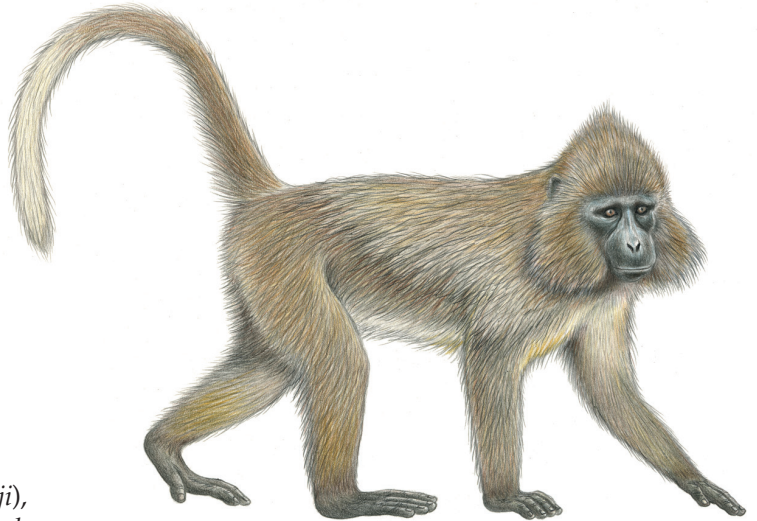


Kipunji

Rungwecebus kipunji (Ehardt, Butynski, Jones & Davenport in Jones *et al.*, 2005)

Tanzania
(2006, 2008)

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The discovery of the kipunji (*Rungwecebus kipunji*), a monkey endemic to southern Tanzania (Jones *et al.* 2005; Davenport *et al.* 2006), demonstrated how much there is still to learn about Africa's forests, as well as the continent's primate fauna. Kipunji were first found by teams working in the Southern Highlands and Udzungwa Mountains in 2003 and 2004, respectively (Jones *et al.* 2005; Davenport 2005, 2006; Davenport and Jones 2005; Davenport *et al.* 2005, 2006), sites that are some 350 km apart. Although initially placed in the genus *Lophocebus* (Jones *et al.* 2005), subsequent molecular and morphological analyses led to the monkey's placement in a new monospecific genus *Rungwecebus*, making it the first new genus of African monkey to be described in 83 years (Davenport *et al.* 2006). Further molecular studies have corroborated the validity of the genus (Olson *et al.* 2008) and anatomical investigations are under way.

More importantly, however, the kipunji is one of the world's most threatened primates, as demonstrated by a recent census that provided the first systematically-derived data on the animal's abundance and distribution (Davenport *et al.* 2008). Kipunji are cryptic, rare, primarily arboreal and in urgent need of conservation attention (Davenport *et al.* 2006; Davenport and Jones 2005), and consequently a complete count after a long-term survey was made, ensuring a much more accurate population estimate (Davenport *et al.* 2008). The census demonstrated that the kipunji is probably Africa's rarest monkey, and provided empirical data in support of its official designation as 'Critically Endangered' on the 2008 IUCN Red List, with the genus facing an extremely high risk of extinction in the wild (Davenport *et al.* 2008; Davenport and Jones 2008).

The kipunji is restricted to a number of discrete portions of the forests of Mt. Rungwe and the adjacent Livingstone (in Kitulo National Park) in the Southern Highlands, and the Vikongwa area of the Ndundulu

forest (in the new Kilombero Nature Reserve) in the Udzungwa Mountains. The Mt. Rungwe-Livingstone population occupies degraded submontane and montane forest between 1,750 and 2,450 m above sea level, whereas the Ndundulu population lives between 1,300 and 1,750 m above sea level in submontane forest (Davenport *et al.* 2006, 2008). Kipunji have not been recorded in the Udzungwa Mountains National Park itself, the closest record being 1.9 km outside the park boundary (Jones 2006). Despite extensive surveys, kipunji have not been recorded from other forests in either the Southern Highlands or the Udzungwa Mountains.

During the census, a total of 34 kipunji groups were identified in the Southern Highlands with an estimated total population of 1,042. Of these, 501 individuals in 16 groups were counted in Mt. Rungwe and 541 individuals from 18 groups in the Livingstone forest of Kitulo National Park. In Ndundulu, just four groups were identified with an estimated total of 75 animals. The total global population of the kipunji therefore, is estimated to be just 1,117 animals, living in some 38 groups (Davenport *et al.* 2008). During the same surveys, the Areas of Occupancy (AoO) for Mt. Rungwe, Livingstone Forest and Ndundulu were estimated to be 671 ha, 408 ha and 199 ha, respectively. The total for Rungwe-Kitulo therefore was 1,079 ha, and the total species' AoO was 1,278 ha based on data collected over three years (Davenport *et al.* 2008). Meanwhile the Extents of Occurrence (EoO) for kipunji for Mt. Rungwe, Livingstone and Ndundulu were 815 ha, 425 ha, and 528 ha, respectively. The total for Rungwe-Kitulo was 1,241 ha and the total species EoO was estimated to be 1,769 ha (Davenport *et al.* 2008).

A total population of just 1,117 animals is very

small. As reported elsewhere, both the Mt. Rungwe and Livingstone forests are heavily degraded (Davenport 2005, 2006; Davenport and Jones 2005) and remote sensing analysis of forest cover has demonstrated that the extent of habitat connection between the various groups is extremely tenuous. Indeed the Mt. Rungwe-Kitulo portion of the population consists of a number of isolated sub-populations and this is compounded by the poor condition of the narrow Bujingijila Corridor that joins Mt. Rungwe and Livingstone (Davenport 2005). With the loss of this corridor, the Mt. Rungwe-Kitulo population will be further fragmented. Furthermore, and in addition to the continuing loss of habitat, this population continues to be hunted (Davenport 2005, 2006; Davenport *et al.* 2005).

The fragile status of the population in Ndundulu is particularly worrying and its causes remain unknown. However, given current thinking on primate population sizes, it may be that this population is no longer viable (Davenport *et al.* 2008). The recent census also revealed an interesting and statistically significant difference in mean group size between the Rungwe-Kitulo and the Ndundulu populations (Davenport *et al.* 2008). This may be due to the small total population size in Ndundulu, or to fragmentation, reduced resource patches and food availability in Rungwe-Kitulo, as demonstrated in other primate species. Either way, the kipunji is more sparsely distributed than initially thought (Jones *et al.* 2005). The total EoO (species range) is just 17.69 km² giving grounds for much conservation concern, and being considerably less than the 100 km² required to fulfill the 'Critically Endangered' criterion of the IUCN Red List.

An estimated 541 individuals reside in Livingstone, a forest that has been incorporated into Kitulo National Park. This should significantly improve protection for the kipunji groups in this area, although the forest is severely degraded (Davenport 2006), and illegal activities, including logging and hunting of primates, are only now being brought under control. A new management plan for Kitulo National Park has recently been produced, in which the mandate for research and monitoring of the kipunji falls to the Wildlife Conservation Society (WCS). There are no immediate plans for habituation of the animal for tourism until appropriate and thorough research has been carried out on its potential impacts. However, a section of forest contiguous with Mt Rungwe, and containing groups of kipunji, is now being leased to, and managed by, WCS. The kipunji here are being studied and monitored full time by WCS staff as well as national and international students.

More than 51% of the total kipunji population lives in forests with comparatively little management. However, there are grounds for optimism. Ndundulu

Forest Reserve was absorbed by the new Kilombero Nature Reserve in 2007 (Marshall *et al.* 2007) under the auspices of the Forestry and Beekeeping Division of the Ministry of Natural Resources and Tourism. Similarly, Mt. Rungwe, so long a neglected Catchment Forest Reserve, is now in the final stages of becoming a nature reserve as well. This will complement the adjacent national park and enable community involvement. A management plan is currently being written, and reserve rangers have recently been hired and trained. It will, however, be some time until illegal activities are brought under control, even with full resources at the authority's disposal.

On Mt. Rungwe, where forest clearance, hunting and fragmentation pose the most serious threats (Machaga *et al.* 2005), the reasons for the animal's discrete distribution are being studied. Moreover, research is being carried out on aspects of the kipunji's social and reproductive behaviour, feeding ecology, home range dynamics, predation and demography. Across Rungwe-Kitulo, the isolated sub-populations may already be subject to a loss of genetic variability due to low effective breeding populations. Some may no longer be viable and this is also under investigation.

Southern Ndundulu, meanwhile, is in excellent condition due chiefly to its remote location (Davenport and Jones 2005). However, the long-term viability of the 7% of the kipunji population must be considered uncertain, at best. It is possible that this population is simply dying out 'naturally', but research into the reasons for, and the viability of, the small Udzungwa population is ongoing. Whether any tangible primate conservation measures could or should be applied in a largely undisturbed habitat is debatable. The focus of applied kipunji conservation work is currently the protection and restoration of the montane forest habitats of Mt. Rungwe, widespread environmental education, and support to both management authorities and local communities across the range.

References

- Davenport, T. R. B. 2005. Finding kipunji. *Africa Geographic* 13(7): 56–61.
- Davenport, T. R. B. 2006. Plants, primates and people. Conservation in the Southern Highlands of Tanzania. *Miombo* (28):7–8.
- Davenport, T. R. B. and T. M. Butynski. In press. The kipunji *Rungwecebus kipunji*. In: *Mammals of Africa*. Elsevier Press, New York.
- Davenport, T. R. B. and T. Jones. 2005. The highland mangabey—Africa's first new monkey for 20 years further illustrates the exceptional value of Tanzania's forests. *Arc Journal* 20: 1–6.
- Davenport, T.R.B. and T. Jones. 2008. The Critically Endangered kipunji *Rungwecebus kipunji*. IUCN RedList. Website: <<http://www.iucnredlist.org>>.
- Davenport, T. R. B., T. Jones, N. E. Mpunga, S. J. Machaga,

- D. W. De Luca, R. Laizzer, A. Mndeme and W. S. Mwakilema. 2005. The highland mangabey *Lophocebus kipunji*, Africa's 'newest' monkey. Unpublished Proceedings of the Fifth Annual Scientific Conference, Tanzania Wildlife Research Institute, Arusha.
- Davenport, T. R. B., W. T. Stanley, E. J. Sargis, D. W. De Luca, N. E. Mpunga, S. J. Machaga and L. E. Olson. 2006. A new genus of African monkey, *Rungwecebus*: morphology, ecology, and molecular phylogenetics. *Science* 312: 1378–1381.
- Davenport, T. R. B., D. W. De Luca, T. Jones, N. E. Mpunga, S. Machaga and G. Picton-Phillipps. 2008. The kipunji *Rungwecebus kipunji* of southern Tanzania: first census and assessments of distribution and conservation status. *Oryx* 42(3): 352–359.
- Jones T. P. 2006. Kipunji in Ndundulu Forest, Tanzania: distribution, abundance and conservation status. Unpublished report for Critical Ecosystems Partnership Fund (CEPF), Washington, DC, Fauna and Flora International (FFI), Cambridge, UK, and the Wildlife Conservation Society (WCS), New York. 28pp.
- Jones, T. P., C. L. Ehardt, T. M. Butynski, T. R. B. Davenport, N. E. Mpunga, S. J. Machaga and D. W. De Luca. 2005. The highland mangabey *Lophocebus kipunji*: a new species of African monkey. *Science* 308: 1161–1164.
- Machaga, S. J., A. A. Massawe and T. R. B. Davenport. 2005. Food, fuel and fitness. Quantifying natural resource use on Mt Rungwe. *Proceedings of the Fifth Annual Scientific Conference, 2005*. Tanzania Wildlife Research Institute, Arusha, Tanzania.
- Marshall, A. R., Z. Aloyce, S. Mariki, T. Jones, N. Burgess, F. Kilahama, J. Massao, E. Nashanda, C. Sawe, F. Rovero and J. Watkin. Tanzania's second nature reserve: improving the conservation status of the Udzungwa Mountains? *Oryx* 41: 429–430.
- Olson, L. E., E. J. Sargis, W. T. Stanley, K. P. B. Hildebrandt and T. R. B. Davenport. 2008. Additional molecular evidence strongly supports the distinction between the recently described African primate *Rungwecebus kipunji* (Cercopithecidae, Papionini) and *Lophocebus*. *Molecular Phylogenetics and Evolution* 48: 789–794.
- Rovero, F., A. R. Marshall, T. Jones and A. Perkin. 2009. The primates of the Udzungwa Mountains: diversity, ecology and conservation. *Journal of Anthropological Sciences* 87: 93–126.