

THE USE OF MICROFAUNAL REMAINS AS HABITAT INDICATORS IN THE NAMIB

C. K. BRAIN

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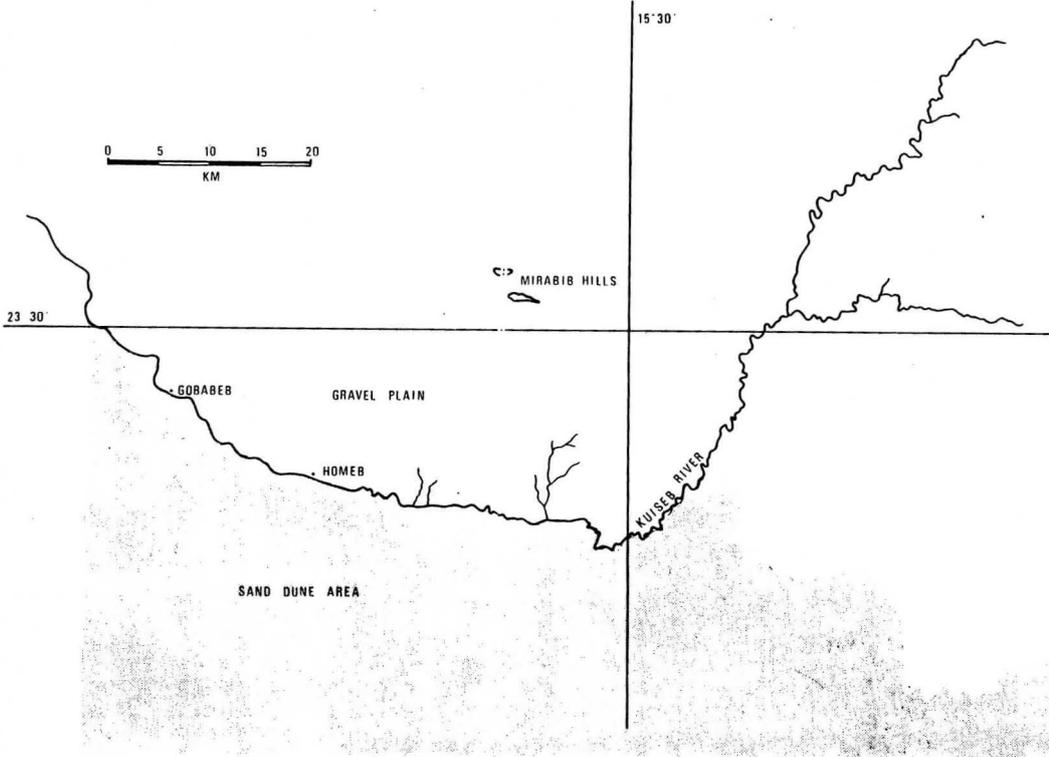
It is well known that owls regurgitate pellets containing the skeletons and other indigestible parts of their prey. These pellets may form a substantial accumulation of microfaunal remains below the owls' habitual roosts and their value from a scientific point of view has long been appreciated. The remains can be used in regional faunal surveys as they come from the range of crepuscular and nocturnal animals available to the owls; they are also of value in palaeontology, where fossilized owl pellet remains in caves are often of great antiquity. Their significance has been emphasized by Dr D. H. S. Davis in his paper 'The Barn Owl's contribution to ecology and palaeoecology' (1959). An invaluable key to the identification of remains likely to be found in owl pellets from southern Africa has also been produced by Coetzee (1972).

The study of owl pellets in the Namib has already provided interesting results. A collection of pellets from Sossus Vlei was studied by Bauer & Niethammer (1959) who, on the basis of the skeletal remains, described a new subspecies of golden mole as *Eremitalpa granti namibensis*. Shortly afterwards Meester

(1962) described some owl pellet remains collected by the present writer on the Kuiseb River near Gobabeb. In these he found *Eremitalpa* remains similar to those from Sossus Vlei. More recently, Nel (1969) analysed the faunal content of a large sample of pellets from Sossus Vlei. He showed that, on the basis of individual animals forming the owl's prey, mammals constituted 93,2%, reptiles 6,8% while the bird and insect components were negligible. Among the mammals, two *Gerbillus* species accounted for 74,1% while 22,7% was contributed by golden moles (*Eremitalpa granti*).

Finally, in a paper dealing with owl pellets from a wide variety of southern African localities, Vernon (1972) listed the faunal content of pellets from Mirabib, an isolated hill in the Central Namib. The pellets had been collected in 1969 by Dr R. A. C. Jensen and were found to contain 61 prey items. These were made up of rodents (46%), reptiles (49%), elephant shrews (3%), birds (2%) while sun spiders (Solifugae) were also recorded.

When we consider the range of animals occurring in owl pellets, it is clear that some of these can be used



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Fig. 1. Map of the Central Namib to show the position of the Mirabib relative to the sand area south of the Kuiseb River.

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Fig. 2. The Mirabib hills looking north. The arrows indicate the position of the rock shelter (left) and owl roost fissure (right).



Fig. 3. An aerial view of the Kuiseb River bed at Gobabeb (arrow) showing the abrupt transition from dunes south of the river to gravel plains in the north.

as sensitive indicators of the habitat in which they lived. In the Namib, for instance, the golden mole (*Eremitalpa*) is restricted to areas of loose sand; it is totally absent from the hard gravelly plains found in some areas. Thus the presence of *Eremitalpa* in owl pellets indicates decisively that sandy areas were within the hunting range of the owls which produced the pellets. Some of the other animals involved also

It seems that microfaunal remains could provide the answer and, in this context, the Mirabib rock shelter is of special significance.

Mirabib is situated in the open gravel plain NW. of Gobabeb, as shown on the accompanying map. It is 24 km from the closest point on the Kuiseb River and is thus the same distance from the nearest sand dunes. A rock shelter on the hill is being inten-



Fig. 4. The Mirabib owl roost fissure. Owl pellets were found littering the floor.

show definable habitat preferences, though these are likely to be more subtle and require further study.

The Kuiseb River bed forms a striking boundary between the Namib sand sea to the south and the gravel plains to the north. From the palaeoecological point of view it would be very interesting to know whether this situation has been stable in the past. Did the Kuiseb River act as an effective barrier to the sand movement from the south in Pleistocene times?

sively studied from the archaeological point of view by Dr B. Sandelowsky, whose report appears in this issue. As shown in the photograph, her trial trench is situated immediately below an owl roost which has apparently been used for a considerable time. Microfaunal remains from the owls' pellets are abundant throughout the floor deposit and occur in layers which will be datable by radiocarbon. Once Dr Sandelowsky has defined and dated the various strati-

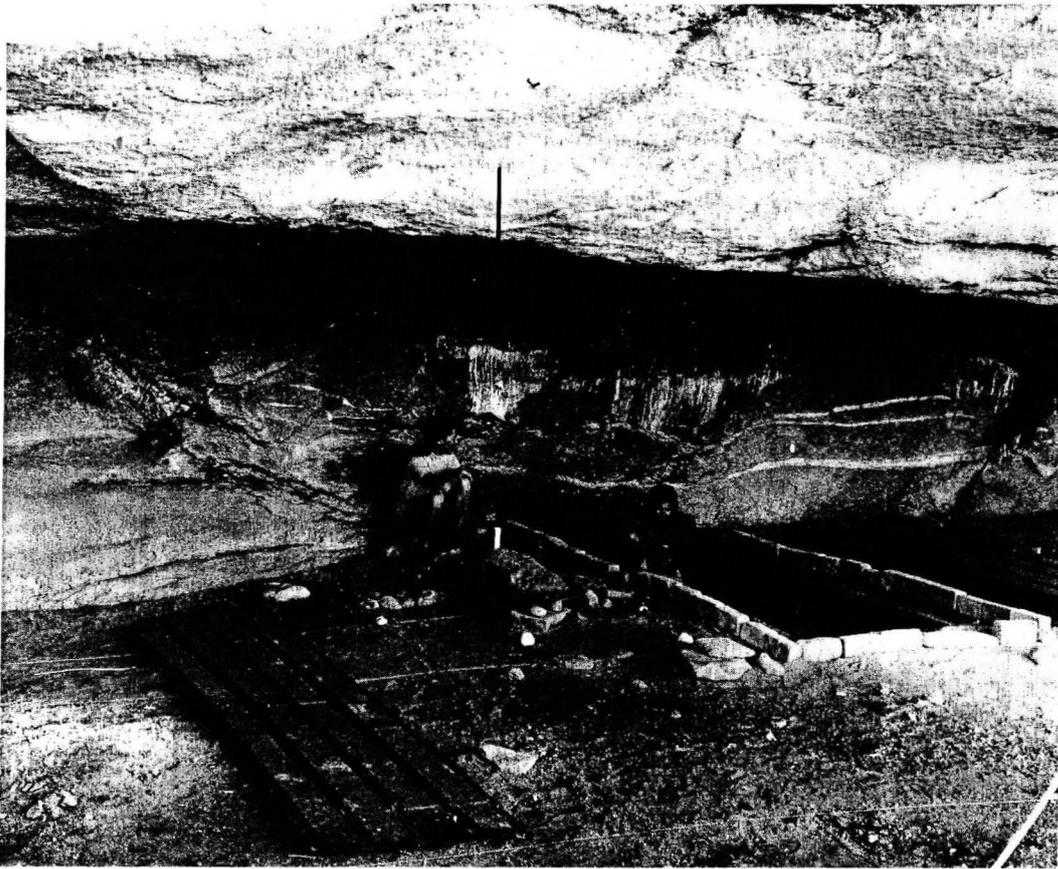


Fig. 5. Dr M. K. Seeley and Dr B. Sandelowsky at the trial trench in the Mirabib rock shelter. The arrow indicates the main owl roost.

graphic layers, it will be possible to build up a picture of microfaunal changes throughout the time-span involved. If, for instance, golden mole bones occur in certain layers of the Mirabib deposit, but not in others, their presence will clearly mean that sand dunes occurred closer to the rock shelter, during the accumulation of the layers in question, than they do at present. This would presumably imply that the dunes had crossed the Kuiseb from the south.

As a test of the validity of deductions about habitat based on microfaunal composition, owl pellets were collected by Dr Seely and the writer from two different localities in August 1972. The first was at Homeb (see map) in a tributary valley close to the north bank of the Kuiseb River. An owl roost occurs here below overhanging mica schist cliffs. The immediate habitat is rocky but sand occurs both in the valley floor and as dunes which rise from the south bank of the Kuiseb River. The second locality is at Mirabib where an owl roost exists in an extensive roofed fissure (see photograph) in an outcrop close to the one containing the rock shelter referred to above. It was from here

that the owl pellets described by Vernon (see above) were obtained. The immediate vicinity is rocky but the Mirabib hills are surrounded by featureless gravel plains for at least 20 km in every direction. Thus the Homeb locality provided resident owls with access to rock, gravel and sand habitats, while the Mirabib one offers only rock and gravel.

52 pellets were collected at Homeb and 57 at Mirabib; these were carefully taken apart, the contents of each being identified and listed. Results are given in the table and shown graphically in the block diagrams. It will be seen that in both samples rodents of the genus *Gerbillus* constituted the most important prey item. At Homeb, golden moles (*Eremitalpa*) made up 15.2% of the prey items, while they were totally absent at Mirabib. Other differences are also apparent due to the inequalities in the local habitats.

The presence of golden moles in the Homeb sample and their absence in the Mirabib one show that these creatures may be used with confidence as indicators of a sandy habitat. An analysis is now being made of owl pellet remains from the stratified Mirabib shelter

INDIVIDUAL PELLETS

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19  
 Numbers of individual animals represented

Homeb Owl Roost

Gerbillus sp. . . . .	1	2	1	1	2	2	2		1	1	2	4	2	1	1	3	3	2	3
Desmodillus auricularis																			
Eremitalpa granti . . . .														3		1			
Bird . . . . .								3											
Gecko (Ptenopus) . . . . .																			

Mirabib Owl Crack

Gerbillus sp. . . . .	2	1	1	1	1	1	2	2	1			6	1	1	1	1	1	1	2
Macroscelides proboscideus . . . . .																			
Bird . . . . .						1				2									
Gecko (Chondrodactylus)	1	1	1	2		2		2		1		1	1	1	1	3			
Solifugid. . . . .				1		1		1					1						

INDIVIDUAL PELLETS

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38  
 Numbers of individual animals represented

Homeb Owl Roost

Gerbillus sp. . . . .	2	4	2	1	1	1	1	2	1		3	4	2	1	3	3	3	1	
Desmodillus auricularis															1				
Eremitalpa granti . . . .									1	1	1							1	1
Bird . . . . .																			
Gecko (Ptenopus) . . . . .							1		1	1				1					

Mirabib Owl Crack

Gerbillus sp. . . . .	2	1	1	1	1	1	1	1	2	1	2	1	3	1	1	1	1	2	1
Macroscelides proboscideus . . . . .																			
Bird . . . . .			1					1											1
Gecko (Chondrodactylus)	2				1			1											1
Solifugid. . . . .	1				1	7													

INDIVIDUAL PELLETS

39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57  
 Numbers of individual animals represented

Homeb Owl Roost

Gerbillus sp. . . . .	2	1	1	2		1	2		2		1	1							
Desmodillus auricularis						1													
Eremitalpa granti . . . .	1		2					2		1		1	1						
Bird . . . . .	3									1									

Mirabib Owl Crack

Gerbillus sp. . . . .	1	1	1	1	2	1	1	1		2	3	2	2	1	2	1	1	2	1
Macroscelides proboscideus . . . . .				1				1											
Bird . . . . .																			1
Gecko (Chondrodactylus)							2			1	1			1					
Solifugid. . . . .							1												

Homeb Owl Roost

	<i>Totals</i>		<i>%</i>																
Gerbillus sp. . . . .	82		73,3																
Desmodillus auricularis . . . .	2		1,8																
Eramitalpa granti . . . . .	17		15,2																
Bird . . . . .	7		6,2																
Gecko (Ptenopus) . . . . .	4		3,6																
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Mirabib Owl Crack

Gerbillus sp. . . . .	77	60,6
Macroscelides proboscideus . . . .	2	1,6
Bird . . . . .	7	5,5
Gecko (Chondrodactylus) . . . .	27	21,2
Solifugid . . . . .	14	11,0
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	127	99,9
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HOMEB

MIRABIB

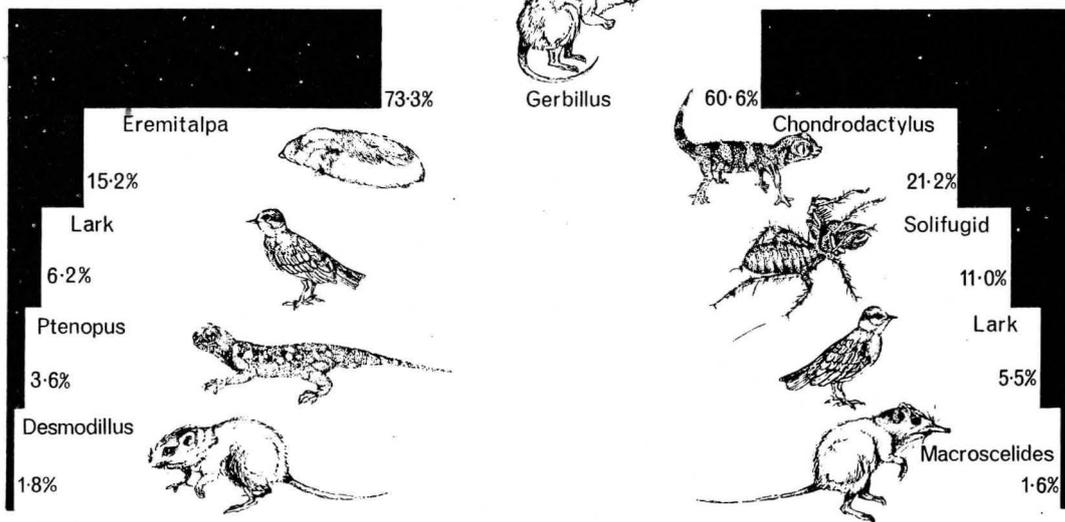


Fig. 6. Diagram showing the percentage abundance of prey items in owl pellets from Homeb and Mirabib. The golden moles, *Eremitalpa*, are indicators of a sandy habitat.

deposit excavated by Dr Pendleton. It should be possible to determine whether or not the dunes crossed the Kuiseb River during the timespan involved.

**Acknowledgements**

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