# *Pan* Africa News

The Newsletter of the Committee for the Care and Conservation of Chimpanzees, and the Mahale Wildlife Conservation Society

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**Instructions to Authors:**

Pan Africa News publishes articles, notes, reviews, forums, news, essays, book reviews, letters to editor, and classified ads on any aspect of conservation and research regarding chimpanzees (*Pan troglodytes*) and bilias (*P. paniscus*). Contributors are requested to write in English and the papers except forums, reviews and essays should usually be 1,000 words or less. Manuscripts should be submitted by e-mail to:

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Photos and figures, however, should be sent by air mail to: T. Nishida, Department of Zoology, Graduate School of Science, Kyoto University, Kitashirakawa Oiwakechou, Sakyo, Kyoto, 606-8502, Japan.

Publication of the next issue will be **June 2006**. Deadline for manuscripts is the **end of April**.

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## <NOTE>

# Current Status of Bonobos and Other Large Mammals in the Proposed Forest Reserve of Lomako-Yokokala, Equateur Province, Democratic Republic of Congo.

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## INTRODUCTION

The priorities that are generally identified in conservation action plans for improving the conservation status of Bonobo (*Pan paniscus*) include a better understanding of their distribution, identification of key areas of high population densities, evaluation of the ecological status of their habitat, evaluating the fragmentation of population and quantification and mitigation of threats to their conservation status[1, 2].

One area that has been identified as critical for the conservation of bonobo is the forest block Lomako-Yokokala (21°05'E, 00°50'N) - situated in the Equateur Province in the "territoire of Befale, District de la Tshuapa and the territoire de Bongandanga, District de la Mongala" (Figure 1). This area historically harbours important populations of bonobos (*Pan paniscus*), seven other species of primates, potential high densities of Congo peafowl (*Afropavo congensis*) and other flagship species as the golden cat (*Felis aurata*), the water chevrotain (*Hyemoschus aquaticus*) and the giant pangolin (*Manis gigantea*)[1, 3, 4]. This forest block of about 3,600 km$^2$ has been identified by the Congolese Institute for Nature Conservation (ICCN) as an area that should receive a protected status[5].

Initiatives to create a protected forest Reserve between the Lomako and the Yekokola rivers have never been finalized, due to the instability in the country. At the same time, the human pressure on the proposed reserve has increased, and the most recent reports of the bonobo's current status are alarming[6].

The proposed Reserve is situated in the Maringa Lopori Wamba (MLW) landscape. This is one of the 11 landscapes on which the activities within the Congo Basin Forest Partnership (CBFP) (which is mainly CARPE/ USAID-funded) are focussed. Activities within the MLW landscape are coordinated by the African Wildlife Foundation (AWF), and set up in partnership with CARE-International and Conservation International (www.awf.org). The main objectives of the strategy in this landscape are a reduction to the destruction of the tropical rainforest and an increase in sustainable use of the natural resources. One of the specific objectives of the partnership between ICCN and AWF is the creation of the Lomako-Yokokala Reserve.

Before commencing with the gazetting of a protected area, it is necessary to evaluate the existing (or remaining) biodiversity in the region and to identify the priority areas for biodiversity conservation. For this reason, a preliminary biodiversity survey was carried out in August-October 2004. The survey implemented a quantitative bonobo and large mammal survey in two specific forest plots (Figure 1). The first plot (L-plot), situated along the Lomako river (21°4'E; 0°55'N - 21°12'E; 0°48'N), covered the former bonobo study areas that have been active since the 70's. A last visit of this area indicated potential eradication of fauna[6]. The second plot (Y-plot) is situated along the Yokokala river (21°15'E; 1°6'N - 21°21'E; 1°3'N) and has been reported to be subject to intensive hunting by population immigrating from the north. As immigration and permanent settlement of a growing group of hunters has been reported[7], a directed search for hunting camps was simultaneously conducted in the forest extending between both blocks surveyed for large mammals.

## METHODOLOGY

The survey was carried out in August-October 2004. The Standing Crop Bed (Nest) Count was used, along straight line transects for the estimation of bonobo densities and for the calculation of Indices of Abundance

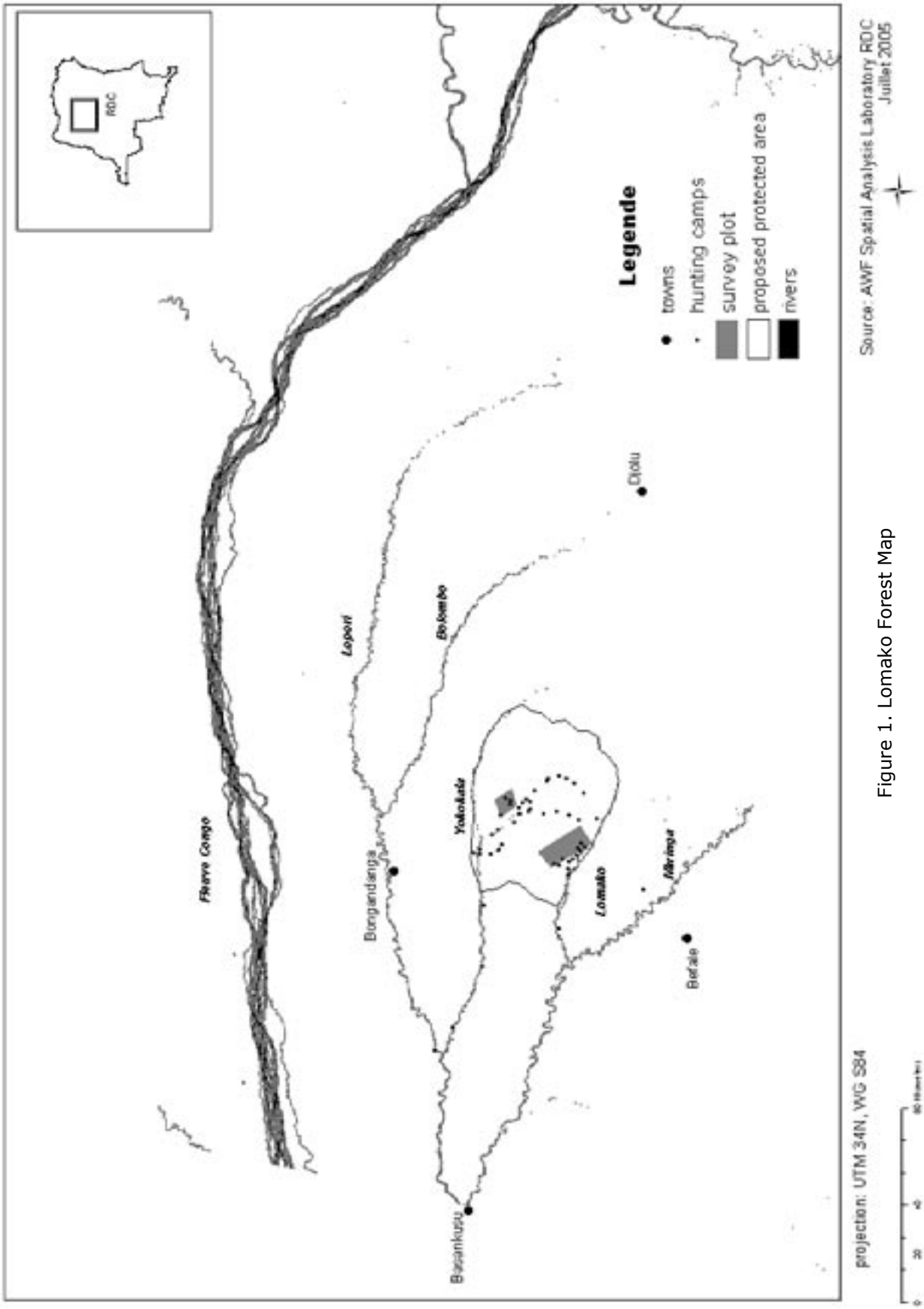


Figure 1. Lomako Forest Map

Table 1. Indices of Abundances per Kilometer (IAK) for flagship species encountered during the surveys in the Lomako-Yokokala forest block.

| Species | IAK (L-plot) | IAK (Y-plot) | IAK total |
|---|---|---|---|
| *Pan paniscus* | 6.54 | 0.95 | 4.41 |
| *Afropavo congensis* | 0.10 | 0.13 | 0.15 |
| *Cephalophus dorsalis* | 0.23 | 0.38 | 0.40 |
| *Manis gigantea* | 0.05 | 0.03 | 0.05 |
| *Panthera pardus* | 0.05 | 0.03 | 0.05 |
| *Syncerus caffer nanus* | 0.02 | 0.00 | 0.01 |
| *Tragelaphus euryceros* | 0.03 | 0.75 | 0.50 |
| *Hyemoschus aquaticus* | 0.05 | 0.03 | 0.05 |

per Kilometer (IAK) of large mammals and flagship species (such as Congo peafowl). The survey was carried out along 21 transects of 5 km:13 in the L-plot, 8 in the Y-plot. Bed data were analyzed with Distance Sampling[8]. Selection of the model that fits best the detection function is based on the AIC-criterion.

Local guides indicated the presence of hunting camps that were visited in a forest block of about 1,440 km$^2$, stretched between the Yokokala and the Lomako rivers. At each camp, GPS-points were taken, estimates were made of the number of inhabitants and their ethnic origin was recorded.

## RESULTS

425 bonobo beds (76 bed sites) were recorded along 65 km of transects in the L-plot, vs. 38 beds (9 bed sites) along 40 km of transects in the Y-plot. Distance analysis estimates 81 beds/km$^2$ in the L-plot, and 12 beds/km$^2$ in the Y-plot, resp. When using the conventional bed decay rate of 113 days, one calculates cautiously 0.7 ind/km$^2$ in the L-plot, vs. 0.1 ind/km$^2$ in the Y-plot. The estimated strip width (ESW) in the L-plot was 39 m, vs. 30 m in the Y-plot.

While bonobo densities are remarkably higher in the southern plot, the opposite is true for traces of bongo (*Tragelaphus euryceros*) (Table 1). Little difference was found in IAK's for other large mammals. Signs of the endemic Congo peacock were also recorded at both sites.

35 hunting camps were recorded. The number of people living in these campsites varies between an estimated 7 and 190 inhabitants, totalling almost 1000 people. About 90% of those people belong to the Ngombe ethnic group and only about 10% are Mongo. The principal activity in these camps is hunting. Hunting is done mainly with snares, but guns and "litimbo" i.e. poisoned arrows, were also used.

## DISCUSSION

The surveys indicate that the proposed Reserve still holds considerable potential for bonobo and large mammal conservation. The relatively high bonobo densities in the southern plot are encouraging, although the low densities in the northern plot confirm the concerns raised by previous surveys. It is not clear, however, whether the differences in densities are related to differential hunting pressures, or whether they refer to patchy distribution due to varying ecological parameters. Considerable differences were observed in ESW between both plots, indicating that different vegetation patterns might be causal factors for the patchiness of the bonobo distribution. While the bonobo population is denser in the plot along the Lomako river, a far greater number of

signs of bongo were found along the Yokokala river.

While the biodiversity potential of this forested area still seems to be present, the same can also be said for the threats. Creation of a protected area will have to deal with a significant human population that has settled in this forest block over the last two decades. Most hunters are Ngombe people that are considered as non-autochtonous, as opposite to the Mongo people. In addition, the eastern part of the proposed Reserve is inhabited by Kitiwalist, a religious sect with their own particular set of conditions. A participatory approach involving all the different potential stakeholders involved will be critical to the success of this initiative and help avoid conflicts.

AWF continues to support the ICCN in the creation of the proposed Reserve. At the time of writing, the first meetings for the creation of a CoCoSi (Comité pour la Conservation de Site) - a coordinating committee bringing together all the key stakeholders were held. The CoCoSi will bring together representatives of the local people, other partners, and ICCN. In addition, a mission to start the process of demarcating and digitizing the boundaries of the proposed reserve is currently being organised, together with the ICCN.

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## <NOTE>

## Introduction of Seasonal Park Fee System to Mahale Mountains National Park: A Proposal.


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Since the Mahale Mountains National Park was established in 1985, the number of tourists visiting it has increased gradually (Figure 1). In 2002, the park welcomed over 400 visitors a year. Of course, this figure seems very small considering the capacity of the park, whose area exceeds 1,600 $km^2$.

However, even this apparently low usage rate is not really low from the viewpoint of the welfare of chimpanzees: because these tourists visit only a tiny portion of the park (c. 10 $km^2$ within the study area of the M-group chimpanzees), their interest in the park revolves around chimpanzee watching (Figure 2), and their visits are concentrated in the dry season from July to October. The chimpanzees of the M group must experience very stressful days during this high season: Every day they are surrounded by 10 to 30 tourists, park guides, and the tour operators' employees for one hour or more, in addition to researchers.

Not surprisingly, the number of monthly visitors is inversely correlated with the monthly rainfall (Figure 3, Spearman's $r_s$=-0.76, $p<0.01$). Moreover, tourists tend to

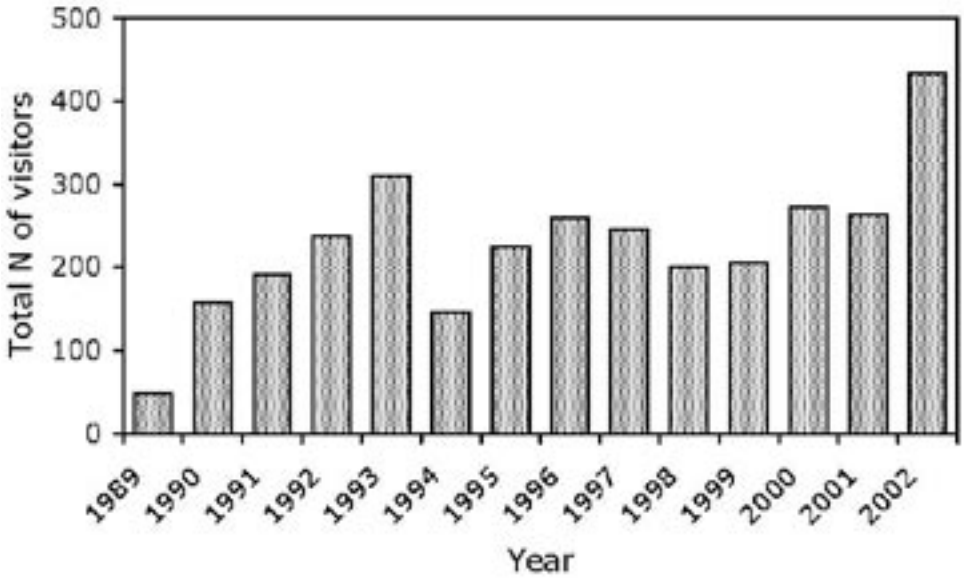


Figure 1. Number of visitors to MMNP

Figure 2. Chimpanzees surrounded by tourists

think that the dry season is the best season to watch chimpanzees. However, the group sizes of visible chimpanzees and the number of tourists are not correlated (Figure 4, $r_s$=0.24, p>0.05). This means that there are few visitors when it is possible to see many chimpanzees at the same time. Visitors do not realize that parties of the greatest size can be seen in the early rainy season of November and December, while parties are smallest in the late rainy season of March and April.

Chimpanzees can be seen at any time of the year. Figure 5 shows the appearance rate of chimpanzee parties calculated from observation records in the Kansyana Research Camp. It turns out that this rate is not less than 0.4 in any month of the year. If the visibility of chimpanzees is low in some months of the year, it is reasonable to expect that few tourists would come during that period. However, as the figure shows, there is no remarkable change in the appearance rate of chimpanzees if the

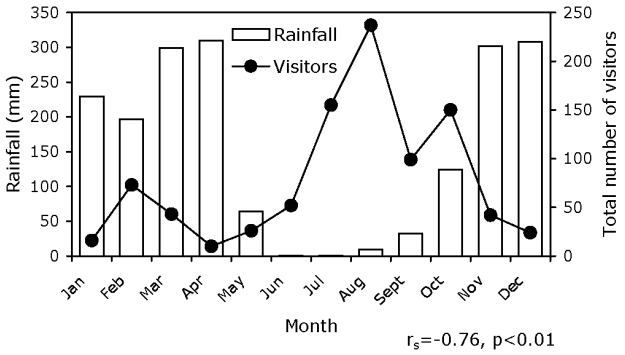


Figure 3. Monthly rainfall and no. of visitors to MMNP

Data for rainfall: 1973-1988[1], for no. of visitors: 2000-2002

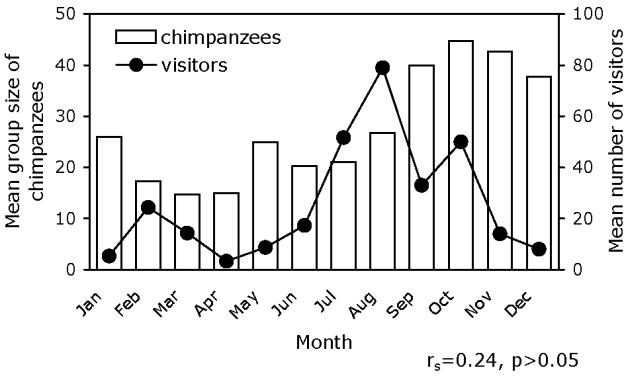


Figure 4. Mean monthly group size of chimpanzees and no. of visitors to MMNP

Data for group size: 1999-2001, for no. of visitors: 2000-2002

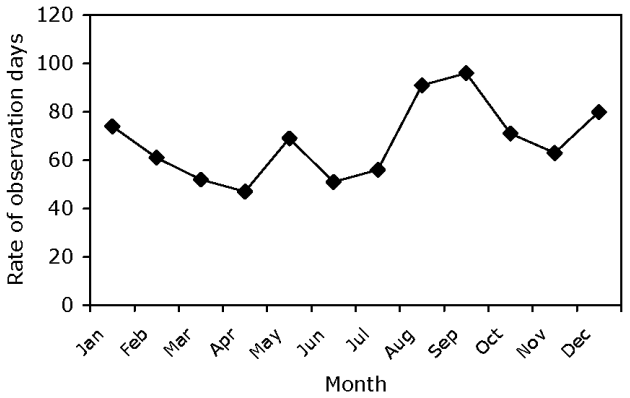


Figure 5. Monthly rate of observation days (1999-2001)

Table 1. An example of seasonal fees

| | Dry season | Rainy season |
|---|---|---|
| Entrance fee | $25 | $25 |
| Overnight fee | $25 | $25 |
| Chimpanzee fee | $150 | $50 |

group sizes of the observed chimpanzees are disregarded. Accordingly, if tourists spent two nights in the park (giving them the opportunity to search for chimps for three days), they would more than likely have an opportunity to watch chimpanzees.

Moreover, a visit during the rainy season has its own merits. There are more animals in the forest, in particular, butterflies and birds. Needless to say, the trees are more beautiful and the air is much fresher than in the dry season. People who enjoy eating fish will find the fish caught during the rainy season more delicious than that available in the other seasons. Furthermore, visitors in the rainy season will be fully rewarded by the sunset, which is much more dramatic and colorful. These seasonal features, as well as the above data, suggest that it would be beneficial to take a strategy that encourages more tourists to come to Mahale in the rainy season.

Until tourists fully understand that the rainy season is as good as the dry season for chimpanzee watching, the park management should introduce a seasonal fee system to encourage people to come in the rainy season. Table 1 shows an example of such a seasonal fee. The chimpanzee-watching fee might be US $50 during the rainy season compared with US $150 during the dry season. At present, the Mahale Park has neither introduced "chimpanzee fees" nor seasonal fees for watching chimps.

We thank all the colleagues that collected attendance record of chimpanzees and the meteorological data at the Kansyana research camp from 1999 to 2001.

(The above is part of a paper presented at the 3rd TAWIRI Annual Conference held in December, 2003 and submitted again in December, 2005.)

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## <NOTE>

# Notes on the Behavior of a Newly Immigrated Female Chimpanzee to the Mahale M group.

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### INTRODUCTION

In chimpanzee societies, females usually transfer between unit-groups[1] on reaching sexual maturity. Recent studies (e.g. 2) have revealed that cultural differences exist among chimpanzee groups. Although such studies usually compare groups that are geographically distant from each other, differences in the social customs between two neighboring groups have also been implied[3].

Although direct comparisons among neighboring groups are often difficult, an observation of the behaviors of immigrant females might provide some insights. For example, some females showed idiosyncratic feeding habits[4, 5] or displayed subtly different types of grooming hand-clasp[6], implying that these females retained the customs of their natal groups. If differences of customs do exist between two neighboring groups, then newly immigrated females should initially be unaware of the customs of the new group. Thus, an investigation of the behavior of newly immigrated females may be useful in determining how the behavioral repertoires differ between their natal groups and the new group. It may also provide information on which customs and the manner in which they are acquired by naïve individuals. However, because newly immigrated females are often intimidated by humans, there are few reports on the behaviors of such females immediately after their immigration.

Since we had an opportunity to observe the behavior of a newly immigrated female to the Mahale M group, we have stated our observations in this report.

Figure 1. Yuri, on the second day after immigration, peering at Michio (an adolescent male) while on the observation trail.

## OBSERVATIONS

On September 24, 2005, when we found a party of the M group chimpanzees at the middle of their home range, we noticed an unfamiliar young female on a tree. Since she had distinctive characteristics, we recognized her face thereafter and named her Yuri (Figure 1). Based on the size of her body and the sexual swelling, we estimated her age to be approximately ten to eleven years. We observed Yuri for approximately three hours intermittently on this day. The other M group members, particularly the males, appeared a little excited by the newcomer. However, we observed only one case of threatening behavior toward Yuri by an adult female, Fuji. Yuri copulated with at least four males, namely, Bonobo (an adult), Cadmus and Orion (adolescents), and Emory (an infant). She was groomed by Fuji (an adult female), Athena (an adolescent female), Acadia (a juvenile female), Masudi (an adult male), and Cadmus, Primus, and Christmas (adolescent males), however, she only groomed back Cadmus.

The grooming hand-clasp was reported as a social custom of both the extinct K group[7] and the M group[8] at Mahale. On the first day, Yuri performed the grooming hand-clasp with Cadmus on a tree. S he also performed leaf grooming[9], which is another custom of the Mahale M group[2].

On the next day, she even tolerated one of the observers up to a distance of approximately three meters, while she followed the other members on the observation trail. She even responded to the distant pant hoot by the members of the M group. We also observed her playing with Michio (an adolescent male) on the ground.

During this season, Yuri's food repertoires did not differ greatly from that of the M group chimpanzees, except, that she was not observed to eat lemons. Licking the surface of dead trees is another cultural behavior of the Mahale M group[10]. On November 12, 2005, we observed Yuri licking the dead wood of a *Ficus vallis-choudae* tree after several chimpanzees had licked it.

## DISCUSSION

Yuri got accustomed to both humans as well as members of the M group very quickly. This could be attributed to the possibility that she had immigrated well before we noticed her on that first day. However, she seemed quite unfamiliar with the M group members as deduced from their unusual excitement on that day. Further, since only one habituated group inhabits Mahale at present, we cannot be certain of Yuri's natal group. Since she tolerated humans to some extent from the very beginning, there is a possibility that she had immigrated from the Miyako group to the north on which a habituation attempt is being conducted. However, she also ate *Myrianthus arboreus* fruits without hesitation although this fruit is scarce in the mountainous areas of the Miyako group. Another possibility is that she immigrated from the N'ganja group to the south, especially because most of the M group members were in the area that overlaps with the N'ganja group's home range on the day before Yuri was first observed.

As she performed the grooming hand-clasp on the very first day without any hesitation, it is likely that she immigrated from a group where this behavior is customarily performed. Given the fact that chimpanzees from both M group and the extinct K group performed this behavior, the grooming hand-clasp could be a common culture of several neighboring groups in Mahale. It would be interesting to investigate further the extent to which this social custom is shared. Leaf grooming is also likely to be a custom of her natal group.

We could not observe Yuri eating lemons. Lemons were introduced to the M group range by humans and have constantly been eaten by the M group chimpanzees since 1982[11]. Thus, it is likely that chimpanzees of other groups in Mahale might not be aware of the fruit. Due to a scarcity of lemon fruits during the period after she immigrated to the M group, we did not have an opportunity to observe how Yuri dealt with the unfamiliar fruits when the other members were feeding on them. As most immigrant females do eat lemons, it may also be interesting to follow the process of how such females learn to eat the unfamiliar fruit.

**ACKNOWLEDGMENTS**

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## <NEWS>

# DNA Sampling and DNA Analysis of Chimpanzees at Mahale

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**INTRODUCTION**

Improvements in genetic techniques have enabled us to study DNA in wild animals. Until recently, it has been difficult to determine the genetic background of wild animals without capturing them. In many cases, capture disturbs their lives. Accordingly, it is better to use non-invasive methods for analyzing DNA. Genetic research on wild chimpanzees has mostly been conducted by the use of fecal samples[1, 2]. Shed or scratched hairs[3, 4], food wadge[5], and urine[6] have been also used as DNA samples of primates.

The chimpanzees of the Mahale Mountains National Park have been studied for a long time. Within one well-habituated group, the M group, we know the profiles of many chimpanzees, including age, year of immigration, and mother's name. Consequently, this group is highly suitable for genetic studies. Furthermore, many other groups exist around the Mahale area. If we collect DNA samples from a wide area, the genetic structure of wild chimpanzees will be clarified.

I have collected many materials as DNA samples at Mahale. In this report, I show samples and sampling methods and then present my perspectives on the analyses.

**SAMPLES**

I conducted research from August to October 2003 and from October 2004 to October 2005. I collected DNA samples from all of the individuals non-invasively with my colleagues and our research assistants.

When we followed chimpanzees of the M group, we sampled what probably contains cells. We collected feces and urine mainly because it was not difficult to get them while following the chimpanzees. I occasionally

observed freshly dropped blood on leaves. When individuals were observed to scratch their body and shed their hair, the hairs were collected. Food wadges, which chimpanzees spat out after chewing food, were also collected. Sometimes they licked branches and their saliva remained. Saliva was collected because it probably includes buccal cells. Male chimpanzees discard sperm remaining on their penis after copulation. The sperm samples are probably contaminated with cells from other individuals, but we still collected them. When mothers brought their dead babies, I obtained some fluids from the carcasses. I also collected tissue samples from carcasses of infants after their mothers left them.

It is difficult to observe the chimpanzees of other groups, but we could find the beds of these chimpanzees. I collected their hairs that remained on the beds and feces near or on the beds (Figure 1).

## SAMPLING METHODS

Some of the fecal samples were dried up with silica. Other samples of feces, blood, food wadges, saliva and fluid from carcasses were put into a 0.9% NaCl and 1 mM EDTA $Na_3$ solution, to which ethanol was added up to 70% vol. Ethanol was also added to urine up to 70% vol. Hair samples were put into the 70% ethanol environment or kept in a dry condition. Sperm and tissues were also kept in the 70% ethanol environment.

## PERSPECTIVES

Genetic research on chimpanzees at Mahale has already been conducted by Linda Vigilant of the Max Planck Institute, Germany. Her team analyzed 8 loci of microsatellite DNA in many M group chimpanzees. They extracted DNA from dried feces and succeeded in determining the genotype of many samples. I will cooperate with them and analyze the microsatellite DNA of all M group members as they did. From the genotype of the M group chimpanzees, we can show the paternity and relatedness of individuals.

Shed hair samples do not always provide enough DNA[7]. If we can get sufficient DNA from shed hairs, we will be able to clarify the genetic structure of wild chimpanzees by microsatellite DNA on autosome, Y

Figure 1. Sampling on the bed of chimpanzee

chromosome and mitochondrial DNA. Through such analysis, this study will provide important information for conservation of wild chimpanzees.

**ACKNOWLEDGEMENTS**

I would like to thank the Tanzania Commission for Science and Technology, the Tanzania Wildlife Research Institute, Tanzania National Park, Mahale Mountains National Park, and the Mahale Mountains Wildlife Research Center for permitting me to conduct this study at Mahale; Osamu Takenaka and Linda Vigilant for their guidance in research methods; and many colleagues and local assistants for cooperation in the field. Financial support was given through the MEXT Grant-in-Aid for Science Research (A1) (#12375003 and #16255007 to Toshisada Nishida).

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