

M. J. A. Werger (ed.)

Biogeography and ecology of Southern

Africa vol. 2 p. 663-1439.

1978

(Monographien Biologie, vol. 31)

Amsterdam, Junk

pp. 981-1040

### 31 Mammals\*

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\* Dedicated to Prof. Dr. F. W. Merkel on his retirement.

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## 31 Mammals

### 1. Introduction

The mammal fauna of the Ethiopian zoogeographic Region comprises approximately 840 species belonging to 52 families and 14 orders (Bigalke 1972). Its diversity compares only with that of Neotropica where Hershkowitz (1972) records 810 species, 50 families and 12 orders. Contemporary African mammals are the products of long periods of isolation with opportunities for evolution within the continent, and some opportunities for immigration from adjacent land masses (Cooke 1972). The resultant fauna has mixed affinities. Some fifteen families and two subfamilies are absolutely or virtually endemic. Ten are shared only with the Oriental Region. Seventeen families also occur in Eurasia (a few also in other regions) and eight are widely distributed.

Within sub-Saharan Africa a primary zoogeographic subdivision into a tropical forest zone – the West African subregion of Sclater (1896) and Chapin (1932) – and an East and South African subregion of savanna, semi-deserts and deserts is well-established. A more refined subdivision into several biotic zones is now widely used (Davis 1962; Fig. 1, and compare Chapter 7).

From Fig. 1 it can be seen that Africa south of 10°S is not a natural faunal region. Although it includes South West Cape, South West Arid and most of the Southern Savanna, it does not extend to the northern boundary of this zone, the 'Sclater line', which runs along the fringes of the Congo Basin in the northwest to the Tana watershed, a little north of the equator, in the northeast (Davis 1962). Conventionally, and with some zoogeographic justification, southern Africa is considered to lie south of the Cunene-Zambezi line.

Nonetheless southern Africa as defined in this book supports a fauna fairly representative of the Ethiopian Region as a whole (Table 1), with most of the families and about half the number of species. That this is so in spite of the exclusion of the lowland forest biome is due partly to the distribution of some forest species quite far out into the savanna zone (Kingdon 1971; Fig. 2). A few extend right down to the southern end of the continent, in relict forest patches along the eastern escarpment and on the coastal plain. Typically forest groups, notably Primates and duikers (Bovidae, Cephalophinae) are however poorly represented. Some which are listed for southern Africa barely enter the region, encroaching marginally along its northern boundary, for example Pongidae (great apes), Lorisidae (lorises) and the chevrotain (Tragulidae) and some species in a number of other families.

There are also other reasons for the representative character of the southern African fauna. The Southern Savanna is richer in mammals than the Northern. It includes a large area of grassland in South Africa which has some faunal peculiarities (Meester 1965) and adds variety. The South West Arid zone has a more distinctive fauna than the Somali and Sudanese Arid zones, which are left out, although it has some affinities with them. Arid zone mammals are therefore well represented in the region here considered. Included in southern Africa is the

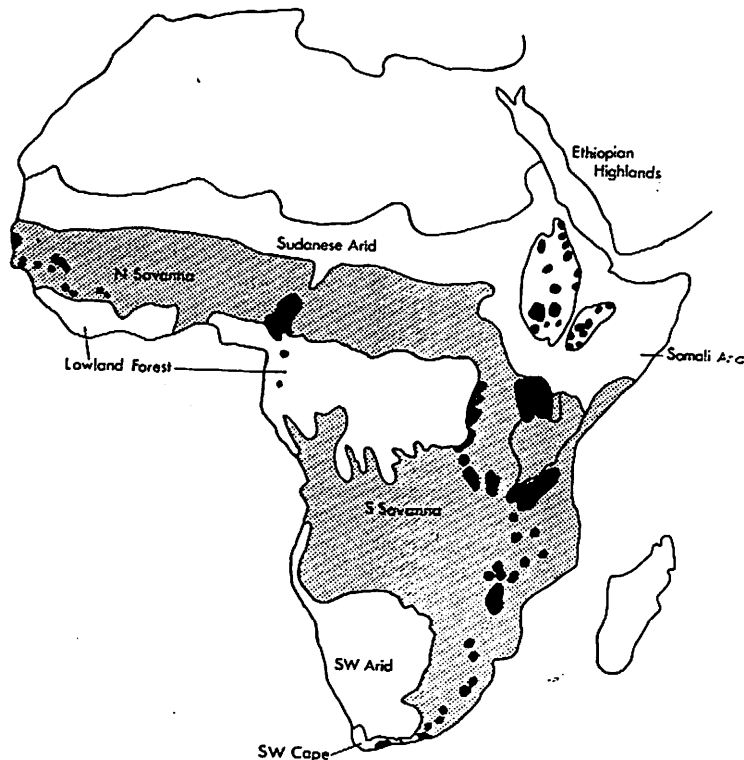


Fig. 1. The main biotic zones of Africa south of the Sahara. Major forest outliers, mainly montane, are shown in black (after Davis 1962).

South West Cape, floristically famous although not of great significance as a faunal zone.

## 2. Some faunal history

Cooke (1972) discusses African fossil mammals and the evolution of the contemporary fauna. He presents evidence suggesting long periods of isolation during which diversification and evolution took place in Africa, separated by a very few rather brief periods during which some faunal interchanges were possible. Exchanges of general significance are thought to have been limited to the late Oligocene, late Miocene and late Pliocene. Even then the fauna as a whole did not become deeply involved in the interchanges. Africa thus appears to have a long history of indigenous development for its wide variety of living mammals, among which several strata can be distinguished.

Ancient surviving groups that evolved from stocks believed to have been present in Africa during the Paleocene, before the continent was isolated from Eurasia, include Menotyphla (*Macroscelididae*\*), some Lipotyphla

Table 1. Orders, families and approximate numbers of species of mammals found in continental Ethiopian Africa (after Bigalke 1972) and in southern Africa as defined in this book.

	No. of species in	
	Africa	southern Africa
<b>LIPOTYPHILA</b>		
<i>Potamogalidae</i> (Otter Shrews)	3	1
<i>Chrysochloridae</i> (Golden Moles)	16	14
<i>Erinaceidae</i> (Hedgehogs)	6	1
<i>Soricidae</i> (Shrews)	56	215
<b>MENOTYPHILA</b>		
<i>Macroscelididae</i> (Elephant Shrews)	13	8
<b>CHIROPTERA</b>		
<i>Pteropodidae</i> (Fruit Bats)	26	17
<i>Rhinopomatidae</i> (Mouse-tailed Bats)	2	0
<i>Emballonuridae</i> (Sheath-tailed Bats)	7	4
<i>Nycteridae</i> (Slit-faced Bats)	11	7
<i>Megadermatidae</i> (Big-eared Bats)	2	1
<i>Rhinolophidae</i> (Horseshoe Bats)	17	10
<i>Hipposideridae</i> (Leaf-nosed Bats)	14	4
<i>Vespertilionidae</i> (Simple-nosed Bats)	64	34
<i>Molossidae</i> (Mastiff Bats)	31	16
<b>PRIMATES</b>		
<i>Lorissidae</i> (Pottos)	2	2
<i>Galagidae</i> (Galagos)	5	2
<i>Cercopithecidae</i> (Monkeys)	47	10
<i>Pongidae</i> (Apes)	3	2
<b>PHOLIDOTA</b>		
<i>Manidae</i> (Scaly Anteaters)	4	4
<b>LAGOMORPHA</b>		
<i>Leporidae</i> (Hares)	10	9
<b>RODENTIA</b>		
<i>Sciuridae</i> (Squirrels)	31	14
<i>Anomaluridae</i> (Scaly Tails)	7	2
<i>Pedetidae</i> (Springhare)	1	1
<b>Muridae</b>		
<i>Murinae</i>	79	40
<b>Cricetidae</b>		
<i>Dendromurinae</i>	14	8
<i>Otomyinae</i>	12	10
<i>Cricetinae</i>	1	1
<i>Gerbillinae</i>	33	10
<i>Lophiomyinae</i>	1	0
<i>Cricetomyinae</i>	5	4
<i>Petromyscinae</i>	3	2
<i>Microtinae</i>	1	0
<i>Rhizomyidae</i> (Bamboo Rats)	2	0
<i>Muscardinidae</i> (Dormice)	7	4
<i>Dipodidae</i> (Jerboas)	3	0
<i>Hystricidae</i> (Porcupines)	5	1
<i>Thryonomyidae</i> (Cane Rats)	2	2
<i>Petryomyidae</i> (Dassie Rat)	1	1
<i>Bathyergidae</i> (Mole Rats)	13	10

Elephants feed on grass and browse, bark, roots and fruit and are dependent on water. Laws et al. (1970) believes that the optimum diet should contain no more than 50 per cent grass. Populations living where browse has become scarce and grass is the predominant food have been shown by Laws et al. to be in poor condition, to mature late and reproduce at a low rate. The destructive influence of elephants on trees and shrubs has given cause for concern, especially in reserves, in many parts of Africa (e.g. Glover 1963, Buechner & Dawkins 1961, Van Wyk & Fairall 1969, Laws et al. 1970, Werger 1977). Population densities of up to 2.9 elephants/sq.km have been described from wet tropical environments (Laws et al. 1970). In dry savannas, densities of 0.3–0.4/sq.km are considered 'safe' (Glover 1963, Van Wyk & Fairall 1969). Elephants contribute substantially to some of the very high standing crop biomasses reported from tropical savannas. For example elephant and buffalo were the dominant species in Lake Manyara Park, Tanzania, where Watson & Turner (1965) determined a biomass of 21,870 kg/sq.km. The social organization is complex and well developed (see e.g. Sikes 1971).

Seasonal migrations were originally a feature of elephant behaviour. Sikes lists minerals from water or soil (licks), shade and shelter as environmental requirements. She believes that the diet must also contain bark, roots and fruit to be adequate. By trampling tall grass and thickets and breaking down trees, elephants make food available to many other animals. In dry areas, they dig for water and thereby provide many other species with drinking places. Their trampling also leads to the formation of pans (Darling 1960). They are thus very important members of terrestrial communities in Africa.

### 3.13 *Hyracoidea*

The Procaviidae are reckoned to the archaic element in the southern African fauna (Meester 1965). This group is confined to Africa with a small overspill to parts of the Middle East. It is known from Oligocene and Miocene deposits and the past distribution appears to be no different to that of the present. Some fossil forms were large but modern survivors are uniformly fairly small, with body lengths of up to about 60 cm and weighing up to 5.5 kg. The three genera are quite similar. *Procavia* and *Heterohyrax* are social, diurnal inhabitants of rock outcrops while *Dendrohyrax* is a genus of mainly arboreal and nocturnal, less gregarious forms. Dassies are herbivorous.

*Procavia* is a widely distributed genus. *P. capensis* is South African and is found as far north as Rhodesia. *P. welwitschii* has a limited occurrence in northwestern South West Africa and southwest Angola and *P. johnstoni* ranges from Malawi and Zambia to Kenya and northeast Zaïre. *Heterohyrax brucei* (yellow-spotted dassie) is known from the northeastern Transvaal to Egypt, with a westward extension into central Angola and is sympatric with *P. capensis* in many localities.

In Botswana, Smithers gained the impression that *H. brucei*, which is much lighter in weight, tended to be confined to large extensive ranges of koppies while *P. capensis* also inhabited small isolated koppies and rock outcrops, colonizing such habitats more actively. Turner & Watson (1965) found little competition for food in mixed colonies in Kenya. *Heterohyrax* fed closer to the rocks and high up in trees, helping to alert the far ranging *Procavia* to danger. *Procavia* does on occasion feed in shrubs and trees and has no difficulty in climbing them. Sale (1970)

has found the body temperature of *Procavia* to change by as much as 2.3°C during the day and shows how by huddling together, and at higher ambient temperatures by basking individually, the animals 'warm up' and presumably save a good deal of energy in consequence.

*Dendrohyrax dorsalis* is a West African forest dassie which enters Angola at its northernmost tip (Bothma 1966a). *D. arboreus* is an east and southeast African species known from Kenya to the forests of the eastern Cape Province. In South Africa it is considered a rather solitary tree dwelling forest species but it has been little studied there. Kingdon (1971) states that it lives colonially among rocks at high altitudes on Ruwenzoni where it is partly diurnal, while in the forests lower down the same mountain these dassies are arboreal, nocturnal and less gregarious.

All dassies seem to be capable of exploiting a wide range of plant foods (see e.g. Sale 1965). In South Africa, *P. capensis* appears to have increased considerably in numbers in some farming areas and is considered a pest in need of control. Millar (1971) shows that in spite of a long gestation period and fairly small mean litter size, this species has a far greater reproductive capacity than was previously thought. In favourable environments there is an increased incidence of large litters. A mean of 3.4 and about 10 per cent of females with 5 young have been observed in the best environment. Also a large percentage of 4–5 months old females attain sexual maturity precociously, there is little neonatal mortality and a high incidence of fertility. These findings explain how numbers may increase rapidly.

### 3.14 *Sirenia*

*Dugong dugong* (dugong) is a Pacific and Indian Ocean species found along the east coast of Africa from the Red Sea into the southern subtropics. They feed on marine angiosperms and are found near coastal sandbanks where food plants grow. Protection from rough seas also appears to be an important habitat factor (Kingdon 1971).

*Trichechus senegalensis* (African manatee) is mainly a fresh water form of West African lakes, rivers and estuaries. It is found as far south as Angola. Food plants include *Cynodocea*, *Polygonum*, the water hyacinth *Eichhornia crassipes*, and also land plants, such as the mangrove *Rhizophora*, within reach (Dorst & Dandelot 1970).

### 3.15 *Perissodactyla*

Both African species of the family Rhinocerotidae have suffered great reductions in numbers and range. *Diceros bicornis* is the more widespread of the two and originally occupied the widest range of open and closed savanna vegetation types, occurring in many parts of the South West Arid, Southern and Northern Savanna zones. Following extermination in a great many regions, surviving black rhino populations are discontinuous and scattered. The main present stronghold of the species is in Tanzania and Kenya, and perhaps also Zululand.

The black rhinoceros feeds on a wide spectrum of plants, although conventionally considered a browser. Trees and shrubs are indeed probably the most important bulk sources of food in most regions. In northern South West Africa

Joubert & Eloff (1971) found that rhino took three species of *Acacia* and *Terminalia prunioides* in large amounts. Smaller shrubs such as *Grewia* were also important and in the rainy season a bigger variety of plants, including several annual herbs, were eaten. In the Tarangire Reserve, Lamprey (1963) classified rhino as primarily browsers on shrubs and trees; herbs, sedges and especially grasses were also taken quite frequently. Schenkel & Schenkel-Hulliger (1969) similarly list shrubs and a few herbs as the chief foods and many subsidiary species in the Tsavo National Park East.

Cover is also an important habitat requirement intimately linked with food preferences. Joubert & Eloff report a clear preference for the densest vegetation in their study area, a tree and thorn shrub savanna, and Lamprey found his animals to prefer denser *Commiphora* woodland. Home range sizes in thickets were about 2 sq.km and in savanna 4-4.5 sq.km in the Hluhluwe Game Reserve (Hitchins 1969). Joubert & Eloff found them to vary from 30 to 40 sq.km in their very dry study area, the largest being in the most arid parts. The black rhinoceros is dependent on drinking water in most regions.

There appears to be some uncertainty over social organization. Authors such as Schenkel & Schenkel-Hulliger and Joubert & Eloff found no evidence of territoriality. However Owen-Smith (1975) regards the species as being territorial and, contrary to conventional beliefs, finds little difference between the social system of *Ceratotherium*, which he studied intensively, and *Diceros*. Only 3.4 per cent of white rhino groupings included more than three individuals against 1.7 per cent for black rhino which is usually said to be much more solitary. Black rhino subadults are however usually found solitarily while in white rhino associations of several individuals are relatively common.

*Ceratotherium simum*, the white or square-lipped rhinoceros, is the largest living purely grass eating mammal. Owen-Smith (1975) shows that some adult males (alpha males) occupy territories of average size of 1.65 sq.km which in the Umfolozi Game Reserve contain both tall and short grassland; this apparently supplies adequate food. There were also shady resting sites and temporary water pools used for drinking and wallowing. Subsidiary males share territories with the alpha males. Adult cows live in home ranges of about 10-15 sq.km, which overlap those of others and also overlap several territories. They are accompanied by a calf or one or more subadults. White rhinos feed entirely on grass and are water dependent. They were found in wooded grassland or bushveld in South Africa as far north as Rhodesia and South West Africa, and also west of the upper Nile in Uganda, parts of Zaïre and the Sudan. Surviving populations are localized in small areas of the original range.

Two species of Equidae are present in southern Africa and a third, *Equus quagga*, is extinct. *Equus burchelli* occurred historically in the Southern Savanna zone from the Orange River northwards to Abyssinia (see Ansell 1967 for detailed account of distribution). It has been exterminated in a number of localities and most large populations are now confined to reserves. Burchell's zebra occupy grasslands and open savanna. Lamprey (1963) found zebra to prefer grassland in the Tarangire reserve but they also made some use of open woodland. In parts of the Kruger Park, Smuts (1974) found that increasing thicket formation was probably confining zebra to diminishing areas of suitable open grazing. They are dependent on water and feed on a variety of grasses. Bell (1970) shows that the diet of Burchell's zebra in western Serengeti consists largely of grass stem and

sheath with the least proportion of leaf of the three grazing species which he compared. Zebra lead the grazing succession in the vegetation catena at the beginning of the dry season, opening up the herb layer by trampling and feeding on stemmy material and rendering it more suitable for wildebeest and other species that follow them. It would be wrong to regard the zebra as primarily a long grass grazer, however. Smuts (1972) and Smithers (1971) both remark on the selection of short grass areas. Presumably as in the case of many other grazers, short grass is preferred when available.

The mountain zebra, *E. zebra*, is a species of the South African escarpment, from southern Angola to the eastern Cape Province. Relict populations are conserved in a National Park and other reserves in the Cape Province. In South West Africa the subspecies *hartmannae* is fairly numerous by comparison, although the population has been drastically and rapidly reduced by man in recent years. Joubert (1973) estimates a total of approximately 7000 in the territory, while Joubert & Mostert (1975) report a total of 16,435 from questionnaires completed by farmers, without being able to indicate how accurate this figure is. Joubert considers that restriction to the extremely rugged mountainous habitat is probably accounted for by adaptation to this terrain (hard, quick growing hooves; relatively large heart capacity), vegetation relatively rich in grasses, availability of water and use of broken terrain for protection against weather extremes and man.

Both species of zebra live in coherent family groups of a stallion, with one or more mares and their foals, and in stallion groups. Territoriality has not been found to occur and the groups move freely over large home ranges (Klingel 1972).

### 3.16 *Artiodactyla*

#### 3.16.1 Suidae

Of the three living genera and species of pigs in Africa, two inhabit southern Africa. *Phacochoerus aethiopicus*, the warthog, occupies many vegetation types, except thick bush, in the Southern and Northern Savanna biotic zones and also tolerates fairly arid conditions in southwestern and northeastern Africa. It has been exterminated in most of South Africa. Hirst (1975) found the preferred habitat to be short-grass savanna. On a gradient from grass to woody plants, most warthog were found at the graminaceous end. Ferrar & Walker (1974) similarly report an association of warthog with open, grassy habitats. Hirst finds the preference logical for a small-statured grazer and rooter. Warthogs graze on many species of short annual and perennial grasses, taking leaf material in the rainy season and basal parts in the dry season (Field 1970, 1972). They also root to some extent for rhizomes and roots. Water is important for drinking and wallowing but they appear to be able to do without drinking for many months in southern Botswana (Smithers 1971). Aardvark burrows are used as night shelters, as nurseries and as refuges from danger; shallow hollows filled with cut grass also serve as sleeping places in some regions. Warthogs appear to be largely confined to home ranges of 0.6 sq.km-3.3 sq.km; these may overlap and Cumming (1970) suggests the term 'clan' for two or more groups which occupy largely overlapping home ranges and share holes. Matriarchal groups, solitary animals and all male groups are the most important types of association, according to this author. The bushpig *Potamochoerus porcus* prefers closed habitats and is typical of