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Instructions for Authors:

Pan Africa News publishes articles, notes, reviews, forums, news, essays, book reviews, letters to editor, and classified ads (restricted to non-profit organizations) on any aspect of conservation and research regarding chimpanzees (*Pan troglodytes*) and bilias (*Pan paniscus*). Contributors are requested to write in English and the papers except forums, reviews and essays should usually be 1,500 words or less. Articles, notes and reviews will be peer-reviewed by at least one appropriate expert on request of the *PAN* editorial staff.

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Deadline of the next issue is April 2016!

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<NEWS>
Mahale 50 Kyoto, Tokyo & Kigoma

Kazuhiko Hosaka

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As announced in the previous issue, this year of 2015 flied as various events were planned and carried out to commemorate the 50th anniversary of the Mahale Mountains Chimpanzee Research Project (MMCRP). In Kyoto on 18 July, a workshop at the 31st Congress of the Primate Society of Japan was held for the purpose of not only reviewing the long-term research at Mahale but also stimulating discussion about common interests shared among field primatologists, such as how to collect and use basic data relating to habitat ecology and life history of study species. In Tokyo on 12 October, a symposium at the 69th Congress of the Anthropological Society of Nippon was held to review long-term and recent findings from Mahale focusing on three topics (demography, DNA research, nocturnal behaviors of wild chimpanzees), leading to discussion about future contributions of wild ape research to anthropology.

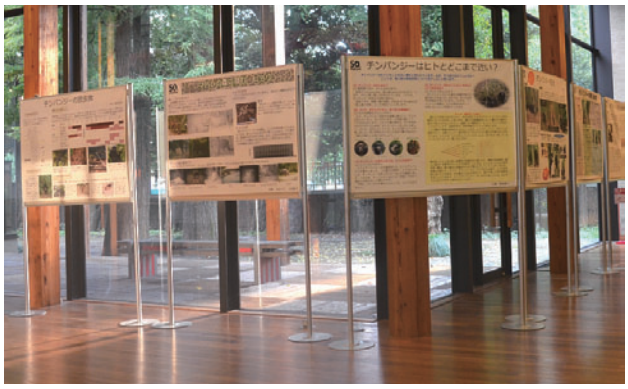

Figure 1. Twenty-three posters featuring 21 topics of research and conservation at Mahale were exhibited in a lobby of Yayoi Auditorium Ichijo Hall, the University of Tokyo.

Two ceremonial gatherings took place both in Tokyo, Japan and in Kigoma, Tanzania successfully. First, 'Mahale 50 Exhibition and Symposium: 50 Years of Wild Chimpanzee Studies' was held at the Yayoi Auditorium of the University of Tokyo on 19 September. The event was open to the public at large and gathered by more than 350 participants. It comprised an exhibition at the lobby and a symposium at the hall. The exhibition featured 21 topics of research and conservation at Mahale (Figure 1). All the poster exhibitions (in Japanese) were later edited as online educational materials and are now available free of charge at http://mahale.main.jp/50th/panels/contents.html. The symposium was called to order by Kazuhiko Hosaka addressing the aim of this public event, followed by Rashidi Kitopeni, a longtime research assistant for MMCRP and a member of Mahale Wildlife Conservation Society (MWCS) local staff, reading a congratulatory address. The first session entitled 'A half-century exploring wild chimpanzees' comprised three speakers, Kosei Izawa, Yukio Takahata, and Michio Nakamura with Toshikazu Hasegawa presiding. The second session entitled 'For the next 50 years of research' comprised three speakers, Nobuko Nakazawa, Takuya Matsumoto, and Juichi Yamagiwa with Hitoshige Hayaki presiding. The final session was a panel discussion of all six speakers with Masaki Shimada presiding (Figure 2).

Figure 2. A panel discussion in the final session of the public symposium, "Fifty years of wild chimpanzee studies".

On 26 November, an international workshop to celebrate the 50th anniversary of collaboration between Japan and Tanzania took place at Kigoma, Tanzania. For the detail, see the next news article.

<NEWS>
Mahale Research 50th Anniversary Event in Kigoma, Tanzania

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The Mahale Research 50th Anniversary Event was held in Kigoma, Tanzania, on 26 November 2015. About fifty participants, including Mahale Mountains Chimpanzee Research Project (MMCRP) researchers and their Tongwe assistants (active and retired), guests from Tanzania Wildlife Research Insitute (TAWIRI), Tanzania National Parks (TANAPA), Embassy of Japan in Tanzania, Japan International Cooperation Agency (JICA), Mahale Wildlife Conservation Society (MWCS), and Gombe Stream Research Centre, assembled at the Lake Tanganyika Hotel (Figure 1).

The event was called to order at 1430 h. His Excellency Masaharu Yoshida (the Japanese Ambassador to Tanzania; Figure 2), Mr. Toshio Nagase (Chief Representative of the JICA Tanzania Office), Mr. Herman Batiho (Chief Park Warden of Mahale Mts. National Park, TANAPA), Dr. Edward Kohi (Director of the Mahale–Gombe Wildlife Research Centre, TAWIRI) and others gave speeches, and a video message from Professor Hosea

Kayumbo (University of Dar es Salaam/ Chairman of MWCS) was screened.

After a coffee break, Michio Nakamura, Nobuko Nakazawa, and Takuya Matsumoto from Kyoto University/MMCRP gave talks titled "An Overview of 50 years of Chimpanzee Research at Mahale," "Recent Research Advances in Mammals other than Chimpanzees," and "Diversity of Chimpanzee Behavior," respectively (Figure 3).

Figure 1. Participants in the International Workshop: 50 Years of Research on Wild Chimpanzees and Other Wildlife in Mahale, at Lake Tanganyika Beach Hotel, Kigoma, Tanzania, on 26 November 2015 (All photos in Figures 1–3 courtesy of Hiroko Sakuragi).

Figure 2. His Excellency Masaharu Yoshida, the Japanese Ambassador to Tanzania, gives a speech.

Figure 3. The whole participants practice "Grooming Hand-Clasp" known as a social custom of Mahale chimpanzees in Matsumoto's talk.

After the event, we enjoyed dinner and celebrated the 50th anniversary of Mahale Research into the night. Ramadhani Nyundo, who worked in the first two decades of MMCRP and later hired by TANAPA, made a toast and Hilali Kalunde expressed the history of Mahale in poetry or song (Shairi in Swahili) at dinner.

Mr. Yoshida commented, "I have seen in a new light that research in Mahale such as cultural behaviors of chimpanzees is not only important to biology, but also attractive to the public." Mwami Rashidi, who had been an assistant of MMCRP and whose father had also belonged to MMCRP, commented that he would like to help research in Mahale for the next 50 years.

<NOTE>

A Case of Infant Carrying against the Mother's Will by an Old Adult Female Bonobo at Wamba, Democratic Republic of Congo

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INTRODUCTION

Kidnapping, one form of allomothering behaviors in which an infant is carried by a non-mother individual for a prolonged time without returning to its mother, has been observed in various primate species (Maestripieri 1994). In bonobos, it occurs rarely and all reported kidnappers were females (Neugebauer 1980; Hohmann & Fruth 2003; Vervaecke *et al.* 2003). Kidnapping can be fatal to the infant. In two cases of captive bonobos, the kidnappers were anesthetized in order to return the infants to their mothers (Neugebauer 1980; Vervaecke *et al.* 2003). In the case of wild bonobos in Lomako, the baby was observed to be dead one day after the kidnapping (Hohmann & Fruth 2003).

Here, I report a case of kidnapping behavior by an old adult female. The incident happened immediately after the infant had gone through a seemingly stressful and possibly fatal accident, falling from the tree canopy to the ground. The old adult female carried an infant for 51 min and kept ignoring the mother's efforts to retrieve her infant, until the mother finally snatched the infant away.

BACKGROUND

The observation was made on 17th March 2015 at Wamba, Luo Scientific Reserve, Democratic Republic of Congo (DRC). A group of bonobos, PE group, has been followed on a daily basis since October 2010. The group had been observed between 1976 and 1991, and at that time, the group was called 'P group' (Idani 1990). The

group consisted of 26 individuals including nine parous females, five adult males and one adolescent male.

An infant female, Marina (Ma), was born in July 2014 as the first offspring of a young and low-ranking adult female, Marie (Mr), of 14 years old. At the time of the event, the infant had already started locomoting independently, though she had never gone beyond her mother's reach.

Bokuta (Bk) was estimated to be more than 50 years old. She was the oldest and high-ranking female in the group. Her existence in P group was confirmed by examining old pictures which had been taken between 1984 and 1988. She was called Yuba at that time, and gave birth in 1982 and 1986 (Idani 1990). When researchers started observation in 2010, she did not have any dependent offspring. Since 2010, she had not shown any obvious swelling cycle and she copulated only twice during the 1,989 h of my *ad libitum* observation between 2012 and 2015. Although I did not conduct any hormonal analysis, I assumed that she was too old for reproduction. She was not a social individual, in that she seldom engaged in grooming behavior with other group members. When other individuals were grooming, she often rested in a day bed. Also, she rarely engaged in social playing with immature individuals. Before the incident, she never showed apparent interest in Ma.

Figure 1. Ma clinging to Bk' body and screaming.

OBSERVATION

On 17th March 2015, at 0836 h, I was following a party of bonobos including eight adult females, three adult males, and one adolescent male. The behavioral context of the party was resting; most individuals were resting, and only three females were feeding.

Mr was feeding on the fruits of *Ochtocosmus africanus* at the canopy, which was approximately 20 m high. Suddenly, Ma fell from the canopy. Because there were no lower branches or vegetation below her, she could not grab anything before her body slammed against the ground with a thud. An unusually loud scream from Ma resonated through the forest. Other bonobos started to vocalize sharply. Mr rapidly descended from the canopy. However, before she reached her infant, Bk ran to Ma and picked her up. When Mr approached Bk, she started walking with Ma. Ma was carried ventrally and she clung Bk's body without any support. Mr was walking close behind Bk. Other individuals also started traveling on the ground.

The bonobos seemed slightly more excited than usual. At 0838 h, Bk dragged a branch (a display behavior of bonobos, but it is also used as a way of proposing a direction of travel; Ingmanson 1996). An adult male drummed the buttress of a tree. At 0848 h, Bk sat on the ground. Ma screamed. Mr peered (gazing behavior within 30 cm by an animal toward another; Idani 1995) at Bk and Ma, and Bk started traveling. Bk dragged a branch again.

At 0853 h, Ma screamed again. Bk climbed about 2 m up a tree. Mr followed her. A 3-year-old male infant came and touched Ma. Bk made him move away by stretching her leg toward him. After 2 min, Bk and another female climbed up to the canopy to feed on the *Grewia pinnatifida* fruits. Mr followed them and sat about 1.5 m away from Bk. Ma screamed and Mr peered at her. At 0858 h, Mr solicited and engaged in genito-genital rubbing with Bk. After this, Mr peered at Bk, but Bk ignored her. From 0901 to 0902 h, Ma was clinging to Bk's body and screaming intermittently (Figure 1). She was pouting her lips. From 0904 to 0905 h, Bk and Mr were feeding on *Grewia pinnatifida* fruits.

At 0905 h, Bk descended to the ground with Ma. Mr followed them. Until 0921 h, Bk traveled on the ground. She sometimes stopped shortly to feed on piths of *Ataenidia conferta* and young leaves of *Cola bruneelii*. Mr walked close behind Bk. Ma was still carried ventrally. She screamed several times (at 0910, 0911, 0913 and 0915 h).

At 0921 h, Bk and Mr climbed onto a fallen tree. Five adult females and one adult male were grooming or resting on the same fallen tree. Other adult individuals did not show interest in Bk and Ma. Mr approached and groomed Bk for less than 30 s. Bk did not groom Mr back and descended from the fallen tree. Mr followed Bk, and two individuals sat on the ground about 1.5 m apart from each other.

At 0925 h, a 6-year-old female approached Bk, and started to pull Ma's leg. Ma screamed intensely, then Mr ran to her and snatched her up. Mr rapidly climbed up, possibly to get out of Bk's reach. The bonobos vocalized and started traveling. In total, Bk carried Ma for 51 min.

After this incidence, Bk never showed interest in Ma until the end of my study period (June 2015).

DISCUSSION

I described a rare behavior of bonobos that a very old female carried a non-kin infant for a prolonged time, and ignored the mother's effort to retrieve the infant. Interestingly enough, Bk was one of the least friendly individuals in the group toward immatures, and often seemed to avoid them to seek a quiet place. The trigger of

her kidnapping behavior must have been the fall of the infant from the high tree. The scream was serious and other bonobos seemed to perceive that Ma was in a critical situation. Bk, who was a mother many years ago, might have taken her up and carried her as she did in the past. Bk did not treat Ma roughly; she even behaved protectively when other infant came to touch her. Thus, she might not have intended to harm Ma. However, if Mr did not have enough courage to snatch her back, Ma might eventually have died of starvation.

It was interesting that the low-ranking mother refrained from retrieving her infant from the high-ranking kidnapper since bonobos were considered to have more egalitarian dominance relationship than chimpanzees (de Waal & Lanting 1997). Mr followed Bk nervously and asked her to return her infant only modestly by peering and genito-genital rubbing. Also, she fled from Bk after she retrieved Ma. It appeared that Mr was aware that she should have difficulty in retrieving her infant if Bk kidnaps Ma again. The ease with which mothers can retrieve their infants from other individuals might be influenced by the strictness of dominance relationship among females (McKenna 1979; Maestripieri 1994). This kidnapping case and the previous case in Lomako (Hohmann & Fruth 2003) might suggest that there is a considerable degree of strictness in dominance relationships among wild female bonobos.

ACKNOWLEDGEMENTS

I sincerely thank the Research Center for Ecology and Forestry and Ministry of Scientific Research, DRC for helping my field research. I especially thank Dr. Sakamaki for his great contribution to continuous observation and camp management at Wamba. I thank Prof. Furuichi, Dr. Garai and Ms. Graham for their helpful comments and English editing. This study was supported by GLTP program of United Nations University.

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<NOTE>
Savanna Chimpanzees (*Pan troglodytes schweinfurthii*) Consume and Share Blue Duiker (*Philantomba monticola*) Meat in the Issa Valley, Ugalla, Western Tanzania

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INTRODUCTION

Meat eating is pervasive across chimpanzee populations in Africa, with red colobus monkey (*Piliocolobus* spp.) being the most common prey (Boesch & Boesch 1989; Stanford *et al.* 1994a; Watts *et al.* 2012, Hosaka 2015) if sympatric in the same habitat. Besides colobus monkeys, chimpanzees consume a variety of other primates, including olive and yellow baboons (*Papio* spp.) and bushbabies (*Galago* spp.). In the forest habitats of western Tanzania chimpanzees have been reported to consume numerous different mammalian species: 18 at Mahale Mountains National Park (Uehara 1997; Hosaka 2015) and eight at Gombe National Park, whilst in the miombo woodland dominated Ugalla Region no direct observations have been recorded to date (Table 1). In West Africa, chimpanzees from Taï Forest, Ivory Coast consume eight different mammal species, all primates (Boesch & Boesch 1989). Wherever chimpanzees consume meat, it is almost always via hunting, as they rarely scavenge (Watts 2008).

Habitat and wildlife diversity clearly influence potential prey for chimpanzees. In Fongoli, Senegal for example, chimpanzees live in a mosaic savanna landscape and prey on patas monkey (*Erythrocebus patas*) (Pruetz & Marshack 2009), a species that is rarely sympatric with otherwise mostly forest-dwelling chimpanzees. In Ugalla, two recent studies on the diet of wild chimpanzees each found only a paucity of animal tissue in over 1,200 combined samples. Yoshikawa and Ogawa (2015) reported a single case of bird bones and another of unidentified mammalian tissue in over 450 samples analyzed between 1995–2011 from the Nguye area, whilst Piel *et al.* (under revision) reported no mammalian tissue in over 800 samples collected from 2009–2014 from the Issa Valley. A reliance of faecal analysis to infer dietary behavior has well-discussed limitations (Boesch & Boesch 1989; McGrew *et al.* 2009; Phillips & McGrew 2013) and so direct observations are critical to revealing items that may be otherwise fully digested or rarely consumed.

Where chimpanzees do capture prey, researchers have long been interested in meat-sharing (reviewed in Mitani & Watts 2001). Initial hypotheses described how

Table 1. Species hunted at Gombe and Mahale, and whether they are present and hunted at Issa, modified from Goodall (1986) and Newton-Fisher (2014).

Common name	Species	Gombe	Mahale	Ugalla	
				Present	Hunted
Primates					
Red-tailed monkey	*Cercopithecus ascanius*	X	X	X	
Blue (Sykes) monkey	*Cercopithecus mitis*	X	X	X	
Vervet monkey	*Chlorocebus pygerythrus*		X	X	
Red colobus monkey	*Piliocolobus tephrosceles*	X	X	X	
Senegalese bushbaby	*Galago senegalesnsis*		X	X	
Human	*Homo sapiens*	X		X	
Greater galago	*Otolemur crassicaudatus*	X		X	
Chimpanzee	*Pan troglodytes*	X	X	X	
Baboon	*Papio* spp.	X	X	X	
Ungulates					
Warthog	*Phacochoerus aethiopicus*		X	X	
Blue duiker	*Philantomba monticola*	X	X	X	X
Bushpig	*Potamochoerus larvatus*	X	X	X	
Bushbuck	*Tragelaphus scriptus*	X	X	X	
Carnivora					
African civet	*Civettictis civetta*		X	X	
White-tailed mongoose	*Ichnuemia albicauda*		X	X*	
Afrotheria					
Elephant shrew	*Rhynchocyon* sp.		X	X**	
Yellow spotted hyrax	*Heterohyrax brucei*		X	X**	
Rodentia					
African striped squirrel	*Funisciurus* sp.	X		X*	

* The genus is present at Issa, but it is uncertain whether the species is similar across Tanzanian sites.
** Other genera of the same Family exist at Issa.

males monopolized meat and used it as currency, trading it for mating opportunities either on a short or long-term basis, dubbed "meat for sex" (Stanford *et al.* 1994a, 1994b; Gomes & Boesch 2009). Others have argued that rather than sharing with females, meat-holders share preferentially instead with other males, using meat to build alliances with other males (Nishida *et al.* 1992; Mitani & Watts 2001). Finally, a third hypothesis suggested that individuals share meat to reduce the number of beggars, who are otherwise energetically expensive to continuously avoid (Gilby 2006).

We report here on an opportunistic observation of chimpanzee consumption of blue duiker (*Philantomba monticola*) and subsequent acquisition of meat by party members in the Issa Valley, Ugalla, Tanzania. On 4 September, 2015 we observed multiple members of the Issa community feeding on the duiker carcass. We describe here this observation in the context of meat-eating of savanna chimpanzees and also the reliability of macro-analysis of faecal samples to infer dietary consumption.

METHODS

The Issa Valley is located in the Ugalla region, almost 100 km east of Lake Tanganyika (Figure 1) in western Tanzania. The study area extends over 85 km². The region is characterized by extreme seasonal variation: Annual rainfall averages 1,240 mm (range: 955–1,537) and the rainy season typically lasts from October to April, whilst the dry season (months with less than 100 mm of rainfall) lasts for five to six months, from April/May to September (Piel *et al.* 2015). The mosaic vegetation structure of the study area is dominated by miombo woodland (*Brachystegia*, *Julbernardia*, and *Isoberlinia*) interspersed with riverine forest, grasslands, and swamps. Russak (2014) recorded 42 mammal and 12 frugivorous bird species including

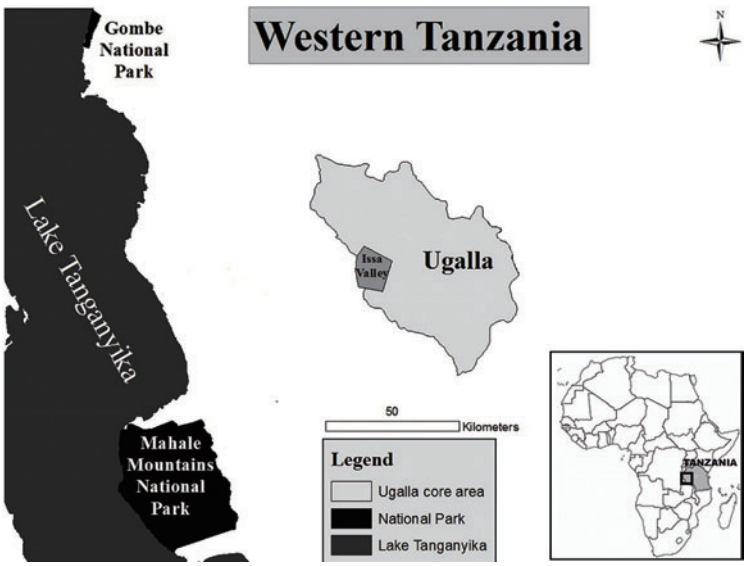

Figure 1. A map of western Tanzania, with the Issa study area as well as Gombe and Mahale Mountains National Parks identified (credit: L. Pintea, Jane Goodall Institute, USA).

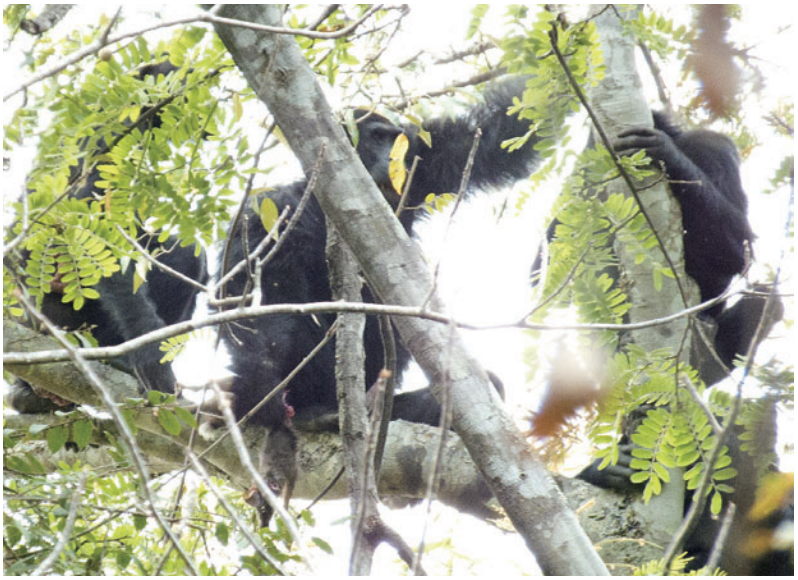

Figure 2. An adult male chimpanzee at Issa holds the blue duiker carcass (credit: E. McLester).

Figure 3. Mammalian (likely blue duiker) remains from chimpanzee faeces collected the day after the observed meat consumption (credit: S. Ramirez-Amaya).

lion (*Panthera leo*) and leopard (*Panthera pardus*). Most recently, researchers observed wild dog (*Lycaon pictus*) (McLester *et al.* unpublished data) in the area.

Since 2008, there has been a continuous research presence at Issa, and chimpanzees continue to show increased comfort with human presence, rarely fleeing approaching observers (Piel *et al.* unpublished data). All individuals are considered to be part of one community with an estimated home range of between 100–200 km² (Rudicell *et al.* 2011). As of September 2015, researchers had individually identified 14 different chimpanzees.

To better understand chimpanzee dietary patterns, researchers collected faecal samples opportunistically and sluice samples in a near-by river.

OBSERVATIONS

At 0816 h EM and a field assistant encountered a party of at least five individuals who were foraging *Julbernardia globliflora* fruits in miombo woodland. Researchers followed the party into a riverine forest, with individuals periodically in and out of sight, when they heard a cacophony of chimpanzee vocalizations, including alarm barks. When researchers arrived, they encountered a party of nine chimpanzees and were able to approach within 10 m, although the chimpanzees were obscured in the canopy vegetation. Through a hole in the canopy, they identified an adult male climbing up whilst holding the carcass of a blue duiker in one of his hands (Figure 2). Six other individuals that clustered within 2 m around him followed him. At this time the carcass had already been dismembered, with only a portion remaining with the male in sight. The meat holder fed on and picked at the carcass whilst simultaneously allowing at least one other adult male as well as an adult female and her dependent offspring to feed from the meat by taking some pieces. Selectively, he chased and denied other individuals access to the meat.

After 10 min the meat holder left the tree, with some individuals in pursuit of him, whilst others remained in the tree. Researchers then saw the male climb an adjacent tree and disappear into the canopy, after which a chorus of pant hoots and screams were heard. There was a period of silence, and at 1015 h, researchers approached the location near the source of the vocalizations and identified three individuals consuming scraps of meat. By 1031 h, the chimpanzees had dispersed and researchers began searching for tissue remains and faecal samples in the surrounding area. None were recovered.

The following day, researchers tracked a chimpanzee party for over 8 h. In that time they collected six faecal samples, three of which contained vertebrate remains: either hair or bone (tooth), or both (Figure 3).

DISCUSSION

Wild chimpanzees consume at least 40 different species of vertebrates across Africa (Newton-Fisher 2014) and numerous studies have addressed the role that meat might play as a nutritional resource (Boesch & Boesch-Achermann 2000), as a social tool to build alliances (Nishida *et al.* 1992), recruit mates (Stanford *et al.* 1994b) and to reciprocate meat sharing (Mitani & Watts 2001). For savanna-woodland chimpanzees in the Issa Valley our observations represent the first direct observation of mammalian consumption and expand the number of communities that are known to consume meat.

During the last three decades of research on wild chimpanzees, discussion of chimpanzee predation focused on the consequences for arboreal prey, namely colobus populations (Stanford *et al.* 1994a; Hosaka *et al.* 2001; Mitani & Watts 2001; Newton-Fisher *et al.* 2002; Gomes & Boesch 2009). More recently, however, with the first habituation of savanna chimpanzees at Fongoli, more unorthodox sources of prey are being revealed, terrestrial and nocturnal, for example *Erythrocebus* (Pruetz &

Marshack 2009) and *Galago* (Pruetz & Bertolani 2007). Now at Issa, we report an observation that also suggests a terrestrial capture. Issa chimpanzees are not the only community to consume antelopes. The chimpanzees of Mahale Mountains also consume blue duikers (Takahata *et al.* 1984). What remains poorly understood is what drives prey selection and hunting frequency.

There are at least three potential explanations for prey selection and hunting frequency variability. First, one reason for lower prevalence of meat-eating at Issa may be the population density of both chimpanzees and potential prey (Figure 4). For example, chimpanzees and red-tailed monkeys live at very low densities, reducing the likelihood of encounters between the species. It may be that with less forest available, and subsequently lower monkey density (Figure 4), chimpanzees living in more open habitats exploit alternative prey sources. More data on prey availability and preference might resolve whether an environmental explanation is sufficient. Second, an alternative explanation in terms of culture might be explored: According to Boesch & Boesch (1989), Taï forest-chimpanzees never eat blue duikers even if they capture them, although blue duikers are fairly common in their habitat, whereas Issa chimpanzees have not been reported to capture or eat arboreal prey, despite the fact that chimpanzees and arboreal monkeys live sympatric at Issa. Third, macro-analysis may be insufficient for detecting animal tissue. Whilst it reveals much about chimpanzee diet (Phillips & McGrew 2013), Boesch & Boesch (1989) have outlined its limitations. That no mammalian tissue was observed in an analysis of over 1200 faecal samples across Ugalla suggests that either meat-eating is an extremely rare event, or else not all items that chimpanzees consume are detectable in faeces. We suspect it is the former, and as chimpanzee habituation improves in the coming months, we anticipate observing more chimpanzee predation events.

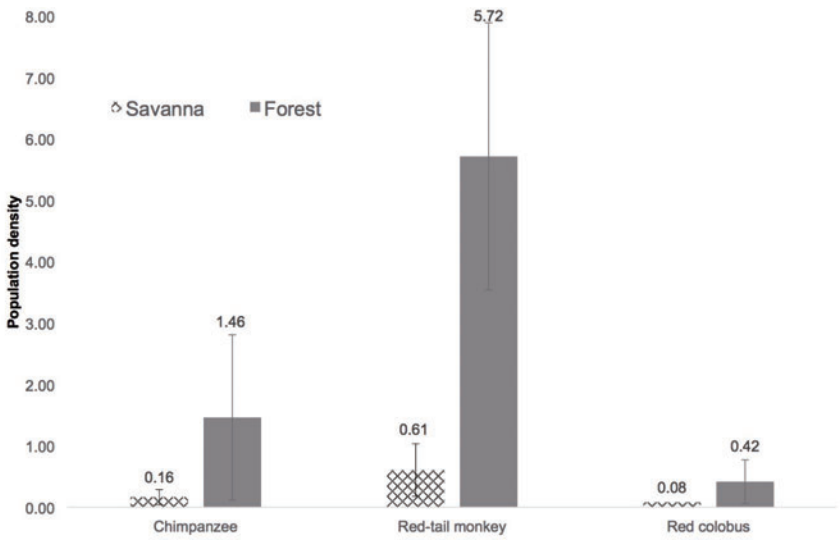

Figure 4. Population density variation between forest-dwelling and savanna primates, with error bars indicating standard deviations (source: Plumptre & Reynolds 1996; Chapman & Lambert 2000; Moyer *et al.* 2006; Rode *et al.* 2006; Davenport *et al.* 2007; Petre *et al.* 2007; Kouakou *et al.* 2009; Moore & Vigilant 2013; Samson & Hunt 2014; Piel *et al.* 2015). A single record exists from Issa's red colobus population, hence the lack of error bars.

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<NOTE>
A Wild Chimpanzee's Newly Invented Play Pattern towards an Artifact after a Short Exploration

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INTRODUCTION

Wild chimpanzees hold and manipulate various types of objects found in their habitat not only as tools, but also as objects to play with or to inspect (Ramsey & McGrew 2005; Nishida *et al.* 2010; Matsusaka *et al.* 2015). The shapes, weights, and other physical features of these target objects inevitably restrict the object manipulation patterns. Matsusaka *et al.* (2015) listed the diversity of object play among wild chimpanzees in Mahale, Tanzania. Infant or juvenile chimpanzees play with spherical objects or lumps, such as stones or fruits. These objects can be picked up, carried, raised and/or dropped, rotated with hands and/or feet laying supine on the ground, put on the chimpanzee's back, held in the groin pocket, or thrown forward or backward under- or overarm. The chimpanzees also play with string-like objects, such as animal tails and skins, or vines, which they drag, drape, flail, and move, among others. Mahale chimpanzees handle not only natural objects, but occasionally, also human artifacts. It has been reported that when Mahale chimpanzees encounter artifacts such as an old abandoned native Tongwe clay pot, wooden boards, or plastic tags used for plant phenological research, they playfully dragged and carried them, or put these artifacts on their head. However, since only several cases are known of chimpanzees trying to steal human belongings throughout Mahale's long research history (Matsusaka *et al.* 2015), chimpanzees are expected to have little idea how to handle the artifacts carried into the forest by the human observers. Intentional presentation or conferment of artifacts to wild chimpanzees should be avoided, because of the risk of disease transmission from humans to chimpanzees. Nonetheless, it is important to analyze how chimpanzees respond to artifacts they occasionally find in the forest, in order to manage such incidents when they happen by chance.

In this article, I report a case of how a juvenile wild chimpanzee in Mahale got hold of a digital video handycam (hereafter, camcorder) in the environment by chance, focusing on how the holder handled and manipulated the camcorder.

METHODS AND MATERIALS

Well-habituated wild chimpanzees of the M group in Mahale Mountains National Park, Tanzania, were studied from August to September 2014 (17 observation days and 86.6 observation hours in total) (see Nakamura *et al.* 2015 for details of the research site). The M group consisted of 63 members in the study period. The number and symbol in parentheses after each individual's name represents his/her age and sex, respectively. I used a camcorder (SONY HDR CX430V: weight 420 g including a battery, size of the main body 58×66×128 mm, length of expanded grip belt 230 mm), a digital photo camera, and field notes to record the behavioral data.

OBSERVATION

On September 1, 2014, I started to follow an adult male CE (16♂). I started recording his behavior using the camcorder at 0905 h. A juvenile female QL (7♀), an infant female AY (4♀), a young male IH (11♂), an adult male DW (25♂), and CE were playing socially in turns, until 1058 h. CE moved into the wood, separating about 50 m away from the other members of the party. I started following CE, and put the camcorder in a pocket of my

Figure 1. QL handles the camcorder laying supine on the ground.

jacket at 1103 h. At 1125 h, I discovered I had unintentionally lost my camcorder, and in order to find it, I returned to our track.

At 1126 h, I found QL handling the camcorder, lying supine on the ground beside the trail where I had observed CE at 1103 h (Figure 1). Since QL seemed eager to handle the camcorder, and frightening wild chimpanzees should be avoided, I decided not to disturb her. Instead, I decided to record her behavior with a digital photo camera or field notes, and to try to get the camcorder back after the chimpanzees would abandon it. QL continued biting, licking, and rotating the camcorder on her belly, then raised her upper body and moved forward on both hands after putting the camcorder in her groin pocket at 1130 h 20 s. QL threw the camcorder forward with her right underhand, and moved forward at 1130 h 35 s. QL then caught the camcorder, carried it, and laid supine on the ground at 1130 h 50 s, after which she was biting and licking the camcorder's body. QL threw quadruped and rolled the camcorder forward at 1131 h 29 s, and subsequently moved to catch it. At 1131 h 39 s, QL lay supine again, licked and bit the camcorder. QL partially loosened the camcorder's grip belt, which is meant for human users to put their hands in for holding the body of the camcorder at 1132 h 09 s, and continued to lick the belt and body of the camcorder. QL ran quadruped, biting the belt, at 1132 h 59 s, with the body of the camcorder dangling from her mouth. QL subsequently ran up a tree and chased AY and AY, who had escaped into the tree. At 1133 h 20 s, QL was hanging with both hands about 5 m above the ground from a branch of a tree. QL then loosened the belt from the camcorder's body, whereas AY was hanging 3 m away from her. QL started kicking the body of the camcorder, alternating both soles, and dangling it by biting one end of the camcorder's belt at 1133 h 33 s (Figure 2; see also video 1 by photo camera, available online at https://www.youtube.com/watch?v=Wkz_k9aJ288). QL kicked the camcorder's body ten times by right sole, and eight times by left sole for 6 s and the camcorder fell to the ground at 1133 h 42 s, and QL immediately ran down from the tree and picked it up. She then ran into the bushes, and up another tree. While QL was hanging down from the tree by one hand, she dangled the main body of the camcorder from her mouth by biting the belt, and consequently starting kicking the body by alternating both soles again. At 1135 h 30 s, QL threw the camcorder down from a tree, from about 3 m above the ground. Since QL did not move rapidly towards the camcorder, I managed to retrieve it.

Throughout the observation, QL did not display a play face and did not utter play pants, nor did she handle the camcorder imitating normal usage by humans, such as holding camcorder by grip belt, opening LCD monitor, or looking into lens. In addition, other chimpanzees, including AY who was at a visual distance from QL, paid no attention to QL or the camcorder. Fortunately, the camcorder's body or the internal data were not destroyed except for a part of built-in cable.

DISCUSSION

The camcorder might have immediately slipped out of the pocket of my clothes after I started following CE, since QL was found handling it at the same place where I had observed CE. Although it is still unknown when QL acquired the camcorder exactly, she handled the camcorder for at least 9 min. During the handling, QL showed continuous biting or licking of both the body and belt of the camcorder. These patterns can be considered non-playful manipulation or exploration (Ramsey & McGrew 2005). Juvenile chimpanzees that encounter a novel object are considered to try to inspect its physical features, such as the hardness, weight, or shape. After QL inspected the

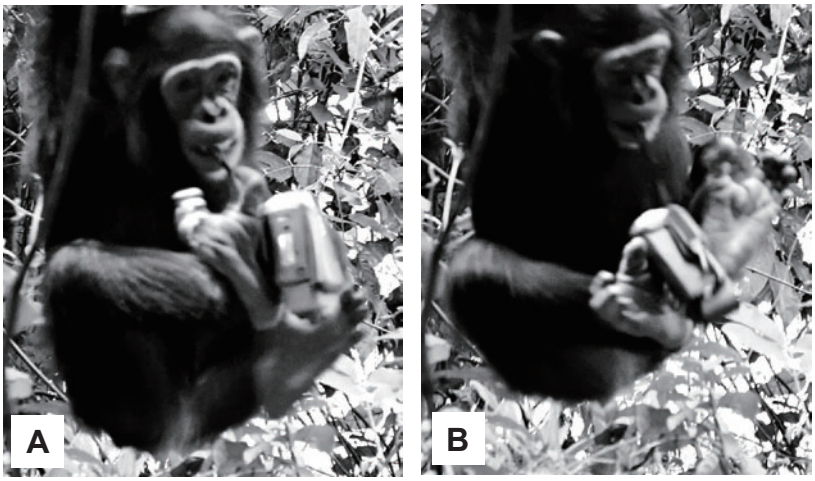

Figure 2. QL kicks the body of the camcorder on right foot (A) and on left foot (B), biting one end of the grip belt of the camcorder to dangle it, while she hangs from a tree (image captured from footage by photo camera).

camcorder for several minutes, she threw it forward and transported it. During these actions, QL discovered that the belt could be expanded, and she repeatedly loosened it. The former is suggested to be the behavioral pattern of solo object play toward sphere-like objects, and the latter is that toward string-like objects (Matsusaka *et al.* 2015). As soon as QL succeeded to fully expand the belt, she started kicking the camcorder, which was then hanging down from her own mouth. The motor pattern 'kicking object' is partially equal to 'hang with legs pitterpat' used to respond to a play partner in a tree, or to 'rotate fruit', carried out lying supine on the ground for object play (Nishida *et al.* 2010). It is therefore implied that QL engaged in kicking the camcorder as object play.

Although captive chimpanzees show various motor patterns responding to the shapes of artifacts and their combinations (Ramsey & McGrew 2005), wild chimpanzees in Mahale are unlikely to find artifacts like the camcorder. Likewise, they are unlikely to find detached natural objects that physically combine a handful lump and string shape during their daily activities. Possible exception may be a set of a handful-sized fruit of ikolyoko (*Voacanga africana*) and the peduncle, which chimpanzees would encounter in a certain season of the year, and thus it cannot be denied that chimpanzees may play with them. Few researchers, however, have reported the play of Mahale chimpanzees with such the sets of the objects (Nishida *et al.* 2010; Matsusaka *et al.* 2015; Hosaka pers. com., Shimada unpublished data). QL's play behavior toward the camcorder is therefore not ordinary among wild chimpanzees, but a novel motor pattern that she invented by adapting her play to the lump (the camcorder's body) and string (the belt) combination. This observation suggests that the creative, cognitive, and physical ability of wild chimpanzees can combine two different established behavioral patterns, and modify them into a new motor pattern after intensive inspection of the novel artifact for several minutes.

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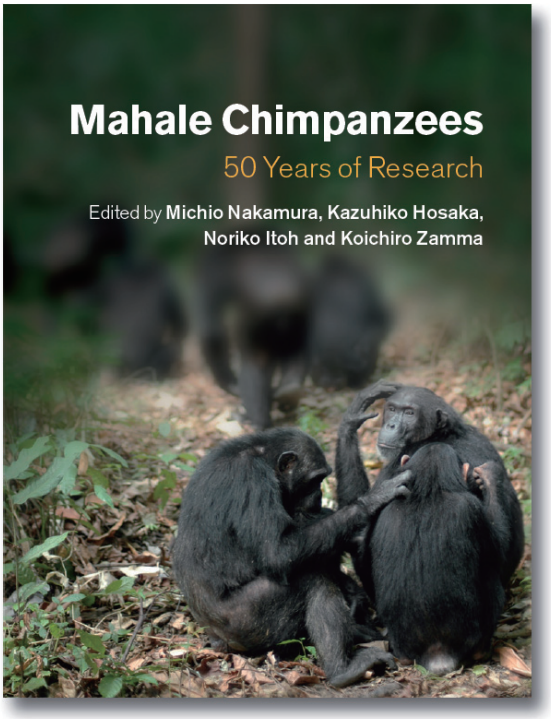
Mahale Chimpanzees: 50 Years of Research

Edited by Michio Nakamura, Kazuhiko Hosaka, Noriko Itoh & Koichiro Zamma



Long-term ecological research studies are rare and invaluable resources, particularly when they are as thoroughly documented as the Mahale Mountain Chimpanzee Project in Tanzania. Directed by Toshisada Nishida from 1965 until 2011, the project continues to yield new and fascinating findings about our closest neighbour species. In a fitting tribute to Nishida's contribution to science, this book brings together 50 years of research into one encyclopaedic volume. Alongside previously unpublished data, the editors include new translations of Japanese writings throughout the book to bring previously inaccessible work to non-Japanese speakers. The history and ecology of the site, chimpanzee behaviour and biology, and ecological management are all addressed through firsthand accounts by Mahale researchers. The authors highlight long-term changes in behaviour, where possible, and draw comparisons with other chimpanzee sites across Africa to provide an integrative view of chimpanzee research today.

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