

T THE HERPETOLOGY OF SOUTH-EAST AFRICA

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INTRODUCTION.

"South-east Africa", for the purposes of this study, includes Bechuanaland, the Caprivi Strip, Rhodesia, Zambia, Malawi and Mozambique, a total area of 1,065,000 square miles. It is therefore considerably larger than South Africa and South West Africa together (800,000 sq. miles) or "East Africa" as defined by Loveridge (1957), i.e. Uganda, Kenya and Tanzania with a total area of 680,000 square miles. It is also slightly larger than the Congo (910,000 sq. miles).

The herpetofauna of south-east Africa has never been considered as a whole. Most South African herpetologists have confined their attention to Africa south of a line formed by the Cunene and Zambesi Rivers, the most important contributions being by FitzSimons (1943 and 1962) on the reptiles and Poynton (1964) on the amphibians.

The only comprehensive survey of the herpetofauna of Bechuanaland was made by FitzSimons (1935b).

Apart from brief descriptions of new forms, the only reports on herpetological collections from Rhodesia are by Boulenger (1902), FitzSimons (1939b ; 1958a) and Broadley (1959b ; 1962d).

Little has been published on the herpetofauna of Zambia until recently. Peracca (1896 ; 1910) reported on Jalla's collections from Kazungula and Barotseland. Boulenger (1907a) listed Neave's small collection and Pitman (1934) published a tentative checklist. Vesey-FitzGerald (1958), Broadley and Pitman (1960) and Wilson (1965) have published reports on large collections of snakes from northern and eastern Zambia.

Malawi received some attention in the last century (Gunther, 1888, 1893, 1894 ; Boulenger, 1897) and was then neglected for fifty years. Loveridge (1953a ; 1953b ; 1953c) provided a good basis for future work in this region. Poynton (1964b) has subsequently made a big contribution to our knowledge of the amphibians of Malawi and eastern Zambia.

Large areas of Mozambique remain blank on the distribution maps. The early collections from Mozambique came either from the coast or along the Zambesi and provided the basis for papers by Bianconi (1847-1862), Peters (1854-1882), Gray (1864) and Gunther (1864). Bocage reported on some reptiles from Angoche (1882) and then listed all the reptiles and amphibians recorded from Mozambique (1896). Pfeffer (1893) listed some material collected by Stuhlmann at Quelimane.

Boulenger (1907b) recorded some specimens collected by Grant and Sternfeld (1911) reported on a collection made in the interior of Mozambique by Tiessler. Cott (1932 ; 1934 ; 1935) and Parker (1931) made valuable contributions to our knowledge of the herpetofauna of the lower Zambesi. Cunha (1935) and Themido (1941) recorded some reptiles from Massangulo and Mertens (1937) listed some material from Inhaminga. Manacas (1952 ; 1957 ; 1959 ; 1961) has published a series of reports on reptiles from Mozambique. A paper on the amphibians of northern Mozambique (Poynton, 1966b) is in press.

During the preparation of the present study it has become obvious that the great weakness in the literature on the herpetofauna of Africa is parochialism. Much intensive and valuable work has been done in the territories bordering south-east Africa, but it has not been co-ordinated. There is a pressing need for the herpetofauna of the Ethiopian Region to be considered as a whole and Poynton has led the way in looking to wider horizons. One of the main objectives of this study is to reconcile the views of workers to the north (Loveridge ; Witte ; Laurent), west (Bocage ; Monard ; Hellmich ; Mertens) and south (Hewitt ; FitzSimons).

Poynton (1960 ; etc.) laid the foundations for studies on the zoogeography of the Ethiopian Region. His conclusions are largely based on the distribution patterns shown by the amphibians, so a comparison of reptile distributions should prove illuminating. As few amphibians are equipped for life in arid regions, the reptiles will shed more light on the affinities of the fauna inhabiting such areas.

Many reptile groups are obviously in need of revision on a pan-African basis. An admirable model for such a study is the revision of the snake genus Dasypeltis by Gans (1959). It is preferable that a study of intraspecific geographic variation should cover the whole range of the species, so this type of analysis has not usually been attempted here.

Most of the amphibian material listed has already been examined and reported on by Poynton (1964a ; 1964b ; 1966b), so I have undertaken little taxonomic work on the amphibians apart from a review of the Brevicaps mossambicus group.

I have tried to collate all the literature references to Zambian amphibians, but the identity of much of this material will remain doubtful until it is re-examined.

The total number of forms (species and subspecies) recognised in south-east Africa is 294 reptiles and 108 amphibians.

#### ACKNOWLEDGEMENTS.

This project was instigated by Dr. J.C. Poynton at the beginning of 1964. At that time his own study on the amphibian fauna of Southern Africa was nearing completion and he felt that I had accumulated enough material from south-east Africa to make a zoogeographical study of that area, based on the distributions of both reptiles and amphibians, a worthwhile proposition. I am grateful to Dr. Poynton for his advice and encouragement, without which this project would not have reached fruition.

The work was carried out at Umtali Museum and occupied a large part of my time during 1965-1966. I am indebted to the Director of National Museums, Mr. Reay H.N. Smithers, not only for his constant encouragement, but also for collecting much herpetological material in Bechuanaland.

It is impossible to list all those who have contributed material and observations, but I am particularly indebted to : Messrs. W.F.H. Ansell; R. Japp; B.L. Mitchell; L.D.E.P. Vesey-FitzGerald and V.J. Wilson (Zambia); Dr. Margaret Stewart (Malawi); Messrs. L. Balarin; D.K. Blake; D. Bredenkamp; I. Cannell; H.C. Garbett; T.N. Liversedge; Prince Edward School and the Rhodesian Schools Exploration Society (Rhodesia); Messrs. T. Pavey (Rhodesia and Mozambique) and C.R. Owen (Mozambique).

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Mr. C.E. Gow (South African Museum); Mr. B.G. Donnelly (Port Elizabeth Museum); Miss. P.M. Barbour (McGregor Museum); Dr. W. Steyn (State Museum, Windhoek); Dr. U. de V. Pienaar (Kruger National Park); Drs. D.M. Cochran and J.A. Peters (United States National Museum); Dr. R.F. Inger (Chicago Natural History Museum); Drs. A. Capart and G.P. de Witte (Institut Royal des Sciences Naturelles de Belgique); and Senor J.J. Cravo (Estacao de Biologia Maritima, Inhaca Island).

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## MATERIALS AND METHODS.

This study is based on the herpetological collections of the National Museums of Rhodesia, now centralised at Untali Museum, which contain over 16,000 specimens from south-east Africa. In the course of revisionary studies on a number of reptile groups, all relevant material in the South African Museums has been examined, together with some material from American Museums, the British Museum (N.H.) and the Institut Royal des Sciences Naturelles de Belgique. The groups in question are :

Riopa sundevalli group

Typhlossaurus lineatus group

Nucras tessellata group

Genus Platyssaurus (Broadley, 1964b)

Genus Natriciteres

Philothamnus natalensis (Broadley, 1966, in press)

Prosymna sundevalli group (Broadley, 1965c)

Psammophis subtaeniatus

The south-east African material examined during the preparation of this study consists of 12,400 reptiles and 5,600 amphibians; additional material from other parts of Africa has been used for comparative purposes.

In order to make the distribution data as complete as possible, all reliable literature records have been collated. In some groups the discovery of sibling species makes literature citations unacceptable (e.g. Hemidactylus mabouia complex; Mabuya striata complex).

Unpublished locality data has been supplied by several colleagues and these localities have been included under "Literature records" followed by the following abbreviations in parentheses:

B = Bredo Collections in the Institut Royal des Sciences Naturelles de Belgique (Data supplied by Captain C.R.S. Pitman).

BM = Material in the British Museum (Data supplied by Miss. A.G.C. Grandison and Captain C.R.S. Pitman).

P = Material examined by Dr. J.C. Poynton.

T = Material examined by Father K. Tassan, S.J.

In those cases where material listed under "material examined" has previously been recorded in the literature, the localities are not usually repeated either in the synonymy or under "literature records". In the synonymy a locality record is normally listed only on the first occasion that it appeared in the literature.

All localities have been listed alphabetically in the gazetteer with their quarter-degree grid references and the distribution maps were compiled from the gazetteer. This system was used by Poynton (1964a) and FitzSimons (1962) also used a quarter-degree reference system, although his method of notation is different. The adoption of this system for plotting animal distributions facilitates comparative socio-geographical studies.

A detailed description of each form has not been included if this is already available in the literature. The range of variation given for relevant taxonomic characters is based only on material from the study area unless otherwise stated.

Lengths for the largest specimens examined are recorded. For reptiles these are given as head and body + tail = total. A + sign after the tail denotes a truncated tail, an \* indicates a regenerated tail. Measurements were normally taken to the nearest millimetre for lengths under 500 mm; a steel whiteface tape was used. Head and foot measurements (where relevant) were taken to the nearest tenth of a millimetre with a pair of Vernier calipers. Head lengths of lizards were measured from end of snout to rear edge of ear opening; foot lengths are from heel to tip of claw on the longest toe. Maximum lengths for amphibians are mostly taken from Poynton (1964a; 1964b; 1966b).

Transverse counts of scale rows on reptiles were taken as follows :

Lizards - at a point midway between armpit and groin.

Snakes (a) Species with regular scalation. Three counts were taken - at a point one head length posterior to the occiput; at a point midway between snout and vent and a point one head length anterior to the vent. Where the counts are constant for a species they are expressed as a formula, e.g. 17 - 19 - 15.

(b) Species with irregular scalation (e.g. Dasyeltis : Bitis). One count was taken at a point midway between snout and vent.

\* and to the nearest 5 mm for lengths over 500 mm;



In some cases it is advantageous to record the manner and place in which the number of dorsal scale rows increase and decrease on different parts of the body (e.g. Oliver, 1948). This can be expressed as a formula, e.g. 19.. III + IV (65-82)..17, which indicates that there are 19 rows of dorsals anteriorly, reducing to 17 posteriorly by the fusion of the third and fourth rows (counting from the ventrals inwards) at a point between ventrals 65 to 82.

Most ventral counts recorded for African snakes have probably been started at the "first ventral wider than long". Dowling (1951) has drawn attention to the subjective nature of this method and has recommended that the count should begin with the first ventral bordered on both sides by the outer row of dorsals, usually yielding a count 1-3 lower than the "first wider than long" system. The old system was used for most of the counts recorded here, but I am using the Dowling system for generic and species group revisions and this is indicated by a "(D)" immediately before the range of ventrals. "Half-ventrals" are included in the ventral count if they are at least half the width of a normal ventral.

Subcaudal scale counts were begun at the first pair in contact on the median line and do not include the terminal spine. A tail is assumed to be complete if the terminal spine is at least one and a half times the length of the preceding subcaudal.

Pasteur (1959 ; 1964) has shown the importance of the caudal scalation in taxonomic studies on the Gekkonidae. He has concentrated on the subcaudal scalation in his work on the genus Lygodactylus and his nomenclature has been used here. I have found that the supracaudal scalation may also provide good diagnostic characters, especially in the genus Pachydactylus.

For lizards, counts of subdigital lamellae were made to the first junction with an adjacent toe.

Dentitional formulae for snakes conform to Bogert (1943), i.e. Roman numerals are used for fangs, Arabic numerals for ordinary teeth and a + sign indicates a gap or diastema in the tooth series.

Statistical methods are based on Mayr, Linsley and Usinger (1953), but in most cases statistical analysis of morphological data has been deferred until more material is available.

Ecological data for reptiles and amphibians from the study area has been included. Much remains to be done on reptile diets, but some new data for snakes have been incorporated. The stomach contents of small carnivores collected on the Bechuanaland Mammal Survey have yielded useful information on predators.

In the lists of localities for material examined, all specimens are in the Umtali Museum unless otherwise indicated.

The abbreviations used to denote various institutional collections are as follows :

- AM = Albany Museum, Grahamstown.
- AMNH = American Museum of Natural History.
- BM = British Museum (Natural History).
- EBM = Estacao de Biologia Maritima, Inhaca Island.
- IRSNB = Institut Royal des Sciences Naturelles de Belgique.
- KM = Kaffrarian Museum, King Williams Town.
- MCZ = Museum of Comparative Zoology, Harvard.
- MM = McGregor Museum, Kimberley.
- NM = Natal Museum, Pietermaritzburg.
- NMK = National Museum of Kenya, Nairobi.
- NMM = National Museum of Malawi, Blantyre.
- NMSR = National Museum of Rhodesia, Bulawayo.\*
- PEM = Port Elizabeth Museum.
- QVM = Queen Victoria Museum, Salisbury.\*
- SAM = South African Museum, Cape Town.
- SMP = Senckenberg Museum, Frankfurt-am-Main.
- TM = Transvaal Museum, Pretoria.
- UM = Umtali Museum.
- USNM = United States National Museum.
- VFNP = Victoria Falls National Park Collection.
- ZMB = Zoologisches Museum, Berlin.
- ZMC = Zoological Museum, Copenhagen.

\* Apart from reference collections, all material catalogued in the National Museum of Rhodesia and the Queen Victoria Museum is held centrally in the Umtali Museum.

## TOPOGRAPHY, GEOLOGY AND VEGETATION.

The physiogeographic regions defined by Wellington (1955) for Southern Africa provide a good basis for a subdivision of "South-east Africa". Some alterations in nomenclature are necessary, as the names of several political divisions have been changed in the past decade. The physiogeographic regions and subregions of South-east Africa are shown in Fig. 1 below.

For the brief descriptions of the regions data have been collated from the following sources :

Geology - Wellington (1955) and Bond & Stowe (1965).

Vegetation - Keay et al (1959), supplemented by data from Pole-Evans (1948) and Smithers (1964) for Bechuanaland, Wild (1965) for Rhodesia, Rattray and Wild (1960) for Zambia and Malawi and Ansell (1960) for Zambia.

1. The KALAHARI BASIN includes Bechuanaland (except for the eastern tip), an area in the north-west of Rhodesia and the Barotse Plain. This huge inland drainage basin is covered by a deep mantle of very old aeolian sands, which has extended much further east in dry periods of sand redistribution during the Pliocene and Pleistocene.

1A. The SOUTHERN KALAHARI is more arid and cooler (mean July temperature below 13°C) than the northern areas. The northern and eastern parts of this subregion are flat or gently undulating, sparsely covered with Acacia scrub and grass. There are numerous pans. The south-western part in the vicinity of the Kalahari Gemsbok National Park is very dry, with long parallel sand dunes and broad dry water courses.

1B. The CENTRAL KALAHARI is very flat and is largely scrub savanna with Acacia and Commiphora. The Makarikari depression is an open saline pan, sometimes seasonally dry, with extensive grassy plains in the north, elsewhere fringed by Mopane woodland. Lake Ngami has dried up during the last hundred years and is now a depression covered with grass and Acacia woodland or scrub. The swamps of the Okovango and the eastern Caprivi Strip have extensive beds of Papyrus and Phragmites, also islands with Hyphaene palms and evergreen trees. The swamps are fringed with well-developed riverine forest, backed by Camelthorn (Acacia giraffae) and Mopane woodland. The Mababe depression is subject to seasonal flooding and is covered with grassland and bordered by Mopane woodland. Extensive areas of Baikiaea

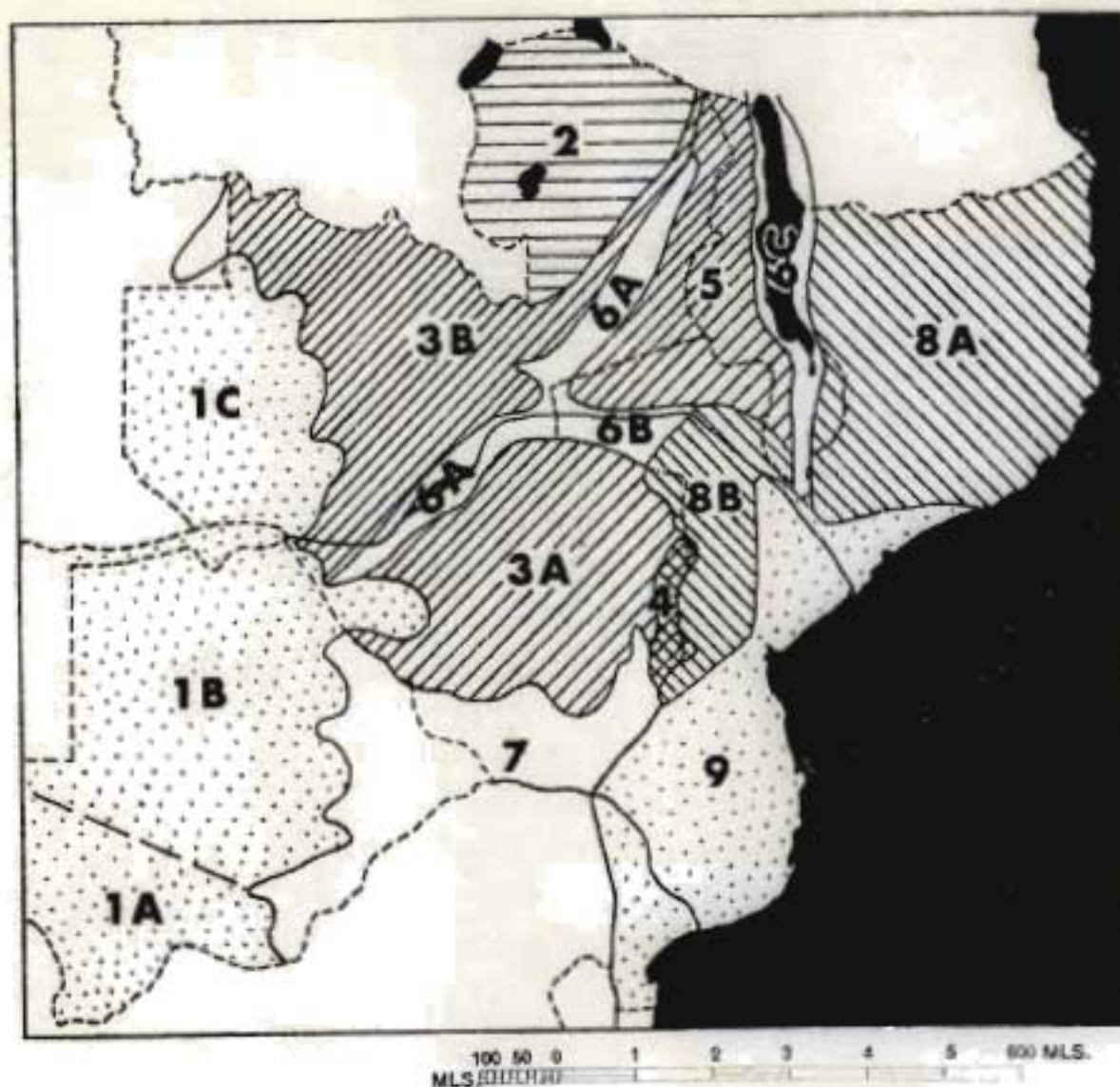


Fig. 1. GEOGRAPHICAL REGIONS OF SOUTH-EAST AFRICA

1. KALAHARI BASIN.
  - 1a. Southern Kalahari
  - 1b. Central Kalahari
  - 1c. Barotse Plains
2. LAKE MWERU BASIN
3. CENTRAL PLATEAUX
  - 3a. Rhodesian Plateau
  - 3b. Zambian Plateau
4. EASTERN RHODESIAN HIGHLANDS.
5. LUANGWA - MALAWI HIGHLANDS.
6. ZAMBEZI - MALAWI TROUGHS
  - 6a. Gwembe - Luangwa Trough
  - 6b. Chicoa Trough
  - 6c. Malawi Trough
7. LIMPOPO - SABI DEPRESSION.
8. MOZAMBIQUE PLATFORMS
  - 8a. Niassa Platform
  - 8b. Manica Platform
9. MOZAMBIQUE PLAIN.

woodland occur in north-eastern Bechuanaland, north-western Rhodesia and to the north of the Chobe swamps.

10. The BAROTSE PLAINS extend well beyond the boundaries of Barotseland to the north and east. The Barotse flood plains are covered with Loudetia grassland. On higher ground occur areas of Baikiaea forest in the south and Cryptosepalum dry evergreen forest in the north-east. Extensive Brachystegia woodlands occur east of the Zambezi.

2. The LAKE MWERU BASIN lies north of the South Equatorial Divide and is linked with the main Congo Basin by the Luvua River, which flows out of the northern end of Lake Mweru near Pweto. The drainage of this region is dominated by Lake Bangweulu and the huge area of swamps bordering it. The Chambeshi River rises in the highlands just south of Abercorn and flows south-west into the swamps south of Lake Bangweulu. The Luapula River flows out of the southern end of Lake Bangweulu and then turns west and north to enter the southern end of Lake Mweru. The Bangweulu Swamps consist of a mosaic of swamp forest (Mushitu) and Papyrus swamps with large areas of Hyparrhenia grassland to the south and on the flood plain of the upper Chambeshi. Pterocarpus-Erythrophleum savanna covers large areas to the north and west of Bangweulu and also borders Lake Mweru and the lower Luapula. The Mweru-Wantipa is a permanent swamp lying between Lakes Mweru and Tanganyika, it is surrounded by a flood plain covered with Hyparrhenia grassland. The higher ground in this region is largely covered with Brachystegia woodland.

3. The CENTRAL PLATEAUX are portions of the Miocene Peneplain which is still recognisable in many parts of central and southern Africa.

3A. The RHODESIAN PLATEAU has been eroded down to the old granite over large areas and granite bornhardts and kopjes dominate the landscape in the south and east of the subregion. Paragneiss replaces granite on the Zambezi escarpment, but is overlaid with Karroo sedimentary rocks in many areas. Other geological features are the Great Dyke, which divides the subregion north-south, the Basement Schists (the "Gold Belts") and relict patches of Kalahari Sand east of the Great Dyke in the Umvuma area.

Brachystegia woodland covers large areas in the north and east, but the drier western areas are largely covered with Acacia and Terminalia savanna. Mopane woodland occurs in the major river valleys. Large areas of Hyparrhenia grassland occur on the main watershed between Bulawayo and Inyanga. Wild (1956) has drawn attention to relics of Albisia-Macaranga montane forest on the south-eastern escarpment of this plateau in the Bikita-Belingwe area.

3B. The ZAMBIAN PLATEAU lacks the distinctive weathered granite formations of Rhodesia, the old granite being largely covered by Pre-Cambrian rocks of the Katanga-Kundelungu series.

The dominant vegetation type is rich Brachystegia woodland. There are extensive swamps along the Kafue river, the most important being the Lukanga Swamp west of Broken Hill and the Kafue Flats. The permanent swamps are bordered by flood plains covered with Hyparrhenia grassland.

Patches of evergreen gallery forest occur in the Mwinilunga District with riparian forest further south along major rivers like the Kabompo and its tributaries (Ansell 1960).

4. The EASTERN RHODESIAN HIGHLANDS consist of a series of separate blocks along the eastern escarpment of the Rhodesian Plateau which exceed 6,000 ft. in height. The northern highlands are largely dolerite and granite, but the Chimanimani Mountains are old fold mountains of metamorphosed quartzites, with the red sandstone and shales of the upper Umkondo System forming the Melsetter Plateau to the west. The montane blocks from north to south are : The Inyanga Highlands, with the highest peak (Inyangani Mountain) reaching 8,514 ft; Stapleford (6,669 ft); Vumba (6,265 ft); Himalaya (7,269 ft); Musapa (7,042 ft) and Chimanimani Mountains (8,004 ft).

The summits of most of these mountains are covered with Themeda-Exothea grassland and Protea scrub. Giant Heath (Phillipia) occupies areas where it is protected from fire by extensive rock outcrops, as on the summits of Inyangani and the Chimanimani Mountains. Relict patches of dry Widdringtonia - Podocarpus montane forest are scattered throughout the eastern highlands, but are best developed on

Himalaya and in parts of the Chimanimani Range. Wet Macaranga-Albizia montane forest occurs as relict patches on the eastern slopes of Inyangani Mountain, in the Pungwe and Mtarazi Gorges, on Stapleford and the summits of Vumba and Silinda Mountains and in the Banti Forest north of Himalaya.

5. The LUANGWA-MALAWI HIGHLANDS occupy a triangular area bordered by the Luangwa Trough on the west, the Malawi Trough on the east and the Zambezi Valley in the south. They include portions of Zambia, Malawi and Mozambique. This region is another dessicated portion of the pre-Karoo surface, most of it lying between 3,000 and 5,000 ft. The granite Nyika Plateau reaches an altitude of 8,697 ft., other areas over 6,000 ft. are the Vipya Plateau and isolated peaks in the Misuku Mountains and the Dzalanyama and Kirk Ranges on the Malawi-Mozambique border. The summits of these mountains are covered with Themeda-Exothea grassland and scattered patches of evergreen montane forest, particularly in the Misuku Mountains on the northern border of Malawi. A patch of Juniperus procera survives on the Nyika Plateau (Loveridge, 1953d).

On the main plateau area Brachystegia woodland is the dominant vegetation type. In the Fort Jameson District of Zambia and adjoining Mozambique massive granite kopjes are a feature of the landscape.

6. The ZAMBEZI-MALAWI TROUGHS are linked with the great Rift-Valley system of East Africa.

6A. The GWEMBE-LUANGWA TROUGH includes the Deka Valley, the Gwembe Valley (now filled by Kariba Lake), the section of the Zambezi Valley between the Kariba and Mpata Gorges, and the Luangwa Valley (including the Lukushashi and Luano valleys).

6B. The CHICOA TROUGH is the lower section of the Middle Zambezi Valley, lying between the Mpata and Cahorabassa Gorges.

The dominant vegetation type throughout these hot dry valleys is Mopane woodland with Baobabs.

6C. The MALAWI TROUGH consists of the basin of Lake Malawi (deepest in the north, becoming very shallow in the south) and the Shire Valley. Vegetation varies from dry savanna with Baobabs to Brachystegia woodland.

7. The LIMPOPO-SABI DEPRESSION is cut mainly in paragneiss and basalt. Post-Karoo igneous intrusions ("ring-complexes") form prominent hill features at Marungudzi and the Mateke Hills. The area is very dry and the dominant vegetation type is Mopane savanna with numerous Baobabs in the valleys.

The Cretaceous Sandstone on the south-eastern border of Rhodesia shows resemblances to the southern Kalahari, with grass covered dune structures (Brain, in litt.) and many pans.

8. The MOZAMBIQUE PLATFORMS have been produced by the recession of the central plateau edge from the border of the Mozambique Plain, caused by the headward erosion of the post-Jurassic rivers.

8A. The NIASSA PLATFORM includes Malawi east of the Shire Valley and consists of basement gneisses and schists with intrusive granite and syenite which forms great inselbergs rising from the platform. The most important of these are Zomba Plateau (6,846 ft.), Chiradzulu (5,821 ft.) and Mlanje (9,843 ft.) Mountains in Malawi and the Namuli Peaks (7,980 ft.) and Mitacue and Ribaue Mountains (both nearly 6,000 ft.) in Mozambique. There are also a number of peaks reaching 5-6,000 ft. in the north-west of Niassa District. The dominant vegetation is Brachystegia woodland, but evergreen forest occurs on the inselbergs, with montane grassland on the summits of the higher ones. Dry Juniperus-Widdringtonia-Podocarpus montane forest occurs in sheltered ravines and valleys on Mlanje Mountain between 4,000 and 7,000 ft.

The coastal plain is very narrow on this stretch of the east coast and is a complex of dry savanna with Baobabs, freshwater swamps and mangrove swamps. The coast is fringed with coral reefs, which have formed numerous small islands, the most important being the Querimba group and Mozambique Island.

8B. The MANICA PLATFORM includes the north-east corner of Rhodesia, the area around Tete and the south-western edge of Malawi, with tongues extending into Rhodesia up the valleys of the Pungwe, Honde, Nyamakari (Burma) and Lusitu Rivers.

Gorongosa Mountain (6,112 ft.) is a large isolated mountain block which has montane vegetation on the summit and extensive evergreen forests on the slopes. Many granite inselbergs are conspicuous because of their "dragon's tooth" shape, which makes them good landmarks, especially Mavita (5,213 ft.), Zembe (4,078 ft.) and Mhanda (4,669 ft.).



There are extensive areas of granite, paragneiss and sandstone outcrops. Garuso (4,882 ft.) is a heavily forested north-south ridge midway between Vila de Manica and Vila Pery.

The vegetation is largely Brachystegia woodland, with patches of lowland evergreen forest concentrated on the eastern edge of the Platform (e.g. Amatongas and forests on the lower eastern slopes of Gorongosa Mountain), but extending westwards along rivers.

9. The MOZAMBIQUE PLAIN lies below 1,000 ft. and is composed of cretaceous and tertiary sandstones and limestones, with large areas covered by recent unconsolidated alluvium. Rising sea levels have drowned deep river valleys and produced long northward pointing spits, which in some cases have been "beheaded" to form Inhaca Island opposite Lourenco Marques and Basaruto Islands between Beira and Inhambane.

The vegetation is varied. Some Mopane savanna is present in the Limpopo Valley. There are large blocks of rich Brachystegia woodland, one extends north from Dondo to Inhamitanga and there is a much larger area inland from Inhambane. Along the coast are patches of swamp forest, especially in the Zambezi Delta, but much of this forest has been cut out. Mangrove swamps occur at river mouths. A belt of freshwater swamps marks the old course of the Zambezi from just below Sena to Beira, widening out into the Pungwe Flats at its southern end.

## 1. SYSTEMATIC DISCUSSION.

## PREFACE

The taxonomic principles of the author are largely based on Mayr, Linsley and Usinger (1953) and Mayr (1963). A "biological species" concept has been used throughout this study and the taxonomic status of each form determined by evaluation of ecological, zoogeographical and morphological characters.

The biological criterion of reproductive isolation has been used, wherever possible, to determine the specific or subspecific status of closely related forms, but this may present difficulties. Moore (1944), in an analysis of variation in Rana pipiens, found that it is not possible to define subspecies in spite of great geographic variation not only in general morphology and secondary sex characters, but also in the viability of larvae produced by crossing individuals from different local populations. When crosses were made between individuals from widely separated populations (Vermont and Florida) the embryos often showed pronounced morphological abnormalities and Volpe (1954) subsequently reported hybrid inviability between Rana pipiens from Wisconsin and Mexico. Such a situation presents a major taxonomic problem when the terminal populations of a circular cline prove to be reproductively isolated, which seems to be the case with Thalotornis kirtlandi kirtlandi and T. k. oatesi in Angola.

The mating call of male amphibians is one of the most useful taxonomic characters when dealing with morphologically similar sympatric forms, particularly those of the genera Bufo, Leptopelis and Hyperolius. Because of intraspecific geographic variation in calls (Bogert, 1960 and 1962; Poynton, 1964a), differences between the calls of allopatric forms must be interpreted with caution.

Intraspecific variation in morphological characters is often underestimated, particularly with regard to osteological and anatomical features which are usually examined in relatively few specimens. Poynton (1964a, p. 13) has criticized the tendency to establish taxa on skeletal proportions based on inadequate samples. Because of ontogenetic variation it is dangerous to compare adult and immature specimens.

Boulenger (1893, 1894a, 1896) used maxillary dentition in his diagnoses of snake genera, but, as pointed out by Bogert (1940), he made little attempt to determine the extent of interspecific and intraspecific variation. Bogert has published some valuable data on the dentition of the African Colubridae (1940) and the Elapidae (1943). The present study incorporates dentitional data for many local snake species, based on 140 cleaned skulls. Dentitional formulae seem to be very stable in some groups, but show considerable variation in others, so caution must be exercised when using dentition as a taxonomic character.

The structure of the snake hemipenis has been valuable in the classification of the suborder Serpentes, especially the Colubridae (Bogert, 1940). Dowling and Savage (1960), in a survey of the basic structure and systematic characteristics of the snake hemipenis, pointed out that the features of the hemipenes are rather stable at the level of the species or species group and may advantageously be used to distinguish related species and genera. They stressed that intraspecific variation in hemipenial characters needs further examination and this warning was underlined by Inger & Marx (1962), who showed that male specimens of Calamaria lumbricoidea from different parts of Borneo may have the hemipenis simple or forked and the calyces smooth or papillate, while the female cloaca shows corresponding geographical variation. An analysis of the variation in the hemipenes of local snakes has not been attempted at the present time.

Poynton (1964a, p. 12) has drawn attention to the problem of long clines, which may have terminal populations which show marked differences, but which lack "steps" in the character gradients which would serve to divide subspecies. Such clines are typical of the East African coastal plain and work on the reptiles supports Poynton's conclusion that most species with a continuous distribution from Kenya to Zululand should not be subdivided.

In the absence of evidence regarding reproductive isolation, the status of closely related allopatric forms may sometimes be deduced by consideration of associated species which show similar distribution patterns. For example, a number of closely related montane forms indicate a former connection between Kulanje and Inyangani Mountains. In one case (Nabuva punctatissimus) the two populations show such slight morphological differences that they would normally be included in the same taxon. On the other hand, Pasteur described Lygodactylus bonoi (endemic to Kulanje Mountain) as a full species because of the wide gap separating it from its close relative L. bernardi on Inyangani Mountain, together with a number of small morphological differences. A number of associated species have different races each side of the Zambezi gap (Scelotes arnoldi; Suberra lutrix; Rana johnstoni; Rana fasciata), so it seems advisable to maintain uniformity of treatment. In this study doubtful allopatric populations are treated as subspecies - as recommended by Mayr, Linsley and Unger (1953), but if two forms occupy different habitats and occur in close proximity without intergradation they are assumed to be distinct species even if they show only slight morphological differences (e.g. Crotaphopeltis hotamboeia and C. tornieri).

where necessary, the spelling of trivial names has been amended to conform with articles 26 to 34 of the International Code of Zoological Nomenclature (1961).

## SUMMARY OF TAXONOMIC CHANGES.

Five forms have not yet been described, either due to lack of material or pending the completion of a generic or species-group revision. These forms are referred to by the following manuscript names:

- Typhlosaurus "relicus"  
Typhlosaurus lineatus "jappi"  
Zygaspis "niger"  
Natriciteres variegata "sylvatica"  
Probreviceps "rhodesianus"

The following appear to be new synonyms:

- Homodactylus turneri Gray = Pachydactylus bibroni (A. Smith)  
Agama kirki fitzsimonsi Loveridge = Agama kirki Boulenger  
Chamaeleo petersii Gray = Chamaeleo dilepis dilepis Leach  
Chamaeleo dilepis var. Quilensis Bocage = Chamaeleo dilepis dilepis Leach  
Chamaeleon isabellinus Gunther = Chamaeleo dilepis dilepis Leach  
Brookesia platyceps carri Loveridge = Brookesia platyceps (Gunther)  
Brookesia ionidesi Loveridge = Brookesia brachyura (Gunther)  
Mabuia parrotetii upembae Witte = Mabuia planifrons (Peters)  
Mabuia obti Werner = Mabuia quinquataeniata margaritifera (Peters)  
Mabuia demarens rhodesiana Broadley = Mabuia lacertiformis Peters  
Mabuia varia nyikae Loveridge = Mabuia varia (Peters)  
Mabuia ellenbergeri Chabanaud = Mabuia striata wahlbergi (Peters)  
Sepacontias modestus Gunther = Riopa sumdevalli sumdevalli (A. Smith)  
Eumecia anchistae major Laurent = Eumecia anchistae anchistae Bocage  
Eumecia anchistae vittai Laurent = Eumecia anchistae anchistae Bocage  
Ablepharus anelli FitzSimons = Ablepharus seydeli Witte  
Melanoseps Boulenger = Scelotes Fitzinger  
Melanoseps ater misukuensis Loveridge = Scelotes ater ater (Gunther)  
Typhlacontias rohani Angel = Typhlacontias gracilis gracilis Roux  
Gerrhosaurus grandis Boulenger = Gerrhosaurus major major Dumeril  
Tetradactylus Boulengeri Witte = Tetradactylus ellenbergeri (Angel)  
Eremias holubi Steindachner = Eremias tessellata ornata (Gray)  
Varanus sicrostictus Boettger = Varanus exanthematicus albicularis  
Daudin
Varanus albicularis angolensis Schmidt = Varanus exanthematicus  
albicularis Daudin
Varanus exanthematicus ionidesi Laurent = Varanus exanthematicus  
albicularis Daudin
Amphisbaena capensis Thomiot = Zygaspis quadrifrons (Peters)  
Chirindia bushbyi Cott = Chirindia stannertoni Boulenger  
Monopeltis decosteri Boulenger = Monopeltis sphenorhynchus Peters  
Monopeltis Ellenbergeri Angel = Tomaropeltis longicauda (Werner)  
\* Gerrhosaurus flavivularis fitzsimonsi Loveridge = G. flavivularis  
Wiegmann

- Glauconia distanti Boulenger = Leptotyphlops scutifrons (Peters)  
Lycophidion acutirostre Gunther = Lycophidion semiannale Peters  
Natrix olivacea ulucurnensis Loveridge = Natriciteres olivacea (Peters)  
Ophirina anchietae Bocage = Pseudaspis cana (Linnaeus)  
Lignirostra Stuhlmanni Pfeffer = Prosymna ambigua ambigua Bocage  
Prosymna ambigua urundienensis Laurent = Prosymna ambigua ambigua Bocage  
Rhamphiophis acutus wittei Laurent = Rhamphiophis acutus acutus (Gunther)  
Calamolaps ventrimaculatus websteri FitzSimons & Brain =  
Calamolaps ventrimaculatus (Roux)  
Nichollia katangae Muller = Hypoptophis wilsoni Boulenger  
Aparallactus bocagii Boulenger = Aparallactus capensis A. Smith  
Naja Anchietae var. barotsensis Argel = Naja haje anchietae Bocage  
Naja melanoleuca subfulva Laurent = Naja melanoleuca Hallowell  
Naja nigricollis var. occidentalis Bocage = Naja nigricollis  
crawshayi Gunther  
Naja nigricollis atriceps Laurent = Naja nigricollis crawshayi Gunther  
Atractaspis congica orientalis Laurent = Atractaspis congica congica  
Peters  
Atractaspis rostrata Gunther = Atractaspis bibroni A. Smith  
Causus lineatus Laurent = Causus bilineatus Boulenger  
Phrynobatrachus cryptotis Schmidt & Inger = Phrynobatrachus  
ukungensis mababiensis FitzSimons

The following forms are revived from synonymy:

- Hemidactylus tasmani Hewitt is a good species, not a synonym of  
Hemidactylus mabouia.  
Hemidactylus platycephalus Peters is a good species, not a synonym of  
Hemidactylus mabouia  
Euprepes punctatissimus A. Smith is a good species, not a synonym of  
Mabuia striata. It now becomes Mabuia punctatissimus (A. Smith)  
Euprepes wahlbergi Peters is a valid race of Mabuia striata, not a  
synonym of it.  
Psemmophis brevirostris Peters is a good species, not a synonym of  
Psemmophis sibilans  
Psemmophis leopardinus Bocage is revived from the synonymy of  
Psemmophis sibilans as a subspecies.  
Naja haje var. annulifera Peters is a valid south-eastern race of  
Naja haje

The status of the following forms has been changed as indicated:

- Lygodactylus bonoi Pasteur = L. bernardi bonoi Pasteur  
Pachydactylus oshugnessyi Boulenger is a good species, not a race of  
P. capensis (A. Smith)



- Pachydactylus capensis katanganus Witte = P. oshaughnessyi  
katanganus Witte
- Pachydactylus affinis Boulenger is a good species, not a race of  
P. capensis (A. Smith)
- Pachydactylus capensis tigrinus Van Dam = P. affinis tigrinus Van Dam
- Agama hispida makarika FitzSimons is a good species, not a race of  
A. hispida (Linnaeus)
- Mabuza boulengeri Sternfeld is a good species, not a race of Mabuza  
maculilabris (Gray)
- Euprepis striatus var. epilogaster Peters = Mabuza punctatissimus  
epilogaster (Peters)
- Mabuza bocagii manjensis Loveridge = Mabuza punctatissimus  
manjensis Loveridge
- Lygosoma johnstoni Boulenger = Eumecia anchistae johnstoni (Boulenger)
- Typhlacontias ngamiensis FitzSimons = Typhlacontias gracilis  
ngamiensis FitzSimons
- Acontias plumbeus occidentalis FitzSimons = Acontias gracilicauda  
occidentalis FitzSimons
- Acontias plumbeus broadleyi FitzSimons = Acontias gracilicauda  
broadleyi FitzSimons
- Typhlosaurus bicolor Hewitt = Typhlosaurus cregoi bicolor Hewitt
- Zonurus tropidosternum Cope is a good species, not a race of Cordylus  
cordylus. It now becomes Cordylus tropidosternum Cope.
- Zonurus jonesi Boulenger = Cordylus tropidosternum jonesi (Boulenger)
- Platysaurus guttatus pungweensis Broadley is a good species, not a race  
of P. intermedius Matschie
- Platysaurus intermedius blakei Broadley = P. pungweensis blakei Broadley
- Chamaesaura miopropus Boulenger = C. macrolepis miopropus Boulenger
- Terra ornata Gray = Nacras tessellata ornata (Gray)
- Lycodonomorphus rufulus manjensis Loveridge = L. leleupi manjensis  
Loveridge
- Natriciteres olivacea bipostocularis Broadley = N. variegata  
bipostocularis Broadley
- Natrix olivacea pembana Loveridge = Natriciteres variegata pembana  
Loveridge
- Leptodira tornieri Werner is a good species, Crotaphopeltis tornieri  
(Werner), not a race of Crotaphopeltis hotamboeia (Laurenti)
- Psemmophylax variabilis Gunther is a good species, not a race of  
P. tritaeniatus (Gunther)
- Psemmophylax tritaeniatus festivus Laurent = P. variabilis festivus  
Laurent
- Psemmophylax tritaeniatus subniger Laurent = P. variabilis subniger  
Laurent
- Psemmophis Ansorgii Boulenger = P. jallas ansorgei Boulenger

- Calamelaps ventrimaculatus Katangensis Witte = C. katangensis Witte  
Elapsoidea Guntheri Bocage = E. sundevalli guntheri Bocage  
Elapsoidea nigra Gunther is a good species, not a race of E. sundevalli.  
Elapochis moebiusi Werner = Elapsoidea nigra moebiusi (Werner)  
Elapsoidea sundevalli loveridgei Parker = E. nigra loveridgei Parker  
Elapsoidea decenteri colleti Laurent = E. nigra colleti Laurent  
Elapsoidea decenteri multicolorata Laurent = E. nigra multicolorata Laurent  
Elapsoidea decenteri scalaris Laurent = E. nigra scalaris Laurent  
Naja mossambica Peters is a good species, not a race of N. nigricollis  
Naja nigricollis var. pallida Boulenger = N. mossambica pallida Boulenger  
Naja nigricollis var. katiensis Angel = Naja mossambica katiensis Angel  
Naja nigricollis nigricinctus Bogert = N. mossambica nigricincta Bogert  
Naja nigricollis woodi Pringle = N. mossambica woodi Pringle  
Breviceps adspersus Peters = B. mossambicus adspersus Peters  
Breviceps pantheri Werner = B. mossambicus pantheri Werner  
Breviceps poweri Parker = B. mossambicus poweri Parker  
Hyperolius mertensi Poynton = H. quinquataeniatus mertensi Poynton

## LIST OF REJECTED SPECIES.

The following species have at various times been recorded for south-east Africa, but the records are rejected for the reasons given.

Lygodactylus picturatus (Peters): Recorded from Victoria Falls (Loveridge, 1929 & 1947) and Tete (Loveridge, 1953a). This material is all referable to L. chobiensis.

Lygodactylus gutturalis (Bocage): Recorded from Lealui (Pasteur, 1964), but based on L. chobiensis. L. gutturalis may occur in the Lake Mweru area.

Phelsuma cepedianum (Merrem): Recorded from Quelimane (Gunther, 1864). I have examined these specimens and they are a pair of Phelsuma v-nigra.

Phelsuma madagascariensis Gray: The two specimens recorded by Boulenger (1885c) are actually P. v-nigra, see above.

Agama agama Linnaeus: Recorded (as A. colonorum) from Manica District (Bocage, 1896) and Lumbo (Thomide, 1941), but both records were probably based on A. kirki. Also recorded from the Zambezi Expedition (as A. occipitalis) by Gunther (1864) and from Lumbo (as A. colonorum) by Loveridge (1920), both these records were based on A. m. mossambica.

Brookesia brevicaudata (Matschie): Recorded (as Rhampholeon brevicaudatus) from Lomba by Werner (1902) and Mitchell (1946), these records were based on specimens of Brookesia brachyura.

Scelotes eggeli Tornier: Recorded from Lumbo (Loveridge, 1920), but these specimens later became the types of Scelotes aeneus Barbour & Loveridge.

Scelotes guentheri Boulenger: Recorded from Lourenco Marques (Hewitt, 1921), but based on Scelotes brevipes.

Acontias meleagris (Linnaeus): Records from Kazungula to Bulawayo (Peracca, 1896), "Bechuanaland" (Bocage, 1896b) and Comodine to Kaotwe (FitzSimons, 1935b) are all apparently based on Acontias gracilicauda occidentalis. Records from Rikatla (Roux, 1907) and Delagoa Bay (Boulenger, 1910) are probably based on Acontias plumbeus. Bocage (1896) recorded this species from "Macequese to the Save River" and as the specimens came from the Rhodesia-Mozambique border they were probably Typhlosaurus c. bicolor, but could be Acontias plumbeus. I have examined the Mazoe specimens recorded by Boulenger (1902) and they are Typhlosaurus c. bicolor.

Platysaurus capensis A. Smith: The specimens recorded from Tete (Peters, 1854) later became types of P. torquatus Peters. Rhodesian material material listed under this name by Boulenger (1910) included specimens of P. i. rhodesianus and P. i. subniger.

Platysaurus guttatus A. Smith: The specimens recorded from Tete (Peters, 1854) later became types of P. torquatus Peters. The record from Hamaacha (Manacas, 1952) is based on P. wilhelmi. Numerous records from Rhodesia are based on either P. i. rhodesianus or P. i. subniger.

Aremias nitida Gunther: The specimen recorded from Eldorado (Hewitt & Power, 1913) later became the type of Latastia kidwelli Boulenger, which is a synonym of Latastia johnstoni.

Typhlops lumbriciformis (Peters): The record from Fwambo (Boulenger, 1896) was based on Typhlops gracilis.

Typhlops decoratus (Bucholtz & Peters) The record from Mlanje Mountain (Sternfeld, 1908) was based on Typhlops obtusus according to Loveridge (1953a).

Typhlops punctatus (Lesch): The records from Abercorn (Vesey-FitzGerald, 1958; Broadley & Pitman, 1962) were based on Typhlops e. schmidti.

Leptotyphlops nigricans (Schlegel): The records from Umfuli River (Boulenger, 1896) and Cafumpe (Manacas, 1954) were based on Leptotyphlops longicauda. Records from Mozambique Island (Peters, 1854 & 1882), Petsake and Luangwa Valley (Boulenger, 1907) and Broken Hill (Pitman, 1934) were probably based on L. conjuncta.



Prosymna frontalis (Peters): Recorded from Angoche (Bocage, 1882), but based on Prosymna s. lineata.

Pythonodipsas carinata Gunther: This species was described from "Zambesi" by Gunther in 1868. It has not subsequently been recorded from Bechuanaland or further east and the type locality is probably incorrect. At my request the type has been examined by Mr. A.F. Stimson, who reports (letter of 27.iv.65) that it bears a collector's label which reads "No. 84. J. Chapman." Chapman's original notebooks cannot be traced, they are not at the British Museum or the Royal Geographical Society. John Chapman's book "Travels in the interior of South Africa" contains a map showing his route from Walvis Bay to Victoria Falls via Lake Ngami in 1861-3. It is likely that the type of Pythonodipsas carinata was collected somewhere between Walvis Bay and Gobabis.

Choristocalamus concolor (A. Smith): The specimen recorded from Emandene under the name Calamolaps concolor (Chubb, 1909b) is a Calamolaps u. miolapis.

Atractaspis irregularis Reinhardt: The records from Quelimane (Pfeffer, 1893; Bocage, 1896) were based on A. bibroni.

Atractaspis microlepidota Gunther: The records for the Lake Bangweulu area (Pike, 1964) were probably based on A. bibroni.

Causus resinus Peters: I have examined the specimen recorded from Petauke by Boulenger (1907) and repeated by Pitman (1934) and Vesey-FitzGerald (1958), it is a Causus defilippii. The records from Angoche (Bocage, 1882) and Lake Bangweulu (Pike, 1964) are also based on this species.

Ptychadena ansorgei (Boulenger): The records from Amatongas (Parker, 1931) and various Malawi localities (Loveridge, 1953b & 1953c) were based on P. c. guibei (see Poynton, 1964a & 1964b).

Ptychadena trinodis (Boettger): The record from Quelimane (Pfeffer, 1893) was based on Ptychadena mossambica (see Poynton, 1966b).

Arthroleptis variabilis Matschie: The record from Chitala (Hoffman, 1944) was based on A. stenodactylus (see Loveridge, 1953b).

Hyperolius concolor (Hallowell): The numerous records for south-east Africa are mostly based on H. tuberilinguis.

## SYSTEMATIC CHECK LIST AND INDEX.

Check List. Index

B = Bechuanaland

R = Rhodesia

Z = Zambia

Ma = Malawi

M = Mozambique

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B. S. Z. Ma M. Page

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<u>Hyperolius tuberculatus</u> A. Smith	+				*	546
<u>Hyperolius kivuensis</u> Ahl					*	547
<u>Hyperolius muillius</u> (Gope)	*	*	*	*	*	547
<u>Hyperolius nasutus nasutus</u> Günther	*	*	*	*	*	548
<u>Hyperolius ? quinquevittatus quinquevittatus</u> Booage					+	549
<u>Hyperolius quinquevittatus marteni</u> Poynton					*	550
<u>Hyperolius mynnerteri</u> FitzSimons	*				*	551
<u>Hyperolius varioratus rhodesianus</u> Laurent	*				*	554
<u>Hyperolius varioratus pyrrhodictyon</u> Laurent					*	554
<u>Hyperolius varioratus sponsemianus</u> Laurent					*	555
<u>Hyperolius varioratus alborufus</u> Laurent					+	555
<u>Hyperolius varioratus angolensis</u> Steindachner	*				+	556
<u>Hyperolius varioratus melanoleucus</u> Laurent					*	556
<u>Hyperolius varioratus rhodocelis</u> (Boulenger)	*				*	557

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<u>Hyperolius marmoratus argentovittis</u> Ahl	*	557
<u>Hyperolius marmoratus nyassae</u> Ahl	*	558
<u>Hyperolius marmoratus marginatus</u> Peters	* * * *	558
<u>Hyperolius marmoratus albofasciatus</u> Hoffman	* *	559
<u>Hyperolius marmoratus broadleyi</u> Poynton	*	560
<u>Hyperolius marmoratus taeniatus</u> Peters	* * *	560

## KEY TO THE REPTILIA OF SOUTH-EAST AFRICA.

## KEY TO THE ORDERS AND SUBORDERS.

- 1a. Body enclosed in a bony shell consisting of an upper (Carapace) and lower (Plastron) portion.....Order Testudinata (2)
- 1b. Body not enclosed in a bony shell.....3
- 2a. Neck hidden when head is withdrawn into shell or head not withdrawable into shell.....Suborder Cryptodira
- 2b. Neck exposed (by being bent laterally) when head is withdrawn into shell.....Suborder Pleurodira  
(Family Pelomedusidae)
- 3a. Anal opening longitudinal.....Order Crocodylia
- 3b. Anal opening transverse.....Order Squamata (4)
- 4a. Body limbless, covered with rectangular segments of soft skin, which form regular rings from the pectoral region to tip of tail.....Suborder Amphisbaenia
- 4b. Body with or without limbs, covered with granules or scales, which do not form regular rings from pectoral region to tip of tail.....5
- 5a. The two halves of the lower jaw rigidly connected by a suture; a moveable eyelid usually present; limbs usually present; a median series of transversely enlarged ventral plates never present.....Suborder Sauria
- 5b. The two halves of the lower jaw connected by an elastic ligament or a nodule of cartilage; no moveable eyelid; limbless; usually a median series of transversely enlarged ventral plates.....Suborder Serpentes

## Order TESTUDINATA

## Suborder CRYPTODIRA

## KEY TO THE FAMILIES

- 1a. Limbs modified as flippers with 0-2 claws; marine.....2
- 1b. Limbs not modified as flippers, each with 3-5 claws; terrestrial or fresh water.....3
- 2a. Carapace with large horny shields; flippers with one or two claws.....Cheloniidae
- 2b. Carapace covered with smooth skin (or small scales in juveniles) and with 7 prominent longitudinal ridges; flippers clawless.....Dermochelyidae (*Dermochelys coriacea*)
- 3a. Carapace with horny shields; feet with 4 or 5 claws; terrestrial.....Testudinidae
- 3b. Carapace without horny shields; feet with 3 claws; fresh water.....Trionychidae (*Cycloderma frenatum*)

## KEY TO THE FAMILY TESTUDINIDAE

- 1a. Carapace hinged posteriorly in adults, usually between 7th and 8th marginals; outer margin of 4th costal markedly wider than outer margin of 3rd.....Kinixys b. belliana
- 1b. Carapace without hinge; outer margin of 4th costal subequal to, or narrower than, outer margin of 3rd.....2
- 2a. First pair of marginals separated by a nuchal; a greatly enlarged scale on anterior face of forelimb.....Testudo oculifera
- 2b. First pair of marginals in contact; no greatly enlarged scale on anterior face of forelimb.....Testudo pardalis babcocki

## KEY TO THE FAMILY CHELONIIDAE

- 1a. Carapace with 4 pairs of costal shields, of which the anterior pair is never the smallest and is separated from the nuchal shield.....2
- 1b. Carapace with 5-6 pairs of costal shields, of which the anterior pair is the smallest and normally in contact with the nuchal shield .....Caretta caretta
- 2a. Snout compressed; 4 prefrontal shields on head; shields of carapace extensively overlapping; usually two claws on each limb.....aretmochelys imbricata
- 2b. Snout not compressed; 2 prefrontal shields on head; shields of carapace not overlapping (except in hatchlings); usually a single claw on each limb.....Chelonia mydas

## KEY TO THE FAMILY PELOMEDUSIDAE

- 1a. Anterior lobe of plastron immovable; pectoral shields extending well onto bridge; plastral fenestration persisting until late in life.....Pelomedusa (P. subrufa)
- 1b. Anterior lobe of plastron moveable; pectoral shields almost excluded from bridge by abdominals; plastral fenestration closed very early in life.....Pelusica (2)
- 2a. Abdominal suture less than half the length of anterior lobe of plastron.....P. nanus
- 2b. Abdominal suture more than half the length of anterior lobe of plastron.....3



- 3a. Abdominal suture subequal in length to the anterior lobe of the plastron; posterior margin of carapace serrated; first pair of marginals together subequal in width to first vertebral; plastron yellow with a sharply defined black peripheral pattern..P. sinuatus
- 3b. Abdominal suture shorter than the anterior lobe of the plastron; posterior margin of carapace not serrated; first pair of marginals together usually narrower than first vertebral; plastron without a sharply defined black peripheral pattern.....4
- 4a. Plastron strongly constricted between the abdominals and the femorals; intergular usually longer than the humeral + pectoral sutures; anterior face of forelimb covered with regular juxtaposed scales; shields of plastron yellow mesially, becoming brown towards the sutures.....P. subniger
- 4b. Plastron not strongly constricted between the abdominals and the femorals; intergular shorter than the humeral + pectoral sutures (in adults); anterior face of forelimb with transversely elongated falciform or striplike scales separated by smaller scales; plastron yellow and/or black, coloration irregularly disposed.....5
- 5a. Head large, more than half width of plastron at abdomino-femoral suture, with distinct yellow markings.....P. bechuanicus
- 5b. Head small, less than half width of plastron at abdomino-femoral suture, without distinct yellow markings.....6
- 6a. Carapace brown; plastron uniform yellow.....P. c. castaneus
- 6b. Carapace black; plastron black, with or without yellow patches (sometimes predominantly yellow).....P. castaneus rhodesianus

## KEY TO THE ORDER CROCODYLIA

- Snout greatly elongated; range West Africa, reaching Lakes Tanganyika and Mweru.....Crocodylus cataphractus
- Snout moderately broad; range throughout tropical Africa.....Crocodylus niloticus

## Order SQUAMATA

## Suborder SAURIA

## KEY TO THE FAMILIES

- 1a. Top of head covered with granules or small irregularly arranged scales.....2
- 1b. Top of head covered with large symmetrical shields.....5
- 2a. Eyelids not or hardly moveable, incapable of closing over eye.....GEKKONIDAE
- 2b. Eyelids moveable, eye can be fully closed.....3

- 3a. Dorsal scales keeled, imbricate; tongue short and broad, covered with papillae.....AGAMIDAE
- 3b. Dorsal scales smooth or granular, juxtaposed; tongue long and slender, not covered with papillae, tip club-shaped or deeply forked...4
- 4a. Digits bound into ~~opposed~~ bundles for grasping; tongue extensile, its tip club-shaped.....CHAMARLEONTIDAE
- 4b. Digits separate, in a single plane; tongue snake-like, forked at tip.....VARANIDAE
- 5a. Dorsal scales imbricate, smooth or with three or more keels; femoral pores absent.....SCINCIDAE
- 5b. Dorsal scales either juxtaposed with a strong median keel or small and granular; femoral pores or a row of differentiated scales on posterior face of thigh.....6
- 6a. A lateral granular fold present and/or limbs vestigial....CORDYLIDAE
- 6b. No lateral granular fold; limbs well developed.....LACERTIDAE

## GEKKONIDAE

## KEY TO THE GENERA

- 1a. Digits not dilated, without adhesive lamellae below distally.....2
- 1b. Digits dilated, with adhesive lamellae below distally.....3
- 2a. Digits short, subcylindrical, clawless; toes without a lateral fringe of pointed scales.....Chondrodactylus (C. argulifer)
- 2b. Digits long and slender, clawed; toes depressed, with a lateral fringe of long pointed scales.....Ptenopus (P. garrulus)
- 3a. Digits each with a strongly developed claw.....4
- 3b. Digits clawless or with a minute inconspicuous claw.....7
- 4a. Digits with a long series of undivided adhesive lamellae below.....Homopholis (H. wahlbergi)
- 4b. Digits with paired adhesive lamellae at the tip.....5
- 5a. Distal digital joint strongly compressed and without adhesive lamellae below.....6
- 5b. Distal digital joint not strongly compressed, with a pair of adhesive lamellae below.....Afrosauria
- 6a. Pupil vertical; inner digits well developed; postanal slits present; enlarged tubercles present on body and tail.....Hemidactylus
- 6b. Pupil round; inner digits small; postanal slits absent; no enlarged tubercles on body or tail.....Lygodactylus
- 7a. Second toe about half length of third....Rhopropus (R. braconieri)
- 7b. Second toe nearly as long as third.....8

- 8a. Pupil round; first digits vestigial; males with preano-femoral pores.....Phelsuma
- 8b. Pupil vertical; first digits well developed; males without pores or with preanal pores only.....9
- 9a. Two transverse adhesive lamellae beneath tips of toes.....Colopus (C. wahlbergi)
- 9b. Three or more transverse adhesive lamellae beneath tips of toes...  
.....Pachydactylus

Key to the genus HEMIDACTYLUS

- 1a. Dorsum covered with smooth granules and scattered small conical tubercles; 12-14 transverse dorsal scale rows in a caudal verticil; arboreal.....H. platycephalus
- 1b. Dorsum covered in small multicarinate scales and rows of keeled tubercles; 7-9 transverse dorsal scale rows in a caudal verticil; rupicolous or arboreal.....2
- 2a. Dorsal tubercles larger than the interspaces separating them; body and tail with conspicuous irregular dark cross-bands; rupicolous..  
.....H. tasmani
- 2b. Dorsal tubercles smaller than the interspaces separating them; body and tail very pale, with only faint indications of cross-bands; arboreal.....H. mercatorius

Key to the genus LYGODACTYLUS

- 1a. Mental with a pair of lateral clefts, resulting from fusion with a large postmental.....2
- 1b. Mental without lateral clefts.....9
- 2a. A series of palpebral spines above eye.....3
- 2b. No palpebral spines above eye.....4
- 3a. Throat uniform bluish-white; rostral usually excluded from nostril; 4-5 lamellae under fourth toe.....L. bernardi bernardi
- 3b. Throat with dark forward-directed chevrons; rostral usually entering nostril; 6 lamellae under fourth toe.....L. bernardi boni
- 4a. Adults 40-50 mm in snout-vent length; throat with dark lines extending from labials to base of throat.....L. rex
- 4b. Adults 30-40 mm in snout vent-length; throat without dark lines extending from labials to base of throat.....5

- 5a. Back grey with irregular large black spots; throat with faint forward-directed chevrons.....L. stevensoni
- 5b. Back brown with a dark lateral and pale dorso-lateral stripe at least anteriorly; throat unmarked or with irregular grey stippling.....6
- 6a. Tail with a continuous series of median transversely enlarged subcaudals; three per verticil.....L. capensis grotel
- 6b. Tail without a continuous series of median transversely enlarged subcaudals.....7
- 7a. Preanal pores in males 4-7.....8
- 7b. Preanal pores in males 7-10.....L. angolensis
- 8a. Postnasal usually present; 5 subcaudals per verticil, 2 single, 1 paired (bibordered).....L. capensis capensis
- 8b. Postnasal absent; subcaudals aperiodic.....L. bradfieldi
- 9a. Rostral entering nostril; throat with dark lines converging from labials to base of throat.....L. angularis angularis
- 9b. Rostral excluded from nostril; throat with forward-directed chevrons or entirely black (males).....L. chobiensis

## Key to the genus AFROEDURA

- Rostral bordering the nostril.....A. transvaalica transvaalica
- Rostral excluded from nostril.....A. transvaalica loveridgei

## Key to the genus PHELSUMA

- Rostral with a median cleft above.....P. dubia dubia
- Rostral without a median cleft above.....P. v-nigra

## Key to the genus PACHYDACTYLUS

- 1a. Dorsum covered with subuniform granules.....P. p. punctatus
- 1b. Dorsum covered with granules intersixed with enlarged tubercles..2
- 2a. Transverse adhesive lamellae under fourth toe 4-5.....3
- 2b. Transverse adhesive lamellae under fourth toe 9-14.....7
- 3a. Original tail with a series of elongate spines across the middle of dorsal verticil, with small irregular scales below...P. rugosus
- 3b. Original tail with uniform scales above or with the posterior row in each verticil enlarged to form a ring of tubercles.....4
- 4a. Original tail with the posterior row of scales in each verticil enlarged to form a ring of tubercles; tubercles on back forming longitudinal rows.....P. c. capensis
- 4b. Original tail without enlarged tubercles; tubercles on back irregularly disposed.....5

- 5a. Dorsum with three broad black-edged cross-bands; body and tail subcylindrical.....P. c. oshaughnessyi
- 5b. Dorsum with 5-6 narrow pale cross-bars or rows of confluent spots; body and tail depressed.....6
- 6a. Adults with large black spots between irregular or poorly defined pale cross-bars or transverse rows of confluent spots.....P. affinis affinis
- 6b. Adults without large black spots between sharply defined dark-edged white cross-bands.....P. affinis tigrinus
- 7a. Rostral bordering nostril; preanal pores present in males.....8
- 7b. Rostral not bordering nostril; preanal pores absent.....P. bibroni
- 8a. Rostral with a median cleft above; no swollen nasal ring; each caudal verticil with a transverse row of 6 enlarged dorsal tubercles.....P. tuberculosa
- 8b. Rostral without a median cleft above; a greatly swollen nasal ring present; each caudal verticil with a pair of slightly enlarged scales above.....P. tetensis

## ACANIDAE

## Key to the genus ACANA

- 1a. Occipital scale no larger than adjoining scales on back of head; dorsal scalation very heterogenous, with a broad vertebral band of enlarged spinose scales.....A. cyanogaster
- 1b. Occipital scale larger than adjoining scales on back of head; dorsal scalation homogenous or with spinose scales forming more or less regular longitudinal rows.....2
- 2a. No well defined vertebral crest extending from nape to base of tail.....A. atra
- 2b. A well defined vertebral crest extends from nape to at least base of tail.....3
- 3a. Dorsal scalation heterogenous, more or less regular longitudinal rows of enlarged spinose scales present.....4
- 3b. Dorsal scalation uniform apart from pointed scales in vertebral crest.....5
- 4a. Ear opening large, diameter more than half that of cleft of closed eye; third and fourth toes more or less subequal; usually 16-21 lamellae under third toe.....A. hispida
- 4b. Ear opening very small, diameter less than half that of cleft of closed eye; third toe much longer than fourth; 12-14 lamellae under third toe.....A. makarika

- 5a. Dorsal scales subequal to ventrals in size; 95-122 scales round midbody; males with a well developed caudal crest.....A. kirki
- 5b. Dorsal scales larger than ventrals; 69-94 scales round midbody; males with a feebly developed caudal crest.....A. n. mossambica

## CHAMAELSONIDAE

## KEY TO THE GENERA

- Tail at least half the length of the body.....Chamaeleo
- Tail not more than a third the length of the body.....Brookesia

## Key to the genus CHAMAELEO

- 1a. Claws simple; tail subequal to body in length.....2
- 1b. Claws bicuspid; tail little more than half body length.....C. marshalli
- 2a. A median ventral crest of white conical tubercles running from snout to vent.....C. d. dilepis
- 2b. No median ventral crest running from snout to vent.....3
- 3a. Snout with a prominent horn; a pair of large occipital flaps present.....C. malleri
- 3b. No horn on snout; no occipital flaps present.....4
- 4a. A gular crest present, consisting of small conical tubercles or compressed scaly lobes.....C. pumilus melanocephalus
- 4b. No gular crest present.....5
- 5a. A vertebral crest of conical tubercles on body and anterior half of tail.....C. goetzii nyikae
- 5b. No vertebral crest present, a few conical tubercles on nape only....  
.....C. mianjensis

## Key to the genus BROOKESIA

- 1a. A pit in the groin.....B. platycaps
- 1b. No pit in the groin.....2
- 2a. A pit in the axilla.....B. brachyura
- 2b. No pit in the axilla.....B. nchisiensis

## SCINCIDAE

## KEY TO THE GENERA

- 1a. Nostril pierced between 2 or 3 nasals, well separated from the rostral.....2
- 1b. Nostril pierced in the rostral or bordered by the rostral.....5
- 2a. Eyelids immovable, the lower one with a large transparent disc which completely covers the eye; limbs short.....Abelpharus
- 2b. Eyelids movable, the lower one scaly or with a large transparent disc, if the latter, limbs well developed.....3

- 3a. Lower eyelid with a large transparent disc; dorsal scales usually keeled, rarely smooth; limbs well developed.....Mabuia
- 3b. Lower eyelid scaly; dorsal scales smooth; limbs short or vestigial.....4
- 4a. Prefrontals small and widely separated; limbs short, but pentadactyle.....Riopa
- 4b. Prefrontals large and usually in contact; limbs vestigial, 1-3 digits on forelimb and 2-3 on hindlimb.....Eumecia
- 5a. Nostril pierced between the rostral and a small nasal or between rostral, supranasal, postnasal and first labial; limbs present or absent.....Scelotes
- 5b. Nostril pierced in the anterior part of a very large rostral, with the posterior border of which it is connected by a longitudinal groove; limbs absent, vermiform.....6
- 6a. Rostral bordered posteriorly by a pair of internasals.....Scolecoseps (S. boulengeri)
- 6b. Rostral bordered posteriorly by a single internasal or frontonasal..7
- 7a. Eye completely exposed, without trace of eyelids; 3 transversely enlarged head shields between rostral and interparietal; no enlarged preanal plate.....Typhlacontias
- 7b. Eye covered by an eyelid or head shields; 1-2 transversely enlarged head shields between rostral and interparietal; an enlarged preanal plate present.....8
- 8a. Eye covered by an elongate moveable eyelid; 3-4 supraciliaries.....Acontias
- 8b. Eye covered by head shields, discernable only as a dark spot; 1-2 supraciliaries.....Typhlosaurus

Key to the genus MABUYA

- 1a. Scales on soles of feet non-spinose, smooth or tubercular.....2
- 1b. Scales on soles of feet keeled and spinose.....7
- 2a. Midbody scale rows 24-26; dorsals smooth.....M. megalura
- 2b. Midbody scale rows 28 or more; dorsals keeled.....3
- 3a. Midbody scale rows 26-34.....4
- 3b. Midbody scale rows 38-52.....M. quinquemaculata margaritifera
- 4a. Supranasals in broad contact; dorsals largely tricarinate; a black lateral band from eye to behind shoulder.....M. planifrons
- 4b. Supranasals usually separated; dorsals with 5-11 keels (adults); no black lateral band from eye to behind shoulder.....5

- 5a. Anterior border of ear opening with 3-4 lanceolate lobules; lamellae under fourth toe 19-23; a dark lateral band with a pale longitudinal stripe below it.....M. homalocephala depressa
- 5b. Anterior border of ear opening with 3-7 short pointed scales; lamellae under fourth toe 15-20; no lateral bands or stripes.....6
- 6a. Midbody scale rows 32-34; usually 5 supraciliaries; build robust, head length usually over 20% of snout-vent length; flanks with much dark speckling, which may extend on to back.....M. maculilabris
- 6b. Midbody scale rows 28-32; usually 4 supraciliaries; build slender, head length usually less than 20% of snout-vent length; dorsum uniform grey-brown or with a few scattered black spots....M. boulengeri
- 7a. Subocular not narrowed below, similar to upper labials.....8
- 7b. Subocular narrowed below or excluded from lip by labials.....9
- 8a. Midbody scale rows 32-36; anterior border of ear opening without pointed lobules; lamellae under fourth toe 15-20.....M. capensis
- 8b. Midbody scale rows 30-32; anterior border of ear opening with 2-3 pointed lobules; lamellae under fourth toe 21-24.....M. occidentalis
- 9a. Anterior border of ear opening with 2-4 lanceolate lobules; centre of nostril usually above or anterior to the suture between rostral and first labial; adults less than 55 mm from snout to vent.....10
- 9b. Anterior border of ear opening without lanceolate lobules; centre of nostril usually posterior to the suture between rostral and first labial; adults more than 55 mm from snout to vent.....11
- 10a. Midbody scale rows 30-34; arenicolous.....M. longiloba longiloba
- 10b. Midbody scale rows 36-40; rupicolous.....M. lacertiformis
- 11a. Lower border of subocular usually at least half the length of upper; usually a conspicuous white lateral longitudinal stripe.....M. varia
- 11b. Lower border of subocular less than a third the length of the upper, or excluded from lip; no white lateral stripe.....12
- 12a. Lamellae under fourth toe 15-18; Nyika Plateau.....M. hildae
- 12b. Lamellae under fourth toe 17-25.....13
- 13a. Usually 5 upper labials anterior to subocular; dorsals tricarinate, without subsidiary ribs; adults usually less than 80 mm from snout to vent.....14
- 13b. Usually 6 upper labials anterior to subocular, or latter excluded from lip; dorsals with 3-7 keels or ribs; adults usually 80-100 mm from snout to vent.....16
- 14a. Belly with irregular black blotches.....M. punctatissimus spilogaster
- 14b. Belly without irregular black blotches.....15



- 15a. A pale vertebral stripe usually present; Mlanje Mountain, Malawi...  
.....M. punctatissimus mlanjensis
- 15b. No pale vertebral stripe; South Africa and Rhodesia.....  
.....M. punctatissimus punctatissimus
- 16a. Dorsum dark with small pale spots, no trace of longitudinal stripes;  
prefrontals usually in contact; subocular usually excluded from lip  
.....M. striata sparsa
- 16b. Either conspicuous pale dorso-lateral stripes or black lateral bands  
at least anteriorly; prefrontals usually separated.....17
- 17a. Dorsum dark, with a pair of conspicuous pale dorso-lateral stripes;  
subocular usually excluded from lip (except in a coastal strip  
extending north from Mozambique Island).....M. striata striata
- 17b. Dorsum pale, with a conspicuous black lateral band which begins in  
front of eye and fades out between fore and hind limbs; subocular  
usually bordering lip.....M. striata wahlbergi

Key to the genus GIOPA

- Adults 80-137 mm from snout to vent; dorsum usually irregularly  
speckled with black and white.....G. afer
- Adults usually 60-80 mm from snout to vent; dorsum uniform brown or each  
scale with a dark spot at the base.....G. sundevalli sundevalli

Key to the genus FUSCICA

- 2-3 digits on forelimb, 3 on hindlimb.....F. anchistae anchistae
- One digit on forelimb, 2 on hindlimb.....F. anchistae johnstoni

Key to the genus ABLEPHANUS

- Frontoparietals and interparietal fused into a single shield; supra-  
oculars 5.....A. boutoni africanus
- Frontoparietals fused, interparietal distinct; supraoculars 3.....  
.....A. wahlbergi
- Frontoparietals paired, interparietal distinct; supraoculars 2-3.....  
.....A. seydeli

Key to the genus SCELOTES

- 1a. Interparietal small and subtriangular, narrower than the frontal,  
well separated from the posterior supraoculars.....2
- 1b. Interparietal large, broader than frontal, in contact laterally with  
posterior supraoculars.....6
- 2a. Limbs with 5 digits.....3
- 2b. Limbs with 3 or 4 digits.....5

- 3a. Frontal 3 times as long as the frontonasal; tail longer than head and body; habitat montane grassland or forest.....4
- 3b. Frontal twice as long as the frontonasal; tail shorter than head and body; habitat alluvium at sea level.....S. nanus
- 4a. Forelimbs 14-17% and hindlimbs 25% of snout-vent length; 11-12 lamellae under fourth toe.....S. arnoldi mlanjensis
- 4b. Forelimbs 8-11% and hindlimbs 14-17% of snout-vent length; 6-8 lamellae under fourth toe.....S. arnoldi arnoldi
- 5a. Limbs with four digits.....S. tetradactylus tetradactylus
- 5b. Limbs with three digits.....S. angolensis
- 6a. Forelimbs tridactyle; hindlimbs tetradactyle.....S. limpopoensis
- 6b. Forelimbs absent; hindlimbs minute (monodactyle) or absent.....7
- 7a. Frontal longer than broad; supraoculars 4; supraciliaries 6.....8
- 7b. Frontal broader than long; supraoculars 3; supraciliaries 4-5.....9
- 8a. A minute hindlimb present.....S. brevipes
- 8b. No trace of limbs.....S. inornatus mosambicus
- 9a. Nostril pierced between rostral and a small oval nasal; midbody scale rows 18-20; pale olive or light brown above.....S. arnicola
- 9b. Nostril pierced between rostral and first labial; midbody scale rows 20-24; black above.....S. ater ater

## Key to the genus TYPHLOCONTIAS

- Usually the third upper labial entering the orbit; Zambia and Angola....  
.....T. gracilis gracilis
- Second upper labial entering the orbit; South West Africa, Bechuanaland and Rhodesia.....T. gracilis namibiensis

## Key to the genus ACONTIAS

- 1a. Midbody scale rows 16-20; ventrals 150-163; adults 250-467 mm from snout to vent.....A. plumbeus
- 1b. Midbody scale rows 16; ventrals 163-179; maximum snout-vent length 230 mm.....2
- 2a. Black above and below, with a few scattered white ventrals anteriorly  
.....A. gracilicauda occidentalis
- 2b. Olive green to grey-brown above, uniform white below.....  
.....A. gracilicauda broadleyi

## Key to the genus TYPHLOSAURUS

- 1a. Snout conical.....2
- 1b. Snout with a sharp horizontal edge and flattened below.....4

- 2a. A single transversely enlarged zygous shield between rostral and the subtriangular interparietal; midbody scale rows 12.....T. aurantiacus
- 2b. Two transversely enlarged shields between rostral and the subtriangular interparietal; midbody scale rows 16-20.....3
- 3a. Three supraoculars; frontonasal much narrower than frontal.....T. cregoi bicolor
- 3b. Two supraoculars; frontonasal and frontal subequal in width.....T. cregoi cregoi
- 4a. Upper labials 4; supraciliaries 2; a subocular.....5
- 4b. Upper labials 3; a single supraciliary; no subocular.....T. garispensis
- 5a. Midbody scale rows 14; rostral bordered posteriorly by 5 shields; second and third upper labials in contact with postocular.....6
- 5b. Midbody scale rows 12; rostral bordered posteriorly by 7 shields; second and third upper labials separated from postocular.....T. "relicus"
- 6a. Dorsum with 4-8 longitudinal rows of confluent dark spots, which form continuous stripes on tail (rarely uniform plumbeous); maximum snout-vent length 133 mm.....T. lineatus lineatus
- 6b. Dorsum with a pair of well defined continuous dark longitudinal stripes, which break up and disappear on tail; adults 140-180 mm from snout to vent.....T. lineatus "jappi"

## CORDYLIDAE

## KEY TO THE GENERA

- 1a. Serpentine, limbs minute or absent, hindlimbs vestigial.....2
- 1b. Not serpentine; limbs well developed.....3
- 2a. A granular lateral groove present; six longitudinal rows of smooth ventral plates.....Tetradactylus (T. ellenbergeri)
- 2b. No lateral groove; ventrals keeled and lanceolate like the dorsals.....Chamaesaura
- 3a. Dorsum covered with regular transverse rows of quadrangular scales.4
- 3b. Dorsum covered with small granules.....Platysaurus
- 4a. Frontoparietals absent; tail much longer than head and body.....Gerrhosaurus
- 4b. A pair of frontoparietals present; tail little longer than head and body.....Cordylus

## Key to the genus CHAMAESAURA

- Midbody scale rows usually 24-26; a minute forelimb (smaller than a dorsal scale) present.....C. macrolepis micropus  
 Midbody scale rows 22; forelimb absent.....C. macrolepis macrolepis

## Key to the genus GERRHOSAURUS

- 1a. Ventrals in 14-20 longitudinal rows.....G. validus validus  
 1b. Ventrals in 8 or 10 longitudinal rows.....2  
 2a. Ventrals in 10 longitudinal rows.....G. major major  
 2b. Ventrals in 8 longitudinal rows.....3  
 3a. Scales on soles of feet keeled and spinose; supraciliaries 4.....4  
 3b. Scales on soles of feet smooth and tubercular; supraciliaries 5.....  
 .....G. flavigularis  
 4a. A pair of well defined yellow black-edged dorsolateral stripes present.....G. nigrolineatus  
 4b. No well defined dorsolateral stripes present.....5  
 5a. Scales on proximal portion of tail strongly spinose; dorsals usually in 24 longitudinal rows; adults uniform grey-brown.....G. bulsi  
 5b. Scales on proximal portion of tail not strongly spinose; dorsals usually in 26 longitudinal rows; adults pale brown, usually with light and dark speckling or ill-defined longitudinal stripes.....  
 .....G. auritus

## Key to the genus CORDYLUS

- 1a. Rostral in contact with frontonasal; occipitals spinose; adults over 100 mm from snout to vent.....2  
 1b. Rostral usually separated from frontonasal; occipitals non-spinose; less than 100 mm from snout to vent.....3  
 2a. Preocular in contact with (or narrowly separated from) the nasal above the loreal; chin and throat pale.....C. warreni regius  
 2b. Preocular well separated from the nasal by the loreal; chin and throat dark brown.....C. warreni mossambicus  
 3a. Head strongly depressed and expanded in the temporal region; head shields finely rugose; laterals similar to dorsals; rupicolous....  
 .....C. cordylus rhodesianus  
 3b. Head feebly depressed, not expanded in the temporal region; head shields very rugose; some laterals smaller than dorsals; arboreal  
 .....4  
 4a. Outer rows of ventrals not keeled; less than 80 mm from snout to vent.....C. tropidosternum jonsai  
 4b. Outer 3-4 rows of ventrals keeled; adults 80-95 mm from snout to vent.....C. tropidosternum tropidosternum

Key to the genus *PLATYSAURUS*

- 1a. Supranasals present.....2  
 1b. Supranasals absent (fused with nasals).....4
- 2a. Scales on side of neck no larger than those on dorsum; 31-36 gulars transversely between posterior sublabials; adults 80-112 mm from snout to vent.....*P. mitchelli*  
 2b. Some scales on side of neck enlarged, spinose; 20-30 gulars transversely between posterior sublabials; maximum snout-vent length 76 mm.....3
- 3a. Supranasals usually in broad contact; occipital usually absent; sublabials usually 6; females and juveniles with tail speckled black and pale yellow.....*P. maculatus maculatus*  
 3b. Supranasals widely separated; occipital large and usually in contact with interparietal; sublabials 5; females and juveniles with tail distinctly striped in black and pale blue.....*P. maculatus lineicauda*
- 4a. Scales on side of neck and flanks no larger than those on dorsum; no trace of pale longitudinal stripes.....*P. ocellatus*  
 4b. Scales on side of neck and flanks larger than those on dorsum; females and juveniles with well-defined pale longitudinal stripes...5
- 5a. Enlarged scales on side of neck flattened; females and juveniles with pale blue tails.....*P. torquatus*  
 5b. Enlarged scales on side of neck conical or spinose; females and juveniles with straw-coloured tails.....6
- 6a. Adult males with yellow head and crimson body, 115-146 mm from snout to vent; adult females with three broad bright yellow stripes on head, 97-120 mm from snout to vent.....*P. imperator*  
 6b. Adult males with head and body red-brown, green or blackish, rarely over 115 mm from snout to vent; adult females with three narrow cream stripes on head, rarely exceeding 97 mm from snout to vent....7
- 7a. Median row of gulars strongly enlarged and as broad or broader than long posteriorly; range south of the Limpopo.....*P. wilhelmi*  
 7b. Median row of gulars not as broad as long posteriorly; range north of the Limpopo.....8
- 8a. Ventrals in 14-16 longitudinal rows.....9  
 8b. Ventrals in 18-24 longitudinal rows.....10
- 9a. Adult males dark brown above with distinct pale spots, pale blue below with black blotches on throat and a black collar.....*P. pungweensis pungweensis*  
 9b. Adult males uniform olive-brown above, throat grey, chest and belly purple or black.....*P. pungweensis blakei*

- 10a. Ventrals usually in 18 longitudinal rows; range north of the Zambezi.....P. intermedius nyasae
- 10b. Ventrals usually in 20-24 longitudinal rows; range south of the Zambezi.....11
- 11a. Nasals usually in contact; usually 4 upper labials anterior to subocular; chest of adult males suffused with green, blue or terracotta.....P. intermedius rhodesianus
- 11b. Nasals usually separated; usually 5 upper labials anterior to subocular; chest of adult males uniform black.....P. intermedius subniger

## LACERTIDAE

## KEY TO THE GENERA

- 1a. Frontoparietals absent; a paired series of smooth transversely enlarged plates extending down middle of back and tail; tail strongly depressed and fringed laterally.....Holaspis (H. guentheri laevis)
- 1b. Frontoparietals present; no vertebral series of enlarged scales; tail cylindrical, not fringed laterally.....2
- 2a. Ventrals keeled.....Gastropholis (G. vittata)
- 2b. Ventrals smooth.....3
- 3a. Digits serrated laterally.....Meroles (M. suborbitalis)
- 3b. Digits not serrated laterally.....4
- 4a. Subdigital lamellae smooth or tubercular.....Nucras
- 4b. Subdigital lamellae keeled.....5
- 5a. Nostril surrounded by 3-5 nasals and the first labial, or narrowly separated from the latter.....Latastia (L. johnstoni)
- 5b. Nostril surrounded by 2-4 nasals, well separated from the first labial.....6
- 6a. Collar well marked; dorsal scales small; head shields smooth or slightly rugose.....Premias
- 6b. Collar absent; dorsal scales large and strongly keeled; head shields keeled or striated.....Ichnotropis

Key to the genus NUCRAS

- 1a. 2-7 small granules between supraciliaries and supraoculars; 20-33 lamellae under fourth toe.....2
- 1b. No small granules between supraciliaries and supraoculars; 17-20 lamellae under fourth toe.....N. boulengeri

- 2a. Dorsum with rows of spots or a reticulated pattern, rarely a single vertebral line present.....N. intertexta
- 2b. Dorsum with 2-7 longitudinal stripes.....3
- 3a. Usually 2 or 4 dorsal stripes; 26-33 lamellae under fourth toe...  
.....N. tessellata tessellata
- 3b. Usually 3, 5 or 7 dorsal stripes; 20-27 lamellae under fourth toe.  
.....N. tessellata ornata

## Key to the genus FREMIAS

- 1a. Ventral plates in 6 longitudinal rows; an elongate upper temporal shield present.....E. lugubris
- 1b. Ventral plates in 10 or more longitudinal rows; no elongate temporal shield present.....2
- 2a. A narrow tympanic shield on anterior border of ear opening; lower eyelid semi-transparent, with a row of 10-12 enlarged scales across the middle.....E. namouensis
- 2b. No tympanic shield present; lower eyelid with a large transparent disc, composed of two large black-edged scales.....E. lineocellata lineocellata

## Key to the genus ICHNOTROPIS

- 1a. Frontonasal single; subocular bordering lip; 34-40 scales round middle of body.....2
- 1b. Frontonasal longitudinally divided; subocular not reaching lip; 46-58 scales round middle of body.....I. squamulosa
- 2a. Prefrontal in contact with the anterior of two large supraoculars; head shields strongly keeled, but with few supplementary striations.....I. bivittata bivittata
- 2b. Prefrontal not in contact with the anterior of two large supraoculars; head shields not strongly keeled, but with numerous fine striations.....I. capensis capensis

## VARANIDAE

## Key to the genus VARANUS

- Nostril round or oval, slightly nearer eye than end of snout; canthus rostralis well defined; build slender; semi-aquatic.....V. niloticus niloticus
- Nostril an oblique slit, much nearer eye than end of snout; canthus rostralis ill-defined, rounded; build robust; terrestrial and arboreal.....V. exanthematicus albigularis

## Suborder AMPHISBAENIA

## AMPHISBAENIDAE

## KEY TO THE GENERA

- 1a. Segments of the pectoral region not differentiated; snout rounded, without a sharp horizontal edge; nostril pierced more or less laterally.....2
- 1b. Segments of the pectoral region enlarged, forming elongate shields; snout depressed, with a sharp horizontal edge; nostril pierced inferiorly in a small nasal.....4
- 2a. Nasal, prefrontal, ocular and upper labial shields all distinct....3
- 2b. Nasal, prefrontal, preocular, ocular, first and second upper labials fused to form one or two shields.....Chirindia (C. swynnertoni)
- 3a. Preocular distinct from prefrontals.....Zygaspis
- 3b. Preoculars fused with prefrontals.....Amphisbaena (A. v. violacea)
- 4a. Nasals separated by rostral; tail bluntly rounded.....Monopeltis
- 4b. Nasals in contact above rostral; tail terminating abruptly in a callus ped.....Tomuropeltis

## Key to the genus ZYGASPIE

- Black above; adults over 300 mm in length.....Z. "niger"
- Pink or pale brown above; maximum length 260 mm.....Z. quadrifrons

## Key to the genus MONOPELTIS

- 1a. Two large shields covering top of head.....2
- 1b. A single large shield covering top of head.....3
- 2a. 70 segments in a midbody annulus; 289 annuli on body....M. mauricei
- 2b. 36-54 segments in a midbody annulus; 182-224 annuli on body.....M. anchietae
- 3a. Nasals not reaching lip, rostral and first labials in contact.....4
- 3b. Nasals bordering lip, separating rostral from first upper labials..5
- 4a. 286-300 annuli on body.....M. ocellaris
- 4b. 174-250 annuli on body.....M. c. capensis
- 5a. 271-273 annuli on body; 42-44 segments in a midbody annulus.....M. habeniichti
- 5b. 193-229 annuli on body; 32-42 segments in a midbody annulus.....M. sphenorhynchus

## Key to the genus TOMUROPELTIS

- 24-32 annuli on tail.....T. pistillus
- 38-45 annuli on tail.....T. longicauda



## Suborder SERPENTES

## KEY TO FAMILIES

- 1a. Tail cylindrical or but feebly compressed; terrestrial or fresh water.....2
- 1b. Tail strongly compressed, car-shaped; marine.....  
.....HYDROPHIIDAE (Polamis platyrus)
- 2a. Body vermiform, covered above and below with small subequal scales; eyes vestigial, buried under the head shields.....3
- 2b. Body not vermiform, head distinct; a median series of transversely enlarged ventral plates present; eyes well developed, movable below a transparent brille.....4
- 3a. Ocular shield not bordering lip; midbody scale rows 20 or more; tail only slightly longer than broad.....TYPHLOPIDAE
- 3b. Ocular shield bordering the lip; midbody scale rows 14; tail at least three times as long as broad.....LEPTOTYPHLOPIDAE
- 4a. Ventral plates much narrower than body; midbody scale rows more than 70; some labials with deep pits; vestigial hindlimbs indicated externally by a pair of claws bordering the vent.....  
.....BOIDAE (Python sebae)
- 4b. Ventral plates almost as wide as body; midbody scale rows less than 50; labials without pits; no trace of hindlimbs.....5
- 5a. No enlarged poison fangs at front of upper jaw.....COLUBRIDAE
- 5b. One or two pairs of enlarged poison fangs at front of upper jaw....6
- 6a. Poison fangs immovable, not enclosed in a membranous sheath.....  
.....ELAPIDAE
- 6b. Poison fangs moveable and very long, folded back against the maxillary bone when not in use and covered by a membranous sheath.  
.....VIPERIDAE

## TYPHLOPIDAE

## Key to the genus TYPHLOPS

- 1a. Nostril pierced laterally; rostral hardly one third width of head; midbody scale rows 20.....T. braminus
- 1b. Nostril pierced inferiorly; rostral more than half width of head; midbody scale rows 24 or more.....2
- 2a. Snout rounded.....3
- 2b. Snout with an angular horizontal edge.....6
- 3a. Dark brown or grey above and below, underside of head and anal region yellowish; prefrontal subequal to the scale posterior to it; maximum length 170 mm.....T. fornasinii
- 3b. Paler below than above; prefrontal much larger than the scale posterior to it; adults over 200 mm in length.....4

- 4a. Prefrontal subhexagonal; supraocular transverse, its lateral apex between preocular and ocular.....T. obtusus
- 4b. Prefrontal subtrapezoidal; supraocular oblique, its lateral apex between nasal and ocular.....5
- 5a. Eye below the preocular.....T. rondoensis
- 5b. Eye below the ocular.....T. schmidti schmidti
- 6a. Flesh pink in colour; midbody scale rows 22; extremely slender, midbody diameter into length 73-116 times.....T. gracilis
- 6b. Some dark pigmentation dorsally; midbody scale rows 24 or more; robust in build, midbody diameter into length 23-57 times.....7
- 7a. Midbody scale rows 24-28; moderately robust, midbody diameter into length 41-57 times.....8
- 7b. Midbody scale rows 30-44; robust, midbody diameter into length 23-53 times.....10
- 8a. Snout distinctly hooked in profile.....T. schinzi
- 8b. Snout not hooked in profile.....9
- 9a. Snout with an obtusely angular horizontal edge.....T. boylei
- 9b. Snout with an acutely angular horizontal edge.....T. delalandei
- 10a. Midbody scale rows 36-44; range south of the Limpopo.....T. schlageli schlageli
- 10b. Midbody scale rows 30-38; range north of the Limpopo.....T. schlageli mucruse

## LEPTOTYPHLOPIDAE

## Key to the genus LEPTOTYPHLOPS

- 1a. Rostral in contact with the supraocular; uniform black above and below.....2
- 1b. Rostral separated from the supraocular by the nasal; brown or pink above, often lighter below.....3
- 2a. Rostral more than twice width of nasal.....L. scutifrons
- 2b. Rostral less than twice width of nasal.....L. conjuncta
- 3a. Supraocular much larger than prefrontal; tail 7 to 10% of total length; brown above, sometimes lighter below.....L. emini emini
- 3b. Supraocular subequal to prefrontal; tail 9 to 18% of total length; pink or red-brown above, white below.....L. longicauda

COLUBRIDAE  
KEY TO THE GENERA

- 1a. No enlarged grooved poison fangs in the upper jaw.....2  
 1b. One or more pairs of enlarged grooved poison fangs in the upper jaw  
 below the eye.....15
- 2a. Loreal absent; scales strongly keeled in 21-27 rows at midbody,  
 three or four lateral rows reduced in size, oblique and serrated...  
 .....Dasypeltis  
 2b. Loreal present (sometimes absent in Duberria); scales smooth (or  
 keeled in 15-17 rows at midbody), no lateral rows reduced in size,  
 oblique and serrated.....3
- 3a. Scales strongly keeled, the vertebral row enlarged and bicarinate..  
 .....Mehelya  
 3b. Scales smooth or feebly keeled, the vertebral row not enlarged or  
 bicarinate.....4
- 4a. Pupil vertically elliptic; nocturnal.....5  
 4b. Pupil round; diurnal.....8
- 5a. Scales in 15-17 rows at midbody; subcaudals 18-47.....6  
 5b. Scales in 19-33 rows at midbody; subcaudals 37-76.....7
- 6a. Nostril pierced in an entire nasal; rostral small, rounded.....  
 .....Lycophidion  
 6b. Nostril pierced in a semidivided nasal; rostral large, with an  
 angular horizontal edge.....Prosymna
- 7a. Scales in 19-25 rows at midbody; ventrals 152-178.....  
 .....Lycodonomorphus (part)  
 7b. Scales in 23-33 rows at midbody; ventrals 186-237.....Boaedon
- 8a. Anal entire.....9  
 8b. Anal divided.....10
- 9a. Scales in 21-25 rows at midbody; subcaudals 51-73.....  
 .....Lycodonomorphus (part)  
 9b. Scales in 15 rows at midbody; subcaudals 23-47.....Duberria
- 10a. Scales in 15-19 rows at midbody.....11  
 10b. Scales in 21-31 rows at midbody.....13
- 11a. Ventrals 130-151; subcaudals 37-67; habit moderate; black, olive  
 or reddish above; terrestrial and semiaquatic.....12  
 11b. Ventrals 141-217; subcaudals 73-140; habit slender; usually green  
 above at least anteriorly; arboreal or semiaquatic.....Philothamnus
- 12a. Internasals paired; subcaudals 50-87.....Natriciteres  
 12b. Internasal single; subcaudals 37-58.....  
 .....Limnophis (L. bicolor bangweolicus)

- 13a. Snout with a sharp horizontal edge; labials excluded from eye by suboculars.....Scaphiopsis (S. s. albopunctatus)
- 13b. Snout without a sharp horizontal edge; one or two labials entering the orbit.....14
- 14a. Scales in 25-31 rows at midbody; subcaudals 43-70; snout pointed.....Pseudaspis (P. cana)
- 14b. Scales in 21 rows at midbody; subcaudals 71-91; snout rounded...  
.....Meigodon (M. s. semiornatus)
- 15a. Loreal present; eye moderate to large; head distinct from the neck; terrestrial or arboreal.....16
- 15b. Loreal absent; eye small; head not distinct from the neck; fossorial.....28
- 16a. Pupil vertically elliptic; head much broader than neck.....17
- 16b. Pupil round or horizontal; head slightly broader than neck.....21
- 17a. Scales in 21-25 rows at midbody, the vertebral row enlarged; ventrals 240-274; subcaudals 120-147.....Boiga (B. blandingi)
- 17b. Scales in 17-19 (rarely 21) rows at midbody, the vertebral row not enlarged; ventrals 141-244; subcaudals 29-102.....18
- 18a. Loreal entering the eye; marbled in red-brown and white above....  
.....Chamaetortus (C. s. sulicus)
- 18b. Loreal excluded from eye by preocular; uniform grey to black above or orange with black blotches.....19
- 19a. Ventrals 141-180; subcaudals 29-65.....Crotaphopeltis
- 19b. Ventrals 195-244; subcaudals 51-86.....20
- 20a. Uniform grey to blue-black above; anal usually entire; a single anterior temporal.....Dipsadoboa (D. shrevei)
- 20b. Orange or pink with a series of black dorsal blotches; anal usually divided; two anterior temporals.....  
.....Telescopus (T. s. semiannulatus)
- 21a. Pupil horizontal, dumb-bell shaped; body extremely slender; subcaudals usually more than 140.....Thelotornis
- 21b. Pupil round (sometimes horizontally pear-shaped in Dispholidus); body moderately slender; subcaudals less than 140.....22
- 22a. Scales strongly keeled in 19 (rarely 17 or 21) rows at midbody; eye very large.....Dispholidus
- 22b. Scales smooth in 11-17 rows at midbody; eye moderate.....23
- 23a. Snout pointed, beak-like.....Rhamphiopsis
- 23b. Snout rounded.....24
- 24a. Nostril pierced in a single semidivided nasal.....25
- 24b. Nostril pierced between at least two shields.....26

- 25a. Snout excavate laterally just anterior to eye; anal entire; proximal 4-12 subcaudals usually single.....Amphorhinus (A. multimaculatus)
- 25b. Snout not excavate laterally; anal divided; subcaudals all paired.....Hemirhamphus (H. n. notataenia)
- 26a. Maxillary teeth interrupted below anterior border of eye by two greatly enlarged fang-like teeth, which are separated from the true fangs by a further series of small teeth below the eye...Pseudophis
- 26b. Maxillary teeth subequal in size, continuing without interruption until the interspace separating them from the grooved fangs below the posterior border of the eye.....27
- 27a. Subcaudals 51-68.....Pseudophyllax
- 27b. Subcaudals 83-105.....Dromophis (D. lineatus)
- 28a. Anal divided; subcaudals paired.....29
- 28b. Anal entire; subcaudals single.....33
- 29a. Two pairs of shields between rostral and frontal.....30
- 29b. A single pair of shields between rostral and frontal.....31
- 30a. Nasal in contact with the rostral; preocular absent....Calomalaps
- 30b. Nasal separated from the rostral; preocular present.....Hiodon (H. collaris christyi)
- 31a. Upper labials 4; yellow above with 3-5 dark longitudinal stripes, tail blunt and with similar markings to the head....Chlorhinopis
- 31b. Upper labials 5 or 6; uniform, blotched or with a single dorsal stripe.....32
- 32a. Scales in 15 rows at midbody; preocular absent.....Amblydipnes
- 32b. Scales in 17 rows at midbody; an elongate preocular (or displaced prefrontal) present.....Xenocelaus
- 33a. Pupil vertically elliptic; snout pointed, rostral enlarged; ventrals 102-118.....Hynonopis (H. wilsoni)
- 33b. Pupil round; snout rounded, rostral moderate; ventrals 106-150..  
.....Aparrallactur

## Key to the genus LYCOCHROMOPHUS

- 1a. Scales in 25 (rarely 25) rows at midbody; endemic to Lake Tanganyika.....L. bicolor
- 1b. Scales in 19-21 rows at midbody.....2
- 2a. Scales in 21 rows at midbody; pupil round to vertically subelliptic  
.....L. leleupi mlanjensis
- 2b. Scales in 19 rows at midbody; pupil vertically elliptic.....3
- 3a. Subcaudals of females 37-47; lowlands.....L. whytei whytei
- 3b. Subcaudals of females 54-69; highlands, except in south Mozambique  
.....L. rufulus

## Key to the genus BOARJON

- Subcaudals paired; habitat savanna.....B. fuliginosus fuliginosus  
 Subcaudals single; habitat forest.....B. olivaceus

## Key to the genus LYCOPHIDIUM

- 1a. A postnasal present; ventrals 171-204; subcaudals 24-40.....2  
 1b. No postnasal; ventrals 139-161; subcaudals 20-30....L. semiannule  
 2a. Dorsum uniform, or each scale with a pale spot...L. capense capense  
 2b. Dorsum with light and dark crossbands; Barotseland.....  
 .....L. capense multimaculatum

## Key to the genus MEHELYA

- Vertebral scale row and ventrals ivory white; ventrals 195-224;  
 subcaudals **45-59**.....M. capensis capensis  
 Vertebral scale row and ventrals dark; ventrals 167-182; subcaudals  
 55-77.....M. nyassae

## Key to the genus MATRICITERES

- 1a. Scales in 19 rows anteriorly, 17 posteriorly.....M. olivacea  
 1b. Scales in 17 rows anteriorly, 15 posteriorly.....2  
 2a. Postoculars usually 2.....M. variegata bipostocularis  
 2b. Postoculars usually 3.....M. variegata "sylvatica"

## Key to the genus DUBERRIA

- 1a. Ventrals 95-110; variegated or spotted above.....D. variegata  
 1b. Ventrals 118-144; uniform above or with a thin dark vertebral line  
 .....?  
 2a. Loreal usually present; subcaudals 34-51 in males, 24-34 in  
 females; ventrals yellow with dark lateral blotches; range south  
 of the Limpopo.....D. lutrix lutrix  
 2b. Loreal usually present; subcaudals 30-39 in males, 21-30 in  
 females; ventrals bluish-white with a paired series of black  
 median blotches; range eastern Rhodesia and adjoining Mozambique  
 .....D. lutrix rhodesiana  
 2c. Loreal usually absent; subcaudals 37-44 in males, 24-34 in  
 females; ventrals yellow mesially, dark laterally; range highlands  
 north of the Zambezi.....D. lutrix shirana

## Key to the genus PHILOTHANNUS

- 1a. Subcaudals smooth; temporals usually 1+1 or 1+2.....2  
 1b. Subcaudals keeled and notched; temporals usually 2+2.....5  
 2a. Usually 2 upper labials entering the orbit.....P. hoplogaster  
 2b. Usually 3 upper labials entering the orbit.....3

- 3a. A yellow-edged brown dorsal band present; usually 8 upper labials; subcaudals usually less than 100.....P. ornatus
- 3b. No brown dorsal band present; usually 9 upper labials; subcaudals usually more than 100.....4
- 4a. Habit moderately slender, head moderate; subcaudals in males 103-126, in females 97-116; widespread...P. irregularis irregularis
- 4b. Habit extremely slender, head very small and narrow; subcaudals in males 115-134, in females 109-126; range north of the Zambesi.....P. heterolepidotus
- 5a. Usually 8-9 upper labials, two of which enter the orbit; subcaudals 108-130.....P. natalensis natalensis
- 5b. Usually 9 upper labials, three of which enter the orbit; subcaudals usually more than 130...P. semivariatus semivariatus

## Key to the genus PROSYMA

- 1a. A pair of internasals; rostral with an acutely angular horizontal edge.....2
- 1b. A single band-like internasal; rostral with a moderately angular horizontal edge.....3
- 2a. Basic dorsal pattern consists of a pale broken dorsal stripe and a pair of dark dorsolateral stripes; ventrals 154-165 in males and 162-180 in females; internasals widely separated.....P. bivittata
- 2b. Basic dorsal pattern consists of short dark streaks, sometimes a vertebral series of dark blotches; ventrals 139-158 in males and 156-168 in females; internasals in contact...P. sundevalli lineata
- 3a. Dorsal scales largely keeled; ventrals less than 130.....P. jani
- 3b. Dorsal scales smooth; ventrals usually more than 130.....4
- 4a. Pale above with dark blotches.....P. angolensis
- 4b. Dark above, often each scale with a pale spot....P. ambiguus ambiguus

## Key to the genus CHOTAPHOPHETIS

- Scales in 19 (rarely 17 or 21) rows at midbody; preocular usually single; habitat savanna.....C. hotamboeia
- Scales in 17 rows at midbody; usually 2 preoculars; habitat montane forests of Tanganyika and Malawi.....C. tornieri

## Key to the genus XIPHOLOPUS

- 1a. Subcaudals 110-136 in males, 104-127 in females.....X. typus typus
- 1b. Subcaudals 97-117 in males and 90-109 in females.....2

- 2a. Males green, uniform or with the scales bordered with black; range Abercorn northwards.....D. typus kivuensis
- 2b. Males black above, each head shield and dorsal scale with an orange or yellow spot; ventrals violet margined with black; range Angola, Katanga and western Zambia.....D. typus punctatus

## Key to the genus THELOTORNIS

- Ventrals 146-164.....T. kirtlandi capensis
- Ventrals 163-176.....T. kirtlandi castei

## Key to the genus PSAMMOPHYLAX

- 1a. Two anterior temporals; ventrum white; habitat savanna.....2
- 1b. A single anterior temporal; ventrum dark grey; habitat montane grassland north of the Zambezi.....P. variabilis variabilis
- 2a. Dark vertebral and lateral stripes well defined.....P. tritaeniatus tritaeniatus
- 2b. Dark vertebral stripe absent, lateral stripes poorly defined or absent.....P. tritaeniatus fitzgeraldi

## Key to the genus RHAMPHIOPHIS

- 1a. Rostral very pointed; dorsum with three well defined dark longitudinal stripes like Psammophylax t. tritaeniatus.....R. acutus
- 1b. Rostral moderately pointed; dorsum uniform or spotted.....2
- 2a. Supracular in contact with prefrontal; subcaudals 87-117; dorsum more or less uniform.....R. oxyrhynchus rostratus
- 2b. Supracular separated from prefrontal by preocular; subcaudals 28-45; dorsum with longitudinal series of dark spots or blotches.....R. multimauculatus

## Key to the genus PSAMMOPHIS

- 1a. Scales in 17 rows at midbody.....2
- 1b. Scales in 9-15 rows at midbody.....8
- 2a. Upper labials usually 8, the fourth and fifth entering the orbit..3
- 2b. Upper labials usually 9, the fourth, fifth and sixth entering the orbit.....P. subtaeniatus subtaeniatus
- 3a. Ventrums with a pair of black longitudinal lines separating the yellow median area from the white marginal areas.....P. subtaeniatus zudanensis
- 3b. Ventrums yellow or white, sometimes with paired series of dark streaks, but never a pair of black lines.....9



- 3a. Anal usually entire; preoculars usually 2; south-west arid.....  
 .....P. notostictus
- 4b. Anal usually divided; preocular usually single.....5
- 5a. Preocular usually in good contact with frontal; usually 3 nasals,  
 the upper postnasal with a pronounced posterior prolongation.....  
 .....P. leightoni trinassalis
- 5b. Preocular usually separated from the frontal; usually 2 nasals, the  
 postnasal without a pronounced posterior prolongation.....6
- 6a. Dorsum with a pale vertebral line flanked by a series of pale black-  
 bordered rings - giving the impression of a double chain, posterior-  
 ly these markings give way to a pale lateral band; ventrals  
 margined with black; range Angola and northern Zambia.....  
 .....P. sibilans leopardinus
- 6b. Dorsum without chain markings; ventrals not margined with black...7
- 7a. Distance from frontal to end of snout less than length of frontal;  
 ventrals 148-165; subcaudals 70-101; a pair of pale dorsolateral  
 stripes present.....P. brevirostris
- 7b. Distance from frontal to end of snout subequal to length of frontal;  
 ventrals 155-184; subcaudals 87-107; no well defined pale dorso-  
 lateral stripes.....P. sibilans sibilans
- 8a. Scales in 15 rows at midbody.....9
- 8b. Scales in 11 (rarely 9) rows at midbody.....P. angolensis
- 9a. Preocular in good contact with frontal; upper labials usually 7,  
 the third and fourth entering the orbit; ventrals 153-177;  
 subcaudals 84-109.....P. jallae jallae
- 9b. Preocular not reaching frontal; upper labials usually 8, the fourth  
 and fifth entering the orbit; ventrals 136-165; subcaudals 61-86  
 .....P. crucifer

Key to the genus CALAMELAPS

- Scales in 19 or 21 rows at midbody; 6 upper labials, third and fourth  
 entering orbit; uniform black above and below.....C. unicolor mirolepis
- Scales in 15 rows at midbody; 5 upper labials, second and third entering  
 orbit; black above, white or yellow below.....C. ventrimaculatus

Key to the genus ANELYODIPEAS

- Four lower labials in contact with the sublinguals; ventrals 127-162;  
 range southern Mozambique and eastern Transvaal.....A. microphthalmus
- Three lower labials in contact with the sublinguals; ventrals 179-207;  
 range Katanga and western Zambia.....A. katangensis katangensis

## Key to the genus XEROCALANUS

- 1a. A small supracular present; a single postocular.....2  
 1b. No supracular; two postoculars.....5
- 2a. Ventrals 184-197 in males, 214-215 in females.....X. transvaalensis  
 2b. Ventrals 201-230 in males, 217-250 in females.....3
- 3a. Snout strongly depressed; habit slender, head at least twice as long as broad and diameter of body over 60 times into length from snout to vent.....4  
 3b. Snout moderately depressed; habit moderate, head less than twice as long as broad and diameter of body less than 60 times into length from snout to vent.....X. bicolor maculatus
- 4a. Yellow, with a purplish-brown dorsal band 5 (rarely 5 or 7) scales wide.....X. bicolor lineatus  
 4b. Black or dark brown above, this coloration covering at least 11 scale rows, yellow to entirely black below.....X. bicolor bicolor
- 5a. Ventrals 227-239 in males, 245-260 in females.....X. mechowi mechowi  
 5b. Ventrals 247-268 in males, 270-282 in females.....X. mechowi inornatus

## Key to the genus CHILONHEINOPHIS

- 1a. Nasal shield not fused with first labial; frontal about  $1\frac{1}{2}$  times as long as broad.....2  
 1b. Nasal shield fused with the first labial; frontal only slightly longer than broad.....C. carpenteri carpenteri
- 2a. Ventrals in males 263-294, in females 274-348; range Katanga, western Zambia, northern Rhodesia.....C. gerardi gerardi  
 2b. Ventrals in males 308-310, in female 375; range eastern Katanga, northern Zambia, western Tanganyika.....C. gerardi tanganyikae

## Key to the genus APARALLACTUS

- 1a. First pair of lower labials in contact behind the mental (rarely narrowly separated); usually the first 4 lower labials in contact with the anterior sublinguals.....A. lunulatus lunulatus  
 1b. First pair of lower labials widely separated by the anterior sublinguals, with which the first 3 lower labials are usually in contact.....2
- 2a. Nasal usually divided; steel blue, usually with two yellow collars on nape, rarely uniform.....A. guentheri  
 2b. Nasal usually entire; red, brown or grey above with top of head black and a black nuchal collar, whitish below.....3
- 3a. Ventrals 129-190; subcaudals 30-63.....A. capensis  
 3b. Ventrals 108-123; subcaudals 20-35.....A. nigricens

Key to the genus *DASYPLITIS*

- All apical pits strongly pigmented, conspicuous; subcaudals in males 81-109, in females 71-80.....*D. medici medici*  
 Apical pits not strongly pigmented, inconspicuous; subcaudals in males 50-80, in females 45-65.....*D. scabra scabra*

## ELAPINE

## KEY TO THE GENERA

- 1a. Head short and snout broader than long; subcaudals less than 75 .....2  
 1b. Head long and narrow, snout longer than broad; subcaudals more than 90.....*Dendroaspis*  
 2a. Scales in 13 rows at midbody.....*Flapscoidea*  
 2b. Scales in 17-25 rows at midbody.....3  
 3a. Rostral very large, projecting laterally and shield-like.....*Aspidelaps (A. scutatus)*  
 3b. Rostral moderate, not projecting laterally.....4  
 4a. Dorsal scales strongly keeled; ventrals 116-150; subcaudals 33-47 .....*Hemachatus (H. haemachatus)*  
 4b. Dorsal scales smooth; ventrals 176-228; subcaudals 48-75.....5  
 5a. Dorsal scales oblique; largely terrestrial.....*Naja*  
 5b. Dorsal scales not oblique; aquatic.....*Boulengerina (B. annulata stormi)*

Key to the genus *ELAPSOIDEA*

- Juveniles with alternate light and dark bands of about equal width; adults dark grey above, immaculate white below; ventrals 162-181.....*E. sundevalli fitzsimonsi*  
 Juveniles with alternate light and dark bands of about equal width; adults with pairs of narrow white rings; ventrals 136-158.....*E. sundevalli guentheri*  
 Juveniles black with white bands which are half to a quarter the width of the interspaces; adults grey or black above, plumbeous to whitish below; ventrals 132-162.....*E. sundevalli decosteri*

Key to the genus *NAJA*

- 1a. Upper labials usually excluded from the orbit by suboculars.....2  
 1b. One or two upper labials entering the orbit.....3  
 2a. Scales in 19 (rarely 17 or 21) rows at midbody.....*N. haje annulifera*  
 2b. Scales in 17 (rarely 15 or 19) rows at midbody.....*N. haje anchistea*

- 3a. Sixth upper labial largest and in contact with the postoculars; a single preocular.....4
- 3b. Sixth upper labial not the largest, not in contact with the postoculars; two preoculars.....5
- 4a. Rostral about as broad as deep; internasals as long as the prefrontals; range South Africa to southern Bechuanaland.....N. nivan
- 4b. Rostral much broader than deep; internasals shorter than the prefrontals; range Zambia, Malawi, Mozambique, eastern Rhodesia.....N. melanoleuca
- 5a. Scales in 17-21 rows at midbody; black or dark grey above, lighter below, with a single broad dark band on the throat.....N. nigricollis crawshayi
- 5b. Scales in 21-27 rows at midbody; light grey or olive above, salmon pink below, with a series of irregular black bands or blotches on the throat.....N. mossambica mossambica

Key to the genus DENDROASPIS

- 1a. Scales in 21-25 rows at midbody; ventrals 242-282; inside of mouth blackish; light grey, olive or dark brown above.....D. polylepis polylepis
- 1b. Scales in 15-19 (rarely 21) rows at midbody; ventrals 201-235; inside of mouth whitish; green above.....2
- 2a. Temporals usually 2+3; uniform emerald green above; range eastern tropical lowlands.....D. angusticeps
- 2b. Upper temporals fused to form a single elongate shield, lower anterior temporal fused with an upper labial (usually 7th), lower posterior temporals usually fused with posterior upper labial; usually olive green above, each scale margined with black; range east Africa and swamp forests of Lake Bangweulu.....D. jamesoni jamesoni

## VIPERIDAE

## KEY TO THE GENERA

- 1a. Head much broader than neck and covered above with small keeled scales; pupil vertical.....3
- 1b. Head not or only slightly broader than neck and covered above with large symmetrical smooth shields; pupil round.....2
- 2a. Loreal present; eye moderate, separated from labials by suboculars; ventrals less than 160.....Causus
- 2b. Loreal absent; eye minute, bordered by two labials; ventrals more than 200.....Atractaspis

- 3a. Canthus rostralis poorly defined; habit robust; ventrals 117-147; subcaudals 16-37.....Bitis
- 3b. Canthus rostralis well defined; habit moderate; ventrals 142-162; subcaudals 32-52.....Atheris

Key to the genus ATRACTASPIS

- Midbody scale rows 21-25 (rarely 19); anal entire; subcaudals all single.....A. bibroni
- Midbody scale rows 19; anal entire or divided; proximal subcaudals (0-9) may be single, distal ones always paired.....A. congica congica

Key to the genus CAUSUS

- 1a. Snout obtuse and not turned up at the tip; ventrals 128-153; subcaudals 21-35.....?
- 1b. Snout pointed and turned up at the tip; ventrals 109-128; subcaudals 10-19.....C. defilippii
- 2a. Head narrow; usually a pair of narrow pale dorsolateral stripes present; ventrals in males 131-141, in females 128-140; range Angola, Katanga, western Zambia.....C. bilineatus
- 2b. Head broad; no pale dorsolateral stripes present; ventrals in males 135-150, in females 134-153; widespread.....C. rhombatus

Key to the genus BITIS

- 1a. Usually one or more pairs of erect horn-like scales on snout between the supranasals; flanks with well defined triangular markings.....2
- 1b. No erect horn-like scales on snout; flanks without well defined triangular markings.....3
- 2a. One pair of internasal horns, which are usually in contact mesially; head pale with a dark median stripe.....B. gabonica gabonica
- 2b. Two or three pairs of internasal horns, which are usually separated by small scales; head blue with a forward-pointing black arrow-head marking; habitat swamp forests (Lake Bangweulu).....B. nasicornis
- 3a. Scales in 29-41 rows at midbody; nostrils directed vertically upwards; adults usually 600-900 mm in length.....B. arietans arietans
- 3b. Scales in 23-33 rows at midbody; nostrils directed upwards and outwards; maximum length about 500 mm.....4
- 4a. Supraorbital region raised and bearing an erect horn-like scale; midbody scale rows 23-37; habitat arid regions.....B. caudalis
- 4b. Supraorbital region not raised, without "horns"; midbody scale rows 29-33; habitat montane grassland.....B. atropos atropos

## Key to the genus ATHERIS

- A large supraocular shield present; subcaudals 32-43, paired; tail not prehensile; habitat lowland swamps.....A. superciliaris
- No supraocular shield present; subcaudals 47-53, single; tail prehensile; habitat montane evergreen forest fringes.....A. nitschei rungweensis

## KEY TO THE FAMILIES

- 1a. Body limbless, vermiform, without visible eyes.....CASCILIIDAE  
 1b. Body with four limbs, not elongated, eyes normal.....2  
 2a. Tongue absent; three inner toes with black claws; eyes directed upwards.....PIPIDAE  
 2b. Tongue present; toes clawless; eyes directed laterally.....3  
 3a. Upper jaw with teeth or, if toothless, snout hardened for digging (*Hemisus*)..... RHANIDAE  
 3b. Upper jaw toothless, snout not very pointed and hardened for digging.....4  
 4a. Parotid glands usually present; no transverse folds on palate..... BUFONIDAE  
 4b. No parotid glands present; transverse folds present on palate..... MICROHYLIDAE

## CASCILIIDAE

Only one form recorded.....*Scolecophorus kirki kirki*

## PIPIDAE

Key to the genus *XENOPUS*

- 1a. Length of subocular tubercle at least half the diameter of the eye.....*X. muelleri*  
 1b. Length of subocular tubercle much less than half the diameter of the eye.....2  
 2a. Width of nostril divided by the internarial space gives a proportion of 0.8 or more.....*X. laevis laevis*  
 2b. Width of nostril divided by the internarial space gives a proportion of less than 0.8.....*X. laevis poweri*

## BUFONIDAE

Key to the genus *BUFO*

- 1a. Tarsal fold present.....2  
 1b. Tarsal fold absent.....8  
 2a. Throat not as granular as lower abdomen...*B. garispensis inyanga*  
 2b. Throat as granular as lower abdomen.....3  
 3a. Parotid glands present; no dorsolateral glandular ridge.....4  
 3b. Parotid glands absent; a prominent dorsolateral glandular ridge extends from tympanum to groin.....*B. carens*  
 4a. Snout pointed; parotid glands at least four times as long as broad; third toe very long.....*B. loumairei*  
 4b. Snout rounded; parotid glands less than four times as long as broad; third toe moderate.....5

- 5a. A light cross on head formed by a light interocular bar and a median stripe.....6
- 5b. No light cross on top of head.....7
- 6a. Parotid glands prominent and not obscured by dark-tipped warts...  
.....B. regularis
- 6b. Parotid glands flattened and obscured by dark-tipped warts.....  
.....B. pusillus
- 7a. Well defined maroon dorsal markings present, usually red  
infusions on upper part of thigh.....B. garmani
- 7b. Coloration uniformly dark; head very broad.....B. ngamiensis
- 8a. First finger shorter than second.....B. urunguensis
- 8b. First finger subequal to second.....9
- 9a. Skin of throat and snout not or only slightly granular.....  
.....B. vertebralis grindleyi
- 9b. Skin of throat and snout granular.....10
- 10a. Only one phalanx of third toe free of webbing.....B. anotis
- 10b. At least two phalanges of third toe free of webbing.....11
- 11a. Chest and abdomen not or hardly marked..B. vertebralis fenoulheti
- 11b. Chest and abdomen with distinct markings or flecking.....12
- 12a. A dark three-pronged marking on chest and abdomen; maximum  
size 32 mm.....B. taitanus taitanus
- 12b. Ventral markings consist of dark flecking.....13
- 13a. Ventral flecking brown to black; Adults 35-42 mm in length.....  
.....B. taitanus nyikae
- 13b. Ventral flecking grey; maximum length 24 mm.....  
.....B. taitanus beiranus

## MICRONYLIIDAE

## KEY TO THE GENERA

- 1a. Inner metatarsal tubercle massively developed, spade-like.....  
.....Breviceps
- 1b. Inner metatarsal tubercle weakly or moderately developed, not  
forming a sharp flange.....?
- 2a. Palms and soles covered with enlarged tubercles.....  
.....Probreviceps (P. "rhodesianus")
- 2b. Palms and soles smooth.....Phrynosomus

## Key to the genus BREVICEPS

- 1a. Outer finger very short, not extending beyond the subarticular  
tubercle of the adjacent finger; a pale spot above the vent....  
.....B. mossambicus poweri
- 1b. Outer finger extending well beyond the subarticular tubercle of  
the adjoining finger; no pale spot above the vent.....2

2a. Ventral region with paired pale blotches.....



- 2a. Vertebral region with paired pale blotches.....  
 .....B. mossambicus adspersus
- 2b. Vertebral region without paired pale blotches.....  
 .....B. mossambicus mossambicus

Key to the genus PHRYNOMERUS

- Tips of fingers expanded into truncated discs; vertebral region usually without pale spots.....P. bifasciatus bifasciatus
- Tips of fingers not or hardly expanded; vertebral region with pale spots.....P. affinis

RAUIDAE

KEY TO THE GENERA

- 1a. Upper jaw toothless; an interorbital groove on top of head connects posterior corners of eyes.....Hemisus (H. marmoratus)
- 1b. Upper jaw with teeth; no interorbital groove on top of head...2
- 2a. Last phalanx of fingers not placed out of linear alignment by an intercalary cartilage.....3
- 2b. Last phalanx of fingers placed out of linear alignment by an intercalary cartilage ("tree-frogs").....10
- 3a. Vomerine teeth present.....4
- 3b. Vomerine teeth absent.....7
- 4a. Outer metatarsals separated from rest of sole by a web; inner metatarsal tubercle not flanged.....5
- 4b. Outer metatarsals bound into the sole; inner metatarsal tubercle strongly flanged.....6
- 5a. Vomerine teeth abutting onto the anterior margins of the internal nares.....Ptychadena
- 5b. Vomerine teeth not abutting onto the anterior margins of the internal nares.....Rana
- 6a. Conspicuous longitudinal light and dark bands on the throat....  
 .....Hildebrandtia (H. e. ornata)
- 6b. No longitudinal banding on throat.....Pyxicephalus
- 7a. Toes webbed.....Phrynobatrachus
- 7b. Toes not webbed.....8
- 8a. A fine dorsal skin ridge running along vertebral line.....  
 .....Arthroleptis
- 8b. No vertebral skin ridge.....9
- 9a. Head narrow, width one-third the snout-vent length.....  
 .....Cacosternum (C. boettgeri)
- 9b. Head broad, width two-fifths the snout-vent length.....  
 .....Nothophryne (N. broadleyi)

- 10a. Outer metatarsals separated from rest of sole by a web.....  
 .....Ghiromantis (G. xerampelina)
- 10b. Outer metatarsals not separated from rest of sole.....11
- 11a. Digital discs present, or if absent, outer metatarsal tubercle  
 longer than inner toe.....12
- 11b. Digital discs absent; outer metatarsal tubercle shorter than  
 inner toe.....Rassina
- 12a. Armpit and groin with scarlet patches...Hylambates (H. maculatus)
- 12b. Armpit and groin without scarlet patches.....13
- 13a. Vomerine teeth present.....Leptopelis
- 13b. Vomerine teeth absent.....14
- 14a. Pupil vertical.....Africanus
- 14b. Pupil horizontal.....Hyperolius

Key to the genus PYXICERHALUS

- 1a. Lower jaw with three sharp bony cusps.....P. adspersus
- 1b. Lower jaw without bony cusps.....2
- 2a. Less than 2 phalanges of outer toe free of webbing..P. marmoratus
- 2b. 2 or more phalanges of outer toe free of webbing.....3
- 3a. Not more than 2 phalanges of third toe free of webbing.....  
 .....P. delalandei cryptotis
- 3b. More than 2 phalanges of third toe free of webbing.....4
- 4a. A light vertebral line present.....P. tuberculatus
- 4b. No light vertebral line present.....P. natalensis

Key to the genus RAHA

- 1a. Less than 3 phalanges of the fourth toe free of webbing.....2
- 1b. More than 3 phalanges of the fourth toe free of webbing.....6
- 2a. A conspicuous broad dark lateral band extending from snout to  
 groin.....8
- 2b. No conspicuous dark lateral band extending from snout to groin..3
- 3a. A light-coloured trans-occipital groove present....R. occipitalis
- 3b. No trans-occipital groove present.....4
- 4a. Tympanum more than half the diameter of the eye.....R. angolensis
- 4b. Tympanum less than half the diameter of the eye.....5
- 5a. Head width divided by tibia length gives a proportion of more  
 than 0.68; Mlanje Mountain.....R. johnstoni johnstoni
- 5b. Head width divided by tibia length gives a proportion of less  
 than 0.68; Inyanga Highlands.....R. johnstoni inyangae

- 6a. Length of foot less than the distance from tympanum to vent.....  
.....H. grayi rhodesiana
- 6b. Length of foot at least equal to distance from tympanum to vent  
.....7
- 7a. Head width divided by length of foot gives a proportion of not  
more than 0.43.....H. fasciata fasciata
- 7b. Head width divided by length of foot gives a proportion of not  
less than 0.43.....H. fasciata fuelleborni
- 8a. Dorsum uniform gold.....9
- 8b. Dorsum with a pair of broad light dorso-lateral stripes extending  
from eyelids to groin, intermediate zone darker, often with  
irregular dark blotches or a dark inner border to the dorsolateral  
stripes.....H. galamensis bravana
- 9a. Digits with discs.....H. albolabris lemairei
- 9b. Digits without discs.....H. darlingi

Key to the genus PTYCHADENA

- 1a. Two or more dark transverse bands running below vent; abdomen  
usually spotted.....P. subpunctata
- 1b. Not more than one dark band running below vent; abdomen not  
spotted.....2
- 2a. Less than 2 phalanges of fourth toe free of web.....3
- 2b. 2 or more phalanges of fourth toe free of web.....4
- 3a. Posterior face of thigh mottled; distance from nostril to tip of  
snout greater than the internarial distance.....P. oxyrhynchus
- 3b. Posterior face of thigh with longitudinal stripes; distance from  
nostril to tip of snout not greater than the internarial distance  
.....P. anchistae
- 4a. Length of foot (including metatarsal tubercle) more than half  
body length.....5
- 4b. Length of foot not more than half body length.....12
- 5a. Two phalanges of fourth toe free of web.....P. m. mascareniensis
- 5b. Three phalanges of fourth toe free of web.....6
- 6a. Posterior face of thigh with clearly contrasted continuous light  
and dark longitudinal stripes.....7
- 6b. Posterior face of thigh spotted or mottled, not with longitudinal  
stripes continuous along whole length of thigh.....10
- 7a. A prominent continuous dark line running almost from knee to  
knee along femurs below vent.....P. taeniocelis
- 7b. No distinct continuous dark line running transversely below vent  
.....8
- 8a. A rostral protuberance present.....P. keilingi
- 8b. No rostral protuberance present.....9

- 9a. Mid-dorsal pair of skin folds continuous from occiput to anal region.....P. grandisonae
- 9b. Mid-dorsal pair of skin folds interrupted or present only posteriorly.....P. chrysoaster guibei
- 10a. A light longitudinal line present on upper surface of tibia.....P. porosissima
- 10b. No light longitudinal line on upper surface of tibia.....11
- 11a. A pair of skin ridges present on snout just in front of eyes (usually continuous with paravertebral ridges), each ridge capped with a dark patch.....P. usungwensis
- 11b. Snout without skin ridges.....P. upembae upembae
- 12a. An outer metatarsal tubercle usually present, sometimes represented only by a white spot; usually a light vertebral band present.....P. mossambica
- 12b. No outer metatarsal tubercle or white spot present; no light vertebral band present.....P. floveri

Key to the genus PHRYNOBATRACHIS

- 1a. Third toe broadly webbed to base of discs.....P. perpalmatus
- 1b. Third toe with at least one phalanx free of webbing.....2
- 2a. One phalanx of outer toe free of webbing; tympanum usually distinct.....3
- 2b. Two or more phalanges of outer toe free of webbing; tympanum usually hidden.....5
- 3a. Tips of fingers and toes with small circular discs; usually a pair of conspicuous elongate skin glands in the scapular region.....P. acridoides
- 3b. Tips of fingers and toes without discs; no conspicuous elongate skin glands in the scapular region.....4
- 4a. Males with femoral glands and a clear transverse posterior fold to the gular pouch.....P. gutturocus
- 4b. Males without femoral glands or a transverse fold to the gular pouch.....P. natalensis
- 5a. A silvery streak below tympanum from eye to arm insertion; posterior quarter of abdomen with dark spots.....P. parvulus
- 5b. No silvery streak below tympanum from eye to arm insertion; posterior quarter of abdomen without dark spots.....6
- 6a. Tips of fingers and toes with discs.....P. ukingensis ukingensis
- 6b. Tips of fingers and toes without discs.....P. ukingensis mababiensis

Key to the genus *ARTHROLEPTIS*

- 1a. Metatarsal tubercle as long as or longer than the inner toe;  
first finger as long as or longer than the second .....  
.....*A. stenodactylus*
- 1b. Metatarsal tubercle shorter than inner toe; first finger  
usually shorter than second.....2
- 2a. Metatarsal tubercle not more than half length of inner toe;  
maximum length 27 mm .....3
- 2b. Metatarsal tubercle at least three-quarters length of inner toe;  
maximum length up to 50 mm.....5
- 3a. Tips of toes expanded, wider than subarticular tubercles.....4
- 3b. Tips of toes not wider than subarticular tubercles.....  
.....*A. troglodytes*
- 4a. Body slender; tips of digits expanded, bulbous, often terminat-  
ing in a tiny point; third finger of males not more than three  
times length of fourth finger...*A. xenodactyloides xenodactyloides*
- 4b. Body globular; tips of digits tapering or swollen, not terminat-  
ing in a point; third finger of males more than three times  
length of fourth finger...*A. xenodactyloides nyikae* or *A. globosa*
- 5a. Tips of digits expanded into discs; metatarsal tubercle three-  
quarters length of inner toe; maximum length 35 mm; habitat  
forests in Tanganyika and north Malawi.....*A. reichci*
- 5b. Tips of digits swollen, but not flattened; metatarsal tubercle  
almost as long as inner toe; maximum length 50 mm; habitat  
forests on Mlanje Mountain.....*A. adolfifriederici francoi*

Key to the genus *LEPTOPALIS*

- 1a. Webbing passing distal tubercle of outer toe....*L. flavomaculatus*
- 1b. Webbing not passing distal tubercle of outer toe.....2
- 2a. Tips of fingers with broad discs.....3
- 2b. Tips of fingers not broader than subarticular tubercles.....  
.....*L. bocagei*
- 3a. Tympanum almost as large as eye.....4
- 3b. Tympanum less than half the diameter of eye.....*L. angolensis*
- 4a. Dark dorsal markings broken up and linked with a dark inter-  
orbital bar.....*L. concolor*
- 4b. Dark marking on back not broken up, no dark interorbital bar....  
.....*L. viridis cinnamomeus*

Key to the genus *KASSINA*

- 1a. Dorsum spotted, but no spots in vertebral region; ventrum with  
a grey reticulate pattern.....*K. ingeri*
- 1b. Dorsum with vertebral and dorsolateral stripes, which may be  
broken up; ventrum immaculate.....

- 2a. Males with a straight transverse fold posterior to a short vocal sac; light dorsal bands each bisected by a narrow dark line; adults 20-22 mm in length.....K. wittei
- 2b. Males without a transverse fold posterior to a long vocal sac; light dorsal bands undivided; adults over 30 mm in length.....K. senegalensis

Key to the genus APIXIALUS

- 1a. Dorsum and outer surfaces of limbs covered with small black asperities.....2
- 1b. Back and limbs without small black asperities.....A. brachycnemis brachycnemis
- 2a. Broad dark mid-dorsal band unbroken.....A. fornasini fornasini
- 2b. Broad dark mid-dorsal band divided by a light vertebral stripe..  
.....A. wittei

Key to the genus HYPEROLIUS

NOTE: Because of polydichromatism and great intraspecific variation it is impossible to identify material with any confidence unless a good representative series of fresh specimens is available, even then comparative material is often required. Many forms in the H. narmoratus superspecies can only be positively identified if adult females are to hand. The following key can act only as a very rough guide and should be used with caution.

- 1a. Size small, not exceeding 25 mm; snout more or less pointed; usually green in life, with small dark dorsal spots or a dark lateral stripe.....2
- 1b. Size large, adults 28-38 mm; snout moderate or blunt.....5
- 2a. A broad black lateral band extends from nostril through eye to groin.....3
- 2b. No black lateral band present.....4
- 3a. Range western and northern Zambia, Angola.....H. quinquevittatus quinquevittatus
- 3b. Range Nyika Plateau .....H. quinquevittatus mertensi
- 4a. Snout projecting strongly beyond mouth.....H. nasutus nasutus
- 4b. Snout hardly extending beyond mouth.....H. pusillus
- 5a. Fourth toe with at least one phalanx free of web (or with a narrow seam extending to disc); snout not truncated.....6
- 5b. Fourth toe with less than half a phalanx free of web; snout truncated (H. narmoratus superspecies).....13
- 6a. A light V-shaped marking extending from snout to eyelids.....7
- 6b. No light V-shaped marking on snout.....8

- 7a. Light band on canthus often continues as a dorso-lateral band or series of spots, but no light spots in the middle of the back...  
..... H. unspicatus
- 7b. Light band on canthus rarely continues posteriorly, but large irregular light spots present in the middle of the back .....  
..... H. argus 99
- 8a. A dark interorbital triangular marking has its apex pointing posteriorly and connecting with a dark more or less pentagonal patch ..... H. tuberculatus (part)
- 8b. No such dorsal markings ..... 9
- 9a. Dorsum brown; range highlands or plateau areas of Central Africa ..... 10
- 9b. Dorsum green; range - tropical lowlands of East Africa ..... 11
- 10a. Dorsum uniform light brown; range northern Zambia to Angola ...  
..... H. bocourti
- 10b. Dorsum dark brown, often with light longitudinal stripes; range - Nyika Plateau to SW Tanganyika..... H. pictus
- 11a. Canthus rostralis prominent; no dorsal markings ..... 12
- 11b. Canthus rostralis rounded; with or without small dark spots and a dark line on the canthus; with or without a pale line running from snout to groin ..... H. argus 88
- 12a. A broken dark lateral stripe extending from nostril through eye and onto flank; Lake Tanganyika region ..... H. kivuensis
- 12b. No dark lateral stripe present; Mozambique Plain .....  
..... H. tuberculatus
- 13a. Brownish or yellow, with or without a dark line on canthus and continuing as a dorso-lateral stripe ..... 26
- 13b. Dorsum with a more distinct pattern ..... 14
- 14a. Dorsum uniform brown, sometimes with a black margin .....  
..... H. m. marginatus (part)
- 14b. Dorsum striped, spotted or marbled ..... 15
- 15a. Dorsum striped ..... 16
- 15b. Dorsum spotted or marbled ..... 20
- 16a. Five white longitudinal stripes, subequal in width to dark intervening stripes ..... H. m. taeniatus (part)
- 16b. Three white longitudinal stripes, much narrower than the intervening dark bands ..... 17

- 17a. White stripes usually regular; range - Rhodesia, Malawi and Mozambique ..... 18
- 17b. White stripes irregular and branching; range north and west Zambia ..... H. m. melanoleucus (part)
- 18a. White stripes with red axes; range - Rhodesia and adjoining Mozambique ..... H. m. broadleyi (part)
- 18b. White stripes without red axes ..... 19
- 19a. Lateral stripes continuous; range - southern Malawi and adjoining Mozambique ..... H. m. albofasciatus (part)
- 19b. Lateral stripes sometimes broken up; range northern Zambia ..... H. m. argentovittis (part)
- 20a. Dorsum spotted ..... 21
- 20b. Dorsum marbled or variegated ..... 23
- 21a. Dorsum pale with darker spots ..... 22
- 21b. Dorsum dark with pale spots ..... H. m. argentovittis (part)
- 22a. Numerous large symmetrical gray (lime green in life) blotches on back and limbs; range - north-west Rhodesia ..... H. m. rhodesianus (part)
- 22b. Irregular black spots or blotches on back, but rarely on limbs; range northern shores of Lake Malawi ..... H. m. nyassae (part)
- 23a. Vague grey speckling, mottling or variegation on a yellow or orange ground; ventrum uniform white; range south-eastern Rhodesia ..... H. swynnertoni (part)
- 23b. Well defined red, black or brown markings; ventrum often with red markings; range Zambia and Bechuanaland ..... 24
- 24a. Dorsum largely maroon, with a light vertebral band and two lateral rows of light spots, or with fine light variegation or stippling; range western Barotseland and northern Bechuanaland ..... H. m. angolensis (part)
- 24b. Dorsum not largely maroon; proportions of light and dark coloration about equal ..... 25
- 25a. Dorsal markings red, lateral surfaces of limbs with small black spots ..... H. m. alborufus (part)
- 25b. Dorsal markings brown to black, lateral surfaces of limbs without small black spots ..... H. m. aposomaticus (part)
- 26a. Ventrums with a red network ..... H. m. nyrhodictyon
- 26b. Ventrums without a red network ..... H. swynnertoni (part),  
H. m. rhodescolis and H. sarmoratus subsp. (part)



SYSTEMATIC DISCUSSION.

Class      REPTILIA  
Order      TESTUDINATA  
Suborder   CRYPTODIRA  
Family     TESTUDINIDAE

Genus   TESTUDO   Linnaeus

Testudo Linnaeus, 1758, Syst. Nat. ed. 10, 1, p. 197. Type (designation by Fitzinger): Testudo graeca Linnaeus.

Geochelone Fitzinger, 1835, Ann. Wiener Mus., 1, pp. 108, 112, 122 (as a subgenus). Type by original designation: Testudo stellata Schweigger = T. elegans Schöppf.

Psemmobates Fitzinger, 1835, Ann. Wiener Mus., 1, pp. 108, 133, 122. Type: Testudo geometrica Linnaeus (designation by Fitzinger, 1843, Syst. Rept., part 1, p. 29.)

Loveridge and Williams (1957) treated Geochelone and Psemmobates as full genera, but Loveridge (1957) and Wermuth & Mertens (1961) relegate them to subgeneric rank.

TESTUDO PARDALIS BARCOCKI Loveridge

Testudo pardalis (not Bell) Peters, 1882, p. 2 (Sena, Tete); Bocage, 1896, p. 97; Boulenger 1907a, p. 6 (Luangwa River; Petauke); Chubb, 1909a, p. 592 and 1909b, p. 34 (Gwanayaya River); Pittman, 1934, p. 307; FitzSimons, 1935b, p. 303 (Gembok; Maun; Shorobe; Shaleshonto; Tsot soroga; Makarikari) and 1939b, p. 18 (Birshenough Bridge); Mitchell, 1946, p. 20.

Testudo pardalis barcocki Loveridge, 1935, Bull. Mus. Comp. Zool., 72, p. 4: Mount Debasiem, Uganda and 1953, p. 158 (Tete); Broadley, 1962, p. 791.

Geochelone pardalis barcocki Loveridge & Williams, 1957, p. 235.

54 specimens examined from: BECHUANALAND. Mahalapye; 5 mi N. of Nata. RHODESIA. Balla Balla; Gekwe District; Gonderowe Falls; Gwaii Bridge; Kapaxi; Kariba Lake (Sanyati Confluence); Rupisi Hot Springs; Sabi-Macheke Confluence; Tuli. ZAMBIA. Chipangali; Kariba Lake (Isafala Confluence).

Literature Records: BECHUANALAND. Gembok; Mahalapye; Makarikari; Maun; Serowe; Shaleshonto; Shorobe; Tsotsoroga Pan. RHODESIA. Birshenough Bridge; Gwanayaya River; Mount Darwin. ZAMBIA. Luangwa River; Petauke. MALAWI. Tengani. MOZAMBIQUE. Cabo Delgado Islands; Sena; Tete.

Variation. Vertebrae 5 (rarely 6); costals 4 (rarely 5); marginals 11 (rarely 10 or 12); supracaudal single.

Coloration. Very variable. Subadult specimens are often strongly marked with black while adults are more or less uniform yellow.

Size. Largest ♀ (QVM, mounted - Golwe District) 358 mm. in carapace length.

Breeding. The eggs of this species are spherical and 5 to 30 may be laid at one time (Loveridge & Williams, 1957). Wilson noted 5 laid by a specimen at Fort Jameson on 23rd June.

Diet. This species is vegetarian and feeds largely on grass, supplemented with succulents and fruit when available. Small bones are broken up and eaten.

Parasites. Ticks (Amblyomma exornatum) are sometimes present on the limbs.

Enemies. The most important predator on the Leopard Tortoise is undoubtedly Homo sapiens, who is responsible for its scarcity in heavily populated areas. The Bushmen use the carapace as a receptacle (Fitz-Simons, 1935b).

Habitat. In south-east Africa this species is most plentiful in dry country, especially the major river valleys, but it does not seem to be common on the Mozambique Plain.

Distribution. Sudan and Ethiopia, south to Natal, northern Cape Province and South West Africa.

#### TESTUDO OCULIFERA Kuhl.

Testudo oculifera Kuhl, 1820, Beitr. Zool. Anat., pp. 77: Cape; Siebenrock, 1910, Sitzber. K. Akad. Wiss. Wien., 119, p. 704 (Kamelalip, S. Kalahari); Werner, 1910, Jena Denkschr. 16, p. 301 (Koca; Lehututu-Kang; Mookane; Vlei Topan, Kalahari). Fitz-Simons, 1935b, p. 304 (Gomodimo; Kaotwe; Gembok; Makarikari). Psammobates oculifer Loveridge & Williams, 1957, p. 315.

5 specimens examined from BECHUANALAND. Lephepe; 5 mls. N and 10 mls. W. of Nata; Serowe; Sherebe.

Literature Records: BECHUANALAND; Gembok; Gomodimo; Kamelalip; Kaotwe; Koca; Ngani Lake; Lehututu to Kang; Makarikari; Mookane; Palapye Road; Serowe (U.S.N.M.); Vlei Topan.

Variation. Vertebrae 5; costals 4; marginals 10-11; supracaudal single.

Size. Largest ♀ (UM 9823 - 10 mls. W of Nata) 106 mm. in carapace length. Bechuanaland specimens are apparently smaller in average size than southern populations. Fitz-Simons (1935a) records a ♂ of 118 mm. and a ♀ of 133 mm. taken together between Schmidtsdrift and Kimberley.

Diet. One captive specimen at Untali was seen to catch and devour grasshoppers.

Enemies. Bushmen eat many of these tortoises and use the shells as snuff boxes. UM 9784 is a juvenile found in the crop of a Secretary Bird (Sagittarius serpentarius)

Habitat. Dry thornbush and grass savanna.

Distribution. South-West Africa and Bechuanaland, extending into western Transvaal and Orange Free State and the Karroo areas of the Cape Province.

Genus KINIXYS Bell

Kinixys Bell, 1827, Trans. Linn. Soc. London, 15, p. 398: Type by original designation: K. caucanus Bell = Testudo gross Schweigger.

KINIXYS BELLIANA BELLIANA Gray

- Kinixys belliana Gray, 1831, Synopsis Reptilium, p. 69: No locality; Pitman, 1934, p. 307; FitzSimons, 1939b, p. 18 (Hot Springs; Mount Silinda; Changadai River; Birchough Bridge).
- Kinixys belliana Peters, 1882, p. 5 (Nossuril; Inhambane; Baror; Sena; Tete); Booge, 1896, p. 97; Boulenger 1907a, p. 6 (Petumbo); 1907b, p. 482 (Beira); Chubb, 1909a, p. 592 and 1909b, p. 34 (Essexvale; Shangani River); Cott, 1935, p. 972 (Gharre; Gaia; Amotongas).
- Homonis darlingi Boulenger, 1902, Proc. Zool. Soc. London, 2, p. 15, pl. iv: Salisbury District, Rhodesia.
- Kinixys lobatiana Power, 1927, Trans. Roy. Soc. S. Africa, 14, p. 410, pls. xix-xx: Lobatse, Bechuanaland.
- Kinixys belliana zombensis Hewitt, 1931, Ann. Natal Mus., 6, p. 469, fig. 1c, pl. xxviii, fig. 4: Zomba, Malawi.
- Kinixys jordani Hewitt, 1931, Ann. Natal Mus., 6, p. 481, pl. xxxvii, figs. 7-9: Isoka, Zambia; Pitman, 1934, p. 307 (Broken Hill).
- Kinixys youngi Hewitt, 1931, Ann. Natal Mus., 6, p. 486, fig. 1d, pl. xxxvii, figs. 4-5: Shore of Lake Nyasa below Livingstonia, Malawi.
- Kinixys australis nababiensis FitzSimons, 1932, Ann. Trl. Mus., 15, p. 37: Tetsoroga Pan, Nababe Flats, Bechuanaland and 1935b, p. 302.
- Kinixys darlingi Pitman, 1934, p. 307 (Broken Hill).
- Kinixys zombensis Mitchell, 1946, p. 19.
- Kinixys belliana belliana Loveridge, 1953a, p. 158 (Malawi localities); and 1953b, p. 140 (Lake Chilwa); Laurent, 1956, p. 29 (Abercorn); Loveridge & Williams, 1957, p. 384; Broadley, 1962, p. 791; Laurent, 1962, p. 5, (Cholo Mountain; Mt. Mada; Isoka; Birchough Bridge; Bulawayo; Hot Springs; Lumane; Mount Silinda; Untali; Abercorn).

70 specimens examined from: RHODESIA. Bulawayo; Gashel; Heathfield; Irisvale; 5 mls. SE of Kapari; Kariba Lake (Sanyati Confluence); Karoi; Mkota Reserve; 6 mls W and 15 mls. NE of Mtoko; Muriel Mine; Shangani River; Salisbury; 20 mls. SE of Tjolotjo; Untali. ZAMBIA. Chipangali; Dimba; Kariba Lake (Luafula Confluence); Kasusu; Livingstone; Siantamba. MALAWI. Blantyre; Fort Johnston; Rumpi; Shire Valley near Zomba. MOZAMBIQUE. 8 mls. NE of Inhaminga; Mhanda Mountain.

Literature records. BECHUANALAND. Lobatse; Tsotsaroga Pan. RHODESIA. Birchborough Bridge; Bulawayo; Changadzi River; Esservale; Hot Springs (Melsetter); Lumane; Marandillas-Untali; Masoe; Salisbury; Sandown; Mount Silinda; Shangani River; Untali; Unsilime River. ZAMBIA. Abercorn; Broken Hill; Isaka; Petauka. MALAWI. Chibotela; Chilwawa; Chilwa Lake; Chiremo; Chitala River; Cholo Mountain; Fort Johnston; Likangala; Livingstonia; Monkey Bay; Npimpi; Mtimbaka; Port Herald; Zomba. MOZAMBIQUE. Amatongas; Beira; Boror; Gaia; Charre; Inhambane; Lumbo; Mowuril; Sena; Tete.

Variation. Vertebrae 5 (rarely 6); costals 4 (rarely 3 or 5); marginals 11 (rarely 12); supracaudal single; 5 claws on forefoot. Pectoral suture is 25 to 54% of abdominal suture. Eastern specimens have deep shells with the highest point posteriorly - this type was described by Hewitt (1931) under the names nombensis and suluensis. Western specimens tend to have more depressed shells - the "spekii" type of Lovridge & Williams (1957). I have not seen any specimens with a pronounced anterior "hump" on the carapace as in the types of jordanii (Hewitt, 1931).

Coloration. Very variable. Females and juveniles are usually more strongly marked than adult males. Eastern specimens are often handsomely marked with black.

Size. Largest ♂ (MZ. 50314 - Mtimbaka) 190 mm; Largest ♀ (QVM, mounted - Untali) 217 mm. in carapace length.

Diet. Omnivorous. Millipedes are chased and devoured greedily and snails (Achatina) are eaten after their shells have been broken. This species is a great scavenger; bones and dried corpses of frogs and other small vertebrates are eaten. Succulents and fungi (Power, 1927c; Mitchell, 1946) are sought out and devoured with relish.

Habitat. Widespread and common in savanna, but scarce in arid areas. Apparently absent from montane grassland above 5,000 feet.

Distribution. Sudan and Eritrea south to Natal, Transvaal and Bechuanaland.

Genus CYCLODERMA Peters

Cycloderma Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 216. Type by original designation: Cycloderma frenatum Peters.

Aspidochelys Gray, 1860 Proc. Zool. Soc. London, p. 6. Type:

A. livingstonii Gray = C. frenatum Peters.

CYCLODERMA FRENATUM Peters.

Cycloderma frenatum Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 216; Zambesi River, Mozambique; 1882, p. 14, pls. 1-iii; Gunther, 1894, p. 618; Bocage, 1896, p. 97; Mitchell, 1946, pp 21, 41; Loveridge, 1953, p. 160 (Mtinkaka; Chowe); Loveridge & Williams, 1957, p. 459; Broadley, 1962, p. 791.

Aspidochelys livingstonii Gray, 1860, Proc. Zool. Soc. London, p. 6, pl. xcii, figs. 1-2. Tributaries of the Zambesi River, Mozambique.

4 specimens examined from RHODESIA. Sabi-Lundi Confluence.

MOZAMBIQUE. Zambesi River near Tete.

Literature Records. MALAWI: Chowe; Mtinkaka; Fort Johnston.

MOZAMBIQUE: Lake Inhambane near Tete; Licuare River; Zambesi River near Tete.

Size. Largest ♂ (UM 10339 - Zambesi River) 500 mm. in carapace length.

Diet. In Lake Malawi, aquatic snails and mussels (Mitchell, 1946).

Distribution. Southern Tanganyika, Malawi (Lake Malawi and Shire River), to Mozambique as far south as the Save River and S.E. Rhodesia. The occurrence of this species in the Sabi-Lundi system has been discussed by Broadley (1962). The Zambesi River formerly entered the sea near Beira and shares its fish fauna with the Pungwe, Buzi and Sabi-Lundi systems.

Family CHELONIIDAE

Genus CHELONIA Brongniart

Chelonia Brongniart (part), 1800, Bull. Soc. Philos. Paris, 2, p. 89

CHELONIA MYDAS (Linnaeus)

Testudo mydas Linnaeus, 1758, Syst. Nat. ed. 10, 1, p. 197: Ascension Island.

Chelonia mydas Peters, 1882, p. 18; (Mozambique Island; Querimba Islands). Bocage, 1896, p. 97; Loveridge & Williams, 1957, p. 474 (Revision).

One specimen examined from MOZAMBIQUE: Cabaceira Peninsula.

Literature Records. MOZAMBIQUE: Mozambique Island; Querimba Islands.

Distribution. All African coasts, known to resort to Zululand beaches for egg laying, so probably breeds on the Mozambique coast also.

Genus *ERETMOCHELYS* Fitzinger

*Eretmochelys* Fitzinger, 1843, Syst. Rept. p. 30. Type by original designation: *Testudo imbricata* Linnaeus.

*ERETMOCHELYS IMBRICATA* (Linnaeus)

*Testudo imbricata* Linnaeus, 1766, Syst. Nat., ed. 12, 1, p. 350: American and Asiatic seas.

*Chelonia imbricata* Peters, 1862, p. 17, (Mozambique Island; Querimba Island); Bocage, 1896, p. 97.

*Eretmochelys imbricata* Loveridge & Williams, 1957, p. 485.

None examined.

Literature Records. MOZAMBIQUE: Cape Delgado; Mozambique; Querimba Island.

Distribution. Coasts of East, South and West Africa.

Genus *CARETTA* Rafinesque

*Caretta* Rafinesque, 1814, Specchio Sci. (Palermo), 2, 9, p. 66. Type: *C. nasuta* Rafinesque = *Testudo caretta* Linnaeus (by monotypy).

*CARETTA CARETTA* Linnaeus

*Testudo Caretta* Linnaeus, 1758, Syst. Nat., ed. 10, 1, p. 197: Islands off America.

*Caretta caretta* Loveridge & Williams, 1957, p. 490. (Inhambane).

One specimen examined from MOZAMBIQUE: Beira.

Literature Records. MOZAMBIQUE: Inhambane.

Data. Vertebrae 5; costals 5-6; marginals 12; supracaudals 2; intergular absent; inframarginals 3.

Distribution. All African coasts.

Family *DERMOCHELYIDAE*

Genus *DERMOCHELYS* Blainville

*Dermochelys* Blainville, 1816, Bull. Soc. Philom. Paris, p. 119. Type: *Testudo coriacea* Linnaeus (by monotypy in Cuvier, 1829).

*DERMOCHELYS CORIACEA* (Linnaeus)

*Testudo coriacea* Linnaeus, 1766, Syst. Nat. ed. 12, 1, p. 350: Mediterranean Sea.

Although there are no records of this turtle from the Mozambique coast, it breeds on the Zululand beaches south of Kosi Bay. It certainly occurs in Mozambique waters.

Distribution. All African coasts.

Family PELOMEDUSIDAE

Genus PELOMEDUSA Wagler.

Pelomedusa Wagler, 1830, Syst. Nat. Amphib., p. 136. Type: Testudo galeata Schaeffer = T. subrufa Lacépède.

PELOMEDUSA SUBRUFÆ (Lacépède)

Testudo subrufa Lacépède, 1789, Hist. nat. Quadrup. ovip. Serpens, 2. Synopsis methodica.

Pelomedusa galeata Peters, 1882, p. 6 (Querimba; Lumbo; Quelimane; Tete); Bocage, 1896, p. 97; Pitman, 1934, p. 307; FitzSimons, 1935b, p. 307 (Metsimaklaba River; Kuke-Gomodimo; Gomodimo; Zweiswe River; N'Kate Pan; Hewitt, 1935, p. 325; FitzSimons, 1939b, p. 20 (Birchenough Bridge).

Pelomedusa subrufa subrufa Loveridge, 1941, p. 470 and 1953, p. 162 (Lirangwe near Blantyre).

Pelomedusa subrufa Broadley, 1962, p. 791.

40 specimens examined from: BECHUANALAND. 15 mls. E of Lake Dow. RHODESIA. 3 mls. S of Antelope Mine; Bulawayo; Eagle Vulture Mine; 5 mls. S of Kasungula; Plumtree. ZAMBIA. Kalikali Dam; Kalabo; Nakalombwe. MALAWI. Fort Johnston.

Literature Records. BECHUANALAND; Gomodimo Pan; Gomodimo to Kuke; Lobatse; Metsimaklaba River; N'Kate Pan; Zweiswe River. RHODESIA; Birchenough Bridge. MALAWI; Livingstonia near Blantyre. MOZAMBIQUE; Lumbo; Quelimane; Querimba; Tete.

Variation. Vertebrae 5; costals 4 (rarely 5); marginals 11 (rarely 12); supracaudals 2; pectorals in contact (separated in the Kalikali hatchling).

Size. Largest (NSR. 2629 - Nakalombwe, Zambia) 170 mm. in carapace length.

Breeding. A female was found under a dried cow skin 10 mls E. of Lake Dow, Bechuanaland. She held 14 eggs measuring 27 x 17 mm. on 22.xi.64. (R. E. Pletts).

Habitat. Generally found in temporary pans and ponds. Buries itself in the mud during the dry season.

Distribution. Sudan south to the Cape and west to Senegal (savannas). Madagascar.

Genus PELUSIOS Wagler

Pelusios Wagler, 1830, Nat. Syst. Amphib. p. 137. Type: Testudo subnigra Lacépède.

## PELUSIOS NANUS Laurent

Pelusios nanus Laurent, 1956, Ann. Mus. Congo, Zool., 48, p. 31, pl. iv, figs. 2-4: Dilolo, Katanga.

One specimen examined from: ZAMBIA. Chambeshi-Lukulu Confluence.

Data. Vertebrae 5; costals 4; marginals 11; supracaudals 2. Abdominal suture 49.2% of length of anterior lobe of plastron; head width 52.9% of abdomino-femoral suture; humeral + pectoral sutures 121.4% of intergular length; abdomino-femoral suture 81.0% of pectoro-abdominal suture.

Size. (NHR. 3998 - Chambeshi-Lukulu Confluence) 75 mm. in carapace length.

Distribution. Angola, southern Congo (Kasai, Katanga) and northern Zambia (Bangweulu drainage).

## PELUSIOS CASTANEUS CASTANEUS (Schweigger)

Emys castaneus Schweigger, 1814, Prodrromi Mon. Chelon., p. 45: No locality (? Madagascar).

Pelusios nigricans castanoides Hewitt, 1931, Ann. Natal Mus., 6, p. 463, pl. xxxvi, figs. 1-2: Richards' Bay, Zululand.

? Sternotherus derbians (not Gray) Cott, 1935, p. 973 (Gharre; Beira).

Pelusios subniger (part, not Lacepede) Loveridge, 1941, p. 489 and 1953, p. 162 (Chibotela).

3 specimens examined from: MALAWI. Chibotela (A.M.N.H.). MOZAMBIQUE. Inhaca Island (I.B.H.). One without locality data.

Variation. Abdominal suture 57.8-78.2% of length of anterior lobe of plastron; head width 46.0% of abdomino-femoral suture; humeral + pectoral suture 107.5-135.1% of intergular length; abdomino-femoral suture 85.5 - 90.1% of pectoro-abdominal suture.

Remarks. Laurent (1965b) has discussed the variation in this species. The limited material available supports the recognition of a central African race, but a good series from the Mozambique Plain and the continental islands is needed to clarify the relationship between the East African terrapins and those on Madagascar and the Seychelles.

Size. Largest (UM 8997 - without locality data) 243 mm. in carapace length.

Coloration. Carapace yellowish or reddish brown; plastron uniform yellow.

Distribution. East African coastal plain from Kenya south to Zululand, the continental islands, also Madagascar and Seychelles.



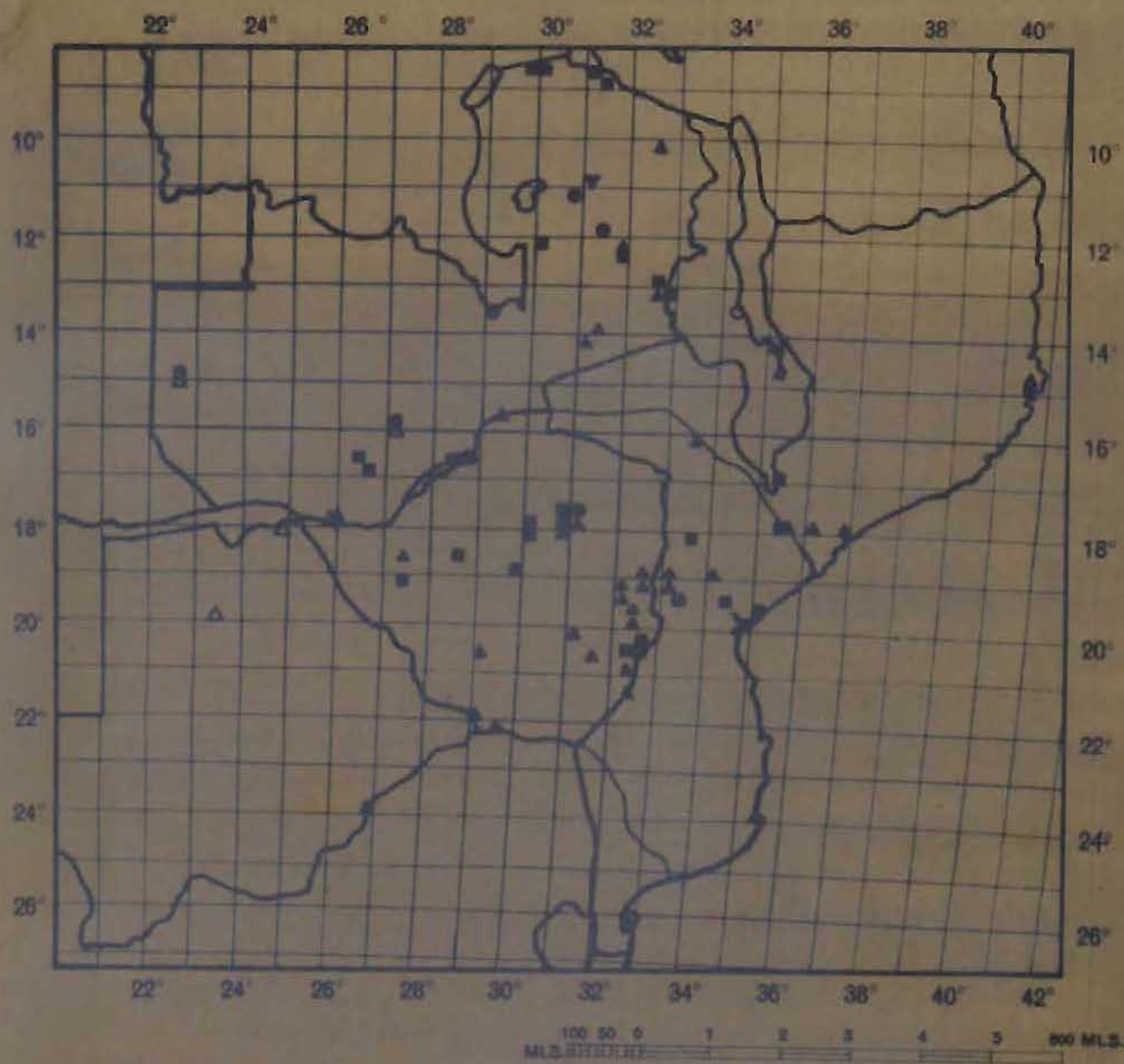


Fig. 2. Distribution of the genus *Pelusios*.

- $\nabla$  *Pelusios namae* Laurent
- $\circ$  *Pelusios castaneus castaneus* (Schweigger)
- $\bullet$  *Pelusios castaneus rhodesianus* Hewitt
- $\Delta$  *Pelusios bechuanicus* FitzSimons
- $\blacksquare$  *Pelusios subniger* (Jacépède)
- $\star$  *Pelusios sinuatus* (A. Smith)

*PELUSIOS GASTANUS RHODESIANUS* Hewitt

*Sternotherus nigriscus* (not Desmoulin) Boulenger, 1907a, p. 6 (part, Msofu River).

*Pelusios nigriscus rhodesianus* Hewitt, 1927, Rec. Albany Mus., p. 375, figs. 1a, 1b, pl. xxvi, figs. 2-3: Mpika District, Zambia; Loveridge, 1933, p. 210 (Nyankolo); Pitman, 1934, p. 307 (Chambeshi River).

*Pelusios subniger* (part, not Lacépède) Loveridge, 1941, p. 489.

*Pelusios castaneus rhodesianus* Laurent, 1965, p. 30 (Nyankolo).

17 specimens examined from: RHODESIA. Salisbury District; Umansidale (Salisbury); Umalilwa River. ZAMBIA. Kalabo; Lochinvar. MOZAMBIQUE. Zembe.

Literature Records. ZAMBIA. Chambeshi River; Mpika District; Msofu River; Nyankolo.

Variation. Abdominal suture 59.3 (hatchling) - 89.4% of length anterior lobe of plastron; head width 32.0-45.9% of abdomino-femoral suture; humeral + pectoral suture 103.1 - 170.0 (hatchling)% of intergular length; abdomino-femoral suture 86.6 - 97.6% of pectoro-abdominal suture.

Coloration. Carapace black; plastron entirely black, more often with irregular patches of yellow, sometimes largely yellow.

Size. Largest (MSR, 2627 - Lochinvar, Zambia) 210 mm. in carapace length.

Habitat. Swamps and dams.

Distribution. Lower Congo and Angola east to southern Kivu, Ruanda, Urundi, western Tanganyika, Zambia, south to Rhodesia and western Mozambique.

*PELUSIOS BECHUANENSIS* FitzSimons.

*Pelusios bechuanensis* FitzSimons, 1932, Ann. Tvl. Mus., 15, p. 37: Thama-lalane River at Nam, Bechuanaland.

*Pelusios subniger* (part, not Lacépède) Loveridge, 1941, p. 489.

7 specimens examined from: BECHUANALAND. Chobe River. ZAMBIA. Kalabo; Livingstone; Lochinvar; Upper Zambezi.

Variation. Abdominal suture 50.7-93.8% length of anterior lobe of plastron; head 52.2 - 59.4% of abdomino-femoral suture; humeral + pectoral suture 108.3-118.6% of intergular length; abdomino-femoral suture 80.8-91.9% of pectoro-abdominal suture.

Coloration. The yellow markings on the head are well marked on all specimens examined and these, together with the enormous size of the head, are the best diagnostic features of the species. Carapace and plastron black.

Size. Largest (UH, 761 - Lochinvar, Zambia) 265 mm.

**Habitat.** Rivers and swamps. Specimens were seen basking on exposed rocks in the Thamalakane River (FitzSimons, 1935b). This species is definitely sympatric with *Pelusica e. rhodesianus* in Barotseland and on the Kafue Flats.

**Distribution.** Upper Zambesi basin (Angola, Barotseland, Caprivi and northern Bechuanaland); Okavango Basin; Kafue Flats.

*PELUSICA SUBNIGRA* (Lacépède)

*Testudo subnigra* Lacépède, 1789, Hist. nat. Quadrup. ovip. Serpens, 2, Synopsis methodica.

*Sternotherus subniger* Gunther, 1864, p. 306.

*Sternotherus nigricans* Peters, 1882, p. 8 (Mossuril); Bocage, 1896, p. 97; Boulenger, 1907a, p. 6 (part, near Chivali's); 1907b, p. 482 (Beira); Chubb, 1909a, p. 592 and 1909b, p. 34 (Gwamyaya River; Gwelo River); Cott, 1935, p. 973 (Cala).

*Pelusica nigricans* Fitzman, 1934, p. 307 (part, Chivali's; Lulimala River; Mnyamadai River).

*Pelusica subniger* Loveridge, 1941, p. 489 (part) and 1953, p. 162 (part, Port Herald); Laurent, 1956, p. 37 (Kalusa; Abercorn; Buleya; Mweru-wantipa); Broadley, 1962, p. 792.

25 specimens examined from: RHODESIA. Hartley; Kariba Lake; Mazos; Ngamo Pan; Que Que; Sabi Experimental Station; 10 mls. W of Salisbury. ZAMBIA. Bilibili Hot Springs; 90 mls. N of Fort Jameson; Kalikali Dam; Kariba Lake (Lusafala Confluence); Mvesi Stream (Kalomo). MOZAMBIQUE. Beira; Mhanda Mountain (foot); Mada; Savane.

**Literature records:** RHODESIA. Gwamyaya River; Gwelo River. ZAMBIA. Abercorn; Buleya; Chivali's; Kalusa; Lulimala River; Mnyamadai River; Mweru-wantipa. MALAWI. Port Herald. MOZAMBIQUE. Beira; Cala; Mossuril.

**Variation.** Abdominal suture 60.0 (hatchling) - 87.1% of length anterior lobe of plastron; head width 46.1-72.7% (hatchling) abscissa-femoral suture; humeral + pectoral suture 60.0-107.7% of intergular length; abscissa-femoral suture 66.0 (hatchling) - 86.3% of pectoro-abdominal suture.

**Coloration.** Carapace brown; plastron yellow and brown, each plate light in the centre, becoming darker towards the sutures.

**Size.** Largest (UM. 3181 - Hartley, Rhodesia) 172 mm. in carapace length.

**Habitat.** Common in swamps around Beira. Taken in pans and small dams in Rhodesia. Kariba specimens are from small pools and tributaries, not from the Zambesi River.

**Distribution.** Ethiopia south to Mozambique and the Transvaal, west to Katanga, Zambia and Rhodesia. Madagascar, Seychelles and Mauritius.

## PELUSIOS SINUATUS (A. Smith)

Sternotherus sinuatus A. Smith, 1838, Ill. Zool. S. Africa, Rept., pl. i: "In rivers to the north of 25°S, South Africa"; Peters, 1882, p. 8 (Inhambane; Quelimane; Boror; Mossuril; Tete); Gunther, 1894, p. 618; Bocage, 1896, p. 97; Boulenger, 1907a, p. 6 (Petauke).

Pelusios sinuatus leptus Hewitt, 1933, Occ. Papers Nat. Mus. S. Rhodesia, l. p. 45, pl. ix, figs 1-2: Isoka, Zambia; Pitman 1934, p. 307 (Mnyamadzi River).

Pelusios sinuatus Loveridge, 1941, p. 502 and 1953, p. 163 (Mtimbuka); Broadley, 1962, p. 792.

33 specimens examined from: RHODESIA. Chimwara Ranch; Hot Springs (Malsotter); Irisvale; Kariba Lake; Kyle Lake; Lake MacIlwaine; Limpopo River (22°03'S. 29°30'E); Mana Pools; Maranka Reserve; Musasvi River; Nyamashatu River; Old Untali; Ruware; Sabi-Lundi Confluence; Sabi-Fsungwezi Confluence; 8 mls. S of Tuli. ZAMBIA. Chipangali; Kalikali Dam; Kifuwe; Songwe. MALAWI. Lake Malawi near Fort Johnston; Lake Maloube. MOZAMBIQUE. Ghemesi; Chicamba Dam; Pungwe River.

Literature Records. BECHUANALAND. Botwani-Limpopo Confluence. RHODESIA. Birchencough Bridge; Mount Silinda; Salisbury. ZAMBIA. Isoka; Mnyamadzi River; Petauke. MALAWI. Mtimbuka. MOZAMBIQUE. Boror; Inhambane; Mossuril; Quelimane; Tete.

Variation. Abdominal suture 75.0-110.0% of length anterior lobe of plastron.

Size. Largest (NHR. 4851 - Lake Nyasa) 380 mm. in carapace length.

Enemies. Specimens have been found in the stomachs of crocodiles from the Limpopo. They are also eaten by most African Tribes.

Habitat. Large lakes and rivers up to 5,000 feet.

Distribution. Somalia south to Natal, west to Lake Tanganyika, Zambia, Rhodesia and Transvaal.

Order CROCODYLIA : Family CROCODYLIDAE  
Genus CROCODYLIUS Laurenti

Crocodylus Laurenti, 1768, Syn. Rept., p. 53: Type by subsequent designation of Stejneger & Barbour (1917): C. niloticus Laurenti = Lacerta crocodilus Linnaeus (part).

## CROCODYLIUS CATAPHRACTUS Cuvier

Crocodylus cataphractus Cuvier, 1824, Rech. Ossem. foss. Quad., ed. 2, 5, p. 58, pl. v, figs. 1-2: No locality; Pitman, 1934, p. 308.

No specimens examined. Recorded from Lake Mweru by H. J. Bredo (Manuscript list) and reported by crocodile hunters to be more plentiful than C. niloticus in this lake. The belly skin of this species is of no commercial value.

Distribution. West Africa, both forest and savanna, from Senegal to Lake Tanganyika, south to Angola and Lake Moeru.

CROCODYLUS NILOTICUS Laurenti

Crocodylus niloticus Laurenti (part), 1768, Syn. Rept., p. 53: "India orientali et Aegypto."; Boulenger, 1897, p. 800; Shubb, 1909a, p. p. 592 and 1909b, p. 34 (Victoria Falls; Kafue River); Bigalke, 1931, p. 597 (Moamba); Pittman, 1934, p. 308; Cott, 1935, p. 973 (Gaia); Mitchell, 1946, pp. 16 (Chiroro; Chiuta Lake); Loveridge, 1953, p. 154 (Chipoka; Mtimbaka); Atwell, 1959, p. 13 (Luangwa Valley).

Crocodilus vulgaris Gunther, 1864, p. 307 (Tete); Bocage, 1896, p. 86 (Quelimane).

Crocodilus vulgaris var marginatus Peters, 1882, p. 19, pl. iv, fig. 4 (Sena; Tete; Querimba; Maravia; Lourenco Marques).

Chameo vulgaris FitzSimons, 1935b, p. 302 (Maun; Kwai; Kabulabula).

19 specimens examined from: RHODESIA. Kariba Lake; Sabi-Odoi Confluence; Umwati River; Victoria Falls. ZAMBIA. Kabonpo. MALAWI. Shire River. MOZAMBIQUE. Grudja.

Literature Records. BECHUANALAND. Kabulabula; Kwai; Maun. RHODESIA. Victoria Falls. ZAMBIA. Kafue River; Luangwa Valley. MALAWI. Chipoka; Chiroro; Chiuta Lake.; Mtimbaka. MOZAMBIQUE. Gaia; Lourenco Marques; Maravia; Moamba; Quelimane; Querimba; Sena; Tete.

Variation. Transverse rows of dorsal scutes 17, rarely 18.

Ecology. Cott (1961 and 1962) has presented a study of the ecology of this species in Zambia.

Breeding. Bigalke (1931) describes eggs from a clutch of 12 laid at Pretoria Zoo by a freshly caught 9 foot ♀ from Moamba.

Dist. Cott (1961 and 1962) has analysed the marked changes in diet associated with the growth of crocodiles. Atwell (1959) has described and illustrated the behaviour of crocodiles feeding on carrion in the Luangwa Valley.

Habitat. Formerly common in lakes and rivers up to about 5,000 feet. Now largely shot out by professional hunters.

Distribution. The whole of Africa south of the Sahara, except the arid south-west. Its southern limit on the east coast is the Tugela River in Natal.

Order SQUAMATA

Suborder SAURIA

Family GEKKONIDAE

Genus CHONDRODACTYLUS Peters

Chondrodactylus Peters, 1870, Monatsb. Akad. Wiss. Berlin, p. 111, pl.,  
fig. 1. Type by monotypy: C. annulifer Peters.

CHONDRODACTYLUS ANNULIFER Peters

Chondrodactylus annulifer Peters, 1870, Monatsb. Akad. Wiss. Berlin,  
p. 111, pl., fig. 1: Nantam, Oerlogarivier, Cape Province; Fitz-  
Simons, 1943, p. 10; FitzSimons & Brain, 1953b, p. 99 (Twee Rivieren).

No local specimens examined.

Literature records. NICHUANAIAND - CAPE PROVINCE BORDER. Kalahari  
Gemsbok National Park at Twee Rivieren and along the Mossob River.

Variation. Original tail covered above with small subtriangular scales,  
6 rows per verticill, with a transverse series of enlarged tubercles in the  
middle of each verticill; subcaudals large, subhexagonal, aperiodic, 3-4  
rows per verticill.

Habitat. These large terrestrial geckos are usually found in the  
vicinity of dry river beds.

Distribution. Throughout sandy regions of the western and north-western  
Cape Province, the south-western Kalahari and southern South-West Africa.

Genus PTENOPUS Gray

Ptenopus Gray, 1865, Proc. Zool. Soc. London, p. 640, pl. xxxviii, fig. 1.  
Type: P. regulatus Gray = Stenodactylus garrulus A. Smith.

PTENOPUS GARRULUS (A. Smith)

Stenodactylus garrulus A. Smith, 1849, Ill. Zool. S. Afr., Rept., App.,  
p. 6: "Sandy Districts in the Interior of South Africa"

Ptenopus garrulus Hewitt & Power, 1913, p. 149 (Ky Ky; Mossob); Brain,  
1962, p. 3 (Revision).

Ptenopus serrulus serrulus FitzSimons, 1935b, p. 331 (Euke; Gomodimo Pan; Kaotwe Pan; Damara Pan) and 1943, p. 12; Loveridge, 1947, p. 31; FitzSimons & Brain, 1958b, p. 99.

Thirteen specimens examined from: BECHUANALAND. Kanya Pans; 10 mls. S of Mochuma; SIM-B.P. Border at 24°S.

Literature records. BECHUANALAND. Damara Pan; Gomodimo Pan; Kaotwe Pan; Euke Pan; Ky-Ky; Mossob River.

Variation. Tail covered above with small scales, 7-9 rows per verticil; subcaudals small, aperiodic, 6-9 rows per verticil.

Size. Largest examined (UM. 7434 - 10 mls S. of Mochuma)  $49 + 35 = 84$  mm.

Enemies. One was found in the stomach of a Bat-eared Fox (Otocyon mesalotis) from Kanya, another in a Genet (Genetta genetta) from Ohakutsa Pans.

Distribution. South West Africa, the northern Cape Province and the southern and central Kalahari. There is a relict population at Great Salt-pan in the northern Transvaal, so it may eventually be found in sandy areas of S. E. Rhodesia and adjoining Mozambique (see map in Brain, 1962).

#### Genus HEMIDACTYLUS Oken

Hemidactylus Oken, 1817, Isis, p. 1183 (based on "Hemidactyles" of Cuvier, 1817, Regne Animal, 2, p. 47). Type: tuberculatus Daud. = mabouia Moreau de Jonnes.

Most specimens of Hemidactylus collected in south-east Africa have been listed under the name Hemidactylus mabouia (Jonnes). However, intensive field work in this region has shown that there are at least three sibling species with different habitat preferences, although all of them are liable to frequent houses. The type locality for Hemidactylus mabouia is "Antilles and the adjacent mainland" and this species was presumably introduced into the West Indies with the slave trade. The species has a patchy distribution in West Africa and has apparently been introduced at ports (Loveridge, 1947) so it seems likely that the West Indian geckos were derived from the Lower Congo. Mr. W. D. Haacke at the Transvaal Museum is at present working on this group, so until the relationships of the eastern forms are clarified, I avoid the use of the name Hemidactylus mabouia for any of them.

All three local species have the median series of subcaudals transversely enlarged, two per verticil, the bordered one largest, but there is interspecific variation in the arrangement of the supracaudals.

#### HEMIDACTYLUS MERCATORIUS Gray

Hemidactylus mercatorius Gray, 1842, Zool. Misc., p. 58: Madagascar; Loveridge, 1953a, p. 165. (Nehisi Mtn.; Mtimbuka; Chikawa; Tete)

and 1953c, p. 140 (Fort Johnston; Port Herald; Nkula).

Hemidactylus gardineri Boulenger, 1909, Trans. Linn. Soc. London (2), 12, p. 296, pl. xl, fig. 4: Farquhar Island, Seychelles; Loveridge, 1947, p. 181 (Lumbo).

Hemidactylus brookii (not Gray) Loveridge, 1920, p. 134 (Lumbo).

Hemidactylus paraimilis Barbour & Loveridge, 1928, Mem. Mus. Comp. Zool., 50, p. 140, pl. iv, figs. 1 & 3: Dar-es-Salaam, Tanganyika (paratypes from Lumbo); Loveridge, 1929, p. 41 (Lumbo).

Thirty-five specimens examined from: MOZAMBIQUE. Beira; Cabaceira Peninsula; Covane; Cruzado; Dondo; Gorongosa Game Reserve; Grudja; Gumbo; Jofane; Metambembe; Nkula; Same; Santa Carolina Island.

Literature records. NIJAWI. Chikwawa; Fort Johnston; Ntimbuka; Nchisi Mtn; Nkula; Port Herald. MOZAMBIQUE. Lumbo; Tete.

Variation. Dorsum covered with small multicarinate scales and rows of rounded tubercles, which are smaller than the interspaces between them; males with 30-31 preano-femoral pores. Original tail with 7-9 dorsal scale rows per verticil and a transverse series of pointed tubercles.

Coloration. Pallid, dark cross-bands on body hardly discernible, but black and white cross-bands on tail often well marked, especially in juveniles.

Size. Largest ♂ (UM. 3617 - Beira) 57+35=132mm.

Breeding. Loveridge (1947 and 1953a) has drawn attention to the fact that this species lays its eggs separately, not glued together in pairs like "H. sabouis". The eggs measure 3-9.5 mm. in diameter.

Enemies. Near Tete Loveridge (1953a) recovered one gecko from the stomach of a Basson f. fuliginosus and another from a Procyon a. unguis.

Habitat. Loveridge (1947 and 1953a) considered that the distribution of this gecko was linked with that of coconut palms, for he found them most frequently under piles of palm fronds; he was surprised to find them at Nchisi, where there are no palms. I have only seen this species on palm trees on the Cabaceira Peninsula, where they were living in the crown and came down the trunk at night. None were found under palm fronds in Mozambique or Malawi, although Lysodactylus sapensis is common in such situations. H. mercatorius is common on house walls at Beira and at Gorongosa Game Reserve. The specimen from Santa Carolina Island was in a Weaver Bird's nest. This species is apparently sympatric with H. platycephalus on trees in some parts of the Mozambique Plain.

Distribution. Coastal areas of eastern Africa from Kenya south to Mozambique, inland to Tete and Malawi. All continental islands south to the Basaruto group; Madagascar; Aldabra; Seychelles and Mauritius.



## HEMIDACTYLUS TASMANI Hewitt

Hemidactylus tasmani Hewitt, 1932, Ann. Natal Mus., 7, p. 120: Driefontein, Rhodesia; FitzSimons, 1943, p. 48 (Chilimansi; Rusape; Macheke; Chishwasha; Musami; Kutama; Mteko; Gokwero; Hicita); Tasman, 1959, p. 141.

Hemidactylus mabouia Fitz Simons, 1939b, p. 25 (part - Vumba Mtn.); Lowridge (part), 1947, p. 167; Broadley, 1963i, p. 792 (part).

One hundred and ninety-four specimens examined from: CAPRIVI STRIP. Liamboni Lake. RHODESIA. Basely Bridge; Beithridge; Charu; Ghido; Chimanimani Mts.; Chinyamanda; Chipinda Pools; Chirundu; Cleve-land Dam; Devuli Bridge; Dora; Eagles Nest; Filabusi; Gilston Estates; Gungunyana; Haroni Gorge; Jemebi; Kariba; Kariba Lake - Charara and Mvunda Confluences; Kyle Lake; Lake MacIlwaine; Limpopo-Umzingwane Confluence; Macheke; Manda; Manga Reserve; Marungudzi; Matinodza; Mkota Reserve; Mount Silinda; 8 mls W & 15 mls NE of Mteko; Musamasi; 3 mls NE of Odzi; Rainham; Sabi-Lundi Confluence; Salisbury; Sentinel Ranch; Shashi-Shashani Confluence; Sinoia; Tandani; Triangle; Tuli; Untali; Vumba Mtn.; 12 mls SW of Wedza; Zambesi-Chewore Confluence; Zowa; Zongoro Bridge. ZAMBIA. Chiawa; Chilwa; Chipopo; Dumhuswani; Fort Jameson; and 30 mls. N; Kabompo; Katete; Kasembora; Luanga Valley; Intembwo; Sesheke; Tandalo; Zongwe River. MALAWI. Blantyre; Mwanza; Mkata Bay; Rumpi. MOZAMBIQUE. Chapala; Chinta (UBM); Gondola-Gorongosa Bridge; Gorongosa Mtn.; Ilha dos Portugueses; Inchope; Inhaca Island; Iurio and 10 mls SE; Magasso; 15 mls E of Mavita; Metolola; Motuchira; Mitucue Mtn.; Morrumbala; Morrumbala Mtn; Namacusa; Ribana; Sabelma; Samo; Somo; Vila Boage; Viola; 5 and 15 mls SW of Sobus.

Literature records. Rhodesia: Hicita; Chilimansi; Chishwasha; Driefontein; Gokwero; Kutama; Macheke; Mteko; Musami; Penhalonga; Rusape; Vumba Mtn.

Variation. Dorsum covered with small multicarinate scales and rows of conical or strongly keeled tubercles which are subequal to or larger than the interspaces between them; males with 26-44 preano-femoral pores. Original tail with 7-9 dorsal scale rows per verticil and a transverse series of pointed tubercles.

Coloration. Grey or brownish with dark wavy cross-bands which are most distinct on the tail. This species is capable of a wide range of colour change, on a white wall they are very pale grey, but specimens from a burnt out hollow tree are almost black.

Size. Largest ♂ (U.N. 966 - Eagles Nest) 70+77=147 mm. ♀ (MNR. 2126-Macheke) 73+90=163 mm.

**Breeding.** The eggs of this species are counted together in pairs. A suitable rock crevice may be used for the deposition of eggs by many females and it is not unusual to find 50 or more freshly laid, juxtaposed eggs, which are about 8.5 to 11 mm. in diameter.

**Enemies.** One was found in the stomach of a Bombus f. fuliginosus from Chikwa, Zambia.

**Habitat.** This is essentially a rupicolous species, but it also lives under loose bark on dead trees and on houses. Specimens were found sharing house walls with H. platycephalus at Lurio and Ribane.

**Distribution.** This is the common species of Hemidactylus in Rhodesia and Zambia and at higher altitudes in Malawi and Mozambique. It may prove to be synonymous with H. bancuallensis Bocage of Angola.

**Discussion.** Loveridge (1942c, p. 322 and 1947, p. 172) placed tasmani in the synonymy of H. mabouia because he could not distinguish a series of Birchenough Bridge geckos from topotypic mabouia from the Antilles. As FitzSimons (1939b, p. 25) states that most of these geckos were taken in baobab trees, they are probably platycephalus and not tasmani.

#### HEMIDACTYLUS PLATYCEPHALUS Peters

Hemidactylus platycephalus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 615; Coast north of Mozambique and Anjoana Island; Gunther, 1864, p. 307. (Zambesi Expedition)

Hemidactylus mabouia (not Jones) Peters, 1882, p. 27, pl. v, figs. 3, 3a-d; Loveridge, 1920, p. 133 (Lumbo); FitzSimons, 1939b, p. 25 (part - Changuadai River; Birchenough Bridge) and 1943, p. 46 (? part); Loveridge, 1953a, p. 164 (? part - Chitala River) and 1953c, p. 140 (Nehalo); Broadley, 1962, p. 792 (part)

Eighty-seven specimens examined from: RHODESIA. Chikalove Bridge; 12 mls SE of Chisumbanje; Haroni-Lusitu Confluence; Ilamba Bridge; Kapani; Kamungula; Kyle Dam; Maryland; Mkota Reserve; 25 mls N of Mtoko; Nyampanda; Sabi-Lundi Confluence; 10 mls NW of Ruenya Drift; Zambesi-Matetsi Confluence. MALAWI. Cape Maclear; 15 mls NW and 15 mls SSW of Fort Johnston; Mpatanzanga Gorge; Palm Beach. MOZAMBIQUE. 10 mls E of Alto Ligonha; Beira; Basi River at 2,000 ft; 5 mls N of Ganda; Cavallo; Cruzado; Grudja; Gunha; Inchope; Jorge; Luala Bridge; Lusbo; Lurio; Maringa; Mavue; Metanbanhe; Metachira; Montize; Mozambique Island; Nuda; Mutuali; Ribane; Samo; Savane; Tete (USNM) and 5 mls E.

**Literature records.** RHODESIA. Birchenough Bridge; Changuadai River. MALAWI. Chitala River; Nehalo. MOZAMBIQUE. Lumbo.

**Variation.** Dorsum covered with smooth granules and scattered small conical tubercles; 12-14 transverse dorsal scale rows per caudal verticil. Tail with rings of small tubercles. Males with 29-51 preano-femoral pores.

Coloration. Grey or brownish with darker cross-bands.

Size. Largest ♂ (MZ 50363 - Chitala River)  $90+87^{\circ}=177$  mm. Largest ♀ (MZ 50364 - Chitala River)  $88+97 = 185$  mm.

Breeding. The two eggs, measuring about 10-12 mm. in diameter, are usually cemented together.

Habitat. This is basically an arboreal gecko; large Baobabs (*Adansonia digitata*) and Figs (*Ficus* spp.) often harbour large colonies, especially if the trees are hollow. Houses are frequently occupied, but it is unusual to find this species in rock crevices.

Distribution. East Africa and most of Mozambique, extending into the Zambezi-Malawi troughs and up the Deka Valley to Wankia District. Common on Baobabs in north-east Rhodesia, in the south-east it seems to be largely restricted to the Sabi Valley.

#### Genus LYGODACTYLUS Gray

Lygodactylus Gray, 1864, Proc. Zool. Soc. London, p. 59. Type: L. stricatus Gray = Hemidactylus capensis A. Smith.

This is an ancient genus, for it is well represented on Madagascar. Pasteur (1964) has published a study of the evolution of this group and has clarified the taxonomy of the difficult L. capensis complex, his terminology for the subcaudal scalation is used in this study.

#### LYGODACTYLUS BERNARDI BERNARDI FitzSimons

Lygodactylus bernardi FitzSimons, 1958, Occ. Pap. Nat. Mus. S. Rhod., 22B, p. 204; Nyanswa, Inyanga, Rhodesia; Broadley, 1962d, p. 793; Pasteur, 1964, p. 41.

Twenty-five specimens examined from: RHODESIA. Inyangani Mtn.; Nyanswa Ridge; Troutbeck; World's View, Inyanga.

Literature record. RHODESIA. Nyanswa.

Variation. Nostril bordered by 2 nasals and the first labial (rostral in contact in one specimen only); internasals 1, rarely 2; supraciliary spines 4-7; mental with short lateral clefts; postmentals 3 (4 in one only); preanal pores in males 7-10; lamellae under 4th toe 5. Original tail with 5-6 scale rows per verticil, above and 3-4 below; subcaudals usually aperiodic, but semi-divided in one specimen; regenerated tail covered with small scales below.

Coloration. Olive brown above with numerous pale ocelli on body and tail; yellow below, except for the throat, which is uniform bluish white.

Size. Largest ♂ (UN. 1287 - Inyangani Mtn.)  $39+30^{\circ} = 69$  mm. Largest ♀ (IMSR. 5095 - Inyangani Mtn.)  $40+40 = 80$  mm.

Breeding. Large communal egg depositaries containing hundreds of eggs are common on Inyangani Mountain, which must support an enormous population. It appears to be the only gecko found in this area.

Habitat. Rock outcrops on the Inyanga Mountains from 7,000 ft. to the summit at 8,514 ft; associated with Makuya p. punctatissimus and Cordylus g. rhodesianus. This species shows close affinities with L. ocellatus of the Transvaal, which occupies a similar habitat.

Distribution. Endemic to the Inyanga District of Rhodesia. See Fig. 2.

#### LYGODACTYLUS BERNARDI BOSSI Pasteur

Lygodactylus bonai Pasteur, 1962, p. 607: Mlanje Mountain at 3,000 metres, Malawi.

Nine specimens examined from: MAIAWI. Mlanje Mountain (Chambe and Dsole).

Literature records. MAIAWI. Mlanje Mtn.; "Zomba" (As in Johnston coll., catalogued at BM in 1894, perhaps from Mlanje Mtn. see remarks of Loveridge, 1953a, p. 146).

Variation. Nostril bordered by 2 nasals, the first labial and the rostral (latter excluded in 2 specimens); internasals 1, rarely 2; supraciliary spines 5-8; mental with short lateral clefts; postmentals 3; preanal pores in males 8-9; lamellae under fourth toe 6. Original tail with 5-6 scale rows per verticill above and 3 below; subcaudals aperiodic; regenerated tail with small irregular scales below.

Coloration. Grey brown above, with numerous pale ocelli, superimposed on a pattern of three pale longitudinal lines, i.e. a pair of distinct dorso-lateral stripes and a faint vertebral line. Below, yellow except for throat, which is blue grey with two forward directed dark chevrons.

Size. Largest ♂ (BM. 1956.1.15.69 - Holotype)  $45 + 38^* = 83$  mm. Largest ♀ (UM. 4255 - Dsole Peak)  $40 + 37^* = 77$  mm.

Habitat. Eight specimens were collected under loose stones lying on the bare syenite summit of Dsole Peak at 8,900 feet. Some shared their refuge with frogs, which became the type series of Hothophryna broadleyi.

The holotype of Scalotes s. mlanjensis was collected at the same place.

In view of the close relationship of this form to L. bernardi, and the similarity of the habitats that they occupy, it seems advisable to treat them as subspecies. Pasteur (1962 & 1964) points out a number of differences between the two forms, but some of these characters may be genetically linked.

Distribution. The summit of Mlanje Mountain (perhaps also Zomba Plateau) in south-east Malawi. (See Fig. 2).

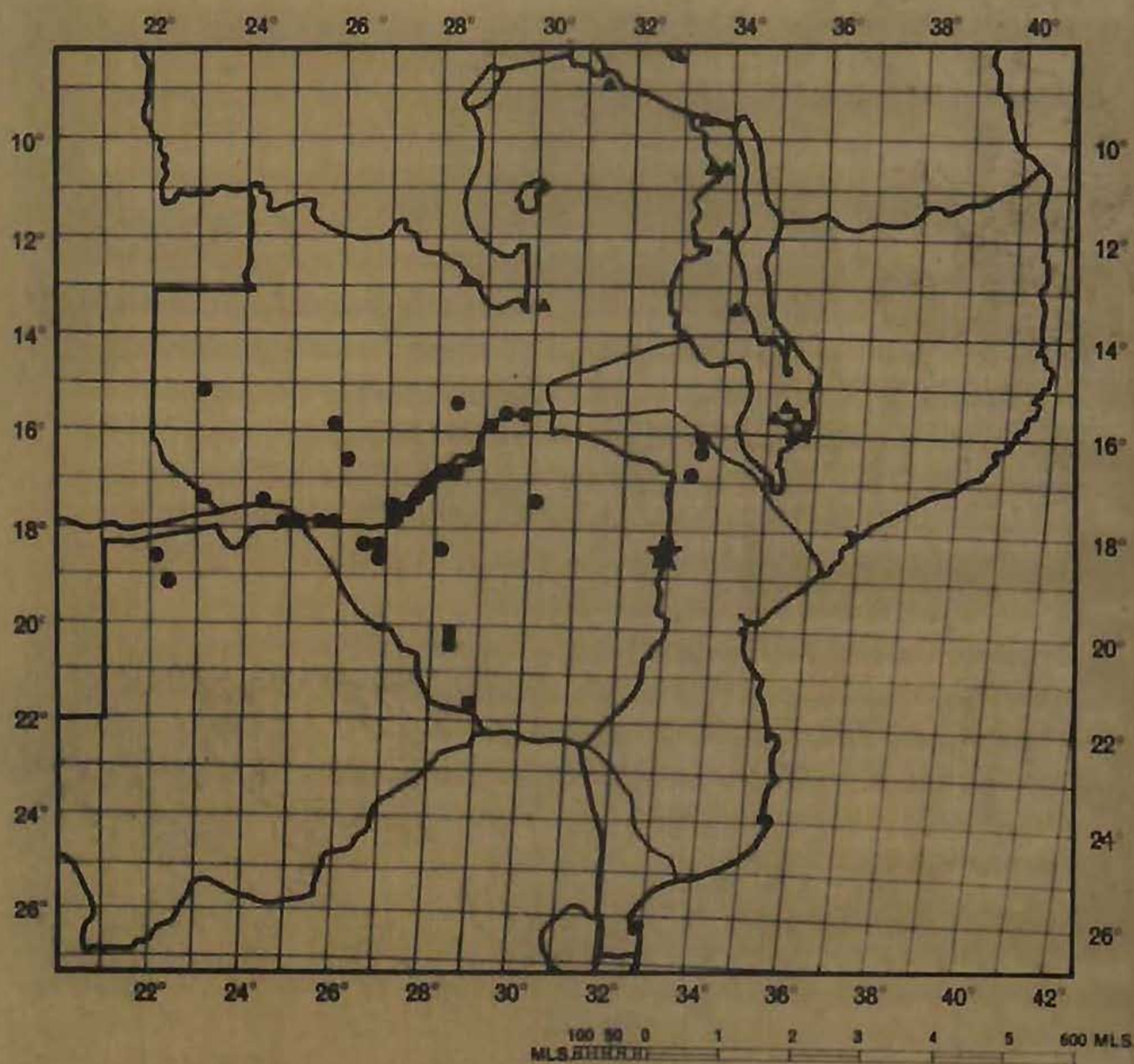


Fig. 3. Distribution of some species of the genus Lygodactylus.

- ★ Lygodactylus bernardi bernardi FitzSimons
- ☆ Lygodactylus bernardi bonsi Pasteur  
and Lygodactylus rex Broadley
- ▲ Lygodactylus angularis angularis Günther
- Lygodactylus stiversoni Hewitt
- Lygodactylus chobiensis FitzSimons

## LYGODACTYLUS REX Broadley

Lygodactylus angularis angularis (not Gunther) Loveridge, 1953a, p. 169  
(part - Mlanje Mtn.).

Lygodactylus rex Broadley, 1963, p. 285; Lujeri Estate, Malawi; Pasteur, 1964, p. 41.

Eight specimens examined from: MALAWI. Ruo Gorge Forest on Mlanje Mtn.; Lujeri Estate.

Literature record. Mlanje Mtn. (Lujeri Power Station).

Variation. Nostril bordered by 2 or 3 nasals, the first labial and the rostral; a single internasal; mental with short lateral fissures; postmentals usually 2, 3 in two specimens; preanal pores in males 9-11; lamellae under fourth toe 6. Original tail with 8-9 scale rows per verticil above and 4 below; subcaudals aperiodic; regenerated tail with transversely enlarged, strip-like scales below.

Coloration. Above, blue-grey suffused with golden-yellow laterally, often with ill-defined dark wavy transverse markings, especially on the tail, above the shoulder is a conspicuous black patch with a cream spot in the centre. Below, throat white with 3 or 4 pairs of irregular black stripes, which converge from the labials towards the base of the throat, chest and belly cream. Tail with a lateral line of minute cream spots.

Size. Largest ♂ (Holotype, UM, 4250) 50 + 51\* = 101 mm. Largest ♀ (UM, 4251 - Ruo Gorge Forest) 46 + 45\* = 91 mm.

Habitat. The trunks of trees in the Ruo Gorge Forest and on the Lujeri Tea Estates at the foot of Mlanje Mountain; one was collected on the verandah of a house. Associated species are Makuya maculilabris and Rolaspis g. laevis.

This gecko, together with L. angularis and L. methueni of the Woodbush Forest in the Transvaal, appears to represent the remnants of an old forest dwelling group of Lygodactylus which has been largely supplanted by the vigorous and expanding L. pleuratus group. It is significant that the southern representative of this group, L. chobiensis, is nowhere sympatric with L. rex or L. angularis. (See Fig. 3).

Distribution. Known only from the Ruo Gorge Forest and the formerly forested areas of Lujeri Tea Estates to the south of Mlanje Mountain, south-east Malawi (See Fig. 2). This species is likely to be found in relict forest patches on the Niassa Platform.

## LYGODACTYLUS ANGULARIS ANGULARIS Gunther

Lygodactylus angularis Gunther, 1893, Proc. Zool. Soc. London, p. 535, pl. xxxiii, figs. 1-3; Shire Highlands, Malawi; Boulenger, 1894b, p. 722 and 1897, p. 800 (Nyika Plateau; Misuku Mtns.); Pitman, 1934, p. 302 (Abercorn; Mushingas = Katundula).

Lygodectylus angularis angularis Loveridge, 1947, p. 221 and 1953a, p. 169  
(part - Zomba Mtn.; Misuku Mtns.; Nchisi Mtn.; Chiredzulu Mtn.);  
Pasteur, 1964, p. 46.

Sixty specimens examined from: ZAMBIA. Abercorn; Ndola; Nyika Plateau. MALAWI. Nyika Plateau; Vinya Plateau; Zomba Plateau.

Literature records. ZAMBIA. Abercorn; Katandula. MALAWI. Chiredzulu Mtn.; Misuku Mtns.; Nchisi Mtn.; Nyika Plateau; Zomba Plateau.

Variation. Nostril bordered by 2 (rarely 3) nasals, the first labial and the rostral (excluded in one specimen); internasals 1, very rarely 2 (3 in one specimen); mental entire; postmentals 2 or 3; preanal pores in males 6-9, usually 7 or 8. Original tail with 5-6 rows of dorsal scales per verticil, median row of subcaudals transversely enlarged, periodicity usually 3, rarely 2 (anteriorly) or 4 (posteriorly); regenerated tail with transversely enlarged strip-like scales below.

Coloration. Olive brown above, with numerous dark and light dorsal spots which may form wavy cross-bands, pale dorso-lateral and vertebral stripes may be discernible. Below, yellow, the throat with about four black chevrons extending from labials towards base of throat. These markings are present in both sexes, but are more pronounced in males. Specimens from Ndola have irregular and rather poorly defined throat markings and show some affinity with the Katanga race hoeneni in this respect.

Size. Largest ♂ (UM. 6923 - Nyika Plateau, Zambia) 41 + 50 = 91 mm. Largest ♀ (UM. 5972 - Nyika Plateau, Zambia) 39 + 41 = 80 mm.

Breeding. Loveridge (1953a, p. 170) notes that this species lays its eggs separately, not cemented together like L. capensis. He found eggs in the Natipa Forest beneath fallen slivers of bark, under slabs of rock and under an old beehive, while on the Zomba Plateau 13 eggs were found under a mat of moss and leaves in a crevice between two large rocks.

Enemies. Remains of one recovered from the stomach of a Thalassidroma k. capensis on Cholo Mountain (Loveridge, 1953a).

Habitat. Loveridge (1953a) found this arboreal gecko adaptable, living on evergreen forest trees, but also in Brachystegia woodland or even on exotic Blue Gums. It also occurred on the walls of Chiredzulu Boma.

The only specimen that I have collected was on a boulder on Zomba Plateau, with no trees in the vicinity. It is apparently common on the walls of the rest house on the Zambian sector of the Nyika Plateau and also on house walls at Ndola (Ansell, in litt.). Pasteur (1964, p. 50) considers L. angularis to be an "espece rare", but although patchily distributed it seems to be locally common.

Distribution. An upland form (2,500-6,500 feet, vide Loveridge, 1953a) which occurs in forested or formerly forested areas, but seems to be rather adaptable with regard to habitat, occupying an ill-defined range in north-eastern Zambia, Malawi and south-western Tanganyika (See Fig. 2).

## LYGODACTYLUS STEVENSONI Hewitt

Lygodactylus stevensoni Hewitt, 1926, Ann. Natal Mus. V, p. 445, pl. xxv, figs. 3 & 4; Khami Ruins, S. Rhodesia, and 1932, p. 126, pl. vi, fig. 11; Pasteur, 1964, p. 63.

Lygodactylus capensis stevensoni FitzSimons, 1943, p. 53.

Lygodactylus angolensis Loveridge (part, not Bocage), 1947, p. 207.

Thirteen specimens examined from: RHODESIA. Khami Ruins; Matopos; Shashi-Shashani Confluence.

Literature record. RHODESIA. Khami Ruins.

Variation. Nostril bordered by 2 nasals, the first labial and the rostral; internasals 2 (1 in 3 specimens); mental with deep lateral clefts; postmentals 3; preanal pores in males 6 - 9. Original tail with 6 - 7 rows of dorsal scales per verticil, subcaudals aperiodic, subhexagonal, juxtaposed, 4 rows per verticil; regenerated tail with small juxtaposed scales below.

Coloration. Above, blue-grey with large black spots irregularly distributed over the back. Below, white, throat with dark forward-directed chevrons

Size. Largest ♂ (MSR. 5228 - Matopos) 40 + 41 = 81 mm. Largest ♀ (MSR. 2131 - Khami Ruins) 37 + 43 = 80 mm.

Habitat. Common at Khami Ruins and in the gorge below the Khami Dam wall, living on big Fig Trees (Ficus capensis) which grow along the rocks. Lygodactylus capensis does not seem to occur in the area occupied by the more robust L. stevensoni.

Distribution. Apparently restricted to the well-wooded granite hills of the Matopos and similar country in south-western Rhodesia. (See Fig. 2). 13

## LYGODACTYLUS ANGOLENSIS Bocage

Lygodactylus angolensis Bocage, 1896, Journ. Sci. Lisbon (2), 4, p. 110: Banha, Benguela, Angola; Loveridge (part), 1947, p. 207; Pasteur, 1964, p. 56.

Lygodactylus stevensoni (not Hewitt) Loveridge, 1933, p. 287 (Nyankolo); Pitman, 1934, p. 302.

Thirty-seven specimens examined from: RHODESIA. Kariba; Kariba Lake-Mwenda and Sanyati Confluences; Que Que; Reichliff. ZAMBIA. Abercorn (IRSHB); Bwana Mubwa; Chikwa; Fort Jameson & 30 mls N of same; 20 mls W of Katete; Mweru-Wantipa and Nassam (IRSHB). NIAIWI. Rumpi.

Literature records. ZAMBIA. Nyankolo.

Variation. Nostril bordered by 2 nasals, the first labial and in some populations (e.g. Kariba) the rostral also; internasals 1 - 2 (rarely 3);



mental with deep lateral clefts; postmentals 3 (rarely 4); preanal pores in males 8 - 9 (6 in one; 10 in one); lamellae under fourth toe 4. Original tail with 5 - 7 rows of dorsal scales per verticil, subcaudals usually aperiodic, sometimes semi-divided posteriorly with a periodicity of 3, rarely all subcaudals semi-divided; regenerated tail with small irregular scales.

Pasteur (1964, p. 58) has analysed the morphological differences between angolensis and capensis, but there is considerable overlap in all characters except the preanal pore counts for males. Single females from isolated localities can rarely be identified with confidence.

Coloration. Olive-brown above, usually with a series of dorso-lateral ocelli. Cream below, throat usually immaculate, never with heavy dark stippling.

Size. Largest ♂ (UM. 5967 - Fort Jameson) 33 + 40 = 73 mm. Largest ♀ (UM. 5233 - Redcliff) 31 + 38 = 69 mm.

Habitat. Occurs on trees and houses like L. capensis.

Distribution. Angola, east through Katanga and Zambia to Malawi, north to Kenya, south to Que Que District of Rhodesia (See distribution map in Pasteur, 1964, p. 62).

#### LYGODACTYLUS BRADFIELDI Hewitt

Lygodactylus bradfieldi Hewitt, 1932, Ann. Natal Mus., 7, p. 126, pl. vi, fig. 10: Quickborn Farn, Okahandja, S. W. Africa; Pasteur, 1964, p. 61.

Lygodactylus capensis namaniensis FitzSimons, 1932, p. 35, and 1935b, p. 334, figs. 8 & 9: Mabelespudi, Bechuanaland.

Lygodactylus capensis bradfieldi FitzSimons, 1943, p. 53.

Lygodactylus capensis Loveridge (part), 1947, p. 208.

One specimen examined from: BECHUANALAND. Tierpub.

Literature record. BECHUANALAND. Mabelespudi.

Variation. Nostril bordered by 2 nasals, the first labial and the rostral; internasals 2 - 3 (rarely 1); mental with deep lateral clefts; postmentals 3; preanal pores in males 5. Original tail with 5 - 6 dorsal scale rows per verticil; subcaudals aperiodic, intricate; regenerated tail with small scales below (Pasteur, 1964, p. 61).

Coloration. Grey-brown, with a pair of pale dorso-lateral bands, which are bordered with narrow black lines. Cream below, often with dark spots on throat.

Size. Female (UM. 9929 - Tierpub) 28 + 33 = 61 mm. This form attains a head and body length of 30 mm. (FitzSimons, 1943).

Habitat. Granite boulders at Mabelanpudi (FitzSimons, 1935b), but more commonly found on Acacia trees (FitzSimons, 1943).

Distribution. South-West Africa, north-western Cape Province and western Bechuanaland (See distribution map in Pasteur, 1964, p. 62).

LYGODACTYLUS CAPENSIS CAPENSIS (A. Smith)

Hemidactylus capensis A. Smith, 1849, Ill. Zool. S.Afr., Rept., pl. LXXV, Fig. 3: "Kaffirland and the districts to the north of Cape Colony"; Peters, 1854, p. 615 (part - Boror; Tete).

Lygodactylus strigatus Gray, 1864, p. 79: South-Eastern Africa (Dr. Kirk); Gunther, 1864, p. 307.

Hemidactylus (Peropus) capensis Peters, 1882, p. 28 (part - Boror; Tete).

Lygodactylus capensis Boulenger, 1885c, p. 160; Gunther, 1893, p. 555, (Shire Highlands); Bocage, 1896, p. 98; Boulenger, 1902, p. 16 (Mashonaland), 1907a, p. 7 (Petauke) and 1907b, p. 484 (Cogomo; Beira); Roux, 1907, p. 405 (Lourenco Marques); Chubb, 1909 a, p. 592 and 1909b, p. 34 (Bulawayo); Boulenger, 1910, p. 458 (Salisbury; Delagoa Bay); Hewitt & Power, 1913, p. 149 (Eldorado); Loveridge, 1920, p. 135 (Masoe; Mount Selinda; Fort Johnston; Zomba); Hewitt, 1926, p. 444 (Salisbury; Malssetter District); Power, 1931, p. 46 (Lobatsi); Loveridge, 1947, p. 208 (part), also 1953a, p. 167 (Mochanchem; Mtimbuka; Chowe; Chiradzulu Mtn.; Blantyre; Cholo Mtn.; Chilawa; Tete; Beira) and 1953c, p. 140 (Fort Johnston; Elephant Marsh; Tangadzi River; Mkwazi River; Lake Malombe); Tassan, 1958, p. 142, photos 6 - 7; Manacas, 1961, p. 146 (Vila Paiva de Andrada); Broadley, 1962, p. 23.

Lygodactylus capensis capensis Cott, 1934, p. 147 (Amatongas; Fambani; Beira; Gaia); Pitman, 1934, p. 302 (Broken Hill; Machingas = Katundula); FitzSimons, 1935b, p. 332 (Gaberones; Kautwe Pan; Motlhatlogo; Maun; Shaleshonto; Tsotsoroga Pan; Figtree; Zimbabwe), 1939b, p. 26 (Vumba Mtn.; Mount Silinda; Birchenough Bridge) and 1943, p. 50 (Chilimansi; Driefontein; Bikita; Macheke; Plumtree; Rusape; Francistown; Bindura; Livingstone; Inhaca Island; Masambo); Mitchell, 1946, p. 23; Manacas, 1952, p. 133 (Manhica; Lifidzi); FitzSimons, 1958a, p. 204 (Nyansima); Pasteur, 1964, p. 56.

Two hundred and thirty-nine specimens examined from: BECHUANALAND. 9 mls S of Foley; 4 mls W of Lechana; 9 mls SE of Nata; RHODESIA. Beitbridge; Bembesi; Binga; Birchenough Bridge; Bulawayo and 9 mls S; Chimanimani Mtns.; Chipinda Pools; Devali River Bridge; Eagles Nest; Fatim; Fern Valley; Pilabusi; Glendale; Gungunyana; Haroni-Lusitu Confluence; Insusa Bridge; Irivale; Kasungula; Khami River Ranch;

Kyle Lake; Lake MacIlwaine; Limpopo-Umaingwane Confluence; Lochard; Macheke; Majinji Pan; Malipati Drift; Marungudzi; Matopos; Mount Hampden; 16 mls NE of Mrowa; Mtarazi Bridge; Ngorima Reserve (E); Nyachova Falls; Nyamashatu Bridge; Old Untali; Rhodes Inyanga Estate; <sup>?H</sup>Runyani; Sabi-Lundi Confluence; Salisbury; Sanyatwe; Sentinel; Shashi-Shashani Confluence; Sinoda; Soti Source; Stapleford; Triangle; Tuli; Untali; Umsiliswe Bridge; Urungwe Reserve; Vumba Mtn.; Zambezi-Chewore and Sebungwe Confluences. ZAMBIA. Broken Hill; Chilanga; Kabompo Boma; Katete and 20 mls W; Kaungashi; Livingstone; Lusaka; Sinjembelo. MALAWI. Cholo Mtn.; 15 mls SSW of Fort Johnston. MOZAMBIQUE. Beira; Boane; Chapala; Chemeni; Chicamba; Cruzado; Dondo; Garuso; Gorongosa Game Reserve; Gorongosa Mtn.; Grudja; Gunba; Ilha dos Portugueses; Inhaca Island; Jofane; Lurio; Maforja; Mandio; Manga; Matareca; Mavue; Motambembe; Mocuba; 9 mls S of Muansa; 5 mls E of Nicudala; Palane; Quelimane; Savane; 4 mls E of Tete; Vila Bocage and 30 mls N; Vila Fontes.

Literature records. BECHUANALAND. Francistown; Gaberones; Kootwe Pan; Lobatsi; Maun; Motlhatlogo; Shaleshonto; Tsotsotogo Pan. RHODESIA. Bikita; Bindura; Birchencough Bridge; Bulawayo; Chilimani; Driefontein; Eldorado; Figtree; Macheke; Masce; Melsetter District; Mount Silinda; Nyamsiva; Plumtree; Russpe; Salisbury; Vumba Mtn.; Zimbabwe. ZAMBIA. Broken Hill; Katundula; Livingstone; Petauke. MALAWI. Blantyre; Chikwawa; Chiredzulu Mtn.; Cholo Mtn.; Chowe; Elephant Marsh; Fort Johnston; Lake Malombe; Mtinkulu; Nehenachena; Kwana River; Tangadzi River. MOZAMBIQUE. Amatongas; Beira; Boror; Cain; Cogumo; Fambani; \* Lifidzi; Lourenco Marques; Manhica; Masambo; Tete; Vila Paiva de Andrada. \* Inhaca Island;

NB. Some of these literature records, particularly those for Zambia, may refer to L. angolensis.

Variation. Nostril bordered by 2 - 3 nasals, the first labial and frequently the rostral also; internasals 1 - 2 (rarely 0 or 3); mental with deep lateral clefts; postmentals 3 (rarely 2 or 4); preanal pores in males 4 - 6 (rarely 7 or 8). Original tail with 6 - 8 dorsal scale rows per verticil; subcaudals normally semi-divided in periods of 3, sometimes aperiodic anteriorly, rarely for entire length of tail, sometimes irregular verticils have divided subcaudals in periods of 3 or (posteriorly) semi-divided in periods of 4; in a standard verticil the unbordered subcaudals are single and the bordered ones are paired, but occasionally the latter may also be single; regenerated tail with transversely enlarged strip-like scales below.

As noted by Pasteur (1964, p. 59) the occurrence in Rhodesia and Zambia of specimens of L. c. capensis with aperiodic anterior subcaudals makes it difficult to distinguish L. angolensis on this character alone.

Coloration. Grey-brown, a dark streak from snout through eye to shoulder, sometimes extending along flank, usually a pale dorso-lateral band which breaks up posteriorly into a series of light spots which continue onto the tail. Below, cream, throat usually more or less stippled with grey or dark brown.

Size. Largest ♂ (QVM/R. 357 - Vumba Mtn.)  $34 + 43 = 77$  mm. Largest ♀ (NMR. 5236 - Bulawayo)  $37 + 44 = 81$  mm.

Breeding. The eggs of this species are sometimes laid singly, but more often cemented together in pairs measuring about  $7.5 \times 5.5$  mm. They are usually laid in rock crevices or under stones or loose bark.

Diet. Cott (1934, p. 148) has published an analysis of the stomach contents of 24 Mozambique geckos.

Parasites. Red mites (Oecyobia australis) numerous beneath the belly scales of Malawi specimens (Loveridge, 1953a).

Enemies. One gecko in the stomach of a Thelotornis k. capensis from Birchenough Bridge, another in a Hemirhagerrhis nototsenia from Metanbanhe, Mozambique.

Habitat. Common on trees, bananas, rocks and houses. It lives in mangrove swamps at Savane and on dead trees below high water mark on Inhaca Island, where it is extremely abundant due to the lack of competition from other arboreal lizards.

Distribution. Kenya south to Natal, the Transvaal and northern Cape Province, west to the Congo, Angola and Bechuanaland (See distribution map in Pasteur, 1964, p. 62).

#### LYGODACTYLUS CAPENSIS GROTEI Sternfeld

Hemidactylus capensis (not Smith) Peters, 1854, p. 615 (part - Mossimboe).

Hemidactylus (Parous) capensis (not A. Smith) Peters, 1882, p. 23 (part - Mocimboe.)

Lygodactylus Grotei Sternfeld, 1911, Sitz. Ges. Naturf. Freunde Berlin, p. 245: Mikindani, etc., Tanganyika.

Lygodactylus capensis mossambica Loveridge, 1920, Proc. Zool. Soc. London, p. 135: Lumbo, Mozambique.

Lygodactylus grotei grotei Loveridge, 1947, p. 212 (part - Lumbo; Mossuril); Laurent, 1964a, p. 31 (Porto Amelia).

Lygodactylus capensis grotei Pasteur, 1964, p. 56 (Ibo)

Nineteen specimens examined from: MOZAMBIQUE, Cabaceira Peninsula; Mossuril; Nampula.

Literature records. MOZAMBIQUE. Ibo; Lumbo; Mocimboa; Mossuril; Porto Amelia.

Variation. Nostril bordered by 2 - 3 nasals and the first labial; internasals 1 - 2; mental with deep lateral clefts; postmentals 2 - 3; preanal pores in males 5 - 7. Original tail with 7 - 8 dorsal scale rows per verticil, subcaudals single, strongly enlarged transversely, bi-bordered widest, in periods of 3; regenerated tail with transversely enlarged strip-like scales below.

Coloration. Grey-brown, usually with a well defined dark lateral stripe and a pair of distinct pale dorso-lateral bands. Green below, throat usually immaculate (sometimes dark in Lumbo ♂ - Loveridge, 1947).

Size. Largest ♂ (UM. 8181 - Mossuril)  $36 + 31 = 67$  mm. Largest ♀ (UM. 8209 - Namupa)  $33 + 35 = 68$  mm.

Habitat. Common on bananas and coconut palms on the Caboazeira Peninsula; on trees lining the streets of Namupa.

Distribution. Coastal regions of Fanguyika and northern Mozambique, southern limit is about  $17^{\circ}S$  (Pasteur, 1964).

#### LYGODACTYLUS CHOBIEENSIS FitzSimons

Lygodactylus capensis (not Smith) Angel, 1920, p. 614 (Lealui).

Lygodactylus picturatus picturatus (not Peters) Loveridge, 1929, p. 46, (part - Victoria Falls); Pitman, 1934, p. 302; Loveridge, 1947, p. 233 (part - Victoria Falls) and 1953 a, p. 171 (Tete).

Lygodactylus picturatus chobienensis FitzSimons, 1932, Ann. Tvl. Mus., 15, p. 35 and 1935b, Ann. Tvl. Mus., 16, p. 335, fig. 10: Kabulabula and Kasane, Bechuanaland, also 1943, p. 54; Loveridge, 1947, p. 224; Broadley, 1962, p. 793.

Lygodactylus picturatus subaurealis (not Bocage) Pasteur, 1960, p. 1442 (Lealui).

Lygodactylus chobienensis Pasteur, 1964, p. 77.

Ninety-six specimens examined from: BECHUANALAND. 15 mls NE of Gomare; Sepoya. RHODESIA. Binga; Chete Jorge; Kapani and 5 & 10 mls SE; Kariba; Kariba Lake at Lumi, Chakara, Mbenda and Sebungwe Confluences, and Sengwa Sound; 2 mls S of Kamupula; Lukosi Bridge; Mlimbasibi; Mana Pools; Sinofa; Victoria Falls and 20 mls WSW; Wenkie; Wenkie National Park - Main Camp; Zambezi-Chevone Confluence. ZAMBIA. Chalwanga River; Chiawa; Chimene River; Danduswensi; Livingstone; Lusaka; Ngoma; Sesheke; Sinjembale. MOZAMBIQUE. Changara; 15 mls SSW of Tete.

Literature records. BECHUANALAND. Kabulabula; Kasane. ZAMBIA. Lealui; Victoria Falls. MOZAMBIQUE. Tete.

Variation. Nostril bordered by 2 (rarely 3) nasals and the first labial; internasals 2 - 3, usually one; mental entire; postmentals 3 (rarely 2 or 4); preanal pores in males 8 - 10 (rarely 7 or 11). Original tail with 7 - 8 dorsal scale rows per verticil; subcaudals single, transversely enlarged, bordered widest, in periods of 3; regenerated tail with transversely enlarged strip-like scales below.

Coloration. Above, blue-grey with large pale dorsal spots, head and neck spotted and streaked darker. Below, yellow, adult males, with throat entirely black or with two heavy black forward-pointing chevrons plus a median "shaft". Females with a similar, but much fainter marking or throat immaculate.

Size. Largest male (UM. 500 - 20 mls WSW of Victoria Falls) 42 + 47 = 89 mm. Largest ♀ (NSR. 2119 - Livingstone) 38 + 35 = 73 mm.

Habitat. Arboreal, common on Baobab and Mopane trees, also on house walls. Occurs on Acacia giraffae trees bordering the Chobe River (Pitt-Simons, 1935b).

Distribution. The Okavango and Upper Zambezi Basins and the Zambezi Valley downstream to Tete, extending onto the Zambian and Rhodesian plateaux (See. Fig. 3).

#### Genus AFROEDURA Loveridge

Afroedura Loveridge, 1944, Amer. Mus. Novit., No. 1254, p. 1, fig. 1.

Type by original designation: A. karrooica bogerti Loveridge

#### AFROEDURA TRANSVAALICA TRANSVAALICA (Hewitt)

Oedura transvaalica Hewitt, 1925, Rec. Albany Mus., 3, p. 350, pl. xvi, fig. 1 and pl. xvii, fig. 1: Njelele River, N. Transvaal.

Oedura transvaalica platiceps Hewitt, 1925, Rec. Albany Mus., 3, p. 353, pl. xvi, fig. 4: Untali, Rhodesia, (also recorded from Matopos); Pitt-Simons, 1939b, p. 25 (Devuli River Bridge) and 1943, p. 43 (Musani; \* Mhita; Matopos; Untali; Devuli River Bridge; Tassan, 1958, p. 142.

Afroedura transvaalica platiceps Loveridge, 1947, p. 266.

Afroedura transvaalica transvaalica Loveridge, 1947, p. 267; Broadley, 1963b, p. 286.

Afroedura transvaalica Broadley, 1962a, p. 794.

One hundred and thirty-seven specimens examined from:

RHODESIA. Baselay Bridge; 18 mls N of Beitbridge; 30 mls W of Birch-enough Bridge; Chido; Chinyamanda; Chivaka River; Dora; Devuli Bridge; Fern Valley; Kondo; Limpopo-Umsingwane Confluence; Lundi River;

\* Mtoko; Empandene between Filabusi & Shabani;

Matinedza; Matopos; Matowa; Mutambara; 7 mls ENE & 15 mls NE of Mtoko; Sabi-Lundi Confluence; Sabi-Machere Confluence; Untali. MOZAMBIQUE. Gorongosa Mtn.; Magasso.

Literature records. RHODESIA. Bikita; Devuli Bridge; Espandana; Filabusi - Shabani; Matopos; Mtoko; Musami; Untali.

Variation. Nostril bordered by three nasals, the first upper labial and the rostral; preanal pores in males 6 - 9, rarely 5 or 10. Original tail strongly verticillate, 6 - 9 scale rows per verticil above and 5 - 7 below; subcaudals aperiodic, squarish or subhexagonal and juxtaposed.

Coloration. Pale grey-brown, with ill defined broad irregular dark cross-bands on body and tail. White below.

Size. Largest ♂ (UM. 4756 - Sabi-Lundi Confluence) 72 + 46 = 118 mm. Largest ♀ (UM. 1067 - Untali) 64 + 63 = 127 mm.

Habitat. This gecko lives in narrow fissures in granite, paragneiss and sandstone outcrops. It is very gregarious, a dozen specimens are often found packed like sardines under a tiny flake. They emerge at dusk to hunt. Pachydactylus a affinis often occurs in association with this species.

Distribution. Southern and eastern Rhodesia, extending south to the Scoutsberg, east to Gorongosa Mountain and north to Mtoko District and adjoining Mozambique (Magasso).

#### AFRODURA TRANSVAALICA LOVERIDGEI Broadley

Afrodura transvaalica (?) transvaalica (not Hewitt) Loveridge, 1953a, p. 171 (Kasumbadodza near Tete).

Afrodura transvaalica loveridgei Broadley, 1963, Ann. Mag. Nat. Hist. (13), 6, p. 236: five miles west of Tete, Mozambique.

Forty-one specimens examined from: MOZAMBIQUE. Tete - 5 mls W, 25 and 30 mls ENE and 15 mls. SSW; Viola.

Literature record. MOZAMBIQUE. Kasumbadodza, Tete.

Variation. Nostril bordered by three nasals and an upward prolongation of the first labial (excluded in 3 specimens); anterior nasals in broad contact behind the rostral; preanal pores in males 6 - 11. Original tail strongly verticillate, 7 - 8 scale rows per verticil above and 5 - 7 below; subcaudals aperiodic, squarish or subhexagonal and juxtaposed.

Coloration. Above pale grey, mottled with grey-brown, with ill defined broad dark cross-bands on body and tail, tip of tail blackish with narrow pale crossbars. Below, uniform white.

Size. Largest ♂ (UM. 3967 - Viola) 59 + 60 = 119 mm. Largest ♀ (UM. 4031 - 5 mls W of Tete) 54 + 57 = 111 mm.

Habitat. Paragneiss and sandstone outcrop in arid country.

Distribution. Known only from a small area around Fete, but occurs on both sides of the Zambezi River.

Genus RHOPTROPUS Peters

Rhoptropus Peters, 1869, Monatsb. Akad. Wiss. Berlin, p. 58. Type by original designation: R. afer Peters.

Dactylichion Thominot, 1878, Bull. Soc. Philom. Paris (7), 2, p. 254. Type by monotypy: D. braconneri Thominot.

RHOPTROPUS BRACONNERI (Thominot)

Dactylichion braconneri Thominot, 1878, Bull. Soc. Philom. Paris (7), 2, p. 254; Environs of Lake Ngami, Bechuanaland; Boulenger, 1885c, p. 209.

Rhoptropus braconneri Hewitt, 1910c, pp. 81, 85, 88; FitzSimons, 1943, p. 114; Loveridge, 1947, p. 286.

Known only from the type in the Paris Museum.

Description (after Thominot) Upper labials 7; lower labials 8; three chin shields present, so arranged as to form a pentagonal whole; digits dilated distally, each with five undivided transverse adhesive lamellae below.

Coloration. Above, olive green marbled with blackish-brown; three transverse black spots on back between hind limbs; limbs each with a reddish-brown chevron-shaped band; tail banded with black. Below, uniform yellowish white.

Size. Type  $56 + 56 = 112$  mm.

Remarks. This gecko was included in a collection received from M. de Castellau, French Consul at the Cape.

Genus PHELSUM Gray

Phelsum Gray, 1825, Ann. Philos. (2), 10, p. 199. Type: Gekko capensis Heron.



PHELSUMA DUBIA DUBIA (Boettger)

Pachydaetylus dubius Boettger, 1881, Zool. Ann., 4, p. 46: Madagascar.  
Phelsuma dubia dubia Loveridge, 1942a, p. 460 (Revision) and 1947, p. 296  
 (Tanzanian localities).

Two specimens examined from: MOZAMBIQUE. Mosambique Island.

Variation. Rostral with a median cleft above; centre of nostril above first labial; nostril bordered by first labial and 3 nasals, the uppermost separated from its fellow by 2 - 3 granules; upper labials 9; lower labials 8 - 9; back covered with obtusely keeled scales; ventral scales smooth; preano-femoral pores in male 27; lamellae under fourth toe 15. Original tail with small squarish feebly keeled scales above in 5 - 7 rows per verticil, large rounded scales below, paired or semi-divided in periods of 3; regenerated tail with irregular scalation.

Coloration (in life) Emerald green above with an orange U-shaped marking on the snout and some large purple-brown blotches in the lumbar region. Immaculate white below.

Size. ♂ (U.M. 8191 - Mosambique Island)  $56 + 60^* = 116$  mm. ♀ (U.M. 8192 - Mosambique Island)  $57 + 60^* = 117$  mm.

Habitat. These geckos were living on trees in the public park near Fort Sao Sebastiao on Mosambique Island, one of those captured was on a railing enclosing the park. The large Fig Trees in the park were occupied by Hemidactylus platycephalus and the two species were not seen in close proximity. No Lycodactylus c. grotzi were seen on the island, although this gecko is common on the mainland opposite.

Distribution. Western Madagascar; Comoro Islands; Zanzibar and coastal areas of Tanzania and northern Mosambique.

PHELSUMA V-NIGRA Boettger

Phelsuma cepedianum (not Merren) Gunther, 1864, p. 307 (Quelimane).

Phelsuma madagascariense (not Gray) Boulenger, 1885c, p. 214 (Quelimane, probably imported).

Phelsuma v-nigra Boettger, 1913, in Voeltzkow, Reise in Ostafrika, 3, pp. 337, 339, 341, 343, pl. xv, fig. 9: Moheli Island, Comoro Islands; Loveridge, 1942a, p. 464 (Revision).

Two specimens examined from: MOZAMBIQUE. Quelimane (EM).

Literature records. MOZAMBIQUE. Quelimane.

Variation. Rostral without a median cleft above; centre of nostril above first labial; nostril bordered by first labial and 2 - 3 nasals, the uppermost separated from its fellow by 1 - 2 granules; upper labials 8; lower labials 6 - 8; chin covered with enlarged flat scales, the outer slightly larger than the inner; back covered with smooth granules; ventral scales smooth; preano-femoral pores in male 23; lamellae under fourth toe 15. Original tail with small obtusely keeled scales above, 7 - 10 rows per verticil, subcaudals paired in periods of 4; regenerated tail with irregular scalation.

Coloration. Green above with darker mottling; cream below with a dark V shaped marking on the inner edge of the lower labials.

Size. ♂ (BM. 64.5.13.4) 51 mm from snout to vent. ♀ (BM. 64.5.13.3) 45 mm from snout to vent.

Discussion. Boulenger (1885c) referred to these specimens as "young", but the female contains eggs. I lack comparative material of P. v-nigra, but these Quelimane geckos key out to that species, the only unusual features being that the male has only two nasals on one side, while the female has the supranasals separated by two granules.

It is possible that the Quelimane colony of P. v-nigra has died out during the last hundred years. Many large trees near the Quelimane docks were scrutinised in December, 1964, but no Phelsuma were seen.

Distribution. Comoro Islands. Introduced to Quelimane sometime before 1864, but perhaps no longer occurring in Mozambique.

Gemma HOMOPHOLIS Boulenger

Homopholis Boulenger, 1885c, Cat. Lizards Brit. Mus., 1, p. 191. Type by original designation: Geko walbergii (sic) A. Smith.

HOMOPHOLIS WAHLBERGI (A. Smith)

Geko walbergii (sic) A. Smith, 1849, Ill. Zool. S. Afr., Rept., pl. lxxv, fig. 1: "Country to the eastward of Cape Colony".

Homopholis wahlbergii Boulenger, 1907b, p. 592 (Cogomo); Chubb, 1909a, p. 592 and 1909b, p. 34 (Matopos; Gwanda); Boulenger, 1910, p. 459, (Delagoa Bay; Salisbury); Hewitt, 1910c, pp. 79, 82, 86 (Palapye; Matopos; Gwanda; 20 mls E of Salisbury); Hewitt & Power, 1913, p. 150 (Gaberones); Cott, 1934, p. 143 (Amatongas); FitzSimons, 1939b, p. 27 (Birchenough Bridge) and 1943, p. 18 (Bilcita; Rikatla; Mochudi; Bulawayo; Masieni; Hunyani River; Mahalapye); Tasman, 1958, p. 141,

Homopholis macrolepis Boulenger, 1885, Ann. Mag. Nat. Hist. (5), 16, p. 474, Delagoa Bay, and 1887a, p. 489; Hewitt, 1910c, pp. 79, 82, 86.

Homopholis wahlbergii arnoldi Loveridge, 1944, Proc. Biol. Soc. Washington, 57, p. 2; Mahalapsi River, Bechuanaland, and 1947, p. 305.

Homopholis wahlbergii wahlbergii Loveridge, 1947, p. 303.

Twenty-six specimens examined from: BECHUANALAND. Foley.

RHODESIA. Beitbridge; Bulawayo; Gwelo; Irisvale; Kildonan; Lake MacIlwaine; 3 mls NE of Makaha; Maryland; Matopos; 7 mls NE and 25 mls N of Mtoko; Marial Mine; Queen's Mine; Shashi-Shashani Confluence; Solusi; Wankie National Park-Main Camp; Zowa. MOZAMBIQUE. Inchope; Namaacha.

Literature records. BECHUANALAND. Gaberones; Mahalapye; Mochudi; Palapye. RHODESIA. Bikita; Birchough Bridge; Bulawayo; Gwanda; Hunyani River; Matopos; 20 mls E of Salisbury. MOZAMBIQUE. Amatongas; Coguno; Delagoa Bay; Masieni; Rikatla.

Variation. Nostril bordered by 4 - 7 small nasals and the first labial; internasal granules 1 - 2; pre-anal pores in males 2; lamellae under fourth toe 10 - 12. Original tail covered above with subhexagonal, subequal scales, 5-6 rows per verticil; subcaudals large, subhexagonal to rounded, 3 - 4 rows per verticil; regenerated tail carrot-shaped and covered with small scales.

Coloration. Pale grey to dark grey-brown above, usually with vague dark and light irregular cross-bands, often a vertebral series of pale blotches, and many specimens (particularly males) have a pair of broad black dorso-lateral stripes extending from the back of the head to about mid-body. Some Mozambique geckos have continuous black stripes from eye to base of tail. The pale grey geckos show no appreciable colour change, but the brownish ones can change from pale fawn to dark purple brown depending on light and background. Below, white or cream, often with small black spots or brownish infuscations. Loveridge (1944) distinguished H. w. arnoldi by the presence of ventral spotting, but as I have previously (1962a) pointed out, the great variation in the extent of ventral spotting has no geographical significance and specimens with and without ventral spots occur together.

Size. Largest ♂ (NSR, 3232 - Queen's Mine) 112 + 91 = 203 mm. Largest ♀ (NSR, 2195 - Irisvale) 120 + 95 = 215 mm.

Dist. This species feeds both by night and day, as indicated by an examination of stomach contents of half a dozen specimens; these consisted largely of cockroaches, grasshoppers and winged termites, with one butterfly and one millipede.

Enemies. The remains of one gecko were found in the stomach of a Genet from Sebungwe District.

Habitat. Often found at the edge of a rock crevice or a fissure in a Baobab, where it waits for an insect to settle nearby. At night it may frequently be found on house walls and one was found on a tarred road after rain at Lupane. Hollow trees and logs are favoured refuges and I have found them in empty swallows' nests in caves on granite kopjes.

Distribution. Southern Mozambique, Zululand, Rhodesia, eastern Bechuanaland and northern Transvaal.

Genus *COLOPUS* Peters

Colopus Peters, 1869, Monatsb. Akad. Wiss. Berlin, p. 57, pl., figs. 1 - 1f:

Type by monotypy: *C. Wahlbergii* Peters.

*COLOPUS WAHLBERGII* Peters

Colopus Wahlbergii Peters, 1869, Monatsb. Akad. Wiss. Berlin, p. 57, pl., Fig 1 - 1f: "Demaraland" (? = Bechuanaland); Werner, 1910, p. 315, (Vlei Topan; Kukong; Kang); FitzSimons, 1943, p. 111; Loveridge, 1947, p. 335; FitzSimons & Brain, 1958b, p. 100.

Colopus kalaharicus FitzSimons, 1932, Ann. Tvl. Mus., 15, p. 36 (Kaotwe Pan) and 1935b, Ann. Tvl. Mus., 16, p. 340, figs 11 - 14 (Matapa Pan; Kuke to Gomodimo; Gomodimo and Kaotwe Pans).

Five specimens examined from: BECHUANALAND. 41 mls NE of Lephope; 10 mls W of Letlaking; Tierpute.

Literature records. BECHUANALAND. Gomodimo Pan; Kang; Kaotwe Pan; Kuke to Gomodimo; Kukong; Matapa Pan; Vlei Topan.

Variation. Nostril bordered by 3 nasals; a single internasal; fourth toe with 2 transversely enlarged adhesive lamellae distally and a minute claw. Original tail cylindrical, not verticillate, covered with flat sub-imbricate scales.

Coloration. Very variable. Usually a dorsal series of large pale-fawn confluent blotches (sometimes dark edged), usually a dark dorso-lateral band extending back from eye, with a yellow band below it, extending above the shoulder and usually breaking up into a series of spots posteriorly. Tail with large dark-edged pale spots or pale with scattered small black spots. Uniform cream below.

Size. Largest ♂ (UM. 10299 - 41 mls NE of Lephope) 55 + 34 = 89 mm. Largest ♀ (UM. 10230 - 41 mls NE of Lephope) 60 + 39 = 99 mm.

Habitat. Lives in holes under small bushes in sandy areas and emerges at night to feed, being particularly in evidence after rain.

Distribution. Southern Kalahari. The original type locality "Demaraland" is very doubtful (see Loveridge, 1947, p. 337).

## Genus PACHYDACTYLUS Wiegmann

Pachydactylus Wiegmann, 1834, *Herp. Mexicana*, p. 19. Type: P. laurii

Wiegmann = inunguis Guerin (not Cuvier) = zeitzii Sparrmann.

Homodactylus Gray, 1864, *Proc. Zool. Soc. London*, p. 59. Type by original designation: H. turneri Gray = Tarentola hibernii A. Smith.

Elasmodactylus Boulenger, 1894, *Proc. Zool. Soc. London*, p. 724. Type by original designation: E. tuberculatus Boulenger.

## PACHYDACTYLUS PUNCTATUS PUNCTATUS Peters

Pachydactylus punctatus Peters, 1854, *Monatsh. Akad. Wiss. Berlin*, p. 615;

Sena and Tete, Mozambique, and 1882, p. 26, pl. v, fig. 2; Boulenger, 1885c, p. 206; Bocage, 1896, p. 98; Boulenger, 1910, p. 462 (Matopos; Serowe); Pitman, 1934, p. 303.

Pachydactylus brumthaleri Werner, 1913, *Denks. Akad. Wiss. Wien*, 88, p. 718; Bulawayo, Rhodesia.

Pachydactylus punctatus lanci FitzSimons, 1932, *Ann. Tvl. Mus.* 15, p. 35; Gembok Pan, Ghansi District, Bechuanaland and 1935b, p. 339 (Gembok; Mabeleapudi; between Mabeleapudi and Lake Ngami; Motlhatlogo).

Pachydactylus punctatus punctatus FitzSimons, 1935b, p. 339 (Tituni; Kalakumti), 1939b, p. 28 (Birchenough Bridge) and 1943, p. 71, (Expandene; Plumtree; Bulawayo); Loveridge, 1947, p. 353 and 1953a, p. 172 (near Tete); Tasman, 1958, p. 139; Broadley, 1962d, p. 795.

Eighty-four specimens examined from: BECHUANALAND. Lake Dow; Sun Pan. RHODESIA. Bebesi; 4 mls NE of Birchenough Bridge; Bulawayo and 9 mls S; Charama Plateau; Devuli Bridge; Irisvale; Kapani and 5 & 10 mls SE; Kariba; Kariba Lake - Buxi, Chimburu & Mwenda Confluences; 5 mls SE of Kasungula; 17 mls SE of Kamsur; 10 mls E of and 15 mls SE of Lumano; Malimbisimbi; Manyoli Ranch; Matopos Dam; Matowa; Msango; Que Que; Red-cliff; Sabi-Lundi Confluence; Sentinel; Shashi-Shashani Confluence; Tuli; Unvuvuvu River; 15 mls E of Wankie; Wankie National Park - Main Camp; Zambesi-Chewore and Sebungwe Confluences. ZAMBIA. Chete Hills; 20 mls W of Katete. MALAWI. Npatapanga. MOZAMBIQUE. Magasso; 4 mls E and 5 mls W of Tete; Viola.

Literature records. BECHUANALAND. Gembok Pan; Kalakumti; Mabeleapudi; Mabeleapudi to Lake Ngami; Motlhatlogo; Tituni; Serowe. RHODESIA. Birchenough Bridge; Bulawayo; Expandene; Matopos; Plumtree. MOZAMBIQUE. Sena; Tete.

Variation. Nostril bordered by three nasals and sometimes also the first labial; the anterior nasals usually in good contact behind the rostral, rarely separated by a small internasal granule; dorsum covered with small subuniform scales; transversely enlarged adhesive lamellae under fourth toe 3 - 4. Original tail covered above with large, imbricate,

rounded scales, not verticillate; subcaudals large, subhexagonal, not transversely enlarged, single (or sometimes semi-divided in parts) in periods of 2.

Coloration. Above, pale grey to purple-brown, usually a dark streak from nostril through eye. Dorsum often with dark spots and/or light spots, sometimes (Kalahari) with irregular dark confluent blotches. Below, white, each upper and lower labial with a median dark spot.

Size. Largest (NSR. 2787 - Lake Dow)  $42 + 45 = 87$  mm.

Enemies. At Kariba Lake, one gecko had been eaten by a Hemirhagerrhis n. nototaenia, another by a Gerrhosaurus v. validus.

Habitat. A terrestrial species which hides under stones or logs during the day and emerges at night to feed. Very common in dry Mopane country of the big river valleys.

Distribution. The Zambezi and Shire Valleys, south through Rhodesia to the northern Transvaal, west through Bechuanaland to South-West Africa and Angola, also Katanga (Witte, 1953, p. 34).

#### PACHYDACTYLUS RUGOSUS A. Smith

Pachydactylus rugosus A. Smith, 1849, *Illus. Zool. A. Africa, Rept.*, pl. lxxv, fig. 2: "Interior of South Africa."; Hewitt & Power, 1913, p. 150 (Ky Ky); FitzSimons, 1943, p. 91 (Junction Cup and Mossob Rivers); FitzSimons & Brain, 1958b, p. 99.

Pachydactylus rugosus rugosus Loveridge, 1947, p. 369.

No local specimens examined.

Literature records. BECHUANALAND - CAPE PROVINCE BORDER. Auob-Mossob Confluence; Ky Ky.

Variation. Nostril bordered by 3 nasals; internasals 1 - 4; dorsum covered with heterogeneous, small, often subconical and striated granules, and irregular series of large striated conical tubercles, largest dorso-laterally; transversely enlarged scapulars under fourth toe 5. Original tail covered with small scales above, 6 - 7 rows per verticil, with a transverse series of elongate spines in the centre of each verticil; subcaudals small, keeled, in 6 rows per verticil.

Coloration. See FitzSimons, 1943, p. 92.

Size. ♂ (T.M. 11962 - Auob-Mossob Confluence) Head and body 51 mm, tail regenerated.

Habitat. This terrestrial species is commonly found beneath stones and logs (FitzSimons & Brain, 1958b).

Distribution. Arid areas of the north-western Cape Province and South-West Africa.

## PACHYDACTYLUS CAPENSIS CAPENSIS (A. Smith)

Tarantola capensis A. Smith, 1845, *Illus. Zool. S. Africa*, *Rept.*, pl. 50, fig. 2: Interior of South Africa.

Pachydactylus capensis Roux, 1907, p. 81 (Rikatla); Boulenger, 1910, p. 461 (Delagoa Bay); Werner, 1910, *Jena. Denkschr.* 16, p. 309 (Vlei Topan; Sevrelela); Hewitt & Power, 1913, p. 150 (Ky Ky); Power, 1927, p. 406 (Lobatsi).

Pachydactylus capensis capensis FitzSimons, 1935b, p. 337 (Lobatsi; Kuke, Gomodimo, Kaotwe, Gembok and Damara Pan; Chukudu; Olam River; Mochudi Pan - Mabelapudi) and 1943, p. 94 (Junction Oup-Hossob Rivers; Mahalappe; Mochudi); Loveridge, 1947, p. 375; FitzSimons & Brain, 1958b, p. 99.

Thirteen specimens examined from: BECHUANALAND. Debeeti; Dik-gomo-di-Kae; 35 mls W. of Kang; 4 mls W of Lechama; 8 mls NE of Lephope; Molofo River, S of Tsabong; 5 mls S of Nata; 14 mls W of Sehita; SWA-NP Border at 24°S.

Literature records. BECHUANALAND. Anob-Hossob Confluence; Chukuku; Damara Pan; Gembok Pan; Gomodimo Pan; Kaotwe Pan; Kuke; Ky Ky; Lobatsi; Mabelapudi to Mochudi Pan; Mahalappe; Mochudi; Olam River; Sevrelela; Vlei Topan. MOZAMBIQUE. Delagoa Bay; Rikatla.

Variation. Nostril bordered by 3 nasals, the anterior in contact behind the rostral; body rather depressed, covered above with small granules and longitudinal rows of large keeled tubercles; usually 5 transversely enlarged adhesive lamellae under fourth toe. Original tail with small, subhexagonal, feebly keeled scales above, 4 rows per verticill, the last row enlarged to form a transverse row of tubercles; subcaudals rounded, imbricate, semi-divided in periods of 2.

Coloration. Grey brown above, spotted and variegated with white and dark brown, sometimes with vague dark cross-bands, a dark streak from nostril through eye. White below.

Size. Largest (UM 10293 - Debeeti) 62 + 45\* mm.

Enemies. Three fragmentary specimens were recovered from the stomach of a genet (Genetta genetta) near Lephope and one from a Mongoose (Bassicyonictis selousi) near Lechama.

Habitat. These nocturnal geckos may be found under stones, logs or loose bark on trees, they also seek refuge in termitaria.

Distribution. Widely distributed in the plateau areas of South Africa, extending west through the southern and central Kalahari to South-West Africa and east to Natal and southern Mozambique (See Fig. 4).



Fig. 4. Distribution of some species of the genus Pachydactylus.

- *Pachydactylus cepensis cepensis* (A. Smith)
- *Pachydactylus oshaughnessyi oshaughnessyi* Boulenger
- ▲ *Pachydactylus affinis affinis* Boulenger
- ▼ *Pachydactylus affinis tigrinus* Van Dam



## PACHYDACTYLUS OSHAUGHNESSYI OSHAUGHNESSYI Boulenger

Pachydactylus oshaughnessyi Boulenger, 1885, Cat. Lizards, Brit. Mus., 1, p. 204, pl. xvi, fig 3: Lake Nyasa (= Cape Maclear), Malawi and 1891, p. 306; Hewitt, 1910c, pp. 80, 84, 87 (Que Que; Gatooma).

Pachydactylus capensis lewyi FitzSimons, 1933, Ann. Tvl. Mus., 15, p. 273: Wankie, S. Rhodesia; Loveridge, 1947, p. 386.

Pachydactylus capensis oshaughnessyi Pitman, 1934, p. 303 (Broken Hill); FitzSimons, 1943, p. 100 (Bindura; Zumbo; Matetsi; Bulawayo; Mushi; Victoria Falls); Loveridge, 1947, p. 387 and 1953a, p. 173; Hanney, 1961, p. 23 (Matope); Broadley, 1962, p. 796.

Twenty-four specimens examined from: RHODESIA. Bulawayo; Kamativi; Kapawi and 10 mls SE; Lukosi; Matetsi; Mkota Reserve; 3 mls W of Nyampanda; Que Que; Redcliff; San Mine; Shawa; Umtati; Unvalwes; Zewa. ZAMBIA. Buwa Mubwa; Chipangali; Fort Jameson; 50 mls ENE of Lusaka; Ndola. MALAWI. Chileka (MMD); Fort Johnston.

Literature records. RHODESIA. Bindura; Bulawayo; Gatooma; Matetsi; Que Que; Victoria Falls; Wankie; ZAMBIA. Broken Hill; Mushi; MALAWI. Cape Maclear; Matope. MOZAMBIQUE. Zumbo.

Variation. Nostril bordered by 3 nasals, the anterior in contact behind the rostral; body sub-cylindrical, covered above with small granules and large keeled tubercles; usually 5 transversely enlarged adhesive lamellae under fourth toe. Original tail with large, rounded, feebly keeled, strongly imbricate scales above, 3 rows per verticil; subcaudals rounded, imbricate, semi-divided in periods of 2.

Coloration. Purplish-brown above, crown of head light golden-brown, a broad, black-bordered, cream crescentic marking on nape, two similar broad cross-bands on back and 4-7 on tail. White below.

Size. Largest (UM 5192 - Que Que) 57 + 33\* mm.

Discussion. This gecko is given specific rank because it shows marked morphological differences from P. capensis and P. affinis and there is no indication of intermediate populations. P. o. oshaughnessyi and P. a. affinis are actually sympatric at Bulawayo and Zewa. P. oshaughnessyi differs from the other species in its cylindrical body, its supracaudal scalation and its coloration, it also differs from P. affinis in subcaudal scalation and habitat preference.

Trinomials are required because specimens from Ndola (4 cream cross-bands on back) and Mushi (3 cross-bands on back, vide FitzSimons, 1943, p. 101) are intergrades between typical oshaughnessyi and P. capensis katangensis Witte (1953, p. 37) described from the Upemba National Park in Katanga, the latter form now becomes Pachydactylus oshaughnessyi katangensis.

Habitat. In Wenkie District this gecko was found under logs lying on Kalaheri Sand and under quartz boulders in the paragneiss hills at Kapani. The Zewa specimen was found by Mr. F. O. Bernhard while carrying out archaeological excavations at Yahokwe Ruins. The Fort Johnston gecko was under a big pile of palm fronds at the end of the dry season, the Matopo specimen under a pile of stones and the Chileka one under a piece of corrugated iron. This species is solitary and does not live in rock crevices like P. affinis.

Distribution. Southern Zambia, northern and central Rhodesia, east to Malawi (See Fig. 4).

PACHYDACTYLUS AFFINIS AFFINIS Boulenger

Pachydactylus affinis Boulenger, 1896, Ann. Mag. Nat. Hist. (6), 17, p. 21; Rustenburg District, Transvaal and 1902, p. 16 (between Untali and Marandellas); Chubb, 1909a, p. 593 and 1909b, p. 35 (Matopos).

Pachydactylus formosus var. affinis Hewitt, 1910c, pp. 84 and 87 (Mashonaland; Matopo Hills).

Pachydactylus capensis tigrinus (not Van Dam) FitzSimons 1939b, p. 27 and 1943, p. 103 (Devuli Bridge).

Pachydactylus capensis affinis FitzSimons, 1943, p. 102 (Mtoko; Macheke; Masami; Espandene; Kutana; Makwiro; Plumtree; Driefontein; Chilimanni; Makushi; Bikita; Tsessebe; Matopos; Essexvale; Untali; Bulawayo); Tasman, 1958, p. 138, photo 3; Broadley, 1963d, p. 796.

Pachydactylus capensis rhodesianus Loveridge, 1947, Bull. Mus. Comp. Zool., 95, p. 384: Espandene, S. Rhodesia (also Gokomere and Devuli Bridge).

One hundred and one specimens examined from: RODESIA. Beseley Bridge; Chibalo Bridge; Chido; Devuli Bridge; Essexvale; Fern Valley; Heathfield; Irievale; Kyle Lake; Lake MacIlwains; Malapati Drift; Marandellas; Matopos; Matona; 7 mls ENE and 15 mls NE of Mtoko; Nyumbatu Bridge; Old Untali; Plumtree; Ruware; Sabi-Landi Confluence; Soti Source; 2 & 19 mls S of Tokwe Bridge; Zewa; Zimbabwe. MOZAMBIQUE. Magasco.

Literature records. BECHUANALAND. Tsessebe. RHODESIA. Bikita; Bulawayo; Chilimanni; Devuli Bridge; Driefontein; Espandene; Essexvale; Gokomere; Kutana; Macheke; Makushi; Makwiro; Matopos; Masami; Plumtree; Untali; Untali to Marandellas.

Variation. Nostril bordered by 3 nasals, the anterior in contact behind the rostral; body strongly depressed and covered with very small granules and small, keeled, irregularly disposed oval tubercles, which are largest and most numerous laterally; usually 4 - 5 transversely enlarged adhesive lamellae under fourth toe. Original tail with small, subhexagonal smooth scales above, 4 - 5 rows per verticil (well defined); subcaudals large, subhexagonal, aperiodic, 3 rows per verticil.

**Coloration.** Purple-brown to grey-brown above usually with 5 - 6 transverse rows of white or yellow confluent spots on the back, with large black spots between them. There is a striking ontogenetic change in the coloration of this species. Juveniles in southern populations have distinct narrow yellow cross-bars or rows of confluent spots at least anteriorly, but those from Lake MacIlbaine and Mtoko District have broad, dark-edged, pale cross-bands. In the adults the pale markings become indistinct and large black spots appear between them. White below.

**Size.** Largest (UM. 3883 - 7 mls. ENE of Mtoko) 54 + 33\* mm.

**Discussion.** Although this gecko is not known to be sympatric with *P. c. capensis*, they may eventually be found together in eastern Bechuanaland or the northern Transvaal. *P. affinis* differs from *P. capensis* in many characters, especially caudal scalation and habitat preference; as there is no indication of intergradation between the two forms I regard them as specifically distinct.

**Habitat.** This species is found only in rock crevices, being common on granite, paragneiss and sandstone outcrops, often in association with *Afroedura t. transvaalica*. It is very gregarious, unlike *P. c. oshaughnessyi* and *P. c. capensis*.

**Distribution.** Rocky areas of the Transvaal and Rhodesia, also adjoining parts of Bechuanaland and Mozambique, replaced in the Limpopo Basin by the following subspecies (See Fig. 4)

#### PACHYDACTYLE AFFINIS TIGRINUS Van Dam

*Pachydactylus capensis tigrinus* Van Dam, 1921, Ann. Tvl. Mus., 1, p. 244, pl. v: Blinkwater, Brak River, Zoutspansberg District, N. Transvaal; FitzSimons, 1943, p. 103; Loveridge, 1947, p. 383.

Nine specimens examined from: RHODESIA. Beitbridge; Shashi-Shashani Confluence.

**Variation.** In build and lepidosis indistinguishable from the typical form.

**Coloration.** Dark purple-brown, crown of head lighter, with 5 - 7 well-defined white, black-edged cross-bands on back and scattered white dots on tail. White below. Juveniles are very similar to young *P. a. affinis* except for their better defined light cross-bands, but the adults never have the large dark dorsal spots which are the dominant markings in adults of the typical form.

**Size.** Largest (UM. 5729 - Shashi-Shashani Confluence) 42 mm. from snout to vent, tail missing.

**Habitat.** Rock crevices in sandstone and paragneiss.

**Distribution.** The Zoutspansberg and the Limpopo Basin (See Fig. 4).

## PACHYDACTYLUS BIBRONI (A. Smith)

Tarentola bibroni A. Smith, 1845, *Illus. Zool., S. Africa, Rept.*, pl. 50,  
fig. 1: Interior of South Africa.

Pachydactylus capensis (not A. Smith) Peters, 1854, p. 615 (Tete; Boror).

Pachydactylus bibroni Peters, 1882, p. 25 (Tete; Boror); Boulenger, 1885c,  
p. 201 and 1907a, p. 7 (Petauke); Chubb, 1909a, p. 593 (Balawayo;  
Springvale Farm) and 1909b, p. 35; Boulenger, 1910, p. 460 (Bechuanaland);  
Hewitt & Power, 1913, p. 150 (Kldorado; Francistown; Ky Ky); Cott, 1934,  
p. 148 (Cherre); Pitman, 1934, p. 302 (Mambwa; Muchingas = Katundula;  
Luangva Valley); FitzSimons, 1943, p. 106 (Bikita; Empandene; Plumtree;  
Serowe; Lobatsi; Battlefields; Mahalapye; Auob-Nossob Confluence;  
Insisa; Wankie; Masambo); Mitchell, 1946, p. 22; FitzSimons & Brain,  
1958b, p. 100 (Twee Rivieren); Tasman 1958, p. 137, Photos 1 - 2.

Homodactylus turneri Gray, 1864, *Proc. Zool. Soc. London*, p. 59, pl. ix,  
fig. 2: "South East Africa" = Tete, Mozambique; Gunther, 1864, p. 307.

Pachydactylus bibronibibroni FitzSimons, 1935b, p. 336 (Tituni; Kalakamati;  
Molepolole; Gaborones; Machumi Pan - Mabeleapudi; Mabeleapudi; Mabeleapudi - Lake Ngami; Motlhatlogo; Maun; Figtree).

Pachydactylus bibroni turneri FitzSimons, 1939b, p. 27 (Birehenough Bridge);  
Loveridge, 1947, p. 405, also 1953a, p. 174 (Kasungu; Chitala River;  
Tete) and 1953c, p. 141 (Nohalo); Hannay, 1961, p. 23 (Lake Chilwa);  
Manasse, 1952, p. 134 (Enokisa; Chibuto; Magaisa); Broadley, 1962,  
p. 797.

One hundred and forty-four specimens examined from: BECHUANALAND. Foley; 12 mls S of Francistown; Ewebe Hills; 10 mls E of Lake Dow; Mahalapye; Molembo; 14 mls W of Sehitwa; Sepopa; SWA-BS Border at 24°S; Toten. RHODESIA. Beitbridge; Birehenough Bridge; Balawayo; Charama Plateau; Chipinda Pools; Chiredzi; Chirundu; Fern Valley; Figtree; Gwelo and 15 mls ENE; Jenembi; 5 & 10 mls SE of Kapami; Eariba; Kariba Lake - Buni and Sangwa Confluences; Idempopo-Jumangwane Confluence; Matopos; Mkota Reserve; Nyakasanga Gorge; Redcliff; Rakometjie Research Station; Ruware; Sabi-Lundi Confluence; Shashi-Shashani Confluence; Sincia; Solusi; Tjolotjo; Triangle; 14 mls. NW of Untali; Wankie; Zambesi-Chevore and Sebungwe Confluences. ZAMBIA. Chiawa; Chipopo; Fort Jameson; Lutanwa; Sinjembale. MOZAMBIQUE. Chicamba Dam; Covane; Lurio; Maringa; Nitugue Mtn.; 12 mls SW of Mangari; Namacha; 4 mls E of Tete; Viola.

Literature records. BECHUANALAND. Auob-Nossob Confluence; Francistown; Gaborones; Kalakamati; Ky Ky; Lobatsi; Mabeleapudi; Mabeleapudi to Machumi Pan; Mabeleapudi to Lake Ngami; Mahalapye; Maun; Molepolole; Motlhatlogo; Serowe; Tituni; Twee Rivieren. RHODESIA. Battlefields;

Bikita; Birchenough Bridge; Bulawayo; Eldorado; Espandens; Figtree; Insisa; Springvale Farm; Wankie. ZAMBIA. Katundula; Luangwa Valley; Mumbwa; Petsuke. MALAWI. Chitola River; Kasungu; Lake Chilwa; Nchalo. MOZAMBIQUE. Boror; Charre; Chibuto; Enchisa; Maguisa; Mazambo; Tete.

Variation. Nostril bordered by 3 (rarely 4) nasals, the anterior usually in contact behind the rostral (rarely separated by a single granule); body moderately depressed and covered above with small, flattened, keeled scales and about 16 rows of very large keeled and stellate tubercles; usually 9 - 11 transversely enlarged adhesive lamellae under fourth toe. Original tail covered above with small subhexagonal keeled scales, 4 - 6 rows per verticil, and a transverse row of six large spinose tubercles in the centre of each verticil; subcaudals sometimes semi-divided anteriorly, always single posteriorly, in periods of 2.

Coloration. Purplish-black to grey-brown, with indistinct dark wavy cross-bands and isolated white tubercles on back, white below.

Size. Largest ♂ (UM, 4460 - Chirundu) 110 + 103 = 213 mm.

Discussion. Loveridge (1947) recognised three races of *Pachydactylus bibroni*, restricting the typical form to the Cape Province, with *palitzersae* Schmidt in northern South-West Africa and Angola and *turneri* Gray covering a huge area including localities in the northern Cape Province and also Angola. He separated these races on the spacing of the tubercles on the head and development of the keels on the dorsal tubercles.

FitzSimons (1943, p. 109) treated *turneri* as a variety, as he found so much variation within populations that it was impossible to separate geographical races on the form and spacing of the dorsal tubercles. He found that in South Africa the variety *turneri* predominates in the west and the typical form in the east, which conflicts with the eastern type locality of *turneri*, which is Tete. It is doubtful whether *palitzersae* warrants subspecific rank, so *P. bibroni* is here treated as a monotypic, if variable, species.

Diet. Cott (1934, p. 149) found a grasshopper, ants, termites, beetles, an earwig and a spider in the stomachs of six Charre specimens.

Enemies. One gecko found in the stomach of a genet (*Genetta genetta*) from Chakutsa Pass. At Tete Loveridge (1953a) found remains in a *Talascopus s. semiannulatus* and discarded tails in two *Philothamnus s. semiannulatus*. One had been eaten by a *Bonason f. fuliginosus* at Kalichero.

Habitat. Common in a wide variety of situations: in rock crevices, under loose bark on trees and on houses. This is a very gregarious species.

Distribution. Tanganyika south to Zululand, extending west through Malawi, Zambia, Rhodesia and the Transvaal into Angola, Bechuanaland (excluding the central Kalahari), South-West Africa and the northern and western Cape Province.

## PACHYDACTYLUS TUBERCULOSUS (Boulenger)

Elasmodactylus tuberculosus Boulenger, 1894, Proc. Zool. Soc. London, pp. 723, 727, pl. xlvii, fig. 2; Lower Congo.

Pachydactylus boulengeri Loveridge, 1933, p. 293 (Nyankolo); Pitman, 1934, p. 302; Loveridge, 1947, p. 409.

Two specimens examined from: ZAMBIA. Chiengi (IRSHB).

Literature record. ZAMBIA. Nyankolo.

Variation. Nostril bordered by 3 nasals, the first labial and the rostral, which has a median groove above; usually a single internasal granule; body moderately depressed and covered with small striate or keeled scales and about 18 rows of large keeled and stellate tubercles; male with 8 preanal pores; 10 - 11 transversely enlarged adhesive lamellae under fourth toe. Original tail covered above with small subtriangular multicarinate scales, 6 rows per verticil, and a transverse row of 6 large keeled tubercles at the posterior edge of each verticil; subcaudals entire, transversely enlarged in periods of 2.

Coloration. More or less uniform grey-brown above, tail with vague light and dark cross-bands posteriorly.

Size. Both Chiengi specimens are desiccated juveniles. The above description is based on three adults from the Rufua Valley in Tanganyika.

Habitat. The Nyankolo series were collected on whitewashed house walls at night (Loveridge, 1933).

Distribution. The Lower Congo, east through Katanga and northern Zambia to Tanganyika, where it occurs on the coast at Tanga.

## PACHYDACTYLUS TETENSIS Loveridge

Pachydactylus tetensis Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 175, pl. v, fig. 3; Tete, Mozambique; Bradley, 1962, p. 777.

Sixty-eight specimens examined from: RHODESIA. Kariba; Kariba Lake (Sanyati Island); Mota Reserve; 25 mls E of Moko; Inyenya River Drift; Zambezi-Chevere Confluence. MALAWI. Mpatananga; Mwanza. MOZAMBIQUE. Chiuta (USNH); Magesso; Matundo; 5 mls W and 1.5 mls SEW of Tete; Viola; 15 mls SW of Zokua.

Literature record. MOZAMBIQUE. Tete.

Variation. Nostril bordered by 3 (rarely 4) nasals, the first labial (excluded in 7 specimens) and frequently by the rostral (36 specimens); usually a single internasal granule (rarely 0 or 2); body moderately depressed and covered above with heterogeneous conical stellate tubercles, the larger ones strongly keeled, but not forming regular rows; there is a vertebral band of small tubercles, the largest tubercles are in the dorso-lateral

region; preanal pores in males 8 - 14; transversely enlarged adhesive lamellae under fourth toe 11 - 14. Original tail covered above with small heterogeneous feebly multicarinate scales, 5 - 7 rows per verticil, and a pair of slightly enlarged scales at the posterior edge of each verticil; subcaudals entire, strongly enlarged transversely in periods of 2.

Coloration. Uniform pale gray above, white below.

Size. Largest ♂ (USNM. 158417 - Chiuta) 100 + 107 = 207 mm. Largest ♀ (MSR. 4489 - Chiuta) 87 + 102 = 189 mm.

Habitat. This species appears to be strictly rupicolous. It is very gregarious and although locally distributed it is invariably abundant where it does occur. It has not been taken in association with Pachydiactylus kibroni, which is often found in similar habitats.

Distribution. The centre of distribution for this distinctive species appears to be the Chicoca trough, from which it has spread up the Zambesi and Shire Valleys. The paratype of P. tetensis was collected by C. J. P. Ionides along the upper Innesdale River, a tributary of the Rovuma River (Loveridge, 1955, p. 171). This Tanganyika population is probably linked with southern populations through the Malawi trough, for no P. tetensis were seen in north Mozambique, although there are plenty of suitable habitats.

#### Family AGAMIDAE

##### Genus AGAMA Daudin

Agama Daudin, 1802 (part), Hist. Nat. Rept., 2, pp. 339, 356. Type by subsequent designation: A. colanorum Daudin (part) = Lacerta agama Linnaeus.

##### AGAMA ATSA Daudin

Agama atra Daudin, 1802. Hist. Rept., III, p. 349: South Africa; Fitz-Simons, 1943, p. 129.

Agama atra atra Fitz-Simons, 1935b, p. 346 (Galani).

No local specimens examined.

Literature record. BEKIHUANALAND. Galani.

Variation. Midbody scale rows about 140; preanal pores in males 12; fourth toe longer than third, fifth toe longer than first; lamellae under fourth toe 20.

Coloration. Above, reddish brown with numerous small dark brown to blackish spots, sometimes with yellow centres. Below suffused with greenish-blue on throat and chest, belly vermillion laterally.

Size. Largest ♂ (FitzSimons, 1935b) 117 + 150 = 267 mm.

Diet. Large ants, grasshoppers and fossorial wasps.

Habitat. Rocky hills near Gahani.

Distribution. The whole of South Africa, southern South-West Africa and the south-eastern corner of Bechuanaland.

#### AGAMA HISPIDA (Linnaeus)

Lacerta hispida Linnaeus, 1758, Syst. Nat. Ed. 10, I, p. 205: "America australis" = Cape of Good Hope.

Agama aculeata Merren, 1830, Tent. Syst. Amph., p. 53: "Cape of Good Hope"; Boulenger, 1885c, p. 351, 1902, p. 16 (Mashonaland) and 1907a, p. 7 (Mosi River); Chubb, 1909a, p. 593 and 1909b, p. 35 (Bulawayo); Boulenger, 1910, p. 465 (Bulawayo; Salisbury; Livingstone); Werner, 1910, p. 318 (Vlei Topen; Lohang - Severelala; Lehututu and Hookana, Kalahari); Hewitt & Power, 1913, p. 151 (Ky Ky; Nosop River).

Agama armata Peters, 1854, p. 616: Sena and Tete, Mozambique, and 1882, p. 42, pl. vii, fig. 2; Boulenger, 1897, p. 800 (Nyika Plateau; Misuku Mtus.); Chubb, 1909b, p. 35 (Kafue River; Umsitu River).

Agama sp. 7 Bocage, 1896, p. 87 (Lourenco Marques; Manica e Sofala)

Agama distanti Boulenger, 1902, Ann. Mag. Nat. Hist. (7), 2, p. 399:

Pretoria, Transvaal; Chubb, 1909a, p. 593 and 1909b, p. 35 (Bulawayo); Boulenger 1910, p. 465 (Mashonaland; Delagoa Bay); Hewitt & Power, 1913, p. 151 (Eldorado; Marundellas; Mochudi; Barolong Farms).

Agama hispida var distanti Boulenger & Power 1921, p. 243 (Bulawayo; Mason; Barolong Farms; Towani; Mochudi; Salisbury; Ghishawasha; Binkura; Importuni Dist.)

Agama hispida var. aculeata Boulenger & Power, 1921, p. 252 (Goma; Tango; Mopani Forest; Lower Mossob; Ky Ky).

Agama hispida var armata Boulenger & Power, 1921, p. 261 (Gasaland; Lourenco Marques; Bulawayo; Rikatla; Serowe; Plumtree; Marundellas; Salisbury; Masambo; Livingstone; Ghishawasha).

Agama hispida distanti Power, 1927c, p. 406 (Lobatsi); FitzSimons, 1935b, p. 342 (Gaberones; Molepolole; Mankie) and 1943, p. 143 (Kupatlene; Chilimani; Driefontein; Kutama; Urvum; Serowe; Francistown; Plumtree; Luvu River).

Agama hispida aculeata Pitman, 1934, p. 303; FitzSimons, 1935b, p. 344 (Molepolole - Kube Pan - Goodino Pan; Kaotse and Damara Pans; Gamsbok; Sunnyside - Machudi; Mabelespudi; Motlhatlogo; Maun; Shorobe; Shale-shonto; Kwai; Eweisve River; Mkatle) and 1943, p. 146 (Serowe; Driefontein; Rusape; Plumtree; Mochudi; Mahalagye; Importuni; Junction Oup and Nosop Rivers); FitzSimons & Brain, 1958b, p. 100.



Agama hispida armata Loveridge, 1933, p. 296 (Ikombo); Cott, 1934, p. 149 (Charre; Caia); Pitman, 1934, p. 303 (Mumbwa; Namwala; Mpika; Serenje; Ghinsali; Broken Hill); Pitsimons 1935b, p. 345 (Figtree); 1939b, p. 28 (Birehenough Bridge), 1943, p. 149 (Driefontein; Rusape; Moko; Kutama; Muzuni; Bikita; Eldorado; Insiza; Bindura; Mazoe; Masieni) and 1958, p. 206 (Nyamsum); Mansons, 1952, p. 138 (Muele; Manica; Lifidui); Loveridge, 1953a, p. 179 (Ban River; Kasungu; Likabala River; Chitala River; Mtinkuka; Tete) and 1953c, p. 141 (Chiromo); Broadley, 1963i, p. 799.

Agama hispida Angel, 1920, p. 614 (Lealui); Mitchell, 1946, pp. 23, 41; Audenaerde, 1963, p. 238 (Katanga material).

Two hundred and ninety-one specimens examined from: BECHUANALAND. Debeeti; 35 mls W of Kang; Kucuntai; Lake Dow and 10 & 15 mls N; Lehututu Pan; 40 mls NW, 10 mls NE and 7 mls S of Lephope; 10 mls W, 10 mls SW and 23 mls S of Letlakeng; Leksabe Pan; 10 mls W of Maboane; 6 mls S of Mochum; 14 mls W and 54 mls NW of Sehiten; Sekium Pan; SW-BP Border at 24°S; 5 mls S of Tsaabong; Tsane; Tselenyane Pan; Wolf Hills.

RHODESIA. Beitbridge and 4 mls NE; Bombesi; Bulawayo and 45 mls NNW and 9 mls S; Changadzi Bridge; Charam Plateau; Chibakwe Bridge; Chimanimani Mtns.; Ghissara Ranch; Ghinyika Reserve; Domboshawa; 4 mls E of Dunala; Glass Block; Kapuni and 10 mls SE; Kariba; Kariba Lake - Charara Confluence; 2 mls S of Eastungula; 15 mls SE of Lupane; Malapati Drift; Malimbani; Marambe Reserve; Marundellas; Marungudzi; Mkota Reserve; Mount Hampden; Msango; 25 mls N and 4 mls W of Moko; Mshandike Bridge; Muanetsi Gorge; Nyamshata Bridge; Odzi; Plumtree and 20 mls WNW; Redcliff; Rekonijsie Research Station; Ruware; Sabi-Lundi Confluence; Salisbury; Sawmills; Sengwe River; Shawanoe Bridge; Shangani; Shashi-Shashani Confluence; Sinola; Sinola Gaves; Sombula; Soti Source; Tanganda Bridge; Toronto; Triangle; Tuli; Turk Mine; Umbali; Wankie National Park - Main Camp; Zambesi - Chewore Confluence and Sebungwe Confluence, also opposite Feira. ZAMBIA. Abercorn; Broken Hill; Buwa Mubwa; Chete Hills; Chikwa; Chilanga; Dushuseenzi; Fort Jameson and 30 mls N; Kafue River; 30 mls W of Katete; Kitunda (IRSB); Lake Chila; Livingstone; Lusaka; Makupa and Mera-Mantipa (IRSB); Ndola; Ngambwe Falls; Siantumba; Sinjebela; Victoria Falls. MOZAMBIQUE. Chicamba Dam; Chiramansa; Covane; Ferreiranga; Jofane; Jorge; Lurio; Maringa; Navus; Notambane; Maluvira; Samo; 5 mls W of Tete; 5 mls SE of Vila Godola; Vila de Marica and 15 mls SE; Zumbo (USRM).

Literature records. BECHUANALAND. Auob-Nossob Confluence. (A); Barolong Farms (D); Damara Pan (A); Francistown (D); Gaberones (D); Gamsbok (A); Kaotwe Pan (A); Kuke Pan (A); Kuke to Gomodimo (A); Kwai (A); Ky Ky (A); Lehututu (A); Lobatsi (D); Lokaneng-Severelala (A); Mabelanpadi (A); Mahalapye (A); Maun (A); Mochudi (D A); Molepolole (D); Molepolole to Kuke (A); Hopani Forest (A); Mookana (A); Motlhatlogo (A);

Sherobe (a); Sunnyside to Mashuri (A); Tango (A); Towani (D); Vlei  
 Topan (A); Eweiswo River (A). RHODESIA. Rikita (X); Bimura (D, X);  
 Birchenough Bridge (X); Bulawayo (D, A, X); Ghilimani (D); Ghiba-  
 washa (D, X); Driefontein (D, A, X); Eldorado (D, X); Espandene (D);  
 Figtree (X); Importuni District (D, A); Insisa (X); Kutana (D, X); Lundi  
 River (D); Marandellas (D, X); Masoe (D, X); Mtoko (X); Musani (X);  
 Nyamiva (X); Plumtree (D, A, X); Rusapo (A, X); Urvusa (D); Wankie (D);  
 ZAMBIA. Broken Hill (X); Chinsali (X); Ikombo (X); Kafue River (X);  
 Lealui; Livingstone (A, X); Mpim (X); Munian (X); Namula (X); Serenje  
 (X); Umsita River (X). MALAWI. Bon River (X); Chiromo (X); Ghitala  
 River (X); Kasungu (X); Likabala River (X); Misuku Mts. (X); Mzimba  
 (X); Nyika Plateau (X). MOZAMBIQUE. Caja (X); Charre (X); Licidai  
 (X); Lourenco Marques (D, X); Manhica (X); Masieni (X); Mauala (X);  
 Manambo (X); Mose River (A); Rikotla (X); Sam (X); Tete (X).

Variation. Midbody scale rows 73 - 108; ventrals smooth to obtusely  
 keeled; third and fourth toes usually subequal; first and fifth toes usu-  
 ally subequal or first slightly longer; lamellae under third toe usually  
 16 to 21 (But 13 - 17 in specimens from northern Zambia); preanal pores in  
 males 8 - 15.

Coloration. Extremely variable, but males usually have a pale dorsal  
 band flanked by paired dark triangles, while females have a vertebral series  
 of pale spots. Throat of adult males usually with a dark blue reticulation  
 or series of wavy longitudinal lines, plus a dark blotch at the base of the  
 throat. The dorsal ground colour covers a wide range of greys, browns and  
 reds and the animal is capable of a considerable amount of colour change.  
 The heads of both sexes are suffused with blue during the breeding season.

Size. Largest ♂ (QVH/R. 487 - 35 mls W of Kang) 108 + 163 = 271 mm.  
 Largest ♀ (QVH/R. 498 - Lokoabe Pan) 100 + 127 = 227 mm.

Discussion. The only comprehensive analysis of the variation within  
 the species Agama hispida was undertaken by Boulenger and Power (1921), who  
 recognised five forms, the forma typica and "varieties" armata, sculeata,  
distanti and brachyura. They showed that the differences between these  
 forms are not clear cut and that in several cases two or more varieties  
 occur together. FitzSimons (1935b, p. 344), with a huge collection from the  
 Kalahari, found that "great difficulty was found in separating certain in-  
 dividuals (of Agama h. sculeata) from A. hispida distanti on the one side  
 and A. hispida armata on the other. In these cases the distinction has  
 been arbitrary and based for the most part on averages." The futility of  
 trying to define geographical races of Agama hispida is shown by the above  
 list of localities collated from the literature: the forms recorded from

each locality are indicated in parentheses (D = distanti; A = aculeata; X = armata), and well collected localities are often credited with all three "varieties", i.e. Serowe; Balawayo; Driefontein and Salisbury. I have previously (1962d, p. 799) noted that most Rhodesian specimens of Agama hispida were intergrades between these three races and Audenaerde (1963, p. 239), after reviewing the situation, decided that it was impossible to recognise geographical races of this species, with which I concur.

The great intraspecific variation shown by Agama hispida may be largely phenotypic, resulting in a morphologically distinct "ecotype" in response to a particular habitat background. The big Kalahari agamas are a good example of this. More ecological studies are required, especially where mosaics of different habitats occur, as in the western Cape Province.

Dist. Cott (1934, p. 149) listed the stomach contents of eleven Mozambique specimens, which consisted largely of ants, supplemented by beetles, Mutillid wasps, termites, etc. Loveridge (1953a, p. 180) lists stomach contents of five Tete females.

Parasites. Mites (Pterygosoma) on a Mtimbuka ♂. Nematodes (Bolydelphis; Strongylaris; Thaladros; Trubunsea) and a cestode (Oocheiritica) in other Malawi agamas (Loveridge, 1953a, p. 180).

Enemies. One specimen was found in the stomach of a Mongoose (Paracynictia selousi) near Lephepe. Cott (1934, p. 149) recovered one from the stomach of a Psammophis s. sudanensis. I have found this agama in the stomachs of Telescopus s. semianulatus (Kabompo); Dispholidus t. punctatus (Fort Rosebery) and Psammophis jallae (Somabula)

Habitat. Widespread and common in savanna, where it is largely terrestrial, although it sometimes climbs into bushes and low trees, especially in the Kalahari.

Distribution. Southern Africa, reaching its northern limits in Angola, Katanga, northern Zambia and Tanganyika.

#### AGAMA MAKARIKARIKA Fitz SIMONS

Agama hispida makarikarika Fitz-Simons, 1932, Ann. Tvl. Mus. 15, p. 36:

Makarikari Saltpan, Bechuanaland, also 1935b, p. 342 and 1943, p. 145.

One specimen examined from: BECHUANALAND. Makarikari Saltpan.

Literature record. BECHUANALAND. Makarikari Pan.

Variation. Midbody scale rows 80 - 105; ventrals smooth or but feebly keeled; third toe much longer than fourth, first toe much longer than fifth; lamellae under third toe 12 - 14; preanal pores in males 10 - 12.

Coloration. Light to dark grey-brown, uniform or with a series of four large dark quadrangular blotches arranged in pairs on either side of the back; a yellowish vertebral line present or absent; head with a distinct X-shaped marking on snout and two dark interocular chevrons pointing posteriorly. Below whitish, with a blue-black reticulation on throat which may extend onto the chest.

Size. Holotype ♂ (TM. 14451)  $66 + 76 = 142$  mm. ♀ (UM. 4655)  $75 + 60 = 135$  mm.

Discussion. This species is readily distinguished from the surrounding populations of *A. hispida* by its smaller size, shorter tail, shorter toes, very small ear-opening and head markings. As FitzSimons (1935b, p. 344) has noted, it has affinities with the highveld form (*distanti*) of *Agama hispida* and is probably derived from this temperate stock, which has been subsequently swamped by invasions of a tropical (*sculeata-ornata*) stock entering from the north. This form has attained reproductive isolation and is a good biological species, whereas the "varieties" of *A. hispida*, although very different morphologically, are not reproductively isolated and therefore intergrade extensively.

Diet. Tenebrionid beetles.

Habitat. Dry open flats of hard-baked lime impregnated ground, where these agamas live in burrows below small scattered salt-bushes.

Distribution. Great Makarikari Saltpan and northern South-West Africa around Ondangua (Steyn, Finkeldey and Buys, 1963, p. 12), also western Orange Free State (Steyn in litt.).

#### AGAMA KIRKI Boulenger

*Agama kirki* Boulenger, 1885, Cat. Lizards, 1, p. 354, pl. xxviii, fig. 2: Zambesi Expedition; Gunther, 1893, p. 555 (Shire Highlands); Boulenger, 1902, p. 16 (Masoo); Chubb, 1909a, p. 593 and 1909b, p. 35 (Matopos; Khami River); Boulenger, 1910, p. 466 (Importani); Hewitt & Power, 1913, p. 153 (Marandellas; Insisa); FitzSimons, 1935b, p. 347 (Zimbabwe), 1939b, p. 29 (Changadai River; Birchenough Bridge) and 1943, p. 136 (Penhalonga; Bindura; Chishawasha; Hunyani River; Macheke; Driefontein; Ependene; Mteko; Chilimansi; Gekomere; Kutam; Bikita; Salisbury; Balawayo; Sinoia; Modudi); Pitman, 1934, p. 303 (Luangwa Valley); Mitchell, 1946, p. 23 (Blantyre; Zomba).

? *Agama colonorum* (not Daudin) Bocage, 1896, p. 86 (Manica District); Themido, 1941, p. 13, (Zumbo).

*Agama kirki fitzsimonsi* Loveridge, 1950, Proc. Biol. Soc. Washington, 63, p. 127: Changadai River, Rhodesia (also paratypes from Birchenough Bridge; Zimbabwe; Gekomere); FitzSimons 1958a, p. 206 (Nyansira); Broadley, 1962a, p. 78.

Agama mossambica (not Peters) Boulenger, 1907a, p. 7 (Mterize River; Petauke).

Agama mossambica mossambica (not Peters) Pitman, 1934, p. 303.

Agama kiriki kiriki Loveridge, 1953a, p. 182 (Mtimbuka; Mpatamanga Gorge; Chiradzulu Mtn.; Likabala River; Ruo River); Broadley, 1962a, p. 798.

One hundred and eighty-six specimens examined from: RHODESIA. Ambi Falls; Angwa-Mukishwe Confluence; Balla Balla; Bazeley Bridge; Bindura; 12 and 20 mls. W. of Birchenough Bridge; Bulawayo; Chera; Chibakwe Bridge; Chido; Chimanimani Mtns.; Chinyika Reserve; Chinyamanda; Chitoro River; Dora; Fern Valley; Ganderowe Falls; Gatsi; Glass Block; Gwelo; Haroni-Lusitu Confluence; Hunters' Road; Inyanga National Park - Wicklow; Kamativi; Kapani; Kariba Lake - Mwenda and Sengwa Confluences; Khami Dam; Lake MacIlwaine; Lukosi Bridge; 3 mls NE of Makaha; Makurupini River; Mambwe Pass; Manda; Matopos; Matowa; Mkota Reserve; 15 mls NE and 7 mls ENE of Mtoko; Mtandurundu; Mupapato Bridge; Nyamakanga; 4 mls. W of Nyampanda; Rusnya River Drift; Ruynani; Ruware; Shawano Bridge; Sinoia; Stapleford; Umtali; Vumba Mtn.; Watsonba; Zewa. ZAMBIA. Chakwenga River; Chilola; Dinda; Kafue; 20 mls W of Katete; 50 mls ENE of Lusaka.\* MALAWI. Cape Maclear; Fort Johnston and 10 mls. SW; Lujeri; Mpatamanga; Mwanza. MOZAMBIQUE. Chicamba Dam; Comacha; Erego; Luala Bridge; Magasso; Mitucus Mtn; 14 mls W of Morrumbala; 15 mls W of Mungari; Mutuali; 20 mls WNW of Namupa; 15 mls SSW of Tete; Vila Coutinho (USNM); Vila Gourveia (USNM); 4 mls W, 7 mls E and 15 mls SE of Vila de Manica; Vumba Mtn. (USNM); 15 mls SW of Zobue.

Literature records. BECHUANALAND. Mochudi, RHODESIA. Mlita; Bindura; Birchenough Bridge; Bulawayo; Changadzi River; Chilimansi; Chishawasha; Driefontein; Espandans; Gokomere; Hunyani River; Importuni; Insisa; Khami River; Kutama; Macheke; Marandellas; Matopos; Masoe; Mtoko; Nyamsia; Penhalonga; Salisbury; Sinoia; Zimbabwe. ZAMBIA. Luangwa Valley.\* MALAWI. Blantyre; Chiradzulu Mtn.; Likabala River; Mpatamanga; Mtimbuka; Ruo River; Zomba. MOZAMBIQUE. Zumbo.

Variation. Midbody scale rows 95 - 122; nuchal and vertebral crests well developed; ventrals subequal to dorsals, smooth; fourth toe longer than third, fifth much longer than first; preanal pores in males 11 - 13.

Coloration. Adult males in the breeding season have the head vermilion to yellow, body purple with vertebral crest whitish, flanked by scattered white scales, hind limbs and tail light blue-green, the latter with narrow white rings, northern specimens usually have a black blotch at the base of the throat. Breeding females have a blue-green head, saffron body with blue-grey blotches, limbs and tail grey. Juveniles and adults during the winter months are a mottled grey-black which blends beautifully with lichen-covered granite.

\* Mterize River; Petauke.

Size. Largest ♂ (UM, 4089 - 15 mls. SW of Zobue)  $115 + 224 = 339$  mm.  
Largest ♀ (MZ, 50505 - Mtimbuka)  $92 + 150 = 242$  mm.

Discussion. Loveridge distinguished fitsimonsi on the less well developed nuchal and vertebral crests, weaker keels and micrones on the dorsal scales and the absence of a dark basal spot on the throats of adult males. In the large series which I have examined, these differences between northern and southern material are apparent, but the larger average size of north Mozambique and Malawi lizards is more noticeable. The development of crests and keels is difficult to assess in series, so I previously (1962d, p. 798) tried to define the ranges of the two races by using the gular spot of adult males as the diagnostic character. As far as possible recent collecting has been restricted to adult males, yielding 177 specimens.

Analysis of this series shows that Loveridge's samples of kirkii from Malawi and fitsimonsi from south-eastern Rhodesia are linked by a cline. In Rhodesia there is a slight "step" in the cline corresponding with the Salisbury-Umtali watershed; specimens from this area have poorly defined gular spots, often paired. Material from Zambia, the Zambezi Valley and Wankie District is variable, the gular spot being usually poorly defined and often absent. Material from the Manica Platform conforms to fitsimonsi except for those from the Tete area, which are typical kirkii. I had already decided that fitsimonsi was too poorly defined to be recognised, when I received four adult males from the Makurupini River on the Mozambique border 40 miles due east of the type locality for fitsimonsi. Two of these have a well marked gular spot, one has a faint spot and one has no spot.

Diet. Loveridge found that termites were the chief food for Malawi lizards. In Rhodesia ants seem to be more important, Kapuni specimens were full of "Matabele Ants" (Megaponera foetens).

Parasites. Red Mites (Pterygosoma aculeata) numerous on a Mtimbuka ♀. Nematodes (Abbreviata amaniensis; Strongyluris sp.) in Likabula River lizards (Loveridge, 1953a, p. 183).

Enemies. A gravid female had been eaten by a Gerrhonotus sp. major near Bikita and another ♀ was recovered from a Theleornis k. capensis on Mitucue Mountain.

Habitat. Granite and paragneiss outcrops and the fig trees which grow on them. The agamas "browse" off the constant stream of ants ascending the tree trunk.

Distribution. Rocky areas of Mozambique, Malawi, Zambia, Rhodesia and eastern Bechuanaland

## AGAMA MOSSAMBICA MOSSAMBICA Peters

Agama mossambica Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 616: Coast of Mozambique between 7° and 20° S. Latitude, and 1882, p. 38, pl. vii, fig 1; Gunther, 1864, p. 307 (Quelimane); Boulenger, 1885c, p. 353 (Quelimane; Zambesi); Gunther, 1893, p. 555 (Shire Highlands); Bocage, 1896, p. 86 (Mossuril; Zambesia); Boulenger, 1907b, p. 184 (Beira); Cott, 1934, p. 150 (Gaia; Marroessa; Amatongas; Charre).

Agama oocinctalis (not Gray) Gunther, 1864, p. 307 (Zambesi Expedition).

Agama colonorus (Not Daudin) Loveridge, 1920, p. 140 (part - Lumbo).

Agama mossambica mossambica ~~Peters, 1854, p. 307~~; Mertens, 1937, p. 7 (Inhaminga); FitzSimons, 1943, p. 135 (Beira); Manacas, 1952, p. 137 (Dondo); Loveridge, 1953a, p. 180 (Likabula River; Ruo River); Manacas, 1961, p. 147 (Vila Paiva de Andrada).

Seventy-two specimens examined from: RHODESIA. Haroni-Lusitu Confluence; Jersey Tea Estate; Ngorima Reserve (E). MALAWI. Cholo Mtn.; Lujeri Tea Estate. MOZAMBIQUE. Cabaceira Peninsula; Cruzado; Dondo; Grudja; Gumba; Inhope; 8 als NE and 12 als SSW of Inhaminga; Jorge; Manga; Mossuril; Mada - Lamgo; Piro; Samo; Vila Junqueira; Xiluvo.

Literature records. MALAWI. Likabula River; Ruo River. MOZAMBIQUE. Amatongas; Beira; Gaia; Charre; Dondo; Inhaminga; Lumbo; Marroessa; Mossuril; Quelimane; Vila Paiva de Andrada.

Variation. Midbody scale rows 70 - 94; keels on the vertebral scale row form a very low crest; ventrals smaller than dorsals, smooth to strongly keeled and mucronate; fourth toe usually slightly longer than third, fifth much longer than first; premaxillary pores in males 10 - 14.

Coloration. Adult males usually pinkish or grey-brown with a blue head and a broad whitish vertebral band, suffused with orange below, throat with a large blue patch. Adult females brilliant orange on the back and very similar to females of Agama kirki.

Size. Largest ♂ (UM. 8169 - Cabaceira Peninsula) 115 + 215 = 330 mm. Largest ♀ (UM. 7283 - Xiluvo) 100 + 150 = 250 mm.

Diet. Cott (1934, p. 150) lists the stomach contents of nine Mozambique specimens. These consisted largely of ants, supplemented by beetles and other insects and one millipede.

Parasites. Orange mites (Pteryosoma triangulare; Schongastia gerhosauri; Trombicula montensis) numerous in the gular fold of Malawi specimens. Nematodes (Abbreviata amaniensis; Abbreviata sp.) recovered from several stomachs (Loveridge, 1953a).

Habitat. Lowland savanna and forest fringes. This species is partially arboreal and partially terrestrial.

Distribution. Tanganyika, south through Mozambique to the Buzi River, east to Malawi, ~~east to Malawi~~ and eastern Rhodesia.

AGAMA CYANOGASTER (Ruppell)

Stellio cyanogaster Ruppell, 1835, Neue Wirbelthiere Fauna Abyss. Amph., p. 10, pl. v: Massaua, Eritrea.

Agama atricollis A. Smith, 1849, Ill. Zool. S. Afr. Rept. ., App. p. 14: "Interior of Southern Africa and Country near Port Natal"; Boulenger, 1887a, p. 496 (Delagoa Bay); Gunther, 1893, p. 555 (Shire Highlands); Boulenger, 1907a, p. 7 (Petauke); Roux, 1907, p. 82 (Bikafila); Chubb, 1909a, p. 593 (Balawayo) and 1909b, p. 35 (Balawayo; Kana River; Gwelo; Broken Hill); Boulenger, 1910, p. 466 (Delagoa Bay; Maroo); Hewitt & Power, 1913, p. 153 (Marandellas; Francistown); Angal, 1920, p. 614 (Lealui); Power, 1927c, p. 406 (Lobatala); Cott, 1934, p. 150 (Amatongas); Pitman, 1934, p. 303 (Broken Hill; Mpika; Serenje; Chinsali); FitzSimons, 1935b, p. 348 (Gabani; Kalakamati); Mertens, 1937, p. 7 (Nsonbo); FitzSimons, 1939b, p. 29 (Mount Silinda); Therid, 1941, p. 13 (Maasangulo); FitzSimons, 1943, p. 127 (Salisbury; Kutama; Sarowe; Plumtree; Mochudi; Chishawasha); Marnock, 1952, p. 135 (Nampacha; Manhica; Guija; Chibuto; Maquese).

Stellio atricollis Bocage, 1896, p. 87 (Mozambique)

Agama cyanogaster Loveridge, 1953a, p. 176 (Shibotala; Chire River Bridge; Chitale River; Nohisi Mtn; Zomba Plateau; Cholo Mtn.; Likabala River); Broadley, 1962d, p. 797.

Agama atricollis atricollis Klausewitz, 1957, p. 161 (Missala, P.E.A.)

Agama atricollis loveridgei Klausewitz, 1957, p. 163: Nakoma, East Africa (also Nsonbo, Lake Bangweulu; Chifumbazi).

One hundred and twenty-two specimens examined from: PROTECTORATE. Debesti; 10 mls E. of Lake Dow; 4 mls W of Lechana; Matjemlooji; Mites; Ootsi. RHODESIA. Achmashe; Beitbridge; Bulawayo; Charama Plateau; Chinyamanda; Dett; Fern Valley; Filabusi; Gwelo; Holdenby; Inyanga Tea Estates; Inyamure; Irisvale; Kapami and 6 mls SE; 10 mls E of Lupane; Malibasiubi; Manda; Marandellas; 25 mls WSW of Mtoko; Nyamandhlova; Nyamashatu Bridge; Pungwe Bridge; Redcliff; Shashi-Shashani Confluence; Umbali and 4 mls NW. ZAMBIA. Abercorn; Chakwanga River; Chiloma Stream; Chiri River Bridge; Fort Rosebery District; Ikalenge; Kabompo; Kasama (IRSNB); Kasha; 20 mls W of Katete; Kondolilo Falls; 50 mls ENE of Lusaka; Mulupa (IRSNB); Mwinilunga; Ndola; Solwezi. MALAWI. Cholo; Rumpi; Zomba. MOZAMBIQUE. Cavallo; 15 mls NNW of Parancungo (USNM); Inchope; Metuchira; Gamo.



Literature records. BECHUANALAND. Francistown; Gabani; Kalakamati; Lebatsi; Mochudi; Serowe. RHODESIA. Bulawayo; Chishavasha; Gwelo; Kama River; Kutama; Marandellas; Masoe; Mount Silinda; Plumtree; Salisbury. ZAMBIA. Broken Hill; Ghinsali; Chire Bridge; Lealui; Mpika; Nsembo; Petsuke; Serenje. MALAWI. Chibotola; Chitala River; Chole Mtn.; Likabula River; Nchisi Mtn.; Zomba Plateau. MOZAMBIQUE. Amatongas; Chibuto; Chifumbesi; Delagoa Bay; Guija; Manhica; Maquese; Massangulo; Namacha; Rikatla.

Variation. Midbody scale rows 100 - 136; no vertebral crest; ventrals smooth; preanal pores in males 17 - 29, in two rows.

Size. Largest ♂ (MEZ, 50544, Chitala River) 167 + 231 = 398 mm.

Largest ♀ (UM, 9726 - 4 mls W. of Lechama) 142 + 178 = 320 mm.

Discussion. Parker (1942) placed Agama atricollis in the synonymy of A. cyanogaster and was followed by Loveridge and others. Klausewitz (1954) revived A. atricollis as a full species and subsequently (1957) recognised six races of it. Audenmerde (1963) found that a series of 800 Congolese agamas showed a range of variation which bridged the alleged specific differences listed by Klausewitz and he therefore recognised only one monotypic species - Agama cyanogaster.

The material considered here does not shed any light on the status of A. atricollis, which can only be definitely established by field studies in north-eastern Africa. The only point to be settled is whether two races can be recognised in south-east Africa, for Klausewitz (1957) distinguished A. a. loveridgei north of the Zambezi and A. a. atricollis south of that river and extending north-west into Angola and Katanga (Elisabethville). Audenmerde (1963, p. 227) has already remarked on the improbability of a subspecific distinction between populations at Elisabethville and Lake Bangweulu; it seems equally unlikely to me that a widespread savanna form should be divided into subspecies by the Zambezi River.

Klausewitz separated loveridgei from atricollis on its slightly longer tail and the coloration. As Audenmerde has already pointed out, the great variation in the coloration of these agamas renders this character useless for systematic studies.

Klausewitz gives the following data for the Tail : Body Length Index:-

Table 1 A	MALES			FEMALES		
	N	Range	Mean	N	Range	Mean
<u>atricollis</u>	16	1.18 - 1.40	1.33	7	1.03 - 1.30	1.16
<u>loveridgei</u>	23	1.15 - 1.59	1.44	8	1.26 - 1.54	1.36

There is a big overlap in the proportions even with these samples, which include only four specimens from "south-central Africa". For comparison I have divided my material from the region into two groups, the southern material from Bechuanaland, Rhodesia and south Mozambique should be atricollis and the northern specimens from Zambia and Malawi should conform to loveridgei.

Table 1 B.	MALES			FEMALES		
	N	Range	Mean	N	Range	Mean
Southern group	34	1.16 - 1.60	1.32	19	1.11 - 1.44	1.23
Northern group	16	1.21 - 1.46	1.35	12	1.21 - 1.41	1.29

These figures certainly do not support the recognition of two local subspecies, but suggest that there is a cline in average tail length, with an increase from south to north.

**Diet.** Cott (1934, p. 150) lists the stomach contents of six *Amantongas* specimens, which consisted largely of ants with a few beetles and caterpillars. Power (1927c) found beetles in a *Lobatsi* specimen, while I (1962d, p. 797) recovered beetles, a grasshopper and a mantis from the stomachs of two *Kapsmi* specimens. One I. R. S. N. B. specimen from Mulupa has been preserved with an adult *Hemirhagerthis n. nototaenia* in its mouth.

**Parasites.** Nematodes (*Abbreviata namaniensis*; *A. variani*) recovered from Malawi specimens (Loveridge, 1953a, p. 178).

**Enemies.** Adult specimens have been recovered from the stomachs of the following snakes: - *Mohelma c. capensis* (Balawayo); *Thelotornis k. capensis* (Irisvale) and *Thelotornis k. oatesii* (Salisbury). One was killed by a crow (*Corvus albus*) at Untali.

**Habitat.** This arboreal species is widespread in savanna, but is perhaps most plentiful in *Brachystegia* woodland and *Acacia* savanna. On the Mozambique Plain its place seems to be taken by *Agama n. mossambica* and these two species are rarely found in close proximity. Both occur in the *Amantonga* - Inchope area, but here *gyanogaster* is the commoner species.

**Distribution.** Eritrea south to Natal, west to the Transvaal, Bechuanaland, Ovamboland, Angola and the eastern Congo.

Family CHAMAELEONIDAE

Genus CHAMAELEO Laurenti

*Chamaeleo Laurenti*, 1768, Syn. Rept., p. 45. Type by subsequent designation. *C. parisiensis* Laurenti = *Lacerta chamaeleo* Linnaeus.

- Bradypodion Fitzinger, 1843, Syst. Rept., pp. 15, 43. Type by original designation: Chamaeleo pusillus Latreille = Lacerta pusilla Gmelin
- Microsaura Gray, 1865, Proc. Zool. Soc. London (1864), pp. 467, 473.
- Type by monotypy: M. melanocephala Gray
- Lophosaura Gray, 1865 (not Gray, 1852) Proc. Zool. Soc. London (1864), pp. 468, 474. Type by restriction: Lacerta pusilla Gmelin.
- Ensirostris Gray, 1865, Proc. Zool. Soc. London (1864), pp. 468, 478.
- Type by monotypy: E. melleri Gray
- Dilepis Gray, 1865, Proc. Zool. Soc. London (1864), p. 472. Type by tautonymy: Chamaeleo dilepis Leach.
- Bicuspis Loveridge, 1956, Breviora (Harvard) No. 59, p. 2. Type by original designation: Chamaeleo marshalli Boulenger (A valid subgenus).

CHAMAELIS PUSILLUS MELANOCEPHALIS (Gray)

- Microsaura melanocephala Gray, 1865, Proc. Zool. Soc. London (1864), p. 471, fig.: Port Natal = Durban; FitzSimons, 1943, p. 160 (Delagoa Bay).
- Lophosaura melanocephala Power, 1932, Proc. Zool. Soc. London, p. 217 (Delagoa Bay).
- Chamaeleo pusillus melanocephalus Hillenius, 1959, p. 63.

No specimens examined.

Literature records. MOZAMBIQUE. Delagoa Bay.

Discussion. Loveridge (1957, p. 197, footnote 38) has pointed out that if the C. pusillus group warrants generic status the first available name is Bradypodion Fitzinger.

Hillenius (1959) reviewed the group and concluded that all the described forms were conspecific. He also questioned the advisability of placing these chameleons in a separate genus on osteological and anatomical grounds when the range of variation in other chameleons, especially the viviparous species in the Chamaeleo bitaeniatus group, is not known.

Distribution. Coastal areas of Pondoland, Natal, Zululand and southern Mozambique, extending inland to the lower slopes of the Natal Drakensberg (5,000 feet).

## CHAMAELEO GOSTZENI NYIKAE Loveridge

Chamaeleo gostzeni nyikae Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 189: Nyika Plateau, directly above Nohemachema at c. 7,500 ft., Malawi.

Seven specimens examined from: ZAMBIA. Nyika Plateau. MALAWI. Ghalinda (Nyika Plateau).

Literature records. MALAWI. Nyika Plateau.

Description. No rostral appendage; no occipital flaps; a vertebral crest of conical tubercles present; no ventral crest; claws simple; tail subequal to about one and a quarter times length of body.

Size. Largest ♂ (UM. 6926 - Nyika, Zambia)  $80 + 97 = 177$  mm. Largest ♀ (AMNH. 6784E - Nyika, Malawi)  $87 + 94 = 181$  mm.

Habitat. Found on low plants in marshy areas (Loveridge, 1953a).

Distribution. Endemic to the Nyika Plateau. The typical form occurs on the Uzungwe, Ubeni, Ukinga, Rungwe and Poroto Mountains in south-west Tanganyika.

## CHAMAELEO MIANJENSIS Broadley

Chamaeleo mianjensis Broadley, 1965, Arnoldia (Rhodesia) 1, No. 32, p. 1: Ruu Gorge Forest, Mlanje Mountain, Malawi.

One specimen examined (Type).

Description. No rostral appendage; no occipital flaps; no vertebral or ventral crests; claws simple; tail 55 per cent of total length.

Size. ♂ (UM. 4268 - TYPE)  $77 + 94 = 171$  mm.

Habitat. Evergreen forest in the Ruu Gorge at about 3,500 feet. Two more specimens were collected when big forest trees were felled on the Luferi Tea Estates; the local Africans consider the species rare, so it is apparently confined to virgin forest (Findlay, in litt.).

Distribution. Likely to occur on the forested inselbergs on the Niassa Plateau north-east of Mlanje Mountain.

## CHAMELEO MELLERI (Gray)

Emirostris melleri Gray, 1864, Proc. Zool. Soc. London, p. 478, pl. xxxii, fig. 1: "Mountains in the interior of East Africa." (restricted to Zomba, Malawi by Loveridge, 1953a).

Chamaeleon melleri Boulenger, 1887a, p. 472; Gunther, 1894, p. 618; Bocage, 1896, p. 89 (Mozambique); Werner, 1902, p. 421 (Zomba; Blantyre); Thewido, 1941, p. 15 (Massangula).

Chamaeleo melleri Mitchell, 1946, pp. 25, 41 (Zomba); Loveridge, 1953a, p. 187 (Likabula River; Zomba Plateau; Blantyre; Cholo Mtn.; Ruo River) and 1953c, p. 141 (Blantyre).

Six specimens examined from: MALAWI. Blantyre; Lujori Tea Estates.

Literature records. MALAWI. Blantyre; Cholo Mtn.; Likabula River; Ruo River; Zomba; Zomba Plateau. MOZAMBIQUE. Massangulo.

Description. A large rostral horn present; occipital flaps very large and in broad contact on the nape; a well developed crested vertebral crest extends onto the proximal half of the tail; no ventral crest; claws simple; tail slightly longer than body.

Size. Largest ♂ (AMNH. 67798 - Likabula River) 288 + 307 = 595 mm. Largest ♀ (MZ. 50644 - Cholo Mtn.) 207 + 225 = 432 mm.

Breeding. The eggs, 38 - 91 in number, are laid in a hole in the ground about the middle of December (Mitchell, 1946)

Diet. Loveridge (1953a) found the remains of grasshoppers and dragonflies in a Zomba Plateau specimen and large black ants in a Cholo chamaeleon. They will eat small birds in captivity.

Habitat. A savanna species which is common on the extensive tea estates in south-eastern Malawi.

Distribution. South-eastern Tanganyika, northern Mozambique and south-eastern Malawi.

## CHAMELEO DILERIS DILERIS Leach

Chamaeleo dilensis Leach, 1819, in Boudich, Miss. Ashantee, App. p. 493: Gaboon; Gunther, 1864, p. 307; Peters, 1854, p. 614; Martens, 1935, p. 7 (Inhambane; Beira); Mitchell, 1946, p. 25; Munnos, 1961, p. 148 (Nocuba; Vila Paiva de Andreia; S. Martinho).

Chamaeleon petersi Gray, 1864, Proc. Zool. Soc. London, p. 470, fig. 1: Mozambique.

Chamaeleo dilensis var. quilensis Bocage, 1866, Jorn. Sci. Lisboa, 1, p. 59: Rio Quilo, Angola; FitzSimons, 1943, p. 155 (Malsetter; Balawayo; Salisbury; Inhambane; Isportuni; Ghishawasha) and 1958, p. 207 (Nyansaiva).

- Chamaeleon dilepis Peters, 1882, p. 21 (Cape Delgado; Inhambane; Tete; Macanga); Boulenger, 1887a, p. 450, pl. xxxix, fig. 6; Gunther, 1894, p. 618; Bocage, 1896, p. 89 (Tete; Lourenco Marques; Sofala); Peracca, 1896, p. 1 (Kasungula); Boulenger, 1897, p. 800 (Nkata Bay to Ruarwe; Kondowe to Karonga; Nyika District & Plateau; Masuku Mtns.; Fort Hill); 1902, p. 17 (Mashonaland), 1907a, p. 9 (Feira; Patauke) and 1907b, p. 486 (Beira); Chubb 1909a, p. 594 and 1909b, p. 35 (Balawayo); Boulenger, 1910, p. 492 (Masoe; Salisbury; Importuni); Hewitt & Power, 1913, p. 160 (Bushman Mine); Loveridge, 1920, p. 160 (Lumbo); Mertens, 1937, p. 7 (Hesombo; Inhanninga; Beira); Theidie, 1941, p. 15, (Beira; Zumbo; Massangulo).
- Chamaeleon nardilobus Boulenger, 1887, Cat. Lizards Brit. Mus., 3, p. 449, pl. xxxix, fig. 5; Natal, French Congo, Cameroon; Gunther, 1893, p. 555 (Shire Highlands); Angel 1920, p. 617 (Lealui).
- Chamaeleon isabellinus Gunther, 1893, Proc. Zool. Soc. London, p. 556, pl. xxxiii, fig. 2; Shire Highlands, Malawi.
- Chamaeleon dilepis var. quilensis Werner, 1902, p. 239 (R. Nata; Delagoa Bay).
- Chamaeleon dilepis var. dilepis Werner, 1902, p. 340 (Zomba; Lake Nyasa; Klantyre; Kota Kota; Inhambane) and p. 457 (Quelimane; Delagoa Bay).
- Chamaeleon dilepis var. isabellinus Werner, 1902, p. 344 (part - Shire Highlands).
- Chamaeleon quilensis Boulenger, 1907b, p. 486 (Goguno; Beira); Chubb, 1909a, p. 594 (Matabelaland); Boulenger, 1910 (Delagoa Bay); Hewitt & Power, 1913, p. 159 (Eldorado; Ky Ky); Power 1927c, p. 409 (Lobatsi).
- Chamaeleon dilepis quilensis Werner, 1910, p. 352 (Lehututu-Kang; Ku-Gui-Di; Vlei Topan, Kalahari); Loveridge, 1929, p. 86 (Victoria Falls) and 1933, p. 331 (Nyankolo); Pitman, 1934, p. 306; FitzSimons, 1935b, p. 378 (Gaberones; Metsimaklaba River; Olam River).
- Chamaeleon dilepis dilepis Loveridge, 1929, p. 86 (Kafue River); Cott, 1934, p. 170, pl. iii, fig. 2 (Charre; Gaia); Pitman, 1934, p. 306 (Mumbwa; Namwala; Broken Hill); FitzSimons, 1935b, p. 377 (Plumtree to Tsessebe; Sebena; Maun; Shaleshonto to Kwasi; Kabulakula; Makarikari; Kumalo) and 1939b, p. 38 (Tanganda River; Mount Silinda; Birch-enough Bridge).
- Chamaeleo dilepis dilepis FitzSimons, 1943, p. 153 (Driefontein; Kutana; Masami; Rilatla; Francistown; Inois; Delagoa Bay; Ghishawasha; Bindura; Arcoturus; Insiza); Manacas, 1952, p. 155 (Manhica; Chibuto; Lifidzi); Loveridge, 1953a, p. 184 (Ghibotela; Nohisi Mtn.; Misuku Mtns.; Nchenschena; Mzimba) and 1953c, p. 141 (Chirone); Broadley, 1962d, p. 799.

Chamaeleo dilepis isabellinus Loveridge, 1953a, p. 183 (Lilabula River; Ruo River; Cholo Mt.).

Chamaeleo dilepis petersi Loveridge, 1953a, p. 186 (Chitala River; Mtimbuka; near Teta).

Seventy-eight specimens examined from: BECHUANALAND. 10 mls W. of Letlaking. RHODESIA. 25 mls W of Birchenough Bridge; Bulawayo; Charama Plateau; Chinyamanda; Chirinda Forest; Chirundu; Erin Forest Reserve; Inyantae Bridge; Irisvale; Kapeni and 5 mls SE; Kariba; Kariba Lake - Chesia Confluence; Karoi; 5 mls SE of Lupane; Masowe; Mount Silinda; Mtoko; New Year's Gift; Rhodes Inyanga Estate; 10 mls W of Salisbury; Selborne Estates; Sinoia; Untali; Zambesi-Sebungwe Confluence; Zowa. ZAMBIA. Ikelenge; Kabompo; Kasempa; Kasusu; Kitwe; Livingstone; Marweni; Mulanga; Sakaŋi Stream; Shshoko; Solwezi. MALAWI. Livingstonia; Lujeri Estates; Rumpi; 10 mls SW of Zomba. MOZAMBIQUE. Beira; Chicamba Dam; 5 mls NW of Dondo; Garuso; Gorongosa Mtn.; Inhaminga; Mavue; Monapo; Sena; Tete (UM & USNM) and 12 mls. SSW; 25 and 25 mls SW of Zobue.

Literature records. BECHUANALAND. Bushman Mine (D); Francistown (D); Gaberones (Q); Kabulabula (D); Ku-Gui-Di (Q); Ky Ky (Q); Letlututu - Kang (Q); Lobasti (Q); Makarikari (D); Mann (D); Metsinklaka River (Q); Okwa River (Q); Sebema (D); Shaleshonto to Kwani (D); Tsussebe (D); Vlei Topan (Q); RHODESIA. Aroturus (D); Bindura (D); Birchenough Bridge (D); Bulawayo (D, Q); Chishawasha (D, Q); Driefontain (D); Eldorado (Q); Importuni (D, Q); Insisa (D); Kasungula (D); Kumalo (D); Kutama (D); Mazoe (D); Malsetter (Q); Mount Silinda (D); Musami (D); Nyamniwa (Q); Plumtree (D); Salisbury (D, Q); Sinoia (D); Tanganda River (D); ZAMBIA. Broken Hill (D); Feira (D); Kafue River (D); Lealui (X); Mumbwa (D); Namwala (D); Nsonbo (D); Nyankolo (Q); Petauke (D); Victoria Falls (Q). MALAWI. Chibotola (D); Chiromo (D); Chitala River (P); Cholo (I); Fort Hill (D); Kondwe to Karonga (D); Lilabula River (I); Misuku Mtns. (D); Mtimbuka (P); Mwalaba (D); Nchenachana (D); Nchisi Mtn. (D); Nkata Bay to Ruarwe (D); Nyika District (D); Ruo River (I). MOZAMBIQUE. Beira (D, Q); Caia (D); Cape Delgado (D); Charre (D); Chibuto (D); Coguno (Q); Delagoa Bay (D, Q); Inhambane (D, Q); Inhaminga (D); \*Massangulo (D); Mocuba (D); Quelimane (D); Rikatla (D); Sao Martinho (D); Sofala (D); Tete (D, P); Vila Paiva de Andrada (D); Zumbo (D). \*Lifidzi (D); Lourenco Marques (D); Macanga (D); Manhica (D);

Description. No rostral appendage; occipital lobes variable in size; vertebral and ventral crests present, formed of white conical tubercles; claws simple; tail subequal to body in length.

Size. Largest ♂ (MZ. 50621 - Tete)  $172 + 176 = 348$  mm. Largest ♀ (MZ. 50614 - Mtinkaka)  $185 + 156 = 341$  mm.

Discussion. In his study on the morphology of the species comprising the genus Chamaeleo, Hillenius (1959) concluded that the status of the many described races of C. dilepis is very doubtful because of the apparent huge overlaps in their distributions. This is shown in the summary of literature localities above, where the forms recorded from each locality are indicated by the following letters in parentheses: D = dilepis; I = isabellinus; P = petersii; Q = quilensis; X = parvilobus.

In several cases dilepis and quilensis have been recorded from the same locality and FitzSimons (1943) finding that intermediates between the two forms were common, treated quilensis as a variety rather than a subspecies. He noted that the variety quilensis (with parvilobus as a synonym), with very small occipital flaps, predominated in the south, and was gradually replaced by typical dilepis as one proceeded northwards. There is certainly no justification for retaining quilensis as a subspecies, but Laurent (1964c), considers it to be a sibling species, sympatric with dilepis. The data he presents are not convincing, because his small sample of dilepis is from Elizabethville and the series of quilensis is from Angola.

Loveridge (1953a) recognised three races of C. dilepis in Malawi. C. d. isabellinus of the Shire Highlands has only 4 - 5 scales across an occipital lobe, compared with 6 - 8 in the typical form, and C. d. petersii of the Zambesi Valley and the Malawi Trough (250 to 1,550 feet) is larger in average size than the typical form, often exceeding 300 mm in total length.

The three specimens that I have examined from the Shire Highlands certainly key out to isabellinus, but so do odd chameleons from other regions. The "Key character" for this form is too nebulous for sound taxonomy.

Loveridge (1953a, p. 186) himself admitted that the separation of petersii on size alone created difficulties, noting that he had recorded a female of 390 mm from Mbanja, north of Lindi and another of 370 mm from Morogoro, both localities in Tanganyika. He also observed that at Mbanja there appeared to be a colony of the giant form surrounded by normal populations. There are populations of "giant" dilepis in north-west Zambia and adjoining Angola. I have ♀♀ of 327 mm (Kasempa) and 300 mm (Kabonpa), also a pair from Cassai, both exceeding 300 mm. The largest Rhodesian specimen is a ♀ of 333 mm. from Irivule. Loveridge (1920) gave the average lengths for Morogoro dilepis as 282 mm. for 23 ♂♂ and 319 mm. for 26 ♀♀, while 13 Lumbo ♀♀ averaged 285 mm. In spite of this he did not include Tanganyika in the range of petersii (1957, p. 199). It appears futile to try and use size as a subspecies criterion in this instance.



In south-east Africa it seems that we are dealing with a variable monotypic species. I retain the trinomial because Parker (1942) has indicated that C. dilepis ruspellii Boettger of Somalia is a valid race.

Breeding. The eggs are buried in a hole in the ground during December. The average size of the clutch is 35 - 50, but I have found 57 full-sized eggs in a gravid female.

Diet. Grasshoppers are the staple diet of this species (Loveridge, 1920, p. 161; Cott, 1934, p. 172; FitzSimons, 1943, p. 154), supplemented by beetles and other insects. I have seen an adult chameleon devour a juvenile of its own species.

Enemies. This species is heavily preyed upon by tree snakes, especially Dispholidus typus and Thelotornis kirtlandi. I have also recovered specimens from the stomachs of Dipsosaurus shrevei (Mabwo) and Telescopus s. semianulatus (Victoria Falls and Msoro). A chameleon had been eaten by a mongoose (Herpestes sanguineus) collected near Salisbury. Found in a trout stomach at Inyanga by Turnbull-Kemp (1960, p. 6).

Habitat. This is a savanna species, and the few records from within the western rain forests are probably due to the occupation of cultivated clearings (Schmidt, 1919, p. 579). In south-east Africa C. dilepis is commonly found on forest fringes, but does not seem to occur within forest proper.

Distribution. Savannas of southern and eastern Africa, from southern Somalia to Natal, Swasiland, Transvaal, Bechuanaland and South-West Africa, extending north from Angola along the coast through the Lower Congo to Cameroun.

#### CHAMELEO MARSHALLI (Boulenger)

Rhampholeon marshalli Boulenger, 1906, Ann. Mag. Nat. Hist. (7), 43, p. 346, fig; Chirinda Forest, Mashonaland, and 1910, p. 493. FitzSimons 1939b, p. 38 (Vumba Mtn.; Chirinda Forest) and 1943, p. 172.

Chameleo (Ricuspis) marshalli Loveridge, 1956a, p. 2.

Seventeen specimens examined from: RHODESIA. Chirinda Forest; Gleneagles; Stapleford; Pungwe Gorge Forest; Vumba Mountain (Bunga and Castle Beacon Forests)

Literature records. RHODESIA. Chirinda Forest; Vumba Mountain.

Description. A small rostral protuberance present; no occipital flaps; a vertebral series of clumps of enlarged tubercles; no ventral crest; claws bicuspid; tail half to two-thirds length of body.

Size. Largest ♂ (TM. 18496 - Vumba Mtn.)  $47 + 26 = 73$  mm. Largest ♀ (TM. 18584 - Chirinda Forest)  $67 + 38 = 105$  mm.

Discussion. Loveridge (1956a) has discussed the intermediate position of this species, which differs from all other species of Chamaeleo in its bicuspid claws and thus bridges the gap between this genus and the subgenus Rhampholeon of Brookesia. C. marshalli has several features in common with Brookesia platyceps of Mianje Mountain, including the rostral protuberance and discontinuous vertebral crest, but marshalli has the wide range of colour change and the prehensile tail of a Chamaeleo: it warrants a separate subgenus.

Breeding. Females collected in December contained 12-13 eggs measuring  $11 - 12 \times 7$  mm. (FitzSimons, 1943).

Diet. Stomach contents largely small beetles, with a few Hemiptera, Hymenoptera (ichneumonids and braconid wasps), Diptera and Pyralid moths and larvae (FitzSimons, 1943).

Habitat. Evergreen forests at altitudes varying from 3,500 to 6,000 feet. The Stapleford specimen was found on Philippia heath about a hundred yards from the nearest patch of forest.

Distribution. Wet evergreen forests along the eastern border of Rhodesia from Inyanga to Mount Silinda. It should occur in the forests on the eastern slopes of the Chisimani Mountains in Mozambique.

#### Genus BROOKESIA Gray

Brookesia Gray, 1865, Proc. Zool. Soc. London (1864), pp. 468, 476. Type by monotypy: Chamaeleo superciliaris Ruhl.

Rhampholeon Gunther, 1874, Proc. Zool. Soc. London, p. 483, fig. Type by monotypy: Chamaeleo spectrum Bichols.

Parker (1942, p. 80) recognised Rhampholeon as a full genus, Loveridge (1953a, p. 190) treated it as a subgenus of Brookesia. Osteological studies on all the species included in the group are required to resolve this problem.

#### BROOKESIA PLATYCEPS (Gunther)

Rhampholeon platyceps Gunther, 1893, Proc. Zool. Soc. London (1892), pp. 555, 556, pl. xxiv, figs. 1 - 1a; Shire Highlands, Malawi, and 1894 (1893), p. 619 ("Tshiroco"); Boulenger, 1894b, p. 725; Werner, 1902, p. 433; Mitchell, 1946, p. 27.

Brookesia platyceps platyceps Loveridge, 1953a, p. 193 (Lichenya Plateau and Ruo Gorge, Mlanje Mountain).

Brookesia platyceps carri Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 194: Lichenya Plateau, 6,000 feet, Mlanje Mountain, Malawi, and 1953c, p. 142.

Nineteen specimens examined from: MALAWI. Ruo Gorge Forest on Mlanje Mountain.

Literature records. MALAWI. Lichenya Plateau and Ruo Gorge Forest on Mlanje Mountain.

The male from "Tchiroso" (BM. 93.10.26.35) probably comes from Mlanje Mountain and not from Chiroso in the Shire Valley (which is spelt correctly on the map on p. 617 of Gunther's 1894 paper). As pointed out by Loveridge (1953a, p. 146), the localities for many of the specimens collected by Sir Harry Johnston are obviously incorrect. Poynton (1964b, p. 203) has shown that the type locality for Buna j. johnstoni - "Tchiroso" is probably an error for Mlanje Mountain. Whyte and sent to the British Museum by

Description. A small rostral protuberance usually present, sometimes completely absent; usually some enlarged tubercles on the supraciliary ridge; an interorbital row of enlarged tubercles; vertebral line with humps of granules which may be enlarged; flanks covered with granules and enlarged tubercles; axillary and inguinal pits present; claws bicuspid; tail about one third length of body.

Size. Largest ♂ (UM. 4269 - Ruo Gorge Forest) 62 + 24 = 86 mm.  
Largest ♀ (MZ. 50749 - Ruo Gorge Forest) 62 + 17 = 79 mm.

Discussion. B. platyceps carri was based on a single gravid female from the Lichenya Plateau and three paratype males from the Ruo Gorge, which Loveridge considered to show signs of intergradation with the typical form. He suggested that BM. 33, 4, 3. 4. from Lichenya Plateau was collected at a lower altitude because it was a "typical platyceps"

A series of nineteen B. platyceps, collected along the path through the Ruo Gorge Forest between 3,000 and 6,000 feet, shows considerable variation in the "diagnostic characters" used by Loveridge. As there is no barrier to gene flow between chameleon populations at different altitudes on Mlanje Mountain, I have no hesitation in placing carri in the synonymy of B. platyceps.

Breeding. The ♀ type of carri contained 12 small eggs.

Habitat. Wet evergreen forest in the Ruo Gorge, extending into mist forest with Fedocarpus and Widderringtonia near the top of the Ruo Falls. These chameleons are often found crossing the leaf-strewn path, but they are abundant on grass fringing the path at the bottom end of the gorge near the Iujeri power house.

Distribution. Evergreen forest on Mlanje Mountain, likely to occur on the forested inselbergs on the Hiassa Platform north-east of Mlanje.

*BROOKESIA* *NOHISIENSIS* Loveridge

*Brookesia nohisiensis* Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p.190, pl. iii, fig. 1: Nohisi Forest at 5,000 feet on Nohisi Mountain, Malawi (paratypes from Misuku Mtns. and the Ukinga, Poroto and Rungwe Mtns. in Tanganyika).

One specimen examined from: MALAWI. Mughese Forest, Misuku Mountains.

Literature records. MALAWI. Misuku Mtns; Nohisi Mtn.

Description. A small rostral protuberance present; superciliary ridge composed of enlarged <sup>pointed</sup> granules; a series of granular humps along the vertebral line; flanks covered with minute granules and very small scattered tubercles; no axillary or inguinal pits; claws bicuspid; tail a quarter to a third of body length.

Size. Largest ♂ (UM. 6604 - Misuku Mtns.) 40 + 12 = 52 mm. Largest ♀ (MZ. 50681 - Holotype) 67 + 16 = 83 mm.

Breeding. Loveridge found two females in the process of laying their eggs under logs in the Nohisi Forest at the beginning of December. The eggs measured 12 x 7 mm and the clutch size varied from 12 to 15.

Enemies. Loveridge found specimens in the stomachs of two *Thelotornis k. capensis* collected in the Misuku Mountains.

Habitat. Evergreen forests and wild bananas beside forest streams.

Distribution. Montane forests of south-western Tanganyika and northern Malawi, extending south to Nohisi Mountain.

*BROOKESIA* *BRACHYURA* (Gunther)

*Rhampholeon brachyurus* Gunther, 1893, Proc. Zool. Soc. London (1892), pp. 555, 557, pl. xxxiv, figs. 2 - 2a; Shira Highlands, Malawi, and 1894, (1893) p. 619; Boulenger, 1894b, p. 725; Thaido, 1941, p.15 (Massangulo).

*Rhampholeon brevicaudatus* (not Matschie) Werner, 1902, p. 431 (Zomba); Mitchell, 1946, p. 26 (Zomba).

*Brookesia ionidesi* Loveridge, 1951, Bull. Mus. Comp. Zool., 106, p. 179; Kilwa, Tanganyika.

*Brookesia brachyura brachyura* Loveridge, 1953a, p. 192 (Blantyre; Mikolongwe).

One specimen examined from: MOZAMBIQUE. Chapala.

Literature records. MALAWI. Blantyre; Mikolongwe; Zomba.

MOZAMBIQUE. Massangulo.

Description. No rostral protruberance; superciliary ridge composed of prominent granular tubercles; no interorbital series of enlarged granules; vertebral line with enlarged conical granules, but no granular humps; flanks covered with minute granules and scattered tubercles; an axillary pit present, but no inguinal pit; claws bicuspid; tail a quarter to a third length of body.

Size. Largest ♂ (MZ. 52131 - Mikolongwe)  $46 + 7 = 53$  mm. Largest ♀ (MZ. 52132 - Mikolongwe)  $46 + 8 = 54$  mm.

Discussion. In describing B. ionidesi Loveridge compared it with brevicaudata and brachyura, but the chameleon which he took to be brachyura was in fact the species that he subsequently described as B. nehisiansis. He thereupon (1953a, p. 193) made ionidesi a race of brachyura, stating that "it differs in lacking the numerous strongly developed granular tubercles displayed by the typical form". When I compared my Chapala specimen with topotypes of ionidesi and found them indistinguishable, it seemed doubtful whether populations at Blantyre and Chapala, about 175 miles due east, were subspecifically distinct. On my request, Miss A. G. C. Grandison has kindly compared the types of brachyura with five paratypes of ionidesi and reports (letter of 4. xi. 65) that they are indistinguishable.

Breeding. The Mikolongwe ♀ contained 6 eggs measuring  $9.5 \times 5$  mm.

Habitat. B. L. Mitchell collected three specimens in gallery forest along the Mudi River at Blantyre and the Mansadi River at Mikolongwe, I found the Chapala specimen asleep on a blade of grass about one inch above the ground, while collecting frogs along a stream at night.

Distribution. South Tanganyika, northern Mozambique and south-eastern Malawi.

#### Family SCINCIDAE

Genus MABUYA Fitzinger

Mabuya Fitzinger, 1826, (part), Neue Class. Rept. pp. 23, 52. Type by tautonymy: M. dominicensis Fitzinger = Lacertus mabuya Lacépède.

*MAIUYA HOMALOCEPHALA DEPRESSA* (Peters)

- Eumecurus depressus* Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Tete, Mozambique, and 1882, p. 71, pl. x, figs. 4, *la-c*.  
*Mabuia depressa* Bocage, 1896, p. 98; Boulenger, 1887a, p. 166; Hewitt, 1910c, pp. 93, 99; Theridie, 1941, p. 14 (Beira).  
*Mabuia homalocephalata* (not Weigmann) Roux, 1907, p. 82 (Rikatia).  
 ? *Mabuia lacertiformis* (not Peters) Cott, 1934, p. 166 (Beira; Caia).  
*Mabuia homalocephalata depressa* FitzSimons, 1943, p. 211 (Masieni); Marnacas, 1952, p. 139 (Mauele).

Twenty-one specimens examined from: RHODESIA. Malapati Drift. MOZAMBIQUE. Beira; Dondo; Ilha dos Portugueses; Inhaca Island; Santa Carolina Island; Savane.

Literature records: MOZAMBIQUE. Beira; Masieni; Rikatia.

The type locality "Tete" is probably incorrect. This skink is restricted to alluvium of the Mozambique Plain and the type may have come from Inhambane or Boror. Tete has been visited by several collectors since Peters' time and if *M. h. depressa* does occur there it is strange that more specimens have not been found.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals well separated; prefrontals in contact or separated; supraciliaries 3 - 6, usually 5; upper labials anterior to subocular 4; 3 or 4 lanceolate lobules on anterior border of ear opening; midbody scale rows 28 - 32, the dorsals with 5 - 9 keels in adults, but tricarinate in juveniles; lamellae below fourth toe 19 - 23.

Coloration. Back grey-brown to red-brown, uniform or with scattered black spots, or with outer borders of scale rows dark, forming narrow longitudinal lines; a dark lateral band (often broken up by pale flecks) extends from eye to groin, bordered below by a yellow stripe which begins on the upper lip, and is edged below by another dark stripe; lemon-yellow below.

Size. Largest ♂ (UM. 2344 - Inhaca Island) 74 + 124 = 198 mm. Largest ♀ (QVM/R. 176 - Malapati Drift) 80 + 105 = 185 mm.

Habitat. Confined to coastal alluvium, where they are largely terrestrial, but may often be found basking on tree trunks or in bushes.

Distribution. The coastal plain of south-east Africa from the Zambezi (if Cott's "*lacertiformis*" is referable to this species, the specimens went to the London Zoo alive and were not preserved) to Natal, including the off-shore islands, inland to southeastern Rhodesia (see Fig. 6).

*MABUYA MACULILABRIS* (Gray)

*Eumecurus maculilabris* Gray, 1845, Cat. Lizards Brit. Mus., p. 114: West Africa.

*Mabuza maculilabris* Loveridge, 1933, p. 312 (Nyankolo); Pitman, 1934, p. 306.

*Mabuza maculilabris comorensis* (? not Peters) Loveridge, 1953a, p. 200 (Ruo River at Luferi).

Eleven specimens examined from: ZAMBIA. Kasama (I.R.S.N.B.); Nyankolo (M.C.Z.). MALAWI. Luferi Estate.

Literature records. ZAMBIA. Nyankolo. MALAWI. Luferi.

Variation. Centre of nostril posterior to suture of rostral/first labial; supranasals usually separated; prefrontals usually well separated (in contact in the Kasama specimen); supraciliaries 4 - 6; upper labials anterior to subocular 4 (rarely 3 or 5); 3 - 7 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 31 - 34, dorsals with 5 - 9 keels; lamellae under fourth toe 17 - 19; head 19.8 - 24.4 per cent of snout-vent length.

Coloration. Olive to grey-brown above, with scattered dark flecks, flanks darker with light and dark flecks, especially on the side of the head and neck; yellow below.

Size. Largest ♂ (UM. 4210 - Luferi Estate) 81 + 136 = 217 mm.

Discussion. This species is greatly in need of revision on a continental basis, but I can detect no significant differences between these specimens and comparative material from Cameroun, the Congo, Uganda and Angola. It is possible that *comorensis* Peters, with 34 - 36 midbody scale rows is a recognisable race endemic to the Comoro Islands (see Fig. 6).

Diet. Loveridge found grasshoppers in the stomach of the Ruo River specimen.

Habitat. These skinks were common on the Luferi Tea Estate in an area which had been recently cleared, leaving a few forest trees standing. These trees were swarming with *Mabuza maculilabris* and *Holaspis g. laevis*. Two were living on the verandah of a house. Loveridge's Luferi specimen was one of a pair living beneath the planks of a suspension bridge straddling the Ruo Gorge.

Loveridge (1933, p. 315) shot his Nyankolo specimen and an adult *Mabuza planifrons* as they basked side by side on a hollow tree trunk.

Distribution. This species is typical of forest-edge and clearings within forest, extending from Guinea to Senegal, south to Malawi, northern Zambia and Angola.

## MABUYA BOULENGERI Sternfeld.

Mabuya boulengeri Sternfeld, 1911, Sitzb. Ges. Naturf. Freunde Berlin, p. 248: Makonde Plateau, Lindi, Tanganyika.

Mabuya maculilabris boulengeri Loveridge, 1953a, p. 200 (Mtimbuka).

Twenty specimens examined from: RHODESIA. Haroni-Lusitu Confluence; Ngorima Reserve (E). MALAWI. Cholo Mtn. MOZAMBIQUE. 10 mls. E of Alto Ligonha; Bairra; Cavallo; Grudja; Gumba; Maringa; Mada; Ponte do Pungwe; Kiluvo.

Literature record. MALAWI. Mtimbuka.

Variation. Centre of nostril posterior to suture of rostral/first labial; supranasals usually separated; prefrontals usually separated; supraciliaries usually 4, rarely 3, 5 or 6; upper labials anterior to subocular 4, rarely 3; 3 - 6 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 28 - 32, dorsals with 7 - 11 keels in adults, 3 - 5 in juveniles; lamellae under fourth toe 15 - 20; head 17.4 - 21.3 per cent of snout-vent length in adults.

Coloration. Grey-brown above, usually with a few scattered black spots on the back; a narrow dark line runs from the preocular, under the eye to the ear opening; uniform yellow below.

Size. Largest ♂ (UM. 10377 - E. Ngorima Reserve) 82 + 190 = 272 mm. Largest ♀ (UM. 8778 - Maringa) 90 + 203 = 293 mm.

Discussion. Although he treated boulengeri as a race of M. maculilabris, Loveridge recorded both "subspecies" from south Tanganyika and Malawi, even listing both from Kilva in the same paper (1955, p. 173). The two species differ strikingly in appearance and coloration. M. maculilabris is a robust skink with a large head, whereas M. boulengeri is slender, with a very long tail and a small head. The head length:snout-vent length ratio, midbody scale count and number of supraciliaries are all useful diagnostic characters when used in conjunction with coloration and habitat.

Dist. A large spider was found in the stomach of Loveridge's Mtimbuka specimen.

Habitat. Loveridge shot the Mtimbuka skink in a creeper covered tree twelve feet from the ground and considers this form to be more arboreal in habits than M. maculilabris. In Mozambique and Rhodesia it is usually found on the ground or basking in the top of tall grass, on thatched roofs or piles of palm fronds. One specimen from the Haroni-Lusitu Confluence was under dead leaves on the forest floor. In riverine forest at Dondo I saw one on a tree trunk spanning a stream, but in the southern part of its range this species cannot be called truly arboreal.



Distribution. Southeastern Tanganyika south through Mozambique to the Save River, west to Malawi and eastern Rhodesia (see Fig. 6).

MABUYA MEGALURA (Peters)

Euprepes (Mabuya) megalura Peters, 1878, Monatsb. Akad. Wiss. Berlin, p. 204, pl. ii, fig. 4: Teita, Kenya.

Mabuya megalura Loveridge, 1920, p. 152 (Lumbo).

Six specimens examined from: ZAMBIA. Abercorn (Vesey-Fitzgerald collection). MOZAMBIQUE. Lumbo (M.O.Z.).

Literature record. MOZAMBIQUE. Lumbo.

Variation. Centre of nostril posterior to suture of rostral/first labial; supranasals in broad contact; prefrontals separated; supra-ciliaries 5 (4 in one); upper labials anterior to subocular 4 - 5; no lobules on anterior border of ear opening; midbody scale rows 24 - 26, dorsals smooth; lamellae under fourth toe 17 - 18. The Abercorn skink is more robust than the Lumbo specimens.

Coloration. Lumbo series. Light orange-brown above, with a dark-edged pale vertebral stripe two scale rows wide, a white lateral stripe one scale wide from upper lip, above shoulder to groin. White below. The Abercorn specimen is grey-brown above and lacks the vertebral stripe.

Size. Largest ♂ (MZ. 18331 - Lumbo) 51 + 208 = 259 mm. Largest ♀ (Loveridge, 1920 - Lumbo) 65 + 235 = 300 mm.

Diet. Loveridge found spiders in the stomach of a Lumbo male.

Habitat. "The Lumbo specimens were found rushing about on sandy ground, which is sparsely grown with clumps of grass." (Loveridge, 1920).

Distribution. Ethiopia, south to Lumbo, Mozambique, and west to Uganda and Katanga.

MABUYA PLANIFRONS (Peters)

Euprepes (Euprepis) planifrons Peters, 1878, Monatsb. Akad. Wiss. Berlin, p. 203, pl. ii, fig. 2: Teita, Kenya.

Mabuya planifrons Loveridge, 1933, p. 315 (Nyankolo); Pitman, 1934, p. 306.

Mabuya parrotetii uxenbaei Witte, 1953, p. 100, pl. ii, fig. 4 and pl. xii, fig. 1: Muncui, Upemba National Park, Katanga; Loveridge, 1956b, p. 4.

Three specimens examined from: ZAMBIA. Nyankolo (M.C.Z.).

Literature record. ZAMBIA. Nyankolo.

Variation. Centre of nostril posterior to suture of rostral/first labial; suprassals in broad contact; Prefrontals separated or in contact; supraciliaries 5; upper labials anterior to subocular 5 (4 on one side of one); 3 - 4 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 30 - 31, dorsals tricarinate; lamellae under fourth toe 15 - 19.

Coloration. Gray-brown above, head often orange-brown, back with scattered dark flecks, a pair of light dorso-lateral bands anteriorly; a broad dark lateral band from nostril, through eye and above shoulder, fading out at about midbody, this may be flecked with white; cream below.

Size. Largest (MCZ. 30911 - Nyankolo) 125 +160 mm.

Discussion. Loveridge (1956b, p.5) suggested that M. p. upembae, together with material from Nyankolo and southern Tanganyika which he had previously (1933) listed as M. planifrons, represented intergrade perrotetii x planifrons populations. Loveridge did not include M. perrotetii in his East African Check List (1957, p. 211), but I have examined seven specimens from Kenya and north Tanganyika (Arusha). This is a massive skink, which is well illustrated by Schmitt (1919, pl. xxvi). I have also examined twenty specimens of M. planifrons from Nyankolo, the Ruha Valley, the Meru District of Kenya and Somalia. These agree with Witte's description and plates of M. p. upembae, although there is some geographical variation, as pointed out by Loveridge. Maisum planifrons is a good species because it is sympatric with M. perrotetii at Merimanti in Kenya. The variation in M. planifrons is clinal and therefore upembae is not a recognisable race.

Habitat. One Nyankolo skink was shot on a tree trunk as it basked alongside a Maisum maculilabris (Loveridge, 1933, p. 315).

Distribution. Ethiopia and Somalia, south to Tanganyika, west through northern Zambia to Katanga.

#### MARJA QUINQUETRANIATA MARGARITIFER (Peters)

Euprepes margaritifera Peters, 1854, Monatsb. Acad. Wiss. Berlin, p. 618: Tete, Mozambique, and 1882, p. 64, pl. x, fig. 1.

Euprepes Savignyi (not Audouin) Peters, 1854, p. 618 (Tete).

Euprepis mularis Gray, 1864, Proc. Zool. Soc. London, p. 61: South-Eastern Africa.

Euprepis Kirkii Gray, 1864, Proc. Zool. Soc. London, p. 62, pl. xi, fig. 1: Tete, Mozambique; Gunther, 1864, p. 307.

Mabuia margaritifera Bocage, 1896, p. 88 (Mozambique).

Mabuia quinquotaeniata (not Lichtenstein) Günther, 1893, p. 555 (Shire Highlands); Boulenger, 1897, p. 500 (Nkata Bay to Ruarwe; Nyika District) and 1902, p. 17 (Mashonaland); Chubb, 1909a, p. 594 (Balwayo; Khami River; Colleen Dam; Espandene) and 1909b, p. 35, (Victoria Falls; Lomagundi District); Boulenger, 1907a, p. 8 (Petauke; Luangwa Valley) and 1910, p. 484 (Matopos; Hwytani); Sternfeld, 1911, p. 417 (Tete; Chifumbazi; Cabayra); Gertt, 1934, p. 165 (Sinjal); Pittman, 1934, p. 305 (Malungushi Valley).

Mabuia obtata Werner, 1913, Mitt. Nat. Mus. Hamburg, 30, p. 43: Kwa Mtoro, Tanganyika.

Mabuia quinquotaeniata margaritifera Schmidt, 1919, p. 547; FitzSimons, 1935b, p. 367 (Kalakamati; Zimbabwe), 1939b, p. 35 (Tanganda Bridge; Changadzi River; Birchenough Bridge; Devuli Bridge) and 1943, p. 213, (Driefontein; Chilizansi; Plumtree; Towani; Insisa; Nalopolole; Strathmore; Shangweiani; Wanle); Mitchell, 1946, p. 27; Mameas, 1952, p. 140 (Namascha); Loveridge, 1953a, p. 199 (Tete); Manaces, 1961, p. 149 (Muzore River; Vila Paiva de Andrada); Broadley, 1962, p. 800.

Mabuia quinquotaeniata obtata Loveridge, 1953a, p. 196 (Nchisi Mtn.; Chitala River; Chove; Mzimba; Chiradzulu Mtn.; Likabala River; Ruo River); Broadley, 1962, p. 799.

Three hundred and ninety-seven specimens examined from:

RESHUNALAND. Foley; Francistown; Mabato; Wolf Hills. RHODESIA. Ambi Falls; Angwa - Makushi Confluence; Balla Balla; Baselay Bridge; 18 mls. N. of Beitbridge; Bindura; Binga; 12 mls W of Birchenough Bridge; Balwayo; Burma Valley; Changadzi River; Charara Plateau; Chibokwe Bridge; Chido; Chimanimani Mountains; Chimwara Ranch; Chinyambila; Chinyamara Hill; Chinyika Reserve; Chipinda Pools; Chirundu; Chitora Bridge; Colleen Dam; Dora; Dott's Drift; Ganderwe Falls; Gatsi; 50 mls. SE of Gwanda; Gwelo; Haroni-Lusita Confluence; Heathfield; Helvetia; Holdenby; Hunters Road; Ilamba Bridge; Inyanga; Irisvale; Kamativi; Kandaryana Pan; Kapani and 5 mls SE; Kariba; Kariba Lake -Mwenza & Sengwe Confluences, Sanyati Island and Sengwe Sound; Khami Dam; Kota Kota; Kyle Dam; Limpopo - Umsingwane Confluence; Lukosi Bridge; Lumli River; Lutopo Gorge; Makurupini River; Manda; Manyoli Ranch; Maranka and Maranka Reserves; Marungudzi; Masanga Hill; Matindema Bridge; Matowa; Mavuradoma Mtn.; Mkota Reserve; Modima; Mount Rudd; 4 mls. ESE of Mpadzi Bridge; 15 mls NE of Mtoko; Mtundurundu; Nelson South;

Ngorima Reserve (E); Nkai; Nyadiri; Nyamashata River; 4 mls W of Nyampanda; Plumtree; Ruanya River Drift; Rungani; Ruware; Sabi - Macheke & Makuni Confluences; Salisbury (N.M.); Sengwe Gorge; Shangani; Shashi - Limpopo Confluence; Shawanoc Bridge; Sincia; Trelawney; Triangle; Tali; Untali; Victoria Falls; Wankie and 5 mls NW; Watsoaba; Zambezi - Sebungwe Confluence and opposite Feira; Zowa. ZAMBIA. Chakwanga River; Chirundu; Fort Jameson. MALAWI. Cape Maclear; 15 & 20 mls NW and 15 mls SSW of Fort Johnston; Mpatamanga; Zomba Plateau. MOZAMBIQUE. Cavalo; Chicamba Dam; Chinta (USNM); Comacha; Garuso; Goonda; Jorge; 30 mls SE of Liciro; Magasso; Mataru; Matunio; Menocade; 15 mls SW of Metololoca; Metuckira; Mitucue Mtn.; Mostine; 14 mls W of Morrumbala; 15 mls. N of Mugeba; Mungari; Namacha; 30 mls ENE of Nampula; Revue; Sabelua; Samo; Tete (USNM) and 5 mls E, 4 mls W and 15 mls SSW; 3 mls N of Vandusi; Vila Coutinho (USNM); 15 mls NW of Vila Junqueira; 4 mls W and 7 mls E of Vila de Manica; Viola; Zomba; Zozue and 5 mls SW.

Literature records. BICHUANLAND. Kalakamti; Molepolole; Tswana. RHODESIA. Birchborough Bridge; Bulawayo; Changadzi; Chilimani; Colleen Bawn; Devuli Bridge; Driefontein; Espandene; Huruyani River; Insisa; Khami River; Matopos; Plumtree; Shangwenani; Strathmore; Tanganda Bridge; Victoria Falls; Wankie; Zimbabwe. ZAMBIA. Luangwa Valley; Mulungushi Valley; Petauke. MALAWI. Chiredzulu Mtn.; Chitola River; Chove; Likakala River; Mshikha; Nchisi Mtn.; Nkata Bay to Ruware; Nyika District; Ruo River. MOZAMBIQUE. Gabayra; Chifumbasi; Namacha; Rbantare River; Sinjal; Tete; Vila Paiva de Andrada.

Variation. Supraciliaries 4 - 7, usually 5; upper labials anterior to subocular 4 - 5, rarely 3 or 6; midbody scale rows 38 - 52; lamellae under fourth toe 17 - 25, usually 20 - 24.

Size. Largest ♂ (UH. 4111 - Mpatamanga) 114 + 177 = 291 mm. Largest ♀ (UH. 4049 - 5 mls W of Tete) 111 + 160 = 271 mm., but UH. 1786 (Nelson South) measures 120 mm from snout to vent (tail regenerated).

Discussion. Loveridge (1953a) revived obsti for Malawi and Tanganyika populations, but could distinguish it only by midbody scale counts, i.e. -

Midbody scale rows 40 - 44; range - Eastern Africa south of the Zambezi .....

Midbody scale rows 44 - 48, rarely 42; range - Eastern Africa north of the Zambezi .....

Subsequently Loveridge (1955, p. 172) recorded margaritifera from south-east Tanganyika; a series of 45 skinks from Kilwa, Livala and Massi had 42 - 46 midbody scale rows, average 42.8.

As I have previously (1962d, p. 800) pointed out, if obsti is recognisable its range extends south of the Zambezi across the Manica Platform and into south-eastern Rhodesia. In Fig. 5. the material examined has

been split into groups, each containing material from within one degree square. The average midbody scale count for each square and the number of specimens in the group (in parentheses) has been marked within the relevant square on the grid map. If an average midbody scale count of 44.0 is taken as the boundary between obsti and marginifer then the heavy line in Fig. 5 divides the two races. In view of the occurrence of populations with low scale counts in South Tanganyika and others with high counts in eastern Bechuanaland, it seems advisable to replace obsti in the synonymy of marginifer. The latter is certainly very different from specimens of the typical form received from Kenya.

Breeding. A ♀ from Changadzi Bridge contained 10 eggs measuring 16 x 10 mm on 28th December.

Diet. Stomach contents of seven Kapami skinks consisted of lepidopterous larvae, small beetles, a grasshopper, a shield bug, termites, a small centipede, a small millipede and the slough of a skink (Broadley, 1963a).

Enemies. One was recovered from the stomach of a Hais n. mossambica at Kariba Lake.

Habitat. This species is common on granite, paragneiss and sandstone outcrops up to about 5,000 feet, it occasionally moves onto house walls if these are not occupied by Mabuza striata.

Distribution. Uganda and Kenya, south to Natal, west through the Transvaal and Rhodesia to eastern Bechuanaland.

#### MABUZA CAPENSIS (Gray)

Tiliqua capensis Gray, 1830, in Griffith's Anim. Kingd., ix, Syn., p. 68:  
Cape of Good Hope.

Mabuza trivittata (not Hardwicke & Gray) Werner, 1910, p. 341, pl. vii, fig. 6 (Mookane; Vlei Topan); Hewitt, 1910c, pp. 93, 99 (Mochudi); Power, 1927c, p. 408 (Lobatsi); FitzSimons, 1935b, p. 368 (Euke; Kaotwe).

Mabuza kalaharica Werner, 1910, Jena. Denkschr., 16, p. 350, pl. viii, fig. 11: Lehututu - Kang, Kalahari.

Mabuza capensis FitzSimons, 1943, p. 216 (Serowe) and 1958a, p. 307 (Nyamsima); Broadley, 1963a, p. 801.

Nine specimens examined from: BECHUANALAND. Kang and 35 mls W; 15 mls E of Lake Dow; 10 mls SE of Letlaking (USNM). RHODESIA. Inyangani Mtn.; Mare Dam; Pungwe View. ZAMBIA. Liuwa Plain.

Literature records. BECHUANALAND. Kaotwe; Euke; Lehututu-Kang; Lobatsi; Mochudi; Mookane; Vlei Topan. RHODESIA. Nyamsima.



Fig. 5. Distribution of *Mabuya quincustaeniat\* margaritifer*, with the average midbody scale counts for material examined from each degree square (number of specimens comprising each group in parentheses).

Variation. Centre of nostril posterior to suture of rostral/first labial; supranasals in contact; prefrontals separated or in contact; supraciliaries 3 - 5, usually 5; upper labials anterior to subocular 4, rarely 5; midbody scale rows 32 - 36, dorsals tricarinate; lamellae under fourth toe 15 - 20.

Size. Largest (USNM, - 10 miles SE of Letlaking)  $100 + 165 = 265$  mm.

Dist. Carabid and tenebrionid beetles in the stomach of a *Eotwa* skink (FitzSimons, 1935b).

Habitat. In the Kalahari, usually found among low bushes bordering the pans. In the Inyanga District this lizard is found in open montane grassland.

Distribution. Common throughout South Africa except for the arid areas of the western Cape Province. It occurs in the southern Kalahari, then there is a break in distribution and the species reappears in Barotseland. On the eastern side of the subcontinent the relict population on the Inyanga Mountains is separated from the eastern Transvaal populations by a gap of 400 miles. *Hemohatus haemohatus* has a similar distribution on the eastern escarpment, but does not extend into the Kalahari. See Fig. 6.

#### MABUYA OCCIDENTALIS (Peters)

*Eumeces occidentalis* Peters, 1867, Monatsb. Akad. Wiss. Berlin, p. 30;  
Otjimbingwe, South West Africa.

*Mabuia occidentalis* Hewitt & Power, 1913, p. 198 (Ky Ky; Nosob River);  
FitzSimons, 1935a, p. 545 (Oup-Nosob River area).

*Mabuia occidentalis* FitzSimons, 1943, p. 919; FitzSimons & Brain, 1958b,  
p. 101.

Two specimens examined from: BECHUANALAND. Lehututu Pan;  
S.W.A. - B.P. Border at 24<sup>th</sup> B.

Literature records. BECHUANALAND. Aueb-Nosob Confluence; Ky Ky.

Variation. Centre of nostril above or posterior to the suture of rostral/first labial; supranasals in broad contact; prefrontals in contact or separated; supraciliaries 5; upper labials anterior to subocular 4; midbody scale rows 30, dorsals feebly tricarinate; lamellae under fourth toe 21 - 22.

Largest (QNM/N, 484 - Lehututu Pan)  $82 + 125 = 207$  mm.

Habitat. Very active during the day on grass-covered dunes in the Kalahari Gossob National Park (FitzSimons & Brain, 1958b).

Distribution. The arid areas of southern Angola, South West Africa and western Cape Province, extending into the Karoo and the south-western corner of Bechuanaland (see Fig. 6).

*MABUYA LONGILOBA LONGILOBA* Methuen & Hewitt

*Mabuia varia* var. *longiloba* Methuen & Hewitt, 1914, Ann. Tvl. Mus., 4, p. 142; Luderitsbucht, South West Africa (Restricted by Mertens, 1955, p. 76).

*Mabuia varia varia* (not Peters) part, FitzSimons, 1935b, p. 369 (Ruks; Kuks - Gomodimo; Kaotwe; Damara Pan; N'Kate to Nata River).

*Mabuia damarua* (not Peters) FitzSimons, 1943, p. 224 (part - exclude Tanganda and Changadai River localities); Munaco, 1952, p. 142 (Muale); FitzSimons & Brain, 1958b, p. 101.

*Mabuia longiloba longiloba* Broadley, 1962d, p. 801.

Fifteen specimens examined from: RHODESIA. Wankie National Park - Main Camp. MOZAMBIQUE. Chigubo (TN); Panda (DM).

Literature records. BECHUANALAND. Damara Pan; Kaotwe; Kuks; Kuks - Gomodimo; N'Kate to Nata River. MOZAMBIQUE. Muale.

Variation. Centre of nostril in front of or above suture of rostral/first labial; supranasals in broad contact; prefrontals usually widely separated, rarely in short contact; supraoculars 5, rarely 4; upper labials anterior to subocular 5, rarely 4; two or three lanceolate lobules on the anterior border of ear opening; midbody scale rows 30-32, dorsals with 5-7 keels; lamellae under fourth toe 18-22.

Coloration. Pale grey-brown above, usually with some dark dorsal spots or streaks, especially a paired series down the middle of the back, a narrow pale dorso-lateral line is usually present in Mozambique specimens, which also have a distinct white lateral stripe running from below the eye, through the ear opening to the groin, this stripe is poorly defined in Kalahari specimens. White below.

Size. Largest ♀ (Munaco, 1952 - Muale) 45 + 64 = 109 mm. This is a much smaller species than *Mabuia varia*.

Discussion. The validity of this dwarfed arenicolous species is now well established and Mertens (1955, p. 77) has shown that its correct name is *longiloba* Methuen & Hewitt, ~~damarua~~ Peters being a synonym of *Mabuia varia* Peters. It is not difficult to distinguish *M. longiloba* from *M. varia*, but it seems to be closely related to *M. lacertiformis*.

Diat. Small beetles in a Muale ♀ (Munaco, 1952).

Habitat. Restricted to Kalahari Sand and coastal alluvium. The skinks collected in the Wankie National Park were living under tree trunks together with *Mabuia varia*, the latter being more plentiful. Other associated skinks were *Elooa sundevalli* and *Troglodytes g. namaniensis*.



Distribution. Southern Angola (Laurent, 1964a, p. 73), South West Africa and arid areas of the Cape Province, extending across the Karroo to the Albany District and through the Kalahari to north-western Rhodesia. There is a relict population at Great Saltpan in the northern Transvaal and another, more extensive one, in south Mozambique. It is likely to be found on the south-eastern border of Rhodesia and the northern end of the Kruger National Park (see Fig. 6).

MABUYA LACERTIFORMIS (Peters)

Eumeces lacertiformis Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618; Boror, Mozambique, and 1882, p. 70, pl. x, fig. 2.

Mabuya lacertiformis Boulenger, 1887a, p. 199; Boocage, 1896, p. 98.

Mabuya damarana (not Peters) FitzSimons, 1939b, p. 36 (Tanganda and Changadzi Rivers) and 1943, p. 224 (part above localities only).

Mabuya lacertiformis Loveridge, 1953a, p. 201 (Mtimbuka; Mpatamanga; Kasunhadadza near Tete).

Mabuya damarana rhodesiana Broadley, 1960, Occ. Pap. Nat. Mus. S. Rhod., 24B, p. 435: Changadzi River Bridge, Rhodesia.

Mabuya lacertiformis rhodesiana Broadley, 1962d, p. 802.

Seventy-three specimens examined from: RHODESIA. 30 mls W of Rirhenough Bridge; Changadzi Bridge; Chimoyo; 8 mls E of Chiwaka Bridge; Devuli Bridge; Helvetia; Kapand; Kariba; Kyle Lake; Lukosi Bridge; Matowa; Mkota Reserves; Mount Rudd; Muro; 7 & 15 mls NE of Mtoke; Rosa Division; Ruerya River Drift; White Waters Bridge.

ZAMBIA. Kota Kota. MALAWI. Cape Maclear; 15 mls NW of Fort Johnston; Mpatamanga Gorge. MOZAMBIQUE. Changara; Magasco; Maseenga; 10 mls W and 12 mls SW of Mungeri; 5 mls W and 15 mls SSW of Tete; Viola.

Literature records. RHODESIA. Changadzi and Tanganda Rivers. MALAWI. Mpatamanga; Mtimbuka. MOZAMBIQUE. Tete.

The type locality "Boror" is certainly incorrect. Peters says that he only obtained four specimens in that marshy area, but M. lacertiformis is a strictly rupicolous species. An Umfolozi Museum Expedition visited the Boror swamps in December, 1964, when they were dry. The only Mabuya seen in the area was M. varia. There is little doubt that the types of lacertiformis came from Tete, where these skinks are common, and associated with Mabuya a. margaritifera, Gerrhonotus v. valignus and Platysaurus torquatus, all of which Peters did collect at Tete. He probably confused this species with M. h. damarana, which might occur at Boror, but certainly not at Tete, its "type locality".

Variation. Centre of nostril usually in front of suture of rostral/first labial; supra nasals in broad contact; prefrontals usually well separated, rarely in contact; supraciliaries 3 - 6, usually 5; upper labials anterior to subocular 5, rarely 4 or 6; three or four lanceolate lobules on anterior border of ear opening; midbody scale rows 36 - 42; dorsals with 3 or 5 keels; lamellae under fourth toe 17 - 22.

Coloration. Grey-brown to bronze above with a few scattered dark spots, tail with an ill-defined pale dorso-lateral stripe. White below, chin and throat with indistinct dark infuscations, ventrals sometimes dark-edged, forming narrow dark longitudinal lines.

Size. Largest ♂ (MZ, 50807 - Kasumbhedza) 48 + 83 = 131 mm.  
Largest ♀ (UM, 2503 - Changaxi Bridge) 55 + 66 = 121 mm.

Discussion. The types of M. lacertiformis in the Berlin Museum cannot at present be traced, so the status of this name remains doubtful. In general Peters' description fits the rupicolous skink that I named rhodesiana in 1960, but he stated that his skink had smooth scales under the fingers and toes, whereas the species under consideration agrees with longiloba in having spinose scales on the soles of the feet and keeled lamellae under the toes. The doubts expressed above concerning the type locality given for lacertiformis must also be taken into consideration. As Peters gives 38-40 longitudinal rows of body scales, the possibility of longiloba being a synonym of lacertiformis is ruled out. Until the types of lacertiformis are found, I provisionally place Mabuza d. rhodesiana n. sp. in the synonymy of M. lacertiformis.

I have previously (1962a, p. 802) treated this skink as a subspecies of M. longiloba, but as both forms occur in Wankie District (within 20 miles of one another) with no sign of intergradation and as they are effectively kept apart by very different habitat preferences, it seems logical to treat them as distinct species.

Enemies. Loveridge (1953a, p. 202) found a freshly swallowed discarded tail in the stomach of a Psammophis s. subtaeniatus.

Habitat. Widespread on granite, paragneiss and sandstone outcrops, where they tend to frequent boulder-strewn slopes rather than the open rock faces beloved of Mabuza s. margaritifera and Platysaurus spp. The Devuli Bridge series was taken on small quartz outcrops, where they were living in hollow tree trunks. They are easily overlooked because of their small size and cryptic coloration. This species is not shy and can often be caught by hand.

Distribution. Rocky areas of eastern Rhodesia and adjoining Mozambique, extending west up the Zambezi Valley to Wankie District and northwards into southern Malawi (see Fig. 6).

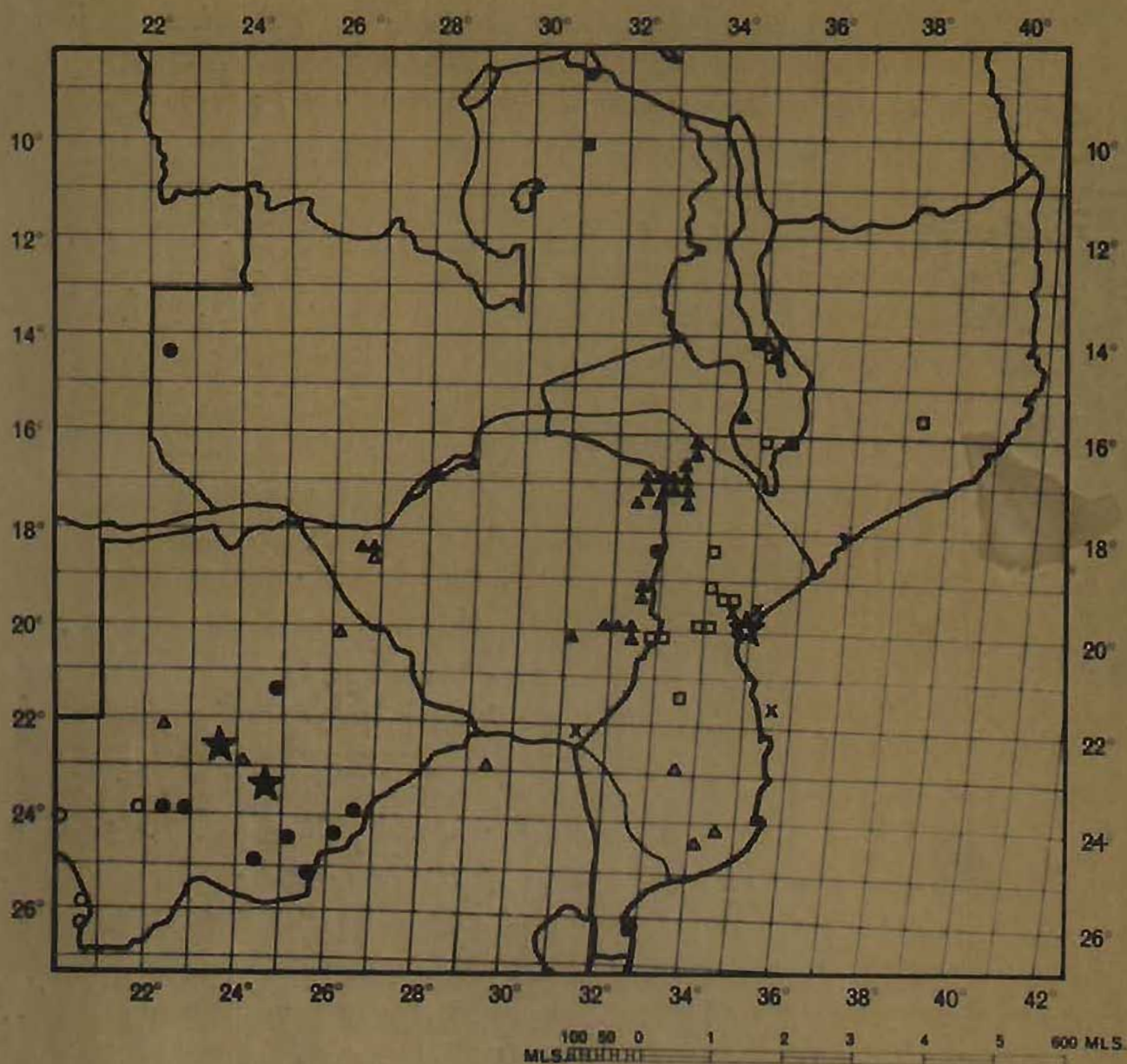


Fig. 6. Distribution of some species of the genus Mabuya

- x Mabuya homalocephala depressa (Peters)
- Mabuya maculilabris (Peters)
- Mabuya boulengeri Sternfeld
- Mabuya capensis (Gray)
- Mabuya occidentalis (Peters)
- ▲ Mabuya longiloba longiloba Methuen & Hewitt
- ▲ Mabuya lacertiformis (Peters)
- ☆ M. h. depressa and M. boulengeri
- ☆ M. capensis and M. l. longiloba

## MABUYA VARIA (Peters)

- Eurorepes Olivieri (not Dumeril & Bignon) Peters, 1854, p. 618 (Tete).  
Eurorepes (Eurorepis) varius Peters, 1897, Monatsb. Akad. Wiss. Berlin, p. 20: Tete, Mozambique, and 1882, p. 68.  
Mabuya varia Gunther, 1893, p. 555 (Shire Highlands).  
Mabuya varia Boulenger, 1897, p. 800 (Nkanta Bay to Ruwaa; Koniwo to Karonga; Nyika District and Plateau; Misuku Mts.); Bocage, 1896, p. 98; Boulenger, 1907a, p. 9 (Potsuko) and 1907b, p. 485 (Beira); Chubb, 1909a, p. 594 and 1909b, p. 35 (Khami River; Colleen Baum; Espanelene); Boulenger, 1910, p. 485 (Salisbury; Serowe); Hewitt & Power, 1913, p. 158 (Eldorado; Marandellas); Loveridge, 1920, p. 153 (Lumbo; Delagoa Bay); Power, 1927a, p. 408 (Lobatsi); Cott, 1934, p. 166 (Charre; Amatongas); Mitchell, 1946, p. 27; Tasman, 1957, p. 28.  
Mabuya varia varia Pittman, 1934, p. 306 (Mumbwa; Mpika; Sarenje); FitzSimons (part) 1935b, p. 369 (Titimi; Gaberones; Gabani; Molepolole to Kuke; Kuke; Gona River to Damara Pan; Damara Pan; Damara Pan to Van Zyl's Cutting; Mabeleapadi; Shaleshonto; Figtree; Matopos; Zimbabwe); Mertens, 1937, p. 10 (Salisbury); Loveridge, 1953a, p. 212 (Zomba Plateau; Likabala River; Misuku Mts.; Nchisi Mtn.; Chitala River; Mtinkaka; Chowe; Chiradzulu Mtn.; Cholo Mtn.; Liohanya Plateau; Ino River; Tete; Beira) and 1953c, p. 142 (Zomba Mtn.; Linbe; Chirozo - Port Herald); FitzSimons, 1958b, p. 207 (Nyamisa); Manasse, 1961, p. 152 (Vila Paiva de Andrada; Gorongosa Mtn.); Broadley, 1962d, p. 801.  
Mabuya varia FitzSimons, 1939b, p. 36 (Vumba Mtn.; Mt. Silinda; Changadzi River; Birchenough Bridge) and 1943, p. 222 (Plumtree; Bikita; Chilimazi; Filabusi - Shabazi; Driefontein; Mtoke; Peshalanga; Mahalaye; Bulwayo; Sinola; Bindura; Mazambo; Shangwenzi); Manasse, 1952, p. 141 (Enchisa; Namacha; Muelo; Lifidzi).  
Mabuya varia nyikas Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 211; Nyika Plateau above Nehemehema, at 7,000 feet, Malawi.

Two hundred and eighty specimens examined from: BECHUANALAND. Debeeti; Kwebe Hills; 15 mls NW of Lechama; Lephepe and 40 mls NW; 10 mls W and 10 mls SE of Letlaking; Sun Pan; Wolf Hills. RHODESIA. Amh Falls; Bengi Spring; Binga; Butler North; Changadzi Bridge; Chapunga; Charam Plateau; Chera; Choto Gorge; Chibake Bridge; Chimanimani Mts.; Chisyanjera; Chiredzi; Devuli Bridge; Dora; Engwa;

Warfell; Ganderowe Falls; Gilston Estates; Glendale; Gokwe; 5 mls W of and 7 mls SE of Gwaii Bridge; Gwelo; Haroni - Lusitu Confluence; Hippo Mine; Holdenby; Ilamba Bridge; Insusa Bridge; Inyangani Mtn.; Inyantue Bridge; Jemenbi; 5 & 10 mls SE of Kapasi; Kariba; Kariba Lake - Dumi, Charawa and Mwenda Confluences, Sanyati Island and Sengwa Sound; Khami; Kota Kota; Kyle Lake; Lonely Mine; 10 mls NW and 10 mls E of Lupane; Makurupini River; Malimbasi; Mana Pools; Manyoli Ranch; Marandellas; Marungudzi; Matopos; Matowa; 32 mls NE of Mtoko; Neema Dam; Niavasha Pan; Nyakasanga Gorge; Nyampanda and 3 mls W; Odzi; Pungwe Bridge; Rhodes Inyanga Estate; Ruanya Drift; Salisbury; Sanyatwe; Sawmills; Sengwe Gorge; Sinoia; Stanmore; Stapleford; Triangle; Tuli; Untali and 14 mls NW; Umsilikwa River; 15 mls WSW of Victoria Falls; Vumba Mtn.; Wankie National Park - Main Camp; Wick Farn; Zambezi - Matetsi and Sebungwe Confluences, also opposite Feira.

ZAMBIA. Abercorn (IRSND); Broken Hill; Bulaya (IRSND); Chilanga; Ikolonge; Kalene Hill; 20 mls W of Kateto; Kuungashi; 50 mls ENE of Lusaka; Mweru-Wantipa (IRSND); Ndola; Ngumbwe Falls; Nsasa (IRSND); Nyika Plateau. MALAWI. Cape Maclear; Cholo Mtn.; 10 mls SW of Fort Johnston; Lujeri; Mlanje Mountain (Ruo Basin); Nyika Plateau; Rumpi; Zomba Plateau. MOZAMBIQUE. 4 mls W of Alto Ligonha; Cabaceira Peninsula; Chicamba Dam; Chinamansa; Cruzado; Garuso; Gorongosa Mtn.; Gumba; Jorge; Lurio; Maringa; Massanga; Matara; Matareca; Menonde; Metambanhe; Mitucue Mtn.; 10 mls W of Moamba; Mosambique Island; Namecuna; Revue; 20 mls E of Ribaus; Samo; Vila Junqueiro; Vila de Manica and 15 mls SE; Viola; Kiluvo.

Literature records. BECHUANALAND. Damara Pan; Damara Pan to Van Zyl's Cutting; Gabani; Gaborone; Kuke; Lobatsi; Mabelsapadi; Mahalape; Molopolole to Kuke; Okwa River to Damara Pan; Serowe; Shaleshonto; Titumi. RHODESIA. Bikita; Bindura; Birchough Bridge; Bulawayo; Changadzi River; Chilimansi; Colleen Bawn; Driefontein; Eldorado; Espandene; Figtree; Filabusi - Shabani; Khami River; Marandellas; Matopos; Mount Silinda; Mtoko; Penhalonga; Plumtree; Salisbury; Shangwanani; Sinoia; Vumba Mtn.; Zimbabwe. ZAMBIA. Mpika; Mumbwa; Petauke; Sereje. MALAWI. Chiradzulu Mtn.; Chiromo - Port Herald; Chitala River; Cholo Mtn.; Chowo; Lichenya Plateau; Likabula River; Limbe; Misuku Mtns.; Mtimbuka; Nchisi Mtn.; Ruo River; Zomba Plateau. MOZAMBIQUE. Amatongas; Beira; Charre; Delagoa Bay; Enchisa; Gorongosa Mtn.; Lifidsi; Lumbo; Maualo; Masambo; Namacha; Tete; Vila Paiva de Andrade.

Variation. Centre of nostril above or posterior to the suture of rostral/first labial; suprasmals usually in broad contact; prefrontals usually separated; supraciliaries 3 - 6, usually 5; upper labials

anterior to subocular 4 - 5, very rarely 6; two or three obtusely pointed lobules on anterior border of ear opening; midbody scale rows 30 - 36 (38 in one Zomba Plateau skink); dorsals tricarinate; lamellae under fourth toe 16 - 25.

Coloration. Very variable, blackish, olive or red-brown above, with or without (a) a pale vertebral stripe, (b) a pair of pale dorso-lateral stripes, (c) black dorsal blotches; flanks darker, usually with a well-defined white lateral stripe extending from subocular through ear opening to groin; bluish-white below.

Size. Largest ♂ (MCZ. 50890 - Cholo Mtn.) 55 + 95 = 150 mm. Largest ♀ (NSR, 412 - Odzi) 74 + 103 = 177 mm.

Discussion. Loveridge (1953a) based his race nyika on six specimens from the Nyika Plateau which differed from typical lowland varia in the following characters:

- (a) centre of nostril directly above vertical of rostral - labial suture in five specimens.
- (b) fewer supraciliaries, 3 on one side, 4 on nine sides, 5 on two sides; usually 5 in the typical form.
- (c) Midbody scale rows 34 - 36 instead of 30 - 34.
- (d) Shorter limbs and more slender habitus.
- (e) Darker coloration, especially chin and throat, which are plumbeous in five specimens.

I have examined a paratype of nyika and six more specimens from the Nyika Plateau (including two from the Zambian sector). These agree with the type series in having four supraciliaries on eleven sides and five on the other side, while three have 34 midbody scale rows and the others have 36. The position of the nostril is variable, as it is with lowland populations, and is too subjective to be used as a taxonomic character with any confidence. These skinks are not appreciably darker than other upland populations, though they are certainly distinguishable from light red-brown topotypes from Tete. One feature which Loveridge did not mention is the shorter toes of the Nyika skinks, with only 17 - 18 lamellae under the fourth toe, compared with 19 - 25 in lowland skinks.

The Nyika Plateau populations could be distinguished from lowland populations by a character complex based on lower midbody scale count, fewer supraciliaries and fewer lamellae under the fourth toe. But this versatile species occurs at altitudes varying from sea level to 11,500 feet on Mount Elgon, and Loveridge (1936d, p. 317) found that alpine skinks did not differ significantly from lowland populations, apart from smaller size. It seems unlikely that the Nyika Plateau should be the only mountain block in eastern Africa to have an endemic race of Mabuya varia, so I have compared some other montane specimens with the Nyika material. All montane

populations of varia tend to be smaller in size, more slender and darker in coloration than lowland populations. They often have high midbody scale counts, i.e. two Zomba Plateau skinks have 36 and 38, Mlanje (1) and Inyangani (2) skinks have 36, nine Chimanimani skinks have 34 and a tenth has 36; on the other hand, four skinks from the summit of Gorongosa Mountain have 30 - 34 scale rows. There is also a tendency for montane skinks to have short toes, e.g. 16 - 19 lamellae under the fourth toes of Gorongosa skinks. None of the other montane populations agrees with nyikma in having a reduction in supraciliaries. Odd specimens from lowland localities have less than five supraciliaries, and in a series of 18 skinks from the Mweru - Wantipa - Abercorn region of Zambia (IRSND), there are four supraciliaries on 13 sides, five on 16 sides and six on two sides. These skinks show no other affinities with nyikma, having 32 - 34 midbody scale rows and 19 - 22 lamellae under the fourth toe.

The only character which Nyika skinks do not share with other montane populations is the reduction in average number of supraciliaries from five to four, and a strong tendency in this direction is shown by north Zambian populations. The fragmentation of a wide-ranging and versatile species like Mabuva varia should not be attempted without analysing the variation throughout its whole range, so I place nyikma in the synonymy of M. varia.

Diet. Cott (1934, p. 166) lists the stomach contents of eight specimens from Charre, which included grasshoppers and their nymphs, bugs, a cockroach, a mantis, a caterpillar, spiders and termites. An Ustali skink disgorged an adult Ablabharus wahlbergi nearly as long as itself when captured.

Enemies. One skink was found in the stomach of an African Wild Cat (Felis libyca) from near Lephape. Specimens have been recovered from the stomachs of the following snakes: Lycophidion capense (10 mls SE of Kapami); Psammophis s. subtaeniatus (Chipengali; Inyati).

Habitat. Almost ubiquitous in savanna and montane grassland. This versatile species is normally terrestrial, but it may be rupicolous at high altitudes if it is free from the competition of Mabuva quinquecostata and M. punctatissimus as on Gorongosa Mountain. The only thoroughly arboreal population that I have encountered was at Menonde in south Mozambique, where there were apparently no Mabuva striata to occupy the "tree trunk niche".

Distribution. Sudan and Somalia, south to the south-eastern Cape Province, west to South West Africa, Angola and the Congo.

## THE MAIUYA STRIATA COMPLEX.

Although Maiuya striata is the commonest lizard in most parts of east and central Africa, the geographical variation throughout the entire range has never been analysed. Several workers have recently studied the variation in circumscribed areas and revived or described various races and related species. Loveridge (1953a) revived allanbergeri Chabanaud for populations along the Zambezi from Barotseland to Yete and described two montane forms from Malawi, Maiuya bocagii mlanjensis and Maiuya hildae (Nyika Plateau). Mertens (1955) recognised three races of M. striata in South West Africa, typical striata, spilogaster of Peters and a new race sparsa. Hellwich (1957b) referred some Angola material to M. striata angolensis Monard, but Laurent (1964c) placed allanbergeri and angolensis of Hellwich in the synonymy of M. striata chimbana Boulenger and treated M. angolensis of Monard as a full species.

After a preliminary survey of the problem, involving the examination of over 600 specimens, I am satisfied that there are two widespread sibling species in southern Africa, but because of considerable intraspecific variation it is doubtful whether a simple key can be devised to separate them. The technique used by Gans (1959) in defining "non-dimensional" species will be of great value in work on the Maiuya striata complex. The taxonomic arrangement here adopted is tentative. I have concentrated on defining biological species and it is evident that the complex consists of a temperate species (M. punctatissimus) in South Africa, which has relict populations and races on the highland areas to the north, and a tropical species (M. striata) centred on the East African lowlands.

## MAIUYA PUNCTATISSIMUS SPILOGASTER (Peters)

Europerus (Europeris) striatus var. spilogaster Peters, 1832, Reise Mossambique Zool. 3. Amphib., p. 68: Otjimbingue, South West Africa.

Maiuya striata spilogaster Mertens, 1955, p. 80, pl. 12, fig. 54 (Damaraland and Great Namqualand).

Twenty specimens examined from BECHUANALAND. Lokabe Pan; Nossob River, 40 & 60 mls. above Auob Confluence; Tsabong and 63 mls N and 5 mls S; Tsane.

Variation. Centre of nostril usually above suture of rostral/first labial; supranasals in broad contact; prefrontals usually widely separated; supraciliaries 3 - 5, usually 5; upper labials anterior to subocular 5, rarely 6; one to three pointed lobules on anterior border of ear opening; midbody scale rows 34 - 36, rarely 32 or 38, dorsals tricarinate; lamellae under fourth toe 20 - 25.



Coloration. Dark brown above, with a pair of pale dorso-lateral stripes, the area between them with light and dark spots, the flanks usually with pale spots; ventral surfaces heavily streaked and blotched with black.

Size. Largest (UM. 10419 - Nossob River, 40 miles above Anob Confluence) 70 + 109 = 179 mm.

Discussion. The specific status of Makuya punctatissimus is established by the fact that M. p. spilogaster is sympatric with M. striata sparsa along the Nossob River and again between Vanylarus and Askhan in the northern Cape Province. A comparison of 11 M. p. spilogaster and 27 M. s. sparsa, collected together on the same trees along the Nossob River by Dr. C. K. Brain in September, 1960 shows the following striking differences between these sympatric populations.

CHARACTER	M. P. SPILOGASTER	M. S. SPARSA
Centre of nostril in relation to rostral/1st labial suture	Usually above	Usually posterior
Prefrontals	Widely separated in 8 Narrowly separated in 1 In short contact in 2	In broad contact in 20 In short contact in 2 Narrowly separated in 5
Upper labial formula	Subocular bordering the lip posterior to the fifth (18 sides) or sixth (4) labial.	Subocular excluded from lip (50 sides) rarely bordering the lip posterior to the fifth (2 sides) or sixth (2) labial.
Midbody scale rows	34 in 5 specimens; 36 in 5; 38 in one.  Mean = 35.3	36 in one specimen; 38 in 8; 40 in 11; 41 in 2; 42 in 3.  Mean = 39.6
Dorsal markings	A pair of light dorso-lateral stripes present.	No light dorso-lateral stripes present
Ventral markings	Heavily streaked and blotched with black	Dark markings largely restricted to throat and sides of belly, consisting of grey stippling.
Maximum snout-vent length	70 mm.	87 mm.

Habitat. This form seems to be largely arboreal, both in South West Africa (Mertens, 1955) and Bechuanaland.

Distribution. Southern South West Africa, south-eastern Bechuanaland and north-western Cape Province.

*MABUYA PUNCTATISSIMUS PUNCTATISSIMUS* (A. Smith)

*Eumeces punctatissimus* A. Smith, 1849, Ill. Zool. S. Africa, Rept., pl. xxxi, fig. 1: North-eastern Districts of Cape Colony.

*Eumeces sundevallii* A. Smith, 1849, Ill. Zool. S. Africa, Rept. App. p. 11: "Interior of Southern Africa".

*Mabuia striata* (not Peters) Power, 1927c, p. 408 (Lobatsi); FitzSimons, (part) 1935b, p. 37 ("phase A" - Gaborones to Kaotwe) and 1943, p. 229, also 1958a, p. 207 (Nyamisa; Pungwe River Causeway); Broadley, 1962d, p. 802 ("phase b").

Eighty-three specimens examined from: BECHUANALAND. Debeeti; 4 mls. W of Lechana; 40 mls NW of Lephepe; 10 mls W of Maboane (U.S.N.M.); 10 mls SE of Letlaking (U.S.N.M.). RHODESIA. Chimanisani Mtns.; Engwa; Erin Forest Reserve; Inyangani Mtn.; Rhodes Inyanga Estate; Silverstreams; Troutbeck; Wick.

Literature records. BECHUANALAND. Gaborones to Kaotwe. RHODESIA. Nyamisa; Pungwe Causeway.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals in broad contact; prefrontals usually separated, rarely in broad contact; supraciliaries 4 - 6, usually 5; upper labials anterior to subocular usually 5; rarely 4, 6, or subocular excluded from lip; usually 2 - 4 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 34 - 42, dorsals tricarinate; lamellae under fourth toe 18 - 23.

Coloration. Dark brown to almost black above with a pair of narrow yellow dorso-lateral stripes and usually each dorsal scale with a pale median spot, which are frequently confluent to form narrow longitudinal lines, head shields often with pale markings; yellow below, throat often suffused with dark brown.

Size. Largest ♂ (QVM - 474 - Troutbeck) 77 + 95 = 172 mm. Several specimens measure 80 mm from snout to vent.

Discussion. Miss A. G. C. Grandison has kindly supplied me with some previously unpublished data concerning the eight cotypes of *Eumeces punctatissimus* A. Smith in the British Museum (N.H.) In four specimens the

subocular is excluded from the lip, in the others it borders the lip posterior to the fifth (5 sides) or sixth (3 sides) labial; midbody scale rows approximately 33 - 38 (several specimens are badly cut up on the belly); lamellae under the fourth toe 18 - 25. The largest specimen (BM.1946.8.15.19) measures 77.6 mm from snout to vent. The type of Eumeces sundersalli (BM. 1946.8.19.16) measures only 35.5 mm from snout to vent and is in very poor condition, it has the subocular excluded from the lip, about 34 midbody scale rows and 19 - 20 lamellae under the fourth toe.

Forty specimens from south-east Bechuanaland agree with Smith's punctatissimus, some of them matching his colour plate in detail. The types are not "typical" of the species in having the subocular excluded from the lip in 50%. Table 2 below shows the variation in some populations of M. punctatissimus.

TABLE 2

<u>M. p. punctatissimus</u>	Labials					Midbody Scale Rows	Lamellae under 4th toe	Maximum Snout-vent Length
	N	Anterior to Subocular	Subocular excluded from lip*	Subocular bordering lip*	Subocular bordering lip*			
Types of <u>punctatissimus</u>	8	5	3	-	8	33-38	18 - 25	78
Northern Cape, Province & O. F. S.	5	9	1	-	-	36 - 38	17 - 20	80
Natal Drakensberg & Midlands	21	5	24	3	10	35 - 40	17 - 21	76
Swaziland & Transvaal Drakensberg	5	10	-	-	-	34 - 38	19 - 23	82
S. E. Bechuanaland	40	50	7	-	23	34 - 41	18 - 23	80
Eastern Rhodesia	43	2	66	15	3	36 - 42	18 - 23	83
<u>M. p. sniogaster</u>								
N. Cape Province & S. E. Bechuanaland	25	46	4	-	-	32 - 38	20 - 25	74
<u>M. p. nianensis</u>								
Kianje Mtn., Malawi	25	2	41	7	-	37 - 42	17 - 22	72

\* sides

In most areas the only race of Makaya striata likely to occur with M. p. punctatissimus is the typical form and the two forms can be distinguished as follows:

Subocular excluded from lip; dorsum dark, with a pair of broad pale dorso-lateral bands, but no pale spots or lines between them; adults over 80 mm from snout to vent; a tropical form ..... M. s. striata  
Subocular usually bordering lip; dorsum with a pair of pale dorso-lateral stripes, the scales between them each with a pale spot, which may form narrow longitudinal lines; adults rarely exceed 80 mm from snout to vent; a temperate form ..... M. p. punctatissimus

Enemies. One skink was recovered from the stomach of a Psammobis crucifer collected at Troutbeck.

Habitat. This species is largely arboreal in the western part of its range, also living on huts. On the eastern escarpment it is rupicolous and is particularly abundant on the summit of Inyangani Mountain (8,514 ft.). Many specimens were found living on the log cabin of the resident forester on Erin Forest Reserve.

Distribution. The eastern escarpment and highveld of South Africa, extending into south-eastern Bechuanaland. A series of relict populations occur on the eastern highlands of Rhodesia, but this skink does not occur on the summit of Gorongosa Mountain.

#### MABUYA PUNCTATISSIMUS MLANJENSIS Loveridge

Mabuya bocourti mlanjensis Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 207; Lichenya Plateau at 6,000 feet, Mlanje Mountain, Malawi, and 1953c, p. 142 (Chambe Plateau, Mlanje Mtn.).

Mabuya striata striata (not Peters) Loveridge, 1953a, p. 205 (part - Lichenya Plateau).

Twenty-five specimens examined from: MALAWI. Injeri Estate; Mlanje Mountain (Dsolo Peak; Lichenya Plateau; Ruo Basin).

Literature records. MALAWI. Chambe and Lichenya Plateaux on Mlanje Mountain.

Variation. Centre of nostril above or posterior to the suture of rostral/first labial; supranasals in broad contact; prefrontals in contact or separated; supraciliaries 5, rarely 4 or 6; upper labials anterior to subocular 4 - 6, usually 5; usually 2 or 3 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 37 - 42, dorsals tricarinate; lamellae under fourth toe 17 - 22.

Coloration. Similar to the typical form, except that the pale lines on the two median scale rows are separated only on the nape, thereafter they converge to form a yellow vertebral stripe.

Size. Largest ♀ (MZ. 50695 - Lichenya Plateau) 72 + 98 = 170 mm.

Discussion. This is a poorly defined race, distinguishable only by the presence of a vertebral stripe, which I have seen in one Inyangani Mountain specimen of the typical form. I have examined AMNH. 67824 from Lichenya Plateau and find that it is a M. p. mlanjensis, not M. s. striata as reported by Loveridge.

Enemies. Loveridge recovered one skink from the stomach of a Psammobis t. variabilis.

Habitat. Rocks and montane grassland on the peaks and plateaux of Mlanje Mountain.

Distribution. Endemic to Mlanje Mountain, southeast Malawi.

MABUYA HILDAE Loveridge

Mabuya hildae Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 209:

Nyika Plateau above Nchenachana at 7,000 feet, Malawi.

One paratype specimen examined.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals in contact; prefrontals separated or in contact; supraciliaries 5; subocular not reaching lip; two or three obtusely pointed lobules on anterior border of ear opening; midbody scale rows 38 - 40; dorsals tricarinate; lamellae under fourth toe 15 - 18.

Coloration. Blackish above, longitudinally flecked with pale brown, a pair of cream dorso-lateral stripes and usually a pale brown vertebral stripe; greyish-white below.

Size. Largest ♂ (MZ. 50686) Head and body 64 mm. Largest ♀ (MZ. 50684 - Holotype) 87 + 63 = 150 mm.

Discussion. In his description of M. hildae Loveridge did not mention the few lamellae under the fourth toe, a character which it shares with no other member of the Mabuya striata group. It seems to be very rare on the Nyika, for it has not been collected since Loveridge obtained the type series in 1948.

Enemies. Loveridge found one in the stomach of a Harrier (Circus macrourus).

Habitat. Montane grassland, sometimes living in rodent burrows.

Distribution. Endemic to the Nyika Plateau.

MABUYA STRIATA SPANIA Mertens

Mabuya striata spania Mertens, 1954, Senckenbergiana, 34, p. 182: Warmed, South West Africa, and 1955, p. 80.

Mabuya striata (part, not Peters) FitzSimons & Brain, 1938b, p. 101.

Twenty-seven specimens examined from: BECHUANALAND - CAPE PROVINCE BORDER. Nossob River - 20, 40 & 60 miles above the Auob Confluence.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals in broad contact; prefrontals usually in broad contact; supraciliaries 5, rarely 4; subocular excluded from lip, rarely bordering lip posterior to fifth or sixth labial; two or three obtusely

pointed lobules on anterior border of ear opening; midbody scale rows 38 - 42, rarely 36; dorsals tricarinate; lamellae under fourth toe 21 - 25.

Coloration. Dark brown to almost black above with numerous scattered pale spots, no trace of light dorso-lateral stripes; white below, uniform or with patches of fine grey stippling, especially laterally and on the throat.

Size. Largest (UM. 10449 - Hossob River 60 miles above Auob Confluence)  $36 + 116 = 202$  mm.

Habitat. Arboreal, being particularly abundant on large Acacia giraffae trees (Brain, in litt.).

Distribution. Apparently restricted to dry river valleys below 3,000 feet in the south-eastern corner of South West Africa and northern Cape Province, extending eastwards along the Kuruman River to within 20 miles of Vansylarus, where it is sympatric with Malaya p. spilogramma. These skinks are very common in the Kalahari Gemsbok National Park, where they occur on practically every tree in the Auob and Hossob River courses (FitzSimons & Brain, 1938b.) and are particularly abundant on Acacia giraffae trees at the Auob-Hossob Confluence. Farther up the Hossob this form is sympatric with Malaya p. spilogramma.

#### MAIYA STRIATA WAHLBERGI X SPARSA

Eleven specimens examined from: BECHUANALAND. Kakia Pan; 35 mls W of Kang; Labututu; Makhe; Teabong and 65 mls N; Tsane.

Variation. Prefrontals in contact in 3, separated in 8; subocular not reaching the lip in 5, bordering the lip posterior to the fifth (8 sides) or sixth (4 sides) labial in the others; midbody scale rows 35 - 38.

Coloration. Intermediate between wahlbergi and sparsa, i.e. like sparsa, but with pale dorso-lateral stripes and therefore very difficult to distinguish from Malaya p. punctatissimus, fortunately these intergrades are actually sympatric with M. p. spilogramma. The position will become difficult if wahlbergi x sparsa intergrades are sympatric with typical punctatissimus in some parts of the southern Kalahari.

## MABUYA STRIATA WAHLBERGI (Peters)

- Euroscops wahlbergi Peters, 1869, *Oefvers. Vet.-Ak. Forh.* p. 660: Damaraland, South West Africa.
- Mabuya allenbergeri Chabrand, 1917, *Bull. Mus. Hist. Nat. Paris*, 23, p. 219, figs. 1 - 2: Lealui, Barotseland, Zambia.
- Mabuya striata (not Peters) Chubb, 1909a, p. 596 (Balawayo; Matopos) and 1909b, p. 35 (Expandens; Broken Hill); Boulanger (part) 1910, p. 485, (Lomagundi; Salisbury; Masoe); Hewitt & Power (part) 1913, p. 158 (Marandellas; Francistown); Loveridge, 1929, p. 76 (Kafue River); Pittman, 1934, p. 306; FitzSimons (part) 1935b, p. 370 ("Colour phase C" - west and north of Katwe); Hartens (part) 1937, p. 9 (Moko; Nsonbo; Fort Rosebery); FitzSimons, 1943, p. 229; Tasman, 1957, p. 28; Broadley, 1963, p. 802 ("Phase A").
- Mabuya striata allenbergeri Loveridge, 1953a, p. 202 (near Tete).

Two hundred and sixty-two specimens examined from: **BECHUANALAND.** Felsy; Francistown, also 50 mls W and 40 mls NW; 15 mls NE of Gomare; Kanya; 5 mls W of Kasungula; Kwebe Hills; Lake Dow and 10 mls E; Mann; 5 mls S and 9 mls SE of Naba; Nokanang; Sehitek and 14 mls W; Sekusa Pan; Sepopa; Taoghe River; Toten; Tsalatyanu Pan. **CAPRIVI.** Liambezi Lake. **RHODESIA.** Benkesi; Binga; Bulawayo; Gemont; Charaya Plateau; Chirundu; Fatima; Glendale; 5 mls W of Gwaii Bridge; Inyanga Bridge; Inyanga Village; Kamativi; Kapani and 5 & 10 mls. SE; Kariba; Kariba Lake - Sumi and Mwenda Confluences; Kasungula; Lake MacIlwaine; Letope River; 18 mls NW of Lupane; Malibesimbi; Marumba Reserve; Marandellas; Mount Dumbo; Mount Hampden; 25 mls W and 30 mls SE of Moko; Mtoashanga Pass; Nampini; Ngano; Nyamangwa Gorge; 15 mls WSW of Nyamandhlovu; Nyamaropa; Plumtree; Rodoliff; Rokwitjie Research Station; 10 mls NW of Rusnya Drift; Saffron Walden; Salisbury; Sanyatwe; Seagwe River; Sincia; Sombula; 8 mls SE of Tjolethje; Urungwe Reserve; 4 mls W of Victoria Falls; Wankie; Wankie National Park - Main Camp, Guvalala and Nyamandhlovu Pans; Zambezi-River - Chewore, Matetsi and Sebungwe Confluence, also 16 mls S of Chirundu. **ZAMBIA.** Balmoral Farm; Broken Hill; Chavuma; Chete Hills; Chikwa; Chinsali (LRNH); Kabompo; Kalabo; Kalichero; Kali Kali; Kamanya Plain; Kamgashi; Mushi; Ndola; Sesheke; Sinjambela; Sitwe; Victoria Falls. **MOZAMBIQUE.** Chinacima; Magasco; 5 mls. W of Tete.

Literature records. **BECHUANALAND.** Francistown. **RHODESIA.** Bulawayo; Expandens; Lomagundi; Marandellas; Matopos; Masoe; Moko; Salisbury. **ZAMBIA.** Broken Hill; Fort Rosebery; Lealui; Nsonbo. **MOZAMBIQUE.** Tete.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals in broad contact; prefrontals usually separated, rarely in broad contact; supraciliaries 5, rarely 3, 4 or 6; upper labials anterior to subocular 5 - 7, usually 6, sometimes subocular excluded from lip;

usually 2 - 4 short obtusely pointed lobules on anterior border of ear opening; midbody scale rows 34 - 42, dorsals tricarinate or with 5 - 7 keels in large adults; lamellae under fourth toe 18 - 24.

Coloration. Top of head orange-brown, very bright in adult males, back grey-brown, often with ill-defined pale dorso-lateral stripes anteriorly, a broad blackish lateral band extends from the eye to above the shoulder, sometimes persisting to midbody, rarely reaching the groin. White below, throat often streaked with orange or yellow.

Size. Largest (UN. 8866 - Sangwe River) 100 + 148 = 248 mm.

Discussion. This race is readily distinguishable from the typical form in the southern part of its range by coloration and upper labial formula. In Zambia there is a broad belt of intergradation extending through the plateau areas of the Eastern Province, the western Nyika Plateau and across northern Zambia.

This is the form which Mertens (1955, p. 79, pl. xii, fig. 53) called Makuya s. striata in South West Africa. As his material included the type of Eumeces wahlbergii Peters I am provisionally accepting this as the earliest applicable name, with allenbergeri Ghabansud as a synonym. Peters also described Eumeces variegatus from Damaraland, but the type had only 32 midbody scale rows, which is very low for the form under consideration. Laurent (1964c, p. 69) placed allenbergeri in the synonymy of Makuya striata chimba Boulenger, which seems to be a recognisable Angolan race judging by three specimens received from Cassai.

Diet. Beetles and a cockroach in a Tete skink (Loveridge, 1953a, p. 204).

Enemies. One recovered from the stomach of a mongoose (Herpestes sanguineus) at Makalambedi. Specimens were recovered from the stomachs of the following snakes: Lycophidion c. capense (Bulawayo; Selubwe; Fort Jameson; Msoro; Chikoma); Mehelya c. capensis (Eusexvale); Philothamnus i. irregularis (Abercorn); Hemirhagerrhis n. nototaenia (Lundazi); Pseustes s. subtaeniatus (Malimbazimbi). This skink is also the staple diet of young Boodon f. fuliginosus and Pseustes sibilans.

Habitat. This arboreal skink seems to be most abundant in the mopane woodlands of the big river valleys, but is also widespread in Brachystegia woodland. It rapidly occupies houses and bridges when available; I noticed that within weeks of the culverts and bridges being completed on a new road line through virgin bush, these structures had their colonies of Makuya striata. Baobab trees often harbour many of these skinks.

Distribution. The Swemba-Luangwa-Chicoa troughs and the plateau areas of Zambia and Rhodesia, extending down the Zambezi to Tete and across northern Bechuanaland to Damaraland.



*MABUYA STRIATA STRIATA* X *WAHLBERGI*

Fifty-seven specimens examined from: ZAMBIA. Abercorn (IRSNB); Salaya (IRSNB); Fort Jameson; Kabata (IRSNB); Lutembwe; Makapi (IRSNB); Mwera-Mantipa (IRSNB); <sup>Nzomo;</sup> Nyika Plateau. MOZAMBIQUE. Maudia.

Variation. Prefrontals usually separated; subocular excluded from lip on 57 sides, reaching lip posterior to fifth (9 sides) or sixth (38 sides) on the others; midbody scale rows 35 - 40.

Coloration. Very variable, ranging from "typical *striata*" to "typical *wahlbergi*" within a single population.

*MABUYA STRIATA STRIATA* (Peters)

Troidolepis striatum Peters, 1844, Monatsb. Akad. Wiss. Berlin, p. 36; Mozambique.

Eumeces uncutatissimus (not Smith) Peters, 1854, p. 618 (Mozambique Island; Calocaira; Qualimane; Boror); Gunther, 1864, p. 307.

Eumecis grantii Gray, 1864, Proc. Zool. Soc. London, p. 62; South-Eastern Africa (Zambesi Expedition); Gunther, 1864, p. 307.

Eumeces (Eumecis) striata Peters, 1882, p. 67.

Mabuia striata Boulenger, 1887a, p. 204; Boeage, 1896, p. 88 (Beira); Boulenger, 1897, p. 800 (Mlata Bay) to Ruarwa; Kondige to Karonga; Nyika District and Plateau; Fort Hill) and 1907b, p. 486 (Beira); Roux, 1907 p. 83 (Rikatla); Boulenger, 1910, p. 485 (part - Balagoa Bay); Loveridge, 1920, p. 154 (Lumbo); Cott, 1934, p. 166, pl. iii, fig. 1 (Fambani; Charro; Gaia; Amatongas); Thonido, 1941, p. 14 (Massangulo).

Mabuia striata FitzSimons (part), 1943, p. 229; Manacas, 1952, p. 143 (Porto Henrique; Maputa; Manhica; Dondo; Mauela; Lfidizi; Moamba; Chibuto; Maquese).

Mabuia striata striata Loveridge, 1953a, p. 205 (Kasungu; Misuku Mts.; Mcheshachema; Chitala River; Mtimbuka; Zomba Plateau) and 1953c, p. 142, (Chiromo; Port Herald); Manacas, 1961, p. 151 (Inhassoro; Vila Paiva de Andrada; Sao Martinho).

One hundred and forty-eight specimens examined from: RHODESIA. Chiryanjere; Chipinda Pools; Farfell; Haroni-Lusitu Confluence; Inyanga Tea Estates; Kyle Lake; Limpopo-Umsingwane Confluence; Majinzi Pan; Malapati Drift; Marungudai; Ngorima Reserve (S); 4 mls SW of Muanetsi Bridge; Pungwe Bridge; Sabi-Lundi Confluence; Sentinel; Shashi-Shashani Confluence; Triangle; Tuli; Untali; Vumba Mtn. MALAWI. Fort Johnston; Lujeri Estate; Rumpi. MOZAMBIQUE. Amatongas; Cabacoira Peninsula;

Cavalo; Chicamba Dam; Covane; Cruzado; Goonda; Gorongosa Mtn.; Grudja; 8 mls. NNE of Inhanga; Jorge; Manga; Maringa; Mavue; Metanbanho; Mozambique Island; Nda -Lasego; Savane; Xiluvo.

Literature records. MALAWI. Chiroso; Chitala River; Fort Hill; Kasungu; Kondowe - Karonga; Misuku Mtns.; Mzimba; Nchenachena; Nkata Bay to Ruarwe; Nyika District and Plateau; Port Herald; Zomba Plateau. MOZAMBIQUE. Amatongas; Beira; Boror; Cabaceira Peninsula; Caia; Charre; Chibuto; Delagoa Bay; Dondo; Fambani; Inhassoro; Idifisi; Lumbo; Manhica; Maputo; Maquese; Massangulo; Mualo; Moamba; Mozambique Island; Porto Henrique; Quelimane; Rikala; Sao Martinho; Vila Paiva de Andrade.

Variation. Centre of nostril usually posterior to suture of rostral/first labial; supranasals in broad contact; prefrontals usually widely separated, rarely in contact; supraciliaries 5, rarely 3, 4, or 6; subocular usually excluded from lip, rarely bordering the lip posterior to the fifth, sixth or seventh labial (except in a coastal strip extending north from Mozambique Island, where the labial normally borders the lip); usually 2 - 4 obtusely pointed lobules on anterior border of ear opening; midbody scale rows 32 - 38, dorsals tricarinate, sometimes with 5 - 7 keels in large adults; lamellae under fourth toe 18 - 24.

Coloration. Red-brown to blackish-brown above, with a pair of broad cream dorso-lateral bands at least two scale rows wide; white below, throat often flecked with orange.

Size. Largest ♀ (UM. 8549 - Cruzado) 104 + 134 = 238 mm.

Discussion. Peters (1882, p. 67) described striata as having the subocular bordering the lip between the fifth and sixth, or sixth and seventh labials. In four topotypes from Mozambique Island the subocular reaches the lip in three specimens, but is excluded in the other. Loveridge (1953a, p. 205) has discussed the distribution of "typical striata", which he found to be dominant on the coastal plains of Kenya and Tanganyika south to Mozambique Island. This central area is bordered by populations of what Loveridge called the "primitive form" with the subocular excluded from the lip, extending from Somalia (Gans, Laurent & Panitt, 1965, p. 36) through the Rift Valley region into south-east Africa. Thus the populations of Makaya striata fall into four groups on the basis of upper labial arrangement, which radiate outwards from a centre in coastal Tanganyika and north Mozambique, from east to west we have:

- (a) "Typical striata" - subocular normally bordering lip.
- (b) "Primitive striata" - subocular excluded from lip.
- (c) vahlbergi - subocular normally bordering lip.
- (d) apurus - subocular excluded from lip.

Diet. Cott (1934, p. 166) listed the stomach contents for 17 Mozambique specimens, which consisted largely of grasshoppers, termites and beetles.

Enemies. Specimens recovered from the stomachs of a Lycophidion c. capense (Birchenough Bridge) and a Telescopus n. semiannulatus (Hot Springs).

Habitat. Largely arboreal, but also abundant on house walls, bridges, etc. This skink lives in mangrove swamps at Beira and Savane.

Distribution. East Africa from Somalia to Natal, extending up the Shire into Malawi and up the Limpopo Valley to the Tuli area.

#### Genus RIOPA Gray

Riopa Gray, 1839, Ann. Nat. Hist., 2, p. 332. Type by subsequent designation: Lacerta punctata Linnaeus

Mochlus Gunther, 1864, Proc. Zool. Soc. London, p. 308. Type by monotypy: M. punctulatus Gunther = Eumeces afer Peters.

Sepaeontias Gunther, 1880, Ann. Mag. Nat. Hist., (5) 6, p. 235. Type by monotypy: S. modestus Gunther.

Mittleman (1952, p. 9) revived the genus Mochlus (including Sepaeontias) distinguishing it from Riopa by the absence of a brille in the lower eyelid and its more robust body and limbs. Loveridge (1957, p. 213, footnote) rejected Mittleman's fragmentation of Riopa, but without any argument to support his criticism, as pointed out by Gans, Laurent and Pandit (1965, p. 37).

The presence or absence of a brille in the lower eyelid is not of generic significance with regard to the genera Malaya, Eremias and Platysaurus, so it is a poor character on which to base Mochlus. Mittleman gives the range for Mochlus as Africa, China, Indo-China, Malaya and the Phillipines, while Riopa occurs in India, Burma and Kenya, which suggests that his grouping does not reflect the true phylogenetic relationships. Finally there is no apparent divergence in adaptive trends shown by these skinks. I can see no justification for the retention of Mochlus even as a subgenus.

#### RIOPA SUNDEVALLI SUNDEVALLI (A. Smith)

Eumeces (Riopa) sundevallii (sic) A. Smith, 1849, Illus. Zool. S. Africa, Rept., App. p. 11: "Country eastward of Cape Colony".

Sepaeontias modestus Gunther, 1880, Ann. Mag. Nat. Hist., (5), 6, p. 235: Мрвара, Угого, Тангарика.

Iyosoma sundevallii Boulenger, 1887a, p. 307 (Lake Nyasa) and 1891b, p. 306; Gunther, 1894, p. 618; Boulenger, 1902, p. 17 (Mashonaland); Chubb, 1909a, p. 594 and 1909b, p. 35 (Balawayo); Boulenger, 1910, p. 486 (Salisbury); Werner, 1910, p. 350 (Selima - Khakha, Kalahari);

Hewitt, 1910c, pp. 95, 100 (Serowe); Hewitt & Power, 1913, p. 159, (Lake Ngami; Ky Ky); Angel, 1920, p. 616 (Lealui); Parker, 1932, p. 359 (part); FitzSimons, 1939b, p. 269.

Lygosoma sundevallii sundevallii FitzSimons, 1935b, p. 372 (Kaotwe; Otwa River - Damara Pan; van Zyl's Cutting; Gembok; Machumi Pan; Mabelapudi - Lake Ngami; Motlhatlogo; Kabulabula; Plumtree; Kalakamati; Matopos).

Riopa sundevallii sundevallii Pitman, 1934, p. 306 (Kalomo; Choma; Lusaka); Broadley, 1962d, p. 804.

Riopa sundevallii FitzSimons, 1939b, p. 37 (Tanganda River Bridge; Birchenough Bridge) and 1943, p. 233 (Mtoko; Gwanda; Macheko; Gwelo; Tshabanda Valley; Rusape; Musami; Espandene; Wankie; Syringa; Insisa; Marandellas); Loveridge, 1953a, p. 218 (part - Mtimbuka; Kausi Village; near Tete); Tasman, 1957, p. 30, photo 2; Haacke, 1965, p. 18 (Gungona).

Two hundred and eighty-two specimens examined from: BECHUANALAND. Gungona (TM); Francistown (TM); Gembok Pan (TM); Geshond Farm (TM); Guisi (AM); Kabulabula (TM); Kalakamati (TM); Kaotwe Pan (TM); Lake Ngami (TM); Machumi Pan (TM); Makalambedi; M'ncove (AM); Mosenbo; Nokaneng and 18 mls S (TM); Sekitwa; Serowe (AM); 15 mls E of Sun Spit; Tso-dilo Hills (TM). RHODESIA. Binga; Birchenough Bridge; Bulawayo; Chete Gorge; Chimwara Ranch; Chiredzi; Chiwehe Reserve; Devuli Bridge; Espandene (AM); Fort Victoria; Gilston Estates; Glass Block; 5 mls W of Gwaii Bridge; Gwanda (AM); Gwelo; Heavy Junction; 10 mls SE of Kapaxi; Kariba Lake - Buni and Charara Confluences; 2 mls S of Kasungula; Lake MacIlwaine; 10 mls E of Lupane; Lusulu; Macheko (AM); Malapati Drift; Malimbasi; Mana Pools Road; Marandellas; Matopos; Mount Darwin; Mount Hampden; Msoro; Mtoko (AM); Mtorashanga Pass; Musami; Malatle Ruins; Nuanetsi (TM); 10 & 15 mls NW of Nyamandhlovu; Nyampanda; Old Untali; Plumtree (AM); Que Que; Redcliff; Rusape (AM); Sabi - Lundi Confluence; Saffron Walden; Salisbury; Sentinel; Shashi-Ghashani Confluence; Syringa; Tanganda Bridge (TM); Trelawney (TM); Tuli; 14 mls NW and 10 mls S of Untali; Vumba Mtn.; Wankie National Park - Main Camp and Nyamandhlovu Pan. ZAMBIA. Chikova; Chilwa; Feira; Fort Jameson; Kalabo; Kalichero; Idvingstone; Lusaka West; Ndola. MALAWI. 10 mls SW of Fort Johnston; Kasungu (AMH); Kausi (MZ); Mtimbuka (MZ); Zomba. MOZAMBIQUE. Chigubo (TM); Moamba (TM); Tete (MZ); 15 mls SE of Vila de Manica; Viola.

Literature records. BECHUANALAND. Gungona; Gembok; Kabulabula; Kalia-Sekhum; Kalakamati; Kaotwe; Ky Ky; Lake Ngami; Mabelapudi - Lake Ngami; Machumi Pan; Motlhatlogo; Otwa River - Damara Pan; Serowe; Tshabanda Valley. van Zyl's Cutting. RHODESIA. Birchenough Bridge;

Bulawayo; Espandene; Gwanda; Gwelo; Insiza; Macheke; Marandellas; Matopos; Mtoko; Musami; Plumtree; Rusape; Salisbury; Syringa; Tanganda Bridge; Wankia. ZAMBIA. Choma; Kalomo; Lealui; Lusaka. MALAWI. Kaosi Village; Lake Nyasa; Mtimbuka. MOZAMBIQUE. Tete.

Variation. Nostril bordered by a supranasal which may be partially or completely fused with the anterior of two nasals; supranasals in broad contact; prefrontals widely separated; supraciliaries 6 - 7, rarely 5 or 8; parietals bordered by 5 - 8 mekals; midbody scale rows 24 - 28; lamellae under the fourth toe 11 - 15; lamellae under the fifth toe 5 - 7.

Coloration. Grey-brown above, each scale usually with a dark spot at the base (visible through the distal edge of the preceding scale), these spots are more pronounced on the tail; white below, tail sometimes with dark spots.

Size. Largest (QVM/R. 137 - Salisbury)  $84 + 81 = 165$  mm. UM. 9627 from Old Untali measures 88 mm from snout to vent (tail regenerated).

Discussion. Loveridge (1933, p. 320) treated modesta as a race of R. sundevallii because he had examined intermediates from Kenya and Uganda; he distinguished the two forms as follows:

"Supranasal not fused with anterior nasal; size larger. Back usually much spotted though occasionally uniform R. s. sundevallii  
Supranasal fused with anterior nasal; size smaller. Back usually uniform brown, occasionally spotted ..... R. s. modestum"

Parker (1932, p. 357) revised the group and decided that modestum was specifically distinct.

Loveridge (1936, p. 322) subsequently accepted Parker's finding and recorded the occurrence of R. sundevallii and R. s. modestum together at Voi and Mt. Mbololo in Kenya.

More recently, populations of Riopa with the supranasal and anterior nasal partially or completely fused have been reported from north-western Rhodesia (Broadley, 1963d, p. 804), and from the Kaokoveld, northern Damaraland, the Kaokoveld, Ngamiland, northern Ghanzaland and southern Angola (Haacke, 1965, p. 18).

Gans, Laurent and Pandit (1965, p. 37) have accepted that modesta is a race of R. sundevallii and revived the name afra for the larger East African species which is sympatric with it.

I have recently examined more Riopa sundevallii material from East and Central Africa and find that although twenty specimens from Kenya and Tanganyika are all modesta, the whole of Zambia and Malawi is occupied by intergrade populations, the percentage of fused supranasals varying in different areas. To accept modesta as a race would imply the recognition of an area of intergradation larger than the territories occupied by "pure" populations of typical sundevallii and modesta, which is unjustified.

Trinacinals are still required because of Riopa s. swahica Parker (1942, p. 90), which has a long fifth toe with 7 - 9 subdigital lamellae.

Diet. Beetles in the stomachs of two Kalahari specimens (FitzSimons, 1935b, p. 373).

Parasites. Trematoid mites (Acanthosomatia sp.) between the toes of Tete skinks, less frequently in the groin (Loveridge, 1953a).

Enemies. One recovered from the stomach of a Cape Fox (Vulpes chama) at Selitua. Specimens were found in the stomachs of five Genets (Genetta genetta) from Mann, Selitua and Makalambedi, the Selitua Genet had eaten eight skinks. The tail of a Riopa was found in an African Wild Cat (Felis libys) at Selungu.

Riopa sundevalli has been recovered from stomachs of the following snakes: Lycophidion c. capense (Binga; Chikwa); Mohelya nasuta (Rumpf).

Habitat. Most plentiful in sandy areas like the Kalahari, but widespread in savanna and frequently found under stones on dry hillsides. It seems to avoid damp conditions.

Distribution. Kenya south to the Transvaal, west through the Kalahari to South West Africa and Angola, absent from coastal areas of East Africa. This species does not occur in Natal and Smith's type probably came from the western Transvaal, not "Country to the eastward of Cape Colony".

#### RIOPA AFER (Peters)

Eumeces afer Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 619: Mosambique Island; Mossimboa; Boror; Inhambane.

Hoplus punctulatus Gunther, 1864, Proc. Zool. Soc. London, p. 308: Zambesi Expedition.

Eumeces verticillator Cope, 1868, Proc. Acad. Nat. Sci. Philadelphia, p. 317: ZANZIBAR.

Eumeces (Genira) Dumerili Steindachner/<sup>1870</sup> Sitzb. Akad. Wiss. Wien, 62, p. 341, pl. iii, fig. 5: Sansibar.

Eumeces sundevalli (not A. Smith) Peters, 1882, p. 75, pl. xi, figs. 2, 2a - c (Quarimba).

Lycosoma sundevalli (not A. Smith) Bocage, 1896, p. 88 (Beira; Mosambique Island); Boulenger, 1907b, p. 486 (Beira) and 1910, p. 486 (part, Beira); Loveridge, 1920, p. 155 (Imbo); Parker, 1932, p. 379 (part); Cott, 1934, p. 168 (Cala; Charre; Mutarara; Amatongas; Fambani); Thomsen, 1941, p. 14 (Beira).

Riopa sundevalli sundevalli (not A. Smith) Mertens, 1937, p. 11 (Inhambane).

Riopa sundevalli (not A. Smith) Manassis, 1952, p. 145 (Mualu); Loveridge, 1953a, p. 218 (part - Mpinpe); Manassis, 1961, p. 153 (Vila Paiva de Andreia).

Neohilus sundevalli sundevalli (not A. Smith) Laurent (part), 1964a,  
p. 78 (Porto Amélia).

Seventy-nine specimens examined from: ZAMBIA. Abercorn (IRSHB); Bulaya (IRSHB); Kasenje (IRSHB); Kitanda (IRSHB); Lungwa - Chibembi Pontoon; Mweru - Wantipa (IRSHB). MALAWI. Mzimba - Shire River (HEZ). MOZAMBIQUE. Beira; Cabaceira Peninsula; Inchops; 8 mls NNE of Inhaminga; Lumbo (HEZ; TH); Manga; Maxixe (PEM); Motuchira; Mozambique Island; Nda-Lango; Nhamitanga River; 5 mls N of Riccadala; Xiluvo.

Literature records. MALAWI. Mzimba. MOZAMBIQUE. Amstongas; Beira; Boror; Caia; Charre; Fambani; Inhambane; Inhaminga; Lumbo; Nausle; Mocimboa; Mozambique Island; Nhamitanga; Porto Amélia; Querimba; Vila Paiva de Andrade.

Variation. Nostril bordered by a supranasal which may be partially or completely fused with the anterior of two nasals, or the latter may be fused (Cott, 1934, p. 169); supranasals in broad contact; prefrontals widely separated; supraciliaries 6 - 9; peristals bordered by 4 - 7 nuchals; midbody scale rows 26 - 28; lamellae under the fourth toe 9 - 14; lamellae under the fifth toe 5 - 6, rarely 7.

Coloration. Grey-brown or plumbeous above, with irregular black and white blotches and streaks, sometimes both on the same scale, but on the back the black blotches usually outnumber the white by 2 : 1, whereas laterally the black and white blotches frequently alternate on a longitudinal scale row; upper labials may be vertically barred in black and white; white below. The light and dark speckling is sometimes distinguishable on the tail only and it appears that these markings fade out just before a skink sloughs.

Size. Largest ♀ (Cott, 1934 - Amstongas) 132 + 125\* = 257 mm. UM. 7300 from Inchops measures 137 mm from snout to vent.

Discussion. This species can most readily be distinguished from R. sundevalli on size and coloration. The nasal arrangement is unreliable, for populations in northern Zambia and the Rufua Valley frequently have the prefrontal fused with the anterior nasal. Comparison of R. afer and R. sundevalli south of the Zambezi shows that the former tends to have more supraciliaries (7 - 9), more midbody scale rows (usually 28) and fewer lamellae under the fourth toe (10 - 12, rarely 13 or 14).

The status of Eumeces guineensis Peters is not clear, but the single specimen I have examined seems closer to R. sundevalli than to R. afer, so I use a binomial for the latter.

Breeding. Four eggs (16 x 9 mm) in a Charre ♀ (Cott, 1934, p. 169).

Diet. Stomach contents consisted largely of Diptera at Lumbo (Loveridge, 1930), while Cott (1934) found termites, ants, a grasshopper, Heteroptera, a cockroach, a beetle and two millipedes in his specimens.

Habitat. Common in the alluvium of the Mozambique Plain, where they may be found under logs or piles of vegetable debris.

Distribution. The Sudan and Ethiopia south to northern Zambia and Mozambique, reaching its southern limit at Inhambane.

Genus EUMECIA Bocage

Eumecia Bocage, 1870, Journ. Sci. Lisboa, 3, p. 67. Type by monotypy:

E. anchietae Bocage.

This genus was resurrected from the synonymy of Riopa by Mittleman (1952, p. 10) and is recognized by Laurent (1964, p. 80), but not by Loveridge (1957, p. 213). Mittleman states that Eumecia "differs from Riopa essentially as follows: Prefrontals large, forming a median suture; ear opening large (only slightly smaller than the eye); limbs minute; digits 2 - 3 (in Riopa 3 - 3 or more)." These features, together with a pointed (but not depressed) snout, a serpentiform body and very long, finely pointed tail are adaptations for life in thick herbage, not the fossorial existence of Riopa. Eumecia is a good genus, showing the same adaptive trends as Chamaesura and Tetradaotylus among the Cordylidae.

EUMECIA ANCHIETAE ANCHIETAE Bocage

Eumecia anchietae Bocage, 1870, Journ. Sci. Lisboa, 3, p. 67, pl. 1:

Hilla Plateau, Angola.

Lycosoma anchietae Angel, 1920, p. 616 (Lealui).

Eumecia anchietae major Laurent, 1964, Publ. Cult. Comp. Diam. Angola, 67, p. 80: Calonda, Lunda, Angola.

Eumecia anchietae vittae Laurent, 1964, Publ. Cult. Comp. Diam. Angola, 67, p. 80: River Katanga, Upemba National Park, Katanga.

Twenty specimens examined from: ZAMBIA. Abercorn; Broken Hill; Chingola; Chisamba; Kalabo; Kalichero; Lunga Game Reserve; Lusaka; Mambwe (IRSHB); Manyinga River; Mount Mahulu; Mporokoso (UM; IRSHB).

Literature record. ZAMBIA. Lealui.

Variation. Nostril bordered by a supranasal and two nasals; supra-nasals in broad contact; frontonasal single, but divided in one Lusaka specimen; prefrontals in broad contact; supraciliaries 4 - 5; the anterior supra-ocular usually fused with the second supraciliary, but fused



with the first supraciliary on one side of MSR. 2862 from Chisank, and fused with first and second supraciliaries on both sides of MSR 1300 from Manyinga River, while there is no fusion between supraocular and supraciliaries in UM. 10046 from Kalabo; midbody scale rows 22 - 24; two digits on fore-limb and three on hind-limb.

Coloration. Ground colour olive to light grey-brown; the distinctive markings illustrated by Bocage (1895, pl. vi) are well defined in all except the Kalabo skink, which has no head markings and only faint longitudinal stripes; pale olive below.

Size. Largest (IRSNB - Mporokoso)  $225 + 300^* = 525$  mm. Another Mporokoso specimen is 250 mm from snout to vent.

Discussion. Laurent (1964a, p. 80) based E. s. major on a single specimen with first and second supraciliaries in contact with the prefrontal and frontal respectively, it's only other distinguishing feature being large size, 300 mm snout to vent. His E. s. vittei was said to resemble major in the arrangement of the anterior supraciliaries, but differed from both the typical form and major in its divided fronto-nasal.

Witte (1953, p. 124) has published a brief account of the 124 specimens which he collected in the Upemba National Park and informs me that in this series "the prefrontal may be absent or divided, the fronto-nasal entire or divided, the first supraciliary in contact with the prefrontal only or with the prefrontal and the frontal." (Letter of 23. iv. 65.)

This species shows such great variation in the arrangement of head shields (only one specimen that I have examined agrees with Bocage's description and it comes from Kaimosi, Kenya) that it seems premature to recognise races based on such characters.

Habitat. In Zambia this species is associated with swamps and dambos and Witte (in litt.) says that it lives in swampy regions of the Upemba National Park.

Distribution. Central and eastern Angola, Zambia, Katanga, western Tanganyika and Kenya.

#### KUMBOYA ANCHINTAE JOHNSTONI (Boulenger)

Lycosom johnstoni Boulenger, 1897, Proc. Zool. Soc. London, pp. 800, 801, pl. xivi, fig. 1; Nyika Plateau, Malawi.

Rioux johnstoni Loveridge, 1953a, p. 220.

Known only from the type (BM. 1946. 8. 21. 90).

Description. Supranasals in contact; frontonasal single, prefrontals in broad contact; supraciliaries 6; midbody scale rows 22; fore-limb monodactyle, two digits on hind-limb.

Coloration. Dark olive above, greenish-white below; a series of small blackish, white-edged spots on each side of the head, from the nostril to the ear.

Size. 263 + 395 = 658 mm.

Distribution. Endemic to the Nyika Plateau.

Genus ABLEPHARUS Fitzinger.

Ablepharus Fitzinger, 1823, in Lichtenstein, Verz. Doubl. Zool. Mus.

Berlin, p. 103. Type by monotypy: A. pannonicus Fitzinger.

Cryptoblepharus (sic) Wiegmann, 1834, Herp. Mexicana, p. 12. Type by subsequent designation: Ablepharus poeciloleuro Wiegmann.

Mittleman (1952, p. 15) revived Cryptoblepharus on the grounds that it "differs essentially from Ablepharus as follows: Frontoparietals and interparietal fused to form a single large shield; ear opening present, large, approximately eye in size."

This splitting of Ablepharus has been rejected by Loveridge (1957, p. 218) and Gans, Laurent and Pundit (1965, p. 38).

Specimens of Ablepharus bontoni recently received from the Zululand coast have the interparietal only partially fused and therefore undermine Mittleman's principal "generic character."

ABLEPHARUS SEYDELI Witte

Ablepharus seydeli Witte, 1933, Rev. Zool. Bot. Afr., 23, p. 187 and Ann. Mus. Congo Belge, Zool., (1), 3, p. 78, figs. 1 - 2: Elisabethville, Katanga.

Ablepharus moerussaia Witte, 1933, Rev. Zool. Bot. Afr., 23, p. 187 and Ann. Mus. Congo Belge, Zool., (1), 3, p. 78, figs. 1 - 2: Kilwa, S. W. Lake Mweru, Katanga.

Ablepharus anselli FitzSimons, 1955, Occ. Papers, Nat. Mus. S. Rhodesia, 2, p. 763, fig: "Kasempa" (Error for Kasempa), Zambia; Ansell, 1957, p. 551.

One specimen examined from: ZAMBIA. Kasempa (Type of Ablepharus anselli FitzSimons). There is another specimen from Mwanse in the British Museum (Pittman, in litt.).

Description. Prefrontals in broad contact; fronto-parietals paired; interparietal distinct; supraoculars 2; supraoculars 4; 3 - 4 upper labials anterior to subocular; midbody scale rows 22; limbs pentadactyle.

Coloration. Top of head and dorsum olive brown, a pale dorso-lateral line, blackish-brown laterally; grayish-white below.

Size. (juvenile)  $29 + 54 = 83$  mm.

Discussion. Witte (1953, p. 130) placed gervalli and moeruanis in the synonymy of Ablepharus smithi Witte, 1936. However, the variation given for his series of 134 smithi includes 24 - 26 for midbody scale rows and frontal in contact with the frontonasal (exceptionally separated). The types of gervalli, moeruanis and anselli agree in having 20 - 22 midbody scale rows and the prefrontals in broad contact, so it seems advisable to group these specimens under the earliest name and to regard gervalli as a species distinct from smithi.

Distribution. Lake Mweru, through eastern Katanga to Kasempa.

#### ABLEPHARUS WAHLBERGI (A. Smith)

Cryptoblepharus wahlbergii A. Smith, 1849, Ill. Zool. S. Africa, Rept.,

App. p. 10: "Country to the eastward of Cape Colony" = Natal.

Ablepharus menestriesii (not Bibron), Biansoni, 1851, Spec. Zool. Mossamb., p. 62.

Ablepharus wahlbergii Peters, 1882, p. 77, pl. xi, figs 3, 3a - c (Inhambane); Boulenger, 1887c, p. 350 (Lake Nyasa); Bocage, 1896, p. 88 (Quelimane); Boulenger, 1891b, p. 306 and 1907a, p. 9 (Luanga Valley; Petuke); Sternfeld, 1911, p. 417 (Tete); Hewitt & Power, 1913, p. 159 (Eldorado); Loveridge, 1920, p. 158 (Lumbo) and 1933, p. 324 (Nyankolo); Gott, 1934, p. 170 (Fambani; Amtongas); Pitman, 1934, p. 306 (Mkana); FitzSimons, 1935b, p. 373 (Tsetsiroga; Kasane; Kalakamati) and 1937a, p. 269; Martens, 1937, p. 11 (Nsombo; Luvingu); FitzSimons, 1939b, p. 37 (Birchenough Bridge to Umtali; Mount Silinda) and 1943, p. 236 (Salisbury; Rusape; Espandene; Driefontein; Bulawayo; Redbank; Vumba Mtn.; Masieni); Munro, 1952, p. 146 (Lifidni); Loveridge, 1953a, p. 215 (Nehisi Mtn.; Dedza; Mtinkala; Chowe; Kausi Village; Gholo Mtn.; near Tete) and 1953c, p. 142 (Limbo); Tasman, 1957, p. 29; Broadley, 1962a, p. 805.

Ablepharus carsoni Boulenger, 1894, Proc. Zool. Soc. London, p. 735, pl. xlix, figs. 4 - 4a: Fumbo, Zambia, and 1897, p. 800 (Nyika Plateau)

One hundred and thirty-one specimens examined from: BECHUANA-  
LAND. 6 mls E of Sua Spit. NIROENIA. Bambesi; Bulawayo; Ghibi;  
Chirundu; Chitoro River; Devuli Bridge; Dora; 10 mls N of Goromonzi;  
5 mls W of Gwaii Bridge; Jantia Farm; 10 mls SE of Kapani; Kariba;

Kariba Lake - Juni, Mwenda and Sanyati Confluences; Kamungula; Kyle Lake; 10 mls E of Lumbe; Mann Pools Road; Marandellas; Mount Darwin; 15 mls W of Mtoko; Park Farm (Untali); 20 mls NW of Plumtree; Redbank; Roma Division; Ruware; Salisbury; Sengwe Gorge; Silverstreams; Triangle; Tuli; Untali; Umalilwe River; Vumba Mtn.; Wankie National Park - Main Camp; Zambezi - Matetsi and Sabungwe Confluences and opposite Feira.

ZAMBIA. Abercorn; Broken Hill; Chakwanga River; Chiengi (IESHB); Chilanga; Fort Jameson; Kabompo; 20 mls W of Katote; Kaungushi; Livingstone; Lusaka; Mukupi (IESHB); Seshoko; Victoria Falls.

SIAMWI. Nchamachama.

MOZAMBIQUE. Beira, and 8 mls NE; Cabocira Peninsula; Gorongosa Mtn.; Inhaca Island; Manga; Maringa; Namacha; 5 mls W of Tete; Vila Junqueiro and 15 mls NW; 15 mls SE of Vila de Manica; Viola; Xiluvo.

Literature records. BECHUANALAND. Kalakamati; Kasane; Tsochoroga.

RHODESIA. Birchborough Bridge - Untali; Bulawayo; Driefontein; Eldorado; Empangeni; Mount Silinda; Redbank; Ruape; Salisbury; Vumba Mtn.

ZAMBIA. Fumbo (near Abercorn); Luangwa Valley; Lusungu; Mhana (Kitwe); Nsoho; Nyankolo; Petenke.

SIAMWI. Gholo Mtn.; Ghowe; Dada; Kausi Village; Lake Nyasa; Liabe; Mtinkaka; Nohisi Mtn.; Nyika Plateau.

MOZAMBIQUE. Amongas; Fambeni; Inhamitani; Ididisi; Lumbo; Marioni; Quelimane; Tete.

Variation. Prefrontals usually separated, rarely in broad contact; frontoparietals fused; interparietal distinct (fused with frontoparietals in the type of carsoni and UM. 2728 from Salisbury, partially fused in two other skins); supraoculars 3; supraciliaries 5, rarely 4 or 6; upper labials anterior to subocular 4, rarely 3 or 5; midbody scale rows 24 - 26, rarely 28 (except in northern Zambia, where 28 is usual); limbs pentadactyle.

Coloration. Light grey-brown to gold above, uniform or with six dark hair-lines or a single median stripe; a narrow light dorso-lateral line, flanks dark brown or blackish. Bluish-white below, except for breeding males which are vermillion.

Size. Largest ♂ (UM. 8007 - Vila Junqueiro)  $46 + 62^* = 108$  mm. Largest ♀ (UM. 2307 - Inhaca Island)  $46 + 67 = 113$  mm., but MZ 50919 (Nohisi Mtn.) measured 52 mm from snout to vent.

Discussion. Loveridge (1953a, p. 215) examined the type of A. carsoni and noted that its sole distinguishing character was the fused interparietal. As a similar specimen is recorded above it is clearly an aberration, particularly as the British Museum has a normal A. wahlbergi from Fumbo, also collected by Carson.

Diet. Largely termites, but Cott (1934, p. 170) also found a mantis, Orthoptera, bugs, beetles, a caterpillar, ants, a woodlouse, a centipede and spiders in 17 Mozambique skinks.

Enemies. One was disgorged by a Mabuza varia at Umtali. Probably eaten by Riopa afer at Lumbo (Loveridge, 1920, p. 158). Specimens have been recovered from the stomachs of the following snakes: Mahalya nyassae near Kapapi; Umtali); Psammophis s. subtaeniatus (Kalicharo; Okovango; near Francistown); Psammophis angolensis (Cesant).

Habitat. Very common under logs on Kalahari sand in Wankie District and under piles of palm fronds and other vegetable debris on Inhaca Island and the Mozambique Plain. Cott (1934, p. 170) found it in the crown of a Borassus Palm. They are common among drifts of dead leaves on well drained hill-sides.

Distribution. Ethiopia and Somalia, south to Natal, west through Transvaal and the Kalahari to Damaraland and southern Angola.

#### ABLINERHARUS BOUTONI AFRICANUS Sternfeld

Ablinerharius Peronii (not Cocteau) Peters, 1854, p. 619 (Mozambique Island; Cabaceira).

Ablinerharius Boutoni (not Desjardin) Peters, 1882, p. 77; Bocage, 1896, p. 98.

Ablinerharius boutoni africanus Sternfeld, 1918, Abhandl. Senckenberg. Nat.

Ges., 36, p. 423; Manda Island and Malindi, Kenya Colony; Pemba Island.

Ablinerharius boutoni var. peronii (not Cocteau) Loveridge, 1920, p. 157 (Lumbo).

Cryptoblinerharius boutoni ahli Mertens, 1928, Zool. Anz., 78, p. 85; Mozambique Island.

Cryptoblinerharius boutoni peronii (not Cocteau) Loveridge, 1929, p. 80 (Lumbo).

Eighteen specimens examined from: MOZAMBIQUE. Cabaceira Peninsula; Mozambique Island.

Literature records. MOZAMBIQUE. Cabaceira; Lumbo; Mozambique Island.

Variation. Prefrontals in broad contact; frontoparietals and interparietal all fused; supraoculars 5; supraciliaries 5, rarely 6; upper labials anterior to subocular 4 (5 on one side of a Mozambique Island skink); midbody scale rows 22 - 26; limbs pentadactyle.

Coloration. Olive brown to blackish, with darker mottling and a pair of ill-defined pale dorso-lateral bands, flanks and tail heavily speckled with white; pale olive below.

Size. Largest ♂ (UM, 8203 - Mozambique Island)  $48 + 61^* = 109$  mm.  
Largest ♀ (UM, 8151 - Lumbo)  $45 + 63^* = 108$  mm.

Habitat. Coral reef of the intertidal zone, where large colonies are found.

Distribution. The East African coast from Somalia to north Mozambique, also the continental islands. This skink was not seen on Inhaca Island, but should be looked for on the Bazaruto group. A colony <sup>of</sup> A. bourtoni recently found on the Zululand coast probably represents an undescribed race.

#### Genus SCÉLOTES Fitzinger

Scelotes Fitzinger, 1826, Neue Class., Rept., pp. 23, 53. Type by monotypy: Elops anguineus Merrem = Anguis bipes Linnaeus.

Herpetosaura Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 619. Type by monotypy: H. arenicola Peters

Sepsira Bocage, 1866, Journ. Sci. Lisboa, 1, p. 62. Type by monotypy: S. angolensis Bocage.

Rhinoscincus Peters, 1874, Monatsb. Akad. Wiss. Berlin, p. 374. Type by monotypy: Sepsira (Rhinoscincus) tetradactyla Peters.

Melanoseps Boulenger, 1887, Cat. Lizards Brit. Mus., 3, p. 422. Type by monotypy: Herpetosaura atra Gunther.

Herpetosaura and Sepsira (including Rhinoscincus) were regarded as synonyms of Scelotes by Barbour & Loveridge (1928, p. 164) and Fitz-Simons (1943, p. 177). Witte & Laurent (1943) revived both these genera, but placed Melanoseps in the synonymy of Scelotes. Melanoseps had been recognised by Barbour & Loveridge (1928, p. 169) and was subsequently revived by Loveridge (1953a, p. 220; 1957, p. 221), who also rejected Witte & Laurent's revival of Herpetosaura and Sepsira. More recently Laurent (1964c, p. 82) has accepted Melanoseps as a full genus, largely because these skinks inhabit forests, unlike Scelotes (*sensu strictu*).

While I concede that Scelotes (*sensu lato*) may be divided into valid phylogenetic groups, more anatomical evidence is needed before a convincing arrangement can be attempted. Studies on the skulls of these skinks at present being carried out at the University of Stellenbosch may prove illuminating.

## SCOLOTES ARNOLDI MIANJENSIS Broadley

Scolotes arnoldi (not Hewitt) Loweridge, 1953a, p. 217 (Lichenya Plateau).  
Scolotes arnoldi mianjensis Broadley, 1963, Ann. Mag. Nat. Hist. (13) 6,  
 p. 287: Dsule Peak (8,900 feet), Mlanje Mountain, Malawi.

Two specimens examined (holotype and paratype) from: MALAWI.  
 Mlanje Mountain (Dsule Peak and Lichenya Plateau).

Variation. Nostril bordered by the upper posterior corner of the rostral and a small ring-like nasal; supraoculars 4; supraciliaries 6; upper labials anterior to subocular 4; midbody scale rows 22-23; limbs pentadactyle, forelimb 14.5 to 17% of snout-vent length, hindlimbs 25%; lamellae under fourth toe 11-12.

Coloration. Above, head dark brown, back yellow-brown, scales broadly margined with black; sides of head and body bluish-white, heavily marked with black. Below, salmon pink, the tail variegated with black; soles of feet black.

Size. Holotype ♀ (UM. 4297 - Dsule) 60 + 43<sup>0</sup> = 103 mm.

Habitat. The holotype was under a stone on a damp, steeply sloping rock face on the summit of Dsule Peak. Several Isoodactylus h. bonzi were taken nearby.

Distribution. Known only from Mlanje Mountain, but likely to occur on the Niassa Platform inselbergs to the north-east.

## SCOLOTES ARNOLDI ARNOLDI (Hewitt)

Sappina arnoldi Hewitt, 1932, Ann. Natal Mus., 7, p. 112, 2 text figs:  
 Vumba Mountain at 5,600 feet, Rhodesia; Witte & Laurent, 1943, p. 14.

Scolotes arnoldi FitzSimons, 1939b, p. 37 (Vumba Mtn.), 1943, p. 204;  
 Tasman, 1957, p. 32; FitzSimons, 1958, p. 207 (Nyamisa; Pungwe River Causeway); Broadley, 1962, p. 803.

Forty-three specimens examined from: RHODESIA. Chera; Engwa; Glenegles; Modim; Nyngari; 3 mls E of Panhalonga; Pungwe Gorge Forest; Rhodes Inyanga Estate; Shela; Silverstreams; Stapleford (Kwanzan and Kusa Peaks); Untali (Gecil Kop); Vumba Mountain (Cloudlands to Leopardi Rock).

Literature records. RHODESIA. Nyamisa; Pungwe River Causeway; Vumba Mtn.

Variation. Nostril bordered by the upper posterior corner of the rostral and a small ring-like nasal; supraoculars 4; supraciliaries 6, rarely 5; upper labials anterior to subocular 4, rarely 3; midbody scale

rows usually 22 in specimens from Vumba Mountain south to Melsetter District and 24, rarely 25 in specimens from Cecil Kop (Untali) north to Inyanga; limbs pentadactyle, forelimb 8 to 11% of snout-vent length and hindlimb 14 - 17 %; lamellae under fourth toe 6 - 8.

Coloration. Above brown, often each scale with a dark spot, forming longitudinal lines, flanks grey, the change in coloration marked by a sharply defined dorso-lateral line; salmon pink below; tail bright blue in juveniles.

Size. Largest (UM. 10413 - Shela)  $86 + 114^* = 200$  mm., but Um. 7602 (Nyageri) measures 95 mm from snout to vent.

Remarks. When more material is available the populations from north of Untali may be distinguishable as a race with normally 24 midbody scale rows instead of 22 as in the typical form.

Enemies. One specimen was recovered from the stomach of a trout taken in the Inyanga National Park; another was found inside a Lycophidion capense from Makore Farm in the Burma Valley.

Habitat. Montane grassland and evergreen forest, where it lives under stones and logs.

Distribution. The eastern highlands of Rhodesia, but not yet recorded from the Chimanimani Mountains.

#### SCELOTES AENEUS Barbour & Loveridge

Scelotes eggeli (not Tornier) Loveridge, 1920, p. 159 (Lumbo).

Scelotes aeneus Barbour & Loveridge, 1928, Proc. New. England Zool. Club, 10, p. 63; Lumbo, Mozambique.

Sepsina aenea Witte & Laurent, 1943, p. 15; Laurent, 1964c, p. 81 (Porto Amelia).

No material examined.

Literature records. MOZAMBIQUE. Lumbo; Porto Amelia.

Variation. Nostril bordered by the upper posterior corner of the rostral, the supranasal, a very small nasal ring and the first labial; supraoculars 4; supraciliaries 6; upper labials anterior to subocular 3 - 4; midbody scale rows 22; limbs pentadactyle.

Coloration. Bronze above, with a slightly darker vertebral band; flanks blackish-brown. Bluish-white below.

Size. Largest ♂ (Loveridge, 1920 - Lumbo)  $63 + 32^* = 95$  mm. Holotype ♀ (MZ. 18355 - Lumbo)  $55 + 48 = 103$  mm. Loveridge gives 67 mm for the snout-vent length of a ♀ with a regenerated tail.



Discussion. Laurent (1964c, p. 81) suggests that S. arnoldi is a race of S. senous, but the two forms occupy different habitats and this is reflected by the relative tail lengths. In S. senous the tail is shorter than the body, but in S. arnoldi unregenerated tails are always longer than the body, sometimes nearly one and a half times as long.

Habitat. Types found in the roots of stumps growing in sandy soil, together with numerous Ablepharus vahlbergi.

Distribution. Known only from the coast of northern Mozambique.

#### SCOLOTES TETRADACTYLUS TETRADACTYLUS (Peters)

Sepsis (Rhinoscincus) tetradactyla Peters, 1874, Monatsb. Akad. Wiss. Berlin, p. 374; Zanzibar Coast.

Sepsis tetradactyla Gunther, 1893, p. 555 (Shire Highlands); Boulenger 1894, p. 725; Bocage, 1896, p. 103; Nieden, 1913, p. 90 (part - Mlanje Mountain); Witte & Laurent, 1943, p. 15.

Scelotes tetradactyla Barbour & Loveridge, 1928b, p. 168 (Zomba).

Scelotes tetradactylus tetradactylus Loveridge, 1953a, p. 217 (Lujeri River); Hanney, 1961, p. 23 (Blantyre; Cholo).

Three specimens examined from: ZAMBIA. Mweru-Wantipa (IBSNB). MALAWI. Lujeri Estate; Zomba.

Literature records. MALAWI. Blantyre; Cholo; Mlanje Mtn.; Zomba.

Variation. Nostril bordered by the upper posterior corner of the rostral, the supranasal, a postnasal and the first labial; supraoculars 4; supraciliaries 4 - 5; upper labials anterior to subocular 3; mid-body scale rows 24; limbs tetradactyle; lamellae beneath fourth toe 3.

Coloration. Dark brown above, white below. The Mweru-Wantipa juvenile is longitudinally striped, each scale row being darker mesially.

Size. Largest ♂ (MZ, 50941 - Lujeri River) 88 + 36° = 124 mm.

Remarks. The young Mweru-Wantipa specimen seems to be referable to the typical form and not S. t. hamphillsi (Witte) of Katanga as one would have expected.

Dist. Termites and a cockroach in a Lujeri River specimen (Loveridge, 1953a, p. 217).

Habitat. Apparently a forest-edge form, usually found under logs.

Distribution. Eastern Tanganyika south to south-eastern Malawi, (?) west to Mweru-Wantipa, Zambia.

## SCHELOTES ANGOLENSIS (Bocage)

- Sepsina angolensis Bocage, 1866, Journ. Acad. Sci. Lisbon, 1, p. 63, pl. 1, fig. 1, la - d: Duque de Braganca, Angola; Angel, 1920, p. 616 (Lealui); Witte & Laurent, 1943, p. 16.  
Scelotes angolensis FitzSimons, 1943, p. 201.

Four specimens examined from: ZAMBIA. Kalabo.

Literature record. ZAMBIA. Lealui.

Variation. Nostril bordered by the upper posterior corner of the rostral, the supranasal, a postnasal and the first labial; supraoculars 5; supraciliaris 5; upper labials anterior to subocular 3; midbody scale rows 24; limbs tridactyle.

Coloration. Yellow-brown above, each scale darker mesially; white below.

Size. Largest (UM. 6753 - Kalabo)  $80 + 64 = 144$  mm; UM. 10047 measures 87 mm from snout to vent (tail regenerated).

Distribution. Lower Congo, Angola, Barotseland and northern parts of South West Africa.

## SCHELOTES LIMPOPOENSIS FitzSimons

- Scelotes limpopoensis FitzSimons, 1930, Ann. Tvl. Mus., 14, p. 35, figs. 17 - 20; Messina, N. Transvaal, and 1943, p. 185 (Beitbridge); Tzaman, 1957, p. 32.  
Herpetosaura limpopoensis Witte & Laurent, 1943, p. 26.

Four specimens examined from: RHODESIA. Beitbridge; Limpopo-Umsingwane Confluence.

Variation. Nostril bordered by the upper posterior corner of the rostral and a very small ring-like nasal; supraoculars 4; supraciliaris 5; upper labials anterior to subocular 4; midbody scale rows 22; forelimbs tridactyle, hind limbs tetradactyle.

Coloration. Light brown above, each scale darker mesially, a pair of broad, buff dorso-lateral bands extend from snout onto tail; slate grey laterally, each scale darker mesially; whitish below, most scales grayish mesially, especially under tail.

Size. Largest (NSR. 3263 - Limpopo-Umsingwane Confluence)  $78 + 36 = 114$  mm.

Habitat. The largest was under dead leaves between rocks near the banks of the Umsingwane River. Three specimens were trapped in fence-post holes at Beitbridge Customs post.

Distribution. Only known from the Limpopo Valley in the Beitbridge-Messina area.

## SCELOTES BREVIPIES Hewitt

Scelotes mentheri (not Boulenger) Hewitt, 1921, p. 4, text fig. 1 b  
(Lourenco Marques).

Scelotes brevipes Hewitt, 1925, Rec. Albany Mus., 3, p. 353, pl. xv,  
fig. 4: Lourenco Marques, Mozambique; FitzSimons, 1930, p. 37  
and 1943, p. 194.

Herpetosaura brevipes Witte & Laurent, 1943, p. 27.

No local specimens examined.

Literature records. MOZAMBIQUE. Lourenco Marques.

Description. Nostril bordered by rostral and a very small ring-like  
nasal; supraoculars 4; supraciliaries 6; upper labials anterior to  
subocular 3; midbody scale rows 18 - 20; forelimbs absent, hindlimbs  
reduced to clawless rudiments not exceeding one millimetre in length.

Coloration. Pale bronze above, each scale darker mesially, flanks  
slate grey, ventrals grey mesially.

Size. Co-type (TM. 2892 - Lourenco Marques) 61 + 65 = 126 mm.

Habitat. Usually found under logs in alluvial sand.

Distribution. Southern Mozambique and Zululand, extending into the  
eastern Transvaal.

## SCELOTES INORNATUS MOZAMBIQUE (Peters)

Herpetosaura inornata var. mozambica Peters, 1882, Reise nach Mosam-  
bique, 3, p. 81: Inhambane, Mozambique; Bocage, 1896, p. 99.

Scelotes inornatus mozambicus FitzSimons, 1943, p. 200 (Masiani).

Herpetosaura inornata (part) Witte & Laurent, 1943, p. 28.

None examined.

Literature records. MOZAMBIQUE. Inhambane; Masiani.

Description. Nostril bordered by rostral and a very small ring-like  
nasal; supraoculars 4; supraciliaries 6; upper labials anterior to  
subocular 3; midbody scale rows 18; limbless.

Coloration. Pale brown or buff, each scale darker in the centre,  
flanks darker than dorsal or ventral surfaces.

Distribution. Southern Mozambique and Zululand.

## SCELOTES ARENICOLA (Peters)

Herpetosaura arenicola Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 619 :

Inhambane and Lourenco Marques, Mozambique, and 1882, p. 79, pl. xi, fig. 4 and pl. xiii, fig. 4; Bocage, 1882, p. 287 (Angoche); Boulenger, 1890, p. 80 (Delagoa Bay), 1907b, p. 486 (Coguno) and 1910, p. 488; Hewitt, 1910c, pp. 92, 102; FitzSimons, 1930, p. 37 (Lourenco Marques).

Scelotes arenicola Bocage, 1896, p. 88; Boulenger, 1887c, p. 415; Fitz-Simons, 1943, p. 196 (Rikatla); Witte & Laurent, 1943, p. 31; Manacas, 1954, p. 3 (Mauele).

Four specimens examined from: MOZAMBIQUE. Inhaca Island (IBM); Lourenco Marques.

Literature records. MOZAMBIQUE. Angoche; Coguno; Delagoa Bay; Inhambane; Lourenco Marques; Mauele; Rikatla.

Variation. Nostril bordered by the rostral and a small elongate nasal; supracoculars 3; supraciliaries 5; upper labials anterior to subocular 3; midbody scale rows 18 - 20; limbless.

Coloration. Above pale brown, a vertebral stripe which posteriorly consists of a double row of dark spots (one on each scale), and a similar upper lateral stripe; yellowish white below.

Size. (TM. 2823 - Lourenco Marques)  $76 + 66 = 142$  mm; a Mauele specimen measures 82 mm from snout to vent (Manacas, 1954).

Habitat. Coastal alluvium. through

Distribution. From Angoche south ~~thru~~ Mozambique to Zululand.

## SCELOTES ATER ATER (Gunther)

Herpetosaura ater Gunther, 1873, Ann. Mag. Nat. Hist. (4) 12, p. 147 :

Zambesi; Peters, 1882, p. 81; Bocage, 1896, p. 99.

Melanoseps ater Boulenger, 1887c, p. 422.

Scelotes ater ater Witte & Laurent, 1943, p. 32.

Melanoseps ater misukuensis Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 220; Matipa Forest, Misuku Mountains, Malawi.

Melanoseps ater ater Loveridge, 1953a, p. 222 (Misuku Mountains; Vinya Plateau).

Three specimens examined from: ZAMBIA. Abercorn.

Literature records. MALAWI. Misuku Mountains; Vinya Plateau. MOZAMBIQUE. Zambesi River.

Variation. Nostril bordered by the rostral and the first labial; supraoculars 3; supraciliaries 4; upper labials anterior to subocular 2; midbody scale rows 20 - 22 in Abercorn specimens, 22 - 24 in Malawi specimens, 22 in the type (Zambozi); limbless.

Coloration. Uniform black above and below or (in the type series of misukuensis) body white below, or with dark stripes formed by a dark spot on each scale.

Size. Largest ♂ (MZ 50961 - Misuku Mountains)  $138 + 46 = 184$  mm.  
Largest ♀ (MZ 50945 - Misuku Mountains)  $178 + 61 = 239$  mm.

Discussion. Loveridge distinguished misukuensis from the typical form solely on its lighter ventral coloration, although he also recorded a specimen of typical ster from the Misuku Mountains. The three Abercorn specimens are intermediate between the typical form and S. a. rondoensis of south-eastern Tanganyika, having 20 - 22 midbody scale rows and snout - vent lengths of 123 - 135 mm.

Habitat. This species is usually found at the edge of montane evergreen forest under logs and stones.

Distribution. Northern Zambia, south through Malawi to the Zambezi.

Genus *SCOLECOSEPS* Loveridge

*Scolecoseps* Loveridge, 1920, Proc. Zool. Soc. London, p. 159. Type by monotypy: *S. boulangeri* Loveridge.

*SCOLECOSEPS BOULANGERI* Loveridge

*Scolecoseps boulangeri* Loveridge, 1920, Proc. Zool. Soc. London, p. 159, fig. 1: Lumbo, Mozambique; Witte & Laurent, 1943, p. 33; Laurent 1965c, p. 82 (Porto Amélia).

None examined.

Literature records. MOZAMBIQUE. Lumbo; Porto Amélia.

Description. Nostril pierced anteriorly in a very large rostral and connected to its posterior border by a longitudinal groove; rostral bordered posteriorly by a pair of internasals; frontonasal twice as broad as long, subequal to frontal in size; interparietal heart-shaped, equal in size to the frontal and fronto-nasal together, bordered behind by a pair of band-like parietals; supraoculars 2; no supraciliaries; upper labials anterior to subocular 2; eye exposed; midbody scale rows 18; anal divided; limbless.

Coloration. Flesh coloured, each scale row with a longitudinal brown striation; tail darker, sometimes almost blue-black, but regenerated tips pale.

Size. Largest ♂ (Holotype in BM - Lumbo)  $90 + 16^* = 106$  mm. Largest ♀ (Loveridge, 1920 - Lumbo)  $95 + 41 = 136$  mm.

Habitat. Coastal alluvium.

Distribution. Coast of northern Mozambique.

Genus *TYPHIACONTIAS* Bocage

*Typhlacontias* Bocage, 1873, Journ. Sci. Lisbon, 4, p. 213. Type by monotypy: *T. minutissimus* Bocage.

*TYPHIACONTIAS GRACILIS GRACILIS* Roux

*Typhlacontias gracilis* Roux, 1907, Rev. Suisse Zool., 15, p. 83, figs. 3 - 4: ZAMBEZI; Angel, 1920, p. 617 (Bealui); Pitman, 1934, p. 305; Witte & Laurent, 1943, p. 35.

*Typhlacontias rohani* Angel, 1923, Miss. Rohan-Chabot Angola - Rhodesia (Paris, 1923) 4, p. 162, figs. 6 - 8: Iwankundu, S. E. Angola; Witte & Laurent, 1943, p. 35.

Eighty-six specimens examined from: ZAMBIA. Kabompo; Kalabo.

Literature records. ZAMBIA. Lealui; Zambesi River.

Variation. Nostril pierced anteriorly in a very large rostral and connected to its posterior border by a longitudinal groove; rostral bordered posteriorly by a single band-like internasal, which is followed by a frontonasal and frontal which are longer, but slightly narrower, then a subtriangular interparietal which is bordered posteriorly by a pair of band-like parietals; supraoculars 2; supraciliaries 2; preoculars 1 - 2, rarely 0; postoculars 1 - 3; the second (12 specimens) or third (74 specimens) upper labial enters the orbit; eye exposed; midbody scale rows 18; limbless.

Coloration. Buff above, each scale in the two median dorsal scale rows dark centred, forming a vague vertebral stripe, which extends onto the head, a broad grey-brown lateral band extends from the eye onto the tail; whitish below, but scales darker mesially.

Size. Largest (UM. 7375 - Kalabo)  $86 + 38 = 124$  mm.

Discussion. The range of variation in the above series (5 from Kabompo; 81 from Kalabo) shows that *T. rohani* is a synonym of *T. gracilis*. The type locality for *rohani* is only 120 miles south-west of Kalabo and there is no break in the Kalahari sands to inhibit gene flow.

Habitat. Kalahari sand. The huge Kalabo series was turned up by graders on road construction (R. Japp).

Distribution. South-eastern Angola and western Zambia.

#### TYPHACONTIAS GRACILIS NEAMIENSIS FitzSimons

*Typhlacontias naminiensis* FitzSimons, 1932, Ann. Tvl. Mus., 16, p. 37:

Motlhatlogo, Bechuanaland and 1935b, p. 374, figs. 17 - 19, also 1943, p. 239 (Guisi); Witte & Laurent, 1943, p. 35; Mertens, 1955, p. 117 (Andara); Tasman, 1957, p. 32; Broadley, 1962a, p. 805; Haacke, 1965, p. 20.

Eleven specimens examined from: BECHUANALAND. Motlhatlogo (Paratype, TM); Tassifupi. RHODESIA. Chiswara Ranch; 10 mls E of Lupane; Victoria Falls National Park; Wankie National Park - Main Camp.

Literature records. BECHUANALAND. Motlhatlogo. CAPRIVI. Anjara.

Variation. Differs from the typical form in the proportions of the large head shields, the length of the rostral being subequal to that of the fronto-nasal + frontal and subequal to the interparietal (rostral longer than these shields in the typical form); supraoculars 2; supraciliaries 2; preoculars 0 - 1; postoculars 1 - 3; the second upper labial enters the orbit; midbody scale rows 18.

Coloration. As in the typical form.

Size. (Type, TM. 14461 - Motlhatlogo)  $80 + 45 = 125$  mm.

Discussion. This form differs from T. gracilis only in the proportions of the head shields and the labial arrangement. The preoculars are so minute that their presence or absence is of little significance. As ngamiensis occupies the same habitat as T. gracilis it is best regarded as a southern race of the latter, the swamps of the Chobe-Chovango system serving to isolate the two forms.

Habitat. Found under logs and piles of vegetable debris in Kalahari sand regions.

Distribution. North-eastern parts of South West Africa, northern Bechuanaland and north-western Rhodesia.

#### Genus AGONTIAS Cuvier

Acontias Cuvier, 1817, Regne Animal, 2, p. 60. Type by monotypy:

Anguis meleagris Linnaeus.

No group of skinks in southern Africa is more poorly understood than the genus Acontias and only a comprehensive revision can clarify the position because of the inadequacy of the published data for many forms. These skinks tend to have discontinuous distributions, although they may be locally common, so that division into demes is well marked in the group - another factor which adds to the difficulties of the taxonomist.

The Acontias plumbeus group contains seven forms which are usually regarded as conspecific. I have analysed the available morphological and distribution data and come to the following conclusions:

(a) Four forms occur in the eastern Cape Province - typical plumbeus at East London (a series from J. D. Visser), tasmani in Port Elizabeth District and at Fort Brown, gracilicauda at Grahamstown and breviceps on the Amatola Mountains. These records form a mosaic which suggests that not all these forms can be conspecific, even if they are not actually sympatric.

(b) Typical A. plumbeus Bianconi is the only form with a tropical distribution pattern. It attains twice the size of any other form and it has much lower ventral (146-163) and subcaudal (26 - 30) counts than either broadleyi (163 - 177 : 29 - 35) or occidentalis (165 - 179 : 27 - 35), showing no signs of intergradation with either. A. plumbeus is evidently a monotypic species.

(c) A. breviceps Essex is a montane form found on the Amatola Mountains and in the south-eastern Transvaal, it has a low ventral count (143 - 154), but a fairly long tail (subcaudals 31 - 38). It can provisionally be considered a good species.



(d) The five remaining forms can provisionally be listed as races of A. gracilicauda, they are manquensis Hewitt, occidentalis FitzSimons, broadleyi FitzSimons, gracilicauda Essex and tasmani Hewitt, although the occurrence of the last two in close proximity requires investigation.

ACONTIAS GRACILICAUDA OCCIDENTALIS

FitzSimons

Acontias macleayana Peracca (?) 1896, p. 1 (Kasungula to Bulawayo);  
Bocage (?), 1896b, p. 118 (Bechuanaland); FitzSimons, 1935b, p. 374,  
(Gomedimo to Kae-twe).

Acontias plumbeus occidentalis FitzSimons, 1941, Ann. Tvl. Mus., 20,  
p. 275: Junction of Crocodile and Marico Rivers, W. Transvaal (also  
Otjivarengo and Okahandja, S.W.A.; Gomedimo to Kae-twe, Kalahari; Junc-  
tion of Limpopo and Magaladina Rivers; Honingfontein near Nylstroom,  
Transvaal) and 1943, p. 247; Broadley, 1962d, p. 806.

Fifty-four specimens examined from: RHODESIA. Bulawayo;  
Cement; Nyamandhlovu; Woodvale (Bulawayo Airport).

Literature records. BECHUANALAND. Gomedimo to Kae-twe. RHODESIA.  
Kasungula to Bulawayo.

Variation. Midbody scale rows 16; ventrals 165 - 179; subcaudals  
27 - 35.

Coloration. Uniform black above and below with a few scattered white  
scales on the throat, sometimes mottled greenish or yellowish below.

Size. Largest (IBSR, 5144 - Cement) 230 + 34 = 264 mm.

Breeding. Females collected in November each contain two full-term  
young measuring 68 - 75 mm in total length.

Habitat. Kalahari sand, the Woodvale series being taken out at a point  
where this substrate meets schist, the Bulawayo and Cement specimens come  
from schist areas.

Distribution. Damaraland, the central Kalahari and western parts of  
Rhodesia and the Transvaal.

ACONTIAS GRACILICAUDA BROADLEYI FitzSimons

Acontias plumbeus broadleyi FitzSimons, 1956, Occ. Pap. Nat. Mus. S. Rhod.  
21b, p. 95: Fara Stamford, Salisbury, Rhodesia; Tasman, 1957, p. 31,  
photo 3; Broadley, 1962d, p. 806.

Forty specimens examined from: RHODESIA. Bulawayo; Cement;  
Lochard; Matopos Dam; Mount Hampden; (Stamford Fara); Salisbury and 10  
mils. W.

Literature record. RHODESIA. Mount Hampden (Stamford Farm).

Variation. Midbody scale rows 16; ventrals 163 - 177; subcaudals 29 - 35.

Coloration. Grey-brown to olive green or yellowish above; white below.

Size. Largest (UM. 10325 - Salisbury) 254 (218 + 36) mm.

Discussion. Seventy-six Acontias gracilicauda were collected at Woodvale during the construction of the new Bulawayo Airport, 29 of these were broadleyi and 49 were occidentalis, five of the latter might be considered intergrades, being mottled with greenish-white below. The occurrence of the two forms together is explained by the meeting of their respective substrate habitat in this area, but this does not explain the almost complete lack of intergrade specimens. The two forms are distinguishable only on colour, but they behave more like good species than races.

Enemies. One specimen was recovered from the stomach of an Atractaspis bibroni at Bulawayo.

Habitat. Common under slabs of red schist on hillsides in the Mount Hampden - Salisbury area, also at Bulawayo and Matopos Dam; in a contact zone of talc schist and Kalahari sand at Gwent; under a quartz boulder at Lochard; under a granite flake in the Matopos.

Distribution. The central watershed of Rhodesia from Salisbury southwest to the Matopos.

#### ACONTIAS GRACILICAUDA subsp.

Three specimens (UM. 10289-91) from Debesti, eastern Bechuanaland, cannot be positively identified. Two of them resemble occidentalis in their uniform black coloration, the other is grey above and white below, resembling broadleyi. They have 14 midbody scale rows, 165 ventrals and 29 - 34 subcaudals. Debesti is only 40 miles north-west of the type locality for occidentalis, but these specimens have sharply tapering tails like A. s. namaquensis. There are no records of the latter from the northern Cape Province, but the Debesti skins look more like intergrades between namaquensis and occidentalis than anything else.

The remains of another pale-coloured Acontias were found in the stomach of a Cape Fox (Vulpes chama) at Debesti.

#### ACONTIAS PLUMBEUS Bianconi

Acontias plumbea Bianconi, 1849, Spec. Zool. Mossamb., Rept., p. 35, pl. III; Mozambique.

Acontias niger Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 619;

Inhambane, Mozambique; Bocage, 1882, p. 287 (Angoche).

Acontias plumbeus Peters, 1882, p. 81, pl. xii; Boulenger, 1887c,

p. 428; Bocage, 1896, p. 89; Boulenger, 1910, p. 489 (Delagoa Bay).

Acontias melagris (not Linnaeus) Roux (?), 1907, p. 83, (Rikatia);

Boulenger (part) 1910, p. 489 (Delagoa Bay).

Acontias plumbeus plumbeus FitzSimons, 1943, p. 245 (Lourenco Marques;

Masiend); Witte & Laurent, 1943, p. 19; Broadley, 1962a, p. 805.

Six specimens examined from: RHODESIA. Jersey Estate; Ngorima Reserve (E); Vumba Mtn. (lower slopes). MOZAMBIQUE. Inhaca Island (I.B.N.).

Literature records. MOZAMBIQUE. Angoche; Delagoa Bay; Inhambane; Lourenco Marques; Rikatia.

Variation. Midbody scale rows 18 - 20; ventrals 146 - 163; sub-ocals 27 - 30.

Coloration. Uniform dark brown to black above and below.

Size. Largest ♂ (UM, 10379 - Ngorima Reserve) 375 + 60 = 435 mm.

Breeding. The big female contained 7 eggs.

Habitat. The female from Ngorima Reserve was under dead leaves on the floor of lowland forest.

Distribution. The coastal plain from Angoche south to Natal and inland to eastern Rhodesia and northern and eastern Transvaal; also a relict population at East London.

#### Genus TYPHLOSAURUS Wiegmann

Typhlosaurus Wiegmann, 1834, Herp. Mex., p. 11. Type: Typhlops cuvieri Wiegmann = Acontias caesus Cuvier.

#### TYPHLOSAURUS GREGOI BICOLOR Hewitt

Acontias melagris (not Linnaeus) Bocage (?), 1896, p. 89 (Macoquece to Save River, i.e. the Rhodesia - Mozambique border); Boulenger, 1902, p. 17 (Mashonaland = Masoe).

Typhlosaurus bicolor Hewitt, 1929, Ann. Tvl. Mus., 13, p. 1, fig. A: Untali, Rhodesia; Witte & Laurent, 1943, p. 22; FitzSimons, 1958a, p. 208 (Nyamiva); Broadley, 1962a, p. 807.

Typhlosaurus gregoi bicolor FitzSimons, 1943, p. 260; Tinsman, 1957, p. 32.

Twenty-six specimens examined from: RHODESIA. Chido; Engwa; Masoe (IB); Nyamiva; Oisi; Rhodes Inyanga Estate; Untali - Chipondicani / Cecil Kop Range.

Literature records. RHODESIA. Masoe; Nyamisa; Umtali.

Variation. Snout conical, rostral subequal in length to the other head shields together; three anguoid head shields posterior to rostral, a frontonasal which is narrower than the frontal, a triangular interparietal bordered by a pair of parietals which form an oblique suture posteriorly; supraoculars 3 (rarely 2 or 4); supraciliaries 2 (rarely 1); suboculars 2; upper labials 5 (rarely 4); midbody scale rows 16 - 20.

Coloration. Usually each dorsal scale row bearing a blackish longitudinal stripe, the underside uniform or with rows of dark spots (obsolescent stripes). Most specimens from the Chipondioni - Cecil Kop Range (the northern Umtali Municipal boundary) agree with Hewitt's type (now lost) in being uniform black above and uniform white below.

Size. Largest (UM. 1336 - Rhodes Inyanga Estate)  $195 + 31 = 226$  mm.

Remarks. In view of the variation in head shields shown by the above series bicolor hardly warrants specific rank.

Enemies. One was found in the stomach of a civet (Viverra civetta) trapped in Zimunya Reserve, Umtali.

Habitat. Montane grassland under rocks.

Distribution. Endemic to the highlands of eastern Rhodesia (7 and adjoining Mozambique).

#### TYPHLOSAURUS GREGGI GREGGI Boulenger

Typhlosaurus greggi Boulenger, 1903, Ann. Mag. Nat. Hist. (7) 12, p. 434: Zoutspanberg, Transvaal.

One specimen examined from: RHODESIA. 20 miles W of Birch-enough Bridge.

Description. A juvenile with 2 supraoculars; 2 supraciliaries; 2 suboculars and 18 midbody scale rows. Uniform plumbeous above and below. Length from snout to vent 60 mm, tail damaged.

Discussion. Adults are needed to confirm the identity of Bikitia populations, but this specimen seems to be closer to typical greggi than bicolor.

Enemies. Recovered from the stomach of a ♂ Platyrrhinus i. rhodesianus.

Habitat. Granite Kopje at the foot of the Bikitia escarpment (c. 3000 ft).

Distribution. Northern Transvaal and the Bikitia District of Rhodesia.

TYPHLOSAURUS AFRANTICUS (Peters)

Typhline ouvieri (not Wiegmann) Bianconi, 1848, p. 27, pl. 1, fig. 3  
(Mozambique).

Typhline surantiana Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 620;  
Inhambane and Lourenco Marques, Mozambique.

Typhlossaurus surantianus Peters, 1882, p. 83; Boulenger, 1887c, p. 433;  
Booge, 1896, p. 89; Roux, 1907, p. 86 (Rikantla); Boulenger, 1910,  
p. 490; FitzSimons, 1943, p. 257; Witte & Laurent, 1943, p. 23;  
Mannion, 1954, p. 4 (Mauale).

Two specimens examined from: MOZAMBIQUE. Inhaca Island.

Literature records. MOZAMBIQUE. Inhambane; Lourenco Marques;  
Mauale; Rikantla.

Variation. Snout conical, rostral subequal in length to the other  
head shields together; two anygous head shields posterior to rostral,  
a frontonasal and a large subpentagonal frontal formed by fusion with  
the interparietal; parietals large, in broad contact behind frontal;  
supraculars 2; a single supraciliary; two preoculars; one subocular;  
upper labials 4; midbody scale rows 12.

Coloration. Pale orange-yellow above, yellowish-white below. Juve-  
niles with 2 - 6 dorsal rows of dark spots, these are ill-defined or  
absent in adults, sometimes occurring on the tail only.

Size. Largest (TM. 2926 - Lourenco Marques) 209 + 33 = 242 mm.

Habitat. Coastal alluvium. One Inhaca specimen was in the roots  
of a Cassava plant, the other under a log.

Distribution. Southern Mozambique and Zululani, extending into the  
eastern Transvaal.

TYPHLOSAURUS "RELIGIOS"

One specimen examined from: RHODESIA. Malapati Drift.

This form is similar to T. lineatus, but differs from that  
species as follows: Rostral bordered by seven shields (5 in lineatus);  
frontonasal and frontal narrower; second and third upper labials separ-  
ated from postocular by a large subocular and two large scales posterior  
to it; mental bordered by five chin shields (3 - 5, usually 4 in  
lineatus); midbody scale rows 12 (always 14 in 58 lineatus examined).

Coloration. Yellow above with six dark longitudinal stripes, the  
four median ones continuous, the other pair broken into spots; white  
below.

Size. (QNM/R, 178 - Malapati Drift) 140 + 24 = 164 mm.

Habitat. In alluvial sand beneath grass.

Distribution. Dr. C. K. Brain (in litt.) suggests that this form is probably widespread in the red sands which extend along the southeastern border of Rhodesia between the Bushetsi and Inzidi Rivers. He found grass-covered dune structures reminiscent of the <sup>southern</sup> Kalahari in this area.

TYPHLOSAURUS LINEATUS LINEATUS Boulanger

Typhlosaurus lineatus Boulanger, 1887, Cat. Reptiles Brit. Mus., 3, p. 132, pl. xxxviii, figs. 3, 3a - b; "Cape of Good Hope"; Boettger, 1887, p. 152 (Nol Kas, near Ghanzi); Boulanger, 1910, p. 490; Hewitt & Power, 1913, p. 159 (Ky Ky); Hewitt, 1929, pl. 11, fig. 22 (Serowe); FitzSimons, 1935b, p. 377 (Kuke - Gomodimo; Gomodimo; Kaotwe; Okwa River - Damara Pan; Gembok) and 1943, p. 264; Witte & Laurent, 1943, p. 22; FitzSimons & Brain, 1958b, p. 101.

Twenty-six specimens examined from: BECHUANALAND. Chalutsa Pans; Gungema (TM); Dakar (TM); Gembok Pan (TM); Ghanzi (TM); Gomodimo Pan (TM); Kaotwe Pan (TM); Kuke - Gomodimo (TM); Ky Ky (TM); Lothlakane; Serowe (AM); SWA - BP Border at 24°S; 4 mls S of Tsaha Pan (TM); Tshutshwe Pan (TM); Tsodilo Hills (TM); Twerivieren (TM).

Literature records. BECHUANALAND. Gembok; Gomodimo; Kaotwe; Kuke - Gomodimo; Ky Ky; Nol Kas; Okwa River - Damara Pan; Serowe.

Variation. Snout with a sharp horizontal edge; rostral subequal to or a little shorter than the other head shields together; frontonasal about three times as broad as long; frontal large and subpentagonal (fused with interparietal), bordered by a pair of large parietals which are in good contact behind; supraoculars 2; supraciliaries 2 (rarely 0 - 1, through fusion with supraoculars); subocular one (fused with preoculars on both sides of a Ky Ky specimen); upper labials 4; chin shields bordering mental 3 - 5, usually 4; midbody scale rows 14.

Coloration. Yellow above with 4 - 8 dorsal rows of dark red-brown spots, the 2 - 4 median rows usually confluent, forming continuous stripes. Two Ky Ky specimens are plumbeous with the two median rows of ventrals white, while a skink from Kuke - Gomodimo is entirely plumbeous.

Size. Largest (TM. 30960 - Tsodilo Hills)  $146 + 21 = 167$  mm, but TM. 30963 from the same locality measures 160 mm from snout to vent (tail regenerated).

Species. The Chalutsa Pans specimen was found in the stomach of a genet (*Genetta genetta*).

Habitat. Restricted to Kalahari sand.

Distribution. Northern Cape Province, South West Africa and Bechuanaland, with a relict population at Great Salt Pan in the northern Transvaal.

TYPHLOSAURUS LINEATUS "JAPPI"

Twenty-four specimens examined from: ZAMBIA. Kalabo.

Variation. Head scalation similar to typical lineatus, but ocular much longer than high; supraoculars 2 (3 on one side of one specimen); supraciliaries 2; suboculars 1, rarely 2; upper labials 4; chin shields bordering mental always 3 (usually 4 in typical lineatus); midbody scale rows 14.

Coloration. Yellow, with two broad continuous black mid-dorsal stripes, which break up and disappear on tail, rarely a faintly indicated series of spots flanking the dorsal stripes on either side. (Never less than four stripes in typical lineatus and the stripes are better defined on the tail).

Size. Largest (UM. 4816, 6757 and 7905 - Kalabo) all measure  $180 + 23 = 203$  mm. Adults are 160 - 180 mm from snout to vent, while typical lineatus rarely exceed 140 mm.

Habitat. Kalahari sand. This fine series was collected by R. G. Japp during road-making operations.

Distribution. Barotseland and adjoining Angola.

TYPHLOSAURUS GARIKENSIS FitzSimons.

Typhlosaurus garikensis FitzSimons, 1941, Ann. Tvl. Mus., 20, p. 276,

figs. 1 - 3; Uppington, N. W. Cape Province, and 1943, p. 266.

Typhlosaurus lineatus (not Boulenger) Brain, 1959b, p. 70 (Tweerivieren).

Five specimens examined from: CAPE PROVINCE - BECHUANALAND BORDER. Ky Ky (AM); Tweerivieren (TH).

Variation. Snout with a sharp horizontal edge; rostral subequal to the other head shields together; frontonasal not quite three times as broad as long; frontal subpentagonal, bordered by a pair of large parietals, which are in good contact behind; supraoculars 2; a single supraciliary; no suboculars; upper labials 3, the first in contact with the ocular; chin shields bordering mental 3; midbody scale rows 12.

Coloration. Yellow above, with four longitudinal rows of dark spots on back; whitish below.

Size. Largest (AM. - Ky Ky)  $130 + 22 = 142$  mm.

Breeding. 2 ♀♀ from Tweerivieren each contained a single young one measuring 71 - 74 mm. (Brain, 1959b).

Distribution. Northern Cape Province, extending to the Bechuanaland border in the Kalahari Gemsbok National Park, where it is sympatric with Typhlosaurus l. lineatus.

## Family GERRHOSURIDAE

## Genus GERRHOSAURUS Wiegmann

Gerrhosaurus Wiegmann, 1828, Isis von Oken, p. 378. Type by monotypy:  
G. flavigularis Wiegmann.

GERRHOSAURUS VALIDUS VALIDUS A. Smith

- Gerrhosaurus validus (sic) A. Smith, 1849, Ill. Zool. S. Africa, Rept., App. p. 9: "Interior of Southern Africa, towards the sources of the Gariep or Orange River."
- Gerrhosaurus robustus Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 618: Tete, Mozambique; Gray, 1864, p. 58; Gunther, 1864, p. 307; Peters, 1882, p. 58, pl. ix, figs. 1-3.
- Gerrhosaurus validus Boulenger, 1887a, p. 121; Bocage, 1896, p. 98; Ghbb, 1909a, p. 594 and 1909b, p. 35 (Matopos; Empandene); Boulenger, 1910, p. 480; Hewitt, 1910c, pp. 104, 105; Sternfeld, 1911, p. 417 (Chifumbazi); Hewitt & Power, 1913, p. 157 (Insisa); Pitman, 1934, p. 305; FitzSimons, 1935b, p. 362 (Zimbabwe), 1937, p. 269 and 1939b, p. 33 (Changadzi River; Devuli River Bridge); Mitchell, 1946, p. 27 (Salima).
- Gerrhosaurus cinerianus Scortecchi, 1930, Atti. Soc. Ital. Milano, 69, p. 319: Old Enchopi, Mozambique, and 1934, An. Fac. Cienc. Porto, 19, pp. 51-54, fig.
- Gerrhosaurus validus validus Loveridge, 1942b, p. 492; FitzSimons, 1943, p. 269 (Plumtree; Matibi); Manceas, 1952, p. 147 (Namacha); Loveridge, 1953a, p. 223 (Mtimbuka; Hpatamanga; Tete); Manceas, 1961, p. 154 (Mhantare River; Vila Paiva de Andrada); Broadley, 1962d, p. 818.

Fifty-eight specimens examined from: **RODHANALAND**. Foley. **RHODESIA**. Beitbridge; Bulawayo; Chibakwe Bridge; 10 mls SE of Gwazi Bridge; Karoi-Lusita Confluence; Heathfield; Kapasi; \* Kariba Lake - Sanyati Confluence; Limpopo - Umsingwane Confluence; Lukosi Bridge; Lundi River; Matopos; Matowa; Nyamshatu Bridge; Prince Edward Dam; Sabi - Mchuni Confluence. \*Khami Dam. **ZAMBIA**. Chete Hills. **MOZAMBIQUE**. Magasso; Matroca; Namacha; Namueva; Sano; 25 & 30 mls ENE and 15 mls SSW of Tete.

Literature records. **RODHESIA**. Changadzi River; Devuli Bridge; Empandene; Insisa; Matibi; Matopos; Plumtree; Zimbabwe. **MALAWI**. Hpatamanga; Mtimbuka; Salima. **MOZAMBIQUE**. Chifumbazi; Inchope; Namacha; Mhantare River; Tete; Vila Paiva de Andrada.



**Variation.** Supraciliaries 5, rarely 4 or 6; dorsals multicarinate and serrated in adults, in 26 - 34 longitudinal and 50 - 58 transverse rows; ventrals in 14 - 20 longitudinal and 34 - 45 transverse rows; femoral pores 14 - 25 on each side; lamellae beneath fourth toe 17 - 23.

**Coloration.** Black above, each head shield and dorsal scale spotted with yellow and a pair of broad yellow dorso-lateral stripes, brownish below.

**Size.** Largest (MSR. 5129 - Chibawe Bridge) 285 + 405 = 690 mm.

**Breeding.** The eggs, usually four in number, are laid in rock crevices. One measuring 44 x 26 mm hatched on 16th February, the hatchling measured 68 + 100 = 168 mm.

**Diet.** The catholic diet of this species is shown by an analysis of the stomach contents of seventeen Rhodesian specimens. Four contained vegetable matter only and eight others contained varying amounts, this consisted of leaves and flower petals (pink or yellow flowers are favoured), but one Kapaxi lizard had eaten nothing but figs. Six specimens contained millipedes and six had eaten beetles, other food items being scorpions (2), centipede (1), lepidopterous larvae (23 in one stomach), mantids (2), grasshopper (1), termites and a small gecko (*Pachyactylus p. punctatus*).

**Parasites.** Worms (*Tachygonetra* and *Thelaniros* spp.) in the intestines of Tete specimens (Loveridge, 1953a).

**Enemies.** A juvenile was found in the stomach of a *Thelotornis k. catesi* from the Matopos.

**Habitat.** Granite, paragneiss or sandstone outcrops. Sometimes occurs in huge colonies, as at Beitbridge and Namusova in north Mozambique.

**Distribution.** Mozambique, southern Malawi and Zambia, Rhodesia, eastern Bechuanaland, north-western and eastern Transvaal, Swaziland and northern Zululani.

#### GERRHOSAURUS MAJOR MAJOR Dumeril

*Gerrhosaurus Major* Dumeril, 1851, Cat. Method. Coll. Rept. Mus. Paris, p. 139; Zanzibar Island; Boulenger, 1907a, p. 8 (Feira); Hewitt, 1910c, p. 104; Sternfeld, 1911, p. 417 (Chifumbazi); Loveridge, 1920, p. 149 (Iambo); Cott, 1934, p. 165 (Gaia; Amatongas).

*Gerrhosaurus grandis* Boulenger, 1908, Ann. Natal Mus., 1, p. 233, pl. xxxvi: Ubombo, Zululani; FitzSimons, 1939b, p. 34 (between Changadzi River and Birabenhough Bridge).

*Gerrhosaurus major grandis* Loveridge, 1942b, p. 500; FitzSimons, 1943, p. 280; Loveridge, 1953a, p. 224 (Idkabela River); Broadley, 1963d, p. 819.

Gerrhonotus major major Fitzinger, 1934, p. 305; Loveridge, 1942b, p. 902 and 1953a, p. 225 (Tete).

Twenty-three specimens examined from: RHODESIA. 20 mls W of Birchborough Bridge; Jomubi Hill; Kapani; Kariba Lake - Sanyati Confluence; Matsa; Ruanya River Drift; Rupisi Hot Springs; Rusaro; Triangle; ZAMBIA. Owen Valley; 20 mls W of Katete. MOZAMBIQUE. Mada - Lamego; 4 mls E of Tete; Kihve.

Literature records. RHODESIA. Birchborough Bridge. ZAMBIA. Feira. MALAWI. Likabala River. MOZAMBIQUE. Amatoongo; Coia; Chifumbasi; Lumbo; Tete.

Variation. Supraciliaries 5, rarely 4; dorsals strongly beaded; rugose in 16 - 18 longitudinal and 31 - 35 transverse rows; ventrals in 10 longitudinal and 28 - 35 transverse rows; femoral pores 10 - 14 on each side; lamellae beneath fourth toe 12 - 15.

Coloration. Buff or yellowish-brown above, uniform or each scale streaked with black, which may form irregular longitudinal lines; tail usually black spotted with yellow; yellow or brown below.

Size. Largest ♂ (Loveridge, 1920 - Lumbo) 240 + 315 = 555 mm. Largest ♀ (UN. 9217 - Mada-Lamego) 245 + 170 = mm.

Discussion. Loveridge (1942b and 1953a) could distinguish grandis from major only on coloration, regarding the latter as a uniform buff coastal form extending from Kenya to the Zambezi, while grandis, streaked with black at least posteriorly, occurred south of the Zambezi, but extended north to Tanganyika, inland from typical major.

The above series is very variable in coloration, but this has no geographical significance, lizards with no black on the body occur together with heavily streaked specimens at Kapani, Kariba Lake and Triangle. The Kapani series from 3,000 feet are actually lighter in colour than specimens from the Hoeschighe Plain, so grandis must be placed in the synonymy of G. m. major.

Hester (1962) has referred a fossil lizard from the Lower Miocene of Mfangazi Island, Lake Victoria, Kenya to Gerrhonotus major, indicating the ancient origin of this genus. It is possible that most of the cordylid groups are derived from such a generalised Gerrhonotus ancestor.

Reproduction. A ♀ from Mada - Lamego contained 2 eggs measuring 98 x 26 mm on 5th November, another from near Tete had 2 eggs of 90 x 23 mm on 11th December.

Diets. S.T.V. contents of eight specimens consisted of beetles, grasshoppers, millipedes and lepidopterous larvae, one from 20 mls W of Birchborough Bridge had eaten a gravid ♀ Agama kirkii. Small beans and grass

with a single beetle leg in a Lumbo specimen (Loveridge, 1920, p. 150). Captive specimens eat fruit.

Habitat. Termitaria are frequently occupied by this species, e.g. Lumbo (Loveridge, 1920), Lalabala River (Loveridge, 1953b), Wankie and Mtoko Districts of Rhodesia (Broadley, 1962d). They also live in rock crevices, but seem to prefer small outcrops, the large kopjes being occupied by Gerrhosaurus v. validus.

Distribution. Kenya to Zululand, extending inland to south-east Zambia, Rhodesia and the Transvaal (below 3,000 feet).

#### GERRHOSAURUS NIGROLINEATUS Hallowell

Gerrhosaurus nigrolineatus Hallowell, 1857, Proc. Acad. Nat. Sci. Philadelphia, p. 49: Gaboon; Boulenger, 1907a, p. 8 (Petouke; Ulunga Mtn.) and 1910, p. 480 (Hunyani River; Victoria Falls); Pitman, 1934, p. 305, (Lavushi Hills); FitzSimons, 1943, p. 277 (Plumtree; Umsweswe River; Victoria Falls).

Gerrhosaurus flavigularis (not Wiegmann) Chubb (part) 1909b, p. 35 (part - Victoria Falls).

Gerrhosaurus flavigularis nigrolineatus FitzSimons, 1935b, p. 365 (Kabulabala; Kasane).

Gerrhosaurus nigrolineatus australis FitzSimons, 1939, Ann. Tvl. Mus., 20, p. 10: Kapsviden, E. Transvaal (also Balawayo; Changadzi River) and 1939b, p. 35.

Gerrhosaurus nigrolineatus nigrolineatus Loveridge, 1942b, p. 508, also 1953a, p. 225 (Kasungu; Chibotela; Misuku Mts.; Nohisi Mtn.; Chitala River; Tete) and 1953c, p. 143 (Port Herald); Broadley, 1962d, p. 819.

Sixty-seven specimens examined from: BECHUANALAND. 5 mls W of Kasungula; Nomaneng. RHODESIA. Binga; Balawayo; Charam Plateau; Chipinda Pools; Chirundu; Fatima; Filabusi; 3 mls W of Gwaai Bridge; Ilamba ridge; Kapani and 5 mls SE; Kariba; Kariba Lake - Mwenda and Sanyati Confluences; Lukosi Bridge; Mount Hampden; Redcliff; Shashi - Shashani Confluence; Turic Mine; Umsweswe River; Victoria Falls; Zambesi - Sehungwe Confluence. ZAMBIA. Abercorn (IRSHB); Chakwanga River; Chete Hills; Fort Jameson and 50 mls N; Kabompo; Kasusu; Kasempa District (1322 Dc); Livingstone; Lusaka East and 50 mls ENE; Nahoonwe; Seshake; Siantamba. MIAMI. 5 mls NW of Livonde. MOZAMBIQUE. Chinaminse.

Literature records. BECHUANALAND. Kabulabala; Kasane; RHODESIA. Balawayo; Changadzi River; Hunyani River; Plumtree; Umsweswe River; Victoria Falls. ZAMBIA. Lavushi Hills; Petouke; Ulunga Mtn.

BEIWEI. Chibotels; Chitola River; Kasungu; Misuku Mts.; Nohisi Mts.; Port Herald. MOZAMBIQUE. Tete.

**Variation.** Head 19.2 - 24.8% of snout vent length; prefrontals in broad contact; supraciliaries 4, rarely 3 or 5; dorsals strongly keeled, but not striated in 20 - 24 longitudinal and 56 - 62 transverse rows; ventrals in 8 longitudinal and 32 - 37 transverse rows; femoral pores 14 - 21 on each side; scales on soles of feet keeled and spinose; lamellae under fourth toe 15 - 18.

**Coloration.** Reddish brown above, with a pair of sharply defined black-bordered yellow dorso-lateral stripes, often a vertebral series of yellow streaks, flanks vermilion or chestnut brown, usually with irregular yellow vertical streaks; crown below.

**Size.** Largest (IBRS - Abercorn) 168 + 375 = 543 mm, but another specimen from the same locality measures 183 mm from snout to vent.

**Discussion.** The systematics of the *Gerrhonotus nigrolineatus* group in central Africa remain confused. The Zambian material listed above can be split into two groups. Ten from Livingstone, the Orange and Zambezi Valleys and the Eastern Province have 20 - 22 dorsal scale rows, attain a maximum length of 160 mm from snout to vent and resemble Rhodesian specimens in coloration. Thirteen from Shekela, Kalomo, Babempe, Kasenge and Abercorn Districts have 24 (rarely 22) scale rows, adults measure 160 - 183 mm from snout to vent, and the coloration is very dark in adults, with black longitudinal lines on each scale row and often a black lateral band, resembling *G. multilineatus* Bocage and *G. G. shufeldti* Halliday & Schmalzer (1955). These specimens have the dorsal scales at the base of the tail strongly mucronate and they look like intergrades between *nigrolineatus* and *G. halsi* which occurs in Schweni and Itainkanga Districts. As *G. nigrolineatus* and *G. halsi* are sympatric in the Upembe National Park and at Enzime (Witte, 1953, p. 92), the affinities of these big Zambian lizards remain obscure.

**Diet.** Stomach contents of nine Rhodesian specimens consisted largely of grasshoppers, supplemented by beetles, lepidopterous larvae, ichneumonids, termites, a plant bug, a mantis, a wasp, a millipede and a selfgid.

**Enemies.** Adult lizards were found in the stomachs of a *Heliconia* h. *patens* from Kalichore and a *Pezomachus* s. *submarginatus* at Victoria Falls.

**Habitat.** Widespread in savanna, living in rodent burrows and termitaria.

**Distribution.** Gabon and Lower Congo, south through Angola to South West Africa, east through Katanga, Zambia and northern Bechuanaland to Kenya, Tanganyika, Malawi, western Mozambique, Rhodesia and northern and eastern Transvaal. Sympatric with *Gerrhonotus flavularis* throughout the eastern part of its range.

## GERRHOSAURUS BULSI Laurent

Gerrhosaurus suritus bulsi Laurent, 1954, Publ. Comp. Dian. Angola, 23, p. 64; Dundo, Angola.

Gerrhosaurus nigrolineatus ansellii Broadley, 1960, Occ. Papers Nat. Mus. S. Rhodesia, 24B, p. 433; Mwinilunga Boma, Zambia.

Sixteen specimens examined from: ZAMBIA. Mwinilunga; Sakeji Stream; Solwezi.

Variation. Head length 18.0 - 23.4% of snout - vent length; prefrontals in broad contact; supraciliaries 4; dorsal scales strongly keeled and mucronate above, but smooth on the flanks, in 24 (rarely 22 or 26) longitudinal and 54 - 60 transverse rows; ventrals in 8 longitudinal and 31 - 35 transverse rows; scales on the tail strongly keeled and mucronate dorsally and laterally, those of the basal portion developed into long backward-pointing spines; femoral pores 13 - 19 on each side; scales on soles of feet keeled, spinose; lamellae under fourth toe 15 - 18.

Coloration. Uniform light brown above, grey-brown laterally, lateral fold blue-grey; white below (see Witte, 1953, pl. ii, fig. 3).

Size. Largest ♀ (NHM, 4950 - Sakeji Stream) 200 + 295 = 495 mm. The largest of 38 Angola specimens measured 172 mm from snout to vent (Laurent 1954a and 1964c), ten of the Zambian specimens are 170 mm or more, while the largest of 68 Katanga lizards was 215 + 347 = 562 mm. (Witte, 1953).

Discussion. G. bulsi has a short head like G. suritus, whereas G. nigrolineatus has a long snout. This character is obscured by allometric growth, so the following head : snout - vent length ratios are based on data for specimens over 100 mm from snout to vent.

Species.	Series	Head : Snout - vent Length %
<u>G. nigrolineatus</u>	40	19.4 - 24.8
<u>G. bulsi</u>	16	18.0 - 23.4
<u>G. suritus</u>	4	18.6 - 23.3
<u>G. flavigularis</u>	37	15.6 - 21.7

Table 3.

G. bulsi and G. suritus may be conspecific, but no intergrade populations have yet been found.

Distribution. Katanga, north-eastern Angola and the Mwinilunga and Solwezi Districts of Zambia.

## GERRHOSAURUS AURITUS Boettger

Gerrhosaurus auritus Boettger, 1887, Ber. Senckenb. Ges. Nat., p. 148, pl. v, figs. 3a - d: Ondonga, Ovamboland, South West Africa; Boulenger, 1910, p. 480; Angel, 1920, p. 616 (Lealui); FitzSimons, 1935b, p. 363 (Okwa River - Damara Pan; Damara Pan; Gamsbok; Mabelsapudi; Kwai) and 1943, p. 275.

Gerrhosaurus nigrolineatus auritus Loveridge, 1942b, p. 506.

Three specimens examined from: BECHUANALAND. Aha Mts. (TM); Dekar (TM); Tamafupi.

Literature records. BECHUANALAND. Damara Pan; Gamsbok; Kwai; Mabelsapudi; Okwa River - Damara Pan. ZAMBIA. Lealui.

Variation. Head 18.6 - 23.3% of snout - vent length; prefrontals usually in contact; supraciliaries 4; dorsals keeled, but not striated, laterals smooth in 24 - 26 longitudinal and 51 - 57 transverse rows; ventrals in 8 longitudinal and 32 - 36 transverse rows; femoral pores 14 - 19 on each side; lamellae under fourth toe 16 - 18.

Coloration. pale brown above, often with pale yellow flecks on head and back, a series of three or four narrow pale dorso-lateral stripes, pale below with dark spots, limbs pale brown with yellow spots; cream below.

Size. Largest (TM. 26979 - Dekar) 155 + 285 = 440 mm.

Remarks. This form seems to be sympatric with G. nigrolineatus in Ngaland, so it cannot be a race of the latter as proposed by Loveridge (1942b).

Diet. Tenebrionid beetles, grasshoppers, termites, a scorpion and a centipede in two specimens (FitzSimons, 1935b).

Enemies. One had been eaten by a domestic cat at Mm.

Distribution. Northern South West Africa, northern Bechuanaland, eastern Angola (Lunda - Honard, 1937, p. 78) and Barotselani.

## GERRHOSAURUS FLAVIGULARIS Wiegmann

Gerrhosaurus flavigularis Wiegmann, 1828, Isis von Gœn, col. 378:

"Africa merid. Kröbe" = South Africa; Peters, 1854, p. 618 (Tete) and 1882, p. 57; Boulenger, 1887c, p. 122; Pfeffer, 1893, p. 74 (Quelimane); Gurthar, 1894, p. 618 (Shire Highlands); Bocage, 1896, p. 88; Boulenger, 1897, p. 800 (Muta Bay to Ruarwe; Nyika District and Plateau; Fort Hill) and 1902, p. 17 (Mashonaland), 1907a, p. 8 (Luangwa River); Cribb, 1909a, p. 594 (Bulawayo; Espondene) and 1909b, p. 35 (part - Espondene); Boulenger, 1910, p. 480 (Serowe; Masoe); Loveridge, 1920, p. 150 (Lumbo); Power, 1927, p. 408 (Lobatsi); Hewitt, 1929, pl. ii, fig. 12; Mitchell, 1946, p. 28; Broadley, 1962a, p. 820.

- Gerrhonotus flavivularis flavivularis Cott, 1934, p. 164 (Caia; Charro; Amotongas); Pittman, 1934, p. 305; FitzSimons, 1935b, p. 365 (Gabani; Gaborones; Molepolole) and 1959, p. 34 (Vumba Mtn.; Changadzi River); Loveridge, 1942b, p. 516; FitzSimons, 1943, p. 272 (Matopos; Driefontein; Salisbury; Mochudi; Marandellas; Mahalapye; Chishawasha); Manasse, 1952, p. 148 (Mashica); Loveridge, 1953a, p. 226 (Nehisi Mtn.; Mtinkulu; Tete); Manasse, 1961, p. 155 (Mutuali; Vila Paiva de Andrade).
- Gerrhonotus flavivularis fitzsimonsi Loveridge, 1942, Bull. Mus. Comp. Zool., 89, p. 514; Mt. Mbololo, Kenya.

Ninety-one specimens examined from: BECHUANALAND. 10 mls. W of Mabeane (USNM); Mahalapye; Tsane; RHODESIA. Aberfoyle; Bulawayo; & 14 mls. NW, Changadzi Bridge; Chibekwe Bridge; Chimanimani Mts.; Fern Valley; Filabusi; Gwelo; Haroni-Lusitu Confluence; Jersey Estate; Kariba Lake - Banyati Confluence; Lumino; Manda; Marandellas; Mashaba; Matopos; Mkota Reserve; Mount Hampden; Ngorima Reserve (E); Nyaratedzi Bridge; Old Untali; Redoliff; Sahl - Macheke Confluence; Salisbury; Selukwe; Sentinel; Tandsai; Triangle; Ungusan Bridge; Untali; Zowa. ZAMBIA. Fort Jameson; 20 mls W of Katete; Mafine. MALAWI. Karonga; Injeri. MOZAMBIQUE. Amotongas; Beira; Caruso; Gorongosa Mtn.; Inhaca Island; Mandic; Manga; Mada; Vila Bocage; Vila de Manica and 15 mls SE; 10 mls WNW of Vila Pery; Xiluvo.

Literature records. BECHUANALAND. Gabani; Gaborones; Lobatse; Mahalapye; Mochudi; Molepolole; Serowe. RHODESIA. Bulawayo; Changadzi River; Chishawasha; Driefontein; Espendene; Marandellas; Matopos; Masoe; Salisbury; Vumba Mtn. ZAMBIA. Luangwa River. MALAWI. Fort Hill; Mtinkulu; Nehisi Mtn.; Shata Bay to Ruwwe; Nyika District. MOZAMBIQUE. Amotongas; Caia; Charro; Limbo; Mashica; Mutuali; Quelimano; Tete; Vila Paiva de Andrade.

Variation. Head 15.6 - 21.7% of snout - vent length (in adults); prefrontals separated (64 specimens), meeting at a point or separated by a small ankyous scale (8) or in contact (19); supraciliaries 5, rarely 3, 4 or 6; dorsals keeled and striated in 20 - 24 longitudinal and 58 - 64 transverse rows; ventrals in 8 longitudinal and 32 - 38 transverse rows; femoral pores 10 - 17 on each side (males only); scales on soles of feet smooth, tubercular; lamellae under fourth toe 16 - 22.

Coloration. Dark red-brown or olive above with a pair of sharply defined black-bordered yellow dorso-lateral stripes; sometimes a paired vertebral series of pale spots; flanks darker, often with irregular yellowish vertical bars, but specimens from Mozambique and parts of adjoining Rhodesia have vermillion flanks like G. nigrolineatus (this coloration does not seem to occur in flavivularis in those areas where it is sympatric with nigrolineatus); cream below, throat bright yellow in breeding males.

The resemblance of this species to nigrolineatus in coloration and markings is remarkable considering the numerous morphological differences between them.

Size. Largest (NSR. 3052 - Kariba Lake)  $142 + 293 = 435$  mm.

Discussion. Loveridge (1942b, p. 515) divided this species into northern and southern races thus:

"Prefrontals in contact 81% of 33 specimens examined; range: East Africa from Sennar south to the Rovuma River, southern frontier of Tanganyika ..... f. fitssimonsi.

Prefrontals separated in 60% of 88 specimens; range: Mozambique south to Natal and western Cape Province ..... f. flavigularis."

G. f. fitssimonsi did not meet the requirements of the "seventy-five per cent rule" when described and the variability of the material under consideration lends no support to recognition of a northern race.

Breeding. Four to six eggs are laid, these measuring about  $22 \times 14$  mm. A hatchling from Aberfoyle measured  $40 + 69 = 109$  mm.

Diet. Largely grasshoppers, supplemented by termites, beetles, mantids, millipedes and centipedes.

Habitat. Widespread in savanna, living in burrows. This species is common along streams, taking to the water readily when pursued.

Parasites. Nematodes (Abbreviata sp.) in Nohisi and Tete lizards (Loveridge, 1953a).

Distribution. Eastern Africa from the Sudan and Ethiopia to the southwestern Cape Province, extending into Malawi, eastern Zambia, Rhodesia, Bechuanaland and Transvaal. Also a relict population at Gobabis, eastern South West Africa (Mitchell & Steyn, 1965).

#### Genus TETRADACTYLUS Merren

Tetradactylus Merren, 1820, Vers. Syst. Amph., pp. 13, 75. Type by monotypy: Chalcides tetradactylus Daudin.

Paratetradactylus Angel, 1922, Bull. Mus. Paris, 22, p. 150, figs. 1 - 4. Type by monotypy: P. ellenbergeri Angel.

Angel considered that the most important character distinguishing his Paratetradactylus from Tetradactylus was the absence of femoral pores, supported by the single nasal and the presence of prefrontals. The first two characters were subsequently found to occur in Tetradactylus boulangeri Witte, while Laurent (1964c, p. 55) considers that the "prefrontals" (one partially fused with the fronto-nasal) of the type of P. ellenbergeri represent an individual aberration. I agree with Laurent that Paratetradactylus is not a valid genus.



## TETRADACTYLUS ELLENBERGERI (Angel)

Paratetradactylus Ellenbergeri Angel, 1922, Bull. Mus. Paris, 28, p. 151, figs. 1 - 4; Barotseland, Zambia; Loveridge, 1942b, p. 534.

Tetradactylus Boulengeri Witte, 1933, Rev. Zool. Bot. Afr., 23, p. 186; Kansenia, Katanga.

Tetradactylus lundensis Monard, 1937, Arquiv. Mus. Bocage, 8, p. 79; Lunda, Angola.

Tetradactylus fitssimossi simplex Laurent, 1950, Rev. Zool. Bot. Afr., 43, p. 350; Kundelungu, Katanga; Loveridge, 1955, p. 176 (Mambwe) and 1957, p. 225.

Eighteen specimens examined from: ZAMBIA. Changue River (Lusaka); Lunga Game Reserve; Mambwe (INSRB).

Literature records. ZAMBIA. "Barotseland"; Mambwe.

Variation. Head shields of juveniles slightly rugose, adults with strongly striated shields; a single nasal; supraoculars 3 - 4 (2 on one side of one); supraciliaries 3 (4 on one side of one); dorsals strongly keeled and striated, in 12 - 14 longitudinal and 64 - 70 transverse rows; ventrals in six longitudinal rows; forelimbs absent, hindlimb minute, monodactyle, without femoral pores.

Coloration. Olive brown above, head with scattered dark spots, side of neck with dark and light vertical barring; pale olive below.

Size. Type (Paris Museum 1921 - 514) 64 + 216 = 280 mm; one Mambwe specimen measures 74 mm from snout to vent.

Discussion. Laurent (1964c, p. 55) retained boulengeri (including lundensis and simplex as synonyms) as a race of T. ellenbergeri because it had 12 rows of dorsals instead of 14. A fine series of sixteen Mambwe specimens bridges this gap; the outer rows vary in size. Thirteen lizards might be considered to have 14 rows, but three others certainly have only 12.

Habitat. The Lunga Game Reserve specimen was in reeds near pools in the middle of a dambo (Ansell field register).

Distribution. Eastern Angola, Katanga, western and northern Zambia, south-eastern Tanganyika.

## Genus CORDYLUS Laurenti

Cordylus Laurenti (part) 1766, Syn. Rept., p. 51. Type by tautonymy:

C. verus Laurenti = Lacerta cordylus Linnaeus.

Zonurus Merrem, 1820, Vers. Syst. Amphib., p. 57. Type by monotypy:

Lacerta cordylus Linnaeus.

## CORDYLUS WARRENI REGIUS Broadley

Cordylus warreni regius Broadley, 1962, Occ. Pap. Nat. Mus. S. Rhod.,  
268, p. 308, fig. 3: Dora, Umtali, Rhodesia.

Twenty-six specimens examined from: RHODESIA. Chido;  
Chinyamanda; Dora; Helvetia; Modisa.

Variation. Preocular usually in contact with the nasal above the loreal; supraciliaries 4, rarely 3; occipitals 6 - 8; gulars between posterior angles of jaws 22 - 31; dorsals and laterals in 22 - 28 longitudinal and 34 - 40 transverse rows, largest dorso-laterally and obliquely set, four to six vertebral rows much reduced in size, flattened and with interpolated incipient transverse rows, laterally very spinose, particularly on the neck; ventrals in 14 longitudinal and 28 - 34 transverse rows, the two outer rows obtusely keeled; femoral pores 7 - 11 on each side (males); lamellae under fourth toe 16 - 20.

Coloration. ♂♂ Head dull brown, body and tail blackish-brown above, bright orange or yellow laterally, limbs and digits blackish-brown with narrow transverse bands of orange or yellow; below bright orange or yellow with a few ill-defined dark infuscations on the chin and throat.

♀♀ differ from males in having transverse rows of small cream spots dorsally, these being more numerous on the nape; flanks yellowish-brown with ill-defined yellow vertical bars; dull yellow below, chin and throat with dark infuscations, posterior lower labials and sublabials suffused with dull red. Juveniles are similar to ♀♀ in coloration.

Size. Largest ♂ (Holotype, U.M.1210) 143 + 187 = 330 mm. Largest ♀ (U.M. 1736 - Dora) 136 + 165 = 301 mm.

Discussion. Although C. W. mossambicus is now known to occur in eastern Rhodesia, regius is readily distinguishable by the anterior prolongation of the prefrontal, larger size, larger and more spinose scales on body, limbs and tail, and pale throat.

Breeding. Four or five young are born in December, measuring 49 + 54 = 103 mm at birth.

Diet. Millipedes and beetles were the most important food items in seven stomachs examined, two contained large caterpillars.

Habitat. Well-wooded granite outcrops between 2,500 and 4,500 feet. This form seems to prefer fissured boulders well shaded by trees, rather than the bare rock faces inhabited by Platysaurus rhodesianus, Agama kirki and Mabuya c. margaritifera.

Distribution. Southeastern Umtali District of Rhodesia.

## CORDYLUS WARRENI MOSSAMBICUS FitzSimons

Cordylus warreni mossambicus FitzSimons, 1958, Ann. Natal Mus., 14, p. 351;  
Gorongosa Mountain, Mozambique.

Twenty-eight specimens examined from: RHODESIA, Haroni-Gorge; Haroni-Lusitu Confluence; Outward Bound School (western foothills of Chimanimani Mountains). MOZAMBIQUE, Gorongosa Mountain; Inchope. Also seen at Bandula and 15 miles east of Mavita.

Literature record. MOZAMBIQUE, Gorongosa Mountain.

Variation. Preocular usually widely separated from nasal by the loreal; supraciliaries 4 (5 on one side of one); occipitals usually 6 (6 - 8 in Rhodesian material); gulars between posterior angles of jaws 24 - 34; dorsals and laterals in 26 - 30 longitudinal and 35 - 46 transverse rows, smaller than in regius and imbedded in granular skin; ventrals in 14 longitudinal and 27 - 37 transverse rows; femoral pores 8 - 11 on each side (males); lamellae under fourth toe 15 - 19.

Coloration. Similar to C. w. regius, but blackish above with yellow spots (in life), throat of adults of both sexes uniform blackish.

Size. Largest ♂ (UM. 9952 - Gorongosa Mtn.) 110 + 133 = 243 mm.  
Largest ♀ (UM. 7959 - Gorongosa Mtn.) 126 + 134 = 260 mm.

Habitat. Nineteen topotypes were collected on the lower south-western slopes of Gorongosa Mountain at about 3,500 feet. They were living in fissured syenite boulders in open grassland. The Rhodesian specimens are from well-wooded rock outcrops on the lower slopes of the Chimanimani Mountains.

Distribution. The southern portion of the Manica Platform, extending from Gorongosa Mountain south-west to the lower slopes of the Chimanimani Mountains.

## CORDYLUS CORDYLUS RHODESIANUS (Hewitt)

Zomurus cordylus rhodesianus Hewitt, 1933, Occ. Papers Nat. Mus. S. Rhod. 1, p. 48, pl. ix, fig. 3: Monte Cassino, Macheke, Rhodesia, also Rusape; FitzSimons, 1939b, p. 30 (Vumba Mtn.).

Cordylus cordylus rhodesianus FitzSimons, 1943, p. 459; Loveridge, 1944, p. 40; Tassan, 1957, p. 32; FitzSimons, 1958a, p. 209 (Nyamini); Broadley, 1962d, p. 808.

Seventy-four specimens examined from: RHODESIA. Chimanimani Mtns.; Chinyanja; Kapwa; Erin Forest Reserve; Inyanga National Park; Macheke; Mtara Falls; /Odsani; Silverstreams; Stapleford; Untali (Cecil Kop); Zowa; Zuruni; MOZAMBIQUE. Chimanimani Mtns., near Martin's Falls.

Literature records. RHODESIA. Macheke; Nyamisa; Rusape; Vumba Mtn.

Variation. Head strongly depressed and expanded in the temporal region (this is very marked in material from the Macheke - Inyanga region, less so in Cecil Kop specimens, while specimens from the Chimanimani Mtns. have only feebly depressed heads), head shields smooth to finely rugose; supra-ciliaries 3, rarely 4; suboculars 3, rarely 4; gulars between posterior angles of jaws 16 - 28; dorsals + laterals in 20 - 26 longitudinal and 25 - 29 transverse rows; ventrals in 12 - 16 longitudinal and 21 - 30 transverse rows; femoral pores 5 - 8 on each side.

Coloration. Olive brown above, blotched with darker, yellowish or greenish white below.

Size. Largest ♂ (UN. 10470 - Silverstreams)  $91 + 71^* = 162$  mm.  
Largest ♀ (UN. 10471 - Silverstreams)  $90 + 84 = 174$  mm.

Dist. Largely beetles.

Enemies. An adult in the stomach of a Bitis a. atropos from the Chimanimani Mtns.

Habitat. Under stones and in fissured boulders in montane grassland and scrub Brachystegia from about 5,000 feet to the summit of Inyangani Mountain (8,514 ft.).

Distribution. Eastern highlands of Rhodesia and adjoining Mozambique.

#### CORDYLUS TROPIDOSTERNUM TROPIDOSTERNUM (Cope).

Zomrus tropidosternum Cope, 1869, Proc. Amer. Philos. Soc., 11, p. 169: "Madagascar" (? = Mozambique); Boulenger, 1885d, p. 254; FitzSimons, 1939b, p. 29 (Birchenough Bridge).

Zomrus cordylus (not Linnaeus) Boulenger, 1897, p. 800 (Nyika Plateau; Misuku Mtns.; Fort Hill).

Zomrus parkeri Cott, 1934, p. 151, pl. ii: Amatongus, Mozambique.

Cordylus tropidosternum FitzSimons, 1943, p. 450 (Untali).

Cordylus cordylus tropidosternum Leveridge, 1944d, p. 33; 1953a, p. 234 (Chove); Broadley, 1962d, p. 807.

Eight specimens examined from: RHODESIA. Macheke; Matona; Untali. ZAMBIA. Bulaya (IRSNB). MALAWI. Rumpi. MOZAMBIQUE. 15 mls. WSW of Machaze; 9 mls S of Muanza.

Literature records. RHODESIA. Birchenough Bridge; Untali. NIAWI. Chowe; Fort Hill; Misuku Mts.; Nyika Plateau. MOZAMBIQUE. Amantonga.

Variation. Head not depressed or expanded in the temporal region; head shields rugose; supraciliaries 3; suboculars 2, rarely 3; gulars between posterior angles of jaws 16 - 23; dorsals + laterals in 20 - 22 longitudinal and 24 - 29 transverse rows; ventrals in 12 - 14 longitudinal and 23 - 28 transverse rows, outer 3 - 4 rows keeled; femoral pores 3 - 8 on each side.

Coloration. Grey-brown to olive above, often with some darker mottling, or white flecking, a poorly defined whitish dorso-lateral band usually present; yellowish-white below.

Size. Largest (UM. 6990 - Rumpi)  $90 + 95 = 185$  mm; the type of parkeri measured 92 mm from snout to vent.

Discussion. Despite the difficulty of splitting up the Cordylus cordylus group on morphological characters, it seems that a group of forms without depressed heads, which are all arboreal rather than rupicolous, are not conspecific with C. cordylus. The latter is a temperate species, centred on the south-western Cape, with relict races on the highland areas to the north. C. tropidosternum is a tropical species, centred on the East African lowlands, again with relict races at the periphery of its range.

Breeding. The ♀ from near Muanza gave birth to two young measuring  $35 + 39 = 74$  mm in mid-November.

Habitat. Found under loose bark on dead trees and in hollow Mopane trees and logs.

Distribution. East Africa, from Kenya south to the Save River in Mozambique, west to Katanga, northern Zambia, Malawi and eastern Rhodesia.

#### CORDYLUS TROPIDOSTERNUM JONESI (Boulenger)

Zonurus Jonesi Boulenger, 1891, Ann. Mag. Nat. Hist. (6) 7, p. 417: Murchison Range, Transvaal; Chubb, 1909b, p. 35 (Balawayo); Hewitt, 1909, pp. 31, 36 (Matopos; Palapye); Boulenger, 1910, p. 468; Hewitt, 1911b, p. 47 (M'isorevo); Van Dam, 1921, p. 243 (Mazanbo; Lundi River); Power, 1927c, p. 407 (Lobatsi); FitzSimons, 1930, p. 29 (Tituni).

Zonurus cordylus (not Linnaeus) Chubb, 1909a, p. 593 (Balawayo).

Zonurus cordylus jonesi FitzSimons, 1935b, p. 349 (Tituni; Molepolole - Kuke; Balawayo).

Cordylus jonesi FitzSimons, 1943, p. 452 (Palapye Road; Empandene; Filabusi - Shabani; Plumtree; Serowe; Mahalapye); Tasman, 1957, p. 33.

Cordylus cordylus jonesii Loveridge, 1944d, p. 36.

Twenty-five specimens examined from: BECHUANALAND. Debeeti; 10 mls NE of Lephepe; 10 mls SE of Letlaking (USNM); Mahalapye. RHODESIA. Beitbridge; Bulawayo; Lumane; Queen's Mine; Shashi-Shashani Confluence. MOZAMBIQUE. 10 mls W. of Moamba.

Literature records. BECHUANALAND. Lobatsi; Mahalapye; Palapye; M'noove; Molepolole - Kuke; Serowe; Tituni. RHODESIA. Bulawayo; Empangeni; Filabusi - Shabani; Lundi River; Matopos; Plumtree. MOZAMBIQUE. Masambo.

Variation. Head not depressed or expanded in the temporal region; head shields rugose; supraciliaries 3; suboculars 2; gulars between posterior angles of jaw 14 - 21; dorsals + laterals in 18 - 24 longitudinal and 22 - 26 transverse rows; ventrals in 12 - 14 longitudinal and 21 - 26 transverse rows, outer rows not keeled; femoral pores 3 - 7 on each side.

Coloration. Similar to the typical form, but usually lighter dorsally, pale dorso-lateral band hardly discernible, a blackish lateral band extending from eye towards groin.

Size. Largest ♂ (NSGR. 2019 - Bulawayo) 75 + 59<sup>h</sup> = 138 mm. Largest ♀ (UM. 2200 - 10 mls. W. of Moamba) 74 + 59 = 133 mm.

Discussion. I was unable to separate jonesii from tropidosternum on any morphological character except size, until J. D. Visser pointed out (in litt.) that the three or four outer rows of ventrals are usually keeled in the latter, smooth in jonesii. The size difference is marked: jonesii never exceeds 75 mm from snout to vent, whereas six out of eight typical tropidosternum examined measure 80 - 90 mm. I do not think that jonesii is any more than a dwarfed south-western race of tropidosternum, the two forms occupy identical habitats.

Breeding. Usually two young (2 - 4 according to FitaSimons, 1943, p. 453) are born in mid-November. A new born young one from Lumane measures 38 + 30 = 68 mm.

Diet. These lizards gorge themselves on winged termites at the beginning of the rains and are not very enthusiastic about eating any other insects.

Habitat. Found under loose bark on trees and logs or in hollow Mopane trees.

Distribution. Dry lowveld country, especially Mopane savanna, of eastern Bechuanaland, south-western Rhodesia, northern Transvaal and southern Mozambique.

## Genus PLATYSAURUS A. Smith

Platysaurus A. Smith, 1844, Ill. Zool. S. Africa, Rept., footnote to pl. xl. Type by monotypy: P. capensis A. Smith.

## PLATYSAURUS MITCHELLI Loveridge

Platysaurus mitchelli Loveridge, 1953, Bull. Mus. Comp. Zool., 110, p. 234: Ruo River Forest, Kulanje Mountain, Malawi; Broadley, 1965b, p. 1.

Seventeen specimens examined from: MALAWI. Ruo Gorge, Kulanje Mountain (including two paratypes).

Variation. Supranasals present and in broad contact behind the rostral; a single postnasal; occipital usually separated from the interparietal (in contact in the juvenile type and two paratypes); upper labials anterior to subocular 4; sublabials 5 - 6; gulars transversely between posterior sublabials 31 - 36, the two median rows enlarged anteriorly, but rapidly decreasing in size posteriorly; dorsal granules transversely at midbody 84 - 94, not enlarged on flanks; scales on side of neck spinose, but not enlarged; collar V - shaped, made up of 9 - 13 small scales; ventrals in 12 - 14 longitudinal and 36 - 40 transverse rows; femoral pores in males 17 - 20; lamellae under fourth toe 22 - 26; scales on tibia towards heel and lateral caudals non-spinose.

Coloration. Adult males: Top of head dark brown with light spots corresponding with the longitudinal head stripes of other species; dorsum uniform olive-brown. Side of head yellow-green, a broad yellow-green band on side of neck; flanks dull purple with large, well defined, pale green spots, tail light blue-green laterally, throat white, suffused with cerise mesially; a broad black collar, followed by a large patch of prussian blue; lower chest and belly brick-red, with a large blue-black patch in centre of abdomen extending onto the anal region; limbs with transverse bands of dark blue and pale green; tail white, suffused with blue-green.

Females and juveniles: Black, with three cream longitudinal stripes, without light spots between them; the vertebral stripe begins on the fronto-nasal and the lateral head stripes are broken up into spots; tail brown; ventral coloration is similar to that in males, but much paler.

Size. Largest ♂ (UM. 4195 - Ruo Gorge) 112 + 187 = 299 mm. Largest ♀ (UM. 4198 - Ruo Gorge) 81 + 136 = 217 mm.

Discussion. Loveridge described P. mitchelli from a series of 19 juveniles (39 - 52 mm in snout - vent length) collected by him in the Ruo Gorge Forest on 31st March. These were found on boulders, brick walls or concrete in the vicinity of the Luferi Estate Power House. Although Loveridge regarded his type series as adults, the gonads were undeveloped in two paratypes obtained in exchange from the MZS. In late December, 1962, not finding any Platysaurus in the area of the Ruo Gorge Forest, I climbed up the steep walls of the gorge until I came to open rock faces, which swarmed with adult Platysaurus (68 - 114 mm in snout - vent length). It appears that the juveniles spend the first months of their lives segregated from the adults, but whether the gravid females, or the hatchlings, make the migration is not yet known.

Diet. Ants and spiders, supplemented by beetles, grasshoppers and centipedes.

Behaviour. This species is distinguished from all other members of the genus by the display behaviour pattern of adult males, which turn broadside to an intruder and inflate their bodies and throats to give an illusion of greater size, while the cerise throat, green-spotted purple flanks and brilliant green tail make a vivid splash of colour. The "lateral presentation" display pattern of P. mitchelli is in marked contrast to the displays of the other species, which face an intruder and brace the front legs to show the brilliant coloration of the throat and chest.

Distribution. Endemic to the lower slopes of Kianje Mountain, south-east Malawi.

PLATYSAURUS OCELLATUS Broadley

Platysaurus ocellatus Broadley 1962, Occ. Pap. Nat. Mus. S. Rhod., 26 B, p. 810: western slopes of the Chimanimani Mountains, Welsetter District, Rhodesia.

Forty-six specimens examined from: RHODESIA. Chimanimani Mtns. (western and southern slopes); Makurupini River. MOZAMBIQUE. 4 mls SE of Haroni-Lusitu Confluence.

Variation. Nostrils in contact; occipital usually absent, but if present, may or may not be in contact with interparietal; upper labials anterior to subocular 4, rarely 5; sublabials 5, very rarely 6; galars transversely between posterior sublabials 17 - 24, the median row strongly enlarged, subequal and more or less rectangular in shape. Dorsal granules transversely at midbody 69 - 82, not enlarged on flanks; scales on side



of neck conical, but not enlarged; collar almost straight, composed of 6 - 8 large, more or less rectangular plates; ventrals in 14 (rarely 12) longitudinal and 32 - 39 transverse rows; femoral pores in males 13 - 18; lamellae under fourth toe 18 - 23; scales on tibia towards heel and lateral caudals non-spinose.

Coloration. Adult males: Head uniform blackish-brown, body dark olive-brown, with numerous sulphur-yellow, dark-edged ocelli, tail orange to yellow in only very large specimens, brown in many mature males. Below, chin and throat slate-grey, a black collar (followed by a patch of yellow in the largest specimens), rest of ventrum pale green to blue, tail orange to yellow.

Females and juveniles, similar to males, but head with lighter mottling, dorsum bronze with ill-defined pale spots, tail blackish. Below, throat white speckled with grey, no collar; a faint yellowish tinge on upper chest, rest of ventrum cream, tail yellow anteriorly, becoming brown distally.

Size. Largest ♂ (UM. 3386)  $94 + 150^* = 244$  mm. Largest ♀ (UM. 3389)  $82 + 123 = 205$  mm; both are topotypes.

Discussion. These lizards are very common on metamorphosed quartzite rocks in stunted Brachystegia woodland on the lower western slopes of the Chimanimani Mountains. They do not occur above the tree line at about 5,500 feet. The rocks are covered with black and grey lichens. Against this background a brightly coloured male lizard would be conspicuous and subject to heavy predation by birds of prey. It seems likely that selection against bright coloration has given rise to dull males by neoteny. The lack of dorsal stripes in females and juveniles may be due to a mutation which has become established in the population, for there is no evidence that the lack of stripes is a primitive condition. It may be significant that in an area where about eighty Platysaurus were collected or seen, the only other rupicolous lizards encountered were eight Agama kiriki and three Mabuia quinquefasciata.

Dist. Stomach contents of 28 types and topotypes were examined. Beetles occurred in 40% of stomachs and vegetable matter (mainly flower petals) in 32%; other food items were cockroaches, grasshoppers, lepidoptera and their larvae, ants, wasps, spiders and millipedes.

Distribution. Known only from the lower slopes and foothills of the Chimanimani Mountains on the border of Rhodesia and Mozambique.

## PLATYSAURUS MACULATUS MACULATUS Broadley

Platysaurus maculatus maculatus Broadley, 1965, *Arnoldia*, (Rhodesia) 1,  
No. 33, p. 1; Mitucus Mountain, Niassa Province, Mozambique.

One hundred and seven specimens examined from: MOZAMBIQUE.  
4 mls W of Alto Ligonha; Mitucus Mtn.; 15 mls N of Mugeba; 20 mls WNW  
and 30 mls ENE of Nampala; Massava; Ribaus Mtn.; 30 mls W and 20 mls  
E of Ribaus; 15 mls NW of Vila Junqueira.

Variation. Supranasals present and usually in contact (separated in  
15); one or two (very rarely 3) post-nasals; occipital usually absent  
(present in 8); upper labials anterior to subocular 4 (rarely 5); sub-  
labials 6 (very rarely 5); gulars transversely between posterior sub-  
labials 20 - 30, the two median rows strongly enlarged anteriorly; dor-  
sal granules transversely at midbody 88 - 116, not enlarged, or but  
slightly enlarged laterally; some scales on side of neck enlarged and  
conical; collar curved, composed of 6 - 11 plates; ventrals in 16 - 18  
(rarely 14 or 20) longitudinal and 34 - 45 transverse rows; femoral  
pores in males 16 - 25; lamellae under fourth toe 19 - 24; scales on  
tibia towards heel and lateral caudals non-spinose.

Coloration. Males. Mitucus Mountain: Dark olive-brown above;  
head with a pale green median stripe; faint indications of five lines of  
spots on the back; tail pink, with a patch of violet at the base; limbs  
dark olive-brown with pale spots. Below, throat and chest yellow to  
orange; collar indicated by a pair of lateral black blotches; abdominal  
and anal regions black; limbs white; tail orange. Ribaus Mountain  
specimens have a continuous pale vertebral stripe flanked by two rows of  
pale spots; tail pink suffused with lime-green. Throat bluish-white;  
a broad black collar; chest bluish; suffused with orange; abdominal  
and anal regions black. Specimens from 30 mls ENE of Nampala are suf-  
fused with yellow-green above and have yellow tails.

Females. Mitucus Mountain: Black above, with five rows of  
lemon-yellow dorsal spots; on the head and nape is a continuous orange  
median stripe; a series of pale spots on the supraciliaries continues as  
a light margin to the posterior parietal, then reverts to a series of  
dorsal spots; the outer row of spots extends from the ear opening to the  
base of the tail. The vertebral stripe is continuous in the pelvic region  
and on the base of the tail, where it is tinged with pale blue, the rest of  
the tail is speckled black and pale yellow. The flanks and limbs are  
black spotted with yellow. Below - white suffused with yellow laterally  
and black in the abdominal and anal regions. Ribaus Mountain specimens

are similar with orange below, especially the throat and tail. Specimens from 30 mls ENE of Nampala and Alto Ligonha have a continuous, but slightly  
vertebral stripe and have additional pale spots between the dorsal line  
and the base of the tail. In specimens from Massava and Vila Junqueira the

are suffused with orange below, especially the throat and tail. Specimens from 30 mls. ENE of Namula and Alto Ligonha have a continuous, but ragged, vertebral stripe and have additional pale spots between the normal five dorsal rows. In specimens from Namava and 15 mls N of Mugeba, both the vertebral and lateral stripes are clear-cut and continuous.

Size. Largest ♂ (UM. 8099 - Ribaus Mtn.) 68 + 97 = 165 mm. Largest ♀ (UM. 8246 - Namava) 70 + 99 = 169 mm.

Dist. Beetles, ants and winged termites are the main food items, supplemented by grasshoppers, cockroaches, lepidopterous larvae, spiders and millipedes. The allotype ♂ contained a gecko's tail (*Hemidactylus*).

Habitat. Granite outcrops, both on mountain slopes and low flat exposures.

Distribution. Endemic to northern Mozambique.

PLATYSAURUS MACULATUS LINEICAUDA Broadley

Platysaurus maculatus lineicauda Broadley, 1965, *Arnoldia* (Rhodesia), 1, No. 33, p. 3: 14 miles west of Morrumbala, Zambezia Province, Mozambique.

Seventeen specimens examined from: MOZAMBIQUE. 14 mls W of Morrumbala.

Variation. Supranasals present, but widely separated; a single post-nasal; occipital usually in good contact with the interparietal; upper labials anterior to subocular 4 (rarely 5); sublabials 5; gulars transversely between posterior sublabials 22 - 27, the median rows irregularly enlarged. Dorsal granules transversely at midbody 88 - 90, enlarged laterally; some scales on side of neck enlarged and conical; collar curved, composed of 5 - 8 plates; ventrals in 16 - 18 longitudinal and 38 - 43 transverse rows; femoral pores in males 19 - 22; lamellae under fourth toe 19 - 22; scales on tibia towards heel and lateral caudals non-spinose.

Coloration. Males - Head dark brown with a well defined pale green median stripe; shoulders and anterior back brown, with three pale green stripes, the whole area suffused with green; the median stripe becomes orange posteriorly, broadening in the pelvic region; tail orange; flanks and limbs brown with pale spots, an orange patch in the armpit. Below - throat and chest white, tinged with orange, a black collar; abdominal and anal regions black; tail black at base, then orange.

Females - Black above, with five narrow longitudinal stripes, orange on head and nape, lemon-yellow on the body, the median and outer rows of stripes continuing onto the tail, where they are Cambridge blue. The vertebral stripe begins on the snout, narrows on the back and widens again on the pelvic region; the second stripe begins on the suprascapular, is continuous until past the shoulder, then breaks up into a series of spots and disappears before reaching the pelvic region; the third stripe begins on the upper edge of the ear opening, breaks up into elongate spots at midbody, but becomes continuous again posteriorly and persists as a lateral stripe. The tail is thus distinctly striped in pale blue and black for its entire length. Below - white, suffused with orange-yellow on the throat, orange laterally and black in the abdominal and anal regions; tail Cambridge blue, suffused with orange at the base and along the median line.

Size. Largest ♂ (UH. 7968 - Allotype) 69 + 104 = 173 mm. Largest ♀ (UH. 7974 - Paratype) 66 + 99 = 165 mm.

Breeding. Females each with two eggs measuring 14 x 6 mm on 21st November.

Diet. Largely ants, also beetles, grasshoppers, a cricket, cockroach, beetle larva, wasps, spider.

Habitat. A small granite outcrop.

Distribution. Known only from the type locality on the edge of the Shire Valley about 25 miles above its confluence with the Zambezi.

#### PLATYSAURUS TORQUATUS Peters

Platyseurus capensis (not A. Smith) Peters, 1854, p. 616 (Tete).

Platyseurus guttatus (not A. Smith) Peters, 1854, p. 616 (Tete).

Platyseurus torquatus Peters, 1879, Sitzb. Ges. Naturf. Freunde Berlin, p. 10; Tete, Mozambique, and 1882, p. 52, pl. ix a; Boulenger, 1885d, p. 262; Bocage, 1896, p. 98; Hewitt, 1909, pp. 31, 38; 1910a, p. 60; FitzSimons, 1943, p. 474; Loveridge, 1944, p. 91; Broadley, 1962a, p. 812.

Platyseurus guttatus torquatus Loveridge, 1953a, p. 238 (Tete).

One hundred and twenty-one specimens examined from: RHODESIA. 3 mls NE of Makaha; Matous; Muro; 25 mls N and 15 mls NE of Mtoko; 3 and 4 mls W of Ruzapanda; Ruaya River Drift and 2 mls W. MOZAMBIQUE. Changara; 3 mls S of Guro; Kasumbhedze; Magasso; Mutundo; 10 mls W, 12 mls WNW, 8 and 12 mls SW of Mangari; 15 mls SSW of Tete.

**Variation.** Nasals usually in contact; a single postnasal; occipital usually in contact with interparietal; upper labials anterior to subocular 4 or 5 (rarely 3); sublabials 5 (rarely 4 or 6); gulars transversely between posterior sublabials 19 - 27, median rows not appreciably enlarged. Dorsal granules transversely at midbody 72 - 92, enlarged laterally; scales on side of neck enlarged, flattened; collar curved, composed of 5 - 10 plates; ventrals in 16 - 20 (usually 18) longitudinal and 35 - 47 transverse rows; femoral pores in males 15 - 23; lamellae under fourth toe 18 - 23; scales on tibia towards heel and lateral caudals non-spinose.

**Coloration.** Adult males: Above, head and body dark brown, with three longitudinal buff stripes, the dorso-lateral body stripes are very broad and ill-defined, flanks and tail bright orange, limbs grey-brown. Below, throat white, a broad black collar; chest orange or yellow, suffused with bright green, becoming prussian blue on the belly, anal region blue-black; tail bright orange.

Females and juveniles: Above, blackish-brown with three well-defined buff longitudinal stripes, light spots between the stripes are few or absent; tail Cambridge blue with a dark median stripe anteriorly. Below, throat white, suffused with yellow or grey; chest white, belly and base of tail orange, rest of tail Cambridge blue.

**Size.** Largest ♂ (NSR 4764 - 3 mls W of Nyampanda) 70 + 120 = 190 mm. Largest ♀ (NSR. 4765 - 3 mls W of Nyampanda) 60 + 116 = 184 mm.

**Breeding.** Adult females contain two eggs measuring about 18 x 7 µm in early December and these are laid about the middle of this month.

**Dist.** Stomach contents of 64 specimens were examined. The main food items were ants (in 67%), beetles (33%) and lepidopterous larvae (30%).

**Habitat.** Granite, paragneiss and sandstone outcrops, especially flat exposures.

**Distribution.** Northeastern Rhodesia and adjoining Mozambique, extending north-east to Matundo on the north bank of the Zambezi opposite Tete.

PLATYSAURUS WILHELMI Hewitt.

Platysaurus wilhelmi Hewitt, 1909, Ann. Tvl. Mus., 2, p. 29 and 1910a, pl. 1, fig. 2: Felspruit, E. Transvaal.

Platysaurus guttatus guttatus (not A. Smith) Maccas, 1952, p. 153, pl. 1, fig. 3 (Namacha).

Platysaurus intermedius wilhelmi Broadley, 1964b, p. 1.

Literature record. MOZAMBIQUE. Namacha.

Variation. Nasals in contact or separated; a single postnasal; occipital usually in good contact with interparietal; upper labials anterior to subocular 4 (rarely 3 or 5); sublabials 5 (rarely 6); gulars transversely between posterior sublabials 16 - 20, the median row strongly enlarged transversely. Dorsal granules transversely at midbody 74 - 86, enlarged laterally; scales on side of neck enlarged, conical; collar curved, composed of 5 - 10 plates; ventrals in 16 - 18 longitudinal and 36 - 40 transverse rows; femoral pores in males 15 - 19; lamellae under fourth toe 17 - 21, scales on tibia towards heel and lateral caudals strongly spinose.

Coloration. Adult males - Above, dull olive green or brown with a few scattered ill-defined pale spots, tail red; below, throat blue-green mottled with black, chest and belly black, tail red.

Females and juveniles - Above, brown with three longitudinal buff stripes and light spots between the stripes; below throat white, chest and belly brownish mesially, white laterally.

Size. Largest ♂ (UM, 2231 - Namacha) 75 + 129\* = 204 mm. Largest ♀ (UM, 2246 - Namacha) 70 + 55\* mm.

Discussion. This form is not known to intergrade with either typical *P. intermedius* of the Transvaal or *P. i. natalensis* of northern Natal and Swaziland, but neither is it known to be sympatric with either of them.

Distribution. Southeastern Transvaal, extending south along the escarpment to the Ukombo Range in Zululand.

PLATYSAURUS PURNZEI MAKAI Broadley

Platyssaurus intermedius Makai Broadley, 1964, *Arnaldia* (Rhodesia), 1, No. 5, p. 1: Fifteen miles south-east of Vila de Manica, Mozambique.

Ninety-nine specimens examined from: MOZAMBIQUE. Bandula; Chicamba Dam; Motuchira; Revue; Semo; 3 mls N. of Vanzusi; 15 mls SE of Vila de Manica; 10 mls WNW and 5 mls NW of Vila Fery.

Variation. Nasals usually in contact (western populations) or separated by an <sup>scale</sup>anxygous/(eastern populations); a single postnasal; occipital usually very small or absent; upper labials anterior to subocular 4 or 5; sublabials 5; gulars transversely between posterior sublabials 19 - 27, the median row enlarged. Dorsal granules transversely at midbody 74 - 92, enlarged laterally; scales on side of neck enlarged, spinose; collar curved, composed of 6 - 10 plates; ventrals in 14 - 16 longitudinal and

31 - 40 transverse rows; femoral pores in males 13 - 20; lamellae under fourth toe 19 - 24; scales on tibia towards heel and lateral caudals spinose.

Coloration. Adult males - Above, blackish-olive, or dark bronze, tail orange; below throat greyish-white, chest and belly purple (western populations) or black (eastern populations).

Females and juveniles - Above, black with three cream longitudinal stripes, the vertebral stripe poorly defined and broken up into a series of spots or dashes, no pale spots between the stripes; bluish-white below.

Size. Largest ♂ (UM. 6090 - 5 mls NW of Vila Pery)  $90 + 136^* = 226$  mm. Largest ♀ (UM. 6095 - 5 mls NW of Vila Pery)  $78 + 112^* = 190$  mm.

Discussion. The forms included under this taxon show much variation. The type series was drawn from two western populations which closely resemble P. wilhelmi and are smaller than eastern specimens of blakei, the largest ♂ measuring 80 mm from snout to vent and the largest ♀ 72 mm. Apart from larger size, the eastern populations differ from typical blakei in the coloration of the males, which are bronze above and black below, and the high frequency of an axygous scale separating the nasals (90% at 10 mls WNW of Vila Pery; 75% at 5 mls NW of Vila Pery and 60% at the most easterly locality - Metuchira). The situation is complicated by intergradation between pungweensis and blakei: specimens from 3 mls N of Vandusi being closer to blakei, while those from Matareca and 12 mls SSE of Vila Gouveia are pungweensis, but showing a high incidence of axygous internasals (40% and 57% respectively).

P. i. rhodesianus also occurs on the southern part of the Manica Platform and the locality records for this form and blakei form a mosaic, the two often occur on kopjes within a few miles of one another. The only place where introgression occurs is at Chicumba Dam, where occasional specimens in a blakei population have rhodesianus markings. The evidence at present available suggests that there is almost complete reproductive isolation between rhodesianus and blakei and that pungweensis should be raised to specific rank and blakei made a subspecies of it. There is no sign of intergradation between P. p. munitensis and P. i. subniger in the Vila Gouveia area.

Breeding. Two eggs, measuring about  $17 \times 7$  mm, are laid in late November or December.

Diet. Ants are the most important food item, but a wide range of invertebrates are eaten.

Habitat. Granite outcrops, including very small isolated ones on the eastern edge of the Manica Platform at Metuchira.

Distribution. The southern portion of the Manica Platform, i.e. south of the Pungwe River.

## PLATYSAURUS FUNGWEENSIS FUNGWEENSIS Broadley

Platyseurus guttatus fungusensis Broadley, 1959, Occ. Pap. Nat. Mus. S. Rhod., 23 B, p. 314; Pungwe River at 2,400 feet, Rhodesia, and 1962i, p. 813.

Forty-eight specimens examined from: RHODESIA. Chinyamara; Pungwe River at Holdenby; Inyanga Tea Estates. MOZAMBIQUE. Matareca; 12 mls SSE of Vila Gouveia.

Variation. Nasals usually in contact (Rhodesian populations) or separated by an oxygous scale (Mozambique populations); a single postnasal; occipital small or absent; upper labials anterior to subocular 4 or 5; sublabials 5 (rarely 4); gulars transversely between posterior sublabials 20 - 27, the median row slightly and irregularly enlarged. Dorsal granules transversely at midbody 76 - 100, strongly enlarged laterally; scales on side of neck enlarged, spinose; collar curved, composed of 6 - 11 plates; ventrals in 14 - 16 (rarely 18) longitudinal and 32 - 38 transverse rows; femoral pores in males 14 - 19; lamellae under fourth toe 18 - 23; scales on tibia towards heel and lateral cuticals spinose.

Coloration. Adult males - Above, dark brown with conspicuous pale spots, which are more numerous laterally, tail dull red, becoming dark brown distally. Below, throat pale blue with irregular black blotches, a black collar, chest light blue, belly dark blue apically, tail coral red.

Females and juveniles - Above, black with three longitudinal buff stripes on the head, the narrow lateral stripes continue to the base of the tail, but the median stripe terminates on the nape, or is represented by a few scattered spots posteriorly, no light spots between the stripes. Below, bluish-white, a few ill-defined dark blotches on the throats of some juveniles, base of tail orange.

Size. Largest ♂ (IBSR, 1975 - Holotype) 87 + 148 = 235 mm. Largest ♀ (UM, 3861 - Holdenby) 78 + 130 = 208 mm.

Discussion. Although almost surrounded by populations of P. i. subniger and P. i. rhodesianus there is no evidence of gene flow between either of these and P. p. fungusensis, which is very distinct in coloration and lepidocis and seems to be a good species.

Diet. Largely beetles and ants, supplemented by a wide variety of other invertebrates.

Habitat. Granite outcrops.

Distribution. The Hondo and Pungwe valleys in eastern Rhodesia, extending down the Pungwe to Matareca in Mozambique and north towards Vila Gouveia.



## PLATYSAURUS INTERMEDIUS RHODESIANUS FitzSimons

Platysaurus guttatus (Not A. Smith) Chubb, 1909a, p. 593 (Matopos; Colleen Bawn) and 1909b, p. 35 (part - Khami River); Hewitt, 1909, p. 30 (part - Khami River; Matopos); Hewitt & Power, 1913, p. 154 (Insisa); FitzSimons, 1930, p. 31 (part - Matopos), also 1935b, p. 350 (Matopos; Zimbabwe) and 1939b, p. 31 (Vumba Mtn.; Changadzi River; Devuli River Bridge).

Platysaurus capensis (not A. Smith) Boulenger, 1910, p. 469 (part - Importuni District).

Platysaurus guttatus rhodesianus Fitz Simons, 1941, Ann. Tvl. Mus., 20, p. 279; Vumba Mountain, Rhodesia (also Matopos; Insisa; Plumtree; Importuni; Chilimnzi; Driefontein; Bikita; Espandene; Tsessebe; Gwanda; Strathmore; Zimbabwe; Vumba Mtn.; Changadzi River; Devuli River - remaining localities refer to P. i. subsp. nov.) and 1943, p. 481 (part); Loveridge, 1944d, p. 86 (part); Tasman, 1957, p. 34 (part); Broadley, 1962d, p. 814.

Three hundred and eighty-three specimens examined from: HIGHLAND. Poloy; Mabete; Madinare; Tsessebe; Wolf Hills. RHODESIA. Baselay Bridge; Benbeni and 5 mls. S; Beitbridge - 18 mls N; 9, 12, & 30 mls W of Birchborough Bridge; Burns; Changadzi River Bridge; Chayiro Bridge; Chibakwe Bridge - 8 mls E and 12 mls WSW; Chibi; Chido; Chinyamanda; Chipinda Pools; 12 mls. E of Chisumbanje; Chitoro River; <sup>Conde</sup> Devuli River Bridge; Dora; Dott's Drift and 4 mls SE; Felixburg Road; Fern Valley; Glass Block; Gwanda; Gwelo; Heathfield; Helvetia; Hippo Mine and 6 mls E; Importuni; Insisa; Kapeni; Khari Dam; Kyle Dam; Limpopo - Umsingwane Confluence; Lundi River Bridge - 4 mls. N and 8 mls SW; Marungudzi; Matopos; Manyoli Ranch; Modisa; 4 mls NNE of Mpaisi Bridge; Mtunzurumini; Mutambara; Nelson South; Nuanetsi Gorge 7 mls above Malipati Drift; Nyamashata River; 3 mls NE of Odni; Plumtree; Redcliff; Rosa Division; Rusere; Sabi - Lundi Confluence; Sabi - Macheke Confluence; Sabi - Makuni Confluence; Sabi River (Marankwa Reserve); Sentinel Ranch; Shangani River; Shashi - Sheshani Confluence; Soti Source; Strathmore; Tsungwesi; Tsungwesi Bridge; Tuli; Ustali; Vumba Mountain; West Selungwe; Whitewaters Bridge; World's View, Matopos; Zimbabwe. MOZAMBIQUE. Bandala; Chemezi; Douio; Garuso; 4 mls W and 7 mls E of Vila de Manica; 10 mls SW of Vila Pery; Xembe.

All available material has been examined, so the above list includes all literature records.

Variation. Nasals commonly in contact, separated in 30%; a single post-nasal; occipital commonly in contact with interparietal, separated in 30%; upper labials anterior to subocular usually 4, 5 in 25%; sublabials 5 (rarely 4 or 6); gulars transversely between posterior sublabials 18 - 32, the median

row slightly and irregularly enlarged. Dorsal granules transversely at mid-body 76 - 102, enlarged laterally; scales on side of neck enlarged, spinose; collar curved, composed of 6 - 15 plates; ventrals in 18 - 24 longitudinal and 36 - 47 transverse rows; femoral pores in males 15 - 28; lamellae under fourth toe 17 - 28; scales on tibia towards heel and lateral caudals spinose.

Coloration. Adult males. Above, head blue-green or yellow-green, usually with faint indications of three pale stripes, body usually blue-green or yellow-green anteriorly (red in some Mozambique specimens), red (western specimens) or green (eastern specimens) posteriorly, tail greenish or yellowish (base of tail orange in specimens from the Manica Platform). Below, two colour phases occur. "Red Phase" - throat blue, a black collar, chest terracotta, belly black mesially. "Green Phase" - throat yellow, a black collar, chest blue or green, belly black mesially.

Females and juveniles: Above, black, with three well-defined cream stripes, the vertebral one much narrower than the lateral ones, usually no light spots between the stripes, tail straw with a dark median stripe. Below, bluish-white, with a pale orange patch on the chest, belly with a black patch or spotted with black mesially, base of tail pale orange, rest of tail straw-yellow.

Size. Largest ♂ (MSR. 5321 - Gwelo) 127 + 188 = 315 mm. Largest ♀ (MSR. 2009 - Matopos) 104 + 172 = 276 mm.

Discussion. I have previously (1964d, p. 2) pointed out that the type of *P. guttatus* has a brille in the lower eyelid and represents the dwarfed species formerly called *P. minor* FitzSimons. The correct name for the large, widespread, species under consideration here is *P. intermedius* Matschie.

Breeding. Two eggs measuring about 20 x 10 mm are laid during December.

Diet. Stomach contents of 160 specimens were examined, the food items occurring most frequently were ants (in 45% of stomachs), beetles (34%), vegetable matter (20%), cockroaches (12%), bees and wasps (12%) and lepidopterous larvae (10%). One ♂ had eaten a young *Tiphloserus*.

Habitat. Granite, paragneiss and sandstone outcrops. One was found under the loose bark of a dead tree lying on a granite outcrop and another was living between the wall and roof of a pump house adjacent to a granite outcrop.

Distribution. Southern parts of Rhodesia, extending into eastern Bechuanaland, Transvaal north of the Boutsansberg and the south-western part of the Manica Platform. Relict populations occur in the Wenkie and Binga Districts of north-western Rhodesia,

## PLATYSAURUS INTERMEDIUS SUBNIGER Broadley

Platysaurus guttatus (not A. Smith) Boulenger, 1902, p. 16 (Masoe); Chubb, 1909b, p. 35 (part - Lomagundi District); Hewitt, 1909, p. 38 (Near Salisbury).

Platysaurus capensis (not A. Smith) Boulenger, 1910, p. 469 (part - Salisbury).

Platysaurus guttatus rhodesianus (part) FitzSimons, 1941, p. 279 (Penhalonga; Chishawasha; Salisbury; Hanyani River; Bindura; Masami; Mtoko) and 1943, p. 481; Loveridge, 1944d, p. 86; Tasman, 1957, p. 34, photos 5 & 6.

Platysaurus guttatus subniger Broadley, 1962, Occ. Pap. Nat. Mus. S. Rhod., 26 B, p. 814; Watsonba, Untali District, Rhodesia.

One hundred and seventy-six specimens examined from: RHODESIA.

Ambi Falls; Bindura; Chera; Chibakwe River Bridge; Chikupo Caves; Chimoyo; Chinyika Reserve; Chishawasha; Concession - 10 mls NW; Domboshawa; Erin Forest Reserve; Inyangombe River; Inyaura; Kwakasipi; Lake MacIlwaine; Mandia; Marandellas; Matindza; Masoe; Mtoko - 7 mls NE, 15 mls NE; Mtoroshanga - 5 mls SSW; Mapapate River Bridge; Nyamakanga; Nyadiri; Odsani River (Lower); Palm Block; Penhalonga; Peterhouse; Rusape - 10 mls. N; Salisbury; Shawanoe River Bridge; Trelawney; 14 mls N of Untali; Uminsidale; Warwickshire Estate; Wick Farm; Zema; Zongoro Bridge.

MOZAMBIQUE. Comacha; Mhanda Mtn.; 20 mls ESE of Vila Gouveia.

All available material has been examined, so the above list includes all literature records.

Variation. Nasals usually widely separated; a single postnasal; occipital and interparietal separated or in contact; upper labials anterior to subocular usually 5; sublabials 5 (rarely 4, 6, 7 or 8); gulars transversely between posterior sublabials 24 - 35, the median row slightly and irregularly enlarged. Dorsal granules transversely at midbody 78 - 100, enlarged laterally; scales on side of neck enlarged, spinose; collar curved, composed of 5 - 13 plates; ventrals in 18 - 22 longitudinal and 34 - 44 transverse rows; femoral pores in males 16 - 24; lamellae under fourth toe 19 - 27; scales on tibia towards heel and lateral caudals spinose.

Coloration. Adult males - above, dark green anteriorly, brownish posteriorly, sometimes almost black (males from Trelawney have uniform red bodies), numerous distinct pale dorsal spots; tail orange. Below, throat orange, yellow or white, uniform or spotted or infuscated with black, sometimes uniform black; chest and belly uniform black.

Females and juveniles - above, black, with three cream longitudinal stripes, the vertebral stripe narrow and sometimes broken up posteriorly, the lateral ones broad and well-defined; tail buff, with a dark median stripe. Below, throat white to yellow, infuscated with grey, chest greyish-white, belly black mesially; base of tail orange, remainder grey.

Size. Largest ♂ (U.N. 1992 - Holotype) 130 + 205 = 335 mm. Largest ♀ (U.N. 7771 - Paratype) 99 + 147 = 246 mm.

Breeding. Two eggs measuring about 24 x 10 mm are laid during December.

Diet. Stomach contents of 73 specimens were examined. Beetles were present in 45%, other important food items being ants (30%), lepidopterous larvae (29%), termites (14%) and vegetable matter (13%).

Habitat. This form occurs at higher altitudes than any other Platysaurus, being found with Gerrhonotus s. rhodesianus on the summit of Nyamkanga (6,677 feet) in the Inyanga National Park; these two species are rarely found together. In Rhodesia P. i. sublinearis does not seem to occur below 3,500 feet, being replaced by P. torquatus and P. inermis at lower altitudes in Mtoho District. It is found below 2,000 feet in Mozambique.

Distribution. North-eastern Rhodesia and western parts of the Malawi Platform. It is sympatric with both P. torquatus and P. inermis in the vicinity of Mtoho, but competes with both and is replaced by them in the north-eastern corner of Mtoho District and adjoining Mozambique. It is replaced by P. n. unguensis in the lower Inyanga Valley.

PLATYSAURUS INTERMEDIUS NEBESAE Loveridge

Platysaurus guttatus nebesae Loveridge, 1953, Bull. Mus. Comp. Zool., 116, p. 237: Nyamkanga, Malawi.

Thirty-five specimens examined from: MALAWI. Nyamkanga (including the paratype); Mozambique. MOZAMBIQUE. Zobue (Gadole Peak on the Malawi border).

Variation. Nasals usually in contact; a single postnasal; occipital usually separated from interparietal; upper labials anterior to subocular usually 5; sublabials 5 (4/6 in the paratype); gulars transversely between posterior sublabials 22 - 30, median row slightly enlarged. Dorsal granules transversely at midbody 78 - 92, enlarged laterally; no anterior patch of enlarged scales on the neck, posterior patch enlarged, conical; collar curved, composed of 7 - 12 plates; ventrals in 18 (rarely 16 or 20) longitudinal and 35 - 41 transverse rows; femoral pores in males 18 - 23; lamellae under fourth toe 19 - 24; scales on tibia towards heel and lateral margins non-spinose.

Coloration. Adult males - Above, dark olive green, becoming brown posteriorly with very faint pale dorsal spots, tail orange. Below, throat dull blue or bright orange, no collar, chest and belly purplish-black, suffused with orange laterally.

Females and juveniles: Above, black with three very narrow, but well-defined, buff longitudinal stripes, the vertebral stripe ill-defined posteriorly, no light spots between the stripes. Below, white, belly orange mesially.

Size. Largest ♂ (UM. 4115 - Mpatamanga)  $102 + 161 = 263$  mm, but UM.4097 from Zolus measures 105 mm from snout to vent. Largest ♀ (UM. 4120 - Mpatamanga)  $90 + 128 = 218$  mm, the holotype ♀ (MZ, 50655) measures 91 mm from snout to vent.

Remarks. This form differs from other races of *P. intermedius* in lacking an anterior patch of enlarged scales on the neck. It agrees with *P. i. rhodesianus* in having the nasals usually in contact, but resembles *subniger* in its high upper labial count. It has a lower average ventral count than either *rhodesianus* or *subniger*.

Breeding. On 13th December at Mpatamanga, four females had recently laid their eggs, three more each contained two eggs averaging  $21 \times 10$  mm.

Diet. Stomach contents of 32 specimens were examined. The most important food items were ants (53%), beetles (44%), lepidopterous larvae (31%), vegetable matter (16%) and cockroaches (13%).

Parasites. Nematodes (*Pharyngodon* sp. and *Thubunsea* sp.) were recovered from the stomachs of the types (Loveridge, 1953a).

Habitat. Paragneiss outcrops.

Distribution. South-western Malawi from the Shire Valley to the Mozambique border at Cadole Peak near Zolus.

#### PLATYSAURUS IMPERATOR Broadley

*Platysaurus imperator* Broadley, 1962, Occ. Pap. Nat. Mus. S. Rhod., 26 B, p. 816: Matowa, Mtoko District, Rhodesia.

Eighty specimens examined from: RHODESIA. Chinoyo; 2 mls NE of Makaha; Maramba Reserve; Matowa; 33 mls N and 7 & 15 mls NE of Mtoko; Nyadiri; Ruanya River Drift. MOZAMBIQUE. 3 mls S of Guro; Magasso; 10 mls W, 12 mls WNW and 12 mls SW of Hungari.

Variation. Nasals in contact or separated; a single postnasal; occipital separated from interparietal; upper labials anterior to subocular usually 5; sublabials 5 (rarely 4 or 6); gulars transversely between posterior sublabials 28 - 39, the median row smallest. Dorsal granules transversely at midbody 84 - 105, enlarged laterally; no anterior patch of enlarged scales on side of neck, posterior patch of enlarged pyramidal scales; collar curved, composed of 7 - 14 plates; ventrals in 22 - 24 (rarely 26 or 28) longitudinal and 40 - 53 transverse rows; femoral pores in males 17 - 24; lamellae under fourth toe 23 - 28; scales on tibia towards heel and lateral caudals non-spinose.

Coloration. Adult males: Above, head ochre yellow, body crimson anteriorly, with numerous large pale spots, ochre yellow posteriorly and on tail; limbs black. Below, throat brick red, a broad black collar, chest reddish or yellowish; limbs, belly and anal region black; tail orange to light yellow.

Females and juveniles: Above, black, with three light longitudinal stripes, these are broad and bright yellow on the head, but narrower and cream-coloured on the body, the vertebral stripe very narrow, broken up or absent posteriorly, the lateral stripes broad, but with uneven or blurred edges; no light spots between the stripes; tail straw-coloured. Below, throat dirty white, tinged with yellow, a divided black collar, chest yellowish white, infuscated with black, belly largely black; tail dirty white, infuscated with black.

Size. Largest ♂ (NSR. 4819 - holotype)  $146 + 246 = 392$  mm. Largest ♀ (NSR. 4561 - Matowa)  $116 + 180 = 296$  mm, but NSR 4859 from Ruanya River Drift measures 130 mm from snout to vent.

Breeding. Females collected in mid-December each contained two eggs averaging  $24 \times 10$  mm.

Diet. Stomach contents of 58 specimens were examined. The most important food items were beetles (67%), lepidopterous larvae (40%), ants (19%), termites (12%) and grasshoppers (11%).

Longevity. An adult male collected with the type series in December, 1960 has lived in captivity for five years.

Habitat. Although sympatric with P. torquatus throughout most of its range P. imperator occupies a different microhabitat - living on the tops of kopjes or big boulders, while P. torquatus inhabits the lower levels and flat rock exposures along river courses. P. i. subniger occupies an intermediate position and competes with both the larger and smaller species in a narrow zone of sympatry.

Distribution. North-eastern Rhodesia and adjoining Mozambique.

#### Genus CHAMAESSAURA Schneider

Chamaessura Schneider (part), 1901, Hist. Amphib., 2, pp. 205, 210. Type by designation of Fitzinger, 1826: Lacerta anguinea Linnaeus.

Mancus Cope, 1862, Proc. Acad. Nat. Sci. Philadelphia, p. 339. Type by monotypy: M. macrolenis Cope.

## CHAMAESAURA MACROLEPIS MIOPROPUS Boulenger

Chamaesaura miopropus Boulenger, 1894, Proc. Zool. Soc. London, pp. 724, 732: Fwanbo, Zambia; Loveridge, 1944d, p. 107 and 1957, p. 226.

Sixteen specimens examined from: ZAMBIA. Abercorn; Katete; Nyika Plateau. MALAWI. Nyika Plateau (Chelinda Depot and Nganda Mtn.).

Literature record. ZAMBIA. Fwanbo (near Abercorn).

Variation. Supraciliaries 3; upper labials anterior to subocular 3 (rarely 4); lower labials 4; large chin shields 4 (rarely 3); midbody scale rows 24 - 26; transverse rows of dorsals from parietal to above vent 38 - 40; limbs monodactyle; a single femoral pore.

Coloration. Light olive to dark brown above, with a pair of dark dorso-lateral stripes, a pale upper lateral stripe, flanks pale olive or yellowish, lighter ventrally.

Size. Largest ♂ (UM. 9192 - Chelinda, Nyika Plateau)  $92 + 225^* = 317$  mm. Largest ♀ (NMR. 3207 - Abercorn)  $120 + 480 = 600$  mm. another ♀ (UM. 9437 - Katete) is  $126 + 460 = 586$  mm.

Discussion. Loveridge (1944d) followed Boulenger (1894) in regarding C. miopropus (midbody scale rows 24 - 26; forelimbs minute) as specifically distinct from C. macrolepis (22 scale rows; forelimb absent). Witte (1953, p. 67) has recorded a range of 22 - 26 in midbody scale rows for 136 miopropus from the Upenba National Park. I consider miopropus to be a northern race of C. macrolepis, distinguished solely by the presence of vestigial forelimbs. The 600 mile gap separating the two races is less than that dividing Chamaesaura a. anguina from its northern race tervieri.

Breeding. A ♀ collected on the Zambian sector of the Nyika Plateau by V. J. Wilson on 27th November, 1963 contained four fully developed young averaging  $40 + 118 = 158$  mm. Another ♀ collected at Katete on 8th May contained six small embryos.

Diet. A ♀ from Nganda Mountain contained a single grasshopper.

Habitat. Montane grassland.

Distribution. Southern Tanganyika, west through northern Malawi and Zambia to Katanga and Angola. It may yet be found on the Vignya, Zomba and Mlanje Plateaux.

## CHAMAESAURA MACROLEPIS MACROLEPIS (Cope)

Uta macrolepis Cope, 1862, Proc. Acad. Nat. Sci. Philadelphia, p. 339:

Natal.

Chamaesaura macrolepis Tasman, 1957, p. 35, photos 7 & 8 (Chimanizani Mtns.); Broadley, 1962d, p. 820.

Two specimens examined from: RHODESIA. Chimanimani Mountains (Bundi Valley; Dragon's Tooth).

Literature Record. RHODESIA. Chimanimani Mountains.

Variation. Supraciliaries 3; upper labials anterior to subocular 3; lower labials 4; large chin shields 3 - 4; midbody scale rows 22; transverse rows of dorsals from parietal to above vent 39; forelimb absent, hindlimb monodactyle; a single femoral pore.

Coloration. Similar to *G. n. micropsus*.

Size. Larger ♀ (NMSR. 3220 - Dragon's Tooth) 120 + 450 = 570 mm.

Diet. A grasshopper in the smaller ♀. The larger ♀ fed readily on grasshoppers in captivity (Tasman, 1957).

Habitat. Thick, moderately long grass above 5,000 feet.

Distribution. Natal, Zululand, Swaziland and south-eastern Transvaal, with a relict population on the Chimanimani Mountains. It may occur on other parts of the eastern escarpment and the summit of Geronzosa Mountain is a likely locality.

#### Family LACERTIDAE

#### Genus GASTROPHOLIS Fischer

*Gastropholis* Fischer, 1886, Abhand. Nat. Ver. Hamburg, 2, p. 1.

Type by monotypy: *G. vittata* Fischer.

#### GASTROPHOLIS VITTATA Fischer

*Gastropholis vittata* Fischer, 1886, Abhand. Nat. Ver. Hamburg, 2, p. 1, pl. 1, fig. 1: "Zanzibar" (? = coast of mainland opposite - Loveridge, 1957, p. 226); Loveridge, 1920, p. 147 (Lumbo) and 1956 b, p. 7.

None examined.

Literature Record. MOZAMBIQUE. Lumbo.

Description of Lumbo ♀ (after Loveridge, 1956b). Supraoculars 4; granules between supraoculars and supraciliaries 4 - 5; supraciliaries 6 - 7; an axyous scale anterior to interparietal, which is followed by a small occipital; parietals separated; gular scales between symphysis of chin shields and median collar scale 21; collar composed of 9 enlarged scales; enlarged shields on forearm anteriorly 7; dorsals keeled in 26 rows at midbody; ventrals keeled in 12 longitudinal and 32 transverse rows; preano-femoral pores 10; lamellae beneath fourth toe 20 - 21.



Coloration. ♂♂ Dull green anteriorly, brown posteriorly, with a pale dorso-lateral stripe. ♀ Pale brown above, with a broad white black-edged dorso-lateral stripe from the nape to base of tail, continuing on the tail as a series of white spots, white below.

Size. ♀ (Loveridge, 1920 - Lumbo) 67 mm from snout to vent. The ♂ type of *G. unasia* (a synonym) measured  $109 + 326 = 435$  mm. A ♀ cotype of *G. vittata* measured  $82 + 195 = 277$  mm.

Distribution. The coastal plain of Tanganyika and northern Mozambique.

Genus *HOLASPIS* Gray

*Holaspis* Gray, 1863, Proc. Zool. Soc. London, p. 152. Type by monotypy:  
*H. guentheri* Gray.

*HOLASPIS GUNTHERI LAEVIS* Werner

*Holaspis Guentheri laevis* Werner, 1895, Verh. Zool. Bot. Ges. Wien, 45, p. 191, pl. v, fig. 4: Usambara Mountains, Tanganyika; Loveridge, 1953a, p. 233 (Ruo River Market); Broadley, 1963b, p. 286.

*Holaspis guentheri* Boulenger (part) 1921, pp. 377, 340 (Zomba); Cott, 1934, p. 163 (Amatongas).

Seventeen specimens examined from: MALAWI. Lujeri Estate. MOZAMBIQUE. Cavallo.

Literature records. MALAWI. Ruo River Market (Lujeri); Zomba. MOZAMBIQUE. Amatongas.

Variation. Collar composed of 8 - 12 plates; dorsals transversely at midbody 58 - 80; ventrals in 6 longitudinal and 25 - 33 transverse rows; femoral pores 17 - 25 on each side; lamellae beneath fourth toe 18 - 26.

Coloration (in life) Black above; a broad cream median stripe on head, terminating on nape; a pair of cream dorso-lateral stripes from suprascapularies to base of tail, where they merge; another cream lateral stripe extends from the upper labials above shoulder to base of tail; tail black with a median series of confluent Cambridge blue spots, serrated lateral scales yellow. Below, throat, limbs and anal region cream, chest and belly orange, tail blue, lateral fringe scales yellow.

Size. Largest ♂ (UM. 4236 - Lujeri)  $48 + 73^{\circ} = 119$  mm. Largest ♀ (UM. 4239 - Lujeri)  $49 + 64^{\circ} = 113$  mm. Both sexes reach a snout - vent length of 50 mm.

Diet. Cott (1934) recovered a grasshopper, a spider and caterpillars from the stomachs of his Amatongas specimens. The Cavallo lizards were feeding on ants.

Habitat. Restricted to the trunks of lowland forest trees. At Lujeri they were plentiful on a few big trees left standing in an area recently cleared for tea planting. They were common in similar circumstances at Cavale, where riverine forest just east of Gorongosa Mountain was being destroyed by the local Africans. At Lujeri they were associated with Makaya maculilabris, but the only other arboreal lizards collected at Cavale were Hemidactylus platycephalus and Agama gransagaster.

Distribution. The East African lowlands from north-east Tanganyika south through Mozambique to the Amatungu Forest, extending into south-east Malawi.

Genus NUCRAS Gray

Nucras Gray, 1838, Ann. Nat. Hist. 1, p. 280: Type by monotypy: Lacerta Islandi (sic) Milne-Edwards.

NUCRAS BOULENGERI Neumann

Nucras boulengeri O. Neumann, 1900, Ann. Mag. Nat. Hist., (7) 2, p. 56: "Luba's" = Luba's Village, Busoga, Uganda.

One specimen examined from: ZAMBIA. Isoka Boma (A.M.).

Description. No granules between supraoculars and supraciliaries; supraciliaries 4 - 5; occipital in contact with interparietal; collar plates 4; dorsals smooth, 40 transversely at midbody; ventrals in 8 longitudinal and 32 transverse rows; femoral pores 12 on each side; lamellae under fourth toe 20.

Coloration. Brown above, with scattered dark spots; bluish-white below.

Size. (AM. 9958 D - Isoka Boma) 58 mm from snout to vent (Specimen desiccated and tail broken).

Remarks. Loveridge (1957, p. 231) considered N. kilosa to be a race of N. boulengeri. This seems unlikely on zoogeographical grounds, for kilosa is completely surrounded by populations of typical N. boulengeri. N. kilosa is probably either a synonym or a full species.

Distribution. Kenya and eastern Uganda, south through Tanganyika to north-eastern Zambia. This species is likely to occur in northern Mozambique.

## NUCRAS INTERTEXTA (A. Smith)

Lacerta intertexta A. Smith, 1838, Mag. Nat. Hist. (2) 2, p. 93: "Country near Letakou" = Kuruman, Cape Province.

Nucras intertexta, forma typica Boulenger, 1917, p. 205 and 1920, p. 17 (Kokong); FitzSimons, 1935b, p. 355 (Kuke).

Nucras intertexta intertexta FitzSimons, 1943, p. 318.

Seven specimens examined from: BECHUANALAND. Kuke Pan (TM); Lephape; 10 mls SE of Letlaking (USHM); Molopo River (15 mls S of Tsabong). RHODESIA. Ntshasindama. MOZAMBIQUE. 15 mls S of Magda (TM).

Literature Records. BECHUANALAND. Kokong (near Lehututu); Kuke Pan.

Variation. Granules between supraoculars and supraciliaries 3 - 5; supraciliaries 5 - 7; one or two occipitals, in contact with interparietal; collar plates 7 - 11; dorsals transversely at midbody 38 - 44; ventrals in 8 longitudinal and 30 - 36 transverse rows; femoral pores 12 - 14 on each side; lamellae under fourth toe 24 - 27.

Coloration. Reddish brown above, with a dorso-lateral series of pale spots, there may also be a vertebral series of pale spots or a narrow light vertebral line; side of neck and flanks with light and dark vertical barring anteriorly, breaking up into pale ocelli posteriorly; white below.

Size. Largest ♂ (TM. 14538 - Kuke Pan) 78 + 178 = 256 mm.

Discussion. N. intertexta appears to be a monotypic species. Its distribution overlaps that of N. t. tessellata in southern South West Africa and it is certainly sympatric with N. t. ornata in the northern Transvaal.

Enemies. The Lephape specimen was recovered from the crop of a Secretary Bird (Sagittarius serpentarius).

Habitat. Dry grassy flats surrounding pans in the southern Kalahari.

Distribution. South West Africa, northern Cape Province, southern Bechuanaland, northern Transvaal and southern Mozambique. Possibly a relict population in the Bulawayo District of Rhodesia (on Kalahari sand) (See Fig. 7).

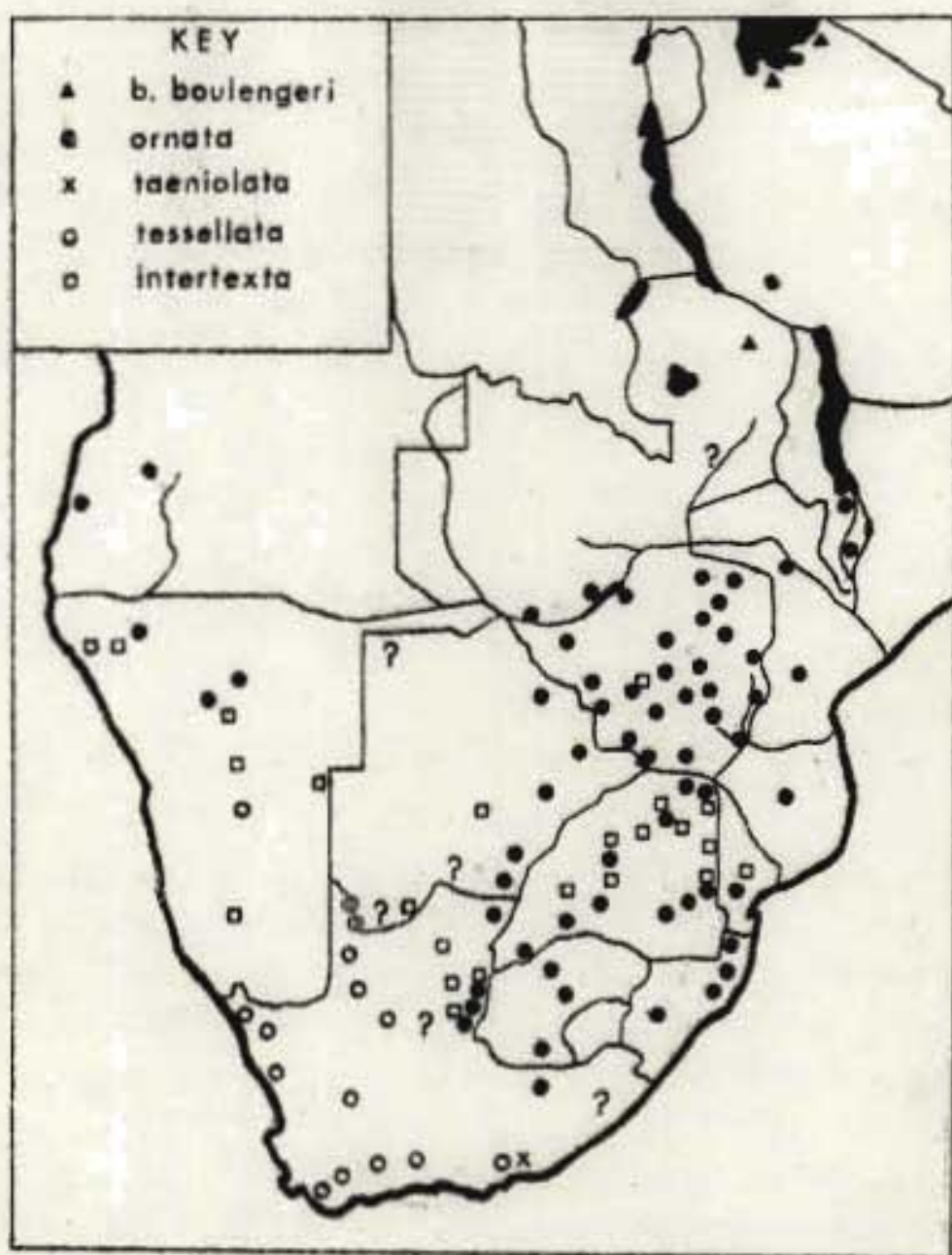


Fig. 7. Distribution of Thersites in northern Africa.

## NUCRAS TESSELLATA ORNATA (Gray)

- Terra ornata* Gray, 1864. Proc. Zool. Soc. London, p. 58: "South-Eastern Africa" (Dr. Kirk) = Zambesi River.
- Bregias holubi* Steindachner, 1882, Sitzb. Ak. Wien, 86, p. 83, pl. 1: Crocodile River, Transvaal.
- Lacerta tessellata* (not A. Smith) Peters, 1882, p. 44 (Tete; Boror); Bocage, 1896, p. 98.
- Lacerta tessellata pseudotessellata* Bedriaga, 1886, Abhand. Senckenberg Ges. 14, p. 377, pl., figs 8, 21: Mozambique.
- Lacerta cameranoi* Bedriaga, 1886, Abhand. Senckenberg Ges., 14, p. 378, pl. figs. 2, 9, 11, 31: Tete, Mozambique.
- Nucras tessellate* (not A. Smith) Boulenger, 1887a, p. 52 (part - Zambesi; Lake Nyasa) and 1891, p. 306; Chubb, 1909a, p. 594 and 1909b, p. 35 (Balawayo); Hewitt & Power, 1913, p. 155 (part - Marandellas); Boulenger, 1920, p. 24 (part) and 1921, p. 382 (part); Thénido, 1941, p. 14, (Massangulo).
- Nucras tessellata* var. *holubi* Boulenger, 1910, p. 474 (Balawayo).
- Nucras intertexta* var. *holubi* Boulenger, 1917, p. 208, also 1920, p. 20 (Bindura) and 1921, p. 382.
- Nucras intertexta cameranoi* Cott, 1934, p. 160 (Charre; Amatongas; Lake Nyasa).
- Nucras intertexta* (not A. Smith) Power, 1927c, p. 407 (Lobatsi; Molepolole); FitzSimons, 1939b, p. 32 (Mount Silinda; Birchenough Bridge).
- Nucras intertexta holubi* FitzSimons, 1943, p. 320; Manacas, 1952, p. 149; (Musanoha; Lifidzi) and 1961, p. 156 (Vila Paiva de Andreda); Broadley, 1962d, p. 821.
- Nucras intertexta ornata* Loveridge, 1953a, p. 227 (Mtimbuka; Ndirandi Mtn.; Tete); Broadley, 1962i, p. 820.

One hundred and forty-one specimens were examined from: BUSHUANA-  
LAND. Francistown; Kanye (TM); Lobatsi (NM); Mochudi (SAM); Molepolole  
(NM); 5 mls S of Nata; Palapye Road (AM); Serowe (AM). RHODESIA.  
Battlefields (NM); Beitbridge (TM); Bembesi; Bindura (SAM); Birchenough  
Bridge (TM & UM); Bulawayo (NSR, NM & SAM); Ghibi; Chiredzi; Chivaka  
River; Empangeni (AM); Essexvale; Fern Valley; Filabusi (AM); Gungun-  
yana; Gwelo; Irisvale; Kapami; Kariba Lake - Buni Confluence; Kyle Lake;  
Makumbi (AM); Marandellas (AM); Marangudzi; Mount Darwin; Mount Silinda  
(TM); Odsi; Old Umtali; Plumtree and 30 mls WNW; Que Que; Redcliff;  
Rusape (AM); Sabi - Lundi Confluence; Salisbury; Shashi - Shashani Con-  
fluence; Somabula; Stanmore; Tegnani; Trelewney (TM); Triangle; Tuli;  
Umtali; Umvuma (NM); Umsilikwe River; Vumba Mtn.; Zana Farm. ZAMBIA.  
Chete Hills; Livingstone; Siantvinda. MALAWI. Cape Molear. MOZAM-  
BIQUE. Boane (TM); Boroma; 12 mls SSE of Changara; Chigubo and 30 km  
WNW (TM); Gorongosa Mountain (NM); Mafonga; 15 km. NE of Moamba (TM);

Literature Records. (All material listed by FitzSimons, 1943, has been re-examined and the localities included in the above list). MALAWI. Mtimbuka; Ndirandi Mtn. MOZAMBIQUE. Amatongas; Charre; Ladidzi; Massangulo; Namach; Tete; Vila Paiva de Andrade.

Variation. Granules between supraoculars and supraciliaries 2 - 7 (rarely 1 or 8); supraciliaries 4 - 8 (usually 6 - 7); occipital usually in contact with interparietal (rarely absent); collar plates 5 - 13; dorsals transversely at mid-body 38 - 64; ventrals in 8 longitudinal and 26 - 34 transverse rows; femoral pores 11 - 20 on each side; lamellae under fourth toe 19 - 30.

Coloration. Above, reddish brown with 2, 3, 5, or 7 light longitudinal stripes, large adults may be almost uniform, but invariably have faint dorso-lateral stripes on the nape, most specimens have clear vertebral and dorso-lateral stripes, while the flanks have two light stripes or a row of pale spots above a stripe, or there may be light and dark vertical bars anteriorly, or the flanks may be uniformly speckled; tail vermilion to red-brown (powder blue in some south Mozambique populations); white below.

Size. Largest ♂ (MZ. 50999 - Tete) 88 + 231 = 319 mm. Largest ♀ (BM. 1837.7.2 - Lake Nyasa) 96 + 135\* = 231 mm.

Discussion. Although this form is sympatric with H. intertexta, its distribution nowhere overlaps that of H. tessellata (See Fig. 7), so it is provisionally placed as a race of that species.

Diet. A large adult collected 12 miles SSE of Changara contained a scorpion (Buthus sp.)

Enemies. Adult specimens were recovered from the stomachs of a Galamelanus H. violacea at Jersey Estate and Atractaspis bibroni at Plumtree and Bulawayo. Both these snakes are nocturnal and must have entered the lizards' burrows to seize their prey.

Habitat. Widespread in savanna, but the populations living at low altitudes on the coastal plain and in the big river valleys reach a much greater size than those from the Rhodesian plateau or eastern Bechuanaland.

Distribution. South-eastern Africa, from Lake Malawi south to Natal, the Orange Free State and north-eastern Cape Province; it occurs in eastern Bechuanaland, is absent from the Kalahari, but reappears in northern South West Africa and south-western Angola.

NUCHAS TESSELLATA TESSELLATA (A. Smith)

Lacerta tessellata A. Smith, 1838, Mag. Nat. Hist. (2) 2, p. 92: "Eastern parts of the Cape Colony."

Nuchas tessellata Hewitt & Power, 1913, p. 155 (part - Ky Ky; Nosob; Lower Molopo); FitzSimons, 1943, p. 315; FitzSimons & Brain, 1958b, p. 101.

Seven specimens examined from: CAPE PROVINCE.- BECHUANALAND BORDER. Auob-Jossob Confluence (MM); Ky Ky (AM & MM); Nossob River (AM & MM); Twee Rivieren (TH).

Variation. Granules between supraoculars and supraciliaries 2 - 4; supraciliaries 6 - 8; occipital in contact with interparietal (absent in one); collar plates 5 - 9; dorsals transversely at midbody 40 - 44; ventrals in 8 longitudinal and 29 - 32 transverse rows; femoral pores 13 - 15 on each side; lamellae under fourth toe 26 - 30.

Coloration. Above, black anteriorly, with four sharply defined yellow longitudinal stripes, flanks vertically barred in black and yellow, posterior half of body and tail uniform buff to orange; white below.

Size. Largest (MM - Lower Nossob River) 77 + 168 = 245 mm.

Habitat. Dry sand-veld.

Distribution. Dry areas of the southern and western Cape Province and southern South West Africa, occurs on the South-western border of Bechuanaland in the Kalahari Gemsbok National Park.

Genus *LATASTIA* Bedriaga

Latastia Bedriaga, 1884, Ann. Mus. Civ. Stor. Nat. Genova, 20, p. 307.

Type by designation of Loveridge, 1957: Lacerta sambarica Blanford = L. longicaudata Reuss.

*LATASTIA* JOHNSTONI Boulenger

Nucras tassellata (not Smith) Boulenger, 1897, p. 800 (Nyika Plateau and Misuku Mts.).

Latastia johnstoni Boulenger, 1907, Ann. Mag. Nat. Hist. (7) 19, p. 392: Misuku and Nyika Plateaus, Malawi; and 1921, p. 16 (Eldorado);\* Pittman, 1934, p. 305; Loveridge, 1953a, p. 229 (Bua River; Mweru-Mantipa).

Bregias nitida (not Gunther) Hewitt & Power, 1913, p. 156 (Eldorado).

Latastia kidwelli Boulenger, 1919, Trans. Roy. Soc. S. Africa, (2) p. 39: Eldorado, Rhodesia.

Latastia bredoi Witte, 1942, Bull. Mus. roy. Hist. nat. Belgique, 18, No. 41, p. 1, figs. 1 - 2: Musosa, Katanga.

\* Sternfeld, 1911, p. 417 (Cabayra; Chifumbazi).

Fourteen specimens examined from: RHODESIA. Eldorado (MM, type of L. kidwelli). SAMBIA. Bulaya; Chilwa; 30 mls N of Fort Jameson; Isoka; Kalichero; Mweru-Mantipa.

Literature Records. RHODESIA, Eldorado, ZAMBIA, Mberu-Mantipa, Chitumbasi.  
MALAWI, Bua River; Misuku Mts.; Nyika Plateau, MOZAMBIQUE, Cabayra; /

Variation. Granules between supraculures and supraciliaries 10 - 13; supraciliaries 5 - 6; occipital in contact with interparietal or separated by an ankygous scale; collar plates 5 - 10; dorsals transversely at midbody 40 - 52; ventrals in 6 + 2 longitudinal and 24 - 27 transverse rows; femoral pores 13 - 18 on each side; lamellae under fourth toe 22 - 27.

Coloration. Above, head grey-brown, body dark brown or black, with a pale vertebral stripe that bifurcates anteriorly to form two lines on the nape, a pair of narrow light dorso-lateral lines merge with the vertebral stripe on the tail; flanks with two light longitudinal lines with black blotches between them.

Size. Largest ♂ (Hol. Cotype - Nyika Plateau) 60 + 160 = 220 mm.  
Largest ♀ (MZ. 51003 - Bua River) 63 + 149 = 212 mm.

Breeding. On 25th November the big Bua River ♀ held 4 eggs measuring about 6 x 5 mm (Loveridge, 1953a).

Diet. The same ♀ had a spider in her stomach.

Distribution. Central Tanganyika, north-western Mozambique, Malawi, northern and eastern Zambia, eastern Katanga, extending south to the Lomgundi District of Rhodesia.

#### Genus *EREMIAS* Wiegmann

*Eremias* Wiegmann, 1834, *Rept. Mexicana*, p. 9. Type by subsequent designation of Boulenger, 1918: *Lacerta valax* Pallas.

#### *EREMIAS LUGUBRIS* (A. Smith)

*Lacerta lugubris* A. Smith, 1838, *Mag. Nat. Hist.*, 2, p. 93: "District immediately beyond the northern frontier of Cape Colony." = Bechuanaland.  
*Eremias lugubris* Peracca, 1896, p. 1 (Easingula to Bulawayo); Boulenger, 1910, p. 477 (Lake Ngami District); Werner, 1910, p. 330 (Lehitutu - Kang); Hewitt, 1910, p. 113 (Palayge Road); Hewitt & Power, 1913, p. 156, (Francistown; Ky Ky; Nossob); Boulenger, 1921, p. 239 (Mabalayge; Lake Ngami; Motwani - Limpopo Confluence); FitzSimons, 1935b, p. 358 (Molepolole - Kuke; Kuke; Kuke - Gomodimo; Gomodimo; Esotse; Okan River; Damara Pan; Sunnyside - Mchund Pan; Mabeleapudi; Lake Ngami; Naun; Shorobe; Kabulabula) also 1937, p. 268, 1939b, p. 33 (Changadzi River;



Birchenough Bridge) and 1943, p. 329 (Empandene; Matetsi; Gasumland; Filabusi - Shabani; Mochudi; Wankie; Masambo); Maracas, 1952, p. 150 (Pafuri); FitzSimons & Brain, 1958b, p. 101; Broadley, 1962a, p. 821.

Eighty-six specimens examined from: BECHUANALAND, Debeetsi; Foley; Kang; Kanyu; 9 mls N of Kwabe Hills; Lake Dow; Lephepe and 40 mls NW; 10 mls W and 10 mls SE of Letlaking (USNM); Malhe; Nata; Nokane; Gotsi; Sehita; Sepopa; Shorebe; Toton. RHODESIA, Beitbridge and 30 mls NE; Binga; Birchenough Bridge and 30 mls W; Changadzi Bridge; Chiki; Devuli Bridge; 4 mls E of Dumela; Lukosi Bridge; Malipati Drift and 14 mls upstream; Manama Mission; Marungudzi; Rupisi Hot Springs; Sabi - Lundi Confluence; Sabi - Makuni Confluence; Shashi - Shashani Confluence; Zambani - Matetsi and Selungwa Confluences.

Literature Records. BECHUANALAND. Damara Pan; Francistown; Gomodimo; Kabulabula; Kaotwe; Kuke; Kuke - Gomodimo; Ky Ky; Lake Ngami; Lehututu - Kang; Mabeleapudi; Mahalapye; Maua; Mochudi; Molepolole - Kuke; Nossob River; Notwani - Limpopo Confluence; Okav River; Palapye Road; Shorebe; Sunnyside - Mochudi Pan. RHODESIA. Birchenough Bridge; Changadzi River; Empandene; Filabusi - Shabani; Gasumland; Matetsi. MOZAMBIQUE. Masambo; Pafuri.

Variation. Tympanic shield present; tympanic shield present; lower eyelid scaly, opaque; supraciliaries 4 - 7; upper labials anterior to subocular 4 - 6 (subocular excluded from lip in one Binga lizard); collar plates 6 - 11; dorsals transversely at midbody 64 - 86; ventrals in 6 longitudinal and 22 - 30 transverse rows; femoral pores 12 - 18 on each side; lamellae under fourth toe 22 - 32.

Coloration. Juveniles, black above and below with a yellow vertebral stripe and symmetrical yellow markings on head and body; tail yellowish distally. Adults - light gray-brown or red-brown above, with three pale dorsal stripes, the median one bifurcates on the nape and continues onto the tail; dark transverse bars on back between the light stripes and also on the flanks; limbs with pale ocelli; white below.

Size. Largest ♂ (UM. 7810 - Nata) 58 + 160 = 218 mm. Largest ♀ (USNM - 10 mls SE of Letlaking) 61 + 130 = 191 mm.

Enemies. At Lephepe, one was recorded from the crop of a Chantrelle Gosawk (*Helicorax musicus*) and three from a Secretary Bird (*Sagittarius serpentarius*). Specimens were found in the stomachs of Yellow Mongooses (*Cynictis penicillata*) at Debeetsi and Toton; *Eremias* remains in several other small carnivore stomachs were not identifiable to species.

Habitat. In Rhodesia, this species is largely restricted to the beds of dry "sand" rivers in the major river valleys.

Distribution. Southern Angola, South West Africa and Bechuanaland, extending through the Deka Trough to Binga and down the Limpopo Valley to Masambo; widespread in south-eastern Rhodesia and north-eastern Transvaal.

EREMIAS NAMAQUENSIS Dumeril & Bibron

Eremias namaquensis Dumeril & Bibron, 1839, *Erpet. Gen.* 5, p. 307:

Namaqualand; Hewitt & Power, 1913 (Ky Ky; Nossob); Boulenger, 1921, p. 230; FitzSimons, 1935a, p. 536 (Junction of Nossob and Auob Rivers); also 1935b, p. 360 (Molepolole - Kuke; Kuke; Gomodimo; Kactwe; Gembok; Motihatlogo) and 1943, p. 332; FitzSimons & Brain, 1958b, p. 101.

Nineteen specimens examined from: BECHUANALAND. Lake Dow and 15 mls. E; Lehututu; Lokabe Pan; 10 mls W of Maboane (USNM); Nossob River 40 mls above Auob Confluence; SWA - BP Border at 24°S; Tsano; Tselenyane Pan.

Literature records. BECHUANALAND. Auob-Nossob Confluence; Gembok; Kactwe; Kuke; Ky Ky; Molepolole - Kuke; Motihatlogo; Nossob River.

Variation. No temporal shield; tympanic shield present; lower eyelid scaly, opaque or semi-transparent; supraciliaries 5 - 8; upper labials anterior to subocular 3 - 5; collar plates 5 - 9; dorsals transversely at midbody 48 - 60; ventrals in 10 - 12 longitudinal and 27 - 32 transverse rows; femoral pores 11 - 16 on each side; lamellae under fourth toe 24 - 29.

Coloration. Above, grey to grey-brown with four or five pale dorsal lines, the median one often restricted to the nape or the median lines may merge to form a broad vertebral band, often pale spots between the outer lines; flanks mottled with whitish; white below.

Size. Largest ♂ (UM. 7469 - 15 mls. E of Lake Dow) 55 + 118 = 173 mm.

Enemies. One was recovered from the stomach of a polecat (*Ictonyx striatus*) at Chukutea Pans and three from a Secretary Bird (*Sagittarius serpentarius*) at Lake Ngami.

Habitat. Hard ground in the acacia belts around the pans in the Kalahari (FitzSimons, 1935 b).

Distribution. Dry areas of southern Angola, South West Africa, Bechuanaland, Orange Free State and the Cape Provinces.

## EREMIAS LINEOCOCELLATA LINEOCOCELLATA Dumeril &amp; Bibron

Eremias lineo-ocellata Dumeril & Bibron, 1839, *Krpet. Gen.*, 5, p. 314: "South Africa"; Werner, 1910, p. 334 (Koon; Mookane; Vlei Topan); Hewitt, 1910, pp. 110, 113 (Mochudi); Hewitt & Power, 1913, p. 156 (Ky Ky; Nossob; Marandellas locality is rejected); Boulenger, 1921, p. 289.

Eremias asperus Boulenger, 1917, *Ann. S. African Mus.*, 13, p. 217: Mochudi, Bechuanaland, and 1921, p. 299.

Eremias lineo-ocellata lineo-ocellata Fitz-Simons, 1935a, p. 538 (Auob and Nossob Rivers) also 1935b, p. 361 (Kuke; Kuke - Gomodimo; Kaotwe; Mabeleapudi; Ramatudi; Shorobe; Makarikari) and 1943, p. 338; Fitz-Simons & Brain 1958b, p. 102.

Sixty-four specimens examined from: BECHUANALAND. Debeeti; Lephape and 40 mls NW; 10 mls SE of Letlaking (USNM); 10 mls W of Maboane (USNM); Molopo River, 15 mls S of Tsebong; 20 mls N. of Noto; Nossob River, 40 mls above Auob Confluence; SWA - BP Border at 24°S.

Literature records. BECHUANALAND. Auob-Nossob Confluence; Kaotwe; Koon; Kuke; Kuke - Gomodimo; Ky Ky; Mabeleapudi; Makarikari; Mochudi; Mookane; Nossob River; Ramatudi; Shorobe; Vlei Topan.

Variation. Temporal and Tympanic shields absent; lower eyelid with a large transparent disc, vertically divided by a black suture; supraciliaries 4 - 10; upper labials anterior to subocular 4 - 6; collar plates 7 - 14; dorsals transversely at midbody 50 - 68; ventrals in 12 longitudinal and 30 - 38 transverse rows; femoral pores 11 - 18 on each side; lamellae under fourth toe 23 - 29.

Coloration. Above, red-brown, grey-brown or buff, usually with a dorso-lateral series of pale spots or streaks, often with a series of darker spots bordering these dorsally and a double row of small pale spots along the middle of the back; often a lateral series of pale blue ocelli, with a pale longitudinal stripe below; white below.

Eremias. At Lephape, nine specimens were recovered from the crop of a Secretary Bird (Sagittarius serpentarius) and one from a Chanting Goshawk (Helicorax musurus).

Habitat. Usually found in association with E. namaquensis on hard ground around the pans in the Kalahari.

Distribution. South West Africa, northern Cape Province, Bechuanaland, Transvaal, Orange Free State and central Natal.

## Genus ICHNOTROPIS Peters

Ichnotropis Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 617. Type by subsequent designation: I. macrolenticola Peters = Algyra capensis A. Smith.

## ICHNOTROPIS SQUAMULOSA Peters

Ichnotropis squamulosa Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 617: Tete, Mozambique, and 1822, p. 49, pl. viii, figs. 2, 2a - b; Boulenger, 1887 a, p. 79 (Kalahari Desert; Lake Nyasa); Bocage, 1896, p. 87; Boulenger, 1897, p. 800 (Fort Hill) also 1907a, p. 8 (Petsuke; Luanga River) and 1910, p. 476 (Delagoa Bay; Bulawayo; Hunyani River; Salisbury); Sternfeld, 1911, p. 417 (Chifumbazi; Cabayra); Hewitt & Power, 1913, p. 156 (Marandellas; Mochudi); Boulenger 1921, pp. 191, 425 (Melopo River); Power, 1927c, p. 407 (Lobatsi); Gott, 1934, p. 162 (Charre); Pitman, 1934, p. 305 (Lavushi Hills; Mushingus); Fitz-Simons, 1935b, p. 357 (Gabani; Molepolole; Kuke; Matapia Pan; Kaotwe; Kaotwe - Damara Pan; Damara Pan; Sunmyside - Mabeleapudi; Mabeleapudi; Haun; Shorobe; Kwai; Tsotsoroga); Mertens, 1937, p. 9 (Lundani - Chama); Fitz-Simons, 1939b, p. 32 (Birchenough Bridge); Therido, 1941, p. 14 (Zumbo); Fitz-Simons, 1943, p. 350 (Tsessebe; Kutam; Moko; Empandene; Chilimansi; Sawalls; Driefontein; Mahalapye; Towni; Umvuma; Plumtree); Loveridge, 1953a, p. 232 (Tete; Cholo).

One hundred and forty-seven specimens examined from: BECHUANA-  
LAND. Debesti; 35 mls W of Kang; Kanyu; 17 mls E of Marusush; Nata; Noinang; 50 mls NW of Sehita; Sekhuma Pan; Toten; Tsane. RHODESIA.  
Beitbridge; Bembei; Einga; Bulawayo; Charama Plateau; Chibakwe Bridge;  
Chibi; Chinyamanda; Condo; <sup>Chitona River;</sup> Eldorado; Fatima; Fera Valley; Glass Block;  
5 mls W of Gwaii Bridge; Heany; Heathfield; Helvetia; Kamativi; 5 & 10  
mls. SE of Kapani; Kariba Lake; Kariba Lake - Sanyati Confluence; Kotua;  
Malapati Drift and 14 mls Upstream; Malinbasinhi; Matopos; Mkota Reserve;  
25 mls WSW of Moko; Nyampanda; Odsi; Plumtree and 30 mls NW; Red-  
cliff; Ruonya River Drift; Sabi-Lundi Confluence; Saffron Walden; Saw-  
alls; Sengwe River; Shashi - Shashani Confluence; Sinoia; Stansore;  
Tegwani; Triangle; Untali; Wankie National Park - Shapi Pan; Zamboni -  
Sebungwe Confluence. ZAMBIA. Bwana Mubwa; Chakwenga River; Chimona  
River; Fort Jameson and 40 mls N; Kaungashi; Kondolilo Falls; Living-  
stone; Lusaka; Siyantamba. MALAWI. Cape Maclear. MOZAMBIQUE. Beira;  
Geonda; Gumba; Inchope; Manga; Maringa; Metuchira; Muda - Lamogo; 10  
mls W. of Mungari; Samo; Vila de Manica.

Literature Records. BECHUANALAND. Damara Pan; Gabani; Kactwe; Kactwe - Damara Pan; Kuke; Ruai; Lobetoi; Mabeleapadi; Mabeleapye; Matapha Pan; Maun; Mochudi; Molepolole; Molofo River; Sharobe; Sunnyside - Mabeleapadi; Tswana; Tsesebe; Tsotsoroga. NIGHERIA. Hrohenough Bridge; Bulawayo; Chilizanni; Driefontein; Ekpende; Hunyani River; Kutana; Maraniellas; Moko; Plumtree; Salisbury; Sawmills; Umvun. ZAMBIA. Lavushi Hills; Izanga River; Lundasi - Chama; Mushingus; Petauke. NIAIWI. Cholo; Fort Hill; Lake Nyasa. MOZAMBIQUE. Cabvra; Charre; Chifumbasi; Delagoa Bay; Tete; Zumbo.

Variation. Frontonasal paired; supraoculars 4 (rarely 3 or 5); subocular excluded from lip; midbody scale rows (including ventrals) 42 - 57; femoral pores 11 - 18 on each side; lamellae under fourth toe 16 - 23.

Coloration. Buff to dark gray-brown above, usually with narrow irregular dark cross bands or series of blotches, upon which are superimposed six longitudinal rows of pale spots, i.e. a double row along the vertebral line, a dorso-lateral and a lateral row; grayish white to plumbeous below, adult males with the lower labials and chin shields mottled with black.

Size. Largest ♂ (U.N. 1776 - Ruanya Drift) 76 + 151 = 227 mm. Largest ♀ (U.N. 1787 - Sabi - Lundi Confluence) 74 + 155 = 229 mm.

Life Cycle. This species emerges from the egg in November - December, reaches maturity in eight months and dies after breeding (See under *I. s. carensis*).

Diet. Largely grasshoppers and termites at Charre (Cott, 1934); termites in the Kalahari (FitzSimons, 1935b).

Enemies. One was recovered from the stomach of a Cape Fox (*Vulpes chama*) at Debesti.

Habitat. Widespread in savanna, but most plentiful in sandy country.

Distribution. Tanganyika south to Zululand, west through Malawi, Zambia, Rhodesia, Transvaal and Bechuanaland to South West Africa and southern Angola.

#### ICHNOTROPIS BIVITTATA BIVITTATA (Boecage)

*Ichnotropis bivittata* Boecage, 1866. Journ. Sci. Lisbon, 1, p. 43: Duque de Braganca, Angola.

One specimen examined from ZAMBIA. Abercorn.

Description. Frontonasal single; prefrontals in contact with the anterior supraoculars; upper labials anterior to subocular 4; midbody scale rows (including ventrals) 36; femoral pores 11 on each side; lamellae under fourth toe 18 - 19; foot/head length ratio 1.00.

Coloration. Dark grey brown above, back blotched with black, a narrow white dorso-lateral line; flanks blackish, with a white stripe extending from snout, through ear opening to groin; below, chin and throat white stippled with dark grey, chest and belly grayish-white.

Size. Subadult (IBSNB - Abercorn)  $41 + 81 = 122$  mm.

Remarks. Witte (1953, pp. 86, 88) has collected good series of this species and I. lowripes (= I. capensis) at the same localities in the Upemba National Park, so this form cannot be a race of I. capensis as suggested by Loveridge (1957, p. 234).

It is impossible to say whether I. bivittata pallida, described from a single specimen from Huila, Angola, by Laurent (1964a, p. 64) is a valid race.

Distribution. Angola, west through Katanga and northern Zambia to southern Tanganyika.

#### ICHNOTROPIS CAPENSIS CAPENSIS (A. Smith)

Agama capensis A. Smith, 1838, Mag. Nat. Hist., 2, p. 94: "Sandy deserts around Latakoo" = Kuruman, Cape Province.

Tropidosaura dumerilii (sic) A. Smith, 1849, Ill. Zool. S. Africa, Rept., App. p. 7: "Sandy deserts to the north-east of Latakoo" = Bechuanaland.

Tropidosaura capensis Bianconi, 1851, p. 61 (Inhambane).

Ichnotropia macrolenticola Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 617; Lourenço Marques, Mozambique, and 1882, p. 45, pl. viii, figs 1, la - b. (Inhambane).

Ichnotropia capensis Boulenger (part) 1887a, p. 78 and 1910, p. 476 (Delagoa Bay; Matopos); Werner, 1910, p. 329 (Lokaneng - Severelela); Hewitt, 1910c, pp. 112, 114 (Mochudi); Hewitt & Power, 1913, p. 156 (Marandellas); Loveridge, 1920, p. 148 (Delagoa Bay); Boulenger, 1921, p. 185; FitzSimons, 1935b, p. 356 (Kaotwe - Damara Pan; Kabulabula; Nkato) and 1937, p. 267; Loveridge, 1953a, p. 230 (Kasungu).

Ichnotropis longipes Boulenger, 1902, Proc. Zool. Soc. London, 2, p. 17, pl. iii, fig. 2; Masoe, Rhodesia; Chubb, 1909a, p. 594 and 1909b, p. 35 (Bulawayo; Khami River); Boulenger, 1910, p. 476 (Livingstone); Hewitt, 1910c, p. 115; Angel, 1920, p. 616 (Lealui); Boulenger, 1921, p. 188 (Masoe; Bulawayo; Livingstone); Pitman, 1934, p. 305 (Mumbwa District).

Ichnotropis capensis capensis FitzSimons, 1943, p. 352 (Plumtree; Salisbury; Driefontein; Marandellas; Delagoa Bay; Matopos; Mochudi; Masiemi); Manacas, 1952, p. 151 (Maule); Broadley, 1962d, p. 821.

Ichnotropis capensis longipes FitzSimons, 1943, p. 354 (Ghishawasha; Livingstone; Masiemi; Filabusi - Shabani; Kutama; Gaxumaland; Dulewoyo; Bombesi; Mute).

Ninety-three specimens examined from: BECHUANALAND. Lophops and 40 mls NW; Tsam. RHODESIA. Beatrice; Bombesi; Bulawayo; Charama Plateau; Chimara Ranch; Insusa Bridge; 10 mls SE of Kapami; Kariba; 5 mls E and 15 mls SE of Lupane; Malimbasi and 35 mls SW; Marandellas; Matopos; Masi; Ntabesigwana; Odoi; Sabi - Lundi Confluence; Salisbury; Sebungwe District; Sinoia; 20 mls WNW and 10 & 15 mls NW of Victoria Falls. ZAMBIA. Balovale; Fakeji Stream; Kalabo; Kasusu; Lunga Game Reserve; Lusaka.

Literature records. BECHUANALAND. Kabulakula; Kootwe - Damara Pan; Lokanang - Severelela; Mochudi; Mute. RHODESIA. Bombesi; Bulawayo; Ghishawasha; Driefontein; Filabusi - Shabani; Gaxumaland; Khami River; Kutama; Marandellas; Matopos; Masoe; Masiemi; Plumtree; Salisbury. ZAMBIA. Lealui; Livingstone; Mumbwa District. MALAWI. Kasungu. MOZAMBIQUE. Delagoa Bay; Inhambane; Lourenco Marques; Masiemi; Maule.

Variation. Frontonasal single; prefrontals usually well separated from anterior supraoculars (rarely in short contact) (the prefrontals are separated by 1 (Livingstone) or 2 (Malimbasi) ankygous scales in two lizards); upper labials anterior to subocular 3 - 5; midbody scale rows (including ventrals) 32 - 42; femoral pores 9 - 14 on each side; lamellae under fourth toe 19 - 26; foot/head length ratio 1.10 - 1.55.

Coloration. Juveniles pale grey-brown with a white lateral stripe. Adults usually uniform grey to red-brown above; with a narrow white dorso-lateral line which may be bordered dorsally by a series of dark blotches; flanks black, with a broad white lateral stripe extending from snout, through ear opening onto tail; white below. In breeding males the lateral stripe, lower labials, chin and throat are bright yellow and there is a bright red latero-ventral stripe from axil to groin.

Size. Largest ♂ (IBSR, 2823 - Lunga Game Reserve)  $60 + 145 = 205$  mm.  
Largest ♀ (IBSR, 3734 - Bulawayo)  $62 + 118 = 180$  mm.

Discussion. Loveridge (1953e, p. 231) has already pointed out the futility of trying to recognise longipes as a north-eastern race. Working from the measurements supplied to Loveridge by Battersby, the foot/head length ratios for the three cotypes of longipes are 1.20, 1.25 and 1.33. Boulenger identified specimens from Bulawayo and Livingstone as longipes. In twenty-one specimens from Livingstone the foot/head length ratio is 1.10 to 1.45 and in four from Bulawayo it is 1.14 to 1.36. Although there is certainly interpopulation variation in average foot length, this is negligible when compared with the variation within a population.

Life cycle. Although Ichnotroica s. capensis and I. squamulosa frequently occur together, I noticed that any series collected invariably included adults of one species and juveniles of the other. The size range of material collected in each month is summarised in tabular form below:

MONTH	I. SQUAMULOSA			I. S. CAPENSIS		
	N.	SNOUT - VENT LENGTHS RANGE	MEAN	N.	SNOUT - VENT LENGTHS RANGE	MEAN
JANUARY	12	40 - 61	51.7	-	-	-
FEBRUARY	11	50 - 70	58.3	-	-	-
MARCH	21	55 - 75	61.2	2	24 - 27	25.5
APRIL	19	59 - 75	66.8	5	22 - 36	31.2
MAY	16	55 - 71	63.6	7	30 - 38	34.0
JUNE	14	60 - 76	66.2	4	36 - 39	37.7
JULY	1	76	76	3	38 - 47	41.3
AUGUST	-	-	-	-	-	-
SEPTEMBER	-	-	-	3	41 - 48	45.3
OCTOBER	-	-	-	11	48 - 60	52.2
NOVEMBER	10	24 - 35	30.4	19	40 - 65	54.7
DECEMBER	20	25 - 49	33.3	20	52 - 62	56.8

Table 4. Variation in snout-vent length for material of Ichnotroica squamulosa and Ichnotroica s. capensis by month of collection.

These data clearly indicate that I. s. capensis reaches maturity in nine months and dies after breeding, the species surviving in the egg form during the months January - March. The emergence of young I. s. capensis during March - April and the hatching of I. squamulosa during November - December obviously reduces competition between two sympatric species with similar food requirements.



Habitat. Widespread in savanna.

Distribution. Katanga, Zambia, Malawi, southern Angola, northern South West Africa, Bechuanaland, Rhodesia, Transvaal, southern Mozambique and northern Natal.

Genus MEROLES Gray

Meroles Gray, 1836, Ann. Nat. Hist., 1, p. 282. Type by monotypy :

Lacerta knoxii Milne-Edwards.

Saurites Peters, 1869, Monatsb. Akad. Wiss. Berlin, p. 60. Type by mono-

typy : S. canirostris Peters.

Mertens (1955, p. 70) has revived Meroles for the South African species formerly included in the genus Scaptira Wiegmann, now restricted to Asia.

MEROLES SUBORBITALIS (Peters)

Eremias suborbitalis Peters, 1869, Geffvers. Vet. Ak. Forh., p. 658 :

Damaraland.

Scaptira depressa Hewitt & Power, 1913, p. 157 (Ky Ky).

Scaptira suborbitalis Boulenger, 1921, p. 354; FitzSimons, 1935a, p. 542 (Hossob River), and 1943, p. 359; FitzSimons & Brain, 1958b, p. 102.

No local specimens examined.

Literature records. CAPE PROVINCE - BECHUANALAND. Ky Ky; Hossob River.

Habitat. Very common in the Auob - Hossob River area of the Kalahari, in association with Eremias l. lineocellata and E. namquensis (FitzSimons, 1935a).

Distribution. South West Africa and arid areas of the Cape Province, occurring on the south-western border of Bechuanaland in the Kalahari Gemsbok National Park.

Family VARANIDAE

Genus VARANUS Merrem

Varanus Merrem, 1820, Vers. Syst. Amphib., pp. 13, 58. Type by subsequent designation : Lacerta varia Shaw.

Polydaedalus Wagler, 1830, Nat. Syst. Amphib., pp. 132, 164. Type by subsequent designation: Lacerta nilotica Linnaeus.

Emragusia Grey, 1838, Ann. Nat. Hist., 1, p. 393. Type by subsequent designation: Monitor flavescens Harbivick & Grey.

Polydaedalus (including Varanus niloticus) and Emragusia (including V. exanthematicus) are recognized as subgenera by Mertens (1942, p. 242.).

VARANUS NILOTICUS NILOTICUS (Linnaeus)

Lacerta nilotica Linnaeus, 1766, Syst. Nat., ed. 12, 1, p. 369: Egypt.

Varanus niloticus Peters, 1854, p. 615 (Cabaceira; Boror; Quelimane; Tete); Boulenger, 1885d, p. 317 (Zambesi) and 1897, p. 800 (Mkuta Bay to Ruarwa; Kondowe to Karonga); Bocage, 1896, p. 87 (Quelimane); Boulenger 1907a, p. 8 (Petauke; Luangwa River) and 1907b, p. 485 (Beira); Chubb, 1909a, p. 593 and 1909b, p. 35 (Balawayo); Werner, 1910, p. 327 (Lobatsi); Gott, 1934, p. 153 (Cais; Charre; Beira); Pitman, 1934, p. 304 (Namala District; Lukulu Swamps); Fita-Simons, 1935b, p. 352 (Maun; Kakulabula) and 1943, p. 405 (Khami River; Chishavasha); Mitchell, 1946, p. 28 (Lake Nyasa); Turnbull-Kemp, 1960, p. 6 (Inyanga National Park).

Monitor niloticus Gunther, 1864, p. 307 (Zambesi Expedition).

Monitor saurus Peters, 1882, p. 23, pl. iv, fig. 2.

Varanus niloticus niloticus Loveridge, 1953a, p. 239 (Chitala River; Mtimbuka; Kausi Village; Tete) and 1953c, p. 143 (Zomba); Broadley, 1962d, p. 825.

Twenty-seven specimens examined from: BECHUANALAND. Botlele River; Sepope. RHODESIA. Balawayo; Basarvale; Hot Springs; Irisvale; Karila; Limpopo - Umingwane Confluence; Matopos; Old Untali; Salisbury and 20 mls. NE; Tali; Untali; Zana Para. ZAMBIA. Abercorn (IKSND); Ikalenge; Kabonpo; Mafwe. MOZAMBIQUE. Boror; Ponte do Pungvo.

Literature records. BECHUANALAND. Kakulabula; Lobatsi; Maun. Inyanga National Park; RHODESIA. Balawayo; Chishavasha; Khami River. ZAMBIA. Luangwa River; Lukulu Swamps; Namala District; Petauke. MALAWI. Chitala River; Kausi Village; Kondowe to Karonga; Lake Nyasa; Mtimbuka; Mkuta Bay to Ruarwa; Zomba. MOZAMBIQUE. Beira; Boror; Cabaceira; Cais; Charre; Quelimane; Tete.

There are also six specimens from Mnyamadzi River, Zambia in the British Museum (Pitman, in litt.).

Variation. Transverse series of yellow spots between axil and groin 6 - 9.

Size. Largest (UM. 10335 - Hoelenge) 1880 mm in total length (flat skin).

Breeding. A 1305 mm g from Irisvale held 17 eggs measuring 65 x 33 mm on 10th September.

Diet. Very catholic, including invertebrates, especially crabs, mussels and land snails (*Achatina*), also any vertebrate that can be caught and overpowered.

Loveridge (1953a) found three crushed *Cycloderma frenatum* eggs in a Ntiniaka specimen, they are also known to dig up and devour the eggs of crocodiles and terrapins.

Parasites. Most specimens harbour some black and gold ticks *Aponomma exornatum*. Loveridge (1953a) preserved nematodes (*Yanus siara*) from several Ntiniaka specimens.

Habitat. All rivers, streams, dams, lakes and swamps, also the fringes of mangrove swamps on the Mozambique coast. Rock crevices are the favourite retreat and specimens are sometimes found on kopjes some distance from water.

Distribution. All savanna areas of Africa. Absent from the arid south-west and also from the western rain-forest, where replaced by *V. n. ornatus* (Daudin).

#### VARANUS EXANTHEMATICUS ALBIGUIARIS (Daudin)

*Varanus albigularis* Daudin, 1802, Hist. nat. Rept., 3, p. 72 : pl. xxxii.

Type locality unknown.

*Varanus albigularis* Peters, 1854, p. 616 (Quitangonha; Sena; Tete).

*Monitor albigularis* Peters, 1862, p. 24, pl. iv, fig. 3.

*Varanus albigularis* Boulenger, 1885d, p. 307 (Lake Nyasa); Boonje, 1896, p. 98; Boulenger, 1907a, p. 8 (Luangwa River); Chubb, 1909a, p. 593 and 1909b, p. 35 (Balawyo); Boulenger, 1910, p. 471 (Salisbury; Fungwe River); Werner, 1910, p. 327 (Koca; Kakia); Hewitt & Power, 1913, p. 155 (Marandillas); Power 1927c, p. 437 (Lobatsi); FitzSimons, 1935b, p. 352 (Gaberones; Metsimklaba River; Gembak; Tsetsoroga) and 1939b, p. 21 (Birchenough Bridge); Thunido, 1941, p. 13.

*Varanus microstictus* Boettger, 1893, Ent. Rept. Samml. Mus. Senckenberg. Naturf. Ges., Part 1, pp. viii, 72: Ethiopia.

Varanus ocellatus (not Hayden) Sternfeld, 1911, p. 416 (Chifumbazi).

Varanus exanthematicus albicularis Schmidt, 1919, p. 483; Pitman, 1934, p. 304 (Chinsali); Loveridge, 1953a, p. 242 (Tete); Munnias, 1961, p. 157 (Vila Machado); Broadley, 1962a, p. 825.

Varanus albicularis albicularis FitzSimons, 1943, p. 403 (Palapye Road; Bembesi; Rikatla; Ghansi - Maun); Mitchell, 1946, p. 28; Munnias, 1952, p. 152 (Chibuto).

Varanus exanthematicus microstictus Loveridge, 1953a, p. 241; Hanney, 1961, p. 23 (Mpeba).

Varanus exanthematicus ionidesi Laurent, 1964, Breviora (Mus. Comp. Zool.), No. 199, p. 2; Kilwa, Tanganyika.

Twenty-five specimens examined from: BECHUANALAND. Debesti; Nata and 10 mls. SE; Shorobe. RHODESIA. Hot Springs; Malanga Bridge; Moodies Pass; Plumtree; Rupisi Hot Springs; Zambesi River opposite Feira. ZAMBIA. Abercorn (IRSNB); Broken Hill; Isombo Stream; Kalomo; Kariba Lake. MOZAMBIQUE. 10 mls W of Moamba; Nova Freixo; Vila de Manica, also collected on Inhaca Island, but subsequently escaped.

Literature records. BECHUANALAND. Gaberones; Gamsbok; Ghansi - Maun; Kakia; Koca; Lobatsi; Metsimahlabi; Palapye Road; Tsotsorega. RHODESIA. Bembesi; Birchough Bridge; Bulawayo; Marandellas; Salisbury. ZAMBIA. Chinsali; Luangwa River. MALAWI. "Lake Nyasa"; Mpeba. MOZAMBIQUE. Chibuto; <sup>Chifumbazi;</sup> Pungwe River; Quitangomba; Rikatla; Sena; Tete; Vila Machado.

Variation. Nuchal scales (without surrounding discs) subequal to, or considerably larger than, those on occiput and dorsum; midbody scale rows 118 - 152; transverse rows of ventrals from collar to groin 76 - 112.

Size. Largest ♂ (UM. 10150 - Debesti) 630 + 665 = 1315 mm. Largest ♀ (UM. 8087 - Nova Freixo) 400 + 495 = 895 mm. Another ♀ (UM. 10065 - Broken Hill) measures 665 mm from snout to vent, tail truncated.

Discussion. Mertens (1942) recognised four races of Varanus exanthematicus and Laurent (1964b) has described another subspecies from south-east Tanganyika. Mertens divided the species into two groups based on the size of the nuchal scales in relation to those on the occiput and dorsum, i.e. considerably larger in the typical form and microstictus, smaller or only slightly larger in albicularis and angolensis. The enlarged nuchals of the typical form are well illustrated by Schmidt (1919, pl. xix), but the Kenya specimens of microstictus illustrated by Laurent (1964b, fig. 2) show only slightly enlarged nuchals and specimens from south-east Africa are very variable in this character, as pointed out by Loveridge (1953a, p. 243). Mertens' other key characters were transverse and longitudinal scale counts i.e. -

RACE	Midbody scale rows	Rows of ventrals from collar to grain
<i>exanthematicus</i>	75 - 100	59 - 75
<i>microstictus</i>	112 - 152	88 - 94
<i>angolensis</i>	110 - 138	74 - 92
<i>albigularis</i>	137 - 167	85 - 110

The typical form is distinct enough and need not be considered further. Witte (1953, p. 73) gives a range of 109 - 144 midbody scale rows and 72 - 89 transverse rows of ventrals for Katanga material referred to *angolensis*, while Laurent (1964b) gives 126 - 141 midbody scale rows and 94 - 98 transverse rows of ventrals for four Lobito specimens. The overlap in midbody scale counts between the three races is such that all the material I have examined (except for six specimens from Abercorn and Broken Hill) could equally well be referred to either *microstictus* or *albigularis*, having "intermediate" counts of 134 - 152. Very high counts (153 - 167) are apparently found only in the extreme south (See Fig 8). Ventral counts show a similar tendency.

*Varanus o. ionidesi* Laurent was based entirely on juvenile pattern. A pattern of transverse pale spots of varying size, which may be confluent, or even form crossbands, is common in specimens from south-east Africa. The different patterns illustrated by Laurent (1964b) are all found in the material under consideration, but without such geographical significance, i.e.

Fig. 2 (Kenya *microstictus*) : Rupsai Hot Springs.

Fig. 3 (types of *ionidesi*) : Nova Freixo; Kalomo.

Fig. 4 ("typical" *albigularis*) : Malonga Bridge; Kariba Lake; Vila de Manica.

Fig. 5 (Zululand *albigularis*) : Mwinilunga; Hot Springs.

Several other patterns occur. The normal *angolensis* pattern is illustrated by Laurent (1964c, fig. 11), this consists of a dorsal row of large pale spots and a dorso-lateral row of much smaller spots, a pattern shown by the Abercorn specimens. Some Bechuanaland specimens are very pale, with scattered dark scales which may form reticulated patterns. Many specimens are intermediate in pattern and geographical races based on pattern cannot be justified.

The data available suggest that only two races are recognisable, the typical form as defined by Mertens and *V. o. albigularis*. Ethiopia, the type locality for *microstictus*, may be considered a region of intergradation between the two races.



Fig. 8. Mean midbody scale rows for some populations of Varanus exanthematicus in south-east Africa.

**Breeding.** In September a ♀ from Vila Machado contained 15 eggs measuring 61.5 x 27.5 mm (Manacas, 1961). A 997 mm ♀ from Nsaba (near Elantyre) contained 28 ova, each 25 mm in diameter, on 12th March (Haussy, 1961).

**Diet.** This species is a scavenger which devours decomposing rats and snakes with relish. It will eat any animal that it can catch, but beetles, snails and millipedes form a large proportion of its diet.

**Parasites.** Ticks (Aronimus apornatus) identified by Dr. Theiler from Irisvale and Beitbridge specimens. Nematodes (Albryviata paradoxus; Polydelphis sp.; Taenia tjara) preserved from Tete specimens by Loveridge (1953).

**Behaviour.** Unlike Varanus niloticus, which relies on speed to escape an enemy, the present species is relatively slow and if no suitable tree or hole offers a refuge, it often "plays possum", but not very convincingly, because it keeps its eyes open.

**Habitat.** This species is most plentiful in dry country - the Kalahari and the major river valleys. It lives in rock crevices or hollow trees, juveniles are often found under loose bark on dead trees.

**Distribution.** Savannas of southern and eastern Africa.

#### Suborder AMPHISBAENIA

#### Family AMPHISBAENIDAE

Much of the published morphological data on amphisbaenids are difficult to evaluate because procedures (particularly methods of counting annuli) were not standardised.

Gans and Alexander (1962, p. 75) have made a careful evaluation of morphological characters in Antillean amphisbaenids of the subfamily Amphisbaeninae and have worked out standard methods for counting annuli, including the separation of lateral annuli, previously included with either body or tail annuli counts.

Gans is at present working on East African amphisbaenids of the genus Chirindia and will be revising all the African genera in due course, which will involve the standardisation of procedures for the subfamily Rhinourinae (including the genera Monopolitia and Touropeltis).

In the circumstances I have not attempted an analysis of variation within this group and have concentrated on the identification of biological species. The genera recognised are defined by Vanzolini (1951; 1953) and are accepted by Gans.

## Subfamily AMPHIBRAENIDAE

## Genus ZYGASPIES COPE

Zygaspis Cope, 1885, Proc. Amer. Philos. Soc. Phila., 22, p. 187. Type by original designation: Amphisbaena quadrifrons Peters.

Shrevea Vanzolini, 1951, Herpetologica, 8, p. 115. Type by original designation: Amphisbaena quadrifrons Peters.

## ZYGASPIES QUADRIFRONS Peters

Amphisbaena quadrifrons Peters, 1862, Monatsb. Akad. Wiss. Berlin, p. 25; Neu Barmen, Hereroland, South West Africa; Boettger, 1887, p. 144 (Noi Xee, near Ghansi); Boulenger, 1894, p. 724 (Kalabari); Roux, 1907, p. 82 (Barotseland); Boulenger, 1910, p. 472 (Sesheko); Peracca, 1910, p. 1 (Barotseland); Werner, 1910, p. 377 (Severela - Kadia; Severela; Vlei Topan); Hewitt & Power, 1913, p. 155 (Mochudi); Angel, 1920, p. 614 (Lealui); Cott, 1934, p. 160 (Charra); Pittman, 1934, p. 304; FitzSimons, 1935b, p. 353 (Molepolole - Kuke; Gomodimo; Chukuku; Kaotwe; Sunnyside; Gembok; Sunnyside - Mochudi Pan; Mabelajudi - Lake Ngami; Motlhathlogo; Shaleshonto; Kabulabula).

Amphisbaena capensis Thomiot, 1887, Bull. Soc. Philom. Paris (7) 11, p. 188; Lake Ngami, Bechuanaland.

Amphisbaena violacea (part), Boulenger, 1910, p. 472 (Bechuanaland).

Amphisbaena quadrifrons quadrifrons Loveridge, 1941a, p. 385; FitzSimons, 1943, p. 376.

Amphisbaena quadrifrons capensis Loveridge, 1941, p. 387 (Chirinda Forest; Mtoko); FitzSimons, 1943, p. 377 (Serowe; Masami); Tasman, 1957, p. 56; Broadley, 1962a, p. 822.

Amphisbaena quadrifrons katanga Witte & Laurent, 1942, Rev. Zool. Bot. Afr., 36, p. 81, fig. 3; Lakafo, Katanga.

Seventy-one specimens examined from: BECHUANALAND. Debeeti; Kwebe Hills; 100 mls. S of Maun; 14 mls W of Sahitwa; SWA - NP Border at 24° S; Toten; Tsov. RHODESIA. BIKITHRIDGS; Doro; Gilston Estates; 4 mls W. of Gwasi Bridge; 2 mls S of Kasungula; Kammar; Lake MacIlwaine; Mavuradona Mts.; Mount Silinda; Mooro; 10 mls NW of Nyamandhlova; Odsi; St. Swithin's Block; Saumills; Shashi - Shashani Confluence; Silver-streams; Victoria Falls and 8 mls W; Wankie National Park - Nyamandhlova Pen. ZAMBIA. Kalabo; Kasfusu; Livingstone; Moeru - Wantipa (IICNB). MOZAMBIQUE. 8 mls NE of Inharringe.



Literature records. BECHUANALAND. Chukudu; Gamsbok; Gomodimo; Kabulabala; Kacwe; Lake Ngami; Mabelapudi - Lake Ngami; Mochudi; Molepolole - Eako; Motlhologo; Noi Kas; Severelela; Severelela - Kakia; Serowe; Shaleshonto; Sunnyside; Sunnyside - Mchudi Pan; Vlei Topan. RHODESIA. Chirinda Forest; Ntoko; Masami. ZAMBIA. Lelui; Sasheke. MOZAMBIQUE. Charre.

Variation. Annuli of body 194 - 230, on tail 37 - 50; segments in a midbody annulus 14 - 20 dorsal + 12 - 18 ventral = 26 - 38; preanal pores 4.

Coloration. Purple brown above, pink below.

Size. Largest (UM. 8333 - Silverstream)  $220 + 36 = 256$  mm; NMR. 1220 from Chirinda Forest measures 230 mm from snout to vent (tail truncated).

Discussion. There is certainly a tendency for counts of body annuli to increase from east to west, but there is no definite "step" in the clime that would justify the recognition of an eastern race. There are some marked differences in counts of body annuli for neighbouring populations, e.g. FitzSimons (1935h) gave an average of 217.6 for Kabulabala specimens, but two specimens which I collected just over the border in Wankie District have 230 and 227 body annuli. On the north bank of the Zambezi at Livingstone, the range of body annuli for 7 specimens is 217 - 221. Witte (1954, p. 987) records 193 - 219 body annuli for Katanga material and Laurent (1964c, p. 84) gives 183 - 195 for a series from Alto Chipaca, north-east Angola.

Enemies. Recovered from the stomachs of the following small carnivores: Bat-eared Fox (Otocyon megalotis) 20 miles W of Rakops; Striped Polecat (Ictonyx striatus) at Tsau; Yellow Mongoose (Cynictis penicillata) at Toten; African Wild Cat (Felis libyca) at Sekitua. One had been eaten by a Galomys m. ventrimaculatus at Kalabo.

Habitat. Kalahari sand in the west and alluvium on the Mozambique Plain. In the Malsetter and Chipinga Districts of Rhodesia this species lives in red clay soil and specimens from this area are certainly larger than those from sandy substrates.

Distribution. Angola, Katanga, Zambia, South West Africa, Bechuanaland, northern Cape Province and Transvaal, Rhodesia, Mozambique.

## ZYGASPIDES "NIGER"

Twenty-seven specimens examined from: ZAMBIA. Kalabo.

Variation. Annuli on body 188 - 203, on tail 46 - 53; segments in a midbody annulus 18 - 22 dorsal + 14 - 16 ventral = 32 - 38; proanal pores 4

Coloration. Black above, on flanks and ventrum the black is confined to the front half of each annulus, giving a ringed effect, throat white.

Size. Largest (UM. 10071 - Kalabo) 275 + 58 = 333 mm; UM. 4618 measures 260 mm from snout to vent (tail truncated).

Discussion. This species differs from Z. quadrifrons in coloration and larger size. It also differs from sympatric specimens of Z. quadrifrons in a much lower count of body annuli, i.e. 188 - 203 instead of 218 - 222.

Distribution. Western Barotseland and adjoining Angola (11 specimens from Gago Coutinho District.).

## Genus AMPHISBAENA Linnaeus

Amphisbaena Linnaeus, 1758, Syst. Nat. Ed. 10. 1, p. 229. Type by subsequent designation: A. fuliginosa Linnaeus.

## AMPHISBAENA VIOLACEA VIOLACEA Peters

Amphisbaena violacea Peters, 1854, Monatsb. Akad. Wiss. Berlin, p. 620; Inhambane and Lourenco Marques, Mozambique and 1882, p. 85, pl. xiii, figs. 2 - 2h; Boulenger, 1885d, p. 446; Bocage 1896, p. 99; Boulenger, 1910, p. 472 (part - Zululand and Portuguese East Africa); Hewitt, 1910a, pp. 60, 70; FitzSimons, 1930, p. 34 (Lourenco Marques); Loveridge, 1941a, p. 389.

Amphisbaena violacea violacea FitzSimons, 1943, p. 378; Harrison, 1952, p. 5, (Manhica).

One specimen examined from: MOZAMBIQUE. Lourenco Marques.

Literature records. MOZAMBIQUE. Inhambane; Lourenco Marques; Manhica.

Variation. Annuli on body 180 - 206, on tail 46 - 59; segments in a midbody annulus 14 - 20 dorsal + 14 - 18 ventral = 28 - 38; preanal pores 4.

Coloration. Pale brown above, pink below.

Size. Largest (Manoas, 1954 - Manhica) 147 + 37 = 184 mm.

Discussion. Amphisbaena violacea is the only non-neotropical species in the genus (Vanzolini, 1951, p. 114) and its circumscribed distribution and peripheral position in relation to the more specialised amphisbaenids of the genus Chirindia are characteristic of a relict group.

Distribution. Southern Mozambique and northern Zululand, extending into the north-eastern corner of the Kruger National Park in the Transvaal.

#### Genus CHIRINDIA Boulenger

Chirindia Boulenger, 1907, Ann. Mag. Nat. Hist. (7), 20, p. 48. Type by monotypy: C. swynnertoni Boulenger.

#### CHIRINDIA SWYNNERTONI Boulenger

Chirindia Swynnertoni Boulenger, 1907, Ann. Mag. Nat. Hist. (7) 20, p. 48, fig. : Chirinda Forest, Rhodesia and 1910, p. 472; FitzSimons, 1939b, p. 32.

Chirindia bushbyi Cott, 1934, Proc. Zool. Soc. London, p. 158, fig. 2: Amantongas, Mozambique.

Amphisbaena bushbyi Loveridge, 1941a, p. 397; FitzSimons 1943, p. 383.

Amphisbaena swynnertoni Loveridge, 1941a, p. 397; FitzSimons, 1943, p. 382; Tasman, 1957, p. 37.

Six specimens examined from: MOZAMBIQUE. Mada - Lanego; 15 mls SE of Vila de Manica; 15 mls S of Vila Paiva de Andrada.

Literature records. RHODESIA. Chirinda Forest. MOZAMBIQUE. Amantongas.

Variation. Annuli on body 235 - 259, on tail 22 - 27; segments in a midbody annulus 12 - 14 dorsal + 12 - 16 ventral = 24 - 30; preanal pores 0 or 6.

Coloration. Pale brown above, pink below.

Size. Largest (UM. 3565 - 15 mls SE of Vila de Manica) 131 + 16 = 147 mm.

Discussion. Three specimens were collected under stones within a few yards of one another 15 miles south-east of Vila de Manica. The variability of head shields within this population bridges the differences between most of the forms in the genus. Loveridge (1941a, p. 376) separated a northern group (overbecki, rondoensis and orientalis) from a southern group (bushbyi, swynnertoni and langi) on the first lower labials being separated by the postmental. In one of the Vila de Manica specimens the first lower labials are in broad contact, in the others they are separated. One of the specimens agrees with swynnertoni in having the temporals in broad contact behind the postfrontals, in another the temporals meet at a point as in bushbyi, while these shields are separated by twoazygous scales in the third specimen. The eight known specimens of Chirindia from this area are provisionally included under C. swynnertoni, although the Vila de Manica series have high counts for both body annuli (249 - 259) and segments in a midbody annulus ( $14 + 16 = 30$ ).

Enemies. The type of C. swynnertoni was recovered from the crop of a Kingfisher (Halcyon albirostris) shot in the outskirts of Chirinda Forest by the late C. F. M. Swynnerton.

Habitat. Chirinda Forest is on red loam derived from dolerite, where Zygaaspis quadrifrons also occurs. The specimens from 15 miles SE of Vila de Manica were under stones lying on sandy soil near the foot of a granite outcrop. The Muda - Lamago specimens had fallen into an oil pipe-line trench crossing the Pungue Flats, this is seasonal swamp. The specimen from 15 mls S of Vila Paiva de Andrada was under a log in heavy Brachystegia woodland growing on granitic sand.

Distribution. Central Mozambique (between the Zambezi and Save Rivers) and adjoining Rhodesia. (See Fig. 9).

#### Subfamily RHINOSURINAE

Genus MONOPELTIS A. Smith

Monopeltis A. Smith, 1848, Ill. Zool. S. Africa, Rept., pl. lxvii. Type by monotypy: N. capensis A. Smith.

MONOPELTIS MAURICEI Parker

Monopeltis mauricei Parker, 1935, Ann. Mag. Nat. Hist. (10) 15, p. 582, figs. 1 - 2: Monjalatsela, near Ghanzi, Bechuanaland.

Known only from the type in the British Museum (N.H.).

Description. Two large shields covering head; nasal excluded from lip, but in contact with a small quadrangular ocular; upper labials 3; lower labials 3; chin shields bordering postmental 2; annuli on body 289, on tail 12; segments in a midbody annulus 40 dorsal + 30 ventral = 70; pectorals 6; anals 4; preanal pores 1 + 1.

Size. 127 + 5 = 132 mm.

Distribution. Known only from the type locality. (See Fig. 9).

#### MONOPELTIS ANCHISTAE (Boecke)

Lepidosternum (Phractosoma) Anchistae Boecke, 1873, *Jorn. Sci. Lisbon*, 4, p. 247, figs. 1 - 4; Huaba, Cuanene River, Moçambique, Angola.

Monopeltis leonhardi Werner, 1910, *Denks. Med. Nat. Ges. Jena*, 16, p. 328, pl. vi, figs. 2a - c; Between Kgokong and Kang, Bechuanaland; Boulenger, 1910, p. 473 (Palapye); FitzSimons, 1943, p. 398 (Gomodimo Pan; Tierkop, Moesob River; Palapye Road); FitzSimons & Brain, 1953b, p. 102.

Monopeltis quadriscutata Werner, 1910, *Denks. Med. Nat. Ges. Jena*, 16, p. 328; Neitass Farm, Grootfontein, South West Africa.

Monopeltis okavangocensis Monard, 1931, *Bull. Soc. Neuchâtel Sci. Nat.*, 55, p. 95, fig. 5; Kakindo and Villa da Ponte, Angola.

Monopeltis vernayi FitzSimons, 1932, *Ann. Tvl. Mus.*, 15, p. 36 and 1935b, p. 354, figs. 15 and 16; Gomodimo Pan, Bechuanaland, also Euke; Loveridge, 1941a, p. 409.

Monopeltis devisi Monard, 1937, *Arch. Mus. Bocage*, 8, pp. 65, 69, fig. 3, no. 3; Mupa, Angola.

Monopeltis anchistae Loveridge, 1941a, p. 410; Broadley, 1962d, p. 823.

Five specimens examined from: RHODESIA. 4 mls. W of Gwasil Bridge; Lupane District; Sawmills; Woodvale (Bulawayo).

Literature records. BECHUANALAND. Gomodimo Pan; Kgokong - Kang; Euke; Moesob River; Palapye Road.

Variation. Two large shields covering head; nasal excluded from lip, not reaching ocular; upper labials 3; lower labials 3 (2 in one Lupane specimen); chin shields bordering postmental 2 - 4; annuli on body 182 - 224, on tail 9 - 12; segments in a midbody annulus 20 - 28 dorsal + 16 - 26 ventral = 36 - 54; pectorals 4 - 6; anals 4; preanal pores absent.

Coloration. Purple-brown above, pink below.

Size. Largest (UM. 2718 - Lupane District) 260 + 13 = 273 mm.

Discussion. Loveridge (1941a, p. 425) suggests that *M. anchietae* and *M. capensis* are conspecific. In Rhodesia *M. anchietae* is immediately distinguishable from *M. capensis* by its dark dorsal coloration and lack of preanal pores, in addition to its two head shields. These characters do not hold good in other areas, but here there appear to be two good sympatric species.

Habitat. Kalahari sand.

Distribution. Angola, South-West Africa, northern Cape Province, Bechuanaland and western Rhodesia. (See Fig. 9).

#### MONOPELTIS OCULARIS FitzSimons.

*Monopeltis ocularis* FitzSimons, 1941, Ann. Tvl. Mus., 20, p. 277, figs. 4-8; Swart Modder, Rietfontein, N. W. Cape Province and 1943, p. 390; FitzSimons & Brain, 1958b, p. 102; Broadley, 1962d, p. 824.

Four specimens examined from: BECHUANALAND. Dikgomo - di -Kae; 10 mls W of Mabeane. ZAMBIA. Sesheke; Shakalonga (Kafue National Park).

Variation. A single large shield covering head; nasal excluded from lip, but in contact with ocular or a small preocular; upper labials 3; lower labials 3; chin shields bordering postmental 2; annuli on body 286 - 298 (300 in type), on tail 12 (15 in type); segments in a midbody annulus 34 - 38 dorsal + 20 - 22 ventral = 54 - 60; pectorals 6; anals 4; preanal pores 1 + 1.

Coloration. Uniform pink.

Size. Largest (MSB. 3498 - Sesheke) 245 + 11 = 256 mm.

Habitat. Kalahari sand.

Distribution. Western Zambia, south through Bechuanaland to the northern Cape Province. (See Fig. 9).

#### MONOPELTIS CAPENSIS CAPENSIS A. Smith

*Monopeltis capensis* A. Smith, 1848, Ill. Zool. S. Africa, Rept., pl. lxxvii; "Latitude 24°S" (i.e. near the Limpopo River in the western Transvaal); FitzSimons, 1943, p. 392 (Mabalajye); Broadley, 1962d, p. 823.

Forty-seven specimens examined from: RHODESIA. Kariba Lake - Bumi, Charara and Sanyati Confluences; Lukosi Bridge; Lupane; Mana Pools Road; Mpuzi Bridge; Wankie. ZAMBIA. Jeki.

Literature record. BECHUANALAND. Mahalapye.

Variation. A single large shield covering head; nasal excluded from lip, not reaching the ocular; upper labials 3 (rarely 2); lower labials 3; chin shields bordering postmental 4 (rarely 3); annuli on body 174 - 218 (240 - 250 in four specimens from Bumi Confluence, Kariba Lake), on tail 8 - 12; segments in a midbody annulus 18 - 24 dorsal + 14 - 20 ventral = 32 - 44; pectorals 4 - 6; anals 4; preanal pores 1 + 1 (rarely 0 + 0 or 2 on one side).

Coloration. Pink dorsum speckled with pale brown posteriorly, upper surface and tip of tail gray-brown.

Size. Largest (UM. 485 - Lukosi Bridge)  $270 + 13 = 283$  mm.

Discussion. I have previously (1962d) noted some geographical variation in counts of body annuli for Rhodesian material. The very high counts for four subadults from Bumi Confluence is remarkable, for normal counts of 208 - 210 have been recorded for specimens from the Sanyati area only 30 miles away. It appears that the poor dispersal powers of these animals results in the development of demes and consequent "mosaic variation" rather than smooth clines. It means that caution must be exercised in evaluating differences between samples.

Habitat. Alluvial sand overlying paragneiss and sandstone in Wankie and Kariba Districts. Moisture content of sand inhabited by Kapazi specimens was 5% (i.e. of dry weight).

Distribution. Southern Angola, South West Africa, northern Cape Province, north-western Orange Free State, eastern Bechuanaland, western Transvaal, Rhodesia and southern Zambia (Zambezi Valley). It extends down the Zambezi to within 55 miles of Feira, so may reach Mozambique in the Zumbo area. A population has recently been found at Mpudzi Bridge (Umtali District), which is further evidence for the extension of Kalahari sands to the Sabi - Odsi valley during at least one interpluvial.

The range of *M. capensis* almost completely encircles central Bechuanaland and Barotseland, a region occupied by *M. ocularis* (See Fig. 9). The ecological relationships of amphibiaenids present some interesting problems.

## MONOPELTIS HABENICHTI FitzSimons

Monopeltis habenichti FitzSimons, 1937, Ann. Tvl. Mus. 17, p. 276, figs. 3 - 5; Lourenco Marques, Mozambique; Loveridge, 1941, p. 426; FitzSimons, 1943, p. 394; Manecas, 1952, p. 6 (Manhica).

No specimens examined.

Literature records. MOZAMBIQUE. Lourenco Marques; Manhica.

Variation. A single large shield covering head; nasal bordering lip, not reaching the ocular; upper labials 3; lower labials 3; chin shields bordering postmental 2; annuli on body 265 - 277, on tail 9 - 11; segments in a midbody annulus 24 - 26 dorsal + 18 ventral = 42 - 44; pectorals 6; anals 4; preanal pores 1 + 1.

Coloration. Uniform pink.

Size. Largest (TM. 3400 - Lourenco Marques) 236.5 + 8.5 = 245 mm.

Habitat. Coastal alluvium.

Distribution. Southern Mozambique, sympatric with M. sphenorhynchus (See Fig. 9).

#### MONOPELTIS SPHENORHYNCHUS Peters

Monopeltis capensis (not A. Smith) Peters, 1854, p. 620 (Inhambane).

Monopeltis sphenorhynchus Peters, 1879, Monatsb. Akad. Wiss. Berlin, p. 275; Inhambane, Mozambique, and 1882, p. 87, pl. xiii A, figs. 1 - 3; Boulenger, 1885d, p. 455 (Zambezi; Shire Valley); Bocage, 1896, p. 99; Hewitt, 1910a, pp. 60, 70; Loveridge, 1941a, p. 427 and 1953a, p. 233; Broadley, 1962d, p. 824.

Monopeltis decasteri Boulenger, 1910, Ann. S. African Mus., 5, pp. 472, 495; Delagoa Bay, Mozambique; FitzSimons, 1937b, p. 377, figs. 6 - 9; Loveridge, 1943a, p. 426.

Eighteen specimens examined from: RHODESIA. Birchenough Bridge; Chipinia Pools; Chiredzi; 40 mls. S of Fort Victoria; Lundi Bridge; Ngundu; Nuanetsi; Ruware; Sabi - Lundi Confluence; Triangle.

Literature records. MALAWI (?). Shire Valley. MOZAMBIQUE. Delagoa Bay; Inhambane; Zambezi River.

Variation. A single large shield covering head; nasal bordering lip, not reaching the ocular; upper labials 2 - 3; lower labials 2 - 3; chin shields bordering postmental 2 - 4; annuli on body 193 - 229, on tail 9 - 12; segments in a midbody annulus 16 - 26 dorsal + 14 - 20 ventral = 30 - 42; pectorals 4 - 6; anals 4; preanal pores 1 + 1.

Coloration. Uniform pink.

Size. Largest (UM. 2535 - Birchenough Bridge) 255 + 14 = 269 mm.



Discussion. H. decoeteri differed from H. sphenorhynchus only in having three lower labials and is invalidated by the great variability in both upper and lower labials shown by the present series.

Enemies. The largest specimen was recovered from the stomach of a Xenocalamus transvaalensis.

Distribution. Central and southern Mozambique and south-eastern Rhodesia. Possibly extends up the Shire Valley into southern Malawi. (See Fig. 9).

Genus TOMUROPELTIS Laurent

Tomuropeltis Laurent, 1947, Rev. Zool. Bot. Afr., 40, p. 58. Type by original designation: Monopeltis giganteus Paracca.

TOMUROPELTIS LONGICAUDA (Werner)

Monopeltis longicauda Werner, 1915, Rept. Amph. in Michaelsen, Beitr. Kennt. Land - Säuget. Deut. Südwestafrikas, 3, p. 340: Okavango River, South West Africa.

Monopeltis Ellenbergeri Angel, 1920, Bull. Mus. Hist. Nat. Paris, 26, p. 615, figs. 1 - 2: Lealui, Upper Zambezi, Zambia.

Dalophis longicauda Loveridge, 1941a, p. 432.

Dalophis ellenbergeri Loveridge, 1941a, p. 433.

Twenty specimens examined from: BECHUANALAND. Tanafupi; Tsau. ZAMBIA. Kalabo.

Literature record. ZAMBIA. Lealui.

Variation. A single large shield covering head; nasal excluded from lip, in contact with ocular; upper labials 3; lower labials 3; chin shields bordering postmental 4 (rarely 5); annuli on body 320 - 332, on tail 37 - 45; segments in a midbody annulus 14 - 20 dorsal + 12 ventral = 26 - 32; pectorals 6; anals 6; no preanal pores.

Coloration. Centre of each segment opaque white: see redescription of type (Loveridge, 1941a).

Size. Largest (UM, 7911 - Kalabo) 365 + 72 = 437 mm.

Discussion. As pointed out by Loveridge (1941a), ellenbergeri differed from longicauda only in its count of tail annuli, 43 - 45 instead of 38. In a series of eighteen specimens from Kalabo (30 miles from the type locality for ellenbergeri) the range for tail annuli is 37 - 43, so ellenbergeri must be placed in the synonymy of T. longicauda.

Enemies. The remains of one specimen were found in the stomach of a Striped Polecat (Ictonyx striatus) at Tsau. A large specimen was recovered intact from the stomach of a Rhynchophis acutus from Kalabo.

Habitat. Kalahari sand.

Distribution. Barotseland and northern Bechuanaland, extending along the Okovungo River into South West Africa. (See Fig. 9). This species is sympatric with T. pistillum in Barotseland and seems to be the commoner species, R. G. Japp having collected 18 longicauda and only 9 pistillum at Kalabo.

#### TOMIROPHELTIS PISTILLUM Boettger

Monopeltis pistillum Boettger, 1895, Zool. Ann., 18, p. 62; Zanzibar.

Monopeltis granti Boulenger, 1907, Proc. Zool. Soc. London, p. 485, fig.

141: Beira, Mozambique, and 1910, p. 473; Hewitt, 1910a, p. 60; Cott, 1934, p. 157.

Monopeltis colobura Boulenger, 1910, Ann. S. African Mus., 5, pp. 473,

495: Sesheke, Barotseland, Zambia; Angel, 1920, p. 615 (Lualaba); Loveridge, 1920, p. 145 (Lunbo); Cott, 1934, p. 157; Pitman, 1934, p. 304.

† Monopeltis fallax Peracca, 1910, Boll. Mus. Zool. Torino, 25, No. 624, p. 1, fig.: Barotseland, Zambia; Loveridge, 1941a, p. 433.

Monopeltis granti transvaalensis FitzSimons, 1933, Ann. Trvl. Mus., 15,

p. 277, figs. 3 - 6: Farm "Hope", between Rylabroon and Vaalwater, Waterberg District, N. Transvaal, and 1943, p. 389.

Monopeltis mossambica Cott, 1934, Proc. Zool. Soc. London, p. 155, figs.

1a - e: Caia, Mozambique.

Monopeltis granti kwanyamensis Monard, 1937, Arch. Museu Boissie, 8, pp. 65,

67: Napenda, Angola.

Dalophia pistillum Loveridge, 1941a, p. 434.

Monopeltis luluae Witte & Laurent, 1942, Rev. Zool. Bot. Afr., 36, p. 66,

fig. 1: Sandoa, Lualaba District, Katanga.

Monopeltis granti colobura FitzSimons, 1943, p. 388.

Tomiropeltis pistillum Broadley, 1962d, p. 825.

Thirty-five specimens examined from: BECHUANALAND. 20 mls N of Tsumafupi. RHODESIA. Charams Plateau; Dala; Dett; Kapami and 6 mls SE; Kariba Lake - Buni and Sanjati Confluences; Karoi; Lusulu; Mana Pools Road. ZAMBIA. Chakwanga River; Kabompo; Kalabo; Katote; Livingstone; 15 mls NE of Lundazi; Pendala River; Zambezi River at 13° 01' S; 22° 44' E.

Literature records. ZAMBIA. Lealui; Sesheke. MOZAMBIQUE. Beira; Gaia; Lumbo.

Variation. A single large shield covering head; nasal excluded from lip, extending back towards ocular, which it may or may not reach; upper labials 3; lower labials 3; chin shields in contact with postmental 4 (rarely 5); annuli on body 276 - 337, on tail 22 - 28; segments in a midbody annulus 13 - 26 dorsal + 10 - 16 ventral = 28 - 42; pectorals 6 (rarely 4); anals 4 - 6; no preanal pores.

Coloration. Colourless, scales not white-centred as in T. longicauda.

Size. Largest (UM. 10076 - Kalabo) 560 + 72 = 632 mm.

Discussion. Laurent (1964a, p. 37) has suggested that this species should be split into three sympatric species - T. distillum, T. mosambica and T. colobura, distinguished by number of body annuli, relative length of tail and arrangement of chin shields. I think that one must allow for considerable intraspecific variation in wide-ranging amphisbaenids and all the available material can be included in a single monotypic species.

Breeding. A Lumbo ♀ laid 4 eggs measuring 26 to 35 x 8 to 9 mm on 20th September, two other ♀♀ each held 4 eggs in August (Loveridge, 1920).

Diet. Cott (1934) found insect remains, probably beetle larvae, in one of his Gaia specimens.

Enemies. Adult specimens were recovered from the stomachs of a Xenocalanus n. meehowi from the Balovale District and a Xenocalanus n. incertus from Kalabo.

Habitat. The Kapami specimens were within 2 - 3 inches of the surface in sandy topsoil above paragnathes.

Distribution. Southern Angola, north-eastern South West Africa, southern Zambia, north-eastern Bechuanaland, northern and western Rhodesia, north-western Transvaal, northern and central Mozambique.



Fig. 9. Distribution of some species of Amphisbaenidae.

- Chirindia swynnertoni
- x Monopeltis mauricei
- ▼ Monopeltis anchietae
- Monopeltis ocularis
- Monopeltis capensis capensis
- ▲ Monopeltis habenichti
- ▲ Monopeltis sphenorhynchus
- ★ M. habenichti and M. sphenorhynchus
- Tomuropeltis longicauda