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A Previously Undescribed Mangabey from Southern Tanzania

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A new form of Cercocebus galeritus *is described. The new mangabey was discovered recently in the Uzungwe Mountains of Tanzania. It inhabits a restricted area of lowland and transitional rain forest on the steep, dissected, southeast-facing scarp slopes. In general appearance (size, shape, hair patterns, posture, gait), it closely resembles other forms of this species:* C. g. galeritus *from the Tana River gallery forests in Kenya and* C. g. agilis *from Gabon and Zaire. The pelage is intermediate in color between these two subspecies. Areas of bare skin differ markedly from the other* C. galeritus, *particularly the almost cream-colored face. Vocalizations are typical for* C. galeritus. *Preliminary field observations indicate that these mangabeys form multimale groups with a tendency to move as dissociated subparties, as is the case for* C. g. galeritus. *Although no formal classification is proposed, the evidence suggests that the new mangabey should join* C. g. galeritus, C. g. agilis *and* C. g. chrysogaster *as a fourth distinct form within the polytypic species* C. galeritus.

KEY WORDS: *Cercocebus galeritus*; Tanzania; new record; new form.

INTRODUCTION

In November 1979 a new form of mangabey was recorded in Southern Tanzania. This paper presents a detailed description based on

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field observations of one large group and close examination of a captive male juvenile (4 – 6 months old at the time). As the population appears to be very restricted in numbers and distribution, no type specimen has been collected. Although a preliminary discussion of taxonomy is presented, no formal name is proposed at this stage. The captive juvenile (Fig. 1) is now available for study at Mount Meru Game Sanctuary, Arusha, Tanzania.

Most authorities, following Schwarz (1928), classify the mangabeys under the single genus *Cercocebus* comprising two species groups. On the basis of morphological evidence, together with other worker's demonstrations of biochemical differences (Cronin and Sarich, 1976; Barnicot and Hewett-Emmett, 1972), Groves (1978) regards the

Fig. 1. The Sanje mangabey: a 6- to 8-month-old infant in captivity.

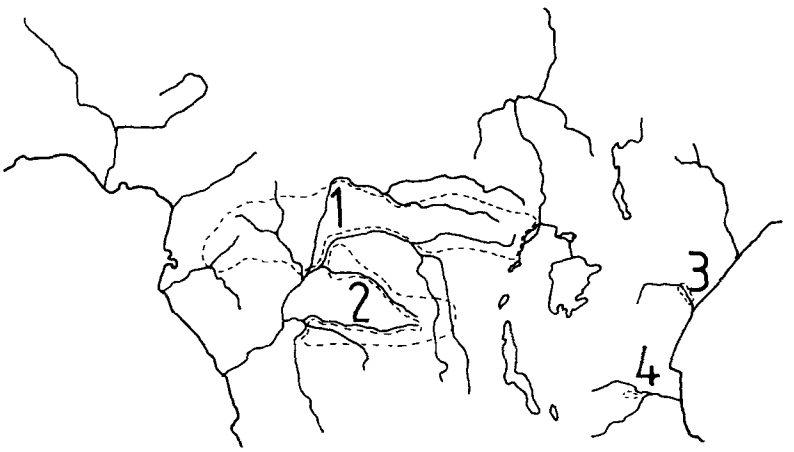

Fig. 2. Distribution of subspecies of *C. galeritus* [after Hill (1974) and Groves (1978)] and the locality for the Sanje mangabey. (1) *C. g. agilis;* (2) *C. g. chrysogaster;* (3) *C. g. galeritus;* (4) Sanje mangabey.

mangabeys as a diphyletic group and so proposes to divide them into two genera. According to his revision, the *albigena* species group would become genus *Lophocebus;* the *torquatus* group (including *galeritus*) would remain genus *Cercocebus.* This proposal has not as yet gained general acceptance and in the present paper we retain the established classification. Of the two groups, the *torquatus* group includes two species: *C. torquatus* with three subspecies and *C. galeritus* (Fig. 2) with three subspecies—*C. g. galeritus* (Tana River, Kenya), *C. g. agilis,* and *C. g. chrysogaster* (Congo forest block). Groves (1978) proposes to split the three *C. galeritus* subspecies into two species, one monotypic (*C. galeritus*) and one with two subspecies (*C. agilis agilis* and *C. agilis chrysogaster*). The classification used here is the established one; Groves' alternative is examined in our concluding discussion.

The new form was first sighted at Sanje Falls on the Sanje River in Mwanihana Forest Reserve at 900 m on the east scarp of the Uzungwa Mountains (7°46'S, 36°54'E). We refer to it in this paper as the Sanje Mangabey. Local names are "ngolaga" (Kihehe) and "makakou" (Kipogoro).

DESCRIPTIONS

The most immediately obvious feature distinguishing *torquatus*-group from *albigena*-group mangabeys is their pelage color, the former

being some shade of smoky or speckled gray or fawn, and the latter mainly black (Hill, 1974). The fawn color of the Sanje mangabey together with its posture and gait (it shows characteristic *torquatus*-group tail arch and downcurled tail) place it with the *torquatus* group, as do other features described below. Within the *torquatus* group, the Sanje mangabey aligns naturally with *C. galeritus* on the basis of pelage color (fawn/gray as in *C. g. agilis* and *C. g. galeritus* rather than the darker gray of *C. atys* and without the white collar of *C. torquatus*) and on the shape of the crown hair whorl (see below; Hill, 1974). The vocalizations of the Sanje mangabey (particularly the adult male's long-range call) are immediately and unequivocally recognizable as being of the sort distinctive of the *C. galeritus* group (Quris, 1975).

In general size and shape, the Sanje mangabey resembles *C. galeritus*. It shows clear sexual dimorphism, with the adult males being larger, more thickset, and longer-snouted than the females. The pelage is long, particularly over the back and shoulders. There is a whorl of hair toward the front of the crown; the hairs radiating from it are short and erect above the brow, but longer and swept backward behind. In full face view, the Sanje mangabey thus looks very much like *C. g. agilis* (Quris, 1975), but from the side it shows a longer backswept crest (though not as long as in *C. g. galeritus*).

In coloration, the Sanje mangabey is intermediate between *C. g. galeritus* and *C. g. agilis* in that the general color is a uniform smoky fawn brown with long banded hairs, giving a speckled appearance. The color pales through light yellow-brown (as in *C. g. agilis;* Hill, 1974) to cream on the underbelly, but is dark along the distal parts of the limbs and dorsal side of the tail. The bare skin of the face differs from other *C. geleritus* subspecies in its beige or pink/cream/gray coloring. Like most *C. g. galeritus,* the Sanje mangabey has white eyelids, clearly paler than the rest of the face, rather than the flesh-colored lids of *C. g. agilis* (Hill, 1974). The bare skin of the ears, hands, and feet is a darker gray-brown than the face, while the skin of the body is pale blue. There is a sharp demarcation between the pink/cream/gray skin of the face and the blue-white skin of the head and body. The ischial callosities and paracallosal skin are gray-brown with a pink tinge along the upper rim and are typical in shape for *C. galeritus:* separate in the female, fused in the male.

Individual hairs are variable. A typical hair from the back or flank has a black tip, a yellow band followed by a second black band (the hair is thickest and uneven in cross section at this point), and then tapers (rarely through an interposed yellow-gray band) to a long fine dark gray stem, becoming lighter along its length to a clear pale gray or colorless base. This banding creates a speckled appearance over the head, back, flanks, rump, limbs, and tail. The banding (and hence speckling) becomes

less conspicuous and the hairs lighter toward the ventral side. Hairs from the underbelly are mostly silky and cream-colored. The crown hairs are strongly banded except for the first line of hairs immediately above the brow, which is black. There are numerous dark gray and black vibrissae over the muzzle. Both the fur color and the shape of the crest are apparently intermediate between those of *C. g. agilis* and *C. g. galeritus.*

The most striking resemblance of the Sanje mangabey to *C. g. galeritus* comes not from its pelage but from its vocalizations. The loud call of the adult male Sanje mangabey is so close to that of the Tana race as to be qualitatively almost indistinguishable; there are obvious similarities to the calls of *C. g. agilis.* Field recordings await sonographic analysis and comparison of the three forms.

DISTRIBUTION, HABITAT, AND ECOLOGY

From a questionnaire study and series of site visits throughout the Uzungwas, it appears that the Sanje mangabey is restricted to an area of scarp forest less than 200 km^2 in extent. The forests are wet (rainfall of up to 2000 mm p.a.) and transitional between lowland and montane forest types. The area of Mwanihana Forest Reserve visited consists of tall primary forest to 35 m, on very steep slopes deeply dissected by frequent ravines with permanent streams. The canopy is diverse, although *Parinari excelsa, Erythrophleum suaveolens,* and *Albizia gummifera* are common. The understory is variable, the area we visited having a high density of fruiting *Bequartiodendron* and *Landolphia* which were obvious attractions to the mangabeys. There are major changes in forest vegetation structure and composition between valley, slope, and ridge locations.

We observed mangabeys from ground level to the canopy tops; they also forage along streams (reportedly searching for freshwater crabs and other items under stones). They are not known to raid cultivation and appear restricted to the tall forest.

The group we observed consisted of at least 20 individuals including a minimum of 3 males, 5 adult females (3 of which had clinging infants), 2 unidentified adults, and several juveniles. Vocalizations made it clear that there were at least 3 adult males in the group, but the lack of any distant or answering calls indicates that there were no other groups within at least a 0.5-km radius, which suggests a low group density. From 12 days' random census walks within the same 4.5-km^2 area, we derived an estimate of 0.6 groups per km^2. Although no satisfactory group counts could be made, if an average group size of 25 (as for *C. g. galeritus;* Homewood, 1976) or 15–20 (*C. g. agilis*; Quris, 1980) is assumed, the total mangabey population does not exceed 1800–3000 individuals and

may be considerably less. The Sanje mangabey is sympatric with low-density populations of red colobus (*C. badius gordonorum*), black and white colobus (*C. angolensis palliatus*), and Sykes' monkeys (*Cercopithecus mitis*). Vervet monkeys (*C. aethiops*) and yellow baboons (*Papio cynocephalus*) occur on the forest–savanna edge. The forest primates are all hunted for meat by the Wahehe people of the Uzungwas; mangabeys are caught with dogs and nets, and occasionally are mistaken for vervets or baboons and killed as crop pests.

DISCUSSION

In the absence of a type specimen, it would be poor systematic practice to name the Sanje mangabey formally; and the taxonomic authorities whom we have consulted are most reluctant to accept as type specimen a live tame individual (which, being captive-raised, may be atypical and, being live, could be easily lost or destroyed). However, field biologists, biogeographers, and conservationists will need information, however preliminary, as to its taxonomic relations. Conservation needs are especially urgent: Mwanihana Forest Reserve is at present satisfactorily protected, but land and timber pressures are increasing and the population size of the Sanje mangabey is dangerously small. Local and international conservation agencies need a label to which their energies can be channeled. For practical purposes, therefore, a preliminary discussion of the taxonomic position of the Sanje mangabey is given here.

Physical appearance, coloring, vocalizations, behavior, and ecology indicate its affinities with *Cercocebus galeritus.* There are similarities both to *C. g. galeritus* and to *C. g. agilis,* but differences in external appearance would suggest a separate status at the subspecific level (Mayr, 1969).

A recent paper (Groves, 1978) suggests a revised classification of the mangabeys which *inter alia* proposes to reasign the three *Cercocebus galeritus* subspecies into two species: *C. galeritus* for the Kenya form and *C. agilis,* with two subspecies, for the Congo forest forms. As this revision would require aligning the Sanje mangabey with either "*C. galeritus*" or "*C. agilis,*" we consider it briefly here.

Groves suggests that on the basis of skull morphology, color, hair tracts, facial appearance, biogeography, and points of ecology and behavior, *C. g. galeritus* differs as greatly from *C. g. agilis* and *C. g. chrysogaster* as does *C. torquatus.* However, his sample of *C. g. galeritus* material (one male, two females) is hardly adequate to demonstrate meaningful differences in skull size from the other two subspecies, particularly in view of the similarities between the female skulls. Differences from *C.*

g. agilis in color patterns and hair tracts are as striking for *C. g. chrysogaster* as they are for *C. g. galeritus* (Hill, 1974). Biogeographical discontinuity is a recognized basis for proposing subspecific rank (Mayr, 1969; Kingdon, 1971), but full specific rank requires considerable morphological differences as well. The degree of variation in ranging behavior, densities, etc., quoted by Groves (1978, p. 19) as an indication of a specific difference between the Kenya and Congo populations is of an order commonly seen intraspecifically in forest primates (Waser and Floody, 1974; Clutton-Brock, 1977). There are possible differences in social organization, but this aspect of *C. g. agilis* was studied under extreme conditions at the very edge of its geographical range. Work on a population from a new study locality indicates that some of these differences may not hold; for example, *C. g. agilis* like *C. g. galeritus* could have more than one male per group (Quris, 1980), contrary to earlier ideas (Quris, 1975; Groves, 1978). As there is no information on group structure and organization in *C. g. chrysogaster,* there is little justification in using this as a basis for the proposed taxonomic distinction.

The existence of the Sanje mangabey has interesting implications for biogeography. Kingdon (1971, 1980) has examined possible refuges and routes whereby forest mammals might have spread from Central Africa to East African forests during Pleistocene periods of climatic amelioration and forest expansion. Other workers, reviewed by Hamilton (1976; Diamond and Hamilton, 1980), have done the same for other animal and plant groups. The consensus is that the southern route via the ancient block-faulted crystalline mountain ranges of Tanzania (of which the Uzungwas are one) provided stable if minor refuges, allowing the survival of some species, and (during warmer, wetter periods) forest spread with colonization of species, in some cases as far east as the coastal forests of Tanzania and Kenya. By contrast, the forests north of Lake Victoria are thought (from their low endemism) to have disappeared completely in drier periods (Diamond and Hamilton, 1980); there is no clear indication of any forest mammals having colonized the coast via the northern route. The Sanje mangabey would in this case be intermediate rather than peripheral in biographical terms, as it is situated along the southern mountain chain linking the major East Zaire refuge (with *C. g. agilis*) to the coastal forest (with *C. g. galeritus*). A more detailed discussion of this and alternative possibilities is presented in a forthcoming paper analyzing the distribution of 74 mammal species in 17 East African forest sites.

The Sanje mangabey is intermediate between *Cercocebus galeritus galeritus* and *Cercocebus galeritus agilis,* in fur color, appearance, and perhaps biogeographical location, as well as showing some direct

resemblances to both. It differs strikingly from all other *C. galeritus* in its beige rather than black facial color. Its status must remain in doubt until suitable type material becomes available, but on present evidence it would appear to fall naturally into the established classification of *Cercocebus galeritus* as a new subspecies within a polytypic species (Hill, 1974; Napier and Napier, 1967).

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REFERENCES

Barnicot, N. A., and Hewett-Emmett, D. (1972). Red cell and serum proteins of *Cercocebus, Presbytis, Colobus* and certain other species. *Folia Primatol.* 17: 442.

Clutton-Brock, T. H. (ed.) (1977). *Primate Ecology. Studies of Feeding and Ranging Behaviour in Lemurs, Monkeys and Apes,* Academic Press, London.

Cronin, J., and Sarich, V. (1976). Molecular evidence for dual origin of mangabeys among Old World monkeys. *Nature* 260: 700-702.

Diamond, A., and Hamilton, A. (1980). The distribution of forest passerine birds and Quaternary climatic change in tropical Africa. *J. Zool. (Lond.)* 191: 379-402.

Groves, C. P. (1978). Phylogenetic and population systematics of the mangabeys (Primates: Cercopithecoidea). *Primates* 19(1): 1-34.

Hamilton, A. (1976). The significance of patterns of distribution shown by forest plants and animals in tropical Africa for the reconstruction of upper Pleistocene palaeoenvironments: A review. In van Zinderen Bakker, E. M. (ed.), *Palaeoecology of Africa IX,* Balkema, Cape Town, pp. 63-97.

Hill, W. C. O. (1974). *Primates: Comparative Anatomy and Taxonomy, Vol. VII. Cynopithecinae,* Edinburgh University Press, Edinburgh.

Homewood, K. M. (1976). *Ecology and Behaviour of the Tana Mangabey* (Cerocebus galeritus galeritus), Ph.D. thesis, University of London, London.

Homewood, K. M. (1978). Feeding strategy of the Tana mangabey (*Cercocebus galeritus galeritus*) (Mammalia: Primates). *J. Zool.* (London) 186: 375-391.

Kingdon, J. (1971). *East African Mammals: An Atlas of Evolution, Vol. I,* Academic Press, London.

Kingdon, J. (1980). Where have the colonists come from? A zoogeographical examination of some mammalian isolates in eastern Africa. *Afr. J. Ecol.* 18.

Mayr, E. (1969). *Principles of Systematic Zoology,* McGraw – Hill, New York.

Napier, J. R., and Napier, P. H. (1967). *Handbook of Living Primates,* Academic Press, London.

Quris, R. (1975). Écologie et organisation sociale de *Cercocebus galeritus agilis* dans le nord-est du Gabon. *Terre Vie* 27: 232-267.

Quris, R. (1980). Émission vocale de forte intensité chez *Cercocebus galeritus agilis:* structure, caractéristiques specifiques et individuelles, modes d'émission. *Mammalia* 44(1): 35-50.

Schwarz, E. (1928). The species of the genus *Cercocebus. Ann. Mag. Nat. Hist.* (10)1: 664-670.

Waser, P. M., and Floody, O. (1974). Ranging patterns of the Mangabey *Cercocebus albigena* in the Kibale Forest, Uganda. *Z. Tierpsychol.* 35: 85-101.