Hystrix It. J. Mamm. (n.s.) 20(2) (2009): 91-100

SMALL MAMMAL COMMUNITIES IN THE MIKUMI NATIONAL PARK, TANZANIA

JESTINA VENANCE

Department of Zoology and Wildlife Conservation, College of Natural and Applied Sciences, University of Dar Es Salaam P.O. Box 35064, Dar. Tanzania
E-mail: jestina@udsm.ac.tz

Received 2 June 2009; accepted 17 November 2009

ABSTRACT - The abundance and similarity of communities of small mammals (rodents and shrews) were investigated in eight habitats in the Mikumi National Park. A total of 767 individuals, belonging to 21 species and 6 families was captured by three types of live traps. The per cent abundance of species did not vary between habitats. Nonetheless, the evergreen forest comprised 28.6% of species, followed by *Acacia-Dalbergia* and *Combretum* woodlands, while the Riverine and Malundwe montane forests showed the lowest species diversity. Most species (76.2%) were found in only one habitat, while *Crodidura hirta* occupied all sampled habitats.

Key words: rodents, shrews, abundance, diversity, Tanzania

RIASSUNTO - ***Comunità di micromammiferi nel Parco Nazionale Mikumi, Tanzania***. L'abbondanza e la similarità delle comunità di micromammiferi (roditori e insettivori) erano rilevate in 8 habitat del Parco Nazionale Mikumi (Tanzania). Un totale di 767 individui, appartenenti a 21 specie e a 6 famiglie, era catturato mediante tre tipi di trappola. Il numero delle specie accertate non variava tra gli habitat. Le foreste sempreverdi comprendevano il 28,6% del totale delle specie rinvenute, seguito dai boschi di *Acacia-Dalbergia* e di *Combretum*, mentre le foreste montane/fluviali mostravano il più basso livello di diversità specifica. Buona parte delle specie (76,2%) era accertata in un solo habitat; solo *Crodidura hirta* era rinvenuta in tutti gli habitat campionati.

Parole chiave: roditori, insettivori, abbondanza, diversità specifica, Tanzania

INTRODUCTION

In the Mikumi National Park over 60 mammals, 400 birds and 1200 plant species have been recorded (Lyaruu, 1997; Hawkins *et al.*, 1996), although only a relatively small portion of the Park, less than 10% of the total area, has been surveyed (Norton, 1998). Most studies were conducted on large and medium-sized mammals, birds, insects and plants (Norton & Hawkins, 2001; Ereckson *et al.*, 2000), whilst small mammals were disregarded, being less attractive to tourists. The only exception was the preliminary survey by Stanley *et al*. (2005), who surveyed the Malundwe montane forest. Rodents and shrews play a major role in the food chain by consuming plant material and invertebrates (Wolda, 1981; Mendelsohn, 1982) and serving as prey for

snakes, raptors and small to medium-sized carnivores.

Vegetation structure and food availability are the main factors determining the pattern of distribution of both rodents and shrews (Rowe-Rowe and Meester, 1982; Kerley *et al.*, 1990; Ahmad *et al.*, 2002) followed by the structure and diversity of small mammals communities in different habitats (Hockings, 1981; Hausser and Neet, 1990; Kerley *et al*., 1990). The high ecological diversity of the Mikumi National Park suggests that the protected area could be inhabited by a wide variety of small mammal species.

The main aim of this study was to assess i) the habitat preferences of small mammal species and ii) the similarity of communities occupying different habitats. Being the most diverse small mammals in terms of habitat and speciation, both rodents and shrews could play a main role as indicators of both habitat quality and perturbation and thus allow the formulation of sound conservation strategies both within the Mikumi National Park and neighbouring unprotected areas.

STUDY AREA

Mikumi National Park is located in the Kilosa District, within the Morogoro Region (7° 00'-7° 45' S and 37º 00'-37° 30' E). The park was gazetted in 1964 and is the fourth largest park (approximately 3,230 km^2) in Tanzania. Field samplings were conducted in various vegetation types within the park, according to the plant community structure proposed by Lyaluu (1997):

i) Mkata floodplain (MK): this area, covering about 100 km^2, is dominated by *Borassus aethiopum*, *Hyparrhenia* spp., *Themeda triandra* and trees such as *Vernonia glabra*, *Dalbergia melanoxylon*, *Tamarindus indica* and *Lonchocarpus cappasa*.

ii) *Brachystegia* woodland (BR): this dry forest forms a large portion of the southern part of the Park and is characterised by *Brachystegia* species such as *Julbernadia globiflora*, *Brachystegia microphylla* and *Pericopsis angolensis*.

iii) Mixed woodland (MIX): this zone includes wooded grassland and shrubs. Grasses such as *Panicum maximum*, *T. triandra* and *H. rufa* dominate the area. The most common tree species is *Xerroderis stuhlmanii*.

iv) *Acacia-Dalbergia* woodland (AD): in the northern part of the Park woods mainly consist of *D. melanoxylon*, together with *Acacia* spp. and *Garcinia buchananii*.

v) *Combretum* woodland (COMB): to the south the Acacia-Dalbergia woodland is progressively substituted by a coppice (height <7 m) dominated by *Combretum hereroense*. This vegetation type also borders the floodplain and supports grass species such as *Brachiaria brizantha*.

vi) Riverine thicket/forest (RIV): river gorges and ravines are normally associated with *Sclerocarya caffra*, *Terminalia kilimandscharica* and *Haplocoelum inoploeum*.

vii) Malundwe montane forest (MAL): the Malundwe Mountains are the only area in the Park covered by afromontane forest (Lovett and Norton, 1989). These hills are considered to be part of the Eastern Arc forests of Tanzania. The vegetation here is floristically and physiognomically montane, although the hills are lower than the normal range of montane forests (1257 m a.s.l.).

viii) Evergreen forest (EV): a patch of evergreen moist forest covers a very small (<10 km^2) area within the southern part of *Brachystegia* woodland. The trees are up to 40 m high but do not form a closed canopy while the mid-stratum trees are very dense. It is dominated by *Polysphaeria* species.

METHODS

1. Trapping

A preliminary survey was conducted in the Mikumi National Park to locate suitable sampling site in each of the above mentioned vegetation types. A Global Positioning System (GPS-12) was used to record the position of all sampling sites. Data collection was based on the techniques used by Stanley *et al.* (1996, 2005) with slight modifications. Sampling was conducted from 13th May to 1st July 2006 (wet season) and from 21st August to 2nd October 2006 (dry season). Three types of live traps were employed: medium-sized Sherman traps (23x9.5x8 cm), bucket pitfall traps (plastic pails measuring 30x35 cm in diameter and depth, respectively) and "mgono" traps. The latter, which are widely used in Tanzania by local hunters, are funnel-shaped, multi-capture traps made of thin wire. Sherman and "mgono" traps were used to capture small to medium-sized rodents and shrews (Kerley, 1992; Ferreira and Van Aarde, 1996; Stanley *et al.,* 1996, 2005). They were both baited with roasted pieces of coconut coated with peanut butter (Cordeiro *et al.*, 2005); old baits were replaced with new ones during trap checking. Pitfall traps were buried in the ground with the opening on the surface for capturing shrews and small rodents. A polythene drift fence was erected to intercept and redirect animals moving on the ground into pitfall traps (Davies, 2002). All traps were set on the ground at 5 m interval.

In each habitat six trap lines were laid, three consisting of a total of 22 "mgono" and Sherman traps, which alternated in position. The other three trap lines consisted of 11 pitfall traps each. Trap lines were set 80 m apart. All were checked daily, early in the morning and evening for seven consecutive days in both the wet and dry seasons.

Rodents and shrews were identified by the keys proposed by Kingdon (1974a, 1974b, 1997) and Delany (1971, 1975).

2. Data analysis

The per cent abundance of small mammal species in each habitat was calculated as the ratio between the number of species found in each habitat and the total number of species recorded in the study area. Variation in the per cent abundance was tested by Cochran's Q test (Zar, 1999).

The similarity of mammal communities among habitats was estimated by Sørensen's coefficient (CCS):

$$CCS = \frac{2c}{(s_1 + s_2)}$$

where s_1 and s_2 are respectively, the number of species in communities 1 and 2, and c is the number of species common to both communities. Pair-wise comparison were made between the eight habitats for constructing a similarity matrix.

Based on these similarity indices a cluster analysis (Zar, 1999) was performed by CAP (Community Analysis Package software). Values of the Dissimilarity (D) index < 0.4 indicate high community similarity.

RESULTS AND DISCUSSION

A total of 767 individuals was captured, belonging to 21 species and six families (Appendix). The most abundant species was *Crocidura hirta* (29.7%), followed by *Suncus lixus* (7.4%), *Rattus rattus* and *Grammomys dolichurus* (both 6.7%). The rarest species were *Myomys fumatus* (1%), *Myosorex geata* and *Graphiurus murinus* (both 1.7%).

Variation in the abundance of small mammals species between habitats was not significant (Q = 10.9, d.f. = 7, N.S.). Nonetheless, the evergreen forest showed the highest species diversity, including 28.6% of species, followed by *Acacia-Dalbergia* and *Combretum* woodlands with 23.8% each (Tab. 1). These results agree with the observations of Isabirye-Basuta and Kasenene (1987) and Kasangaki *et al.* (2003), who reported that evergreen forests support a variety of food resources and provide several microhabitats which may offer cover and nest sites to different small mammal species. *Acacia-Dalbergia* and *Combretum* woodlands are highly grazed by large and medium sized mammals (Reed and Clockie, 2000; Brits *et al.,* 2002). According to Hiernaux (2004) and Noy-Meir (1993), the effects of grazing probably stimulate the growth of both indigenous and alien plant species, increasing resource variability for rodents and shrews.

The Riverine and Malundwe montane forests showed the lowest species abundance (both 14.3%). The former habitat is characterised by recurrent flood. Flooding has a strong impact on rodent and shrew populations, resulting into high mortality of non-tolerant species (Pachinger and Haferkorn, 1998; Andersen *et al.,* 2000). According to Wijnhoven *et al.* (2006), the successional landscape mosaic of riverine forests provides species-specific patterns for few tolerant mammals. Malundwe montane forests are characterised by a low floristic diversity, as also reported by Nor (2001) for Mount Kinabalu (Malaysia). Moreover, according to Happold and Happold (1989), increasing altitude results into a reduction of both plant growth and grass biomass, affecting the richness of animal species. Nonetheless Stanley e*t al.* (2005) documented the presence of two species of shrews and five species of rodents in Malundwe montane forests, suggesting that the low number of species recorded in the present study could be a consequence of sampling faults, possibly due to the traps used. Pitfall traps were shown to be more efficient (about 58.1% of total captures) than the other two types (Sherman traps: 36.9%; "mgono" traps: 5.0%). Accordingly, Wells *et al. (*2006), emphasized the importance of pitfall traps in sampling small mammals because of the broader spectrum of species caught.

Most species (76.2%) were found in only one habitat (Tab. 1), while *C. hirta* occupied all sampled sites, probably due to its ability to exploit various vegetation mosaics (Kingdon, 1997). The community of the evergreen forest was the most peculiar (D ≈ 0.617, CCS ≈ 0.2; Tab. 2 and Figure 1), followed by *Acacia-Dalbergia* (D≈ 0.555, CCS ≈ 0.25) and mixed woodland (D≈ 0.524, CCS ≈ 0.2). The peculiarity of the former habitat agrees with the results reported by Andreone *et al.* (2000) in Ambolokopatrika rainforest (northeast Madagascar), although the specific vegetation cover of these two lowland rainforests may differ.

Acacia-Dalbergia woodland is dry savannah woodland, while mixed woodland occurs next to human settlements. Accordingly, in the latter habitat synanthropic species, such as *R. rattus* and *M. musculus*, were recorded. Probably

Table 1 - Species of rodents and shrews recorded in Mikumi National Park within various habitat types (0 = not recorded, 1= recorded; MIX = Mixed woodland, AD = *Acacia - Dalbergia* woodland, BR = *Brachystegia* woodland, COM = *Combretum* woodland, RIV = riverine forest, MK = Mkata Floodplain, MAL = Malundwe montane forest, EV = evergreen forest).

	Habitat types							
Species	MIX	AD	BR	COM	RIV	MK	MAL	EV
Acomys wilsoni	0	1	0	0	0	0	0	0
Mus musculus	1	0	0	0	0	0	0	0
Mus triton	1	0	0	0	0	0	0	0
Rattus rattus	1	0	0	0	0	0	0	0
Grammomys dolichurus	0	0	1	1	0	0	1	0
Myomys fumatus	0	0	0	0	1	0	0	0
Praomys tullbergi	0	0	0	1	0	0	0	0
Mus minutoides	0	0	1	0	0	1	0	0
Dendromus mystacalis	0	0	1	0	0	0	0	0
Dendromus mesomelas	0	0	0	1	0	0	0	0
Funisciurus anerythrus	0	0	0	0	0	0	0	1
Grammomys ibeanus	0	0	0	0	0	0	0	1
Steatomys minutus	0	0	0	0	0	0	0	1
Steatomys opinus	0	0	0	0	0	0	0	1
Funisciurus congicus	0	0	0	0	0	0	0	1
Graphiurus murinus	0	0	0	0	0	0	1	0
Crocidura hirta	1	1	1	1	1	1	1	1
Crocidura luna	0	1	0	0	0	0	0	0
Myosorex geata	0	1	0	0	0	0	0	0
Petrodromus tetradactylus	0	1	0	0	0	1	0	0
Suncus lixus	0	0	0	1	1	1	0	0
Species abundance	4	5	4	5	3	4	3	6
% abundance	19.0	23.8	19.0	23.8	14.3	19.0	14.3	28.6

Table 2 - Coefficient of Community Similarity between various habitat types in Mikumi National Park (see the legend of Tab. 1 for abbreviations).

Habitat types	MIX	AD	BR	COM	RIV	MK	MAL
AD	0.2222						
BR	0.25	0.2222					
COM	0.2222	0.2	0.4444				
RIV	0.2857	0.25	0.2857	0.25			
MK	0.25	0.4444	0.25	0.4444	0.5714		
MAL	0.2857	0.25	0.5774	0.25	0.3333	0.2857	
EV	0.2	0.1818	0.2	0.1818	0.2222	0.2	0.2222

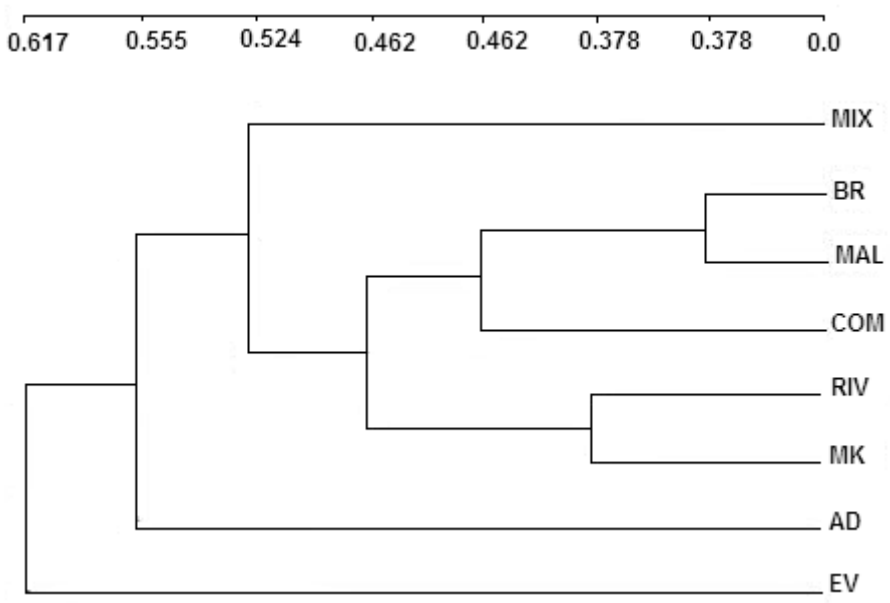

Figure 1 - Dendrogram showing the similarity of small mammals communities in the Mikumi National Park (see the legend of Tab. 1 for abbreviations).

these species benefit of the steady availability of food sources of human origin.

The highest similarity of communities was recorded between Malundwe montane forest and *Brachystegia* woodland (CCS = 0.5774, D ≈ 0.378). Both these habitats are highlands, with *Brachystegia microphylla* being dominant in both habitats at the lowest altitude. Similarity of floristic characteristics in separated habitats could result into similarity of their faunistic communities, as reported by Webala *et al.* (2006) and Reed and Clockie (2000) about the communities of rodents and shrews of, respectively, Mukogodo forest (Kenya) and Mount Elgon (Uganda).

A high similarity coefficient was recorded also between the communities of the Mkata floodplain and Riverine forest with (D ≈ 0.378, CCS = 0.5714). These habitats suffer recurrent floods, with shape the communities of both habitats favouring the most tolerant species (*C. hirta* and *S. lixus*).

This study provided information on the abundance and distribution of many small mammal species in Mikumi National Park. From a management point of view, we argue that the building of new settlements and recreation activities should be programmed in order to minimize the impact on the rarest species, which often inhabit only one particular habitat of the protected area. .

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to the University of Dar Es Salaam for financial support through

NORAD Human Development Project. Also I am grateful to Prof. J.D.L. Kabigumila and other members of the Department of Zoology and Wildlife Conservation of the University of Dar es Salaam for their assistance and criticism.

REFERENCES

Ahmad M.Y., Batin Z. and Shukor N. 2002. Influence of elevational habitat changes on non- volant small mammal species: distribution and diversity on mountain Nuang, Hulu langat, Selangor Malaysia. *Pakist. J. Biol. Sci.,* 5: 819-824.

Andersen D.C., Wilson K.R., Miller M.S. and Falck M. 2000. Movement patterns of riparian small mammals during predictable floodplain inundation. *J. Mammal.,* 81: 1087-1099.

Andreone F., Randrianirina J.E., Jenkins P.D. and Aprea G. 2000. Species diversity of Amphibians, Reptilia and Lipotyphyla (Mammalia) at Ambolokopatrika, a rainforest between the Anjanaharibe-Sud and Marojejy Massifs, N.E. Madagascar. *J. Biol and Cons.,* 9: 1587 - 1622.

Brits J., Van Rooyen M .W., Van Rooyen N. 2002. Ecological impact of large herbivores on the woody vegetation at selected watering points on the eastern Basaltic soils in the Kruger National Park. *Afr. J. Ecol.,* 40**:** 53-60.

Cordeiro N.J., Seddon N., Howell K.M. and Stanley W.T. 2005. Notes on the ecology and status of some forest mammals in four Eastern Arc Mountains, Tanzania. *J. Afr. Nat. Hist.*, 94(1): 175-189.

Davies G. (ed.). 2002. African forest biodiversity: a field survey manual for vertebrates. Earthwatch Institute, Oxford, 161 pp.

Delany M.J. 1975. The Rodents of Uganda. British Museum (Natural History), London.

Ereckson A.E., Norton G.W. and Hawkins D.M. 2000. The elephant population in Mikumi National Park, Tanzania: poaching and population change. 5th Annual International Elephant Research Symposium (presentation).

Ferreira S.M. and Van Aarde R.J. 1996. Changes in community characteristics of small mammals in rehabilitating coastal dune forests in northern KwaZulu/Natal. *Afr. J. Ecol*., 34: 113-130.

Hausser J. and Neet C.R. 1990. Habitat selection in zones of parapatric contact between the common shrew *Sorex araneus* and Millet's shrew *S. coronatus*. *J. Animal Ecol.*, 59: 235-250.

Happold D.C.D. and Happold M. 1989. Biogeography of small montane mammals in Malawi, central Africa. *J. Biogeogr.*, 16: 353-367.

Hawkins D.M. and Norton G.W. 1996. The baboons of Mikumi National Park: long-term collaborative primate field research. Poster for the European Workshop on Primate Research, Madrid.

Hiernaux P. 2004. Effects of grazing on plant species composition and spatial distribution in rangelands of the Sahel. *J. Plant Ecology*, 138: 191-202.

Hockings M.D. 1981. Habitat distribution and species diversity of small mammals in South-East Queensland in relation to vegetation structure. *Austra. Wildl. Res.*, 8: 97-108.

Isabirye-Basuta G., and Kasenene J.M. 1987. Small rodent populations in the selectively felled and mature tracts of the Kibale forest, Uganda. *Biotropica,* 12: 260–266.

Kasangaki A., Kerbis J. and Kityo R. 2003. Diversity of rodents and shrews along an elevational gradient in Bwindi Im-

penetrable National Park, Southwestern Uganda. *Afr. J. Ecol.*, 41: 115-123.

Kerley G.I.H., Erasmus T., Knight M.H. 1990. Small mammal microhabitat use and diet in the Southern Kalahari, South Africa. *S. Afr. J. Wildl. Res.*, 20: 123-126.

Kerley G.I.H. 1992. Ecological correlates of small mammal community structure in the semi arid Karoo. *S. Afr. J. Zool. Lond.*, 227: 17-27.

Kingdon J. 1974a. East African Mammals. An Atlas of Evolution in Africa. IIA: Insectivores and Bats. Academic Press, London.

Kingdon J. 1974 b. East African Mammals. An Atlas of Evolution in Africa. IIB: Hares and Rodents. Academic Press, London.

Kingdon J. 1997. The Kingdon field guide to African mammals, AP Natural World Academic Press, Harcourt Brace & Company, San Diego, 145-146.

Lovett J.C. and Norton G.W. 1989. Afromontane rainforest on Malundwe Hill in the Mikumi National Park, Tanzania. *Biological Conservation*, 48: 13-19.

Lyaruu H.V.M. 1997. Plant community structure and land degradation in Mikumi National Park, Tanzania. *Medd. Växtbiologiska inst., Uppsala*, 1: 1-35.

Mendelsohn J.M. 1982. Notes on small mammals on the springbok flats, Transvaal. *S. Afr. J. Zool,*. 17: 197-201.

Nor S. 2001. Elevational density patterns of small mammals on Mount Kinabalu, Sabah, Malaysia. *Global Ecology and Biogeography,* 10: 41- 62.

Norton G.W. 1998. Mikumi National Park: the unknown and neglected National Park. Wildlife Conservation Society of Tanzania, Dar es Salaam.

Norton G.W. and Hawkins D.M. 2001. Studies of Mpingo. Second Annual Scientific Meeting of the Tanzania Wildlife Research Institute.

Noy-Meir I. 1993. Compensating growth of grazed plants and its relevance to the use of rangeland. *Ecological Application*, 2: 32-34.

Pachinger K. and Haferkorn J. 1998. Comparison of the small mammal communities in floodplain forests at the Danube and Elbe rivers. *J. Ekol.*, 17: 11-19.

Reed M.S. and Clockie M.R. 2000. Effects of grazing and cultivation on Afromontane plant communities on Mount Elgon, Uganda. *Afr. J. Ecol.,* 38(2): 154-162.

Rowe-Rowe D.T. and Meester J. 1982. Habitat preferences and abundance relations of small mammals in Natal Drakensberg. *S. Afr. J. Zool.*, 17: 202-209.

Stanley W.T., Goodman S.M. and Hutterer R. 1996. Notes on Insectivora and Elephant shrews of the Chome Forest, South Pare Mountains, Tanzania. *Zool. Abh. Mus. Tierkd. Dreden.*, 49: 131-147.

Stanley W.T., Gunn J. and Kihaule P.M. 2005. Results of preliminary small mammals survey of Malundwe Mountains, Mikumi National Park, Tanzania. *J. Afr. Nat. Hist.,* 94 (1): 213-222.

Wijnhoven S., Van der Velde G., Leuven R.S.E.W. and Smits A.J.M. 2006. Modelling recolonization of heterogeneous river floodplains by small mammals. *Hydrobiologia*, 565: 135-152.

Webala W.P., Muriuki G., Lala F. and Bett A. 2006. The small mammals community of Mukogodo forest, Kenya. *Afr. J. Ecol.*, 44: 363- 370.

Wells K., Preiffer M., Lakim M.B. and Kalko E.K.V. 2006. Movement trajectories and habitat partitioning of small mammals in logged and unlogged rain forests on Borneo. *J. An. Ecology,* 75(5): 1212-1223.

Wolda H. 1981. Similarity indices, sample size and diversity. *Oecologia*, 50: 196-302.

Zar J.H. 1999. Biostatistical Analysis. 4th ed. Prentice-Hall, Inc., New Jersey.

Appendix - Species of rodents and shrews captured by different live traps in the monitored habitat types of Mikumi National Park, Tanzania (N = number of trapped individuals).

Bucket pitfall traps captures	N	Sherman live traps captures	N	"Mgono" live traps captures	N
		***Acacia-Dalbergia* Woodland**			
Acomys wilsoni	11	*Acomys wilsoni*	8	*Acomys wilsoni*	3
Crocidura hirta	25	*Crocidura luna*	12	*Crocidura luna*	4
Crocidura luna	6	*Myosorex geata*	2	*Myosorex geata*	2
Myosorex geata	9	*Petrodromus tetradactylus*	10	*Petrodromus tetradactylus*	3
Petrodromus tetradactylus	3				
		Mixed Woodland			
Crocidura hirta	45	*Crocidura hirta*	4	*Crocidura hirta*	2
Mus musculus	13	*Mus musculus*	12	*Mus musculus*	2
Mus triton	10	*Mus triton*	9	*Mus triton*	5
Rattus rattus	15	*Rattus rattus*	29	*Rattus rattus*	8
		***Combretum* Woodland**			
Crocidura hirta	19	*Crocidura hirta*	7	*Dendromus mesomelas*	1
Suncus lixus	13	*Suncus lixus*	7		
Grammomys dolichurus	21	*Grammomys dolichurus*	12		
Dendromus mesomelas	5	*Dendromus mesomelas*	8		
Praomys tullbergi	7	*Praomys tullbergi*	1		
		Mkata Floodplain			
Crocidura hirta	23	*Crocidura hirta*	6	*Suncus lixus*	2
Suncus lixus	15	*Suncus lixus*	13		
Petrodromus tetradactylus	14	*Petrodromus tetradactylus*	8		
		Brachystegia Woodland			
Mus minutoides	10	*Mus minutoides*	25	*Grammomys dolichurus*	2
Grammomys dolichurus	7	*Grammomys dolichurus*	4	*Crocidura hirta*	3
Dendromus mystacalis	6	*Dendromus mystacalis*	9		
Crocidura hirta	9	*Crocidura hirta*	10		
		Malundwe Montane Forest			
Crocidura hirta	16	*Crocidura hirta*	11		
Mus minutoides	7	*Mus minutoides*	1		
Grammomys dolichurus	3	*Grammomys dolichurus*	2		
		Graphiurus murinus	13		
		Riverine Forest			
Crocidura hirta	7	*Crocidura hirta*	3		
Suncus lixus	4	*Suncus lixus*	3		
Myomys fumatus	7	*Myomys fumatus*	1		
		Evergreen Forest			
Crocidura hirta	31	*Crocidura hirta*	7	*Steatomys opinus*	1
Funisciurus congicus	9	*Funisciurus congicus*	12		
Funisciurus anerythrus	21	*Funisciurus anerythrus*	11		
Grammomys ibeanus	35	*Grammomys ibeanus*	6		
Steatomys minutus	5	*Steatomys minutus*	10		
Steatomys opinus	15	*Steatomys opinus*	7		
Total individuals	446		283		38