

A new population of de Brazza's monkey in Kenya

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*Until recently, de Brazza's monkey *Cercopithecus neglectus* was not known to occur in the Kakamega and Kisere forests of western Kenya. Today, four groups of successfully breeding de Brazza's monkeys have been identified with a possibility of more. Although this may make the future of this species in Kenya slightly less bleak, efforts to conserve these forests are desperately needed. Through the efforts of Kenya's President, about 4000 ha of these forests have been designated a national reserve, but this area is far too small to support the rare de Brazza's monkeys as well as many other threatened species of flora and fauna. The forests cover about 25,000 ha and more of this land should be set aside as a reserve.*

Introduction

Until recently, the geographical range of de Brazza's monkey *Cercopithecus neglectus* was believed to stretch from Cameroon in West Africa to as far east as the slopes of Mt Elgon in Kenya (Figure 1). Whereas the range is continuous from Zaire westwards, it occurs as isolated pockets of forests eastwards from Zaire. For example, in East Africa, the species is found in western Uganda and Mt Elgon, but nowhere in between. In 1962 the species was reported from the slopes of the Cherengani Hills (Booth, 1962). This increased the range by about 60 km east of Mt Elgon (Figure 2). Brown and Urban (1969) reported further sightings of de Brazza's monkeys in south-western Ethiopia, extending the range northwards by over 1500 km. No sightings have been reported between Cherengani and Ethiopia since 1969.

Kingdon (1971) suggests that *C. neglectus* is not a typical western African species. The de Brazza's monkey is a typical forest guenon with a preference for riverine or gallery forests (Brown and Urban, 1969; Dorst and Dandelot, 1970; Gautier-Hion and Gautier, 1978; Brennan, 1985). This species appears to be tolerant of high altitude and can be found as high as 2100 m on Mt Elgon (Kingdon, 1971) and 2000 m on the Cherengani Hills (Booth, 1962). It is absent, however, from the coastal forests of East Africa. Elsewhere, it has been reported to occur in closed forests, bamboo forests and along water courses of dry montane forest.

Today de Brazza's monkey is better known as 'swamp monkey' because of its association with swamp forests.

Prior to reports by Booth (1962), de Brazza's monkeys in Kenya were believed to be restricted to the western slopes of Mt Elgon. Booth pointed out that *C. neglectus* was very rare in Kenya, and expressed fears that the species would become extinct unless it was protected. Especially important was the fact that the Cherengani Hills lie within an agriculturally

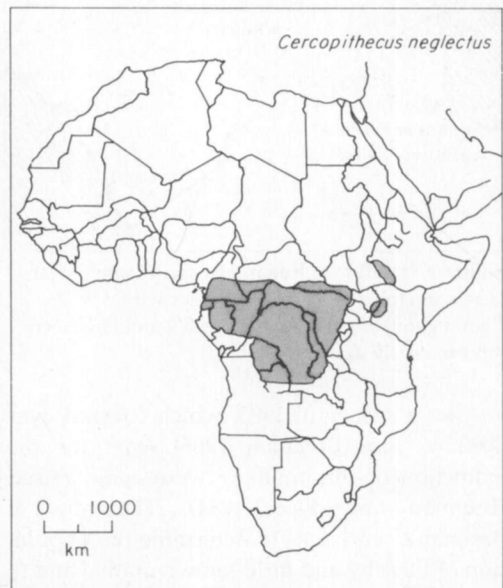


Figure 1. Suspected geographical range of de Brazza's monkey in Africa showing a continuous range in Central and West Africa, but a patchy distribution in East Africa.

fertile zone, which was settled by large-scale landholders in the 1960s. The result was fragmentation of the forest in this area. Except for the Saiwa Swamp Forest, a national reserve, almost all the land, including patches of forest in which de Brazza's monkeys are to be found in Cherengani, is privately owned. With their home ranges reduced, de Brazza's started raiding crops, mainly maize. Regarded as pests, they were heavily trapped and killed, resulting in a sharp decline in their population. Today de Brazza's monkeys still occur in these privately owned patches of forests, but hopes for a refuge are unlikely to be fulfilled in the near future.

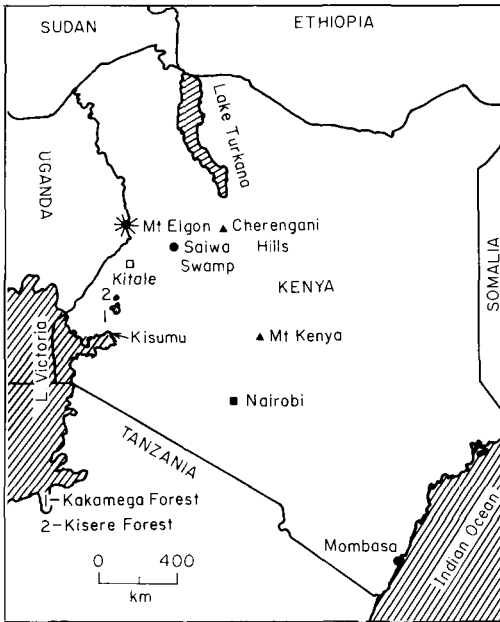


Figure 2. Location of Kakamega and Kisere Forests in relation to Lake Victoria together with Cherengani Hills where de Brazza's monkeys were reported early in the 1960s.

After a survey in 1983, which covered over 3000 sq km (Brennan, 1985) fears for the extinction of this monkey were again raised (Brennan and Else, 1984). The aim of Brennan's work was to determine the population of this shy and little-known animal and to make recommendations regarding its conservation in Kenya. The survey involved both population censuses and habitat evaluation. Results of this study were startling. It was esti-

mated that there were a little over 100 animals left in the wild in Kenya, most of which were on private land. It was recommended then that a research team be set up to look into the possibilities of translocating the animals from private land to suitable habitat elsewhere.

In the summer of 1984 the second author, while surveying Kakamega Forest, sighted a troop of de Brazza's monkeys in a fig tree (*Ficus thoningii*) by the Nandamaywa River in the northern Kisere Forest (Figure 3). A quick count revealed one adult male, four females, two large juveniles, two small juveniles and three infants. The presence of infants indicated that the group was breeding successfully.

In December 1987 a survey was carried out over a period of about 2 weeks in Kisere and the northern part of Kakamega forest. The main objective was to determine the status of the 1984 group and also to search the forests for more troops. In addition, Kakamega forest was to be assessed as a potential translocation site. The final objective was to confirm reports by local people of sightings of this monkey in Kakamega Forest.

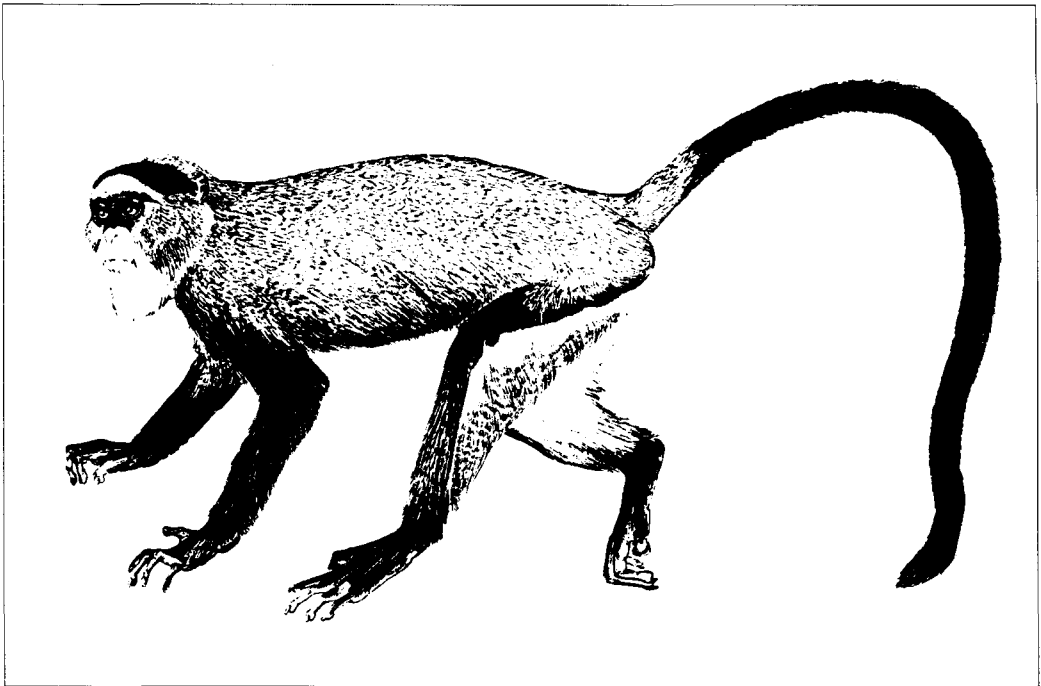
The study area

Kakamega and Kisere forests are situated in western Kenya, about 40 km north of Lake Victoria (Diamond, 1979; Oruko, 1979) (Figure 2). About 48 per cent of this forest is currently natural forest, the rest supporting plantation forests, grasslands and, until 1986, farmlands under shifting cultivation schemes (Diamond, 1979). Shifting cultivation was banned in 1986 by Kenya's President as a measure to support conservation.

Kakamega forest is a complex of five forests (Table 1; Figure 4). Rainfall averages about

Table 1. Forests in the Kakamega forest complex

| Forest | Area (ha) | % of total |
|----------|-----------|------------|
| Kakamega | 23,777 | 89.7 |
| Kisere | 484 | 1.8 |
| Malaba | 719 | 2.7 |
| Bunyala | 785 | 3.0 |
| Maragoli | 750 | 2.8 |



De Brazza's monkey.

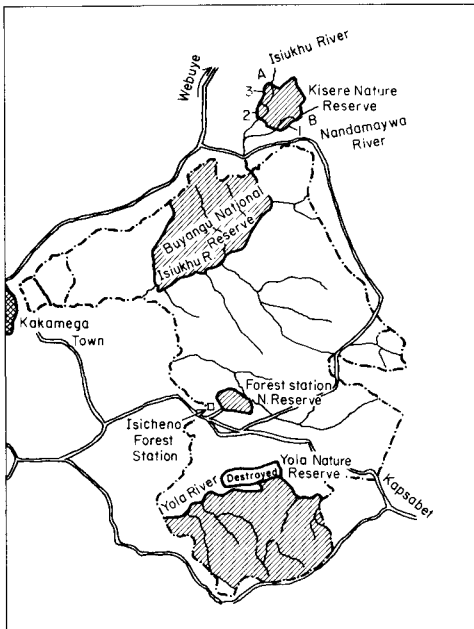


Figure 3. A map of the Kakamega Forest showing the three study groups – 1, 2, 3. The map also shows the newly established Buyangu or Kakamega National Reserve in the northern part of the forest.

2215 mm per year and is seasonal, with most falling between March and July and the rest in October and November. The average monthly maximum temperature is 18–29°C, while the average monthly minimum is 4–21°C.

Study animals and methods

De Brazza's monkeys are easily distinguished from other cercopithecines by their white face and beard, while the chestnut forehead is separated from the grey back by a narrow white band. They are sexually dimorphic with males, at 5.8–7.8 kg, bigger than females at 4.5–5.0 kg (Kingdon, 1971). Apart from a smaller body size and two distinct nipples in adult females, the colour pattern is the same for both sexes. Juveniles have brown or yellow-brown hair with a trace of white around the muzzle. De Brazza's monkeys have been reported to live in monogamous family units in Gabon (Gautier-Hion and Gautier, 1978).

Surveys were carried out in the morning using a pair of 10x40 Leitz binoculars. The first

Table 2. Composition of two groups of de Brazza's monkeys in Kakamega Forest

| Day | Adult males | Adult females | Large juveniles | Small juveniles | Infants | Uids | Total |
|----------------|-------------|---------------|-----------------|-----------------|---------|------|-------|
| Group 1 | | | | | | | |
| 1 | 1 | 3 | 2 | 2 | 1 | — | 9 |
| 2 | 1 | 2 | 2 | 3 | — | — | 8 |
| 3 | 1 | 4 | 4 | 3 | 1 | 1 | 14 |
| 4 | 1 | 2 | 3 | 2 | 1 | — | 9 |
| Group 2 | | | | | | | |
| 1 | 1 | 4 | 3 | 3 | 2 | 1 | 14 |
| 2 | 1 | 3 | 2 | 2 | 2 | — | 9 |
| 3 | 1 | 4 | 2 | 3 | 2 | — | 12 |
| 4 | 1 | 4 | 3 | 2 | 2 | — | 12 |

survey lasted for 6 days in Kisere Forest and 4 days in Kakamega Forest. Because of the shy and quiet nature of de Brazza's monkeys surveys were made by a single observer along and in the vicinity of river banks. Each observer walked quietly along a transect stopping every 100 m or less depending upon visibility. At every stop, the surrounding forest was inspected for sound and movement of monkeys. If a troop was located, the observer would sit for as long as monkeys were in

sight. Data on group composition and interactions, movement patterns, intertroop distances, foraging behaviour, and responses to predators were recorded. Plant food items were collected and stored in plastic bags for later identification.

Results

A total of four groups of de Brazza's monkeys were located, three in the Kisere Forest and one in Kakamega Forest. In Kisere Forest, two groups were located along the Isiukhu River (groups 2 and 3), which runs along the western edge of the forest (Figure 3). These two groups were timid and hard to follow. A third group (1) was located along the Nandamaywa River, which marks the southern boundary of the Kisere Forest (Figure 3). This group was more habituated and easier to watch. Censuses of one of the groups along the Isiukhu River and the one on the Nandamaywa River were made (see Figure 3, groups 2 and 3) on 4 consecutive days and the results are presented in Table 2.

The mean group size was 10.9. Both groups observed had a single adult male with several adult females, strongly suggesting a polygynous social organization. This is contrary to what has been reported among de Brazza's monkeys elsewhere in Africa. Further support for polygyny comes from the observations of several immature animals of similar ages in the groups, suggesting that all the females

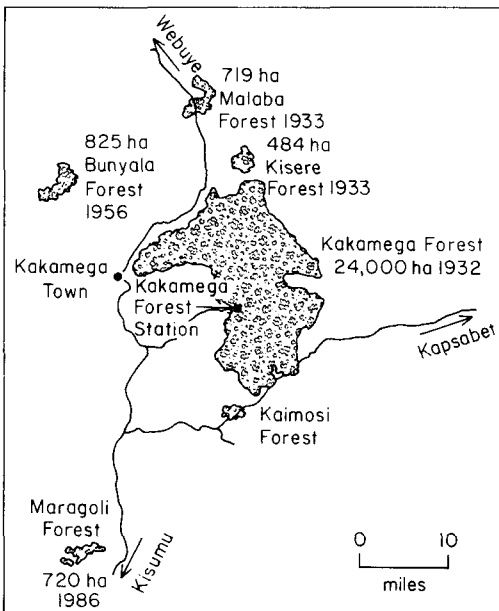


Figure 4. The constituent forests of the Kakamega Forest complex together with their location relative to the main Kakamega Forest and their relative hectareage.

Table 3. Plant species and parts eaten by group 2

| Plant species | Part eaten |
|----------------------------------|-------------------|
| <i>Markhamia platycalyx</i> | Flowers |
| <i>Celtis durandii</i> | Leaves, fruits |
| <i>Trichilia roka</i> | Leaves |
| <i>Albizia grandibracteata</i> | Seed pods, leaves |
| <i>Teclea nobilis</i> | Leaves |
| <i>Blighia unijugata</i> | Leaves |
| <i>Ficus thoningii</i> | Fruits, leaves |
| <i>Acacia abyssinica</i> | Seed pods |
| <i>Cassipourea ruwenzorensis</i> | Leaves, fruits |
| Unidentified | Leaves |

were breeding and were not merely subadults within a monogamous family unit.

The distance of groups from the river varied on a daily basis, depending on the availability of food resources. Monkeys on average were found within 30.26–46.52 m of the river. Ranging behaviour also varied depending on the time of day. The monkeys travelled more during the early morning and late evening, and were less active during mid-morning to

Table 4. Monkey species, other than de Brazza's, found in the Kakamega Forest

| English name | Scientific name |
|----------------------------------|----------------------------|
| Olive baboon | <i>Papio anubis</i> |
| Blue monkey | <i>Cercopithecus mitis</i> |
| Black-cheeked white-nosed monkey | <i>C. ascanius</i> |
| Black-and-white colobus | <i>Colobus guereza</i> |

late afternoon. A calculation of distance moved in 4 h of observation averaged 233 m, about 59 m per hour and, by extrapolation, about 500 m daily. Mean intergroup distance for the three groups in Kisere was about 0.8 km. The height in the canopy varied with the time of day; in the early morning they fed high up at about 20–30 m, descending to below 20 m by 1100 h. After this time they concentrated their activities in the thick undergrowth along the river where visibility was very poor.

Ten plant species were seen to be eaten by

group 2 during the observation period (constantly for 4 days) and these are shown in Table 3. The majority of these trees were not fruiting during the survey period, but they had young leaves, which the monkeys appeared to prefer. Monkeys were also observed feeding on insects along the river banks at about 5 m from the ground. Feeding was most intensive early in the morning and late in the afternoon. Incidences of farm raiding for maize were also reported by local people living next to the forest. De Brazza's, however, were not the only reported farm raiders. Other monkey species found in this forest were also reported to raid farms (Table 4). Although de Brazza's were never observed drinking water, reports by local people suggested that they do occasionally come down to the river to drink.

Although associations with other monkey species were not observed during the survey, they were first seen in 1984 among groups of blue monkeys and black-cheeked white-nosed monkeys in fruiting fig trees. Whether they were brought together by a common food source or were associating for other reasons (Cords, 1984) remains to be determined. Kingdon (1971) reported that these monkeys are not known to associate with other sympatric cercopithecine species, an observation first reported by Haddow (1952). A group of black-and-white colobus monkeys was on one occasion seen to tail the de Brazza's. No interactions between the two groups were observed.

During the surveys, two crowned hawk eagles *Stephanotus coronatus*, the only avian monkey predator in this forest, were observed hovering above one of the study groups. In one episode, one hawk eagle swooped into the middle of the group. The monkeys responded by dropping into the thick undergrowth and froze for about 15 minutes. After this, females were heard to make grunting-growling sounds. The males made barking noises during the encounter. The predatory attempt was unsuccessful. During normal feeding, the males were heard humming occasionally. Calls reported by Kingdon (1971) were not heard during this study.

Discussion

On the basis of the surveys reported here, the Kakamega and Kisere Forest are now known to contain resident groups of successfully reproducing de Brazza's monkeys. No previous surveys (e.g. Brennan, 1985) or accounts of distribution (Booth, 1962; Kingdon, 1971) mention the presence of de Brazza's monkeys in such an eastern locality. These new observations have two implications for Kakamega and Kisere Forests. First, these forests cannot be used as suitable translocation sites for the endangered Cherangani populations (e.g. Brennan, 1984). Second, an intensive drive for conservation of these forests needs to be initiated, and comprehensive studies of the fauna and flora carried out. Through the initiative of Kenya's President, 4000 ha of the Kakamega complex, including all Kisere Forest (500 ha), have been designated a National Reserve (Figure 4). This area is still far too small for a forest reserve and efforts should be made to increase the size of the protected area.

The observations made during this study also show behavioural patterns that contradict earlier findings that the species is monogamous (Quris, 1976; Gautier-Hion and Gautier, 1978). The presence of relatively habituated groups, which are easy to watch and follow, should enable further observations of this shy and rare monkey.

Acknowledgments

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References

- Booth, C. 1962. Some observations on the behaviour of *Cercopithecus* monkeys. *Ann. N. Y. Acad. Sci.* **102**, 477–487.
- Brennan, E.J. and Else, J.G. 1984. The status of Kenya's de Brazza's monkey: a need for immediate conservation efforts. *Int. J. Primat.* **5**, 324.
- Brennan, E.J. 1985. De Brazza's monkeys (*Cercopithecus neglectus*) in Kenya: census, distribution and conservation. *Amer. J. Primat.* **8**, 269–277.
- Brown, L.H. and Urban, E.K. 1969. De Brazza's monkey (*Cercopithecus neglectus* Schlegel) in the forest of south-western Ethiopia. *E. Afr. Wildl. J.* **7**, 174–175.
- Cords, M. 1984. Mixed species groups of *Cercopithecus* monkeys in the Kakamega Forest, Kenya. Ph.D. thesis, University of California, Berkeley.
- Diamond, T. 1979. Kakamega. *Swara*, **2**, 25–26.
- Dorst, J. and Dandelot, P. 1970. *A Field Guide to the Larger Mammals of East Africa*. Collins, London.
- Gautier-Hion, A. and Gautier, J.P. 1978. Le singe de Brazza: une strategie originale. *Z. Tierpsych.* **46**, 84–104.
- Haddow, A.J. 1952. Field and laboratory studies on an African monkey, *Cercopithecus ascanius schmidti* Mattschii. *Proc. Zool. Soc. London*, **122**, 297.
- Kingdon, J. 1971. *East African Mammals*. Cambridge University Press, Cambridge.
- Oruko, J.R. 1979. Kakamega Forest Station Annual Report.
- Quris, R. 1976. Donnees comparatives sur la socio-ecologie de Huit Especes de Cercopithecidae vivant dans une meme Zone de Forêt Primitive Periodiquement Inondee (Nord-est du Gabon). *La Terre et la Vie*, **30**, 193–209.
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