

CHAPTER 8BATHYERGUS SUILLUS (SCHREBER) 1782

The first description of the Cape dune mole-rat (i.e. Bathyergus) was supplied by Schreber (1782), naming the animal Mus suillus. However, this was not the first bathyergid to be described from Southern Africa, for Pallas had already described the Cape mole-rat or "blesmol" (i.e. Georychus) in 1778.

Six years after Schreber's publication, Gmelin (1788) coined the name Mus maritimus for the identical animal while in the same year Thunberg also referred to this species as Marmota africana. Illiger (1811) erected the genus Bathyergus, for it was evident that the mole-rats could not be fitted into the same genus as the murids. In addition, Cuvier referred to the dune mole-rat as Orycterus in 1829. Consequently, in terms of priority rules concerning zoological nomenclature, it is evident that the generic name Bathyergus has priority over Orycterus and similarly the specific name suillus over maritimus.

The earliest mention of the dune mole-rat (according to Sclater, 1901, xi) was made by Abbé de la Caille who visited the Cape in 1750 to make certain astronomical observations. His journal (published in 1763) contains descriptions of a number of animals he encountered during his stay. According to Desmarest (1820, 323) this bathyergid was called the Taupe du Cap by de la Caille.

This early record of Bathyergus was followed by an account written by Masson in 1776 who also pointed out/...

out the existence of this animal. Masson, a gardener from the Royal Botanical Gardens at Kew, travelled extensively in South Africa between 1772 and 1776 in order to collect new plants for the improvement of the gardens (Sclater, 1901, xii).

Bathyergus was thus known to the early travellers, but the first satisfactory description of the species was transmitted to Professor Allamand of Leyden, Holland, by Col. Gordon who eventually commanded the Dutch forces at the Cape before the first occupation of the Cape by the English in 1795 (Sclater, 1901, II, 73). This description apparently appeared in the Dutch edition of de Buffon's work and was reprinted by de Buffon in his *Histoire Naturelle* (1774-1789). It has to be noted that no scientific name was attached to this early description of Bathyergus. Allamand called this bathyergid the *Taupe de dunes*, while de Buffon referred to it as *Grande taupe du Cap* (Desmarest 1820, 323).

In 1785 Sparrman also noted the occurrence of this bathyergid in the Cape Province and according to Sclater (1901, II, 71) ".... identified these animals with the African rat of Pennant". Furthermore, Thunberg in 1795 described this rodent as the "witte mol" from the vicinity of Cape Town; he also gave an account of certain behavioural aspects exhibited by these animals. The original edition of this account appeared in Swedish in 1788 which was translated into English in 1795. Many incidental accounts of the larger animals are given, which were afterwards separately published in the *Memoirs of the St. Petersburg Academy for 1811* (Sclater, 1901, xiii).



Desmarest (1820, 323) refers to these animals as *Bathyergue des Dunes* and he gives the vernacular name used by the colonists as "Land-Moll." The same vernacular name was also reported by Smuts (1832). Furthermore, Allamand recorded that the Hottentot word for *Bathyergus* was "kauwhowba", meaning, "the hippopotamus mole" (Sclater, 1901, II, 71).

The ship H.M.S. "Challenger" undertook a voyage round the world between the years 1872-1876 and Moseley (1879, 145), the naturalist on board, wrote an interesting account of the habitat and habits of *Bathyergus*, i.e. the "sand mole" as it was named vernacularly by him. He had the opportunity to study this animal in the vicinity of Cape Town during the "Challenger"'s sojourn in Simonstown.

Sclater (1901, 71), Shortridge (1934, 318) and Allen (1939, 425) all refer to *Bathyergus* as the sand mole while Shortridge also lists the vernacular name "duinmol." Roberts (1951, 380) refers to it as Cape dune mole-rat and "Kaapse duinmol" while Ellerman et.al. (1953, 228) speak of the Cape sand mole, mole-rat and "duinmol."

The type localities given by Schreber (1782) and Gmelin (1788) are defined rather vaguely in both cases as the Cape of Good Hope. Schreber however states that *Bathyergus* lives "... am Vorgebirge der guten Hoffnung in den Dünen oder Sandhügeln der Kuste...." (p. 715).

As here understood *Bathyergus suillus* is a monotypic species confined mainly to the south-western Cape Province where it occurs endemically in the soft soils of coastal sand dunes and alluvial soils of river and stream banks.

The following synonyms are often included under Bathyergus suillus: Mus suillus Schreber, Mus maritimus Gmelin, Marmota africana Thunberg and Georychus maritimus A. Smith. Furthermore, during the course of this work, it has become evident that the subspecies Bathyergus suillus intermedius Roberts, does not appear to warrant the subspecies rank accorded to it by Roberts (1926, 261) and has therefore been regarded as a synonym of the typical B. suillus (Schreber).

Bathyergus suillus (Schreber)

- Mus suillus Schreber, Die Säugethiere, IV: 715, pl. 204B, 1782. Type locality: Cape of Good Hope.
- Mus maritimus Gmelin, Linn. Syst. Nat. ed. 13, I, 140, 1788. Type locality: Cape of Good Hope.
- Marmota africana Thunberg, Resa uti Europa, Africa, Asia, etc. I: 293, 318. pl. I, 1788. Type locality: Cape of Good Hope.
- Bathyergus suillus intermedius Roberts, Ann. Transv. Mus., 11 : 261, 1926. Type locality: Klaver, Cape Province.
- Type specimen: ?
- Type locality: Defined vaguely as the Cape of Good Hope (Schreber, 1782, 715).

Distribution: (Fig. 8.1).

Occurs where-ever loose, unconsolidated coastal sand dunes are present in the south-western Cape Province/...



Province. Recorded in the vicinity of Klaver (the northern-most known locality at present). Travellers Rest (the farthest inland locality known: approximately 50 miles from the coast), Kompanjiesdrift and Lambert's Bay. From thence southwards via Citrusdal, Het Kruis, Eendekuil, Malmesbury and Kersfontein to Cape Town where it occurs abundantly on the Cape Flats and adjacent areas. Similarly, they are found along the coast between Cape Town and Knysna including localities such as Bredasdorp, Stilbaai and Belvedere.

Diagnostic characters:

A very large species, in fact the largest bathyergid occurring in Southern Africa, H.B.: M = 281 mm. C.B.: M = 62.9 mm. (♂♂). Claws of front feet adapted to digging. Upper incisors grooved, not extending backwards into pterygoid region. Angular process of mandible drawn backwards. Colour cinnamon to drab-grey with an ill-defined brown band mid-dorsally, flanks and ventral surfaces drab-grey.

Colour:

General colour cinnamon above, some specimens portraying a better defined brown mid-dorsal band. The lateral and ventral pelages are paler and the overall colour has been described as a drab-grey (Thomas and Schwann, 1904, 180) while Sclater (1901, II, 71) described it as a slaty-grey. In the original type-description by Schreber (1782) the colour was described as whitish above, "... mit Gelblichem überlaufen ....." and "... an den Seiten und unten weissgrau". There is no trace of sheen on the fur.

The fur is soft, thick, woolly. The individual hairs are slaty-grey for the greater part of their/...

their lengths, the tips being a light yellow or light brown. The base of the hair is a very dark grey, almost black. Because of wear the hair on the ventral surface is usually short, resulting in a grey ventral surface due to the basal grey portions of the hair showing through (Roberts, 1951, 380).

There is a buffy to white spot round each eye and the area around the muzzle and throat is also usually white. According to Roberts (op.cit.) these areas are usually albinistic in character.

Another feature pertaining to the colouration of these animals, is the fact that piebald varieties occur. Sclater (1901, II, 73) states that white varieties are not uncommon, but in the available study material used in the present work, I have come across one specimen only which could possibly be called white in a series of 163 skins.

The species is rather uniformly coloured. However, when ♂ and ♀ study skins from the different localities are compared it is found that the individuals (both sexes) from the more northernly situated localities (e.g. Klaver, Lambert's Bay, Kompanjiesdrift and Travellers Rest) are definitely paler in colour or of lighter hue. This pale colouration gradually darkens (i.e. the colour becomes "richer") as is illustrated by specimens from Cape Town and the Cape Peninsula. This tendency towards darker colouration is continued eastwards from Cape Town and very clearly seen in specimens from Zoetendalsvlei and Stilbaai which have a rich, lightbrown colour, while those from the farthest eastern locality i.e. Knysna, are fairly drab-grey i.e. dark. These differences in the colour of/...



of the dorsal pelage are only clear and illustrative when a number of specimens are compared simultaneously and collectively. When, for example, an individual study skin from Travellers Rest or Kompanjiesdrift is taken and placed between specimens from Cape Town, it is hardly possible to point out the single northern specimen. The same applies if a specimen from Knysna is placed among specimens from Cape Town, Het Kruis or Travellers Rest; again, it is virtually impossible to discern the single eastern specimen.

No difference could be detected in the available study skins between winter and summer pelages. This uniformity is possibly explained by the fact that the environment within the tunnels remains more or less constant during the entire year. As has been commented upon earlier in this work, no clear-cut evidence of post-mortem discolouration could be detected in the study specimens.

It has already been stated that the specimens obtained in the north-west (Travellers Rest and vicinity) are of a paler hue compared to specimens from Cape Town, which in turn are more lightly coloured than the rich-brown colour exhibited by specimens from Stilbaai. The reason for this gradual and scarcely perceptible colour change may be correlated with rainfall: it is possible that the darker individuals (e.g. from Knysna, which falls within a high rainfall zone, 32-40" per annum) reacts phenotypically to the greater degree of moisture being present, by becoming darker. Similarly, the specimens from the drier northwest (e.g. Lambert's Bay, Kompanjiesdrift, etc., rainfall 8-12" per annum) are of lighter colour.

Finally/...

Finally, it may be mentioned that the individual hairs of the dorsal pelage in B. suillus portrays the typical agouti type of hair which shows a certain distribution of yellow and black pigments. Genetically, this is controlled by a multiple allelomorph series, the base of the hair being black, with a subdistal yellow band with a black or brown tip. The yellow and brown portions may merge. This type of hair occurs in many wild types of animals of most species (especially in rodents) and may serve a function of protective colouration (Hovanitz, 1953, 172).

Size:      Adult ♂♂:

H.B.	235-330 mm., M = 281 mm.
T.	18-70 mm., M = 49 mm., (17.4% of H.B.)
H.F.	41-55 mm., M = 51 mm., (18.1% of H.B.)
C.B.	53.5-74.4 mm., M = 62.9 mm.
B.C.	18.7-25.2 mm., M = 21.3 mm., (13.8% of C.B.)
I.W.	9.2-11.5 mm., M = 10.2 mm., (16.2% of C.B.)
Z.W.	34.0-50.3 mm., M = 40.5 mm., (64.3% of C.B.)
M.W.	10.6-15.1 mm., M = 13.3 mm., (21.1% of C.B.)
U.T.R.	9.3-11.1 mm., M = 10.3 mm., (16.3% of C.B.)
L.J.	30.9-45.7 mm., M = 37.8 mm., (60.0% of C.B.)
L.T.R.	10.4-12.8 mm., M = 10.9 mm., (17.3% of C.B.)

Adult ♀♀:

H.B.	204-300 mm., M = 251 mm.
T.	27-61 mm., M = 45 mm., (17.9 % of H.B.)
H.F.	30-52 mm., M = 46 mm., (18.3% of H.B.)
C.B.	45.5-66.9 mm., M = 55.6 mm.
B.C.	19.7-22.3 mm., M = 20.3 mm., (36.5% of C.B.)
I.W.	9.3-11.8 mm., M = 10.1 mm., (18.1% of C.B.)
Z.W.	22.2-45.5 mm., M = 36.5 mm., (65.6% of C.B.)

M.W./...



M.W.	10.6-14.4 mm., M = 12.0 mm., (21.5% of C.B.)
U.T.R.	8.1-10.2 mm., M = 9.7 mm., (17.4% of C.B.)
L.J.	27.8-40.8 mm., M = 33.7 mm., (60.6% of C.B.)
L.T.R.	9.9-12.6 mm., M = 11.0 mm., (19.7% of C.B.)

These tables (above) are based on adult ♂♂ and ♀♀ collected over the entire distributional range of B. suillus.

A glance at the figures given above, will immediately convey the fact that those given of H.B., T. and H.F. for both sexes are rather unreliable. These were taken at their face value from the different labels attached to the available study skins. The observed minimum-maximum size range is often exceedingly large (e.g. the size variation in the tail lengths) - an individual with tail length of 18 mm. was classified as an adult specimen as was the individual with a tail length of 70 mm. The skull measurements (taken by myself) do not show this enormous amount of variation. The differences shown in external measurements are well explained by the following quotation from Doult (1961, 293) who states that differences in external measurements "... are the result of different measuring techniques on the part of collectors. It is apparent that external measurements should be handled with extreme caution. In fact, the external measurements made by one collector, using a slightly different technique, provided differences which were statistically highly significant and if we had not been aware of the reason for this difference we would have had what anyone would call a good subspecies from this locality. The skull measurements, if they all were made by one person should be strictly comparable,

but/...

but if they were made by two or more individuals they may also be open to question, especially in statistical studies, which do draw very fine lines."

In the available study material, sexual dimorphism is apparent. When 13 ♂♂ and 13 ♀♀ from Travellers Rest are compared in respect of condylo-basal length, ♂♂ ( $M = 67.3 \pm 4.845$  mm.) are very significantly larger than the ♀♀ ( $M = 55.1 \pm 2.905$  mm.) at the 0.10% level ( $t = 7.5$ , 24 degrees of freedom,  $P = \ll 0.001$ ).

Similarly, the condylo-basal length of 14 ♂♂ and 9 ♀♀ were taken at random, i.e. localities were not taken into consideration. In this case, the ♂♂ ( $M = 62.8 \pm 4.360$  mm.) are again significantly larger than the ♀♀ ( $M = 57.1 \pm 3.415$  mm.) at the 1.0% level ( $t = 4.73$ , 21 degrees of freedom,  $P = \ll 0.01\%$ ).

All localities which have yielded sufficient material for study, show that the ♂♂ are constantly larger than the ♀♀.

With the kind permission of the authorities concerned, the following information concerning weight attained by these animals was derived from labels attached to study skins housed in the Plauge Research laboratories of the South African Institute for Medical Research, Johannesburg. A mature ♂ and ♀ from Tulbaghkloof weighed 495 and 386 gms. respectively when these animals were trapped. Another ♀ from the same locality weighed 425 gms., while still another ♀ from a nearby locality (Drostdy, Tulbagh) has a recorded weight of 512 gms.

Skull/...



### Skull and dentition

For a full description of the skull of Bathyergus, see Chapter 4. Diagnostically the skull of B. suillus is rugged and robust with well developed sagittal and nuchal crests, especially in old ♂♂. Upper incisors grooved, not extending beyond the first upper cheek teeth. Skull rather flat and broad, conspicuously larger than skulls of B. janetta. The angular process of the mandible is drawn backwards to a considerable extent.

### Discussion

As far as the synonymy is concerned, the following aspects may briefly be dealt with. As has been stated above, Bathyergus suillus (Schreber) was first described as Mus suillus in 1782. Some synonymy lists give this date as 1792. This has led to a certain amount of confusion in the past resulting in B. suillus still being referred to as B. maritimus as recently as 1958 (e.g. Eloff, 1958). It appears that the specific section of Schreber's work in which the dune mole-rat was described, appeared in 1782, while the actual volume (i.e. volume IV) was only completed in 1792. In 1788 Gmelin described the same animal as Mus maritimus and consequently some misunderstanding of the correct name had arisen. Sclater (1901) therefore refers to B. maritimus and lists Gmelin (1788) and Schreber (1792), in that order, in his synonymy list. For a full explanation on the dates of publication of Schreber's work, the reader is referred to Sherborn (1891, 587).

Thunberg also described this animal as Marmota africana in 1788. This narrative, a description of his travels in Europe, Africa and Asia between 1770

and/...

and 1779, was translated into English in 1795. The genus and species was changed by Lamarck (1796, 384) in a publication describing Thunberg's voyage to Japan, etc. The new designation was Arctomis (sic) africana and in the publications of the St. Petersburg Academy (1811) the spelling adhered to by Thunberg was Arctomys africana.

Ellerman et.al. (1953, 228) have tentatively regarded all forms of Bathyergus as conspecific. This procedure does not seem to be justified for Bathyergus suillus is decidedly a different species compared to the much smaller B. janetta. In fact, 13 years earlier, Ellerman (1940, 84), commented as follows: "Two well marked species are known, the "giant" suillus, and the moderate-sized janetta, which appears to have a less heavily ridged skull."

Apart from size and certain features of the skull there seems to be an absolute separation between suillus and janetta in all the material seen. This applies especially to colour. Roberts (1951, 380) has retained both species: suillus with two subspecies, (B.s. suillus, B.s. intermedius) and B. janetta with three subspecies: B.j.janetta, B.j.inselbergensis and B.j.plowesi). As far as suillus is concerned, I am inclined to agree with Ellerman et.al. (1953, 228) in treating B.s.suillus and B.s.intermedius as synonyms while disagreeing with them in their interpretation of suillus and janetta as conspecific forms.

It is thus clear that Roberts adhered to a polytypic interpretation of B.suillus. According to Roberts, the reason for separating suillus suillus from s. intermedius rests largely on two aspects:

a)/...



- a) The smaller overall size of B.s. intermedius
- b) The fact that all six specimens of s. intermedius which are known to science at the present portray a conspicuous white spot on the forehead where as ".... those from the South usually have only a small spot in half the specimens." (Roberts, 1951, 381).

This latter statement has prompted me to investigate the occurrence of white spots on the foreheads in populations of B.s. suillus.

A total of 157 study skins were available for comparison, ranging from Knysna to Lambert's Bay, consisting of 62 ♂♂ and 63 ♀♀ as well as 32 unsexed specimens. The question whether a white frontal spot is to be classified as large (conspicuous), medium-sized or small is relative and will eventually depend on the interpretation of the investigator. For the purposes of this work, the white spots were divided into three categories: large, medium-sized and small.

In the study skins, the ♂♂ and ♀♀ occurred more or less in a 1:1 ratio. In the case of the ♂♂, 48.4%, (30 individuals) and in the case of the ♀♀ 47.6% (30 individuals) showed no sign of spotting at all. Interpreting Robert's remark rather broadly i.e. that the forms from the south only have a small spot in half the specimens, this conclusion then points to confirmation of the statement. It may well be that Roberts interpreted all the spots seen in the southern forms as small, while in actual fact many specimens have white patches covering a considerable area on their foreheads which can hardly be classified as small. Theoretically and in practice, it could be possible to obtain six study skins consecutively from/...

from a certain locality, which would all show large frontal spots. Such localities could possibly include Eendekuil, Citrusdal and Het Kruis, which have yielded study skins with large and conspicuous patches.

Therefore, I am inclined to disagree with Roberts in using the absence or presence of the frontal spots as a criterium for subspecific distinction whenever it crops up a number of times in all members of a sample (e.g. at Klaver).

The first criterium, i.e. its smaller size, is a far more convincing one for separating B. suillus suillus from B.s.intermedius. This, however, is not statistically justified, as will be shown in the discussion below.

Although the type locality for B. suillus is defined rather vaguely as the Cape of Good Hope, and that it lives "... am Vorgebirge ...." in the coastal dunes and soft sand hills, it is probable that Cape Town or a locality within its immediate surroundings was implied in the description of the type locality.

The skins available for study from Cape Town, the Cape Peninsula and adjacent Cape Flats could not be separated on the basis of colour. For macroscopic pelage colour comparisons, the males, females and unsexed specimens were compared simultaneously whenever they were collected at the same locality. In view of the fact that these specimens from in and near Cape Town showed no appreciable difference in colour the adult male and female specimens from Maitland, Cape Town and Strandfontein were treated together and the following statistical parameters for C.B. length and L.J. length were obtained, as shown in Table 8.1.

Table/...



Table 8.1. C.B. length and L.J. length in B. suillus from Maitland, Cape Town and Strandfontein.

C.B.		L.J.	
♂♂	53.5-71.4 mm. M= 64.8 ± 6.480 mm. N= 6, C.V.= 10.5%	♂♂	30.9-41.4 mm. M= 37.8 ± 4.083 mm, N= 5, C.V. = 10.8%
♀♀	52.9-66.9 mm. M= 59.5 ± 4.993 mm. N= 6, C.V. 8.3%	♀♀	32.9-40.8 mm. M= 36.0 ± 3.323 mm. N= 5, C.V. = 9.2%

In both ♂♂ samples the C.V. values are slightly above the usually accepted 10% in the case of mammals. This may be due to the fact that these samples are not entirely homogeneous as far as ages of the different individuals are concerned. The values obtained in the case of the ♀♀ however, indicate that this procedure of lumping together was justified and that these specimens form a homogeneous sample.

Apart from Cape Town and vicinity, Bathyergus suillus extends eastwards to Knysna. Sclater (1901, II, 73) states that their distribution may extend as far east as Bathurst in the eastern Cape Province. However, the farthest eastern locality from which study skins are available is Knysna although Roberts (1951, xxvii), states Bathyergus to occur as far east as Plettenberg Bay along the coastal sand dunes. The nearest locality to Cape Town and Pensinsula from whence study skins are available is Zoetendalsvlei. Again on the basis of colour, these specimens are virtually indistinguishable from the Cape individuals, although of richer colour hue. The measurements of the skulls fall well within the variation range exhibited by the Cape Town specimens.

Similarly/...

Similarly, specimens collected at Bredasdorp and Stilbaai compare very well with those from Zoetendalsvlei on the basis of colour.

Nine study skins were available for study from Knysna and it has already been mentioned that the pelage of these specimens are a shade darker than other specimens from any other locality. The sample for the ♀♀ was too small for statistical manipulation, but this could be done in the case of the C.B. length and L.J. length in the ♂♂. The former value varied between 56.2-71.2 mm.,  $M=63.3 \pm 6.768$  mm.,  $N = 5$ , while the latter parameter varied between 34.0-43.5 mm.,  $M = 38.2 \pm 3.852$  mm.,  $N = 5$  (Fig. 8.2). The direct graphical comparison with specimens from Cape Town makes it clear that there is no ground whatsoever for not treating the eastern forms conspecifically with specimens obtained in close proximity of the implied type locality.

The distribution of Bathyergus suillus extends not only to the east of Cape Town but to the north as well. Roberts (1951, 380) states that the specimens of the south (i.e. Cape Town and vicinity), are slightly larger compared to specimens occurring north of the Berg River and south of the Olifants River which are slightly smaller but still with the upper and lower tooth row measurements of "... the typical subspecies, (i.e. suillus) namely 10.5 - 11.7mm." Furthermore, they tend towards the "smaller subspecies" which occurs to the north of the Olifants River (i.e. Roberts' B.s.intermedius).

Table/...



Table 8.2. The slightly smaller size of B.suilles from the area north of the Berg River and south of the Olifants River.

	U.T.R.		L.T.R.	
	♂♂	♀♀	♂♂	♀♀
Area south of Berg River: Cape Town, Cape Peninsula, Malmesbury, Kersfontein)	M=10.2 mm. (N=8)	M= 9.8 mm. (N=8)	M= 11.5 mm. (N=6)	M=11.4mm. (N=6)
Area north of Berg River and south of Olifants River: (Het Kruis, Eendekuil, Kompanjiesdrift, Lambert's Bay)	M=10.1 mm. (N=9)	M= 9.6 mm. (N=7)	M= 11.0 mm. (N=8)	M=10.5mm. (N=9)

In the statement by Roberts quoted above, he did not indicate whether he considered ♂♂ and ♀♀ together or whether the values he gave for the southern forms were based on separate sexes or unsexed animals. The important point is however, that he was correct in emphasizing the slightly smaller size of the animals occurring to the north of Cape Town, between the Berg and Olifants Rivers, as can be seen in Table 8.2.

In the case of 12 ♂♂ collected at Eendekuil, Het Kruis, Kompanjiesdrift and Lambert's Bay the average C.B. length was 62.2 mm, compared to 64.8 mm. in the Cape forms.

Obviously, there is not much difference between samples of the different populations which occur at the different localities. It seems to be a

safe/...

safe procedure therefore, to treat all these forms (occurring to the north of Cape Town) as conspecific as Roberts and others have done. On lumping the specimens together, 12 ♂♂ and 11 ♀♀ were available for comparison. That this step was justified is shown by the C.V. values of 7.2% and 7.6% for the C.B. length and L.J. length respectively in the ♂♂. Similar data for the ♀♀ gave a C.V. value of 5.3% and 6.5% respectively. It is furthermore evident that there is a considerable overlap of this material with that collected at Knysna and vicinity.

The area east of the Olifants River is also represented by a number of study skins, especially from Tulbagh and vicinity, Citrusdal and Travellers Rest near Clanwilliam. Once again, the colour of the pelage is exceedingly uniform although there is a possibility that the Travellers Rest specimens are a shade lighter than those trapped at Kompanjiesdrift. The lengths of the L.J. and C.B. for specimens from Travellers Rest, are shown in Table 8.3.

Table 8.3. C.B. length and L.J. length in B. suillus from Travellers Rest.

C.B.	L.J.
♂♂ M = 63.7 ± 4.485 mm. N = 12, C.V. = 7.0%	♂♂ M = 38.5 ± 3.661 mm. N = 17, C.V. = 9.5%
♀♀ M = 55.1 ± 2.905 mm. N = 13, C.V. = 5.2%	♀♀ M = 34.1 ± 1.910 mm. N = 14, C.V. = 5.6%

It is clear that there is a considerable degree of overlap between the specimens from Travellers Rest and those lumped together from Eendekuil, Kompanjiesdrift and Lambert's Bay.

Up/...



Up to this point, the results obtained in the study of this species agrees well with the conclusions reached by Roberts (1951). In addition, a number of statistical parameters have been added. However, the inclusion of Bathyergus suillus intermedius Roberts from Klaver in the typical B. suillus requires some explanation (Fig. 8.3).

This supposed subspecies was described by Roberts (1926, 261) as very "... similar to B. suillus of Cape Town, but with the white mark on the forehead much larger and more persistent, and the dimensions smaller, intermediate between the typical form and B. janetta Thomas and Schwann from Port Nolloth". In colour, these specimens are similar to the typical southern form (Roberts 1951, 381) excepting that "... all of the six specimens from Klaver have a conspicuous white spot, whereas those from the south usually have only a small spot in half the specimens." Furthermore, Roberts has stated that they are smaller in size compared to the southern suillus suillus.

The length of the head and body in the type specimen (T.M. 2171, type locality, Klaver, ♂) was given as 258 mm. while a ♀ specimen measured 230 mm. The corresponding values for 40 ♂♂ and 50 ♀♀ collected at localities south of Klaver were  $M = 280.7$  mm. and  $M = 250.8$  mm. respectively.

As far as the white frontal spots are concerned, this has already been commented upon above. It is possible that the fact that all six specimens show this tendency could be ascribed to coincidence and that on more intensive trapping in the area/...

area, specimens from this locality could be obtained which portray no frontal spots. The sample ( $N = 6$ ) is too small to attach much value to the importance of this characteristic.

These animals were all collected between 22/9/17 and 2/10/17 by Roberts and Adendorff on the sandy flats at Klaver north of the Olifants River.

The sample consists of six specimens, an adult ♂, five ♀♀ (one old, three adult and one immature). No reliable statistical parameters could be obtained from the four adult female specimens due to the sample being too small. As is the case in specimens from other localities, sexual dimorphism is also evident here so that the ♂ and ♀ specimens could not be considered simultaneously. In this instance, a value for the standard deviation has been inferred from the mean of standard deviations in samples where calculation of this parameter is possible. For the C.B. length and L.J. measurements, the mean S.D. in two samples (from Kompanjiesdrift and Travellers Rest) are given in Table 8.4.

Table 8.4. Measurements of C.B. length and L.J. length in B. suillus from Kompanjiesdrift and Travellers Rest.

	C.B.	L.J.
Kompan- jiesdrift	♀♀ $M=54.8 \pm 3.112\text{mm.}$ ( $N=8$ )	♀♀ $M=32.8 \pm 2.383 \text{ mm.}$ ( $N=7$ )
Travellers Rest	♀♀ $M=55.1 \pm 2.905\text{mm.}$ ( $N = 13$ )	♀♀ $M=34.1 \pm 1.910 \text{ mm.}$ ( $N = 14$ )
	Mean S.D. = 3.008 mm.	Mean S.D. = 2.147 mm.

These/...



These samples were chosen, for they are localities from which a fair amount of material is available for study and due to the fact that these two localities are the closest geographically speaking to the Klaver locality. It is further necessary to assume that sample means for the area represented by these small samples are representative of the populations from which they are drawn.

In comparing the C.B. length and L.J. measurements of the ♀♀ from Klaver and those from Travellers Rest/Kompanjiesdrift, the ♀♀ from the latter localities have  $M = 54.9 \pm 3.008$  mm. ( $N = 21$ ) for C.B. length compared to  $M = 52.4 \pm 3.008$  mm. ( $N = 4$ ) for the same measurement in the ♀♀ from Klaver. A C.D. value of 0.415 was obtained from these figures, indicating a J.N.O. of far less than 75%, a figure not significant for subspecific recognition.

Similarly, the differences between the L.J. measurements (four ♀♀ from Klaver,  $M = 30.5 \pm 2.147$  mm., 21 ♀♀ from Travellers Rest/Kompanjiesdrift,  $M = 33.6 \pm 2.147$  mm.) gave a C.D. value of 0.721 which again is far below the value of 1.28 (i.e. 90% J.N.O.), the conventional level for subspecific recognition. In this case, the J.N.O. value is approximately 77%.

In a similar fashion, the four ♀♀ from Klaver were compared independantly with the ♀♀ from Travellers Rest and the ♀♀ from Kompanjiesdrift. In the former comparison, a C.D. value of 0.45 (i.e. far below 75% J.N.O) and in the latter comparison a C.D. value of 0.39 (i.e. even less than the former value) was attained.

It/...

It is clear that there is a great degree of overlap in all cases. Based on these figures, it is therefore proposed in the present work that the subspecific rank of intermedius is not valid and that the species suillus be interpreted as monotypic.

Finally, it is evident that the possibility of a size cline exists in the available study material. It has been attempted above to prove that there seems to be no valid reason to credit the Klaver specimens with subspecific rank. If they are thus accepted as members of the nominate race the following observations become evident when C.B. length and L.J. length ( $\frac{00}{++}$ ) is considered: the smallest individuals occur at Klaver and the size increases gradually in a southerly direction via Kompanjiesdrift, until Cape Town and vicinity is reached where the largest specimens are encountered (See Table 8.5). This size gradually decreases when the Knysna locality is approached. The specimens from Travellers Rest however, (south east of Klaver) show a slight increase in size.

Table 8.5. Size variation in C.B. length in B. suillus.

	C.B.	L.J.
Klaver M =	52.4 mm. (N=4)	M = 30.5 mm. (N=4)
Kompanjiesdrift	54.8 mm. (N=8)	32.8 mm. (N=7)
Cape Town and vicinity	59.5 mm. (N=6)	36.0 mm. (N=5)
Knysna and vicinity	55.8 mm. (N=3)	33.7 mm. (N=3)
Travellers Rest	55.1 mm. (N=13)	34.1 mm. (N=14)



Biological:

All the known localities at which B. suillus have been collected are below 1,000' above sea-level. This is understandable in view of the fact that these animals are virtually confined to the soft sands and sand dunes adjoining the coast. This species is apparently not encountered on mountains and/or mountain slopes, where rocky substrata prevail.

Botanically speaking, the animals range through the following types of vegetation: Karroo succulent steppe, Cape macchia and temperate and subtropical evergreen forests (Keay, 1959). It is doubtful whether this geographical distribution points to any correlation, for it is unlikely that the animals live on the dominant plants on which the different vegetation maps are based. Virtually nothing is known about the food and feeding habits of Bathyergus suillus.

Furthermore, there seems to be no correlation with rainfall in the range where these animals occur. It seems that they do not occur at places with a rainfall less than 100 mm. (0-4") but do occur at various rainfall intensities up to 801-900 mm. (32-40") per annum, e.g. in the vicinity of Knysna and Belvedere.

It appears that the animals disperse via soft alluvial soils along the river beds. An interesting example of this kind of dispersal is seen in the case of the Travellers Rest specimens. These animals must have migrated beyond Klaver in a southernly direction along the Olifants river and then turned eastwards along the Doring river, (a tributary of the Olifants river) which flows between the Gif-  
berge/...

berge and Nardouw mountains. This river forms a wide flat sandy valley between the Bokkeveld mountains to the north and the Pakhuisberge to the south. Again, a tributary of the Doring River is the Brandewyn river which flows past Travellers Rest. At Travellers Rest the elevation rises slightly above 1,000'. Similarly, the animals may have migrated down the Olifants river to Citrual but not further south down that river, for southwards the valley narrows down, squashed between the Kouebokkeveld mountains and the Olifantsriver mountains, both mountains giving rise to the north flowing Olifants River.

In a similar fashion, they may have spread from Lambert's Bay and Kompanjiesdrift via the Verlorenvlei river and Kruis River to Eendekuil and vicinity. Furthermore, they may have penetrated southwards via the Berg river up to Franschhoek, where Roberts has reported them (Roberts, 1951, 380). No specimens from this locality is available in the present study collection. The Cape and Cape Peninsula seems to be a natural cul-de-sac for these animals, and their eastward distribution could have occurred via the Klein Berg river, past Wolseley, and down the Breede River, extending its range as far eastwards as Knysna and, according to Roberts (1951, xxvii), Plettenberg Bay.

Additional biological information pertaining to B. suillus has been given in Chapter 6 and will not be repeated here. Attention may however be drawn to the known parasites of this species, which include the following:

Platyhelminthes: gen.et sp. indet.

Nemathelminthes/...



Nemathelminthes: Trichuris sp., Heterakis  
macrospiculum, Libyostrongylus bathyergi, Longistriata  
bathyergi. Arthropoda: Ixodes alluaudi,  
Haemaphysalis leachii mühsami, Proenderleinellus  
lawrensis and Cryptoctenopsyllus ingens (de Graaff,  
 1964, 122).

Phylogenetic:

According to Roberts (1951, 343) the Bathyergidae contain a large number of species "seemingly indicating a modern origin, with the exception perhaps of Bathyergus." The animals may have invaded their present geographical localities from the north-west and have migrated, via the soft soils of the water courses down to the Cape and eastwards to Knysna via the Breede River. Probably an evolved species, seen in terms of its large size.

List of localities:

Belville, 4 (TM), Belvedere, Knysna, 5 (TM), Bredasdorp, 1 (TM), Cape Flats, 1 (SA), Cape Town, 2 (SA), Citrusdal, 4 (KM, TM), De Hoop, 1 (MM), Drostdy, Tulbagh, 1 (ME), Eendekuil, 3 (TM), Elsies River, 1 (SA), Goodwood, 1 (SA), Greenpoint, 1 (KM), Kersfontein, 1 (KM), Koeberg, 2 (SA), Hazendal, 1 (SA), Het Kruis, 10 (KM), Kalk Bay, 1 (SA), Klaver, 6 (TM), Knysna, 10 (SA, TM), Kompanjiesdrift, 48 (KM, NM, EM, PE, MM), Lambert's Bay, 5 (TM, MM), Maitland, 4 (TM), Malmesbury, 1 (TM), Mowbray, 1 (SA), Rondebosch, 1 (SA), Stilbaai, 3 (TM), Strandfontein, 2 (SA), Travellers Rest, 38 (NM, PE, KM, AM, EM), Tulbaghkloof, 1 (ME), Vogelsvlei, Gouda, 3 (ME), Wynberg, 1 (SA), Zoetendalsvlei, 2 (TM).