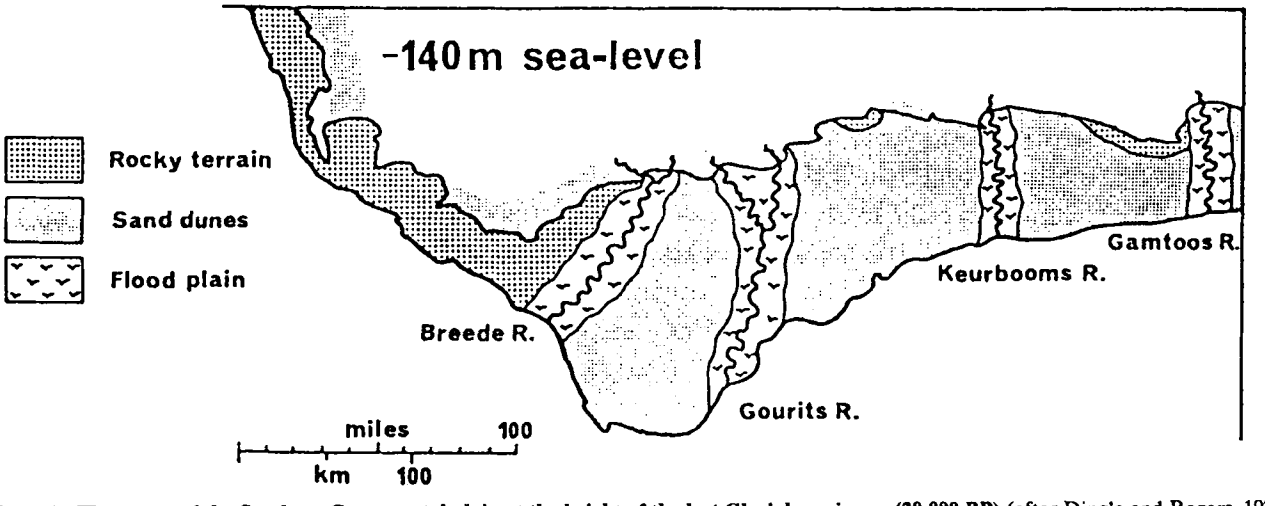
Comments: There is confusion over the type locality of the Cape Wolf Snake. Although many authors (eg. FitzSimons, 1962) have quoted 'Kurrichane' (= Rustenberg District, W. Transvaal) as the type locality, Smith (1831) in his original description designates no type locality and lists only two localities (Cape Town and Port Elizabeth). Noting this discrepancy, De Waal (1978) restricted the type locality to Port Elizabeth as the species is relatively common in the coastal regions of the Eastern Cape and, moreover, is not known from Cape Town. At the time Port Elizabeth was considered to be the south-western limit of this tropical species. Broadley (1983) followed De Waal's (1978) conclusions, and also incorporated an additional locality west of Port Elizabeth (i.e. George, 3322CD) and another for the eastern Karoo (i.e. Mt Zebra Nat. Pk., 3225AB) in his distribution map; both records are based on the specimens documented above. The Robinson's Pass and particularly the Cape Agulhas (250 km west of George) records are considerable range extensions along the coastal plain of the southern Cape, and perhaps bring in to question the correctness of restricting the type locality to Port Elizabeth.



Map. 22 *Psammophis crucifer* ■ , *Telescopus beetzi* ⧗ , *Philothamnus s. semivariegatus* ●



Map. 23 *Atractaspis bibronii* ⧗ , *Aparallactus capensis* ■ , *Homoroselaps lacteus* ◆ , *Aspidelaps lubricus lubricus* ▲



Map. 24 **The extent of the Southern Cape coastal plain at the height of the last Glacial maximum (20 000 BP)** (after Dingle and Rogers, 1972)

Subfamily: Incerta cedis

Amplorhinus multimaculatus **Map 21**

Additional material: PEM R 1922, Veldbroekbraai picnic spot, Diepwall Forestry Station, Prince Alfred's Pass, Knysna District (3323CC), 9 April 1980, J. Koen. PEM R 4128 (KWT 754), King Williams Town (3227CD), 20, December 1972, Mr Goldswain, found in sewage works.

Comments: Fills in part of the large gap in the distribution between the Eastern Cape and Southern Cape populations. This secretive snake may be more widespread within the Cape Fold Mountains.

Subfamily: Psammophiinae

Dipsina multimaculata **Map 21**

Additional material: PEM R 4749, 27 km E Calvinia to Williston (3120AA), 27 October 1983, W.R. Branch, DOR. PEM R 4444, 70 km E of Calvinia (3120BC), 12 November 1983, W. R. Branch, DOR. PEM R 4447, 10 km S Beaufort West (3222BC), Mr De Bruin, alongside railway line. PEM R 3508, Farm Kwaggaskop, N. Van Rhynsdorp (3118BC), 5 May 1982, E. van Jaarsveld.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The new localities fill in the apparant gap in the western Karoo shown in Broadley's (1983) map. It is probable that the species is distributed more widely in the Karoo region.

Psammophis crucifer **Map 22**

Additional material: PEM R 992, Niewefontein, Garies, Little Namaqualand (3018CA), 25 November 1967. PEM R 1609, 9 km E on jeep track to Meringspoort, Swartberg Pass (3322AC), 31 November 1979, W. R. Branch and M. S. Smale. PEM R 1901, Lambert's Bay, Western Cape (3218AB). A small specimen (that subsequently escaped) was found at the top of Engelmanskloof, Cedarberg (3219AC), 29 October 1986, W. R. Branch and C. McCartney. PEM R 4823, 1 km N Gamkakloof turn-off, Swartberg Pass (3322AC), 26 October 1986, W. R. Branch and C. McCartney. PEM R 4988 (CDNEC 10104), Oorloogskloof Nature Reserve, Calvinia (3119AC), 18 October 1989, W. Pretorius.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The Swartberg Pass record is mentioned in Broadley (1983) but is not shown on his distribution map. The Garies record is the southern record for the apparantly disjunct population in Little Namaqualand, although the Lambert's Bay, Cedarberg and Calvinia records also bridges this gap, albeit from the south.

Subfamily: Boiginae

Telescopus beetzi **Map 22**

Additional material: PEM R 4743, 10 km N Marydale, N Cape (2922AC), 26 October 1988, W. R. Branch, DOR. PEM R 4449, 24 km E Williston (3121AC), 19 October 1984, W. R. Branch, DOR. PEM R 4450, 19 km W Williston (3120BD), 19 October 1984, W. R. Branch, DOR. PEM R 4451, Farm Dasslestrote, Brandvlei road (3120AA), 12 November 1983, W. R. Branch, DOR. Specimens too badly flattened to collect were found at Van Rhynsdorp (3118DA) and 40 km N of Fraserburg (3121DB) whilst night driving, 12-13 November 1983, W. R. Branch.

Comments: Additional records for this secretive, nocturnal species which is known from only a few scattered records in the western Karoo (Broadley, 1983). Baard (1987) records additional specimens from Little Namaqualand. The Fraserburg record forms the present southern limit for the species.

Subfamily Colubrinae

Philothamnus semivariegatus semivariegatus **Map. 22**

Additonal material: PEM R 4291, Woodridge School, Van Staden's Pass (3325CD), J. Williams. PEM R 4126 (KWT 715), Hobbiton, Hogsback, Amatola Mountains (3227CA), 26 November 1967, P. Rowlands. PEM R 4110 (KWT 677), Yellowwoods River, Fort Beaufort (3226DB), 26 October 1965, J. Banks. PEM R 4111 (KWT 599), Line Drift, Keiskamma River (3327AA), 16 February 1964, A. Rademeyer.

Comments: Extends the southern range a further grid-square west, and also adds further records for the Eastern Cape, the southern extremity for this tropical wide-ranging species.

Subfamily: Atractaspidinae

Atractaspis bibronii **Map 23**

Additional material: PEM R 4475, Colesburg, NE Cape (3025CA), 10 January 1981, C. P. Davis, crawling on lawn at night.

Comments: First record for NE Cape (approximately 200 km SW of the nearest other record, Bloemfontein; Bates, 1988), and full documentation for the record incorporated into Broadley's (1983) distribution map for the species.

Aparallactus capensis **Map 23**

Additional material: PEMR R 3288, 8 km S Cradock (3225BA), alt. 900m, 30 November 1981, W. R. Branch, in dead termite nest. PEM R 178-79, 1 km E TV tower, Suurberg (3325BA), 23 October 1979, W. R. Branch and M. Smale. PEM R 3423-24, 5 km N Suurgerg Inn, Suurberg Pass (3325BC), 9 June 1981, W. R. Branch. Plus numerous other specimens from the same region (eg. PEM R 1122-1131, 1465-66, 1605-08, 1739).

Comments: Despite its common name, the Cape centipede eater has only a limited penetration into the Cape Province. It is common within termite nests along the summit of the Suurberg range, which appears to form the southern limit of the species. An old record (PEM R 1138) from Prince Albert in the Port Elizabeth Museum (shown in FitzSimons (1962) and Broadley (1983)), must be considered suspect until substantiated by modern material. The collector (Dr Van der Merwe) lived at Prince Albert and supplied the PEM collection with other species not usually found in the region (eg PEM R 1085, *Homoroselaps lacteus*). It is possible that his specimen of *A. capensis* originated elsewhere, and has been recorded under the collector's home town. The Cradock specimen falls in the large gap between records from the Suurberg and the north-eastern Cape.

Homoroselaps lacteus **Map. 23**

Additional material: PEM R 3111, Steynshoek, Mountain Zebra National Park, Cradock District (3225AB), 30 November 1981, W. R. Branch. PEM R 5019, Algeria Forestry Station, Cedarberg (3219AC), February 1990, J. van Deventer.

Additional specimens from the Karoo National Park, Beaufort West have been described elsewhere (Branch and Braack, 1989).

Comments: The Cradock and Beaufort West specimens are the first for the Karoo escarpment mountains.

Family: Elapidae

Aspidelaps lubricus lubricus **Map. 23**

Additional material: PEM R 3450, 300m S of Krui River, Little Karoo (3321CA), 8 September 1981, N. Palmer, DOR. PEM R 4830, 20 km S Willowmore on dirt road to Baviaanskloof (3323BC), 28 February 1983, J. Hurter, DOR. PEM R 4832, Sneeukop, Ceres District (3219CD), May 1985, W. R. Branch, DOR. PEM R 4831, 19 km W Coemes River (3324BD), 10 February 1986, J. Hurter, DOR.

Comments: An additional record for the SW Cape, and the first records for the Little Karoo and karroid valleys of eastern Cape Fold Mountains.

DISCUSSION

The large amount of new distribution data included here, and in the companion publications (listed in the introduction), graphically demonstrate how poorly known the herpetology of the Cape Province remains. In 1981 I prematurely suggested (Branch, 1981) that the alpha phase of the taxonomy of the Cape herpetofauna, in which new taxa are described, was for the most part over. This has proved much too optomistic, and in the intervening eight years, three new species of frog (including a new genus) and four new lizards have been described. Many other species have also undergone taxonomic revision and numerous new taxa are in the process of being described (see annotations in Branch *et al.*, 1988).

In addition to the unresolved taxonomic status of many species, there has still been no detailed phylogenetic analysis of supra-specific relationships in any reptile or amphibian group in the subcontinent. It is thus premature to offer a meaningful zoogeographic analysis of the Province's herpetofauna. However, it is increasingly evident from the distributions of many species that certain 'generalised tracts' (*sensu* Croizat *et al.*, 1974) can be discerned. In addition, increasingly more detailed data concerning climatic changes in the Late Pleistocene and Holocene are accumulating, which may offer explanations of these distributions. The following observations introduce some of the aspects that will be more thoroughly covered in a fuller discussion of the topic (Branch, *in prep.*).

Cape Fold Mountains

The Cape Fold Mountains (CFM) have a complex flora. Characteristically they are clothed in fynbos (comparable to the Mediterranean heathland of southern Europe); this rich, fire-adapted vegetation grows on shallow, acidic, nutrient-poor soils that receive cool, winter rain and hot summer droughts. Due to its bissected topography, the CFM region forms a complex 'archipelago' of mountain summits and rock faces, on which the vegetation has varied in cyclic fashion with climatic fluctuations (Axelrod and Raven, 1978; Zinderen Bakker, 1978). Many authors (summarised in Poynton, 1989) have noted the distinctiveness of the Cape amphibian fauna, which for the most part is adapted to breeding in cool winter conditions. Vicariance has generated disjunct populations of numerous frogs and some chamaeleons, which in turn has resulted in genetic isolation and in some cases speciation. Examples of species complexes associated with these mountains include:

Strongylopus bonaespei - fasciatus
Capensibufo rosei - tradouwi
Heleophrne purcelli - regis - hewitti
Breviceps acutirostris - fuscus
Bradypodion spp.

In its turn, the CFM forms the southern end of the Afro-Montane biome, an archipelago of cool, temperate habitats associated with latitude in the south and altitude in the north (White, 1978). Again, certain species in the CFM have sister taxa to the north in the Amatola Mountains or Natal Drakensberg, eg:

Tropidosaura gularis - T. cottrelli
Pseudocordylus microlepidotus - P. melanotus
Heleophryne purcelli complex - *H. natalensis*
Bufo angusticeps - B. amatolica
Arthroleptella hewitti - A. lightfooti

Stuckenberg (1962) noted a similar disjunct distribution among montane palaeogenic elements of South African invertebrates.

Inland escarpment

Relict populations of a number of species are found in association with montane grassland on the mountains of the inland escarpment. These include numerous Cape Temperate species, whose main distribution occurs in the southern coastal regions, and in some cases extends onto the Transvaal highveld and even, in disjunct fashion, along the northen escarpment mountain chain to Zimbabwe; eg.

Homopus femoralis
Pedioplanis burchelli
Mabuya homalocephala
Cordylus cordylus
Pseudocordylus microlepidotus
Tetradactylus tetradactylus
Lamprophis aurora
Homoroselaps lacteus
Hemachatus haemachatus.

It is believed that at the Last Glacial Maximum pure grassland replaced other forms of grassland (Brain, 1985), and van Zinderen Bakken (1978) has postulated that grassland expansion in southern Africa was a recurrent feature as a particular stage of the glacial cylce. The ranges of certain species, including those listed above, may have expanded in association with this vegetation type, and it is of interest to compare the similar distributions of the cross-barred sand snake (*Psammophis crucifer*), ringhals (*Hemachatus haemachatus*) (Broadley, 1983), and the white-tailed mouse (*Mystromys albicaudatus*) (De Graaff, 1981).

Due to their height, these mountain ranges receive a higher rainfall than the southern plains (200-400 mm pa.) and thus have a very characteristic grassveld and associated flora. They also experience lower temperatures, with winter snow and regular, severe frosts. The inland plateau, although of similar height, lies in the rain shadow of the escarpment edge and is thus drier. A number of species adapted to the arid southern plain thus re-occur inland of the escarpment, although at high altitudes, eg:

Psammobates tentorius
Meroles suborbitalis.
Pedioplanis namaquensis

The herpetofauna of the Winterberg, including the Amatola Mountains, shows close affinities with the Cape, Transkei and Natal Drakensberg, and harbours isolated populations of *Pseudocordylus melanotus subviridis* and the *Afroedura amatolica-nivaria* complex. There are, however, certain anomalies, most noteably the absence of ghost frogs (*Heleophryne*) and the berg adder (*Bitis atropos*). It has, however, been a minor centre of speciation, with two endemic frogs (*Bufo amatolica* and *Anhydrophryne rattrayi*). Meadows *et al.* (1987) have noted that on the Winterberg forest occupied a greater area in the mid-Holocene (8000 BP), but that it was still confined to patches. These have subsequently been reduced by human activity and greater burning frequencies.

Southern Cape coastal belt

A number of species have disjunct populations in the southern and Eastern Cape coastal regions, eg.

Nucras lalandii
Lycophidion capense
Bufo pardalis complex
Hyperolius horstocki
Afrixalus brachynemis-knysnae complex
Gerrhosaurus flavigularis

These distributions can best be interpreted as resulting from the expansion and retraction of a coastal plain caused by sea level fluctuations associated with Glacial Maxima. The polar ice sheets have fluctuated in regular pulses during the last 500 000 years, and this has influenced not only climatic regimes in the subcontinent, but also the sea level as ice was regularly locked in the expanding polar ice sheets. In simple outline, with a periodicity of about 100 000 years, the climate has become cooler and drier during glacial periods, as the ice sheets expanded and sea levels dropped. During interglacials the climate was wetter and warmer, with smaller ice fields and higher sea levels. The last glacial maximum occurred 25 000 to 17 000 BP (Deacon and Deacon, 1986) and at its maximum temperatures were 5-6°C lower than present.

Dingle and Rogers (1972) have noted that with a maximum sea level regression of -140 m at the height of the last Saale (Riss) Glaciation (20 000 BP), the Agulhas Bank would have been nearly 160 km wide SE of Cape Agulhas and still 64 km wide at Cape St Francis, although less than 16 km wide west of the Cape Peninsula (Map 24). At this time the Agulhas Bank would have formed an extensive, flat, southern Cape coastal plain with small koppies, and the clayey soil would have supported a rich flora and fauna, with extensive marshy ground in the poorly drained tracts (Dingle and Rogers, 1972). It may have formed a large area of suitable habitat for many of the species listed above.

The initial rise of sea levels during the Flandian transgression was quite rapid and a height of -100 m was reached by 17-15 000 years BP, and by the start of the Holocene (11-9 000 years BP) with the disappearance of permafrost conditions in NW Europe, the sea level was only - 50 m. This would have resulted in a rapid submergence of the coastal plain, which is now almost absent, particularly in the region between Witelsbos and Mossel Bay, where the Tsitsikama and Outeniqua Mountains fall abruptly into the sea. In addition that last interglacial maximum probably occurred about 5000 BP, when seas would have been 3-4 m higher than present. It is therefore probable that the above species previously had much wider distributions, and that subsequent vicariance has occurred with rising sea levels and the contraction and disruption of the southern Cape coastal plain.

In the case of *Cordylus cordylus*, its distribution also appears to involve competitive exclusion. It inhabits coastal rocks from Saldana Bay to the Transkei, except in the southern Cape coastal region, from Mossel Bay to Witelsbos, where it is replaced on coastal rocks by *C. coeruleopunctatus*. The blue-spotted girdled lizard is a small, almost melanistic cordylid, and it extends inland into the Outeniqua Mountains. The transition zone between the two species occurs rapidly, over only several hundred metres of roadside rocks near the top of Prince Alfred's Pass (Branch, *pers. obs.*). Mouton and Oelofsen (1988) have presented a model explaining the disjunct distribution of melanistic *Cordylus cordylus* populations in the south-western Cape. The model emphasizes the role of montane refugia for melanistic lizards, that adapted to cooler conditions during the last glacial maximum and whose range has contracted as conditions warmed. As a consequence of the proximity of the CFM to the sea, higher rainfall and cooler conditions prevail in the Wilderness-Storms River region of the southern Cape. It is possible that *C. coeruleopunctatus* had a wider distribution during the last glacial maximum, but that its range has now contracted, in a similar fashion to that of the melanistic *Cordylus cordylus* populations in the SW Cape, and relict populations of the species may still occur in localised cool regions within the CFM.

The East coast tropical subtraction

Poynton (1962, 1964) noted a reduction of tropical amphibians southwards along the South African east coast, particularly in the region of St Lucia, Natal. A final, minor, subtraction of tropical forms occurs in the Eastern Cape. A number of amphibian and reptile species with tropical affinities reach their southern limit in the Addo-Port Elizabeth region, including the bullfrog (*Pyxicephalus adspersus*), the Natal puddle frog (*Phrynobatrachus natalensis*), the yellow-striped reed frog (*Hyperolius semidiscus*), and the spotted bush snake (*Philothamnus s. semivariegatus*). Other Tropical wide-ranging species that drop out 'earlier' along the corridor are the brown egg eater (*Dasypeltis inornata*), which reaches Port Alfred, and the Natal black snake (*Macrelaps microlepidotus*) and the giant legless skink (*Acontias plumbeus*), both of which reach East London, with relict populations in the forests at Stutterheim (Branch, 1988). A relict, now extinct, population of the African rock python (*Python sebae natalensis*) also occurred in historical times in the Albany region (FitzSimons, 1962), whilst a number of fossorial skinks (eg. *Acontias percivalli* and *A. breviceps*) have relict populations in the Eastern Cape, but are more widely distributed in the north of the subcontinent.

West Cape coastal region

An interesting, and as yet unexplained, radiation of species, particularly fossorial forms, has occurred along the western Cape coastal dunes. The region contains numerous endemics, some of which have obvious sister taxa with most of their range north of the Orange River, eg.

Bitis schneideri - B. peringuey
Meroles ctenodactylus - M. cunerostris
Typhlosaurus vermis - T. caecus
and *Breviceps macrops - B. namaquensis.*

Fluctuating sea levels have also affected the offshore islands, which contain a number of relict populations of fossorial skinks (Robben Island, *Scelotes bipes* and *Acontias meleagris*; Dassen Island, *Scelotes gronovii*; Branch, 1990b). All the offshore islands were connected to the mainland during the height of the Flandian Transgression (approximately 20-16 000 BP), and consequently there has been little time for speciation. Earlier glacial cycles (Dingle and Rogers, 1972; Tankard, 1976; Davis, 1980), with concommitant climatic changes, may have resulted in the expansion and contraction of the dune fields, with consequent vicariance and speciation of the dune-adapted fauna.

The Namib-Karoo transition

Similar events have affected the whole Western arid region, leading to the evolution of the unique and diverse Namib herpetofauna. Arid and semi-arid conditions have occurred in Africa, at least on a limited scale, since the Cretaceous (summarised in Werger, 1978). In its southern region the Karoo consists of a number of relatively distinct arid flat plains, bissected by dry river courses and rocky koppies. They lie in mountain rain shadows; ie, the Little Karro within the CFM, the southern plain of the Great Karoo to the north of the Swartberg range, and the Tanqwa Karoo to the east of the Cedarberg. These karroid pockets form isolated refugia for a number of species, particularly lizards, that are characteristic of the western arid regions, eg:

Psammobates t. tentorius
Chondrodactylus a. angulifer
Ptenopus garrulus maculatus
Pachydactylus m. mariequensis
Chamaeleo namaquensis
Cordylosaurus subtesslatus
Pedioplanis namaquensis
Dipsinia multimaculata
Bitis caudalis.

Some species also extend into the karroid valley bottoms between the northern ranges of the CFM (eg. *Pachydactylus capensis, Mabuya sulcata*, and *Psammobates tentorius*), a few even reaching the Alboa Basin via the Steytlerville Flats that lie between the Klein and Groot Winterhoekberg (eg. *Pachydactylus mariquensis, Pedioplanis namaquensis*, and *Aspidelaps lubricus*). That all these populations are only recently isolated is indicated by the lack of genetic distinctiveness at the specific or subspecific level within the Kalahari and the Karoo (including its outliers). Haacke (1984) has noted the concordance of certain reptile distributions with rainfall gradients with the Kalahari Domain.

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REFERENCES

Axelrod, D. I. and P. H. Raven, 1978. Late Cretaceous and Tertiary vegetation history of Africa. pp 77-130. In: *Biogeography and Ecology of Southern Africa*, M. J. A. Werger and A. C. van Bruggen (eds.), Junk, Hague.

Baard, E. H. W., 1987. New herpetological distribution records in the western Cape Province. *J. Herpetol. Assoc. Afr.* **33:** 29-30.

Bates, M. F., 1988. New distribution records for the Orange Free State. *J. Herpetol. Assoc. Afr.* **34:** 51.

Boulenger, G. 1910. A revised list of South African reptiles and batrachians with synoptic tables, special reference to specimens in the South African Museum, and descriptions of new species. *Ann. S. Afr. Mus.* **5:** 455-538.

Bourquin, O., 1989. Herpetofauna in the Natal Parks Board reserves and resorts. In: Proceeeding of the First HAA Conference, Stellenbosch, W. R. Branch (ed.), *J. Herpetol. Assoc. Afr.* **36:** 19-25.

Boycott, R. C., 1990. Geographic distribution: *Pacydactylus namaquensis. J. Herpetol. Assoc. Afr.* **37:** this volume.

Braack, H. H., R. C. Boycott and W. R. Branch, 1990. Geographic distribution: *Bufo vertebralis. J. Herpetol. Assoc. Afr.* **37:** this volume.

Brain, C. K., 1985. Temperature-induced environmental changes in Africa as evolutionary stimuli. In: *Species and Speciation*, Vrba, E. S. (ed.), *Transvaal Mus. Monog.* **4:** 45-52, Transvaal Museum, Pretoria.

Branch, W. R., 1981. An annotated checklist of the lizards of the Cape Province, South Africa. *Ann. Cape Prov. Mus. (nat. Hist.)* **13(11):** 141-167.

Branch, W. R., 1988. Distribution and diversity of the reptiles and amphibians of the Eastern Cape. pp 218-246. In: *Towards an Environmental Plan for the Eastern Cape.* M. N. Bruton and F. W. Gess (eds.), Rhodes Univ. Press, Grahamstown.

Branch, W. R., 1990a. New records for *Tetradactylus* (Sauria: Gerrosaurinae) in the Cape Province, South Africa, and their taxonomic status. *J. Herpetol. Assoc. Afr.* **37:** this volume.

Branch, W. R., 1990b. Notes on the herpetofauna of the off-shore islands of South Africa and Namibia. *Annls. Cape Prov. Mus.* in press.

Branch, W. R. and H. H. Braack, 1987. The reptiles and amphibians of the Addo Elephant National Park *Koedoe* **30:** 61-112.

Branch, W. R. and H. H. Braack, 1989. Reptiles and amphibians of the Karoo National Park: A surprising diversity. In: Proceeeding of the First HAA Conference, Stellenbosch, W. R. Branch (ed.) *J. Herpetol. Assoc. Afr.* **36:** 26-35.

Branch, W. R. and N. Hanekom, 1987. The reptiles and amphibians of the Tsitsikama National Parks *Koedoe* **30:** 49-60.

Broadley, D. G., 1972. A review of the *Nucras tessellata* group (Sauria: Lacertidae). *Arnoldia Rhod.* **5(20):** 1-36.

Broadley, D. G., 1977. A review of the *Mabuya striata* complex in South-eastern Africa (Sauria: Scincidae). *Occ. Pap. natn. Mus. Rhod.* **B6(2):** 45-79.

Broadley, D. G., 1983. *FitzSimons' Snakes of Southern Africa*. Delta Books, Johannesburg, 376p.

Burrage, B. R., 1973. Comparative ecology and behaviour of *Chamaeleo pumilus pumilus* (Gmelin) and *Chamaeleo namaquensis* A. Smith (Sauria: Chamaeleonidae). *Ann. S. Afr. Mus.* **61:** 1-158.

Burrage, B. R., 1978. Reptiles collected from the west coast of the Cape Province, South Africa. *Trans. Kansas Acad. Sci.* **81(3):** 265-271.

Channing, A. 1986. A new species of the genus *Strongylopus* Tschudi from Namaqualand, Cape Province, South Africa (Anura: Ranidae). *Ann. Cape Prov. Mus. (nat. Hist.)* **16:** 127-135.

Croizat, L, G. Nelson and D. E. Rosen, 1974. Centers of Origin and related concepts. *Systematic Zool.* **23(2):** 265-287.

Davis, O., 1980. Last interglacial shorelines in the South Cape. *Palaeont. afr.* **23:** 153-171.

De Graaff, G., 1981. *The Rodents of Southern Africa*. Butterowrth, Pretoria.

De Waal, S. W. P., 1978. The Squamata (Reptilia) of the Orange Free State, South Africa. *Mem. Nas. Mus. Bloemfontein* **11:** 1-160.

Dingle, R. V. and J. Rogers, 1972. Pleistocene palaeogeography of the Agulhas Bank. *Trans. Roy. Soc. S. Afr.* **40(3):** 155-165.

FitzSimons, V. F. M., 1943. The Lizards of South Africa. *Mem. Transvaal Mus.* **1:** 1-528.

FitzSimons, V. F. M., 1962. *Snakes of Southern Africa*, Purnell, Cape Town, 423 pp.

Frost, D. R. and R. Etheridge, 1989. A phylogenetic analysisand taxonomy of Iguanian lizards (Reptilia: Squamata). *Misc. Publ. Univ. Kansas Mus. Nat. Hist.* **81:** 1-65.

Greig, J. C. and P. D. Burdett, 1976. Patterns in the distribution of southern African terrestrial tortoises (Cryptodira: Testudinidae). *Zool. Africana* **11(2):** 249-274.

Haacke, W. D., 1975. The burrowing geckos of southern Africa. Part 1. (Reptilia: Gekkonidae). *Ann. Transvaal Mus.* **29(12):** 197-241.

Haacke, W. D., 1976. The burrowing geckos of southern Africa. Part 4. (Reptilia: Gekkonidae). *Ann. Transvaal Mus.* **30(5):** 53-69.

Haacke, W. D., 1984. The Herpetology of the southern Kalahari domain. *Koedoe (suppl.)* **1984:** 171-186.

Haagner, G. V., 1989. *Chersina angulata*: Size and Distribution. Life History Note. *J. Herpetol. Assoc. Afr.* **37:** ******

Hendey, Q. B., 1981. Palaeecology of the Late Tertiary fossil occurrences in 'E' Quarry, Langebaanweg, South Africa, and a re-interpretation of their geological context. *Ann. S. Afr. Mus.* **84(1):** 1-104.

Lambiris, A. J. L., 1988. *A Preliminary Survey of the Amphibians of Natal/Kwa-Zulu*. M. Sc. thesis, University of Natal, Durban, 441 pages + 109 fig. pages.

Loveridge, A., 1944. Revision of the African lizards of the Family Cordylidae. *Bull. Mus. comp. Zool. (Harv.)* **95:** 1-118.

Loveridge, A., 1947. Revision of the African lizards of the Family Gekkonidae. *Bull. Mus. comp. Zool. (Harv.)* **98:** 1-469.

McLachlan, G. R., 1979. The taxonomy of *Pachydactylus rugosus*. *J. Herpetol. Assoc. Afr.* **21:** 4-7.

McLachlan, G. R., and J. M. Spence, 1966. The genus *Pachydactylus* (Part 1.). *Ann. Cape Prov. Mus.* **5:** 149-156.

Meadows, M. E., K. F. Meadows and J. M. Sugden, 1987. The development of vegetation on the Winterberg escarpment. *Naturalist* **31(1):** 26-32.

Mertens, R., 1955. Die amphibien und reptilien Südwesafrikas. *Abh. senckenb. naturforsch. Ges.*, **490:** 1-172.

Mouton, P. le F. N. and B. W. Oelofsen, 1988. A model explaining patterns of geographic character variation in *Cordylus cordylus* (Reptilia; Cordlyidae) in the south-western Cape, South Africa. *S. Afr J. Zool.* **23(1):** 20-31.

Mouton, P. le F. N. and J. H. van Wyk, 1989. *Cordylus minor*: A valid species of South African lizard (Reptilia; Cordlyidae). *S. Afr J. Zool.* **24(4):** 322-328.

Mouton, P. le F. N. and J. H. van Wyk, 1990. ****** *Cordylus minor*: A valid species of South African lizard (Reptilia; Cordlyidae). *S. Afr J. Zool.* **25():** .

Mouton, P. le F. and J. H. van Wyk, 1990. Taxonomic status of the melanistic forms of the *Cordylus cordylus* complex (Reptilia: Cordylidae) in the south-western Cape, South Africa. *S. Afr. J. Zool.* **25(1):** 31-38.

Oelofsen, B. and W. Vorster, 1976. A new record of *Ptenopus* (Reptilia: Gekkonidae) from Calitzdorp. *Zool. Africana* **11(1):** 225.

Parry, C. R., 1982. A revision of southern African *Pyxicephalus* Tschudi (Anura: Ranidae). *Ann. Natal Mus.* **25(1):** 281-292.

Passmore, N. I. and V. C. Carruthers, 1979. *South African Frogs.* Wits University Press, Johannesburg, 270 pp.

Poynton, J. C., 1962. Patterns in the distribution of the southern African amphibians. *Ann. Cape Prov. Mus.* **2:** 252-272.

Poynton, J. C., 1964. The Amphibia of southern Africa: A faunal study. *Ann. Natal Mus.* **17:** 1-334.

Poynton, J. C., 1989. Evolutionary activity in the southern part of Africa: Evidence from the Amphibia. In: Proceeeding of the First HAA Conference, Stellenbosch, W. R. Branch (ed.) *J. Herpetol. Assoc. Afr.* **36:**

Stuckenberg, B. R., 1962. The distribution of the montane palaeogenic element in the South African invertebrate fauna. *Annls. Cape Prov. Mus.* **2:** 190-205.

Tankard, A. J., 1976. Cenozoic sea-level changes: A discussion. *Ann. S. Afr. Mus.* **71:** 1-17.

Visser, J., 1979. New and reconfirmed records for the Cape Province with notes on some "rare" species. *J. Herpetol. Assoc. Afr.* **21:** 40-50.

Werger, M. J. A., 1978. The Karoo-Namib Region. pp 231-299. In: *Biogeography and Ecology of Southern Africa*, M. J. A. Werger and A. C. van Bruggen (eds.), Junk, Hague.

Zinderen Bakker, E. M. van, 1978. Quaternary vegetation changes in Southern Africa. pp 131-143. In: *Biogeography and Ecology of Southern Africa*, M. J. A. Werger and A. C. van Bruggen (eds.), Junk, Hague.

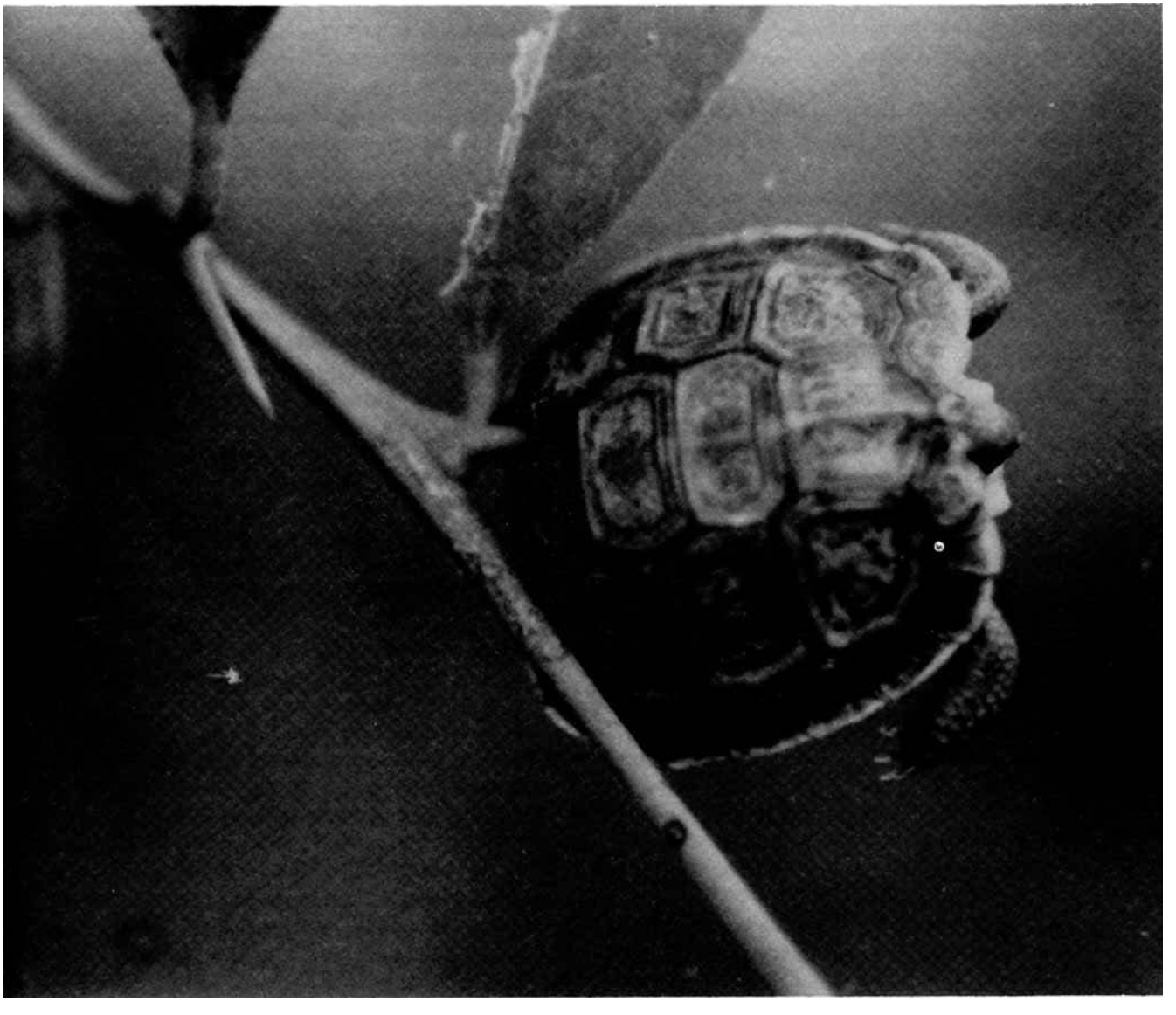

Fig. 1 *Chersina angulata*: **Avian predation** (see p 52, Life History Notes, W. R. Branch)