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THE HERPETOLOGY AND HERPETOFAUNA OF NAMIBIA

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"Notwithstanding the dryness of the soil and the atmosphere between the Orange River and the seventeenth or eighteenth degrees of south latitude, reptiles are rather numerous . . . indeed, some parts of Damara-land are so infested by them as to be almost uninhabitable."

Charles John Anderson, "Lake Ngami", 1956

Namibia, which became independent on the 21st March 1990, lies on the extreme south-west corner of Africa (hence its previous name, South-West Africa), north of South Africa, west of Botswana and south of Angola. The country can be conveniently split into four regions. They are: the Kalahari (semi-desert scrub, not true desert) occupying the eastern third of the country; the highlands – an area of relatively high, rocky land running from south to north, up the centre of the country, from the great Karas mountains through the Aus range (where Windhoek, the capital, is sited) to the Waterberg and Brandberg (the highest mountain, 2579 m altitude); the Namib Desert – a true desert, lying along the coastline, with less than 50 mm of rain a year and rainfall reliability less than 20%; and the Northern savanna, an area of relatively (more than 500 mm/year) high rainfall. In the northern savanna are two features of interest, a huge evaporate pan, Etosha, around which a big National park is sited, and the Caprivi Strip, a finger of land extending far east of the north-east corner, across to the Linyanti and Chobe river. The Caprivi strip is much more well watered than the rest of Namibia and contains the country's only genuine wetlands (Jones, 1990). The Caprivi was given by the British to the German colonists in 1889 in order to give them access to the Zambezi river. Two major rivers cross the Caprivi strip, the Kavango and Cuando, and the Zambezi/Linyanti rivers border the eastern edge of the strip. The Cunene river forms the western side of the border with Angola. In the south, one permanent river, the Fish, bisects the high land and enters the Orange river.

Sited on a cold coastline, cooled by the Benguela current, Namibia is a dry land. Most of the country has less than 400 mm rainfall annually. There is no forest, although in the north and the Caprivi there is some savanna woodland. It is a country of harsh, wind and heat worn landscapes. The settlement of Noordoewer, in the south, has an average daily maximum temperature of over 40 degrees centigrade during the height of summer. There are few people, just over one million, in a country of 820 000 square kilometres (compare Nigeria, with an area of 924 000 km² and 90 million people!). The country's economy is based on mining (large reserves of diamonds and uranium), stock farming and fishing, the cold sea providing abundant catches (data from Van der Merwe, 1983).

THE HERPETOFAUNA

Despite the dryness of the land, Namibia has a relatively diverse herpetofauna. The region (particularly if one includes in the region the 250 km northern extension of the Namib desert into Angola, to the Mossamedes/San Nicolau area) has a very high number of endemic species, mostly associated with the Namib desert. An interesting comparison can be made with the herpetofauna of Egypt, which lies at a similar latitude to the north of the equator and is slightly larger in area: the number of species present are as follows (Namibian reptile data from Branch (1988a), Namibian frog data from Channing and Van Dijk (1976) and Griffin (1990), Egyptian data from Marx (1968).

	NAMIBIA	EGYPT
Land Tortoises (Testudinidae)	6	1
Soft-shelled Terrapins (Trionychidae)	1	1
Side-necked Terrapins (Pelomedusidae)	4	0
Snakes (Serpentes)	76	34
Worm Lizards (Amphisbaenia)	8	0

Lizards (Sauria)	111	46
Crocodiles (Crocodylidae)	1	0
Frogs (Anura)	50	6
Total	257	88

The number of Namibian species is somewhat boosted by species known only from the Caprivi strip, sticking out like a finger east of Namibia proper, into the Chobe/Zambezi river system. For example, all three species of *Pelusios* (Hinged Terrapins) found in Namibia only occur in the Caprivi, some seven or eight snake species (including the Congo Burrowing Adder, *Atractaspis congica* and Rufous beaked-snake, *Rhamphiophis oxyrhynchus*), three Dwarf Gecko species (*Lygodactylus*) and three or four frog species (including the Foam-nest Tree Frog *Chiromantis xerampelina* and Red Toad *Schismaderma carens*) reach the Caprivi but no further west. Nevertheless, for a dry land, Namibia has a very rich reptile fauna.

The structure of the Namibian herpetofauna is best considered in terms of its zoogeographic affinities, with most species falling into the following major groups:

Pan-African Savanna species: widespread throughout the African savanna south of the Sahara. There are a number of snakes in this group (examples: *Python sebae*, *Lamprophis fuliginosus*, *Rhamphiophis oxyrhynchus*, *Dasypeltis scabra*, *Dispholidus typus*) and nine frogs (examples: *Ptychadena mascareniensis*, and *Kassina senegalensis*.) but few lizards (only *Varanus niloticus* and *Chamaleo dilepis*; this latter species does not reach West Africa proper).

South-east African Species: occurring generally from Somalia/Sudan/Ethiopia/Kenya down the eastern seaboard, across to Namibia and Angola. Associated with savanna and/or semi-desert. There are about 17 snakes, 15 lizards and 13 frogs in this group, including such species as *Thelotornis capensis*, *Pseudaspis cana*, *Hemirrhagerrhis nototaenia*, *Gerrhosaurus flavigularis*, *Agama atricollis*, *Pachydactylus bibronii*, *Bufo carens*, *Phrynomerus bifasciatus* and *Ptychadena mossambica*.

Southern African Endemics, not confined to Namibia, found on both east and west sides of the sub-continent. There are 10 or 11 snakes in this group, about 13 lizards and three frogs. Typical species: *Aspidelaps scutatus*, *Psammophylax rhombeatus*, *Agama atra*, *Bradypodion ventrale*, *Strongylopus grayii*, *Breviceps adpersus*.

Southern African Endemics, confined to the western (drier) side of the sub-continent. Quite a large group, with some 14 snakes and nearly 30 lizards (of which 10 are geckoes), but only a couple of frogs; examples are: *Naja nivea*, *Dipsina multimaculata*, *Telescopus beetzi*, *Mabuya sulcata*, *Pachydactylus weberi*, *Pachydactylus serval*, *Phrynomerus annectans*.

Namibian Endemics: Confined to Namibia and/or the Namib desert, including the section of the Namib desert that enters southern Angola as far as Mossamedes. Branch (1988a) did not consider those occurring north of the Namibian border as endemics, but I feel this is an artificial division, as the Namib fauna is reasonably heterogeneous, and most species found in the northern Namib enter Angola. There are seven or so snakes but nearly 40 lizards in this group (including 18 geckoes). Some species are associated purely with the desert, others with the rocky mountains to the west of the desert. Typical species are: *Python anchietae*, *Mehelya vernayi*, *Pythonodipsas carinata*, *Bitis peringueyi*, *Sepsina albertii*, *Aporosaura anchietae*, 4 species of *Cordylus* (*C. campbelli*, *C. jordani*, *C. pustulatus* and *C. namaquensis*), *Meroles micropholidus*, *Narudasia festiva*, *Pachydactylus bicolor* and all six known species of *Rhoptropus*. This group could be split into two sub-groups, species associated primarily with the dry rocky mountains and species associated with the gravel plains or dunes of the Namib and pro-Namib (a transition zone between the Namib desert and the higher land to the east).

Species associated purely with the Kalahari but not the Namib: This is a small group, including the snake *Amblyodipsas ventrimaculata*, the gecko *Colopus wahlbergii* and the skink *Typhlosaurus garipeensis*.



Plate 1: The Horned Adder, *Bitis caudalis*, found throughout Namibia. (photograph by Stephen Spawls).

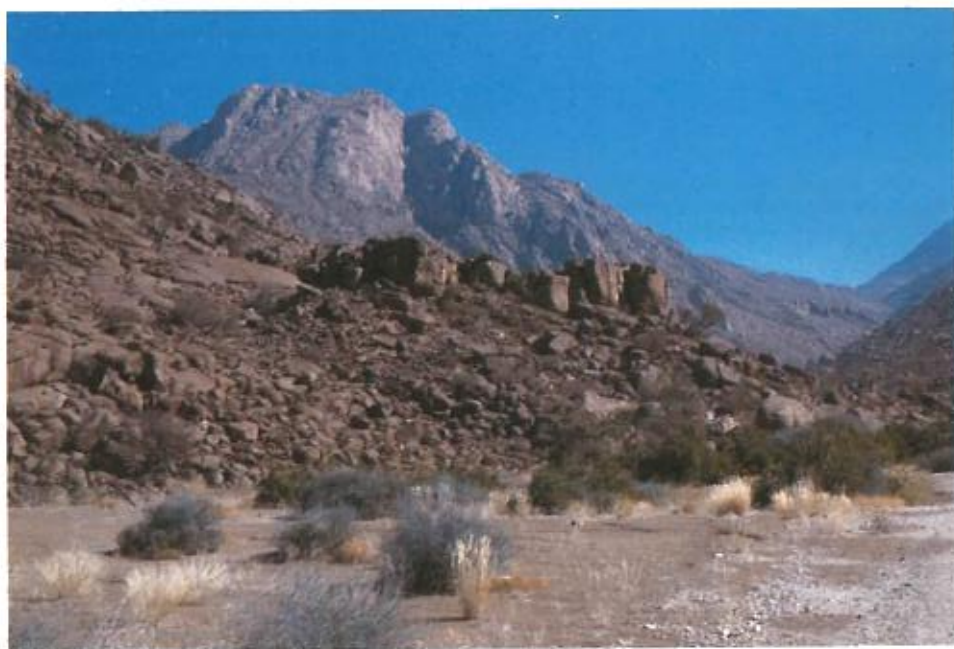


Plate 2: In the Brandberg, Namibia's highest mountain. *Rhoptropus* geckoes were active on the boulders during the day. (photograph by Stephen Spawls).

There are a few species, occurring mostly in the Caprivi strip, which do not fit easily into any of these categories, for example the snake *Limnophis bicolor* (associated with the south-central African watershed), the burrowing adder *Atractaspis congica* (central African forests) and two species of *Lygodactylus*, both associated with the Zambezi basin.

It is worth discussing the herpetofauna of the Namib desert proper, because for a desert it is remarkably rich. Joger (1985) indicates that the Namib and associated rocky hills is one of the principal radiation centres of nocturnal geckoes (Gekkoninae), more than 20 species occurring in the region (for comparison, only eight in the Arabian desert of Egypt). Some of these geckoes are astonishingly weird and beautiful animals, including species such as the virtually transparent Web-footed Gecko, *Palmatogeoeko rangei*, and the Kaoko Web-footed Gecko, *Kaokogeoeko vanzyli*, confined to the gravel plains of the Kaokoveld in the north-west. Some twelve or so species of Lacertid lizard also occur in the Namib. Among them is the strange Shovel-snouted Lizard, *Aporosaura anchietae*, which lives on the dune slipfaces (sites of much life in the Namib) and has fringes on its toes. This lizard can withstand body temperatures of 44 degrees C and when overheated cools itself by an amusing thermal dance, whereby it lifts its legs and tail into the air (interestingly, this same behaviour is shown by another desert dwelling lizard from the opposite corner of the continent, *Acanthodactylus boskianus*, a species from Egypt, which also has fringes on its toes (Flower 1933)). In addition, in the triangle of desert and dwarf shrub savannah in the south-east of the country, between Luderitz Bay, Keetmanshoop and Karasburg, no less than six species of true African vipers (*Bitis*) occur; nowhere else in Africa is this diversity found. In fact, the number of *Bitis* species found in Namibia may be seven. There are two major dune seas in the Namib, one extending south of Walvis bay and the other north of the Huab river, separated by a huge gravel plain. Work by Mike Griffin, at the Ministry of Wildlife, Conservation and Tourism in Windhoek indicates that the specimens of *Bitis peringueyi* from the northern sector of the Namib are genetically different from those from the southern sector. The curious plated lizard *Angolosaurus skoogi* is only found in the northern sand dunes.

The reason for this huge diversity of reptile life in the Namib is that, despite the lack of rainfall, the desert is by no means waterless, for it receives a large amount of fog-water precipitation. Wind moving across the sea from the south-west (from which direction most of Namibia's coastal wind comes) picks up much moisture. As it approaches the Namibian coastline, the sea surface temperature gradually falls, from 21 to 12 degrees C (this is caused by upwelling of Antarctic waters of the Benguela current). At the same time, an inversion layer (a layer of cool air overlying warm coastal air) prevents the air stream rising and becoming turbulent, or forming clouds. Hence as the warm air stream is cooled by the sea, huge fog banks are formed, and these can be often seen offshore as one drives towards the Namibian coast. On approximately 100 days of the year, onshore winds at night push the fog banks inland onto the Namib, and as they rise over the desert they are cooled past the dew point, and fog condenses out onto the desert. Most fog water falls between elevations of 300 and 600 m above sea level. In this area there are many plants, in particular lichens, which simply lie on the rocky ground and depend on this fog water. Dependent on the plants (and fog-water !) are herbivorous animals, and dependent on the herbivores are the carnivores. Thus the fog-water explains why the Namib dunes contain so much more life than comparable areas of the Sahara. The Namib is a desert of astonishing beauty. As well as the remarkable landscape, with its Seif and barchan dunes (often coated with garnets !), and jagged rocky hills, the plant life is unlike anywhere else on earth. It includes the strange Welwitschia, a plant that may live to be more than a thousand years old and only has two leaves, that grow continuously. On rocky hills one sees the strange Phantom or Moringa trees, distinctive because of their ghostly white bark.

CONTEMPORARY HERPETOLOGICAL WORK IN NAMIBIA

Herpetological research in Namibia is or has recently been conducted by four major institutions; they are the State Museum, at Windhoek, the Namib Desert Research Station at Gobabeb, south-east of Swakopmund on the coast, the Ministry of Wildlife, Conservation and Tourism

(formerly the Directorate of Nature Conservation and Recreational resorts. Headquarters in Windhoek but offices and scientists in all six major Namibian national parks and game reserves), and the Transvaal Museum, in Pretoria. A handful of foreign and South African scientists also research on Namibian herptiles (to be detailed shortly), and although at present there is no snake park or reptile house in Namibia exhibiting the fauna, one will shortly open in Windhoek. There are also 3 crocodile farms in the country.

The State Museum in Windhoek houses a collection of some 7,500 preserved Namibian reptiles (about half are lizards) and 850 amphibians under the curatorship of R.E. (Eryn) Griffin. Herpetologists who have been based there include the late Dr. W. Steyn, who published on various aspects of herpetology, often in conjunction with other authors, (mostly in Cimbebasia), e.g. Steyn, (1963), Steyn and Els, (1963), Steyn and Mitchell, (1967). The Austrian herpetologist Hartwig Berger-Dell'mour recently spent a short sojourn at the Museum, and produced several papers, especially on the Lacertid genus *Pedioplanis* (Berger-Dell'mour and Mayer, 1989, Mayer and Berger-Dell'mour, 1988). The Museum produces the journal *Cimbebasia*, which appears on an irregular basis; issues usually contain 200-odd pages and often have herpetological papers in them. Examples are Professor Geoff McLachlan's revision of the taxonomy of *Agama hispida* (McLachlan 1981), Steyn and Haacke's description of the new Web-footed Gecko *Kaokogecko* (from the Kaokoveld of north-west Namibia) (Steyn and Hacke, 1966) and Helmut Finkeldey's notes on *Python anchietae* (Finkeldey 1963). Early issues contained several papers by Dr. C.K. Brian (e.g. Brain 1962), one of southern Africa's most remarkable zoologists. Dr. Sam Telford, from Cape Town, has just been appointed to the post of herpetologist at the State Museum, and is commencing a project on the barking gecko, *Ptenopus*.

The Namib Desert Research Station, 100 km south-east of Walvis Bay, is sited astride the 3 main biotypes of the Namib; they are the red dunes, the gravel plains and the riverine bush of the Kuiseb river. The research station was the brainchild of Dr. Charlie Koch, an Austrian entomologist who came to Namibia in 1949 with a University of California/Transvaal Museum expedition. Koch was a foremost authority on the strange *Tenebrionid* beetles that flourish in the Namib. Originally set up as a field station of the Transvaal Museum, in 1963, the research station became the headquarters of the Desert Ecological Research Unit (DERU), a South-African based organisation. It remains to be seen what administrative changes will take place in this post-independence era. Scientists based at the Research Station have produced many important works, in various scientific journals (in particular the *Annals of the Transvaal Museum*), but the station also produces its own journal, *Scientific Papers of the Namib Desert Research Station* (whilst under the auspices of DERU, *Bulletins of the Desert Ecological Research Unit*). Herpetological works appearing under this imprint includes Wulf Haacke's description of two new lizard species (Haacke 1964) and ongoing work on the strange Plated lizard, *Angolosaurus skoogi*, of the northern dune sea (Hamilton and Coetzee, 1969, Seeley, 1987(a), (for further work on this lizard, see also Seeley, Mitchell, Roberts and McLain, 1988)).

Scientists operating from the station have produced some 40 odd papers on the herpetofauna of the Namib. Herpetologists of note who have visited the Namib and/or the Research Station and published on their work there include Edward Ross, (really an entomologist, at the California Academy of Sciences, but a keen herpetologist as well !) (Ross; 1972), Yehudah Werner of the Hebrew University of Jerusalem (Werner, 1977), Karl Switak (1981) and Leonard Hoffman, who worked on Horned Adders, *Bitis caudalis* (Hoffman 1988). Helmut Finkeldey, a herpetologist, was for some years based at the Research Station. The present director of the research station, Dr Mary Seely, as well as researching on *Angolosaurus*, has produced a delightful book on the Namib, essential reading for anyone who would like to understand the delicate ecology of this fascinating desert (Seely 1987(b)).

Resident herpetologist at the Ministry of Wildlife, Conservation and Tourism (formerly the Directorate of Nature Conservation) is Mike Griffin, officially the Small Animal Biologist. Originally from California, Mike has been resident in Namibia for 16 years, and has produced an interesting (if somewhat speculative) checklist of amphibians, reptiles and mammals of Etosha (Griffin, 1989, but author stated simply as "Small Animal biologist" !), he has also recently



Plate 3: Dwarf Python, *Python anchietae*, collected in Namibia. (photographed by Laura Spawls).



Plate 4: Kalahari Ground Gecko, *Colopus wahlbergi*, associated with the Kalahari in Namibia. (photograph by Stephen Spawls).

summarised herpetological work being carried out in Namibia (Griffin 1990). His present studies concern the conservation status of various species of the Namibian herpetofauna, and the production of a Red Data Book. At present, the only Red Data book in existence for African Reptiles and amphibians is that prepared for South Africa by Geoff McLachlan (1978), updated by Branch (1988b). Mike Griffin is also working on some 3,000 odd snakes that were collected from the Eastern National Water Carrier, a somewhat controversial canal, mostly open, that transports water from Grootfontein in northern Namibia, 260 km south to Omatoko. A preliminary report on this collection has been published (Griffin, Panagis and Berriman, 1989). The canal has attracted much heated debate (e.g. see Comrie-Greig, 1986), with ecologists pointing out that it serves as a deadly trap for a huge range of vertebrates, with little means of escape.

In Etosha National Park, in northern Namibia, Andy Phillips, from the Centre for Reproduction of Endangered Species in San Diego, is working with the Ministry of Wildlife, radio-tracking *Varanus albigularis*, the Southern Monitor, which together with Toy Bodbijs' Gaboon Viper radio tracking project in Zululand, are the first two reptile radio-telemetry projects in Africa. The Directorate of Nature Conservation (as it was) produced a quality scientific journal, Madoqua (the generic name of the Dik-dik !); four issues appeared each year. Madoqua regularly published herpetological papers, e.g. Penrith's (1971) paper on *Trionyx*, the Nile Soft-Shelled Turtle that just reaches Namibia, Wulf Haacke's (1981) paper on *Mehelya* in southern Africa, Jurgens' (1979) work on the *Rhoptropus* geckoes. A worrying aspect of the Ministry's work is the control of herpetofaunal poaching. Namibia's remarkable endemic reptiles, although fully protected by legislation against commercial exploitation, are greatly in demand among overseas hobbyists, in particular its rare endemic python, its beautiful geckoes and little vipers. South African based collectors visit the region, collect and remove Namibian animals and sell them both within South Africa and overseas. It is hoped that increased fines and new stricter border controls will discourage this illegal trade.

During the last 3 decades, the most important herpetological research in Namibia has been carried out by Wulf Haacke. Born in Windhoek, but now assistant director of the Transvaal Museum, Wulf has been publishing on the herpetofauna of Namibia since the early 1960's. Under V.F.M. Fitzsimons, who joined the staff in 1924, the Transvaal Museum began to build up a major preserved collection of Namibian reptiles and amphibians. When Wulf started at the museum he continued to expand the collection. The Transvaal museum now houses the most comprehensive collection of the Namibian herpetofauna in the world. Wulf's own work includes five classic papers on the ground-dwelling and burrowing geckoes of the region (Haacke 1975a, 1976 (a,b,c,d), several works on the biogeography of the area (Haacke 1982, 1984), descriptions of new species of lizards and snakes (Haacke 1965, 1975(b) and he has recently found a new species of *Lycophidion* from the area, presently being described by Don Broadley at the Natural History Museum in Bulawayo, Zimbabwe. Although based in Pretoria, Wulf travels to Namibia frequently, where he takes remarkable photographs as well as doing field work. Anyone wishing to research on the Namibian herpetofauna would be well advised to talk with him and look at the Transvaal museum collection before they start.

Visiting herpetologists who have done or are now doing research include Dr Aaron Bauer from Villanova University, Michigan, who (with Bill Branch from the Port Elizabeth Museum, South Africa) is working on the herpetofauna of the Kamanjab area, north-west Namibia. They have turned up a remarkable 25 species of snake while collecting during the winter, making a total of 39 snake species from that area. Alan Channing, a biochemist from the University of the western Cape, is shortly to produce a monograph on the Namibian frogs. A student at the University of Namibia, N. Heidman, is currently working on behavioural ecology of ground agamas in the Windhoek area.

HISTORICAL HERPETOLOGY IN NAMIBIA

Early herpetological work in Namibia has been detailed by Mertens in his classic (1955) paper, under the section "Historical remarks" (Historische Bemerkungen, pp 7-8) and most papers referred to in this section are detailed in his reference list. This work can be summarised

into three phases, firstly, random collections made by early adventurers into what was hard hostile land, secondly collecting by the German colonists who arrived after the annexation of the area (1883-1885), documented by German museum workers, thirdly work by South African scientists after that country was given a mandate to rule Namibia by the League of Nations in 1915.

Among the early adventurers were Johann Wahlberg, a Swede, who collected extensively in southern Africa, and was eventually killed by an elephant at Lake Ngami in Botswana in 1856. Several lizards were named after Wahlberg, one by Wilhelm Peters, herpetologist at the Berlin Museum, who between 1862 and 1882 (detailed in Mertens 1955) produced a series of papers on the herpetofauna of Namibia. Peters named the gecko genus *Rhoptropus*, later immortalised by V.F.M. Fitzsimons, normally a most careful zoologist, who consistently misspelled the name as *Rhotropus* !

After Peters' death in 1883, herpetological research on Namibia was centred at the Senckenburg Museum in Frankfurt, under Oskar Boettger, whose thorough work included a series of papers produced between 1886 and 1898 (detailed in Mertens 1955). Another German museum housing herpetological collections from this era in Namibia was the Natural History Museum at Wiesbaden (Lampe 1901, 1902, 1911, and Andersson, 1908, including description of the new Gecko genus *Palmatogekko*, detailed in Mertens 1955). Unfortunately, most of this collection was destroyed by Allied bombing during the second world war. A herpetologist who worked at both Senckenburg and Berlin was Richard Sternfeld, who between 1908 and 1911 produced several papers on the Namibian herpetofauna (among other regions in Africa, notably the then German colonies of Kamerum (Cameroon) and Togo). However, his 1910 paper on the snakes and 1991 work on other reptiles and amphibians were much criticised by Werner (1915), because Sternfeld added to the known list of the Namibian herpetofauna a number of species that he thought might occur there (most of which did not !). This practice bedevils herpetologists, and is still not uncommon, especially in Africa.

Franz Werner detailed, among other works, the Namibian herpetofaunal collection by Michaelsen in the Frankfurt museum (1915), and between 1920 and 1926, Kurt Falk produced some very readable and popular articles on the Namibian herpetofauna (detailed in Mertens). After the first world war, most work was done by South African scientists, in particular, by John Hewitt at the Albany Museum in Grahamstown, Natal, and V.F.M. Fitzsimons, from the Transvaal Museum. However, three British herpetologists deserve an honourable mention in Namibia's herpetofaunal history; they are George Boulenger, of the British Museum, who among other things produced a short report on Namibian tortoises (Boulenger 1886), H.W. Parker (also of the British Museum) who documented Dr Karl Jordans' herpetological collection from Namibia and Angola (Parker 1936), and Arthur Loveridge, of the National Museum, Kenya, and the Museum of Comparative Zoology, Harvard, whose series of comprehensive revisions of African herpetofauna, published between 1935 and 1951, did much to sort out taxonomic problems posed by some of Namibia's herpetofauna.

MODERN HERPETOLOGICAL LITERATURE AVAILABLE ON NAMIBIA

There are a handful of popular works that cover Namibia, as part of the herpetofauna of the southern African sub-continent. The reptiles of the region are covered in Bill Branch's field guide (Branch 1988a). This book is intended for the keen amateur as well as the serious herpetologist. It has a good photographic record of most species, and I found it useful in Namibia for identifying lizards. It is compact enough to be useful in the field, too. The snakes of Namibia are covered in Don Broadley's revision of "Fitzsimons Snakes" (Broadley 1983: revised 1990), and their range within Namibia can easily be seen from the large clear distribution maps in this work. The only significant bound work on the lizards of the region is Fitzsimons' (1943) monograph, "The Lizards of South Africa" which despite its name also covers Namibia, Botswana, Swaziland, Lesotho and Zimbabwe. A series of popular articles on the lizards of southern Africa (including Namibia) were published by John Visser, in the Afrikaans farming weekly "Landbou Weekblad" (Visser 1984; published in 38 consecutive issues: nos 319-356),



Plate 5: The Common Barking Gecko, *Ptenopus garrulus*, whose characteristic call is associated with sunset in the Namib desert. (photograph by Stephen Spawls).



Plate 6: Rock and Sand, the Namib desert near Rossing. (photograph by Laura Spawls).

although written in Afrikaans these articles contain some interesting range maps. The Chelonians are covered by 2 works dealing with the region as a whole, that is Comrie-Greig and Burdett's (1976) paper on patterns in the distribution of terrestrial tortoises, with range maps covering the entire sub-continent, and Boycott and Bourquins (1988) book, "The South African Tortoise Book". This handy work is beautifully produced and has no less than 56 excellent colour plates. However, its major shortcoming where Namibia is concerned is that the distribution maps for each species cut off at about 22 degrees south, thus excluding the northern 40% of Namibia.

Passmore and Carruther's useful book, "South African Frogs" (1979) does not cover Namibia; the range maps are restricted to the republic of South Africa. The only book with any Namibian frog data in it is Vincent Wager's "Frogs of South Africa" (1986), this re-issue of his original 1965 work gives ranges for most species reaching Southern Africa, although the endemic Namibian frog *Phrynomerus affinis* is conspicuously absent! The most important paper on the frog fauna of southern Africa, including Namibia, is John Poynton's 1964 work; "The Amphibia of Southern Africa".

As far as I am aware, the only popular book dealing exclusively with any aspect of the Namibian herpetofauna is Buys and Buys "Snakes of South-West Africa" (no date), also available in Afrikaans and German. It is a 64 page guide to the snakes of the region, somewhat lightweight in approach. It contains some remarkable photographs (including one of a Puff Adder striking with a closed mouth, and some gruesome snakebite injuries!), but many pictures are unnecessarily duplicated (there are nine pictures of a Puff Adder), and few of the Namibian endemics, such as the small Vipers; the odd *Pythonodipsas* or *Python anchietae* are illustrated. It has no range maps.

The definitive paper on the Namibian herpetofauna, as mentioned, is Mertens' 1955 monograph "Die Amphibien und Reptilien Sudwestafrikas", 172 pages of baseline data, illustrated by 24 plates. This paper has sometimes been criticised, on the grounds that Mertens' data was very insular, he only considered specimens that he had collected and/or seen, from a handful of Museums (notably Senckenberg, Berlin, Hamburg and the Museum of Comparative Zoology) – he did not take note of the Transvaal Museum specimens. Nevertheless, this paper (and a revised update which appeared in 1971) represents the single most comprehensive work in the herpetofauna (including the amphibia) of the region. The 24 plates are remarkable, both in quality and informative content; particularly so when one considers the general standard of herpetological photography in the 1950's; Mertens' living subjects (plates 2-18) are obviously live, alert, and fill the frame, his picture of *Rana* (now *Tomopterna*) *delalandii* on plate 2 is a gem.

Other substantial recent works on the herpetofauna include Fitzsimons' (1938) report on a Transvaal Museum expedition to the area, and Channing and Van Dijk's (1976) monograph on the amphibia (to be updated soon). Recent scientific work on the Namibian herpetofauna has been published in a variety of journals, much in the annals of the Transvaal museum, but also in *Herpetologica*, *Copeia*, *Herpetozoa*, *Journal of the Herpetological Association of Africa*, and the *South African Journal of Science*, among others. As far as I am aware, there is no comprehensive bibliography of Namibian Herpetofauna, but if one could be produced, Wulf Haacke would be the man to do it.

NOTES FOR THE INTENDING HERPETOLOGICAL VISITOR TO NAMIBIA

Namibia is a dry, healthy country, which is just opening up to the visitor. The people, I found, were friendly and hospitable, and the black Namibians, in particular, were very eager to talk to visitors from Europe. The herpetofauna is stunning and visible, especially in the rocky hills and the desert; in the Brandberg I saw 10 species of lizard inside two hours, and this in winter. There are also some other remarkable tourist attractions, in particular Etosha National Park (the best National Park I have ever been in for viewing large carnivores); the Skeleton Coast park and the Namib-Naukluft park (THE park to see the Namib desert); the curious rock engravings at Twyfelfontein; the rock paintings of the Erongo mountains and

the Brandberg (especially the enigmatic "White Lady"); Spitzkoppe, an isolated cluster of jagged volcanic peaks; the wierd Waterberg plateau, a national park on a mountain top, with only one way in; the Fish River Canyon, Namibia's answer to the Grand Canyon; the strange Germanic coastal towns of Swakopmund and Luderitz Bay; the worlds' tallest dunes (at Sossusvlei) and the biggest meteorite (at Hoba).

For the herpetological visitor, the best time for seeing fauna is October/November, when the rains are starting. For those unused to heat, however, this can be a trying time to travel, and in fact the herpetofauna (especially the lizards) is visible virtually throughout the year. The usual precautions for desert work should be taken.

Zambian Airways fly to Windhoek from London, and Namib Air fly to Frankfurt. Information for the budget traveller is contained in the Namibia chapter of Geoff Crowthers "Africa on a Shoe string" (1989). There are a number of tour operators in Windhoek, and the big car rental gencies are there. (For addresses, a useful publication is "Africa's Gem", produced by the Namibian tourist board, address below). It is worth hiring a car, as unlimited mileage deals are available, public transport is poor and distances vast, although hitching on the major roads is practical. Hotels are somewhat expensive but the National parks and recreational resorts offer a range of self-catering accommodation, often at camps with attached restaurants, at extremely modest rates. These usually need to be booked in advance. Information on hotels and National Park accommodation can be obtained from the Namibian Tourist Board, Private Bag 13297, Windhoek 900. Herpetologists wishing to observe and photograph need no permits, those wishing to collect and/or research should contact Mike Griffin, at the Ministry of Wildlife, Conservation and Tourism, P.O. Box 13306, Windhoek. Bear in mind that any commercial collecting is unlikely to be permitted! There are also various areas of Namibia that are closed to visitors, in particular the diamond fields in the south. But for the herpetologist and/or naturalist Namibia is a delight, you will see a large number of species, in particular lizards, under excellent viewing conditions. In addition, with the exception of certain spectacular species, very little ecological work has been done on the Namibian herpetofauna. The field notes in the most modern texts all too often are simply rehashed versions of notes from monographs produced 50 or more years ago. Much work still has to be done on the ecology, even of the larger species. Bill Branch is at the minute in the process of describing a new tortoise species from the dry mountains of southern Namibia. The visiting herpetologist, even on a short trip, may well be able to make observations which are new, or note range extensions. So go there !

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Plate 7: Welwitschia Flats, Namib desert, near Swakopmund. (photograph by Laura Spawls).

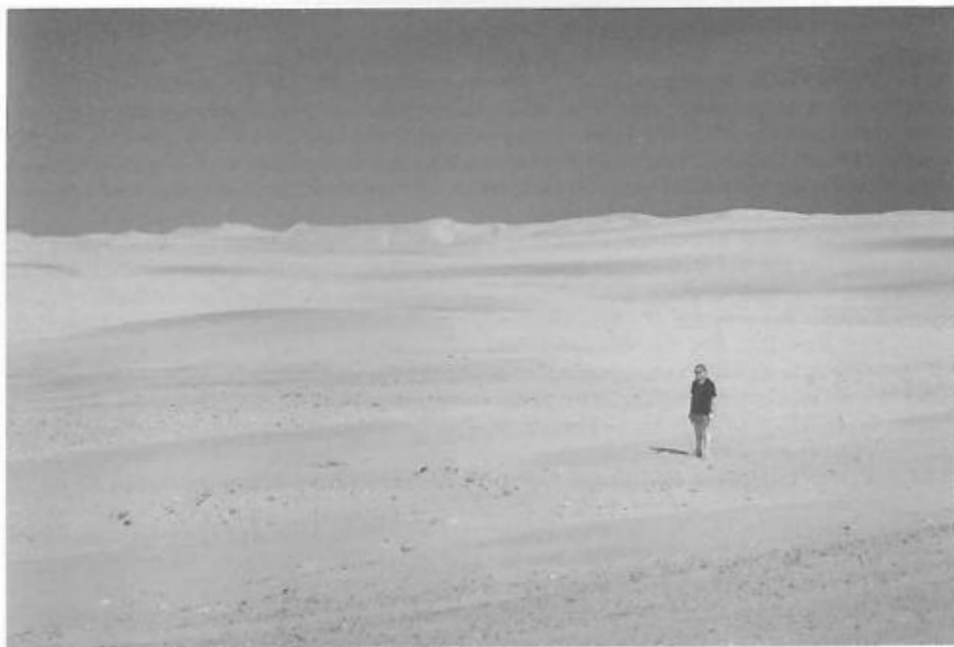


Plate 8: The author in the southern Namib dune sea, near Walvis Bay. (photograph by Laura Spawls).

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