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RELATIONSHIPS BETWEEN THE FOREST DWELLING PEOPLE OF SOUTH-WEST MAU AND TREE HYRAX, *DENDROHYRAX ARBOREUS*

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ABSTRACT

A brief study was carried out in South-West Mau region of the Mau Forest Complex in March 1993. The primary aim was to assess the importance of the tree hyrax, *Dendrohyrax arboreus* (A. Smith, 1827), to the local forest-dwelling people as a source of food and medicine and in their spiritual traditions, while investigating the effect of the human expoitation on hyrax population size. Interviewing the predominantly Okiek hunters also provided an opportunity to learn something of the ecology of this poorly understood species.

INTRODUCTION

A brief ethno-zoological study of the tree hyrax, *Dendrohyrax arboreus* (A. Smith, 1827), was carried out in the South-West Mau region of the Mau Forest Complex, Kenya, from 14th–31st March 1993. The aims were to assess the importance of the tree hyrax to the local forest-dwelling people as a source of food or medicine and its role in their ritual or spiritual traditions. Secondly, it was to estimate hyrax population density in different forest habitats and determine whether human exploitation has influenced population size.

Considerable research has been done on the anatomy, physiology, ecology and social structure of the rock and bush hyrax, *Procavia* spp and *Heterohyrax* spp (*e.g.* Sale, 1965; Hoeck *et al.*, 1982; Maloiy & Eley, 1992). While these two genera share many similarities in terms of social structure, habitat and activity budgets, important differences in behaviour and ecology exist between them and *Dendrohyrax*. Little work has ever been done on the tree hyrax due to the inherent problems of studying a predominantly nocturnal, forest dwelling species. Much of the literature available is anecdotal (*e.g.* Fey, 1960; Whittal, 1960; Rahm, 1963; Richards, 1964; Kingdon, 1971). However, a small captive population of *D. arboreus* has been studied (Rudnai, 1984a, b) and diet and habitat requirements of the same species have been investigated by indirect methods in South Africa (Gaylard, 1994). A good understanding of the social organisation, ranging behaviour and activity patterns has yet to be established although an in-depth study of the ecology of *D. arboreus* is in progress in the Virunga Volcanoes, Rwanda.

This paper is based largely on the anecdotal evidence of a traditional hunting tribe and, in the absence of scientific data on the tree hyrax, the opportunity was taken to discover if local knowledge could add to our understanding of the general biology of this animal.

A rough index of hyrax distribution in Mau Forest has previously been made, based on nocturnal calling at three sites (Davies *et al.*, 1992). However, as yet there is no well established survey method for tree hyrax. The problems associated with its censusing are discussed by Gaylard (1994). A detailed examination of the influence of commercial

exploitation on *Dendrohyrax validus* has been carried out on Mt Kilimanjaro (Kundaeli, 1976a) using indirect survey methods.

STUDY AREA

Mau Forest, in Rift Valley Province of Kenya (see fig. 1), is the largest remaining closed canopy forest in Kenya. Descriptions of its flora and fauna have been made elsewhere (Mutangah *et al.*, 1992; Davies *et al.*, 1992; Bennun & Waiyaki, 1992). Here it is sufficient to say that within South-West Mau there is a range of forest types from moist montane forest dominated by *Tabernaemontana stapifiana* and *Neoboutonia macrocalyx* in the west through forest/bamboo mosaic to open canopy *Macaranga* scrub and grassland with isolated patches of *Podocarpus latifolius/Schefflera* sp forest and bamboo in the east. There is a gradient of increasing altitude from west to east (approx. 2,000–3,000 m respectively) and a corresponding change in climate from warmer wetter weather in the west to cooler, drier weather in the east.

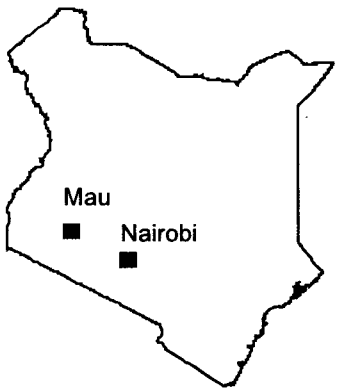

Figure 1: map of Kenya, showing the approximate location of Mau Forest

Visits were made to five villages in the region: Chekuborot (an official forest station village) and Kabongoi in the east, outside the proposed South-West Mau Nature Reserve; Kipsauongon and Chesoen deep within the forest; and Monges in the west (fig. 2). From these, sorties were made into the surrounding forest. Data from Kipsauongon and Chesoen were pooled because their geographical close proximity made distinction meaningless.

METHODS

The work reported here was executed by means of forest surveys for hyrax in the company of a local hunter, and by interviewing men resident within the forest with the help of a translator. At least six line-transects 140 paces long (roughly 100 m) were walked in the forest of each of the four areas. Strip-width varied from 10–18 m depending on the density of the understorey vegetation and was calculated from the distribution of estimated distances to each tree of approximate dbh 25 cm or greater. Such trees were examined for holes suitable for hyrax to inhabit and for positive signs of the animal's presence such as hairs, footprints and droppings which accumulate in latrines. A note was made of the dominant tree species, type of understorey vegetation and forest structure.

At night any hyrax calls audible from the village were noted together with a subjective assessment of intensity, the prevailing weather conditions and the phase of the moon.

Ten men resident in each area (except Kipsauongon/Chesoen where only nine interviews were possible) were interviewed to determine how important the hyrax is to the socio-economy of the forest-dwellers, to what extent it features in their traditional beliefs, and what understanding they have of its ecology. Of the ten questioned, one was a known hunter and the others were chosen randomly within age classes so as to include a range of clans and hunting

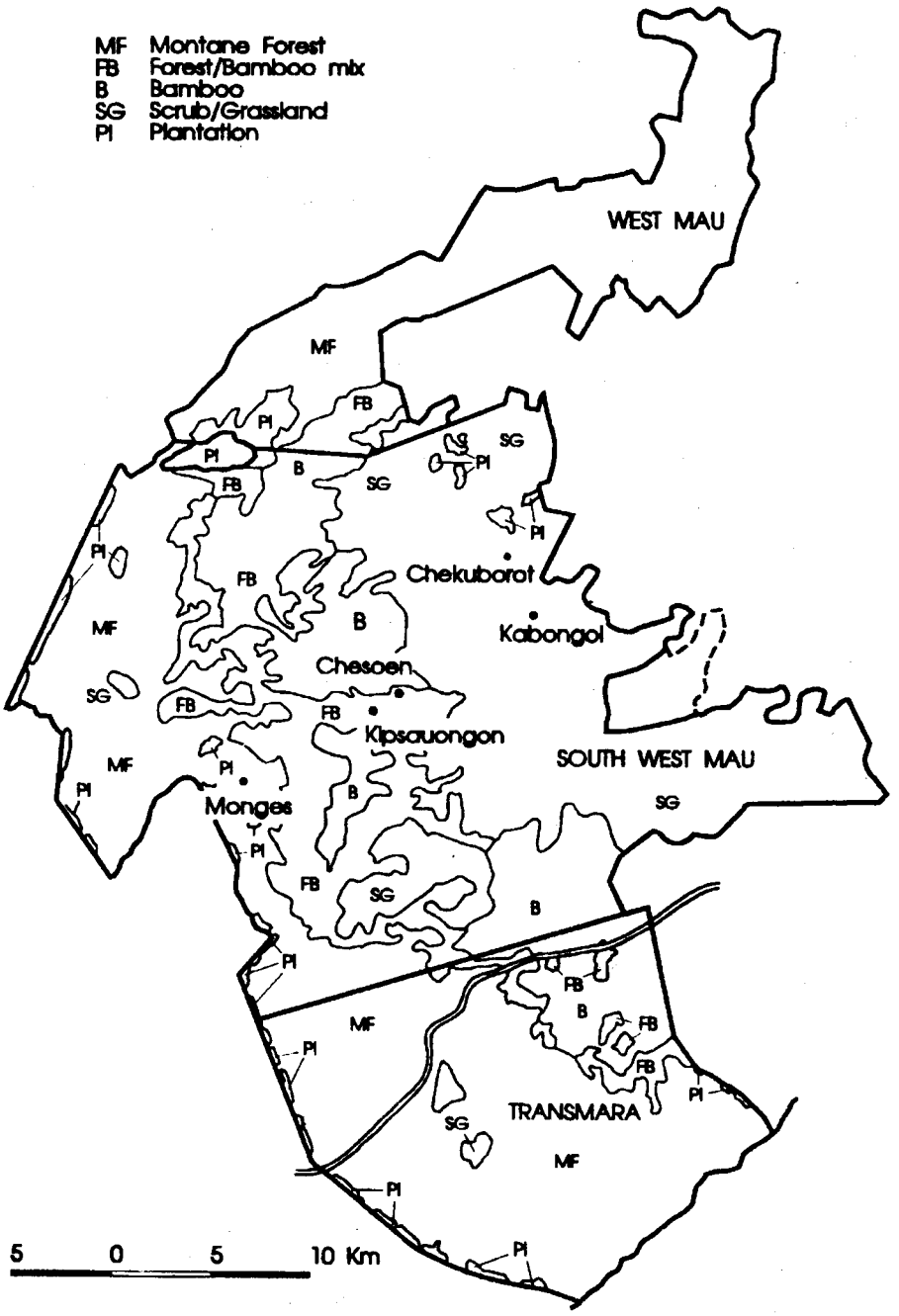

Figure 2. Map showing locations of survey sites in South-West Mau

prowess. Questions were raised in discussion with hunters allowing other information to be volunteered. Interviewees were not given options to choose between.

RESULTS AND DISCUSSION

Hyrax Density

The dominant species of tree and type of understorey vegetation are shown in table 1. This was important in determining the suitability of the habitat for hyrax.

Table 1. Dominant tree species and characteristics of the forest in each area

Chekuborot & Kabongoi	*Macaranga kilimandscharica, Podocarpus latifolius, Olea capensis, Polyscias kikuyensis, Schefflera volkensii.* Understorey: bamboo *Arundinaria alpina.* Canopy open. Badly degraded.
Kipsauongon & Chesoen	*Schefflera abyssinica, Szygium guineense, Macaranga kilimandscharica, Tabernaemontana stapfiana, Podocarpus latifolius.* Understorey: bamboo *Arundinaria alpina.*
Monges	*Tabernaemontana stapfiana, Albizia gummifera, Neoboutonia macrocalyx, Macaranga kilimandscharica.* Understorey: *Acanthus eminens Mimulopsis* sp. Many lianas & creepers. Canopy closed.

The minimum number of hyrax per hectare was calculated from the number of trees found with positive signs of hyrax presence along the transects and assuming that each individual lived alone (Kingdon 1971, pers. obs., Rwanda). However, these values were low when compared with the intensity of nocturnal vocalisation heard. It must therefore be assumed that some other trees were also inhabited but remained undetected. An upper limit was estimated by counting the number of trees of a suitable size, with holes (table 2). The mid-point between these values was then used to estimate the number of hyrax in South-West Mau. This can only be regarded as a very rough estimate of population but at the moment a more satisfactory methodology is not available.

Table 2. Hyrax density in each area.

	Area surveyed	No. hyrax / ha min.	max.	mid-point	
Chekuborot	1.5 ha	1.4	11	6.2	
Kabongoi	1.1 ha	2.3	15	8.7	
Kips/Chesoen	1.6 ha	1.2	14	7.6	
Monges	1.2 ha	0	2.5	1.3	
Average		1.2	11	7.5	forest/bamboo
density				1.3	montane forest

Gaylard (1994), surveying *D. arboreus* in the forests of the Eastern Cape, South Africa, used the number of hyrax latrines found per man-hour searching but, without a calibration factor, only used this to compare relative densities in different forests.

Use of calls alone is not a satisfactory census technique because although hearing calls indicates tree hyrax presence, the absence of calls can not be interpreted as an absence of hyrax due to the seasonal nature of calling behaviour (pers. obs., Rwanda). However, during periods of high intensity vocalisation, as was the case on many nights during this study, an impression of the minimum number of hyrax present can be ascertained. It is known that both males and females call (Kingdon, 1971; Rudnai, pers. comm.) and that they stay in specific locations during calling bouts (Kingdon, 1971; pers. obs., Rwanda). Therefore, if it was not for the logistical difficulties in counting the number of calling individuals, this could prove a useful technique at certain times of the year.

The hyrax density found in Mau was low compared with those of *D. validus* on Mt Kilimanjaro of 13, 23 and 70 hyrax per hectare at three different sites (Kundaeli, 1976b) and that of 16 *D. arboreus*/ha in the Virungas (Milner, unpubl. data). However, *D. arboreus* in the Eastern Cape were also living at low density with only 37 latrines found in 376 man/hr (Gaylard, 1994).

It was evident that the moist, dark forest in the west of Mau sustained a much lower population of tree hyrax. This was because of a paucity of large trees with cavities such as *Podocarpus latifolius* and *Schefflera* sp. It was also suggested that in the Monges area where there was a high population of squirrels, *Heliosciurus rufobrachium*, (Davies *et al.*, 1992), these animals competed with tree hyrax for holes.

Speaking to local residents, it was confirmed that the habitat favoured by tree hyrax was mixed forest with bamboo as is found in the Chekuborot area. However, it should be noted that such forest represents a very small proportion of the vegetation in the eastern sector of the forest, being predominantly open scrub and grassland which was unable to support tree hyrax. In addition, hyrax were unable to inhabit pure stands of bamboo where neither their food nor shelter requirements were met. There are some known *Dendrohyrax* populations which have adapted to living amongst rocks, *e.g.* in Ruwenzories, but such habitat was not available in Mau.

If it can be assumed that mixed forest with bamboo covers an area of approximately 13,000 ha and there is 23,000 ha of moist montane forest (together representing nearly 50% of the whole of South-West Mau forest area), then, using the average density for each of these habitat types, there would be a population of at least 127,000 tree hyrax in South-West Mau.

HYRAX HUNTING

Hunting Frequency

Of the 39 men spoken to, 16 claimed to be frequent, practicing hunters, four rarely hunted and eleven had been hunters in the past but no longer practiced. Reasons for this included that hunting has been made illegal, they had stopped eating the meat (*e.g.* for religious reasons), loss of interest, eviction from the forest or lack of time because of cultivating. The remaining eight had never hunted. This however was an under-estimate of the non-hunting proportion of the population since at least another eight had refused to participate in the interviewing because they came from agricultural backgrounds and felt unable to answer the questions.

Table 3. Composition of interviewees from each village in terms of age and regularity of hunting (F-frequent, R-rare, U-used to, N-never)

	Age group (Years)			Hunting Frequency			
	> 55	35-55	< 35	F	R	U	N
Chekuborot	4	2	4	4	2	2	2
Kabongoi	2	4	4	5	0	4	1
Kips/Chesoen	4	2	3	3	2	1	3
Monges	4	4	2	4	0	4	2
	14	12	13	16	4	11	8

There was no apparent relationship between age and hunting frequency. However there did seem to be a regional relationship, with those living in the east of the forest being the most frequent hunters. Monges was particularly notable for the large number of non-hunting people who would not be interviewed.

The men came from 24 different clans of which five were identified as being true Okiek (listed in appendix 1). Of the 38 men prepared to reveal their clan, 17 belonged to these five clans and a further three to closely related clans (sharing their animal symbol with one of the major clans). This suggested that only about half of those people now living in the forest were true Okiek, the remainder being of Kipsigi origin (agriculturalists with little hunting tradition), some of whom have only very recently moved into the forest.

On average, even frequent hunters made only one–two hunting trips per week, usually at weekends. Hunting seemed to be regarded as more of a leisure pursuit while cultivation, now the principal means of livelihood, took precedence of time during the week.

Of all those who do or have hunted regularly, only seven (25%) said they ever made trips specifically to hunt hyrax. These tended to be men who either particularly enjoyed the meat or who required hyrax for medicinal purposes. However the majority of men coming across hyrax while hunting for antelope, would kill them.

Hunting Methods

The most common principle for catching hyrax was to dislodge them from trees and then kill them on the ground, but the exact technique varied between hunters and with season (table 4). In most cases the tree has to be climbed. A stick was employed to knock the hyrax off its branch and so be caught by dogs or a fellow hunter waiting below. More frequently, when the hyrax was within its hole (*e.g.* rainy season), a stick would be inserted into the hollow cavity and rattled around so causing the hyrax to loose its footing or used to pull it out. Again the animal would actually be killed on the ground, or even taken alive.

Table 4. Number of men using each method of catching hyrax

Arrow	Stick	Dogs	Snare	Smoke
1	20	17	1	2

Alternatively the hyrax could be smoked out of its hole and caught in a sack at the bottom of the tree-trunk. Bow and arrow could only be employed in the dry season when on rare occasions a hyrax may be spotted outside its hole. Trapping hyrax with snares was also considered a difficult method. Five men declared it not possible and only one admitted to ever snaring hyrax but he considered it a much less effective method than using a stick. This was in

complete contrast to the situation on Mt Kilimanjaro where trapping of hyrax occurs on a commercial scale (Kundaeli 1976a).

Most hunting trips involved a group of men, especially when larger game was sought (table 5). Group size was usually two-three men but sometimes up to ten. Some men preferred to hunt alone if they had sufficient dogs (at least three) thus avoiding the need to share their catch. Even the meat of a hyrax would normally be split between those hunters who eat it. (If none were hyrax-eaters the meat would be fed to the dogs.) However possession of the skin went to the man who climbed the tree.

Table 5. Number of men hunting alone or in groups

Alone	Group	Either
6	16	3

Hunting Success

Hunting success proved impossible to evaluate, most catches resulting from fortuitous encounters with hyrax. Even estimates of the number of animals killed per year were difficult to establish and were mostly guesses, some inevitably more reliable than others.

Table 6 shows that the majority of hunters (62%) caught ten or fewer hyrax per year. In the case of group hunting, if the average group size were four, this would be less than three animals per man per year. Included in the 'lone hunter' category were nine men (23% of those interviewed) who have never caught a single hyrax. The approximate annual total was calculated using the number estimated by each interviewee and in cases when he said "at least...", an arbitrary value of 20% was added to his estimate. Guesses at the larger end of the scale were very likely to have been exaggerated in the attempt to quantifying 'many'. This would obviously lead to an over-estimate of the total number. It should also be noted that because hunting is forbidden there is a possibility that hunters under-declared their kills. However, if this was the case it would be expected that they would altogether deny hunting.

Table 6. Number of hunters who estimated to kill a given number of hyrax per year, and estimate of total number of hyrax killed per year

No. hyrax	0-10	11-50	51-100	>100	Approx. total
Lone hunter	13	1	1	1	350
Group (av. 4 men)	8	6	2	2	450/4=112
Total	21	7	3	3	462

Included in this table was data from men who no longer hunted. Since these men represented 28% of those sampled, the total number of hyrax currently killed per year would be reduced by 28% to 336 per annum. This would give an average of about eight hyrax killed per man per year as a very rough guideline to the annual off-take. If there are 2,000 households in South-West Mau and this would mean an total off-take of 16,000 hyrax per year and if it can be assumed that on average each pair has one offspring per year, this would represent a quarter of the annual population increment.

There seemed to have been a significant decline in hunting activity in general and hyrax hunting in particular, in recent years. When asked whether they considered hyrax hunting to still be important in their lives, 21 (54%) men interviewed said no, while 18 (46%) believed it was important but to a lesser extent than in previous generations.

Hunting Ethic

In the past there were restrictions on hyrax hunting, set by the elders throughout South-West Mau. This was in order to prevent over-hunting. Each family or clan had its own hunting territory on a specific ridge. Limits were set to the number of hyrax that could be caught each year, but it was difficult to establish what these were—possibly ten per group of hunters or four per individual. The limit was fixed regardless of the hyrax population size. One man said that children were not allowed to hunt hyrax and that only males could be killed. Another said that if a female with young was caught, he would rear the young one himself and then release it.

Only six men spoken to, predominantly old, knew of these regulations which were clearly no longer enforced. Some claimed that this was because restrictions were no longer needed due to the decline in interest in hunting. There was however a general awareness of the need to avoid over-exploitation.

No-one was able to cite occasions of hyrax population explosion or crash and conflicting answers were given as to whether the population had increased or decreased over recent years. Eleven felt that hyrax numbers had risen due to the relaxation of hunting pressure while 16 others acknowledged that habitat loss, in particular of large old trees, had caused a decline in the population.

USES OF HYRAX

Food

In the past, hyrax meat was undoubtedly of great importance in supplementing the diet. Now with a shift in emphasis from hunting to cultivation and more people keeping domestic stock, there has been a decline in its importance. Furthermore, with the spread of Christianity, many people believed that they should not eat hyrax meat for religious reasons. Nevertheless, over 2/3 of those men asked said that they had eaten it although many did so only occasionally (table 7).

Table 7. The number of men using hyrax in different ways

Meat	Skin	Medicine	Ritual	None
27	24	24	11	5
(69 %)	(62 %)	(62 %)	(28 %)	(13 %)

There seemed no correlation between the age or village of a man and the uses he made of hyrax, although it was interesting to note that all the men interviewed in Kabongoi and all the men of the middle age category ate the meat. It might be expected that a man's clan would influence his uses, especially in ritual and ceremonial uses of the skin. However there was no apparent pattern to this effect or differences in uses between men of Okiek and Kipsigi origin.

Skins

The use of hyrax skins was still important for clothes for initiation and wedding ceremonies but they have not been worn on a daily basis since the advent of European clothes. Because skins may be stored for five or more years and borrowed from or lent to relatives, this use did not warrant special hunting trips. In the past hyrax skins were also sewn into sleeping skins and there was a good market for them. Only three of the men questioned ever sell skins now. The rate quoted was 30 KSh per skin or one cow for a blanket (16–40+ skins sewn together).

Medicine

The use of traditional medicines was still actively practiced both as a means of prevention and cure from a number of ailments. The principal medicinal use of hyrax was to cure deep coughing, especially in children, by drinking the ash of its burnt hairs mixed with water or honey. Coughing in cattle could also be cured by mixing the dried stomach contents of hyrax with animal feed. The plant material in hyrax stomachs was used as a herbal remedy in people too, believed to ease aching ribs or, if burnt, the ash helped scars heal.

Rituals

The hyrax played an interesting role in the beliefs of the people. Some clans traditionally bless their new-born babies by wrapping them in the skin of a hyrax so ensuring good health. Over a quarter of all families still carry out this ritual although in some instances just a token strip of the fur is pinned to the child's clothing.

One man also described a blessing he used for his stock. By scattering the dried stomach contents of hyrax on pasture he believed his goats and sheep would breed well. However, he was not a hunting Okiek.

Other Beliefs

The hyrax was believed by 25 of those questioned to serve as an omen. The most commonly stated situation was when a hyrax was heard to cry during the day, warning of a terrible event to come and so causing a mass migration from the area. Twelve of those questioned (of whom all but two were from Chekuborot and Kabongoi in the east) had heard hyrax calling in the day, one instance being just prior to the government eviction of the forest-dwellers in 1976!

Hyrax were also regarded as a bad omen if one entered a house, in which case it should not be killed or the householders would die. If a hyrax was seen to cross the path during a journey, this was a bad sign and the excursion should be abandoned. However, both these omens probably apply to other animals as well (Wily, 1991).

It has been reported that in the Mau Forest albino hyrax are killed because of a superstition about their colour (Whittall, 1960). However, no evidence supporting this was found. Infact, two men said that an albino hyrax could not be hunted, it being the king or witch-doctor of the hyrax. If one were killed by mistake it should not be eaten and must not be taken home or it would bring ill-fate on the family. Many of the interviewees had never heard of an albino and did not know whether it was a good or bad omen. Only seven, of whom four were from Kabongoi, had ever seen one. Its vernacular name is "kibitiolit".

Many people believed that during the daytime the hyrax was blind. This was presumably because when seen in the day hyrax were often inactive, either dozing or staring fixedly.

ECOLOGY OF HYRAX

Many basic facts of the behaviour and ecology of the tree hyrax are uncertain. In the absence of scientific data, the following collection of anecdotal evidence sheds light on some of the issues and substantiates observations of others. However, local knowledge was insufficient to provide new information on many aspects of tree hyrax biology.

Habitat

As discussed above, the density of hyrax in an area was very dependent on the forest type and the tree species present. The best habitat was generally acknowledged to be thick forest, away

from the villages (and therefore, presumably, human disturbance) and often near rivers. Although hyrax do not need to drink (Sale, 1965; Maloiy & Eley, 1992), larger trees tended to grow by watercourses. Mixed forest with bamboo was said to be better for hyrax than where bamboo was absent, not because bamboo was important to hyrax (only one man believed hyrax to live or feed in bamboo), but because there were bigger trees growing in such forest. It would appear that the factor limiting the hyrax population was the availability of shelter in tree cavities rather than food supply. Gaylard (1994) reached a similar conclusion in South Africa.

Everybody interviewed was able to name some of the trees which were inhabited by hyrax and some of its food plants. The number of tree species deemed suitable for hyrax to live in totalled nine (listed in appendix 2), but generally it was considered hyrax would inhabit any tree that had a large enough cavity, under fallen logs or even in empty bee-hives. The number of species of food plant totalled 25 (appendix 3) which included the leaves or fruits of trees, shrubs, creepers, epiphytes and some herbs. The tree hyrax is principally folivorous and no seeds or insect parts were present in any of the faeces found.

Hyrax Predators

The predators of hyrax were less well known. Six men were unable to suggest any at all and a further 13 answered man and/or dogs. Eagles ("kipsiechit" - possibly Ayre's hawk eagle or mountain buzzard and "kachewewt" - crowned eagle) were the only 'natural' predator consistently named (by 51%) and a number of those interviewed had witnessed such a kill. Other predators mentioned included mongoose, an unidentified animal "kibachit" (possibly striped polecat), leopard and even squirrel but such incidents were obviously rare. Leopard and raptors are also well known predators of the other hyrax genera (Maloiy & Eley, 1992).

Activity Pattern

Of the 39 questioned, only three had never seen a tree hyrax but most admitted that they only saw them occasionally, believing them to be primarily nocturnal. Since *D. arboreus* is the only hyrax of any genera present in Mau, no mis-identifications can have been made. Mostly the men had seen hyrax in early to mid morning although some also saw them in the late afternoon. Hyrax were usually observed inactive, basking in the sun although a few had been seen feeding, again either in the early morning or late afternoon. The number of sightings during daylight hours was, nonetheless, high for a nocturnal animal. It has been suggested that the tree hyrax is diurnal except in circumstances where it is subjected to hunting pressure, as was the case in Mau, and has adapted to nocturnal life as a survival strategy (Rudnai, 1984a). Alternatively nocturnality could be a strategy evolved against avian predators. In the Virunga Volcanoes where there are few large raptors, tree hyrax are often seen during the day (pers. obs.).

Social Structure

When asked how many hyrax they thought lived together in a tree some interviewees felt that it was dependent on the size and number of holes in the tree and that as many as ten individuals may co-habit. However most believed that tree hyrax lived in family groups comprised of an adult pair and their offspring, although evidence to support this belief was very scant.

Rock hyrax are gregarious animals living in colonies of 25–40 individuals whereas *Dendrohyrax* are considered more solitary, living singly or in small family groups (Kingdon, 1971). Kundaeli (1976b) established from observation of known animals that any occupied tree had only one tree hyrax, except for females with young of the year or trees with more than one independent cavity. This is also the situation in the Virungas (pers. obs.). The results found here

tend towards this rather than colonies. Most men were unable to say what the litter size of tree hyrax was but four believed it to be one–two young. No one knew how frequently hyrax bred.

Table 8. Distribution of men's responses to the question of how many hyrax live in each tree

1(+young)	2(+young)	>3
10	21	9

Territoriality

On the issue of territoriality, eight men said that they did not think a hyrax would defend its tree from others but 18 either thought they would or that there was no need for defence since every hyrax knew its own tree and which others were occupied. These latter answers both support the theory that tree hyrax are territorial. Furthermore, 15 men had seen and/or heard fights between individuals. It has also been suggested that the nocturnal calls may be territorial (Kingdon, 1971).

There was evidently some degree of seasonality to calling, suggesting it may also be associated with breeding. Twenty-six men claimed there was a season in which more calls were heard but if and how this corresponded to the wet and dry seasons was unclear. However April was named as being the month in which there was the most calling activity.

Table 9. Distribution of men's responses on questions of calling activity

	Yes	No	Call more	Call less	No diff.	Don't know
Seasonality	26	2	-	-	-	11
Dry season	-	-	10	12	-	17
Moonlight	-	-	6	3	7	23

Having been in Chekuborot during periods of full and new moon, it was my impression that brightness and moon phase had no influence on the degree of vocalisation. Apparently weather conditions do though, few hyrax will call while it is actually raining.

SUMMARY

Hyrax density was greatest in mixed forest with bamboo on the eastern side of South-West Mau where large trees with cavities were relatively more common. However, only small isolated patches of forest remained there. It was estimated that at least 127,000 tree hyrax existed within South-West Mau forest as a whole. Only about 40% of the forest-dwelling people were still hunting on a regular basis and of these only 25% hunted specifically for hyrax. The most common hunting method was to knock the animal from its tree with a stick, to be caught on the ground by dogs or another hunter. The average hunting off-take was about eight hyrax per man per year, with an estimated annual off-take for South-West Mau of about 16,000 hyrax. Hunting was probably not having a significant negative impact on the hyrax population. However, if numbers were limited by the availability of shelter, then forest degradation and the removal of large trees, especially hollow ones for bee hives, could have a more serious impact on the population.

Hyrax hunting was not important in the lives of 54% of those asked and of the remainder, most agreed that it was now less important than in previous generations. Restrictions on hyrax hunting were no longer imposed by the elders due to its small scale. Over 60% of the men spoken to ate hyrax meat, though many did so only occasionally. Hyrax was also widely used for medicinal purposes, especially to cure coughing in children. Skins are now only used for making ceremonial clothes.

The most important trees for hyrax to inhabit were *Podocarpus latifolius* and *Schefflera volkensii* with cavities. These trees were also among the 25 species of food plants named. Other than man, eagles were said to be the most important predator of tree hyrax. Hyrax were believed to be nocturnal yet they had been seen by over 90% of the men, either in the early morning or late afternoon. It was generally thought that hyrax lived in small family groups. Evidence was found of territorial behaviour and a distinct seasonality to nocturnal calling.

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Appendix 1: Clans of Interviewees & their Symbols
(* true Okiek, symbol, number of interviewees belonging to clan)

Kibasisek *	sun	5	Kipcheromek *	lion	5
Cheroikek *	monkey	5	Kibaek *	frog	1
Kimeitek *	elephant	1	Kibomuek	duiker	2
Komosek	baboon	1	Babuserek	buffalo	1
Kabarangwek	elephant	2	Narachek	sparrowhawk	1
Kabargesaek	duiker	1	Kiptebek	cr.crane	1
Musoswek	cr.crane	1	Kipmarusindet	baboon	1
Kapsengerek	mushroom	1	Kapnawoek	monkey	1
Talai	lion	1	Kimatage	buffalo	1
Kiblekemek	leopard	1	Kipkendek	bee	1
Kapecherek	baboon	2	Kapioria	hyaena	1
Kabroek	cr.crane	1			

Appendix 2: Trees Inhabited by Hyrax
(Vernacular names & botanical names)

Tinet	*Schefflera volkensii*	Saptet	*Podocarpus latifolius*
Tarakwet	*Juniperus procera*	Eburwet	*Maytenus undatus*
Emitiot	*Olea africana*	Lemeiyuit	*Szygium guineense*
Ewat	*Schefflera abyssinica*	Simotwet	*Ficus thonningii*
Rerendet	*Tabernaemontana stapfiana*		

Appendix 3: Food plants used by tree hyrax
(Vernacular & botanical names, plant part eaten is leaf (l) unless stated, f - fruit)

Tinet	*Schefflera volkensii* l, f	Tangotwet	*Ilex mitis*
Saptet	*Podocarpus latifolius* l, f	Tarakwet	*Juniperus procera* f
Tangotwet	*Ilex mitis*	Silibwet	*Dombeya torrida*
Lugumeito	*Macaranga kilimandscharica*	Ewat	*Schefflera abyssinica*
Ararwet	*Ekebergia capensis*	Emitiot	*Olea africana*
Lemeiyuit	*Szygium guineense*	Simotwet	*Ficus thonningii* l, f
Simbeywet	*Scutia myrtina*	Basiriat	*Rhus natalensis*
Nukiat	*Dovyalis abyssinica*	Tegat	*Arundinaria alpina*
Kibirirgorokiet	*Hypericum revolutum*	(immature)	
Sewerweriet	*Xymalos monospora*	Siriat	(shrub)
Chepindorwet	*Toddalia asiatica*	Setiot	*Mimulopsis* sp
Kimoiyat	*Ipomoea wightii*	Chepngurnguriet	*Senecio* sp
Meswat	*Sparrmannia ricinocarpa*	Chepkalenotiot	(tall herb)
Chachani	(climber)		