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THE REPTILES AND AMPHIBIANS OF ZANZIBAR AND PEMBA ISLANDS (with a Note on the Freshwater Fishes)

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ABSTRACT

This work, more than a mere check-list, aims to be exhaustive, and an Appendix excludes absolutely species whose reported occurrence rests on mistaken identity or locality or other confusion; and provisionally those whose records are dubious, needing confirmation. It updates the last such list (Moreau & Pakenham 1941), from which 21 species have now been rejected, and 17 new ones added. The total number of forms (excluding vagrants) is 70: 23 amphibia and 47 reptilia (4 Testudinata, 17 Sauria, 26 Serpentes); and a Note on the 6-7 freshwater fishes, probably all introduced, is added. Account has been taken of the loose application, in the 19th century, of the name "Zanzibar" to the opposite mainland coast. Topography and climate are briefly described; distribution of species between the islands is compared; and some limited observations are made on breeding periods. A complete species list and a list of references are included.





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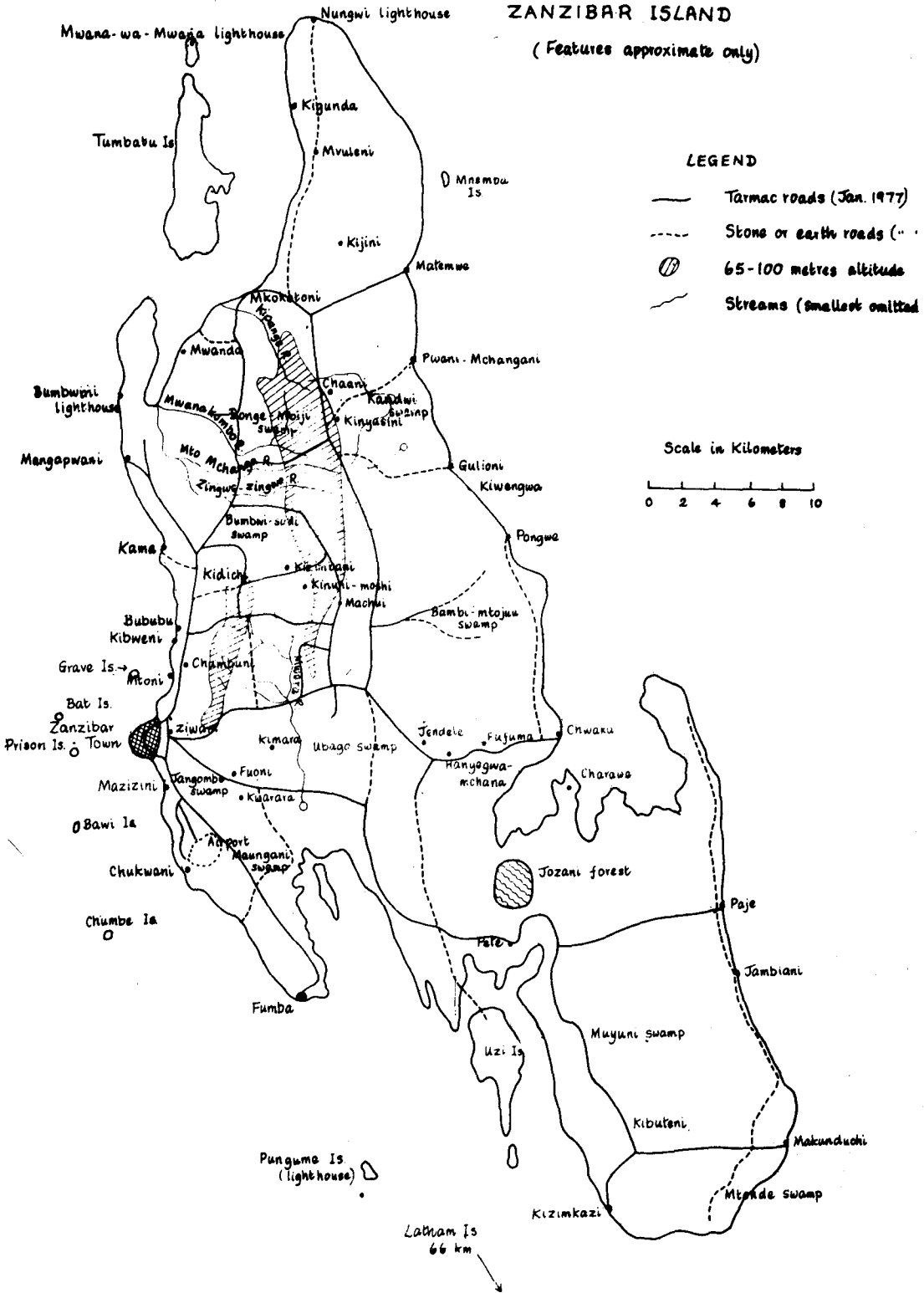
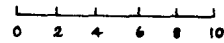
ZANZIBAR ISLAND

(Features approximate only)

LEGEND

-  Tarmac roads (Jan. 1977)
-  Stone or earth roads (" "
-  65-100 metres altitude
-  Streams (smallest omitted)

Scale in Kilometers



INTRODUCTION

This account is based largely upon my own collecting and observation during the years 1938-48, supplemented by specimens in the British Museum (Natural History) and the Museum of Comparative Zoology, Harvard, and also by the work of other authorities herein mentioned. Agricultural Officers and the Superintendent of Prisons kindly co-operated by sending me specimens turned up by their working parties.

Pakenham (1979) dealt with the islands' history, geography and geology, with comments on access and general conditions, and briefly with endemism among the vertebrates as a whole.

Mafia Island, though included in Moreau and Pakenham's zoogeography (1941), is omitted from this account owing to lack of information: the sources available then are now no longer so. Moreover, Zanzibar and Pemba form a more natural unit, though with mutually dissimilar geological histories, and lie substantially further off the mainland coast (40-48 km) than Mafia (16 km).

The sequence of families (omitting sub-family titles) mainly follows that in Loveridge's 1957 Check-List of East African reptiles and amphibians, but the latter are placed first and the snakes last. Within families, genera and species are arranged alphabetically, and the species in each Order are numbered serially within the Order. In accord with current practice, eight snake genera formerly classified in other families are transferred to the Colubridae. The removal of one of these, *Atractaspis*, from the Viperidae follows Bourgeois (1965:206), Underwood (1967:103), and McDowell (1968:570).

References to the species lists on pages 304 of Voeltzkow (1923) and 348 of Boettger (1913) are usually omitted (except in Appendix) as both refer to species "reported in literature" as occurring or "known to occur" in the islands, and several of these unconfirmed records are now shown to be unreliable or erroneous.

The Appendix comprises species excluded from the islands' list, either absolutely by reason of mistaken locality or other confusion, or (indicated by asterisk) provisionally owing to doubt for reasons stated in the text and subject to confirmation by further evidence.

Misunderstanding arises from reference, in writings and specimen labels of early naturalists, to "Zanzibar" meaning often not the island but the strip of country down the East African coast from Somalia to Mozambique, which was under the suzerainty of the Sultans of Zanzibar during the 19th century. This may also affect interpretation of type localities. However, Voeltzkow (1923), Boettger (1913), Neumann (Zool. Jahrb. 1900:592 etc) and Pfeffer (1893:90, 98, etc) did recognise this difference between mainland and insular "Zanzibar".

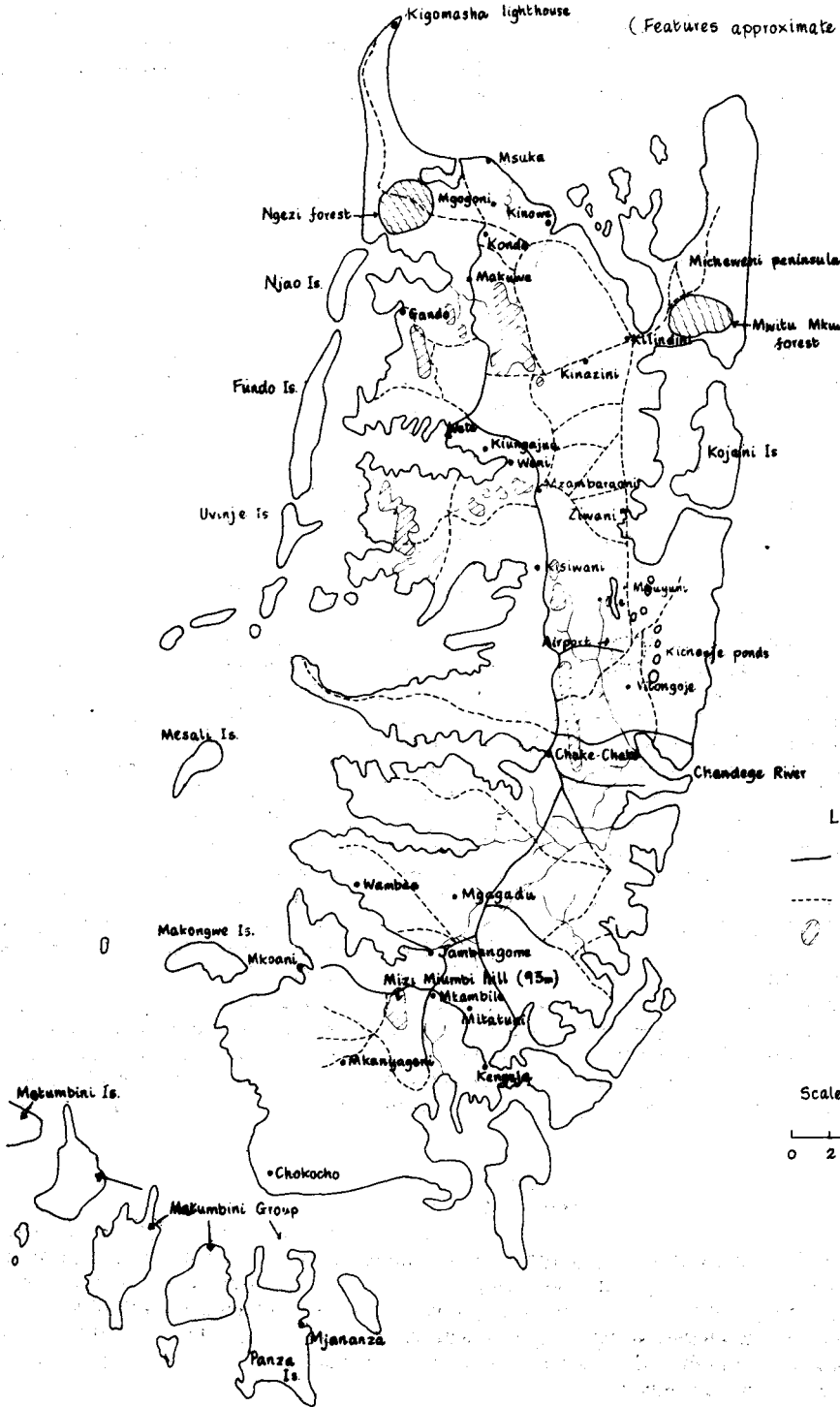
In Dr. Livingstone's 1858-63 expedition to the Zambesi and country southwest of Lake Nyasa, Dr. Kirk collected specimens which were, in some instances, despatched to London from "Zanzibar", possibly causing misunderstanding of their origin. Similarly, both as Political Agency Surgeon (1866 onwards) and later as H.M. Consul General and Political Agent (1873-87), Sir John Kirk's duties must often have taken him to the mainland part of the Sultan's dominions, probably for long enough to collect specimens; the receipt of which from "Zanzibar" left doubt about the locality of collection. The origin of Kirk's specimens from "Zanzibar" and accessioned by the British Museum in 1868 is particularly dubious since in that year a consignment of reptiles was received from him, labelled "Zanzibar" though containing a number of species well known in Mozambique but more than half as yet unknown from Zanzibar Island (see Kirk 1867:952).

TOPOGRAPHY

It may be useful to summarise briefly the general topography of the islands. While Zanzibar Is. is relatively flat or undulating, with two main hill ranges under 100m (320ft) except at five points, Pemba Is. is a network of small valleys and hills, only two of which exceed 90m and most are much smaller. The principal water-courses, swamps, and high ground in Zanzibar Is. are shown on the map, but in Pemba these are so numerous and much smaller than in Zanzibar that no detailed indication can be given.

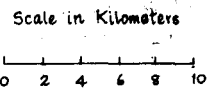
PEMBA ISLAND

(Features approximate only)



LEGEND

- Tarmac roads (Jan. 1977)
- - - Stone or earth roads (")
- ◐ 65-100 metres altitude
- ~ Streams (smallest omitted)



The centre and western side of both islands from north to south is fertile and mainly covered with plantations of cloves and/or coconuts, interspersed with food cultivation, trees and bush. The exception to this is the southern portion of Zanzibar Is. from about Pete southwards, which is wholly 'coral-rag' and tall bush from shore to shore. In Pemba, conversely, plantation country extends right across to the southeast coast.

Down the entire eastern seaboard of both islands from the northernmost tip is a band of bush country of varying width, growing on thin soil covering the old outcropping coral rock (called 'coral-rag'). Between the fertile central area and this rocky coastal bushland (except in the southern part of Zanzibar Is.) lies discontinuously a belt of open or semi-open grassy country, with scattered bush, supporting cattle and cultivation.

CLIMATE

Pakenham (1979:20-23) shows that there are no really extreme seasonal variations in the islands as regards either rainfall or temperature. Average total annual rainfall in Zanzibar Island over 41 years was 148.81cm, and in Pemba over 34 years was 186.05cm. The monthly mean figures taken over the same periods are: Zanzibar 12.40cm (but the three 'long rain' months, March-May, average 24.76cm p.m.; two 'short rain' months, November-December, average 16.23cm p.m.); Pemba 15.50cm (but the three 'long rain' months average 36.34cm p.m.; two 'short rain' months average 17.47cm p.m.). In fact, hardly a month passes without some wet days. Temperature rarely exceeds 34° C or falls below 21° C. The difference between the highest mean daily maximum and lowest mean daily minimum temperature, month by month throughout the year over periods of 41 years (Zanzibar) and 34 years (Pemba), is no more than 7.98° C in Zanzibar and 9.23° C in Pemba. Thus the climate is reasonably equable, and there is little contrast between the islands, perhaps accounting for the fact that some species (as with many of the birds) seem to breed almost throughout the year without seasonal preference.

DISTRIBUTION

Species and subspecies found on Zanzibar and Pemba Islands

1	2	3	4
	Zanzibar	Pemba	Both Zanzibar and Pemba
Amphibians (frogs)	19	6 (1E)	3
Lizards	10 (1E) (4-5 others doubtful: see <i>Agama</i> sp. (App.), <i>Chamaeleo</i> spp., & <i>Mabuya maculilabris</i>)	10 (4E) or 11 (5E if <i>Chamaeleo</i> <i>d. martensi</i> is included: see systematic text)	5
Snakes	23	9 (3E)	6

Notes:

Frogs having been very inadequately collected, especially in Pemba, conclusions on numbers of species must be reserved.

Amphibians: *Bufo gutturalis* & *Ptychadena anchietae* (both doubtful) are excluded from figure 19 (col.2), and *Ptychadena* (sp. undet.) from figures 19 (col.2) and 6 (col.3).

Snakes: figure 9 (col.3) excludes *Python sebae* (very doubtful) and *Dendroaspis angusticeps* (probable on circumstantial evidence but no specimen obtained).

MALAGASY ASSOCIATION

Three geckos show some possible connection with the Malagasy area. *Ebenavia*, of which only a juvenile and two hatchlings from eggs (in the extreme south and in the north respectively) have so far been found in Pemba, is a monotypic genus known hitherto only from a species believed to be restricted to Madagascar and the Comoro Islands: whether Pemba examples belong to the Malagasy species or to an undescribed species will be decided on study of more mature individuals. *Phelsuma dubia*, which occurs in northwest Madagascar and the Comores, is also found in Zanzibar Island and the Tanzanian mainland coast. The Palm Gecko endemic to Pemba, formerly *Phelsuma madagascariensis parkeri*, is now treated as a subspecies of *P. abbotti* of Aldabra (Börner 1942). These seem to be the only examples of connection with the Malagasy region.

BREEDING

The condition of a few specimens throws a little light on breeding periods. Of the snakes, *Crotaphopeltis hotamboeia* and *Dispholidus typus* were near laying or about to lay eggs (details under species) in the first half of July, *Lycophidion capense* in the last week of August into September, and *Boaedon fuliginosus* between mid and end of September. On December 7 a *Naja melanoleuca*, and on February 7 a *Boaedon fuliginosus*, were also near to laying. This suggests a preference for the cool months of July-September before the short rains, with some species or individuals breeding in the hot months December-February.

As to the lizards, judging from the evidence of 30 actually breeding examples distributed among 14 lizard species, their breeding periods viewed overall seem to be fairly evenly distributed through the year, but avoiding the hottest period from the beginning of January to mid March (details under species). To particularise, the geckos seem to favour either the period end of March to early July or else November-December; chamaeleons actually laid on 25 September and 8 March, and carried eggs on 12 December; and the Scincidae were breeding in the late part of the year from August to October and throughout December (gonads of a *Riopa* ♂ on 22 May were enlarged, but ovaries of two ♀♀ on the same date were, on dissection, found not to be so. A pair of *Mabuya striata* copulated on 20 July). A *Varanus* sp. carried well-formed eggs on 5 July. A *Chelonia mydas* on 17 January contained scores of fully formed eggs, but this date may be irrelevant to breeding periods of terrestrial Testudinata. Frogs (see under species) appear to breed principally in April-May (period of heavy rains) and August to early December (before, during, and after the short rains).

Abbreviations

Apart from the more familiar ones, the following abbreviations are used in the lists of synonyms under species headings and elsewhere: Z (Zanzibar), P (Pemba), Vag. (vagrant), Kisw. (Kiswahili), E (Endemic), Vltz. (Voeltzkow), Bttgr. (Boettger), Mor. (Moreau), Pak. (Pakenham), P.&G. (Playfair & Günther), BM (British Museum of Natural History, London), MCZ (Museum of Comparative Zoology, Harvard), ZM (Zanzibar Museum), and ZMB (Zoologisches Museum der Humboldt Universität, Berlin).

ACKNOWLEDGEMENTS

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LIST OF ADMITTED SPECIES
(excluding species listed in the Appendix)

Class: AMPHIBIA

Order: ANURA

Family: Pipidae

1. *Xenopus muelleri* (Peters) Z

Family: Bufonidae

2. *Bufo gutturalis* Power Z P
3. *Mertensophryne micranotis* (Loveridge) Z

Family: Rhacophoridae

4. *Chiromantis xerampelina* Peters Z

Family: Hyperoliidae

5. *Afrixalus brachycnemis* (Boulenger) Z
6. *Afrixalus fornasini* (Bianconi) Z, P
7. *Afrixalus pygmaeus pygmaeus* (Ahl) Z
8. *Hyperolius argus* Peters Z
9. *Hyperolius marginatus mariae* Barbour & Loveridge Z
10. *Hyperolius mitchelli* Loveridge Z
11. *Hyperolius parkeri* Loveridge Z
12. *Kassina maculata* (Duméril) Z
13. *Leptopelis flavomaculatus* (Günther) Z

Family: Ranidae

14. *Hemisis marmoratus marmoratus* (Peters) Z
15. *Hylarana galamensis bravana* (Peters) Z, P
16. *Phrynobatrachus acridoides* (Cope) Z, P
17. *Phrynobatrachus minutus* (Boulenger) Z
18. *Phrynobatrachus natalensis* (Smith) Z
19. *Phrynobatrachus pakenhami* Loveridge P(E)
20. *Ptychadena* sp. Z, P
21. *Ptychadena anchietae* (Bocage) Z?, P
22. *Ptychadena mascareniensis* (Duméril & Bibron) Z

Family: Phrynomeridae

23. *Phrynomerus bifasciatus* (Smith) Z

Class: REPTILIA

Order: TESTUDINATA

Family: Dermochelyidae

1. *Dermochelys coriacea* (Linnaeus) Z (vag.)

Family: Chelonidae

2. *Chelonia mydas* (Linnaeus) Z, P
 3. *Eretmochelys imbricata* (Linnaeus) Z, P

Family: Testudinidae

4. *Geochelone gigantea* (Schweigger) Z (intro.)

Family: Pelomedusidae

5. *Pelusios castaneus castanoides* Hewitt P

Order: CROCODYLIA

Family: Crocodylidae

1. *Crocodylus niloticus* Laurenti Z (vag.)

Order: SQUAMATA: SAURIA

Family: Gekkonidae

1. *Ebenavia* sp. (? *inunguis*) Boettger P
 2. *Hemidactylus brookii angulatus* Hallowell Z, P
 3. *Hemidactylus mabouia* (M. de Jonnés) Z, P
 4. *Hemidactylus platycephalus* Peters Z, P
 5. *Lygodactylus capensis pakenhami* Loveridge P (E)
 6. *Lygodactylus luteopicturatus zanzibaritis* Pasteur Z (E)
 7. *Phelsuma abbotti parkeri* Loveridge P (E)
 8. *Phelsuma dubia dubia* (Boettger) Z

Family: Chamaeleontidae

9. *Chamaeleo dilepis* Leach subsp. and ?*C. quilensis* Bocage Z, P

Family: Scincidae

10. *Cryptoblepharus boutonii africanus* (Sternfeld) Z, P
 11. *Mabuya maculilabris albotaeniata* Boettger P (E)
 12. *Mabuya maculilabris* (Gray) subsp. Z
 13. *Mabuya striata* (Peters) Z, P
 14. *Riopa pembana* Boettger P (E)
 15. *Riopa sundevallii sundevallii* (Smith) Z

Family: Cordylidae

16. *Gerrhosaurus major major* Duméril Z

Family: Varanidae

17. *Varanus niloticus niloticus* (Linnaeus) Z

Order: SQUAMATA: SERPENTES

Family: Typhlopidae

1. *Ramphotyphlops braminus* (Daudin) Z, P
 2. *Rhinotyphlops lumbriciformis* (Peters) Z

3. *Rhinyophlops pallidus* (Cope) Z, P
 4. *Rhinyophlops schlegelii dinga* (Peters) Z

Family: Leptotyphlopidae

5. *Leptotyphlops emini pembae* Loveridge P(E)

Family: Boidae

6. *Python sebae* (Gmelin) Z, ?P

Family: Colubridae

7. *Atractaspis bibronii rostrata* Günther Z
 8. *Boaedon fuliginosus* (Boie) Z, P
 9. *Chamaetortus aulicus aulicus* Günther Z
 10. *Crotaphopeltis hotamboela* (Laurenti) Z
 11. *Dasypeltis medici medici* (Bianconi) Z
 12. *Dispholidus typus* (Smith) Z, P
 13. *Lycophidion capense loveridgei* Laurent Z
 14. *Lycophidion capense pembanum* Laurent P(E)
 15. *Mehelya capensis capensis* (Smith) Z
 16. *Mehelya nyassae* (Günther) Z
 17. *Natriciteres olivacea* (Peters) Z
 18. *Natriciteres variegata pembae* (Loveridge) P (E)
 19. *Philothamnus macrops* (Boulenger) Z
 20. *Philothamnus semivariegatus semivariegatus* (Smith) Z, P
 21. *Psammophis sibilans sibilans* (Linnaeus) Z
 22. *Psammophis subiaeniatus sudanensis* Werner Z

Family: Elapidae

23. *Dendroaspis angusticeps* (Smith) Z, ?P
 24. *Naja melanoleuca* Hallowell Z
 25. *Naja mossambica mossambica* Peters Z, P

Family Viperidae

26. *Causus defilippii* (Jan) Z

APPENDIX: LIST OF EXCLUDED SPECIES

(asterisk signifies provisional exclusion, for reasons stated in text, subject to confirmation of occurrence)

Class: AMPHIBIA
Order: GYMNOPTERODONTA

Family: Caeciliidae

1. *Hypogeophis rostratus guentheri* Boulenger

Order: ANURA

Family: Rhacophoridae

1. *Afraxalus dorsalis leptosomus* (Peters)
 2. *Hyperolius picturatus* Peters
 3. *Hyperolius puncticulatus* (Pfeffer) *
 4. *Hyperolius tuberilinguis* Smith *
 5. *Hyperolius vermicularis* Ahl *

Family: Ranidae

6. *Ptychadena floweri* (Boulenger)

Class: REPTILIA**Order: TESTUDINATA****Family: Testudinidae***Kinixys bellana* Gray**Order: SQUAMATA, SAURIA****Family: Gekkonidae**

1. *Hemidactylus parkeri* Loveridge

Family: Agamidae

2. *Agama* sp. *
3. *Uromastix princeps* O'Shaughnessy

Family: Chamaeleontidae

4. *Chamaeleo tigris* Kuhl

Family: Scincidae

5. *Mabuya quinquetaeniata obsti* Werner *
6. *Panaspis wahlbergii* (Smith) *

Family: Cordylidae

7. *Gerrhosaurus flavigularis fitzsimonsi* Loveridge

Family: Lacertidae

8. *Gastropholis vittata* J.G. Fischer

Family: Varanidae

9. *Varanus exanthematicus microstictus* Boettger *

Order: SQUAMATA: SERPENTES**Family: Typhlopidae**

1. *Rhinotyphlops unitaeniatus* (Peters)
2. *Typhlops punctatus* (Leach) *

Family: Colubridae

3. *Aparallactus capensis* Smith
4. *Aparallactus guentheri* Boulenger *
5. *Aparallactus werneri* Boulenger
6. *Atractaspis irregularis* (Reinhardt)
7. *Boiga blandingii* (Hallowell)
8. *Bothrophthalmus lineatus* Peters
9. *Dromophis lineatus* (Duméril & Bibron)
10. *Duberria lutrix* (Linnaeus)

11. *Lamprophis inornatus* Duméril & Bibron
12. *Lycophidion semiannule* Peters
13. *Meizodon semiornatus* (Peters)
14. *Philothamnus heterolepidotus* (Günther)
15. *Philothamnus thomensis* (Bocage)
16. *Prosymna ambigua stuhlmanni* (Pfeffer) *
17. *Psammophis angolensis* (Bocage)
18. *Rhamphiophis oxyrhynchus rostratus* Peters
19. *Rhamphiophis rubropunctatus* (Fischer)
20. *Telescopus semiannulatus* Smith

Family: Elapidae

21. *Elapsoidea nigra* Günther
22. *Naja haje* (Linnaeus)

Family: Viperidae

23. *Bitis arietans* (Merrem)
24. *Bitis gabonica* (Duméril & Bibron)

Class: AMPHIBIA

Order: ANURA

Family: Pipidae

1. XENOPUS MUELLERI (Peters) Tropical Platanna or Müller's Clawed Frog Z.
Dactylethra muelleri Ptrs. 1844 : Ber.Akad.Wiss.Berlin:37. Mozambique.
Xenopus muelleri, Btgr.1913:347 Mkokotoni,Z. Pfeffer 1893:104 (coll.Stuhlmann,Kibweni,Z). Niden
 1915:387(coll.Werth.Z) Mor.& Pak.1941:109 Z.

Stuhlmann found larvae on 25 May and 6 & 15 August. I collected 13 examples (12 in BM) in 1938 from a water-hole near Jozani forest (Z). G.F. Losse took 81 at Kwarara (Z) in 1963 (in BM). Dr. R. Tinsley has confirmed the identification of all my specimens. No record from Pemba.

Family: Bufonidae

2. BUFO GUTTURALIS Power Guttural Toad. Z, P.
Bufo regularis gutturalis Power 1927. Trans.R.Soc.S.Afr. 14:416. Lobatsi, S. Africa.
Bufo regularis, Vltz 1923:185 P Mor & Pak.1941:109 Z, P. Lov.1957: (?part) 310 Z, P
Bufo gutturalis, Tandy 1972.

The toads of these islands were for long considered to be *Bufo regularis*, but Dr. Tandy, who has examined all my Pemba specimens, has identified all as *Bufo gutturalis* Power, a member of the "*Bufo regularis* species group". Identification of members of this group is difficult without full notes on colour in life, ecological niche, and call (tape recorded).

The abundance of the Mozambique Spitting Cobra (*Naja mossambica*) in Pemba may be linked with its reputed partiality for toads (Loveridge 1922(?):15; Pitman 1938:226) which occur in large numbers. They come out mainly at night, and vary in colour from very pale brown to almost black; some at least have a handsome red pigmentation on the inner part of the thigh. On Zanzibar Is. toads are much less common, but BM has a ♀ and an immature received 1889 from Dr. J.G. Fischer, labelled "Zanzibar". Loveridge (1957) includes Zanzibar in its range, and took 3 in the island.

3. MERTENSOPHRYNE MICRANOTIS (Loveridge) East African Pygmy Toad Z.
Bufo micranotis Lov.1925:770 Kilosa, Morogoro, Tanganyika.
Bufo micranotis rondoensis Lov.1942d:387 Nchingidi, Rondo Plateau, Lindi Prov., S.E. Tanganyika;
 1957:313 Z.
Bufo sp. near *micranotis*, Pak. 1947:140 Z.

Zanzibar records of this rare pygmy toad, females of which attain only 23mm, are limited to seven specimens (not six as quoted by Pakenham 1947): 4 BM, 3 MCZ (2 of them juvs.) taken from a waterhole at Jangombe swamp. Jangombe is now a prohibited military area. Elsewhere the species is known to occur in coastal Kenya and in mainland Tanzania where it has been found in *Achatina* snail shells and holes in trees (Grandison 1980:299 etc.) and on the forest floor. The altitudinal range of the species in Tanzania is from sea level near Dar-es-Salaam to 914m (3000ft) on the Rondo Plateau.

Family: Rhacophoridae

4. CHIROMANTIS XERAMPHELINA Peters Great Grey Foam-nest Tree-Frog Z.

Chiromantis xerampelina Ptrs. 1854:627. Tete & Sena, Mozambique. Btgr. 1913:346 Z. Nieden 1915:366 (imm.coll. Böhm Z). Mor. & Pak. 1941:109 Z.

I found it at Fufuma cave-well near Chwaka, 1944 and 1945: on 18 December 1944 one of these frogs lay close to three foam-nests on the face of the rock in the entrance to a cave with no water immediately beneath. One of the nests held sandy-coloured larvae swimming free in the foam. On 15 April 1945 at Mtoni (Z), a crust-covered foam nest containing spawn was attached to a plant c. 45cm. above a wet ditch. A ♀ on 9 September was gravid. Apparently uncommon in Zanzibar; not reported from Pemba.

Family: Hyperoliidae

5. AFRIXALUS BRACHYCNEMIS (Boulenger) Golden Leaf-folding Frog or Short-limbed Banana-Frog Z. *Megalixalus brachycnemis* Blgr. 1896 Ann.Mag.nat.Hist.(6)17:403. Chiradzulu, Nyasaland. Mor.&Pak.1941:109 Z.

Rappia fulvovittata, Btgr.1913:346 Mkokotoni, Z. Parker *et al.* 1940:311. Lov.1957:323, footnote. Z.

I obtained 2 specimens on a flooded rice plain at mile 7 (11.3km) on Makunduchi road (Z), 22 November 1938.

6. AFRIXALUS FORNASINI (Bianconi) Greater Leaf-folding Frog or Brown-striped Spiny Reed Frog Z, P.

Euchnemis fornasini Bianc.1849 Nuovi.Ann.Sci.nat.Bologna (2) 10:107. Mozambique.

Megalixalus fornasinii, Btgr. 1913:346 Z. Vitz. 1923:185 P. Mor.& Pak. 1941:109 Z, P.

Afrixalus fornasini fornasini, Lov.1957:322. Z, P.

Tornier (1897:156) also reports examples from "Sansibar" (unqualified by "Insel" as elsewhere) taken by Kirk and Hildebrandt. I took one on a *Poinsettia* plant in central Zanzibar in 1944, but it was lost at sea; also five specimens from banana plants at Pete (Z), 29 December 1938; and several from parts of south Pemba in April and July-Aug. 1939, and at Kilindini Kinazini (north P), Sept. 1940: from banana plants, other plants near a swamp, and in a small deep-sided pond (water 1.5m. below ground level). BM also has an example taken by G.F. Losse at Jozani forest (Z), 1963.

7. AFRIXALUS PYGMAEUS PYGMAEUS (Ahl) Z.

Hyperolius pygmaeus Ahl 1931:22 Tanga, Tanganyika.

Hyperolius brachycnemis brachycnemis (non Blgr.) Lov.1957:323 Z.

Hyperolius pygmaeus has long been regarded as a synonym of *H. brachycnemis* Blgr., but Schiøtz (1974) recognised *pygmaeus* as a distinct species and distinguished it from *brachycnemis*. 13 examples (in BM; first records for these islands) were collected by G.F. Losse 1963 at Kwarara, Mazizini, and Jozani forest (Z).

8. HYPEROLIUS ARGUS Peters Argus Sedge Frog Z.

Hyperolius argus Ptrs. 1854:628 Boror, Mozambique.

Laurent (1943b:12) cited a ♀ *H. argus* in Brussels Museum dated c. 1879 from "Zanzibar", but Loveridge (1957:331, footnote) questioned its identity. However, several juvenile specimens (in BM), taken by me in Jozani forest, 1938, are believed by BM to be of this species; G.F. Losse (1963) obtained an example (in BM) at Kwarara (Z); and D.W. Gibbons took a ♀ (in BM) 19 August 1979, at a large swamp near Kinyasini bridge (Z). ZM has 2 ♂♂ and a ♀ identified by BM but without data. Unrecorded from Pemba.

9. HYPEROLIUS MARGINATUS MARIAE Barbour & Loveridge Z.

Hyperolius mariae, Barb. & Lov. 1928 Mem.Mus.comp.Zool.Harv.50:217 Derema, Usambara Mts., Tanganyika. Parker *et al.* 1940:311. Mor. & Pak. 1941:109 Z. Lov. 1957:328 Z. Schiøtz 1971:62-63 Z.

Hyperolius cinciventris, (non Cope) Mor. & Pak. 1941:109 Z.

Hyperolius melanophthalmus, Ahl 1931 Tierreich 55:341.

Hyperolius renschi, Ahl 1931 Tierreich 55:397.

Hyperolius viridiflavus mariae, Schiøtz 1975:206. Z.

I follow Laurent (1976:83, 99) in considering *mariae* as a race of *marginatus*. Schiøtz (1971) quotes the distribution of *H. mariae* as southern coastal Kenya north-eastern Tanzania, Zanzibar and Mafia Islands. Zanzibar records are sufficiently modern to dismiss any question that the type localities might not be insular. A tree frog collected by me in Jozani forest (Z), 26 November 1939, was tentatively identified by BM as "*Hyperolius ?ciniventris*". (See also Loveridge 1957:324 footnote).

10. HYPEROLIUS MITCHELLI Loveridge Z.

Hyperolius punctulatus mitchelli, Lov. 1953 Bull. Mus. comp. Zool. Harv. 110:360. Mtimbuka, Nyasaland.
Hyperolius punctulatus, Mor. & Pak. 1941:109 Z.
Hyperolius mitchelli, Schiøtz 1975:151.

Loveridge's specimen MCZ 17162 from Mwera (Z), which he identified as *H. punctulatus* (1957:331), has been re-examined by Schiøtz who refers it to *H. mitchelli* (Schiøtz 1975. See also *H. punctulatus* in Appendix). A ♂ and ♀ (in BM) taken by D.W. Gibbons off lily pads in Donge-Mbiji swamp (north Z), 29 August and 5 September 1979, also belong to this species. It occurs in mainland Tanzania, even up to 914m (3000 ft), and was formerly confused with *H. punctulatus*.

11. HYPEROLIUS PARKERI Loveridge Z.

Hyperolius parkeri, Lov. 1933:410. Bagamoyo, Tanganyika.

Several specimens (in BM), taken by me in Jozani forest 1938, have been referred to this species by BM staff. Not hitherto recorded from the islands.

12. KASSINA MACULATA (Duméril) Red-legged Pan Frog Z.

Hylambates maculatus Dum. 1853 Annls. Sci. nat. (Zool.) 19:165 Z. Tornier 1897:157 (coll. v.d. Decken, Peters). Z. Btgr. 1913:347 Mkokotoni Z. Nieden 1915:366 Z. (coll. Werth, 8 individ.). Mor. & Pak. 1941:109. Z. Lov. 1957:320. Z.

G.F. Losse (1963) collected 27 examples (in BM) at Kwarara (Z). No record from Pemba.

13. LEPTOPELIS FLAVOMACULATUS (Günther) Johnston's Tree Frog Z.

Hyperolius flavomaculatus Günther 1864:Proc. zool. Soc. Lond.:310. Rovuma Bay, Tanganyika.

An adult obtained at Jozani forest (Z) by Mrs. Fatina Omari in April 1980 was forwarded to BM by Dr. K.M. Howell of the University of Dar-es-Salaam. First record for these islands.

Family: Ranidae

14. HEMISUS MARMORATUS MARMORATUS (Peters) Mottled Shovel-nosed Frog Z.

Engystoma marmoratum Ptrs. 1854:628. Cabaceira, Mozambique.
Hemisus sudanensis (non Steindachner) Btgr. 1913:347 Mkokotoni, Z. Parker *et al.* 1940:311.
Hemisus marmoratum, Mor. & Pak. 1941:109. Z.
Hemisus marmoratus marmoratus, Lov. 1957:354. Z.

Laurent (1972:29, 33) examined the Vienna Museum specimen no.4078 with locality "Zanzibar 1869" which Boettger and Voeltzkow had recorded as *H. sudanensis* Stein., and he referred it to the nominate subspecies which ranges from Kenya to Mozambique. The Mkokotoni material presumably also belongs to this form and not to the Sudanese race *H. m. sudanensis* Steindachner. I did not encounter it. Unrecorded from Pemba.

15. HYLARANA GALAMENSIS BRAVANA (Peters) Golden-backed Frog Z, P.

Limnoytes bravanus Ptrs. 1882 Sber. Ges. naturf. Freunde Berl.:3. Barawa, Italian Somaliland.
Rana bravana, Btgr. 1913:349 P. Vltz. 1923:185 Z, P. Nieden 1915:352 (coll. Werth, Z, & Vltz., P).
Rana galamensis bravana, Mor. & Pak. 1941:109. Z, P. Lov. 1957:338 Z, P.

Examples collected by me 1939-40 in north Pemba (in BM and MCZ); and 20 taken by G.F. Losse in 1963 at Kwarara (Z) are in BM. A large frog with a loud gurgling, almost vomiting-like, croak. Fairly common.

16. PHRYNOBATRACHUS ACRIDOIDES (Cope) East African Puddle Frog Z, P.

Staurois acridoides Cope 1867 J. Acad. nat. Sci. Philad. 6:198 Z.
Phrynobatrachus acridoides, Btgr. 1913:349 P. Vltz. 1923:185 Z, P. Mor. & Pak. 1941:109 Z, P. Lov. 1957:346 Z, P.

Very common in Pemba and Zanzibar. My specimens (in BM & MCZ) were found mostly in damp places in herbage, ditches, edges of wet meadows or of woodland beside or near swampy ground, and once in secondary woodland apparently not near fresh water. Usually dark brown or greenish above (one brown with light green dorsal stripe, another with bright green hour-glass marking, from neck to rump): a broad

dorsal band was characteristic of many, also dark and white barring on lower lip and hind limbs, less so on fore limbs; dusky freckling on throat but one was greyish pink; warty lumps on back and head. Another had dark chevron marks between the eyes and between the shoulders. Ten specimens (in BM) taken by D.W. Gibbons 1979 in swamps from Donge-Mbiji (north Z) to Mtende in extreme south, were identified tentatively as this species, with the reservation that the whole genus needs to be revised.

17. PHRYNOBATRACHUS MINUTUS (Boulenger) Z.

Arthrolepits minutus Blgr. 1895 Proc.zool.Soc.Lond.:539. Durro, Western Somaliland (Ethiopia). Parker *et al.* 1940:311. Mor. & Pak. 1941:109. Z.

Arthrolepits scheffleri, Nieden 1910:438 Z.

Phrynobatrachus minutus, Lov. 1957:349 Z.

I collected a ♂, ♀, and four juveniles, 25 September 1938, on the damp black soil and in wayside herbage in Jozani forest (Z). One of the juveniles jumped from the mouth of a *Ptychadena* sp. No Pemba record.

18. PHRYNOBATRACHUS NATALENSIS (Smith) Snoring Puddle Frog Z.

Stenorhynchus natalensis Smith 1849 App.:24. Natal. Tornier 1897:96 (coll.Neumann. Z).

Phrynobatrachus natalensis, Nieden 1915:358 (coll.Böhm. Z). Mor. & Pak. 1941:109 Z. Lov. 1957:348 Z.

Neumann's four specimens were evidently insular in contradistinction from "Festland von Sansibar", but with Böhm's 14 examples the island is not specified as distinct from the mainland. Loveridge (1957) includes Zanzibar in its range. No examples were found by me, and no specimen from the islands is in BM.

19. PHRYNOBATRACHUS PAKENHAMI Loveridge (PE).

Phrynobatrachus pakenhami Lov. 1941a Proc.biol.Soc.Wash., 54:178. Machengwe, Wete, P; 1957:347 P. Mor. & Pak. 1942:62 P.

The type specimen was a gravid ♀ taken 9 April 1940. This and other gravid ♀♀ were taken 9 April and 4 May, among grass and thickets in wet or swampy places. Described as sharing generally characteristics of *P. acridoides* but c. 10mm. larger in both sexes, lower jaws not sharply chequered brown and white, and digital discs well developed.

20. PTYCHADENA sp. Z, P.

Until a thorough review of the genus can be undertaken it is unwise to attempt a specific determination of my nine specimens from Pemba and two from Zanzibar (all in BM).

21. PTYCHADENA ANCHIETAE (Bocage) Savanna Ridged Frog or Plain Grass Frog Z?, P.

Rana anchietae Bocage 1867 Proc.zool.Soc.Lond.:843. Benguella.

Ptychadena abyssinica Peters 1881 Sber.Ges.naturf.Freunde Berl.:163 Ailet, near Massawa, & Keren, Bogoa, Eritrea. Guibe & Lamotte 1961:384.

Rana oxyrhynchus (non Smith), Bttgr. 1913:346 Mkokotoni, Z; 348 P.

Rana oxyrhyncha (non Smith), Vitz. 1923:185 Z, P.

Rana oxyrhynchus oxyrhynchus (non Smith), Mor. & Pak. 1941:109 Z.P. Lov. 1957:340 Z, P.

Ptychadena anchietae Poynton 1964:125.

One specimen in BM from Mgagadu (P) and three in MCZ from Weni, Wete (P) were taken in damp grassy meadows or cultivation. Evidence of its possible occurrence in Zanzibar Is. rests on a specimen labelled "Zanzibar" received in BM 1887 from F.J. Jackson, at which date it may have come from the mainland (see Introduction).

22. PTYCHADENA MASCARENIENSIS (Duméril & Bibron) Common Mascarene Frog Z.

Rana mascareniensis Dum. & Bib. 1841 Erpét.Gén.8:350 Madagascar, Mauritius, Seychelles. Tornier 1897:92 (coll.Kirk, Stuhlmann) "Sansibar". Mor. & Pak. 1941:109 Z. Lov. 1957:341 Z.

I took an example in Jozani forest 1939, and D.W. Gibbons collected one from Kandwi swamp, east of Chaani, 1979 (both in BM). Not reported from Pemba.

Family: Phrynomeridae

23. PHRYNOMERUS BIFASCIATUS (Smith) Banded Rubber Frog Z.

Brachymerus bifasciatus Smith 1849:Pl.63. E. & NE. of Cape Colony.

Phrynomantis bifasciatus, Pfeffer 1893:102 (coll. Stuhlmann) Mkokotoni, Z. Bttgr. 1913:347 Mkokotoni, Z.

Phrynomerus bifasciatus, Mor. & Pak. 1941:109 Z. Lov. 1957:355 Z.

Stuhlmann's three specimens were taken in 1888-89. ZM has four examples, without data but said to be local, identified by BM. Though Loveridge (1957) includes Zanzibar in its range, I personally did not find it. No Pemba record.

Class: REPTILIA

Order: TESTUDINATA

Family: Dermochelyidae

1. DERMOCHELYS CORIACEA (Linnaeus) Leathery Turtle or Luth Z. Vag.
Testudo coriacea Linn. 1766 Syst.Nat.12th ed. 1:350. Mediterranean Sea.
Dermochelys coriacea, Lov. 1957: 164.

This turtle, said to be becoming rare everywhere, roams all over tropical seas and very occasionally turns up at Zanzibar. One (1650mm nose to tail tip) was taken by fishermen at Kizimkazi (south Z) 27 April 1940, and is in ZM. Another was reported to have been brought in to Zanzibar market some years previously.

Family: Cheloniidae

2. CHELONIA MYDAS (Linnaeus) Green Turtle Z, P.
Testudo mydas Linn. 1758 Syst.Nat. 10th ed. 1:197. Ascension Is.
Chelonia mydas, Lov. 1957:165.

The common turtle of the seas around both islands, and sometimes caught by fishermen. A ♀ in Chake-Chake market (P) 17 January 1941 contained many scores of fully formed eggs, and perhaps over 1000 including those in the ovaries. Gwynne, Parker & Wood (Geogr.J. 1970, 136:251) recorded nine turtle nests, probably this species, October 1967 in sandy areas of Latham Is. Kisw. name "kassa".

3. ERETMOCHELYS IMBRICATA (Linnaeus) Hawksbill Turtle Z, P.
Testudo imbricata Linn. 1766 Syst.Nat.12th ed. 1:350. American and Asiatic seas.
Eretmochelys imbricata, Lov. 1957:166.

Occurs in waters around the islands but less commonly seen than the last species. The "tortoise-shell" of commerce. Kisw. name "ngamba".

Family: Testudinidae

4. GEOCHELONE GIGANTEA (Schweigger) Giant Tortoise Z. Introduced.
Testudo gigantea Schweigger 1812 Königsb.Arch.Naturw.Math. 1:372. "Brazil".
Testudo daudintii Dum.&Bib. Erpét. Gén. 2:123.Indes Orientales.

On Prison Island, a small rocky island in Zanzibar harbour, are two large Giant Tortoises and a number of smaller ones of various sizes, which have been there a very long time, probably nearly a century. Martin (1978:105) says there are about 30, all flourishing and unmolested, the largest weighing some 204 kg. Another very large one wanders around Chwaka on the east coast near the "bungalows" (or did so up to c. 1955). History does not record how, when, or whence these tortoises came, possibly as presents to one of the early Sultans by a ship-master in the mid to late 19th century. Martin states they are from Aldabra or Seychelles. Two Giant Tortoises at Government House, Dar-es-Salaam, in 1918, had come from stock introduced into the Seychelles from Mauritius (Lov. pers. comm.). There are no indigenous land tortoises in Zanzibar or Pemba. Kisw. "kobe".

Family: Pelomedusidae

5. PELUSIOS CASTANEUS CASTANOIDES Hewitt Brown Terrapin P.

Sternothaerus nigricans castaneus, Bttgr. 1913:352 P. Vltz. 1923:185 P.
Pelusios castaneus castanoides, Hewitt 1931, Ann. Natal Mus. 6:463. Broadley 1981, Occ.Pap. natn. Mus. Mon. Zimbabwe 6: 672.
Pelusios nigricans (non Donndorff), Parket *et al.* 1940:311 P. Mor. & Pak. 1941:109 P.
Pelusios subniger, (part) Lov. 1957:174 Z, P.
Pelusios castaneus, Laurent 1956, Annl. Mus.r. Congo Belge Sci.zool. (8^o) 48:34. Wermuth & Mertens, 1977. Das Tierreich, 100:117. "Inseln Pemba und Zanzibar".

Very common in the larger ponds of Pemba, but they seem mostly fairly small: four carapaces measured 127, 179, 180, 229 mm. Loveridge's collectors took many in Pemba (Loc. Mbuyuni and Vitongoje) in 1923; he found that they closely resemble the Seychelles form in colour and smaller size than those from mainland Africa. He stated (pers.comm. 1940) that the largest continental example was 290 mm. Not found by me nor, it seems, by Loveridge in Zanzibar Is. MCZ's only specimen from "Zanzibar" is one presented in 1865 by C. Cooke (U.S. Consul at Zanzibar) and may not be insular. ZM Curator cannot confirm occurrence in Zanzibar (pers.comm.) but heard that Pemba terrapins were placed in the pools at Marahubi Palace ruins many years ago and did not survive. Ingrams (1931:429) says they occur in Pemba only. Kisw. "kobe".

Order: CROCODYLIA

Family: CROCODYLIDAE

CROCODYLUS NILOTICUS Laurenti Nile Crocodile Z. Vag.
Crocodylus niloticus Laurenti 1768 Syn.Rept.:53. Egypt. Lov. 1957:177 Z (accidental).

There are no indigenous crocodiles in the islands but a few have wandered across the strait of c. 40 km. between the mainland coast and Zanzibar Is. in April, June and October: one at Chwaka (east coast) 16 October 1917, length 2413mm; a ♀ at Mtende (extreme south-southeast) 26 June 1939, length 3962mm; a juvenile at Nungwi (extreme north) 24 April 1945, length 1588mm; one at Mwanda (northwest) 10 April 1952, length c. 1830mm; and a small one at Matemwe Kijini (northeast) 28 April 1952. All probably washed out to sea from African rivers swollen by the heavy rains (April-June) or the short rains (October). Kisw. "mamba". No records from Pemba.

Order: SQUAMATA: SAURIA

Family: GEKKONIDAE

1. EBENAVIA sp. (?*inunguis*) Boettger P.

Ebenavia Btgr. 1878 Abh.Senckenb.naturforsch.Ges.11:276. Type by monotypy: *E. inunguis* Btgr. Lov. 1957:190 P.

Not hitherto recorded from these islands or in East Africa. On 13 August 1939. I took a juv. at Chokocho (south P): the biscuit-coloured, almost golden, hue of the upper side extended onto the base of the tail, the terminal half of which was ringed black and white. A darkening line from the nose through the eye to the base of the tail divided the upper from the greyish underside. On 2 May 1943 two eggs were taken at the base of banana plants at Kiungajuu, Wete (north P), white, brittle, ellipsoidal, each 7x6mm. One had hatched on 19 August 1943, the other on 30 August. These hatchlings and the Chokocho specimen are in BM. In several ways they resemble *E.inunguis*, yet there are differences, and more material is needed. Dr. H.W. Parker, after examination under very high magnification, found that these hatchlings belong unquestionably to *Ebenavia*, but that the species cannot be determined until adults are examined (Loveridge 1957:190). The record is of special interest in that hitherto the only known species of this genus is found in Madagascar and the Comoro Islands. Unrecorded from Zanzibar.

2. HEMIDACTYLUS BROOKII ANGULATUS Hallowell Brook's Gecko Z, P.

Hemidactylus angulatus Hallowell 1852 Proc.Acad.nat.Sci.Philad.:63. "West coast of Africa" i.e. Gabon, French Congo.

Hemidactylus brookii angulatus, Mor & Pak: 1941:107. Lov. 1957:184.

BM has four examples taken by me: a ♂ from rocks among food-crops in a clearing at Kibuteni (Z) 4. December 1938; a hatchling from an egg 8x7mm taken beside the Kiwengwa feeder-road (Z) 28 November 1948; and at Mgagadu (P) 18 June 1939, two ♀♀ taken on the trunk of a clove tree and among fallen branches in a wood. The latter are the first records from Pemba.

3. HEMIDACTYLUS MABOUIA (M. de Jonnés) Common House Gecko Z, P.

Gecko mabouia M. de Jonnés 1818 Bull.Sci.Soc.philom.Paris:138. Antilles and adjacent mainland.

Hemidactylus persimilis Barb. & Lov. 1928:140. Lov. 1957:186P. (Syn.of *H. mercatorius*).

Hemidactylus mabouia, Btgr. 1913:347 Mkokotoni, Z: 348P. Mor. & Pak. 1941:107 Z, P. Lov. 1957:185 Z, P.

Probably the most abundant gecko in the islands, found on and in houses, caves, tree trunks, etc. The local Kiswahili name "mjusi kafiri" ("kafiri" = pagan, infidel) seems to be applied to all geckos, because of their supposedly evil reputation, due doubtless to their sinister appearance, and they are said to pray for the destruction of all living things. In contrast to these, "mjusi Islam" is generally applied to the skinks, sleek and handsome, whose name is thus associated with the Muslim religion, for they pray continually for the wellbeing of all living things! "Mjusi" (Kisw.), with variations, signifies "lizard" generally. One which I found in a House Snake (*Boaedon fuliginosus*) had been swallowed tail first. A ♀ on 28 June 1942 had two eggs developing, together with several small ova; another on 9 November contained one nearly formed egg. This species, like some others, assume dark or light colouring according to their surroundings: one taken in a dark corner of a closed house was dark brown, but in the light, after death, became very pale. My five Pemba specimens were at first identified as *H. mercatorius* Gray, which is a synonym of *H. mabouia* (vide Kluge 1969, Broadley 1977). Two of these were from Mgagadu 18 June 1939 and Mkanyageni 24 June 1939, and three in MCZ from Mzambaraoni Piki 7 March 1940, Mwituu Mkuu, Micheweni, 9 September 1940, and Wete 31 October 1940: found among logs and dead leaves, and on the trunk of a forest sapling.

4. HEMIDACTYLUS PLATYCEPHALUS Peters Baobab Gecko Z.P.

Hemidactylus platycephalus Ptrs. 1854:615. Coast north of Mozambique; Anjouan Is., Comoro Ids. Broadley 1977:13 (type locality restricted to Mozambique Is.) Z, P.

Eighteen individuals taken by me in Zanzibar and Pemba are in BM. Seven from Pete (Z) were taken on houses and mango trees. Of seven from Mkanyageni (P) four contained two eggs each, 24 June 1939. Broadley's (1977) reference to this species' occurrence in Zanzibar and Pemba is based on this BM material.

5. LYGODACTYLUS CAPENSIS PAKENHAMI Loveridge Pemba Island Dwarf Gecko P (E).

Lygodactylus grotei pakenhami Lov. 1941:176 Wete, P; 1947:216 P; 1957:187 P. Mor. & Pak. 1942:61 P. Wermuth 1965:104 P.

Lygodactylus capensis pakenhami, Pasteur 1964:15, 68-70, 74-75 P.

A plain little greyish gecko with black speckling or lines down the sides of head and body, and in some cases a pinkish or vinous flush on the upper side. Endemic to Pemba. The type specimen (at MCZ), a gravid ♀ taken 22 December 1940, held 2 eggs 3.5-4mm diameter, not quite fully formed. Not uncommon throughout Pemba, often found on trees with pale smooth bark such as *Cassia*, *Pterocarpus*, *Terminalia catappa*, *Syzigium jambolanum (cumini)*, jack-fruit, pawpaw, and coconut palm. Gonads of a ♂ taken 31 July were much enlarged (4 mm), and of another on 17 August less so. Pasteur (1964:74-75) discusses briefly the anomalous distribution of this gecko and its relative in Zanzibar, so different from one another and from their congeners on mainland Africa.

6. LYGODACTYLUS LUTEOPICTURATUS ZANZIBARITIS Pasteur Yellow-headed Dwarf Gecko Z (E).

Lygodactylus picturatus picturatus (non Peters), Mor. & Pak. 1941:107 Z. Lov. 1957:188 Z.

Lygodactylus luteopicturatus zanzibaritis Pasteur 1964:78-80 Zanzibar Town.

This little yellow-headed blue-grey gecko (♂♂ so: ♀♀ browner), subspecifically endemic to Zanzibar Island, has been found on orange, clove and mango trees and sawn timber. A ♀ on 29 December contained two very much enlarged eggs. Two eggs, $7 \times 5 \frac{1}{2}$ and $6 \frac{1}{4} \times 5$ mm stuck together, picked up among coconut palms on 5 April, hatched on 18 May, one three hours after the other. Both hatchlings were 26 (14 + 12) mm long, and sloughed their skins within an hour of hatching, revealing dull yellowish marking on the head and five pale yellowish lines down back and sides.

7. PHELSUMA ABBOTTI PARKERI Loveridge Parker's Palm Gecko P (E)

Phelsuma madagascariensis (non Gray) Btgr. 1913:350 P. Vltz. 1923:185 P.

Phelsuma madagascariensis parkeri, Lov. 1941a:175 P; 1942:468 Kinowe, P; 1957:190 P. Mor. & Pak. 1941:107 P.

Phelsuma parkeri, Mertens 1963:349; 1964:113 P. Wermuth:1965:131 P.

Phelsuma abboti parkeri, Börner 1972:25,44,57.

MCZ has specimens of mine mainly from Kinowe and Kilindini (north P); and BM has nine examples from the south (Wambaa, Mkoani, Mkanyageni). See Introduction, "Malagasy association". Loveridge's type specimen from Kinowe is a gravid ♀ containing two eggs (12x9, later in alc. 13x8 mm) on 8 December 1940. At Msuka they were called "mjusi wa mnazi" as well as "mjusi kafiri" (unspecific). They are certainly found exclusively, or almost so, on coconut palms.

8. PHELSUMA DUBIA DUBIA (Boettger) Palm Gecko Z

Pachydactylus dubius Btgr.:1881 Zool.Anz.4:46 Madagascar.

Phelsuma dubium, Parker et al. 1940:309 Z. Mor. & Pak. 1941:107 Z.

Phelsuma dubia dubia, Lov. 1957:190 Z.

Parker et al (1940) point out that, despite earlier synonymy of this species with *P. laticauda*, the form occurring on Zanzibar is now recognised to be *P. dubia*. This is also recognised by Loveridge (1942a:462), though not there convinced that *laticauda* did not also occur on Zanzibar (p. 473); but his 1947 revision of Gekkonidae (p. 298), removes this ambiguity. Though *P. d.dubia* occurs in northwest Madagascar, the Comores, Tanzanian mainland coast, and Zanzibar Island, *P. laticauda* is confined to Madagascar (chiefly north) and its islands, and to the Comores. These geckos are difficult to obtain as they keep to the crowns of coconut palms: found chiefly at the base of the fronds and among the bracts enclosing the branched nut-bearing panicles. They were of a much paler and bluer green than the deep grassy green of *P. abboti parkeri* of Pemba. One had on the head, body and sides, groups of up to three granules of very pale blue, giving a pretty stippled effect; others had, over the entire upper side, beautiful purplish-brown mottlings, contrasting strongly with the green or blue-green background; in a juvenile this turned to yellowish across the hindquarters and legs, and to rich egg-yolk yellow on the tail. Three ♀♀ contained two well-developed eggs each on 23 March. Of 6 ZM specimens taken at ZM precincts October 1939, Dr. Parker remarked "Upper nasals separated by one granule only, not 2 or 3 — a very rare condition"; see also Loveridge 1942:461.

Family: Chamaeleontidae

9. CHAMAELEO DILEPIS Leach subsp. East African Flap-necked Chamaeleon Z. P. *Chamaeleo dilepis* Leach 1819 in Bowdich, Miss.Ashantee,App.:493. French Congo. Bttgr. 1913:347 Mkokotoni, Z. Mor. & Pak. 1941:108 Z, P. *Chamaeleo dilepis* var.*quilensis* Bocage 1866 Journ.Sci.math.phys.nat.1:59 Rio Quilo, Cabinda. Bttgr. 1913:351 P. Vltz. 1923:185 P. *Chamaeleo angusticoronatus*, Barbour 1903 Proc.biol.Soc.Wash.16.61 "Zanzibar Island". *Chamaeleo d. dilepis*, Lov. 1957:199 Z, P. Witte 1965:50,52 Z, P. Mertens 1966:12. Tanzania ' + 'including Zanzibar". *Chamaeleo dilepis martensi*, Mertens 1964:114 P ; 1966:13 P. *Chamaeleo quilensis*, Witte 1965:76,77,85 Z, P.

The taxonomy of the chamaeleons of Zanzibar and Pemba Islands, especially those of Pemba, seems to be extremely confused, owing to the divergence of expert opinion and to the degree of variation within the forms themselves. ZM has two specimens (of doubtful origin) identified by BM as *C. d. dilepis* many years ago. I collected four chamaeleons in Zanzibar, all in BM, and J. Hurtur took one in Zanzibar (in U.S. National Museum). In Pemba I collected 12, all now in BM except one in MCZ. All these from Zanzibar Is. were at one time considered to be *C. d. dilepis*. Leach. Mertens (1964:113) points out, referring to Pemba, that Boettger (1913:351) evidently regarded the form *quilensis* as no more than a variety of *C. dilepis*, though in 1966 (p.25) Mertens accepts de Witte's (1965:66) recognition of *quilensis* as a full species. De Witte (1965) observed that *quilensis* very closely resembles *C. d. dilepis*, and quotes FitzSimons (1943) in saying that it is only the adult individuals, especially the males, of the two forms, that can be distinguished from each other with certainty. FitzSimons, on *C. d. var. quilensis* (p. 156), says that *quilensis* is found almost exclusively in the south of South Africa, but admixture with *d. dilepis* becomes increasingly apparent the further north one goes, until at the northernmost limit *dilepis* strongly predominates. Hence, he says, it appears logical to regard *quilensis* as a varietal form as opposed to a subspecies which implies more fixity of character. However, de Witte decided provisionally, after some deliberation as to their clear differentiation, to rank *quilensis* as a distinct species rather than subspecific to *C. dilepis* — surely the only course where two distinguishable forms share the same locality. He has placed two Zanzibar specimens under *C. quilensis* (one in BM taken by me, Jambiani 1938; the other by J. Hurtur, U.S. Nat. Mus. 58.464, "Zanzibar"), and the rest under *C. d. dilepis*. Assuming that *quilensis* is recognisable as a full species, it would appear that the chamaeleons in Zanzibar Is. belong either to it or to nominate *C. dilepis*, as both are probably present, and it may be that the latter predominates, as more specimens from Zanzibar have been so identified by BM and de Witte.

In Pemba the position is more obscure. Mertens (1964) seems to reject both *C. d. dilepis* and *C. d. quilensis* for Pemba, assigning this island's form to a new subspecies *C. d. martensi* (including Voeltzkow's six 1905 specimens which Boettger had called *C. d. var. quilensis*, and three examples by Martens, Wete 1962). De Witte (1965) does not mention *martensi*, possibly due to an overlap in publication. Consequently de Witte has assigned most of my Pemba specimens (9 out of 11) to *C. quilensis* and the other two to *C. d. dilepis*, whereas Mertens would apparently have them all to be *C. d. martensi* (and so an endemic form). Dr. D. Hillenius, who has studied chamaeleons for many years, has expressed doubt (pers. comm. 19 December 1978) concerning the subspecific divisions of *C. dilepis*, owing to lack of clear sub-specific criteria, and prefers at present to comprehend all these forms under *C. dilepis* until exhaustive examination of the whole group is undertaken. Alternatively, it is possible that *C. d. dilepis* Leach and *C. quilensis* Bocage may be found in Zanzibar, and *C. quilensis* Bocage and *C. d. martensi* Mertens in Pemba, but it remains an open question.

Of two ♀♀ and a ♂ chamaeleons brought in at Pete (Z), now in BM, taken on mango and East African almond (*Terminalia catappa*) trees, one ♀ on 12 December 1938 contained 23 eggs of yolk colour and cheesy texture, covered with a thin transparent membrane. A chamaeleon in Pemba laid eggs on 8 March 1941, and one in Zanzibar on 25 September, 1938 had just buried 12 eggs.

The commonest Kiswahili name for a chamaeleon is "kinyonga", but in southern Zanzibar I heard "kimbaumbau" (plank-sided) and "kimalale", and in east central Pemba "rumbwirumbwi"; Ingrams (1931:430) also gives "kigaogao". Chamaeleons usually inspired among local Africans fear of ill effects if touched, sometimes even abject terror.

Family: Scincidae

10. CRYPTOBLEPHARUS BOUTONII AFRICANUS (Sternfeld) Coral-rag Snake-eyed Skink Z, p. *Ablepharus boutoni africanus* Sternfeld 1918 Abh.senckenb.naturforsch. Ges.36.423. Manda Is. & Malindi, Kenya. P.

Ablepharus boutoni var. *peroni* (non Coct.) Bttgr. 1913:351 P. Vltz. 1923:185 Z, P.
Ablepharus boutonii africanus, Mor. & Pak. 1941:108 Z, P. Lov. 1957: 218 Z, P.
Cryptoblepharus boutonii africanus, Fuhrn 1970 Revue roum.Biol.(Zool.) 15:391 Z, P.

I collected four specimens in Zanzibar Island (one at Chwaka, three at Charawe), all in BM. Sternfeld and also Loveridge's collectors obtained it in Pemba (the latter at Vitongoje), and I took 18 examples in Pemba two from Kigomasha and Micheweni, both in MCZ; 11 from Mjananza (Panza Is.) and Msuka, and five from a small bush-covered rock 6 km off southwest Pemba; all these 16 in BM. I also saw one at Mesali, a remote island off west-central Pemba. Loveridge (1925) had expressed the view, on the basis of his five specimens from Vitongoje, that these were *C. boutonii* var. *peronii*, but he evidently changed this opinion as in 1940 he identified my specimens in MCZ as *C. b. africanus*, both of which showed clear white spots on the sides, and one at least had the light lateral band, edged with black above and below. These skinks commonly frequent seashore rocks, and run out onto the beach at low tide. Two ♀♀ taken on 25 December contained two eggs each, measuring 11x6 and 10x5 mm respectively.

11. MABUYA MACULILABRIS ALBOTAENIATA Boettger Pemba Speckle-lipped Skink P (E).
Mabuia alboataeniata Bttgr. 1913:350 P. Vltz. 1923:185 P. Parker *et al.* 1940:310 P.
Mabuya maculilabris alboataeniata, Lov. 1941a:175 P. Mor. & Pak. 1942:61 P. Pak. 1947:135 P. Lov. 1957:210 & footnote, P.

Although in 1947 I thought this endemic race merited full specific status, it is now generally recognised as a subspecies of *M. maculilabris*. A very beautiful creature, especially an example I took at Mkoani (length 196 mm) described, on capture, as having head rich copper and the last 15 mm of tail also copper; upper side green with coppery lustre, underside jade green with golden lustre. Found on and under fallen logs, about trunks and roots of trees, on dead leaves under trees and bushes, among cut vegetation, on heaps of coconut husks, etc., even entering houses. Encountered in all parts of Pemba and even on Mesale Is., 5-6 km off Pemba. Seventeen examples are in BM, nine in MCZ (Loveridge's collectors also took six in Pemba): one had a 20 mm cricket in its mouth. The largest specimen was 217 (65 + 152) mm, and the average ratio of tail to total length of 19 measured specimens was 0.65. Females taken on October 6, 23 and 31 contained three, four and three eggs respectively, the last two having 20 and nine more respectively in the ovary, of pinhead size or smaller. Loveridge took a ♀ containing three eggs (14x8 mm) 6.10.23. On 15 December I found a juvenile 51mm long. This skink is the real "karakaka" of Pemba.

12. MABUYA MACULILABRIS (Gray) subsp. Speckle-lipped Skink Z.
Euprepis maculilabris Gray 1945 Cat.Liz.Br.Mus.:114. West Africa.
Euprepes comorensis Peters 1854:619. Johanna Is., Comoro Ids.
Mabuya maculilabris, Mor. & Pak. 1941:108 Z. Pak. 1947:135Z. Lov. 1925:73 P; 1957:209 and footnote.
Mabuia comorensis, Bttgr. 1913:347 Mkokotoni, Z. Lov. 1925:73 Z.
Mabuya maculilabris comorensis, Lov. 1957:209 footnote, 210 Z.
Mabuya comorensis, Parker *et al.* 1940:310 Z. Mor & Pak. 1942:61 Z.

The taxonomy of the two closely allied forms, nominate *maculilabris* and one near *comorensis*, probably only on Zanzibar Is., is obscure. Clearly they are similar, and most authorities take the view that, pending a comprehensive study of the species, it is best to treat them (excluding *M. m.alboataeniata* of Pemba, on which no doubt arises) as variants of one species *M. maculilabris* (Gray), though two races of the same species are unlikely to coexist in one small island. Comparison of the forms *M. m.maculilabris* and what was provisionally called *M. m.comorensis* in Zanzibar and mainland coastal areas, while recognising some differences in build and colour pattern, does reveal gradations in both respects, of which the cause is unclear. Most relevant is Loveridge's (1933:314) observation that "Apparently *M. maculilabris* is a skink that reacts readily to its environmental conditions and produces colour forms which are ill-defined when long series are available, yet are very striking and often of a characteristic type in a given locality". I myself (1947) had been inclined to assign the Zanzibar form to "*comorensis*", especially those individuals frequenting the edge of Jozani forest (i.e., p.136); and Loveridge (pers.comm. July 1941) said, "I think this will prove to be the rain forest race of *maculilabris* in East Africa. It is common at Amani and has been described from Ruwenzori under the name *major*". See also Lov. 1942c:344. But Broadley (1974) makes the point that counts of subdigital lamellae on the fourth toes may prove significant in determining taxonomic difference between these skinks. He finds the count in *M. comorensis* to be 20-24, whereas in *M. maculilabris* it is 15-20. All my 10 Zanzibar examples fall within the latter bracket. On balance, it seems best at present to treat all Zanzibar skinks of this species as "*M. maculilabris* subsp."

M. maculilabris is found all over Zanzibar Island, but I particularly remarked the apparently more robust and strongly marked individuals at Jozani forest and a few other places. These were very quick in movement, restless in temperament, and frequented logs, sawn timber, and the foot of coconut palm trunks. Voeltzkow and Loveridge both took, at Mkokotoni, specimens suggesting the "*comorensis*" form. Otherwise habitats of these Zanzibar *maculilabris* resemble those of *alboataeniata* in Pemba. Loveridge (1957) confines

M. m. macuilabris (omitting Zanzibar) to savanna areas of the mainland from southern Sudan to Zambia and Angola.

Local Kiswahili names are "gonda" and "kigorong'ondwa" (Jendele & Muyuni), also "gonda-mjusi" at Muyini, but "gonda" tends to be generic and is applied also to *M. striata*.

13. MABUYA STRIATA (Peters) Common Two-striped Skink Z. P.
Tropidolepisma striatum Peters 1844 Ber. Akad. Wiss. Berlin:36 Mozambique.
Mabuia varia (non Peters) Btgr. 1913:347 Mkokotoni, Z.
Mabuia striata, Btgr. 1913:350 P. Vltz. 1923:185 Z. P. Mor. & Pak. 1941:108 Z. P. Lov. 1957:213 Z. P.

Common in both islands. Tornier collected this skink in Pemba, and Boettger and Loveridge in Zanzibar Town. I took two at Chwaka and Kizimkazi, Zanzibar, and saw several at Mkokotoni; in Pemba I took specimens at Konde and Mgogoni (3), Wete (1), Mkoani (4), Jambangome (2); so they are well distributed. All mine are in BM except one in MCZ. The largest, a ♀, was 218 (99 + 119) mm long, but many had lost their tails; this ♀ carried four membrane-covered eggs in her body (4 December, but copulation was also observed 20 July). They were found in sandy runnels between grass tussocks or on bases of coconut palms or around or in buildings; one leapt into a water-filled ditch and swam well. Another large one swallowed a small lizard holding its body and severed tail together in its mouth. These skinks are locally known, at least in Pemba, as "mjusi Islam" (see under *Hemidactylus mabouia*), and also loosely as "karakaka", the name usually reserved for *M. macuilabris*; "gonda" in Zanzibar.

14. RIOPA PEMBANA Boettger Pemba Island Writhing-Skink P (E).
Lygosoma (Riopa) pembanum Boettger 1913:350 P. Vltz. 1923:185 P.
Riopa pembanum, Mor. & Pak. 1941:108 P.
Riopa pemba, Lov. 1957:216 P.

This skink had always been regarded as endemic to Pemba until Parker (1931:360-361) recorded two taken at Takaungu on the Kenya coast, about 48 km north of Mombasa and c. 129 km from Pemba. Loveridge (1942c:349) reported three juveniles taken 0.8 km from the ferry landing opposite Kilindini, Mombasa, barely 96 km from Pemba. Probably both occurrences were due to human transportation, and basically it may well still be a Pemba endemic.

I took 21 examples from north, central and south Pemba (14 in BM, seven in MCZ), in such localities as a rotten tree stump and under rotten logs, under heaps of field rubbish and coconut husks, and amongst dead leaves. The bite of this harmless little reptile is much feared in Pemba and it is liable to be chopped to pieces. Its vigorous wriggling sometimes enables escape, for which its rudimentary legs are of little use, and the readily detachable tail often saves its life. The two largest I caught were both 159 (89 + 70) mm. A ♂ taken 22 May had enlarged gonads though two ♀♀ the same day were not in breeding condition. Kiswahili name is "kiumambuzi" (the little one that hurts goats).

15. RIOPA SUNDEVALLII SUNDEVALLII (Smith) Sundevall's Writhing-Skink Z.
Eumeces (Riopa) sunderallii Smith 1849 App.:11. "Country east of Cape Colony" i.e. Natal.
Eumeces perdicolor Cope 1868 Proc. Acad. Nat. Sci. Philad.:317. "Zanzibar".
Euprepes (Senira) dumérilii Steindachner 1870 Sber. Akad. Wiss. Wien (1) 62:341. "Zanzibar".
Riopa sundevallii sundevallii, Mor. & Pak. 1941:108 Z. Lov. 1957:215 Z.

The BM collection has two specimens presented from "Zanzibar" by F. Finn (1867) and Sir J. Kirk (1891), but whether collected in the island is not stated; 19th century material labelled "Zanzibar" often was not so. However, Tornier (1897:45-46) and Pfeffer (1893a:75) record examples taken by Stuhlmann at Mkokotoni (Z) and Bawi Is. (Z), also by Kirk and Hildebrandt (loc. "Sansibar" distinguished from "Sansibar Kueste"). Loveridge (1925:73) records two specimens taken by him in Zanzibar Town 11 August 1923; and BM identified as *R. sundevallii* five ZM specimens (without data). Loveridge (1957:215) omits Pemba from the range of this species although his collectors took one at Chake-Chake, now in Zm, identified by him; his omission may indicate doubt.

Family: Cordylidae

16. GERRHOSAURUS MAJOR MAJOR Duméril Zanzibar Great Plated Lizard Z.
Gerrhosaurus major A. Duméril 1851 Cat. method. Coll. Rept. Mus. Paris:139. Zanzibar Island.
Gerrhosaurus zanzibaricus Pfeffer 1889 Jb. hamb. wiss. Anst. 6:7. Kibweni, Zanzibar Is.
Gerrhosaurus major major, Mor. & Pak. 1941:108 Z. Lov. 1957:224 Z.

This lizard is common in Zanzibar but does not occur in Pemba, and lives in holes in the ground and among rocks. One seen at Mvuleni Kigunda was most approachable, and a blue line along the side from the foreleg was very clear and handsome. Loveridge (1942b:503) quotes Peters that in life the lateral folds are grey-blue and skin between scales bluish (though I saw much clearer blue than that), and he adds that some

Zanzibar individuals show slight trace of black on the keels and even form ill-defined dark lines on the lumbar region and tail. One stomach contained vegetable matter only, and a large red tick adhered to one foot. Kiswahili name is "guruguru".

Family: Varanidae

17. VARANUS NILOTICUS NILOTICUS (Linnaeus) Nile Monitor Z.

Lacerta nilotica Linn. 1766 Syst.nat.12th ed., 1:369. Egypt.

Varanus niloticus, Pfeffer 1892 Jb.hamb.wiss.Anst. 10:72 (coll. Stuhlmann Kibweni, Z). Mor. & Pak. 1941:108 Z. Lov. 1957:235 Z.

Not uncommon in Zanzibar but absent from Pemba. A ZM skin taken at Kizimkazi (Z) 4 January 1939 was identified by BM as this species. This small-grained monitor frequents close bush or undergrowth, reeds and tall grass, near streams or wet places. I saw a large one at Mto Mchanga, Zanzibar, and it has been taken at Kizimbani. Aders (1920:338) confirms occurrence of *V. niloticus* at Zanzibar and says it reaches 1.2 m (4ft) (*V. exanthematicus* can be nearer 1.5 m = 5ft). He describes it as "greenish-grey above, with darker reticulation, and yellowish ocellated spots on the back and limbs", which raises a question whether in fact he saw "*V. ocellatus*" (= *V. exanthematicus*: see Appendix), not *niloticus*. More specimens are needed. Fond of eggs and will raid chicken runs and even take small fowls. On 5 July, a gravid ♀ *Varanus* sp., presumably *niloticus* though not specifically identified, was brought in to ZM from Mkotoni containing 36 well-developed eggs. Kisw. "kenge".

Order: SQUAMATA : SERPENTES

Family : Typhlopidae

1. RAMPHOTYPHLOPS BRAMINUS (Daudin) Brahminy Blind Snake Z.P.

Eryx braminus Daudin 1803 Hist.Nat.Rept. 7:279. Bengal.

Typhlops braminus, Mor. & Pak. 1941:108 Z. Pak.1947:138 P. Lov. 1957:244 Z. Roux-Estève 1974:28-29 Z.

Typhlina (?) *bramina*, McDowell 1974, J. Herpet., 8:22.

For discussion on the relative validity of the generic names *Ramphotyphlops* Fitzinger and *Typhlina* Wagler, see A.F. Stimson, J.Robb & G.Underwood, 1977, Bull.zool.Nomencl.33:parts 3/4. Believed to have originated somewhere in Asia, this species is now found as far afield as the coastal areas of southern Asia, the islands of the Indian and Pacific Oceans, western South America and the Antilles, and coastal regions of West Africa and of East Africa from Somalia to Mozambique and eastern South Africa. No doubt transported worldwide in the roots of plants etc; hence its alternative name "Flower-pot Blind Snake". Moreover, its ubiquitous distribution may well be facilitated by the fact that it is apparently an all-female species.

The first record for the islands was one found in Zanzibar Town 16 June 1939. I took one at Chake-Chake (P), swept out of my bungalow 31 December 1939, and another at Wete (P) 5 December 1942, under a log. Z.M. has 8 specimens taken at Kikwajuni, Zanzibar Town, 1941 and 1943. Paris Museum has a "Zanzibar" specimen distinct from mainland Tanzania (Roux-Estève 1974:29).

2. RHINOTYPHLOPS LUMBRICIFORMIS (Peters) Wormlike Blind Snake Z

Onychocephalus (Letheobia) lumbriciformis Ptrs. 1874 Mber.K.preuss.Akad. Wiss.:377. "Zanzibar Coast" i.e. mainland Tanzania.

Typhlops lumbriciformis, Parker *et al.* 1940:312. Mor. & Pak. 1942:62 Z. Lov. 1957:245 Z.

Rhinotyphlops lumbriciformis, Roux-Estève 1974:221-224 Z.

Two from Zanzibar (as distinct from "Tanzanie") are in Paris Museum. I collected one at Kwarara Fuoni (Z) 22 June 1940: length 308 (301 + 7) mm, diameter 5mm, mid-body scale rows 18; and one at Maungani (Z) 4 October 1940: length 320 (311 + 9) mm, diameter 6mm, mid-body scale rows 18. Both taken out of wet ground (both now in MCZ). The doubts of Parker *et al.* (1940) about occurrence at Zanzibar are thus resolved.

3. RHINOTYPHLOPS PALLIDUS (Cope) Pallid Blind Snake Z.P.

Letheobia pallida Cope 1868 Proc.Acad.nat.Sci.Philad.:322. Zanzibar Island.

Typhlops pallidus, Bttgr 1913:351 P. Vltz. 1923:185 Z, P. Mor. & Pak. 1941:108 Z, P. Lov. 1957:244 Z, P.

Rhinotyphlops pallidus, Roux-Estève 1974:217-221 Z.

One example in ZM (undated but c. 1930s) from Kikwajuni, Zanzibar Town. Another (in BM) was taken at Hanyegwa-mchana (Z) 2 July 1949, in a heap of earth; length 125 (122.5 + 2.5) mm in spirit; eyes just visible, diameter 50 times in total length, mid-body scale rows 22. A specimen in BM was received

from Col. Playfair in 1869, with a collection of fishes, ostensibly from Zanzibar, but Kirk's (1868) is discounted as probably from abroad (see Introduction). Evidence of occurrence in Pemba is not clear. Though Loveridge, like Boettger and Voeltzkow, includes Pemba in its range, MCZ has no material from there, and only one specimen from C. Cooke at "Zanzibar" 1886. Boettger gives Voeltzkow's single Pemba specimen as an adult, c. 155mm long, with 22 scale rows and mid-body diameter 50 times in total length. On the strength of this, Pemba is included in the distribution of this species, but confirmation is desirable.

4 RHINOTYPHLOPS SCHLEGELII DINGA (Peters) Eastern Schlegel's Blind Snake Z.

Onychocephalus dinga Ptrs. 1854:620. Tette, Sena, Chupanga, Mozambique.

Onychocephalus mucruso Ptrs. 1854:621. Tette & Macanga, Mozambique.

Typhlops schlegelii mucruso, Pitman 1938:47 Z. Mor. & Pak. 1941:108 Z. Lov. 1957:241 Z
Rhinotyphlops schlegelii dinga, Roux-Estève 1974:169.

Apart from an example from Kirk, "Zanzibar", discounted by the 1868 date (see Introduction), and a Paris Museum specimen no. MHNP 5733 labelled "Zanzibar", which actually came from Bagamoyo, Tanzania (1877), two accredited Zanzibar specimens are in BM: one from F. Finn 1894, and one from me 1950. ZM has 3 specimens labelled *T. schlegelii*: 2 taken at Kikwajuni, Zanzibar Town, 13 January 1940 and 12 March 1940, and one at Kimara (Z) August 1940. No record from Pemba.

Family : Leptotyphlopidae

5. LEPTOTYPHLOPS EMINI PEMBAE Loveridge Pemba White-chinned Worm Snake P(E).

Glauconia emini, Bttgr. 1913:351 P. Vltz. 1923: 185 P.

Leptotyphlops emini pembae, Lov. 1941a:177 Wingwi Pwana, P; 1957:247 P. Mor. & Pak. 1942:62 P.

This endemic subspecies seems to be common in Pemba. Of examples taken by me, nine are in BM, six in MCZ; a few others in ZM were identified by Loveridge. They were taken at Wete, Konde, Kinowe, Mwituu Mkuu, Kisiwani, Vitongoje, Wambaa, Mitatuni, Mizi Miumbi hill, and Mkoani. Lengths varied from 124 (100 + 24) mm with diameter 2mm, to 220 (195 + 25) mm diameter not recorded. Body diameter maximum was c. 4.5mm in an individual of 205 (186 + 19) mm length. Ratio of diameter to length varied from 1:45 to 1:74. Mid-body scale rows were recorded in three cases only, all 14. Distinguished from the mainland form (*L. e.emini*) in having white on chin, throat, and circumanal region, and mid-body diameter 50-70 times in total length (Loveridge 1941a).

Kiswahili name for all Typhlopidae and Leptotyphlopidae is "mtumia-kuwili" (i.e. the one that goes both ways, owing to superficial similarity between head and tail ends), but at Ole (P) the name "uti-wa-wanja" was used.

Family: Boidae

6. PYTHON SEBAE (Gmelin) Common African Python Z. (?P).

Coluber sebae Gmelin 1789 Syst.Nat., 13th ed., 1:1118. "America" (error).

Python sebae, Mor & Pak. 1941:108 Z.

Pythons are killed or caught occasionally in Zanzibar Is., especially in the north and centre (the better watered and main plantation areas), and even Tumbatu Is. and smaller islands. Aders (1920:338) records one measuring 4.57m (15ft.) Once one was killed near Pemba's east coast* but I never heard of another wild python in Pemba and suspect this one had escaped from one of the mainland tribesmen who come over for employment (some do keep them), or else had crossed the strait from mainland Africa. Pythons (Kisw. "chatu") may well be indigenous to Zanzibar Is. (a river, 'Mto Chatu', in northeast Zanzibar appears in a map surveyed before 1907); a juvenile just over 600mm long was brought in from Kizimbani, July 1947. These immigrant tribesmen believe many strange things about pythons (their voice, wisdom, habits, etc), and those in captivity are quite usually given flour which they are said to eat, besides occasional eggs or small fowls.

* Mar. 1933.Skin in ZM.

Family: Colubridae

7. ATRACTASPIS BIBRONII ROSTRATA Günther Bibron's Burrowing Adder Z.

Atractaspis rostrata Gthr. 1868. Ann.Mag.nat.Hist. (4) 1:429 "Zanzibar". Parker *et al.* 1940:311.

Atractaspis bibronii rostrata, Lov. 1957:298, "Zanzibar coast, possibly Island".

Günther's two type specimens of *A. rostrata* from "Zanzibar" were sent to BM by Kirk in 1868, a date which casts doubt on locality of origin (see Introduction). My three specimens (in BM), taken May 1942 and May 1943, all at or near Kizimbani, central Zanzibar, appear to be first records for the island. Another *Atractaspis* sp., taken Aug. 1942 in the same area, apparently similar, was lost in transit in the war. Three of the four had anal entire (a character of *bibronii*) and subcaudals (or most of them) single, but one (iden-

tified as *bibronii*) had anal divided (unusual); however, Werner (1923) considers division of anal and pairing of subcaudals to be unreliable characters. Lengths varied from 277 to 411mm, and mid-body scale rows were 25 (one had 23). One was taken from a mud heap in a grassy spot among cultivation. Ditmars (1931:185) says that this genus "is of particular interest as it is hard to surmise what had influenced the members in acquiring enormously developed poison fangs, as they are burrowers".

8. BOAEDON FULIGINOSUS (Boie) Common House Snake Z. P.

Lycodon fuliginosus Boie 1827 Isis, Jena 20:551. "Java" (error).

Boodon bipraeocularis Günther 1888 Ann.Mag.nat.Hist. (6) 1:330. Lake Tanganyika, and Rabai Hills, Kenya.

Boodon lineatus var. *bipraeocularis*, Bttgr. 1913:348 Mkokotoni, Z.

Boaedon lineatus, Parker et al. 1940:310. Mor. & Pak. 1941:108 Z. P.

Boaedon fuliginosus fuliginosus, Lov. 1957:251 Z. P.

Very common in both islands. They were found in and about houses; among grass, bushes, and in forest; among food crops and growing rice: in heaps of straw, coconut husks and fronds; in heaps of compost, and mud and sand; in a firewood dump, a termite hole, and under an iron sheet. Maximum length was 1068 (938 + 130) mm, but out of 34 measured only two were 1000mm or more, nine between 600 and 1000mm, and 20 between 300 and 600mm. Out of 46 collected, 31 were lost in transit in war.

Colouring of upper side varied a good deal; grey; grey-brown with or without blue-green lustre or speckled reddish-brown; pale greyish copper; reddish brown; olive brown speckled red-brown; dusky cane with more or less diamond barring of pale Indian red; black. Colour seemed not to be associated with age. In some cases (proportion not noted) a pale or darker line ran back from the eye (in two instances from the nose) across the side of head and neck, between the respectively darker or paler upper and lower colouration, but this was apparently not invariable. Rows of spots or mottling, 2-4 scales wide, were quite often observed, freely distributed over the upper side and tending to form an oblique or chevron striation. Undersides were white with pearly or pale salmon lustre, bluish white, pinkish grey and white, pale grey-brown, or pinkish-sandy. The distribution of *Boaedon* from eastern through to western Africa, and the possible grounds for separating *fuliginosus* from *lineatus* are analysed and discussed by Thorpe & McCarthy (1978), showing that the former is probably the East African species. Loveridge (1942c:263) gave mid-body scale rows in East and Central Africa as 27-29/31, with a tendency to lower scale counts in the east. Out of 43 mid-body scale counts, I found 21 having 27, and 13 having 29, but only one with 23, 4 with 25, 2 with 26, and 2 with 28. Ventrals (196-218), he found, reflected the same tendency; but out of 40 counts, I found a range of 184-223, with 12 having less, and 28 more, than 200.

Two individuals taken 11 November and 21 February were sloughing their skin. Two ♀♀ taken 10 September and 7 February contained eggs — the first not fully developed, the second with seven eggs near laying (the largest 14x7mm) and about 10 embryonic ova. Stomachs of several individuals held a mouse (*c.* 150mm), a young rat, skink, *Hemidactylus mabouia* (tail first), and *Hemidactylus* sp. (just over 170mm).

9. CHAMAETORTUS AULICUS AULICUS Günther Cross-barred Tree Snake Z.

Chamaetortus aulicus Gthr. 1864 Proc.zool.Soc.Lond.:310 Zambezi River. Pak. 1947:140 Z. Lov. 1957:272 Z. Broadley 1971:4 Z.

The first record from Zanzibar of this little snake was one taken 27 May 1942, in mud under a fallen palm log in a maize plot: length 106 (85 + 21) mm, mid-body scale rows 15, ventrals 183, subcaudals 89. The other (29 April 1945) was found hanging in a loop from the underside of a bicycle saddle: length 220 (167 + 53)mm, mid-body scale rows 17, ventrals 185, subcaudals 88. Both (now in BM) were from Kizimbani (Z). Not recorded from Pemba.

10. CROTAPHOPELTIS HOTAMBOEIA (Laurenti). White-lipped or Herald Snake Z.

Coronella hotamboeia Laurenti 1768 Syn.Rept.:85. "India orientali" i.e. Africa.

Leptodira hotamboeia, Bttgr. 1913:348 Z.

Crotaphopeltis hotamboeia, Mor. & Pak. 1941:108 Z. Lov. 1957:271 Z.

Seems to be fairly common in Zanzibar but absent from Pemba. No specimens from Zanzibar in BM. Twenty one examples were sent to me 1942-43 (mostly from Kizimbani/Kinuni-moshi area), but all lost in transit during the war. These were taken variously in patches of grass, bananas, rice or other crops; in mud or compost heap or under a log, or in hoeing a field. In August a 'nest' of these snakes was found buried some 15cm deep in mud in a grassy spot. The largest taken (unsexed) was 590 (500 + 90) mm long. Mid-body scale rows of the whole series were consistently 19 except one of 17. Ventrals 156-165; subcaudals 38-50. Two ♀♀ taken in July contained six eggs each: one on 7 July had half-developed eggs and a number of small ova; the other on 14 July contained eggs ready to lay, *c.* 14.5x7mm, and a smaller undeveloped ovum. Both had eaten a frog. No red was found on the lips of any of these 21 though the species has also been called (in South Africa) "Red-lipped Snake".

11. DASYPELTIS MEDICI MEDICI (Bianconi) East African Egg-eater Z.

Dipsas medici Bianc. 1859 Memorie R.Accad.Sci.Ist.Cl.Sci.fis. Bologna 10:501 Mozambique.

Dasytelis scaber var. *fasciolata* Peters 1868 Mber.K.preuss.Akad. Wiss.:451 "Zanzibar" ("allegedly from Zanzibar").

Dasytelis elongata Mocquard 1888 Mem.Soc.Philom.Paris Cent.:131 "Zanzibar" (probably not insular).

Dasytelis scaber (non Linn.). Pitman 1938:125 Z. Mor. & Pak. 1941:108 Z.

Dasytelis medici medici, Lov. 1957:289 Z. Gans 1959:157 Z.

BM has one example of mine from Zanzibar Is. (1950); no other data. Gans (1959:151) lists three BM specimens of *D. scabra* from "Zanzibar", from Kirk's 1868 consignment, presumably from Mozambique. He also records two examples of *D. m. medici* from "Zanzibar", nos. 5737 and 17219, in ZMB (coll. by Salwin and Fischer and labelled *D. scaber*), but they may not be insular. Two specimens of *Dasytelis* sp. taken by me in Zanzibar Is. (July and Dec. 1943), were lost at sea before reaching a museum: the largest was 682 (541 + 141) mm after five months in alcohol. The Egg-eater and its habits seem to be well known to the local people. No record from Pemba.

12. DISPHOLIDUS TYPUS (Smith) Boomslang Z, P.

Bucephalus typus Smith 1829 Zool.J.Lond.4:441. Old Latakoo, South Africa.

Dispholidus typus, Mor. & Pak. 1941:108 Z, P. Lov. 1957:273 Z, P.

Present in both islands, this species may not attain the sizes recorded in central Africa. Lengths of Zanzibar adults (unsexed) were 1332, 1410, 1470 & 1486 (the latter 1067 + 419) mm; 4 Pemba ♀♀ were 1100, 1140, 1162 & 1165 (the latter 770 + 395) mm. Ratio of tail to total length in these largest examples is 1:3.5 (Z) and 1:3 (P). ZM has two specimens, one green, the other quite black (the latter colour, Pitman says (1938:176), may be associated with regions of considerable humidity); another sent to me (Z) was also green. Local name of one at Jambiani (Z) was given as "peku". The three largest of my four Pemba snakes, all taken at Mkanyageni in clove trees (where they are frequently found) had, on the upper side, the inner half of each scale olive or grey and the outer half whitish, with brown or rust-coloured skin between the scales, giving a barred effect, while the underside of the snake was rust coloured. All these four carried well-formed eggs (July 2, 3, 16): one contained six, the others four each; in one of the latter, eggs measured 14-15 x 48-52mm, in another 16-18 x 41-48mm. Local names in Pemba are "ukukwi" and "gangawia".

13. LYCOPHIDION CAPENSE LOVERIDGEI Laurent Cape Wolf Snake Z.

Lycophidion capense, Bttgr. 1913:348 Mkokotoni, Z.

Lycophidion capense loveridgei Laurent 1968:476. Usambara Mts., Tanzania. Z.

This race is found within a relatively narrow belt from coastal Kenya southwards, through coastal Tanzania (Usambara and Uluguru Mts.) and Zanzibar Is., to the northern shore of Lake Nyasa (Laurent 1968). ZM has 3 old specimens labelled "*L. capense*" without data (ZM nos. 1529-1531); one had a pale or whitish vertebral line of scales, but the other two were very bleached: one seemed to be over 700mm, another about 475mm (stiffly coiled in bottles). BM has a specimen of mine from "Zanzibar Is." 1950 which Laurent has assigned to *loveridgei*.

14. LYCOPHIDION CAPENSE PEMBANUM Laurent Pemba Wolf Snake P (E).

Lycophidion jacksoni (non Blgr.) Bttgr. 1913:352 P. Vltz. 1923:185 P. Parker *et al.* 1940:310 P.

Lycophidion capense pembanum Laurent 1968:478 P.

Described, from an example taken by me at Mtambile (P), as "highly characteristic", particularly as regards the very peculiar colour pattern on the head and low ventral counts (172 in ♂ holotype, 179-180 in ♀♀). On p.469 Laurent deals especially with these islands. BM has the holotype and two paratypes; MCZ also has a paratype. Boettger's and Voeltzkow's "*jacksoni*" was doubtless this form, as Laurent (1968:474-476) assigns *L. c. jacksoni* to a more westerly range: Sudan, western Ethiopia, to central Africa.

Endemic to Pemba. I took five examples at Mtambile, Gando and Ziwani, 1939-42, among dead leaves and weeds, and in a clove plantation. A mainly nocturnal species (FitzSimons 1962:127), and a burrower judging from the behaviour of one in captivity. It burrowed with great rapidity and spent much of its time underground, surfacing in early evenings: when surprised above ground, it retreated backwards down its hole with perfect ease. Brown in life, the colour turned blue after death. This one, unsexed, taken at Ziwani 12 August 1942, is in ZM: length 331 (274 + 57) mm; scale rows 19 or 17 at neck, 17 mid-body, 15 anal; ventrals 170, subcaudals 47 (the first two paired, next five single, rest paired). Lengths of the other four were: ♂ 330 (277 + 53); ♀♀ 304 (267 + 37), 320 (277 + 43), 348 (296 + 52) mm. One was black but speckled due to white edging of each scale; head appeared paler as fewer black-centred scales, most head-scales being plain pale purplish flesh colour. Two others were paler than the latter, blue-grey replacing its black scalation, and head colour was uniform with the body; ventrals pale blue-grey. In spirit all white edging of scales disappeared, scale colour reverting to that of the scale centre. A ♀ on 25 August 1940 contained four eggs ready to lay, measuring 15x8mm, and two batches of four tiny embryo ova indicating clutches of four, evidently to be laid together.

15. MEHELIA CAPENSIS CAPENSIS (Smith) Southeastern Cape File Snake Z.

Heterolepis capensis Smith 1849. Pl 55: eastern Cape Province, South Africa.

Simocephalus poensis, (non Smith) Pfeffer 1893:86 coll. Stuhlmann, Mkokotoni, Z. Parker *et al.* 1940:312 Z.

Mehelya capensis capensis, Lov. 1939:142-144 Z. Mor. & Pak. 1942:62 Z.

Boettger (1913) and Voeltzkow (1923) both report *Simocephalus poensis* only as "found in literature" or "reported to occur" in Zanzibar, but, as with Stuhlmann's specimen, these reports probably rest on misidentified *S. capensis*. I took one of the latter at 8km (m.5) on Chwaka road (Z) 9 December 1939, length 1295mm: and another in Zanzibar Is. 28 October 1952. Both in BM and believed to be first clear records for Zanzibar Is. The head of the second had been shot off, but what was left was 1255mm long (vent to tail tip 102mm). A third, not identified by a museum because lost at sea 1942, had scale rows 22-15-15, ventrals 218, subcaudals 45, and length 1240 (1097 + 143) mm. Vertebral scales were white down the centre, the white widening a little at hinder end of scale; other scales black save the lowest 2-3 rows of lateral scales which had the hinder tip white. This snake contained a *Boaedon fuliginosus* 889mm long, whose tail protruded from the *Mehelya*'s mouth. No record from Pemba.

16. MEHELIA NYASSAE (Günther) Nyasa File Snake Z.

Simocephalus nyassae Gthr. 1888 Ann.Mag.nat.Hist.(6) 1:328 Lake Nyasa.

Mehelya nyassae, Lov. 1939:148 Z. 1957:255 Z. Parker *et al.* 1940:312 Z. Mor. & Pak. 1941:108 Z.

Occurs in Zanzibar but not recorded from Pemba. Two taken by me, at Ziwani (Z) 22 July 1942, and in Zanzibar Town 15 October 1944, were identified by BM: scale rows in both 19-15-15, ventrals in both 170, subcaudals 78 and 75 respectively. Lengths were respectively 444 (336 + 108) and 485 (367 + 118 in spirit) mm. Three other specimens were taken, not identified by a museum (lost in transit in war); in each case the scales on the upper side all black with white skin between them. Ventral count (165, 172, 167) tended to be much lower than in *M. capensis*, which was over 200, whereas the subcaudal count tended to be higher (79, 51, 64). Two entered a bungalow at Chwaka together three hours after dark, evidently hunting as both stomachs were empty.

17. NATRICITERES OLIVACEA (Peters) Olive Marsh Snake Z.

Coronella olivacea Peters 1854:622. Tete, Mozambique.

Tropidonotus olivaceus, Butgr. 1913:347 Mkokotoni, Z.

Neusterophis (Natrix) olivacea olivacea, Mor. & Pak. 1942:62 Z.

Natrix olivacea olivacea, Pak. 1947:138 Z.

Natriciteres olivacea olivacea, Lov. 1957:256 Z. 1958:29-37 Z.

Natriciteres olivacea, Broadley 1966a:8-9 Z.

ZM has one (length 300mm), taken at Mchungwani (Z) 12 September 1941. Between then and 1944 I collected or was given 22 more specimens, mostly from Kizimbani and Kinuni-moshi, one from Jozani forest (Z). Unfortunately all were lost in the war years, but I have descriptions, measurements, and scale counts. Localities of capture were among weeds and bushes, in a compost heap, in wet fields, and in a stream. A 'nest' of five together was found in mid-December (? aestivating) when hoeing an earth motor track. Ten of the 22 had lost half or more of their tails. Lengths of those with complete tails varied from 290 to 430mm. A few had the ventrals yellowish or even salmon pink, and one was bordered red. Nominate and Pemba races are discussed in Loveridge 1935:6 & 1958, and Broadley 1966a.

18. NATRICITERES VARIEGATA PEMBANA (Loveridge) Dwarf or Pemba Marsh Snake P(E).

Natrix olivacea pembana Lov. 1935:7-8 Chake-Chake, P. Mor. & Pak. 1941:108 P. Pak. 1947:138 P.

Natriciteres olivacea pembana, Lov. 1957:256 P. 1958:42 P.

Natriciteres variegata pembana, Broadley 1966a:7 P.

Endemic to Pemba. The characteristics of the species and races of the genus *Natriciteres* are fully discussed in Broadley 1966a. He found Pemba snakes' ventral counts 120-126 and subcaudals 50-62 (53-62 in ♂♂, 50-56 in ♀♀). All my 11 examples (Broadley saw only five) had 17 scale rows at approximate (but three at mathematical) mid-body, except one which had 15 at mid-body. The others reduced to 15 posteriorly, but one reduced further to 13. Three of these are in BM, 5 in MCZ, and three lost during the war. My largest ♂ was 278 (200 + 78) mm and the largest ♀ 285 (210 + 75) mm.

My specimens (all taken in northern Pemba save two at Mgagadu and Mkoani) were found variously in a clove plantation, under rotten wood at the edge of a swampy forest, under heaps of coconut husks, and among grass roots in a damp meadow.

Broadley observed that "the Pemba Is. population became dwarfed and also developed lower ventral and subcaudal counts, the pale nuchal collar degenerated to a pair of pale spots. . . ."

19. PHILOTHAMNUS MACROPS (Boulenger) Usambara Green Snake Z.

Oligolepis macrops Blgr. 1895 Ann.Mag.nat.Hist.(6) 16:171. Usambara Mts., Tanzania.

Chlorophis macrops, Pak. 1947:140 Z.

Philothamnus macrops, Lov. 1957:260 Z; 1958:58 Z.

One specimen (now in BM), first record for the islands, was taken by labourers 23 July 1943 at Kinunimoshi (Z) in a rice valley, coloured all black (when received in spirit five months later), with whitish chin and throat, and a large eye. Length 487 (340 + 147) mm; scale rows 15-13-11; ventrals 139, subcaudals (paired) 84, anal entire.

20. PHILOTHAMNUS SEMIVARIEGATUS SEMIVARIEGATUS (Smith) Spotted Wood Snake or Bush Snake Z, P.

Dendrophis (Philothamnus) semivariatus Smith 1849,Pls.59,60,64: Bushman's Flat, Cape Province, S. Africa.

Ahaetulla kirkii Gthr. 1868. Ann.Mag.nat.Hist.(4) 1:424 "Zanzibar".

Philothamnus punctatus var. *sansibaricus* Pfeffer 1893:83 Jambiani, Z.Is.

Philothamnus punctatus var. *thomensis* (non Bocage) Pfeffer 1893:84 Jambiani, Z.

Philothamnus semivariatus, Parker *et al.* 1940:310-311 Jambiani, Z.

Philothamnus semivariatus semivariatus, Bttgr. 1913:348 Mkokotoni Z; 352 P. Vltz. 1923:185 Z,

P. Pitman 1974:95 Z, P. Mor. & Pak. 1941:108 Z, P. Lov. 1957:262 Z, P. 1958:105 Z, P.

Very common in both islands: specimens taken in trees and bushes, house thatch, a wood pile, and among grass. Though colour is usually green to dark olive or olive-brown, I have encountered occasionally, in Pemba only, a bluish or bluish-green form (three of these identified by BM as this species), and twice I have seen in Pemba similar bush-snakes dark blue in colour, which have not been identified. Loveridge (1942c:274; 1958:113) found individuals in mainland Tanzania with blue or bluish heads, and in one case the anterior third of the body was transversely barred with blue, and colouring generally was extremely variable. Pitman (1974:95) confirms great variation in colour, including blue, particularly when about to slough. In my experience the bluish varieties were usually found near water or in damp places. Of my 15 specimens the largest was 1115 mm long, taken in Pemba. The local Kiswahili name in Zanzibar was "nyoka-kuti" or "nyoka-ukuti", and in Pemba "ukukwi", but at one locality in Pemba they distinguished the bluish form as "gangawia" which I found more usually applied to *Dispholidus typus*.

Five individuals, apparently of this species, taken in Zanzibar and Pemba, all had 11 scale rows (normally 15) at approximately mid-body (not mathematically checked), and one had 13 scale rows. Of these six, two in Pemba were not preserved, and the other four were lost in transit (1942-43). Their ventral and subcaudal counts and ratio of tail to total length were virtually as in *P. s.semivariatus*, unlike *P. macrops* which, in all these respects, gave a substantially lower count. Perhaps in these islands some individuals may record a scale count as low as 11, unless of course this reduction occurred more anteriorly than exact mid-body. Even the one giving 13 at "mid-body" was similar in its other counts to *P. semivariatus*, not to *P. macrops*.

21. PSAMMOPHIS SIBILANS SIBILANS (Linnaeus) Hissing Sand Snake Z.

Coluber sibilans Linn. (part) 1758 Syst.nat.,10th ed., 1:222. "Asia" (error).

Psammophis sibilans, Pitman 1938:158 Z.

Psammophis sibilans sibilans, Lov. 1940:40 Z; 1957:279 Z. Mor. & Pak. 1941:108 Z.

BM has a specimen from Kirk dated 1868, the year of his Mozambique consignment and therefore suspect (see Introduction). Loveridge records the locality "Kumbuni" (1940:10), probably copied from Pfeffer (1893:86) recording an example taken by Stuhlmann, swimming across a sea-creek at "Sansibar, Kumbuni". Local enquiry failed to confirm this place name, but there is a "Chumbuni" between Marahubi and Mtoni, not far north of Zanzibar Town, near the seashore and close to the small creek of the Upepo stream. The name may have been mis-heard by Stuhlmann or have changed in 80 years, as names do. The neighbouring sea-creek makes the record credible, and inclusion of this species in the Zanzibar list seems justified.

22. PSAMMOPHIS SUBTAENIATUS SUDANENSIS Werner Northern Stripe-bellied Sand Snake Z.

Psammophis subtaeniatus var. *sudanensis* Werner 1919 Denkschr.Akad. Wiss.Wien. 96:504. Kadugali, Sudan.

Psammophis subtaeniatus, Pitman 1938:158 Z. Mor. & Pak. 1941:108 Z.

Psammophis subtaeniatus sudanensis, Lov. 1940:50 Z; 1957:280 Z. Broadley 1966b:5-7 Z.

BM has a specimen (without subspecific determination) from "Zanzibar", received in 1886 from J.G. Fischer, whose two *P. sibilans* examples received the same year are from "Zanzibar coast" (mainland), so omission of "coast" in the first may indicate the island (but see under *Philothamnus heterolepidotus* in Appendix). National Museums of Kenya, Nairobi, have an example taken by V.G.L. van Someren in Zanzibar

Is. February 1919. Kirk's 1868 "Zanzibar" material in BM is too dubious, being the year of his Mozambique consignment. BM has two examples of mine from Mangapwani (Z) 23 January 1940, and "Zanzibar" without precise locality, 1950. The former was 558 + . . . (523 + 35 + . . .) mm long (part of tail missing), and mid-body scale rows 17. A ZM specimen labelled "*punctulatus*" was corrected by Loveridge to read "*P. subtaeniatus* var.". Loveridge (1940:51) recognised the northern race, *sudanensis*, as clearly distinct from nominate *subtaeniatus* south of the Zambesi; but Broadley (p.1) qualifies this rigid geographical limitation. The local Kiswahili name "nyoka mwale" was given to me at Muyuni (Z). No record from Pemba.

Family: Elapidae

23. DENDROASPIS ANGUSTICEPS (Smith) Common Green Mamba Z, ?P.

Naia angusticeps Smith 1849 Pl.70. Natal, South Africa.

Dendroaspis angusticeps, Mor. & Pak. 1941:109 Z.

Dendroaspis angusticeps, Lov. 1950:4 Z; 1957:294 Z.

First record of this species in these islands was a ♀ brought to me 16 January 1939 from Pete (Z), now in BM. Located in an orange tree, it retreated to a coconut palm before being killed. Length 1905 (1499 + 406) mm. Local people said these snakes are seen occasionally. In January 1956 a green snake c. 2440mm long (8 ft) was reported seen at Kama (Z) but not captured. The Headman of Chwaka (Z) stated that green snakes of at least 1830 mm (6 ft) were sometimes seen in the east coast bushlands or at Fufuma Chwaka, and that the largest are yellowish. Muyuni people confirmed this, saying they attain about 2740 mm (9 ft), and that the largest are called "shangauka" and smaller ones generally "mtunguu". Chwaka and Muyuni folk knew also a big black tree snake which they call "nyoka-kima", reputed to be very aggressive; this might prove to be *D. polylepis* Black Mamba or Boomslang *Dispholidus typus*. In 1942 I received from Kidichi (Z) a green *Dendroaspis* taken from a clove tree (but lost in transit during the war): length 1835 (1410 + 425) mm. A British friend saw a long green snake cross a 1.8m (6 ft) wide roadway at 21 km (m.13) on Fumba road, the head being well into one grass verge before the tail cleared the other. Another saw a green snake of equal size cross the road at Kizimbani (Z). These and similar accounts are evidence that very large tree snakes, both green and black, occur in Zanzibar Is., sometimes in the clove trees, and could be mambas or boomslangs.

No specimen from Pemba, but the Overseer of the Clove Growers Association there told of large green tree snakes seen occasionally in the clove trees at Makuwe, about 1.8m long and perhaps 30-35mm thick: also seen on the ground and ascending the trees. A clove picker told me he once encountered a similar snake in a clove tree while picking.

24. NAJA MELANOLEUCA Hallowell Black-lipped Cobra Z.

Naia haie var. *melanoleuca* Hallowell 1857 Proc.Acad.nat.Sci.Philad.:61. Gabon, French Congo.

Naja melanoleuca, Mor. & Pak. 1941:109 Z. Lov. 1957:293 Z.

A ♀ sent to me 23 December 1938 from Machui (Z) was the first recorded from these islands: length 1842 (1556 + 286) mm. Occurrence in East African coastal regions seems unusual for this snake which was associated with the western side of Kenya and Tanzania and further west. Loveridge's 1939 Mikindani example was a 500 mile eastward extension of range (actually some 56km (35 m) further east in longitude than Zanzibar, though on the mainland). It does not occur in Pemba. ZM has two specimens taken locally between 1923 and 1940 which were never identified by a museum nor publicised: lengths 1711mm and 1377mm; also one identified by BM, erroneously labelled *Naja haje* in ZM. Besides these I had six others (four in BM, two lost in transit), of which the longest was 1921mm, the largest I had seen. One carried 11 ticks, *Aponomma laeve* Nn., another had eaten a rat. Eight (another, a juvenile, with 18) had 17 mid-body scale rows, which Dr. Broadley informs me is unusually low for this species, though some taken in the Usambara Mountains had the same count. Ventral counts of Zanzibar individuals also tend to be lower than the mainland average, recorded Zanzibar ones being 200, 204, 205 (2), 206, 207 (2). One ♀ on 7 December contained 7 eggs not quite ready for laying, measuring c. 45mm. These snakes were found severally in plantation country, bush-land, a cassava patch, two together (Nov.) under bridge in marshy land, in the dense Jozani forest (one lying in a puddle), on the seashore (and raced down a crab hole), and one of c. 60 cm actually chased off a food-plot by a chicken! At Pete (Z) I was informed that at the end of the Masika heavy rains the mangrove swamps adjoining Muongoni are full of nesting egrets and also of large black and brown snakes up to 1830mm long "as thick as your leg" (sic) which prey upon the nestlings. Pitman (1947:184) remarks that this cobra rarely climbs but can do so well.

25. NAJA MOSSAMBICA MOSSAMBICA Peters Mozambique Spitting Cobra Z.P.

Naja mossambica Ptrs. 1854:625. Sena & Tete, Mozambique.

Naja nigricollis var. *mossambica*, Btgr. 1913:352 P. Vltz. 1923:185 P.

Naja nigricollis (non Reinhardt) Mor. & Pak. 1941:109 Z. P.

Naja nigricollis nigricollis, Lov. (part) 1957:292 Z. P.

Naja mossambica mossambica, Broadley 1968:11

One of the commonest snakes in Pemba, but uncommon in Zanzibar though said to occur; I never encountered it there. Aders in Pearce (1920:337) says "very few specimens have been obtained in Zanzibar". Tornier (1897) records that one "*N. nigricollis*" (Mus. No. 11157) was taken by Neumann from "Sansibar" (which he usually distinguished from "Sansibar Kueste"); and Boettger (1913) says Stuhlmann is reported to have got an example from Zanzibar Is. Both Pitman (1938) and Broadley (1968) describe *N. nigricollis* Reinhardt in Africa as a large cobra which may exceed 2000mm, but Broadley (p.11) calls *N. mossambica* Pts. "a small cobra rarely exceeding 1500mm in total length", which agrees with sizes found in Pemba. Broadley also observes (p.7) that *mossambica* has a series of irregular black bands or blotches on the throat, whereas *nigricollis* has a single broad dark band on the throat. In Pemba I took six individuals over 1000mm in length, besides smaller ones, the largest 1302 (1079 + 223) mm; I never saw a larger. Omitting two juveniles, the average of 11 specimens was 1008mm. The abundance of the toad *Bufo* sp. in Pemba, as well as of swamps sustaining frogs, may account for the large number of *N. mossambica*. I once found one of these cobras climbing the banisters of my house in Pemba.

Family: Viperidae

26. CAUSUS DEFILIPPII (Jan) Snouted Night Adder Z.

Heterodon De Filippii Jan 1862 *Archo.Zool.Anat.Fisiol.*, 2:225. "Africa".

Causus defilippi, Mor. & Pak. 1941:109 Z.

Causus defilippii, Lov. 1957:299 Mtende, Z.

The occurrence of this adder in Zanzibar is established by a ZM specimen, first record for the islands, taken 7 October 1937 at Mtende and identified by Loveridge. ZM has another said to have been taken on the Kinyasini road (Z) about 1927. Local name is "kipillili". I never encountered this snake myself on either island despite many enquiries and offers of rewards, but many of the country people seemed to know of it and recognised the name, which usually evoked fantastic tales of its jumping ability, and its ferocity is legendary. One informant claimed it could leap about 30-46 cm, and another that it could spring as high as a man and bite him on the scalp! Actually, Mr. Loveridge told me, of all the *Causus* spp. he saw, one just cleared the ground when teased, except for the tip of its tail (see also Pitman 1938:251, on *C. rhombeatus*). It may conceivably be of rare occurrence in Pemba in the more open and drier east coast areas, but there is no firm evidence. Moreover, being nocturnal or crepuscular (as Loveridge informs me) it should be looked for at evening, or, by day, hidden under piles of weeds etc.

APPENDIX: LIST OF EXCLUDED SPECIES

(asterisk signifies provisional exclusion, for reason stated in text, subject to confirmation of occurrence)

Class : AMPHIBIA

Order : GYMNOPHIONA

Family : Caeciliidae

HYPOGEOPHIS ROSTRATUS GUENTHERI Boulenger

Hypogeophis guentheri Blgr. 1882 *Cat.Batr.Grad.s.Caud.Batr.Apoda Brit.Mus.*:96 "Zanzibar" (error).

Hypogeophis rostratus Parker 1941:7, 16-17.

Hypogeophis rostratus guentheri, Parker 1958:75-76. Taylor 1968:773.

Parker (1941 & 1958) and Taylor (1968) state conclusively that the oft-repeated reference to Zanzibar as the source of specimens of this caecilian is erroneous.

Order : ANURA

Family : Rhacophoridae

I. AFRIXALUS DORSALIS LEPTOSOMUS (Peters)

Hyperolius leptosomus Ptrs. 1877 *Mber.K.preuss.Akad.Wiss.*:619. Chinchoxo, "Portuguese Congo".

Megalixalus leptosomus, Mor. & Pak. 1941:109 Z.

Afrixalus dorsalis leptosomus, Schiøtz 1975:77-78.

Tornier's (1897:157) citation of 26 examples taken by Stuhlmann 6 September 1888 on "Sansibar Insel" must be a misidentification or mistaken locality. Though repeated by Boettger, Voeltzkow himself (1923) omits it, probably indicating doubt. Loveridge (1957:322) excludes Zanzibar from this species' range, and (pers. comm.) suggested that these individuals were misidentified *Megalixalus brachycnemis* before the latter was described (1896). This taxon is known only from coastal Rio Muni south to Angola.

2. HYPEROLIUS PICTURATUS Peters

Hyperolius picturatus Ptrs. 1875. Mber.K.preuss.Akad.Wiss.:206. Victoria, Cameroon. Mor. & Pak. 1941:109 P.

Rappia picturata, Btgr. 1913:349 P. Vltz. 1923:185 P.

Loveridge (1957:325, footnote) states that Voeltzkow's alleged example of this species in Pemba, on re-examination by Mertens (1940), was found to be a juvenile *Afrivalus f. fornasini*.

3. HYPEROLIUS PUNCTICULATUS (Pfeffer)* Broad-striped Sedge Frog

Rappia puncticulata Pfeffer 1893a:99.

Hyperolius substriatus Ahl 1931 Tierreich 55:358. Magrotto Mt., nr. Tanga.

Hyperolius puncticulatus, Mor. & Pak. 1941:109 Z.

Hyperolius puncticulatus substriatus, Lov. 1957:331 Z.

Pfeffer's description (above) states that the type specimen was taken in May 1888 behind the German Club-house at "Zanzibar", possibly the island as his *Rappia vermiculata* was taken less than three months later on "Sansibar Insel". Loveridge (1957) identified his own specimen no. MCZ 17162 from Mwera (Z) as *H.p. substriatus*, but Schiøtz (1975:146-151) refers it to *Hyperolius mitchelli* (q.v.).

4. HYPEROLIUS TUBERILINGUIS Smith* Straw or Green Sedge Frog.

Hyperolius tuberilinguis Smith 1849:App.26. East of Cape Colony, i.e. Natal. Schiøtz 1975:119.

Rappia sansibarica Pfeffer 1893a:97 "Zanzibar".

Hyperolius sansibaricus loveridgei Laurent 1947 Ann.Mag.nat.Hist. (11) 14:294. Kitaya, Rovuma river, Tanganyika.

Hyperolius concolor tuberilinguis, Lov. 1957:332.

The report of occurrence of *H. tuberilinguis* on Zanzibar Island rests solely on the type locality of Pfeffer's *Rappia sansibarica* (1893), but it is not clear (see Introduction) whether the island, not the coast, was meant Schiøtz (1975) considers *sansibarica* a synonym of *H. tuberilinguis* which has a mainly coastal distribution from Kenya to Natal. *H. concolor* (Hallowell) listed for Zanzibar Is. by Moreau & Pakenham (1941:109) is, according to Schiøtz (l.c. 119), entirely West African. He regards it as a distinct species from *H. tuberilinguis*, within the bracket of the *H. concolor* super-species.

5. HYPEROLIUS VERMICULARIS Ahl*

Rappia vermiculata (non Peters) Pfeffer 1893a:98 "Sansibar, Insel".

Hyperolius vermicularis Ahl 1931 Tierreich 55:275. Mor. & Pak. 1941:109 Z. Lov. 1957:330 Z.

This is a replacement name for Pfeffer's *R. vermiculata*. Schiøtz has stated (pers. comm. 11 November 1977) that the type material is now unidentifiable owing to its condition. Retained in Appendix until further material available from Zanzibar Is.

Family : Ranidae

6. PTYCHADENA FLOWERI (Boulenger)

Rana floweri Blgr. 1917. Ann.Mag.nat.Hist.(8) 20:417. Rosaires, Blue Nile, Sudan.

Kirk sent a specimen from "Zanzibar", received at BM in 1868, probably in his 1867 consignment (see Introduction) containing specimens from the African mainland. No other Zanzibar record. Excluded as mistaken locality.

Class: REPTILIA

Order: TESTUDINATA

Family: Testudinidae

KINIXYS BELLIANA Gray Bell's Eastern Hinged Tortoise

Kinixys belliana Gray 1831 Synops.Rept.:69. No locality. Lov. 1924:2 Z: 1957:170 (not "Z").

Nothing in Loveridge & Williams' references (1957:395) to Strauch's, Müller's, Boulenger's and Loveridge's records of this tortoise authenticate its occurrence on Zanzibar Island; they refer probably to the coastal "Zanzibar". In 27 years I never heard of it in the islands. Parker *et al.* (1940:311) are dubious of two examples from "Zanzibar": one sent to BM 1893 by F. Finn, a visitor to Zanzibar; the other to MCZ, probably by C. Cooke, U.S. Consul. Excluded as unlikely to be insular.

Order: SQUAMATA: SAURIA.

Family: Gekkonidae

1. HEMIDACTYLUS PARKERI Loveridge

Hemidactylus parkeri Lov. 1936a:59 Z (? introduced). Mor. & Pak. 1941:107 Z. Lanza 1978:276.

Loveridge described it from a specimen sent to MCZ in 1862 by Caleb Cooke, apparently collected on Zanzibar Is.; but he synonymised it (1947:131) with *H. puccionii* (Calabresi 1927) supposing that Cooke's specimen was accidentally imported into Zanzibar from Somalia. Lanza (1978) showed that *H. parkeri* is a valid species, occurring in Somaliland and Eritrea, if not further north. Its occurrence at "Zanzibar" (no certainty, at that early date, that the island itself was meant) was probably accidental. Not otherwise recorded from Zanzibar Is., it can hardly be listed as a Zanzibar reptile.

Family: Agamidae

2. AGAMA sp.*

Mr. K.T. Clarker informed me that in 1932, when visiting the ruined palace at Chukwani, 9.7km (6 miles) south of Zanzibar Town, he watched some large brightly coloured lizards on the old walls, both on the cliff-top wall on the north side and on the ruinous walls on the south. He guessed the length as 250-300mm (10-12 ins), and described the colouring as either bright blue head and red body or vice versa: it being ten years after the incident, he could not remember which way it was. Such a description seems to point to an Agamid, possibly *A. agama* subsp., but none are yet known from Zanzibar. I visited the ruins later but failed to see them. Unfortunately they are now within a prohibited military area.

3. UROMASTYX PRINCEPS O'Shaughnessy Dabb Lizard

Uromastyx princeps O'Shaughnessy 1880 Proc zool.Soc.Lond.:445. "Zanzibar" (error).

The type, BM's only specimen, was presented in 1879 by Sir J. Kirk, ostensibly collected at Zanzibar. This is doubtless the basis of Boulenger's (1885) and Tornier's (1897) records of the species at Zanzibar, but Boulenger adds to its range "Somaliland and? Aden". A native of these hotter northern lands and unrecorded from East Africa, it is most unlikely to have been taken on Zanzibar Is. Discounted as accidental.

Family: Chamaeleontidae

4. CHAMAELEO TIGRIS Kuhl Seychelles Islands Chamaeleon

Chamaeleo tigris Kuhl 1820 Pt.1:104. No locality.

Mentioned by Boettger (1913) and Voeltzkow (1923) as reported in literature or hearsay to have occurred at Zanzibar, probably accountable by a ♂, ♀ and young from "Zanzibar" presented to BM in 1876 by Capt. J.E. Parish. Excluded as incorrect locality since the species is otherwise known only from the Seychelles Ids., which lay within the naval station of Capt. Parish R.N.

Family: Scincidae

5. MABUYA QUINQUETAENIATA OBSTI Werner* Tanganyika Five-lined Skink

Mabuia obsti Werner 1913 Jb.hamb.wiss.Anst.30:43. Kwa Mtoro, Usandawi, Tanganyika.

Mabuia quinquetaeniata, Mor & Pak. 1941:108 Z.

Mabuia quinquetaeniata obsti, Lov. 1957:208 Z.

Said by Loveridge (1957) to have been reported (Tornier 1900) taken by Werth on Chapwani (not "Chapnani") Is. (= Grave Is. = French Is.) on the north side of Zanzibar harbour but not on the main island of Zanzibar. No specimen from Zanzibar in BM nor MCZ nor ZMB. I never sought it on Grave Is. nor saw anything like it on the main island. The ♀♀ (not adult ♂♂), very distinctively striped, could not be confused with *M. maculilabris*. Loveridge (1957) says that "only females and young are five-lined and blue-tailed, the males are strikingly different. . . inhabitant of rocky outcrops. . ." Omitted pending confirmation.

6. PANASPIS WAHLBERGII (Smith)* Savanna Snake-eyed Skink
Cryptoblepharus wahlbergii Smith 1849, App. 10. Natal, South Africa.
Ablepharus wahlbergii, Mor. & Pak. 1941:108 Grave Is., Z. Lov. 1957:219 "reported from Grave Is., Z. possibly in error".
Panaspis wahlbergi, Fuhn 1970 Revue roum. Biol. (Zool.) 15:383.

Recorded by Tornier (1897:46) from Mafia Is., and also as collected by Böhm on "French Is. near Zanzibar" (now known as Grave Is., across the harbour), but ZMB has no material from Zanzibar. The record is considered doubtful. Elsewhere Loveridge found it not on the seashore but beneath piles of palm fronds and coconut husks, under heaps of wet weeds beside a rice swamp and among herbage under mango trees. Fuhn records similar habitats. Possibly misidentified *Cryptoblepharus bouillonii*.

Family: Cordylidae

7. GERRHOSAURUS FLAVIGULARIS FITZSIMONSI Loveridge Kenya Yellow-throated Plated Lizard
Gerrhosaurus flavigularis fitzsimonsi Lov. 1942b:514. Mt. Mbololo, Teita, Kenya. Mor. & Pak. 1941:108 Z (?error). Lov. 1957:225 "Zanzibar".

Although Loveridge thought that the range of this form may extend from Kenya and mainland Tanzania to Zanzibar, no *G. flavigularis* has been found on the island. Smaller than *G. m. major* but the tail is much longer in relation to the body.

Family : Lacertidae

8. GASTROPHOLIS VITTATA J.G. Fischer Keel-bellied Ground Lizard
Gastropholis vittata Fischer 1886 Abh. Geb. Naturw. Hamburg 9:1 "Zanzibar". Mor. & Pak. 1941:108 Z. Lov. 1957:226.

Boulenger (1887) records the type specimen as taken at "Zanzibar" by Fischer, but Loveridge (1957) says there is no definite record from the island: a century ago "Zanzibar" included the mainland coast. I agree with Loveridge (1957) that the type specimen probably did not come from the island.

Family : Varanidae

9. VARANUS EXANTHEMATICUS MICROSTICTUS Boettger * Eastern Savanna Monitor
Varanus microstictus Btgr. 1893 Kat. Rept. Samml. Mus. Senc. Naturf. Ges. 1:72. Ethiopia.
Varanus albigularis (non Daudin) Mocquard 1888:115 Z. Parker *et al.* 1940:310. Mor & Pak. 1941:108 Z.
Varanus exanthematicus microstictus, Lov. 1957:236 Z.

Mocquard's record of *V. albigularis* was based on two individuals reported to have been taken at Zanzibar by Révoil, but Loveridge was convinced that these were misidentified *V. ocellatus* Rüpell (now referred to *V. e. microstictus* Btgr.) which is "the only large-scaled monitor occurring in East Africa"; and that *V. albigularis* does not occur north of Mozambique, and certainly not in Zanzibar Island (pers. comm. to Parker, 25 April 1940 & Pakenham 4 June 1942). *V. e. microstictus* is not otherwise known from Zanzibar, and Révoil's specimens may not have been taken in the island at all but on mainland "Zanzibar". See, however, Aders' (1920) description, under *V. niloticus*, which raises a question of identity of what he saw. Loveridge (1957:235-236) records both *niloticus* and *exanthematicus* for Zanzibar. BM has no specimen from the island but comparison between examples of these species shows that even *V. niloticus* has yellowish ocelli which could conceivably be described as "ocellations", and specimens are needed to clarify the matter. Pending confirmation of the record, the balance of evidence excludes it.

Order SQUAMATA, SERPENTES

Family: Typhlopidae

1. RHINOTYPHLOPS UNITAENIATUS (Peters) Stripe-backed Blind Snake
Typhlops (Letheobia) unitaeniatus Peters 1878 Mber. K. preuss. Akad. Wiss.:205 "Taita" (Teita), Kenya.
Typhlops unitaeniatus, Blgr. 1893:55. Parker *et al.* 1940:312.
Rhinotyphlops unitaeniatus, Roux-Estève 1974:241.

The record for Zanzibar rests on Boulenger's range of "Somaliland and Zanzibar", but it was described from Kenya, and Boulenger refers to a specimen collected by Mr. Last at Mombasa, a locality which, until shortly before 1890, was within the "Zanzibar Coast". See Parker *et al.* 1940. Voeltzkow (1923:304) states that this species had "become known" from Zanzibar, but adds a qualification which casts doubt. ZMB has no specimen from Zanzibar. Excluded on ground of mistaken locality.

2. TYPHLOPS PUNCTATUS (Leach) * Spotted Blind Snake

Acontias punctatus Leach 1819 (in Bowdich) Miss.Ashantee.App:493. Fanti, Ashanti, Gold Coast.
Typhlops punctatus, Pak. 1947:138 Z.

Pakenham (1947) recorded what appeared to be its first and only occurrence on Zanzibar Is., taken in a rice field at Kinuni-moshi on 19 July 1943, and referred by Dr. Parker of BM to this species. It is not now in BM collection. Length (in spirit, 1943) 427 (418 + 9) mm, diameter 11-12mm. Scale rows: neck 27, mid-body 24, anus 22. My field notes record "8 heavy black longitudinal lines on back, 2 thinner lines on each side, 5-6 very faint lines on each side of belly; 2-3 central rows of ventrals without black. Whole snake looks black, speckled dusky yellow above, and old ivory speckled black below".

ZM has an unidentified specimen of a *Typhlops* sp. no. 40.14, taken at Kimara (Z) mid August 1940. My note, on examining it April 1941, was: "Upper side dark grey to blackish, with pale centre and black side edging to each scale, forming 11 light dorsal stripes. The dark and light striping faded on the sides to a cream undersurface. Length 430 (422 + 8) mm. Mid-body diameter 10.5mm (40.5 times in total length). Mid-body scale rows 24". BM sought but failed to obtain loan of this specimen for identification.

These two apparently conspecific specimens cannot be *Typhlops punctatus*, a species not found east of the Great Lakes (Roux-Estève 1974:77, pl.4). However, they may well belong to *T. lineolatus lineolatus* (Jan 1864:24) which, according to Roux-Estève (1974:78, pl.5) occurs on the African mainland opposite Zanzibar, although not yet recorded from the island itself. Disregarded for lack of identification.

Family : Colubridae

3. APARALLACTUS CAPENSIS Smith Cape Centipede-eater

Aparallactus capensis Smith 1849, App.16. Kaffirland eastward to Cape Colony, i.e. Natal, Mor. & Pak. 1941:109 Z. Lov. 1957:287 Z.

Boulenger (1896:260) recorded two ♂♂ and seven ♀♀ in BM received in 1868 from Sir J. Kirk at Zanzibar: see Introduction. Both Voeltzkow's reported record (1923:304; apparently not at first hand) of this species and Loveridge's inclusion of Zanzibar in its wide range may rest on these Kirk specimens which probably did not come from the island at all. ZM has one specimen of doubtful origin, without data. Excluded as probably mistaken locality.

4. APARALLACTUS GUENTHERI Boulenger* Günther's Centipede-eater

Aparallactus guentheri Blgr. 1895 Ann.Mag.nat.Hist.(6) 16:192. East & Central Africa. Mor. & Pak. 1941:109 Z. Lov. 1957:287 Z.

The record for Zanzibar seems to rely only upon BM's juvenile specimen from "Zanzibar" presented by F. Finn in 1894. There is no certainty that it was not from the mainland "Zanzibar coast", though at that date the island had begun to be politically distinguished from coastal "Zanzibar". Loveridge gives the range of *A. guentheri* as coastal Kenya, Tanganyika Territory and "Zanzibar" (his quote marks) to Nyasaland. Excluded from the island's list pending reliable evidence of occurrence.

5. APARALLACTUS WERNERI Boulenger Usambara Centipede-eater

Aparallactus wernerii Blgr. 1895 Ann.Mag.nat.Hist.(6) 16:172. Usambara Mts., Tanganyika.

ZM has a specimen no.1538 so named but without data and stated by the staff in 1941 to have been taken on Kinyasini road (Z) c. 1927 by attendant Mzee Shomari. But Loveridge comments (1944:200-201) that *A. wernerii* is "a montane species... of eastern Tanganyika..." to which he limits its range: Zanzibar is omitted from his 1957 check-list. So the BM specimen may have been confused with *Causus defilippi*, another small snake, brought in by Mzee Shomari from the Kinyasini road about the same time. Excluded on these grounds and of mistaken locality.

6. ATRACTASPIS IRREGULARIS (Reinhardt) Eastern Burrowing Adder

Elaps irregularis Reinhardt 1843 K.dansk.Vidensk.Selsk.Afhandl. 10:264. Gabon.

Atractaspis irregularis Tornier 1897:84 "Sansibarkueste" (coll. Hildebrandt, Salmin). Pitman 1938:288 Z. Parker *et al.* 1940:313.

Zanzibar is a very questionable locality. Parker *et al.* remark that Voeltzkow (1923), Loveridge (1924) and Pitman (1938) — but not Boettger (1913) — give *irregularis* as on Zanzibar, based possibly on Tornier's 1897 report of examples from "Zanzibar coast" (not the island) which Loveridge (1957:298, footnote) states are, in any event, misidentifications of *bibronii*. Neither Aders (1920:338) nor I found it in Zanzibar. Excluded as mistaken locality.

7. BOIGA BLANDINGII (Hallowell) Blanding's Tree Snake

Dipsas blandingii Hallowell 1844 Proc.Acad.nat.Sci.Philad.:170. Liberia.

Dipsadomorphus blandingii, Blgr. 1896:77 "Zanzibar" (error). Parker *et al.* 1940:313
Boiga blandingii, Pitman 1938:135; 1974:125. Lov. 1957:269 footnote.

Occurrence in Zanzibar is very doubtful, for Pitman (1938, 1974) gives its distribution as from West Africa to south Sudan, west Kenya, Uganda, Angola, and south of Lake Tanganyika, observing that "Boulenger's Zanzibar record is remarkable". The latter is clearly an error (Lov. 1957). Pitman's Luganda name for this species, "temankima", resembles that at Muyuni and Chwaka (Z), "nyoka-kima", for a large black tree snake reputed to occur there, which I never saw. Rejected as mistaken locality.

8. BOTHROPTHALMUS LINEATUS Peters Red-and-black Striped Snake
Elaphis (Bothrophthalmus) lineatus Peters 1863 Mber.K.preuss.Akad.Wiss.:287. Guinea.
Bothrophthalmus lineatus, Lov. 1924:4 Z; 1957:249 (Z omitted). Pitman 1938:68 Z (cites Lov. but dubious), 302 (explains error); 1974:73. Parker *et al.* 1940:313.

This is a West and Central African rain-forest species. Mention of Zanzibar was due to a misprint in Loveridge's 1924 check-list. Rejected as misinterpreted locality.

9. DROMOPHIS LINEATUS (Duméril & Bibron) Buff-striped Grass Snake
Dryophylax lineatus Dum. & Bib. 1854 Erpet.Gén.7:1124. White Nile, Sudan.
Dromophis lineatus, Blgr. 1896:150 "Coast of Zanzibar". Pitman 1938: 152 Z; 1974:153.

Voeltzkow (1923:304) names this snake among species which had "become known" on "Zanzibar" up to 1905, probably from a specimen presented to BM in 1886 by Emin Pasha from "coast of Zanzibar", a phrase indicating the mainland coast. Loveridge (1940) says that Boulenger's record is considered erroneous, and (1957) omits Zanzibar from its range, as does Pitman (1974). Excluded as mistaken locality.

10. DUBERRIA LUTRIX (Linnaeus) Slug-eater
Coluber lutrix Linnaeus 1758 Syst.Nat., 10th ed.:216 "ex Indiis".
Duberria lutrix, Mor. & Pak. 1941:108 Z.

Moreau & Pakenham's ground for inclusion of this species cannot now be determined: no specimen from Zanzibar in BM collection, and unlikely to be a reliable record. Loveridge (1944:141; 1957:267, footnote) wrote that this is an upland species (Kilimanjaro & Usambara Mts) which would never have come from Zanzibar. The "Zanzibar" record probably refers to the coastal belt of that name. Rejected as mistaken locality.

11. LAMPROPHIS INORNATUS Duméril & Bibron Olive-brown House Snake
Lamprophis inornatus Dum. & Bib. 1854 Erpet.Gén.7:434. Cape of Good Hope. Smith 1928 Ann.Mag.nat.Hist.(10)1:495. FitzSimons 1962:114.
Boodon infernalis Gthr. 1858 Cat.colubr.Sn.Br.Mus.:199. Port Natal & "S. Africa". Blgr. 1893:330 Z. Parker *et al.* 1940:312.

Parker *et al.* (1940) give grounds for rejecting from the Zanzibar list *Boodon infernalis*, which was referred by Smith 1928 to *Lamprophis inornatus* D. & B. Speke presented two specimens to BM, said to have come from "Zanzibar". It is a South African species. FitzSimons (1962:115) disregards its reported occurrence in Zanzibar and Tanganyika. Excluded as mistaken locality.

12. LYCOPHIDION SEMIANNULE Peters Half-banded Wolf Snake
Lycophidium semiannulis Peters 1854:622. Tete, Mozambique.
Lycophidium acutirostre Gthr. 1868 Ann.Mag.nat.Hist.(4)1:427 Z. (error)
Lycophidium capense acutirosire, Lov. 1933:234; 1936b:242; 1937:493; (see also 1957:253 & footnote).
Parker *et al.* 1940:310 Z. Mor. & Pak. 1941:108 Z.

Lycophidium semiannule, Laurent 1968:471.
Boettger (1913:348) and Voeltzkow (1923:304) include *L. acutirostre* among snakes "reported" to occur in Zanzibar, but this species is now regarded as a synonym of *L. semiannule* which has not been found on the island. Those reports may well have arisen from material received at BM from Kirk in 1868, and now believed to have originated from Mozambique (see Lov. 1933:234; 1957:253 footnote). MCZ has no specimen of this species from Zanzibar. Rejected as mistaken locality.

13. MEIZODON SEMIORNATUS (Peters) Southern Semiornate Snake
Coronella semiornata Peters 1854:622. Tete, Mozambique. Blgr. 1894:195 "Coast of Zanzibar". Pitman 1938:109 Z; 1974 (not Z). Parker *et al.* 1940:312.

An East African species from Kenya and Tanzania southwards to southern Africa, but apparently never taken on Zanzibar Is. The specimen in BM (mentioned by Boulenger), purchased from Boucard in 1878, is labelled "Mainland opposite Zanzibar" and "Coast of Zanzibar". Rejected as misinterpreted locality.

14. PHILOTHAMNUS HETEROLEPIDOTUS (Günther) Slender Green-Snake
Haetiulla heterolepidota Gthr. 1863 Ann.Mag.nat.Hist.(3) 11:286 "Africa".

Chlorophis heterolepidotus, Blgr. 1894:95; 1896:631. Parker *et al.* 1940:313.

The Zanzibar record evidently rests only on a specimen in BM, purchased in 1886 from J.G. Fischer's collection (Berlin), labelled "Coast of Zanzibar", which means the African mainland coast. Rejected as mistaken locality.

15. PHILOTHAMNUS THOMENSIS (Bocage)

Parker *et al.* (1940:310) explain the erroneous inclusion of this species among the snakes of Zanzibar due to misunderstanding of Pfeffer's term (1893:84) "var. *thomensis*"; the single specimen from Jambiani (Z) under reference is regarded as *P. s.semivariatus*.

16. PROSYMNA AMBIGUA STUHLMANNI (Pfeffer) * East African Shovel-snout

Ligonirostra stuhlmanni Pfeffer 1893a:78. Usambara, Tanganyika.

Prosymna ambigua stuhlmanni, Mor. & Pak. 1941:108 Z. Lov. 1957:265 Z; 1958:160 Z. Broadley 1980:542 Z.

Probably uncommon, if it occurs, in Zanzibar. Pitman (1938:120) mentions Sternfeld's 1910 record "from the island of Zanzibar", but actually the latter says only "Fundorte (= habitat): Zanzibar, Usambara, Bukoba", so Zanzibar may be used in its African mainland sense. ZMB has no specimen from Zanzibar or Pemba. Reports of occurrence at Zanzibar may be due to 10 examples received by BM from Kirk in 1868, probably part of his consignment of Mozambique reptiles sent via Zanzibar (see Introduction). A ZM specimen without data, only presumably from the island, was presented to BM in 1950. Broadley informs me that these alleged records are alone the basis of his mention in 1980:542. Moreau & Pakenham listed it possibly in error.

Loveridge, including Zanzibar in its range, observes (1958:131) that the fact "that a burrowing genus like *Prosymna* has been reported from "Zanzibar" alone of the ten major islands off the coasts of tropical Africa suggests that the specimen in question came from the opposite littoral to which the name Zanzibar was formerly applied rather loosely". No record from Pemba. Excluded as dubious.

17. PSAMMOPHIS ANGOLENSIS (Bocage) Pigmy Sand Snake

Amphiophis angolensis Bocage 1872 *Jorn.Sci.math.phys.nat.*4:82. Dondo, Cuanza river, Angola.

Psammophis angolensis, Blgr. 1896:170 "Zanzibar". Mor. & Pak. 1941:108 Z. Lov. 1957:280 Z. FitzSimons 1962:235 Z.

No ground can be found for the above Zanzibar records unless they derive from a specimen in the consignment from Kirk (Zanzibar) which reached BM in 1868, having almost certainly come from Mozambique via Zanzibar. MCZ has no material from these islands. Excluded as mistaken locality.

18. RHAMPHIOPHIS OXYRHYNCHUS ROSTRATUS Peters Eastern Brown Beaked Snake

Rhamphiophis rostratus Ptrs. 1854:624. Tete; Mesuril & Quitangonha, Mozambique. Mor. & Pak. 1941:108 Z.

Rhagerrihis unguiculata Gthr. 1868 *Ann.Mag.nat.Hist.*(4) 1:422 Z.

Rhamphiophis oxyrhynchus rostratus, Lov. 1953 *Bull.Mus.comp.Zool.Harv.* 110:270; 1957:277 Z. Pitman 1974:151 Z.

The above records of *R. rostratus* and *R. oxyrhynchus rostratus* for Zanzibar by Moreau & Pakenham, Loveridge, and Pitman probably rest on a record of *rostrata* based on the type of *Rhagerrihis unguiculata* Gthr. which is Kirk's 1868 specimen from "Zanzibar" (unacceptable: see Introduction), and also on Finn's 1894 example from "coast of Zanzibar", i.e. mainland coast. No specimen from Zanzibar in MCZ. Not mentioned by Boettger (1913) nor Voeltzkow (1923), and I never found it. Omitted on ground of mistaken locality.

19. RHAMPHIOPHIS RUBROPUNCTATUS (Fischer) Red-spotted Beaked Snake

Dipsina rubropunctata Fischer 1884 *Jb.hamb.wiss.Anst.*1:7. Near Arusha, Tanganyika.

Rhamphiophis rubropunctatus, Mor. & Pak. 1941:108 Z. Lov. 1957:277 Z. Pitman 1974:149 Z.

Moreau & Pakenham's source for their Zanzibar record is undetermined, and Loveridge's mention rests on their word alone. BM has no specimen from Zanzibar. Loveridge (1957) and Pitman (1974) give the species a wide range from southern Sudan to Somalia, eastern Kenya, northern Tanzania, and Zanzibar, but I found no evidence of its occurrence in the islands. Excluded for these reasons.

20. TELESCOPUS SEMIANNULATUS Smith Eastern Tiger-Snake

Telescopus semiannulatus Smith 1849, Pl.72. S. Africa. Lov. 1957:270.

Tarbophis semiannulatus, Blgr. 1896:52 "Zanzibar coast". Parker *et al.* 1940:313.

Boulenger's record is doubtless based on a specimen in BM received in 1886 from J.G. Fischer, but it clearly refers to the mainland coast. Rejected as mistaken locality.

Family : Elapidae

21. ELAPSOIDEA NIGRA Günther Eastern Garter Snake

Elapsoidea nigra Gthr. 1888 Ann.Mag.nat.Hist.(6)1:332. "Ushambola, Zanzibar" i.e. Usambara Mts., Tanganyika. Broadley 1971b:599.

Elapsoidea guentheri, Pitman 1938:199 (part) Z. Parker *et al.* 1940:311, 313.

Elapsoidea sundevalli nigra, Lov. 1944:225-227; 1957:290.

As the type specimen was sent to BM by Kirk (then H.M. Consul-General, Zanzibar) from "Ushambola", this place was presumed to be in Zanzibar Island (Lov. 1944:227), but the name is the archaic form of "Usambara" in northeastern Tanzania, where this species' habitat is montane rain-forest. The specimen had nothing to do with the island, nor have any been found in Zanzibar. Excluded as mistaken locality.

22. NAJE HAJE (Linnaeus) Egyptian Cobra

Coluber haje Linn. 1758 Syst.nat.10th ed., 1:225. Lower Egypt.

Naja haje, Mor. & Pak. 1941:109 Z. Lov. 1957:291 Z.

Very doubtful. Though common in Africa, there is no evidence of its occurrence in Zanzibar, nor is any Zanzibar material in BM. Moreau & Pakenham's and Loveridge's records rest probably on a ZM specimen marked *N. haje* which BM has since identified as *N. melanoleuca*. Excluded as misidentified.

Family : Viperidae

23. BITIS ARIETANS (Merrem) Puff Adder

Vipera (Echidna) arietans Merrem 1820 Vers.Syst.Amph.:152. Cape of Good Hope. Lov. 1924:8 Z.

Bitis lachesis, Mor. & Pak. 1941:109 Z (very doubtful).

Bitis arietans, Lov. 1957:301 Z (doubtful).

Loveridge (1957) comments "possibly Zanzibar, on the basis of a single specimen collected by Kirk though not necessarily on the island". Kirk's specimen, received by BM in 1868 is believed to have been in his consignment of Mozambique reptiles: see Introduction. Aders (1920:338) says the Puff Adder seems not to occur in Zanzibar, and I concur. Rejected as mistaken locality.

24. BITIS GABONICA (Duméril & Bibron) Central African Gaboon Viper

Echidna gabonica Dum. & Bib. 1854 Erpét.Gén.7:1428. Gabon, French Congo.

Bitis gabonica, Lov. 1924:8 Z; 1957:302 (not Z). Pitman 1938:270 Z. Parker *et al.* 1940:313 (?Z).

Loveridge (1924, on the basis of Sternfeld's 1910 listing), Pitman (1938, positively stating capture "on the island of Zanzibar", perhaps a wrong deduction from reports as he omits the island in 1974:211), and Voeltzkow (1923, from reports of others) all include Zanzibar in this species' range, but Boettger (1913) and Loveridge (1957) omit it. As Parker *et al.* (1940) observe, these records may rely on Kirk's 1879 specimen in BM, taken at "Ushambola" (Blgr. 1896:499): see *Elapsoidea nigra* on this place name. If so, the Zanzibar record is discounted. I am convinced that neither this viper nor *B. arietans* occurs in the islands.

FRESHWATER FISHES

In conclusion of this account of the cold-blooded vertebrates, a note on the freshwater fishes may not be out of place. Very little is known of these; in fact Pemba has not been explored at all in this respect. Playfair & Günther deal entirely with marine fishes except for the briefest reference in their preface, observing that as Zanzibar contains only relatively small streams the number of strictly freshwater species is very limited. Excluding those which live in both salt and fresh water, such as *Gobius* and *Eleotris*, they found only two species in Zanzibar Island (Pemba not mentioned), namely the cat-fish *Clarias gariepinus* and *Fundulus orthonotus*. As the range of the former is now known to lie in southern Africa, it seems, in BM opinion, more likely that what P & G found in Zanzibar was *C. mossambicus* Peters (of which I have taken a specimen, in BM). Similarly, *Fundulus* (now referred to *Nothobranchius*) *orthonotus* (Peters 1844), described from Quilimane, ranges from Mozambique southwards, and the Zanzibar form is believed to be *N. guentheri* (Pfeffer 1893), type locality "Sansibar" (presumably the island), which has a more northerly range. Vanderplank considers this to be the commonest small freshwater fish in Zanzibar (pers. comm.).

Pfeffer (1893) says that *N. guentheri* was found in pools, swamps, ditches, and little streams in Zanzibar Is.; and P & G (1866) found "*Fundulus orthonotus*" (? *N. guentheri*), 50-100mm in length, in "wells at Zanzibar". This may refer to the fairly large subterranean cave wells in the old

coral limestone areas, many of which hold pure fresh water, and in which I sometimes observed (but never secured) very small fishes hardly more than 30-40mm long. I can find no information whether *N.guentheri* could have been introduced or indigenous, possibly the latter as P&G found them before 1866.

In this century several *Nothobranchius* species from African waters were introduced into other parts of East Africa during the 1940s for mosquito larvae control, and the guppies (*Poecilia reticulata* Ptrs.) which Vanderplank found common in ornamental ponds in Zanzibar may well have been introduced then for this purpose. He believes (pers. comm.) that he also found *Gambusia* sp. (another mosquito-eating introduction) in Zanzibar but there is no confirmation: in general, this species is more commonly used than *Poecilia* sp. But introduction of mosquito-eating fish into rural areas by the Sultan's government as a public health measure in the mid 19th century would have been very unlikely, having regard to the absence in those days of any effective public health service even in the Town. After World War I, Dr. W.M. Aders of the government's Public Health Department took steps to introduce mosquito-eating fish which may have included the last named two species and also *Pachypanchax playfairii* (described from the Seychelles in 1866 as *Haplochilus playfairii* by Günther). Myers (1933) states that the latter species occurs also in Madagascar, and that "living material has been obtained in Zanzibar". I failed to locate this material, but the species has been found in the Athi river, Kenya (possibly introduced, since this is far from its other known habitats).

Examples of *Kuhlia rupestris* (Lac.), taken by me in Zanzibar (locality ?), were identified by BM in 1947. This larger fish, attaining up to c. 380mm, is a marine species but enters rivers and can adapt to brackish water. At the Bububu stream in west Zanzibar I observed fishes apparently up to 200-250mm in length and 60mm or more in depth, which were not identified and may well be of marine origin, e.g. *Eleotris* sp., having accustomed themselves to fresh water, as the spot where they were seen is 0.8km ($\frac{1}{2}$ m) from the seashore.

Dr. Trewavas in 1955 identified as *Hypseleotris cyprinoides* (C. & V.) – whose type came from "la riviere Saint-Maurice a l'ile de Bourbon" (an early name of Reunion Is.) – a "pale Eleotrid" sent to BM by Dr.F.Talbot from Zanzibar, taken in either Bububu stream or Zingwe-zingwe river, both within c. 5 km (3-4 m) of the sea. She also identified as *Eleotris fusca* Bl.Sch. a "dark Eleotrid" sent to BM by Dr.Talbot at the same time from the same source.

A fish identified formerly as *Tilapia mossambica* Peters, but now as *Sarotherodon hornorum* (Trewavas), is known to have been introduced into the islands from Africa at some time in this century. The first recorded specimen in BM from Zanzibar was sent by Aders in 1918. In 1946 Dr.J.D.Robertson (and earlier Dr.Leakey) sent examples of it to BM, taken from the Mwera river and neighbouring swamps where it abounds. I sent others (locality?) in 1947. J.S.Last (1929:6) states that *T.natalensis* had been introduced from Dar-es-Salaam to destroy mosquitos and as an article of food. It seems doubtful whether *Tilapia* were ever indigenous to Zanzibar, but some local 'wild' *Tilapia* (believed to be *mossambica*) were sent in the late 1950s from Zanzibar to an aquaculture research station in Malacca.

Dr. Talbot and Dr. Newell (1957), writing of an experiment of stocking marine fish-ponds in Zanzibar Is. with *Tilapia*, normally a freshwater species, state that to do this they took a number of 'wild' *Tilapia* from the estuarine reaches of the Zingwe-zingwe river in northwest Zanzibar. Presumably these were of the same stock as the above since the authors remark that they were closely allied to *T. mossambica* (Ptrs.) and *T. pangani* Lowe. A fish-pond was created by the government at Chukwani (now an inaccessible military area), stocked with these fish, and the project seems to have been a success (unless the soldiers have eaten them). Professor F.B. Wilson, when an agricultural officer in Pemba about 1946-48, introduced fry of *Tilapia* sp. imported from Africa into the Weni stream at Wete, Pemba, and into the Ole ponds (P), and learnt some years later that they were thriving.

Cat-fish are plentiful in the inland swamps and streams of both islands and are popularly used for food, but it is not known whether Zanzibar and Pemba species are the same: probably so. The cat-fish is an air breather and extremely resilient to exposure if kept moist, and is known to be easily transportable, e.g. by the dhows in the East Indies, so Zanzibar and Pemba waters were probably stocked long ago by importation from mainland Africa where *C.mossambica* is very common.

In the light of all the above, it appears that Zanzibar Island has no indigenous freshwater species with the possible exception of *N.guentheri*: all the others are likely to have been imported

for either food (*Clarias mossambicus* and *Sarotherodon hornorum*) or mosquito control (*Pachypanchax playfairii* and *Poecilia reticulata*), or to have worked their way up stream from salt to fresh water to which they became in time accustomed (*Kuhlia rupestris* and *?Eleotris* sp.).

Pemba Island, which abounds in swamps and rivulets, has even fewer water courses worth calling rivers than Zanzibar, though several fairly large ponds, and there is no evidence as to what fish life exists in them except an undetermined species of cat-fish and an introduced "*Tilapia*" (*Sarotherodon*); but the presence of indigenous forms there seems as unlikely as in Zanzibar. Up till the 1940s at least, a very large and venerated fish (nicknamed "Mwana Mshungi") lived in a small dark water-hole under a rock near the township of Chake-Chake, and its visitors fed it by hand with eggs and other delicacies! This "monster" (only its head was visible), believed by some to be an eel, was probably a cat-fish, a species which, with ample food supply, can attain an unusually large size.

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