

Pan Africa News

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



ISSN 1884-751X (print), 1884-7528 (online) mahale.main.jp/PAN/

JUNE 2018

VOL. 25, NO. 1

P. A. N. EDITORIAL STAFF

Chief Editor:

Kazuhiko Hosaka, *Kamakura Women's University, Japan*

Deputy Chief Editor:

Michio Nakamura, *Kyoto University, Japan*

Associate Editors:

Christophe Boesch, *Max-Planck Institute, Germany*

Jane Goodall, *Jane Goodall Institute, USA*

Tetsuro Matsuzawa, *Kyoto University, Japan*

William C. McGrew, *University of St. Andrews, UK*

John C. Mitani, *University of Michigan, USA*

Vernon Reynolds, *Budongo Forest Project, UK*

Yukimaru Sugiyama, *Kyoto University, Japan*

Richard W. Wrangham, *Harvard University, USA*

Takeshi Furuichi, *Kyoto University, Japan*

Editorial Secretaries:

Noriko Itoh, *Kyoto University, Japan*

Koichiro Zamma, *Nagano College of Nursing, Japan*

Eiji Inoue, *Toho University, Japan*

Takuya Matsumoto, *Research Institute for Humanity and Nature, Japan*

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 bonobos (*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.

PAN is published twice a year in June and December. Submit your manuscripts via e-mail to pan.editor@gmail.com.

- **Manuscripts:** Format as DOC or RTF files
- **Photos and figures:** Format as JPEG or GIF files. Do NOT paste on Word files or create as PDF files. Figures could be sent as excel files also.
- **Audiovisual data:** Authors could include audiovisual data to enhance their papers, although they will be included in the online version only. Sound or video files should be sent only after communicating with the editor to obtain more detailed instructions.
- Send these **separately** by e-mail attachments.

See also <http://mahale.main.jp/PAN/instruction.html>

Contents

<NOTE >

Masturbation with a Tool by an Infant Male Chimpanzee

Michio Nakamura

2

<NOTE>

Four Cases of Grooming Sessions between Chimpanzees and Guenons at the Kalinzu Forest Reserve, Uganda

Takumi Tsutaya, Natsumi Aruga,

Hodaka Matsuo, & Chie Hashimoto

5

<NOTE>

Deposit and Theft? Two Unusual Interactions over Wild Plant Food between Adult Chimpanzees in Mahale

Takuya Matsumoto & Hiroko Sakuragi

8

<BOOK REVIEW>

Following Fifi. My Adventures among Wild Chimpanzees: Lessons from Our Closest Relatives (By John Crocker); Among Chimpanzees. Field Notes from the Race to Save Our Endangered Relatives (By Nancy J Merrick)

William C. McGrew

11

<ERRATUM>

13

<EDITOR'S NOTE>

14

Pan Africa News, Vol. 25, No.1

Published in June, 2018

Address: c/o Human Evolution Studies,

Dept. of Zoology, Faculty of Science,

Kyoto Univ., Kyoto, 606-8502, JAPAN

TEL: (+81)75-753-4108

FAX: (+81)75-753-4115

E-mail: pan.editor@gmail.com

URL: <http://mahale.main.jp/PAN/>

ISSN: 1884-751X (Print), 1884-7528 (Online)

Masturbation with a Tool by an Infant Male Chimpanzee

Michio Nakamura

Graduate School of Science, Kyoto University, Japan
(E-mail: nakamura@jinrui.zool.kyoto-u.ac.jp)

INTRODUCTION

Here I report a case of “masturbation” with a tool by a wild infant chimpanzee. More accurately, the infant male inserted his erect penis into a wadge discarded by an adult male and performed several thrusts, as if he was copulating with the wadge. The observed “masturbation” did not involve ejaculation, because infant chimpanzees are unable to ejaculate. A similar behavior, *i.e.*, rubbing the penis against a piece of fruit (*e.g.*, orange peel), was reported for infant male orangutans in captivity (Harrison 1962). There are also some reported cases of captive or rehabilitant orangutans and chimpanzees stimulating their own genitals with tools (Dixson 2012).

Masturbation, or self-stimulation of one’s own sexual organs, is common among humans and nowadays is regarded as useful for healthy sexual development (Kaestle & Allen 2011). Various nonhuman primates are also known to masturbate (Thomsen *et al.* 2003; Dixson 2012; Thomsen & Sommer 2015); therefore, it may be a phylogenetically ancient behavior. However, there are relatively few studies that focus on masturbation among nonhuman primates in the wild (Thomsen & Soltis 2004). Male chimpanzees (*Pan troglodytes*) are known to stimulate their own penises. Although Goodall (1989) noted that captive chimpanzees sometimes ejaculate by stimulating their own penises, it had not been observed to result in ejaculation in the wild conspecifics at Gombe. Similarly, at Mahale, it is common for males to “fumble with penis,” but without it culminating in ejaculation (Nishida *et al.* 1999). Such fumbling of penis is done usually by hand (and sometimes by foot), but, thus far, I have found no reports of such penile-stimulating behaviors with tools, at least in wild chimpanzee populations.

OBSERVATION

The observation was made on the M group chimpanzees at the Mahale Mountains National Park, Tanzania (for the research site, see Nakamura *et al.* 2015). The “masturbation” event was recorded for a two-year old infant male named Peace, first born of Puffy (Figure 1). Puffy was born in the M group and has an elder maternal brother (*i.e.*, uncle to Peace), Primus, who is the current alpha male of the M group.

On September 15th 2016, I was conducting *ad libitum* observations by following a party of chimpanzees since morning. At 11:04 h, I saw Puffy and Peace descending to the rocky riverbed of the Kasiha Valley. Many chimpanzees of the M group were feeding on *Saba comorensis* and *Ficus vallis-choudae* fruits along the valley while they slowly moved downstream. The *Ficus* fruits are of-



Figure 1. Peace on the back of his mother, Puffy

ten eaten by wadging (*i.e.*, extracting juice by chewing and compressing the fruits; defined by Goodall 1989; see also Figure 2). After extracting the juice, the remainder is usually spat out as “a wadge.”

At 14:36 h, Primus and Puffy seemed to have finished feeding and started grooming each other on the riverbed, while Peace sat nearby (Figure 3). Then at 14:47 h, Peace picked up a wadge of *Ficus* discarded by Primus and applied it to his genital area, inserting his erect penis into it and thrusting several times (Figure 4; Video 1 available at <http://mahale.main.jp/PAN/2018/001.html>). He successively used several wadges. At 14:52 h, he copulated with an estrus adult female, Omo.

DISCUSSION

Probably, no one would doubt that so called “sex toys,” which some human males use for masturbation, are “tools” in the broader sense. The wadges into which



Figure 2. An adult male eating *Ficus vallis-choudae* fruits by wadging



Figure 3. Primus (left) and Puffy (right) grooming each other while Peace sits in front

Peace inserted his penis apparently have the same function with those of “sex toys” even though the wadges were not purposefully made for that function. The wadges had just been discarded; therefore, they seem to have had moderate warmth, moisture, and softness that may give more pleasurable stimuli than those made with a hand or with rubbing his penis against ground. The wadges are also manipulable objects and thus meet the criteria of animal “tools” (Shumaker *et al.* 2011).

According to Morris (1971), the word masturbation appears to be a corruption of *manu-stuprare*, or “to defile with the hand,” thus it primarily implies using a hand. Definitions of masturbation by macaque (*Macaca* spp.) males also include “manual rubbing” (Thomsen & Soltis 2004) or “manual manipulations” (Dubuc *et al.* 2013). However, these cases may simply reflect the use of a hand or hands being observed, and if we think of human and nonhuman ape masturbation using tools, the use of hand may not necessarily be a condition of the definition of masturbation.

Some may consider that male masturbation *potentially* leads to ejaculation (though it may sometimes end before ejaculation). The fact that discussions of male masturbation are often done in strong connection with sperm competition (Thomsen *et al.* 2003) also implies that ejaculation is thought of as a basic and fundamental component of this behavior. Although behavioral definitions of male primate masturbation do not usually require ejaculation to occur (Thomsen & Soltis 2004;

Dubuc *et al.* 2013), these studies clearly showed that the defined behaviors of these males did sometimes lead to ejaculation. On the other hand, in the case of Mahale chimpanzee males (including sexually mature ones), Nishida (2008) emphasizes that their penile fumbling “is not masturbation” because it completely lacks ejaculation. Considering that male masturbation requires ejaculation, as stated in the study by Nishida, the observed subject (Peace) cannot be stated to have masturbated.

Some authors say that it is inappropriate to call contact to/with sexual organs by infant primates as *sexual* (Mizuhara 1981). On the other hand, Takenoshita (2009) argues that some behaviors can be *sexual* even without ejaculation. It is difficult to discern whether or not an infant chimpanzee, which cannot ejaculate, had *sexual* pleasure by stimulating his own penis. At least, when a chimpanzee infant male inserts his erect penis into the vagina of a female and thrusts it (without ejaculation), the behavior is called “copulation” (*e.g.*, Hasegawa 1990), the same term used for a mature male’s almost identical sexual behavior. Hence, Peace’s behavior may be regarded as *sexual*, despite lacking ejaculation. Peace copulated with an estrous female following his behavior involving wadges; hence, it seems that motivation underlying this behavior might have been similar to that underlying copulation with a female.

ACKNOWLEDGMENTS

I would like to thank the Tanzania Commission for Science and Technology, the Tanzania Wildlife Research Institute, and the Tanzania National Parks for the permissions to conduct field research at Mahale. I would also like to thank Dr. Ruth Thomsen, Dr. Kazuhiko Hosaka, and an anonymous reviewer for their helpful comments and suggestions on the earlier manuscript. The study was supported by the MEXT/JSPS kakenhi JP15H04429, #4903 JP17H06381, and JP26284138.

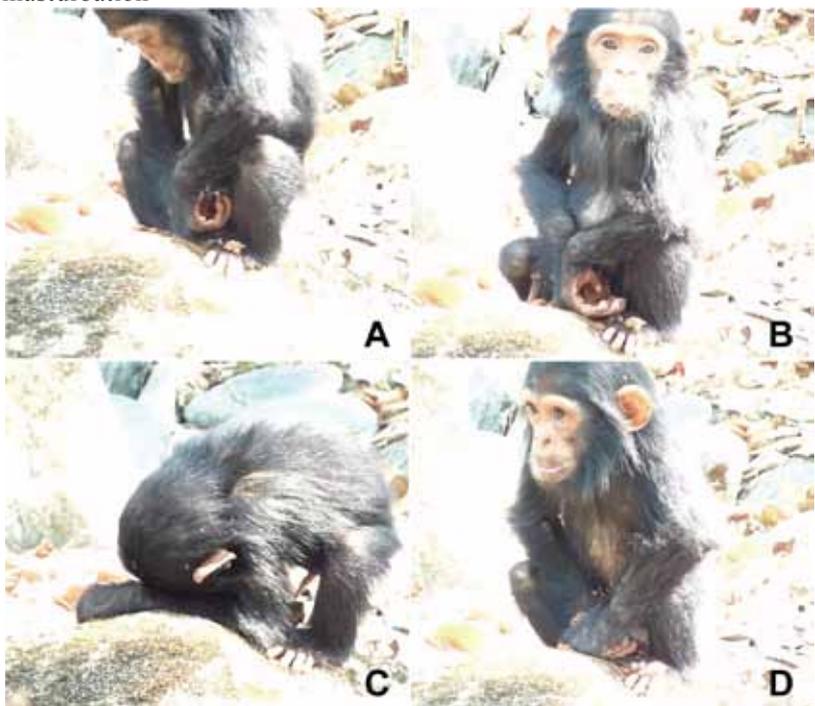


Figure 4. Peace inserting his penis into a wadge and thrusting (still images taken from video)

REFERENCES

- Dixon AF 2012. *Primate Sexuality*. Oxford University Press, Oxford.
- Dubuc C, Coyne SP, Maestriperi D 2013. Effect of mating activity and dominance rank on male masturbation among free-ranging male rhesus macaques. *Ethology* **119**: 1006–1013.
<https://doi.org/10.1111/eth.12146>
- Goodall J 1989. *Glossary of Chimpanzee Behaviors*. Jane Goodall Institute.
- Hasegawa T 1990. [Mystery of promiscuous society: Sexual life of chimpanzees.] In: [*Cultural Historiography of Monkeys*.] Nishida T, Izawa K, Kano T (eds), Heibon-sha, Tokyo, pp. 371–388, in Japanese.
- Harrison B 1962. A study of orang-utan behaviour in the semi-wild state 1959–60. *Int Zoo Yearb* **3**: 57–68.
<https://doi.org/10.1111/j.1748-1090.1962.tb03396.x>
- Kaestle CE, Allen KR 2011. The role of masturbation in healthy sexual development: Perceptions of young adults. *Arch Sex Behav* **40**: 983–994.
<https://doi.org/10.1007/s10508-010-9722-0>
- Mizuhara H 1981. [*Notes on Behavioral Theory of Japanese Macaques*.] Dōbutsu-sha, Tokyo, in Japanese.
- Morris D 1971. *Intimate Behaviour: A Zoologist's Classic Study of Human Intimacy*. Random House, New York.
- Nakamura M, Hosaka K, Itoh N, Zamma K 2015. *Mahale Chimpanzees: 50 Years of Research*. Cambridge University Press, Cambridge.
- Nishida T 2008. [*Society of Chimpanzees*.] Tōhō Shuppan, Tokyo, in Japanese.
- Nishida T, Kano T, Goodall J, McGrew WC, Nakamura M 1999. Ethogram and ethnography of Mahale chimpanzees. *Anthropol Sci* **107**: 141–188.
<https://doi.org/10.1537/ase.107.141>
- Shumaker RW, Walkup KR, Beck BB 2011. *Animal Tool Behavior: The Use and Manufacture of Tools by Animals*. The Johns Hopkins University Press, Baltimore.
- Takenoshita Y 2009. [Sex by Japanese macaques: “Proceptivity” observed in homosexual behaviors.] In: [*Anthropology of Sex*.] Okuno K, Shiino W, Takenoshita Y (eds), Shunpū-sha, Tokyo, pp. 3–34, in Japanese.
- Thomsen R, Soltis J 2004. Male masturbation in free-ranging Japanese macaques. *Int J Primatol* **25**: 1033–1041.
<https://doi.org/10.1023/B:IJOP.0000043350.75897.89>
- Thomsen R, Soltis J, Teltscher C 2003. Sperm competition and the function of male masturbation in nonhuman primates. In: *Sexual Selection and Reproductive Competition in Primates*. Jones CB (ed), American Society of Primatologists, Norman, pp. 437–453.
- Thomsen R, Sommer V 2015. Masturbation (nonhuman primates). In: *The International Encyclopedia of Human Sexuality (First Edition)*. Whelehan P, Bolin A (eds), Wiley-Blackwell, Boston.
<https://doi.org/10.1002/9781118896877.wbiehs289>

Received: 4 October 2017

Accepted: 1 February 2018

Four Cases of Grooming Sessions between Chimpanzees and Guenons at the Kalinzu Forest Reserve, Uganda

Takumi Tsutaya^{1,2}, Natsumi Aruga³, Hodaka Matsuo³, & Chie Hashimoto³

¹ Graduate School of Science, Kyoto University, Kyoto, Japan

² Department of Biogeochemistry, Japan Agency for Marine-Earth Science and Technology, Kanagawa, Japan

³ Primate Research Institute, Kyoto University, Aichi, Japan
(E-mail: tsutayatakumi@gmail.com)

INTRODUCTION

Interactions between wild chimpanzees and other primates have mostly been studied in terms of hunting (e.g., Boesch & Boesch 1989). On the other hand, affiliative interactions have been less studied. Although a few cases on affiliative interactions have been reported, evidence is mostly anecdotal and sporadic. Young chimpanzees frequently play with and sometimes engage in grooming with young baboons in Gombe, Tanzania (Goodall 1986; Teleki 1973). Grooming of a red-tailed monkey by a subadult female chimpanzee was observed in Budongo, Uganda (John & Reynolds 1997).

Here four cases of affiliative interactions (i.e., grooming) between wild chimpanzees and sympatric guenons in the Kalinzu Forest Reserve, Uganda, are reported. One case is described in detail, and the other three other cases are succinctly described. Although these cases are anecdotal, they contribute to understand typical affiliative interactions between wild chimpanzees and sympatric guenons.

OBSERVATIONS

Kalinzu Forest Reserve

The Kalinzu Forest Reserve is located in western Uganda (30°07'E, 0°17'S) and covers an area of 137 km² (Hashimoto 1998). Ecological and behavioral studies on wild chimpanzees in the Kalinzu Forest Reserve have been conducted since 1992. Six sympatric primate species have been identified in the reserve: eastern chimpanzee (*Pan troglodytes schweinfurhii*), blue monkey (*Cercopithecus mitis*), red-tailed monkey (*C. ascanius*), L'Hoest's monkey (*C. lhoesti*), Abyssinian black-and-white colobus (*Colobus guereza*), and olive baboon (*Papio anubis*) (Hashimoto 1998). The two dominant tree species in the Kalinzu Forest Reserve are *Parinari excelsa*, a primary forest species, and *Musanga leo-errerae*, a secondary forest species, and several *Ficus* trees are also found (Hashimoto 1998). The fruits of *Musanga* and *Ficus* are important food sources for primates in the Kalinzu Forest Reserve (Tashiro *et al.* 1999).

The studied group of chimpanzees was the M-group (Hashimoto 1998), which has been continuously studied since 1997. There are approximately 100 individuals in this group, and most group members have been identified (Hashimoto *et al.* 2015).

Detailed Observation

On December 2, 2015, a chimpanzee mother (Ida) was the subject of focal animal sampling from 10:34 h at a *Musanga*-dominant secondary forest. Her offspring (Iku, a 10-year-old female; Iyo, a 5-year-old female; and Iliya, a 2-year-old male) were accompanied by Ida, but Iku was out of the observers' sight for most of the observation period. Other chimpanzees were not observed, and their voices were not heard during the observation period. After eating fruits of *Musanga*, Ida made day bed at 10:49 h and rested until the end of the observation period. Around noon, a solitary male red-tailed monkey (RT1) approached within 30 m and started feeding on the fruits of *Musanga*. Around 13:00 h, Iyo and Iliya moved to a *Funtumia africana* tree located 10 m away from Ida's tree and possibly started interacting with RT1. We estimated RT1 as a solitary (i.e., individual who does not belong to a specific group) because we did neither see nor hear the presence of other red-tailed monkeys during the observation.

At 13:08 h, the first author observed RT1's tail next to Iyo and Iliya at the *F. africana* tree and started recording a video from 13:10:07 h (Video 1 available online at <http://mahale.main.jp/PAN/2018/003.html>). Iyo was on the adjacent branch (< 1 m away) with RT1, and Iliya was on a different branch, approximately 1 m above. RT1 seemed to request grooming by posing his shoulder, hip, cheek, tail, or back mostly to Iyo and sometimes to Iliya. Iyo groomed at least the hip, cheek, tail, and back of RT1 by hand and mouth (Figure 1). Iyo held RT1's tail and inspected it for more than 10 s. Iliya touched RT1 but did not groom him. Self-scratching was observed by both Iyo and RT1. After a sudden movement by RT1, Iyo and Iliya moved to another branch in the same tree at 13:15:04 h. No grooming from RT1 was observed.

After this grooming interaction, no grooming was observed, but Iyo and Iliya shook branches on which RT1 was sitting (see Video 2 from 13:18:21 h, Video 3 from 13:21:15 h, and Video 4 from 13:24:00 h available online at <http://mahale.main.jp/PAN/2018/003.html>). Iyo made day bed and rested in it (Video 3). Finally, RT1 moved 5 m from Iliya on the same tree, after Iliya shook a RT1's branch at 13:24:50 h (Video 4). From 13:24:49 h, Iyo and Iliya played with each other. At 13:26:15 h, RT1 moved to another tree and left the chimpanzees.

Throughout the interaction, Ida was observed by a



Figure 1. Iyo grooms a solitary male red-tailed monkey (RT1).

local research assistant. She was resting in her bed about 10 m away from the *F. africana* tree and was totally ignorant.

Other Three Cases

Although detailed data are not available, three additional cases of affiliative interactions between chimpanzees and solitary guenons were observed in the Kalinzu Forest Reserve. These guenons were estimated as solitary because we did neither see nor hear the presence of the other monkeys during the observation.

The second author observed that a chimpanzee mother (Nono) groomed her older offspring (Noe, an 11-year-old female). Her younger offspring (Nobita, a 5-year-old male) played alone within 2 m from Nono. A solitary male blue monkey (BM1) approached within 10 m to these chimpanzees at 13:42 h on June 30, 2015. BM1 approached within 2 m to Nono at 13:52 h and touched Nono by hand to groom her several times from 13:55 h to 13:58 h. Nobita swayed a branch behind Nono toward BM1, and Noe drove away BM1 at 13:59 h. No other chimpanzees were present within the observer's sight.

The third author observed a solitary red-tailed monkey (RT2) approaching a resting mother–infant pair of chimpanzees. Although RT2 posed his back to the infant within < 1 m, possibly to request grooming, the mother subsequently drove RT2 away. No other chimpanzees were present within the observer's sight.

The last author observed Minny (a juvenile female chimpanzee) grooming a solitary male blue monkey (BM2) on a *Ficus saussureana* tree for more than 1 h. Minny traveled with Gai (a nulliparous adult female) during the observation day. BM2 requested grooming by posing his back to Minny. BM2 did not groom the chimpanzees. No other chimpanzees were present within the observer's sight.

DISCUSSION

Most actors of chimpanzee side are mother and

offspring, and all actor of guenon side is solitary male. Because adult chimpanzees tend to be aggressive to other species (Ross *et al.* 2009), guenons probably avoid groups of chimpanzees, especially groups of adult male chimpanzees (but see Hosaka & Ihobe 2015). However, immature chimpanzees have a relatively small body size, and thus guenons may be able to approach non-adult chimpanzees without fear of lethal aggression.

Solitary guenon males seem to spontaneously approach isolated mother–offspring pairs and small groups of female chimpanzees and request grooming from them. One possible reason for this behavior is hygiene. Freeland (1981) reported that a pet male red-tailed monkey gets 8.2 ticks per hour as a result of nine walks in the Kibale forest, Uganda. Because some parts of the body are difficult to reach and groom, grooming by other individuals is important to keep the whole body clean. Red-tailed and blue monkeys create one-male social group. Adult males are intolerant of each other and do not form “bachelor groups” in these species (Struhsaker 1980; Butynski 1982). Because of such social structures, solitary male red-tailed and blue monkeys need to be groomed by other species. It has been reported that solitary male red-tailed monkeys sometimes travel with groups of red colobus (*Colobus badius*) in the Kibale Forest, Uganda and are groomed by members of the group (Struhsaker 1981). The last author observed a solitary male red-tailed monkey travel with and be groomed by a group of Abyssinian black-and-white colobus in the Kalinzu Forest Reserve. It is possible that solitary male red-tailed and blue monkeys approach isolated mother–offspring chimpanzee pairs with the expectation of being groomed.

Because the observations reported here are anecdotal, collecting quantitative data on affiliative interactions will be crucial to further understand inter-species relationships between sympatric primates.

ACKNOWLEDGMENTS

We thank local research assistants for helping our field-

work. We are grateful to Yasuko Tashiro, Moe Go, Hiroshi Ihobe, Ikki Matsuda, Mina Isaji, Hiroyuki Takemoto, Takeshi Furuichi, members of Laboratory of Human Evolution Studies, and a reviewer for helpful comments on this study. This work was supported in part by Grants-in-Aid for Scientific Research (KAKENHI: 15J00464) from the Japan Society for the Promotion of Science.

REFERENCES

- Boesch C, Boesch H 1989. Hunting behavior of wild chimpanzees in the Tai National Park. *Am J Phys Anthropol* **78**:547–73.
<https://doi.org/10.1002/ajpa.1330780410>
- Butynski TM 1982. Harem-male replacement and infanticide in the blue monkey (*Cercopithecus mitus stuhlmanni*) in the Kibale Forest, Uganda. *Am J Primatol* **3**:1–22.
<https://doi.org/10.1002/ajp.1350030102>
- Freeland WJ 1981. Functional aspects of primate grooming. *Ohio J Sci* **81**:173–177.
- Goodall J 1986. *The Chimpanzees of Gombe: Patterns of Behavior*. Belknap Press, Cambridge.
- Hashimoto C 1998. Chimpanzees of the Kalinzu Forest, Uganda. *Pan Afr News* **5**:6–8.
<https://doi.org/10.5134/143364>
- Hashimoto C, Isaji M, Koops K, Furuichi T 2015. First records of tool-set use for ant-dipping by Eastern chimpanzees (*Pan troglodytes schweinfurthii*) in the Kalinzu Forest Reserve, Uganda. *Primates* **56**:301–305.
<https://doi.org/10.1007/s10329-015-0478-y>
- Hosaka K, Ihobe H 2015. Interspecific relationships. In: *Mahale Chimpanzees: 50 years of Research*. Nakamura M, Hosaka K, Itoh N, Zamma K (eds), Cambridge University Press, Cambridge, pp. 213–224.
- John T, Reynolds V 1997. Budongo Forest chimpanzee groups a redtailed monkey. *Pan Afr News* **4**:6.
<https://doi.org/10.5134/143349>
- Ross SR, Holmes AN, Lonsdorf EV 2009. Interactions between zoo-housed great apes and local wildlife. *Am J Primatol* **71**:458–465.
<https://doi.org/10.1002/ajp.20675>
- Struhsaker TT 1980. Comparison of the behaviour and ecology of red colobus and redtail monkeys in the Kibale Forest, Uganda. *Afr J Ecol* **18**:33–51.
<https://doi.org/10.1111/j.1365-2028.1980.tb00269.x>
- Struhsaker TT 1981. Polyspecific associations among tropical rain-forest primates. *Z Tierpsychol* **57**:268–304.
<https://doi.org/10.1111/j.1439-0310.1981.tb01928.x>
- Tashiro Y, Furuichi T, Hashimoto C 1999. A preliminary report of the feeding ecology of chimpanzees in the Kalinzu forest reserve, Uganda: fecal analysis and habitat use. *Primate Res* **15**:179–185, in Japanese with English summary.
<https://doi.org/10.2354/psj.15.179>
- Teleki G 1973. The omnivorous chimpanzee. *Sci Am* **228**: 32–42.

Received: 16 December 2017

Accepted: 23 March 2018

Deposit and Theft? Two Unusual Interactions over Wild Plant Food between Adult Chimpanzees in Mahale

Takuya Matsumoto^{1,2,3} & Hiroko Sakuragi^{1,4}

¹ Japan Society for the Promotion of Science (JSPS) Research Fellow

² Graduate School of Science, Kyoto University, Japan

³ Research Institute for Humanity and Nature, Japan

⁴ Wildlife Research Center, Kyoto University, Japan

(E-mail: matsumoto@chikyu.ac.jp)

INTRODUCTION

Food sharing is assumed to be one of the most important behaviors in the process of human evolution (e.g., Isaac 1978). Therefore, its occurrence and characteristics have been studied extensively across primates (McGrew 1975; Jaeggi & van Schaik 2011). Among chimpanzees (*Pan troglodytes*), the most genetically closest species to humans (*Homo sapiens*), food sharing is commonly observed, and relevant data on several populations have been well documented and analyzed (Hosaka 2015).

Food sharing among chimpanzees can often be observed between mothers and infants. Studies suggest that infants learn food items through food sharing from their mothers (e.g., Nishida & Turner 1996). Most of the food items shared among non-kin adults include meat and cultivated food (Boesch & Boesch 1989; Hockings *et al.* 2007; Ohashi 2007). Sharing of wild plant food among adults is rare. Boesch & Boesch (1989) defined six types of food transfer interactions (focusing on meat) and suggested that most are characterized by passive sharing (but see Gilby 2006 for active sharing occurring relatively more often among Gombe chimpanzees). A recipient shows begging behavior and takes a part of the food without any facilitation or resistance from the “possessor”, who is defined as an individual in physical contact with the food (McGrew 1975; Jaeggi & van Schaik 2011).

The present study reports two cases of wild plant food sharing among chimpanzees. The events are seemingly similar to those reported by Nakamura & Itoh (2001). However, the cases shown here had notable differences from typical food sharing interactions observed in chimpanzees. The subjects were adult chimpanzees (*P. t. schweinfurthii*) of the M group at the Mahale Mountains National Park, Tanzania (see Nakamura *et al.* (2015) for details on the study site and chimpanzee group).

OBSERVATIONS

Case 1, on February 4, 2013 (observed by TM)

At 15:51 h, an adult female, XP, obtained a lemon (*Citrus limon*) fruit and started to feed. XP placed her right hand on the ground behind her to hold herself up as she sat cross-legged with her 3-month-old infant sleeping on her lap. XP peeled the lemon with her left hand and teeth; twenty seconds later, an adult male, CT, approached and sat beside XP on her left, peering at her mouth. When XP finished peeling the lemon, she divided it into halves

using her teeth and placed one half in CT's right foot. CT kept holding the half with the same foot, while XP kept the other half in her left hand. CT kept peering at XP's mouth and did not show interest in the fragment handed by XP. After XP finished eating the first half, she took back the half in CT's foot, all the while CT kept peering at her. Then, XP divided the retrieved half into quarters and had CT hold one quarter with his foot again. After finishing her portion, XP took back the quarter from CT's foot and ate it. At 15:55 h, XP put the last piece of fruit in her mouth while CT continued to peer. XP left the site chewing; CT left 30 s later. Forty seconds after CT moved from the site, he obtained a lemon fruit for himself.

Case 2, on July 19, 2015 (observed by TM and HS)

At 12:37 h, an adult female, BD, was found holding four fruits of *Tabernaemontana pachysiphon* (two bunches with two fruits each) on a tree. Another adult female, RJ, rushed to BD and tried to pull the fruits toward herself. BD screamed, apparently resisting; however, RJ succeeded in snatching a bunch. BD started to eat a fruit of the other bunch while RJ placed the bunch snatched from BD at her feet. RJ then pulled the fruit that BD was eating using both hands and started to feed on it (for details of the event after then, see Video 1 available online at <http://mahale.main.jp/PAN/2018/004.html>). Both BD and RJ held the fruit, although only RJ was able to eat it. After a while, BD moved slightly away from RJ and the fruits. After finishing the first fruit, RJ started to eat the second fruit from the bunch. A while later, BD re-approached, then touched and peered at the fruit that RJ was eating. RJ seemed to share a small piece once by mouth-to-mouth transfer. BD tried to pull the fruit toward herself and eat it; however, RJ resisted by biting BD's arm and face (Figure 1). RJ started to eat the third fruit, which allowed BD to have the second's leftover. However, most edible portions of the second fruit had been consumed by RJ. BD peered at the third fruit that RJ was eating, but RJ did not share. At 12:44 h, BD left the site. RJ continued feeding and ate all four fruits. There were no individuals other than BD, RJ and RJ's infant in the vicinity.

DISCUSSION

Although some studies operationally define possession as being in physical contact with the item (McGrew

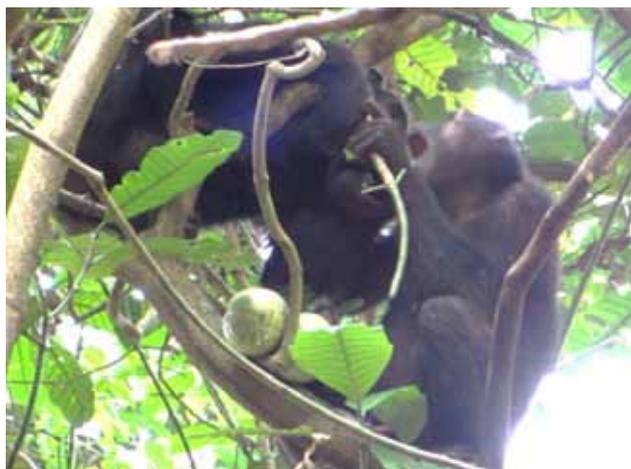


Figure 1: An adult female, RJ (right), exhibited threatening behavior toward an adult female, BD (left), which tried to take back the *Tabernaemontana pachysiphon* fruit.

1975; Jaeggi & van Schaik 2011), Case 1 in the present study raises a question to this definition. CT kept peering at the piece of lemon that XP was eating while apparently showing no interest in the fragment handed by her. XP took the lemon fruit back from CT's foot as if from her own and ate the entire fruit by herself. Both individuals seemed to share the awareness that the fruit held by CT belonged to XP, even though the individual in physical contact with it was CT, not XP. XP had only one hand available for handling the fruit, for three of her limbs were occupied: legs with her sleeping infant, arm for holding herself up. It seems plausible that XP may have used CT's foot so as not to get dirt on the surface by placing it on the ground. She would have used her own foot to hold a peeled fruit if her feet had not been occupied. This rare behavior of XP may lead to a better understanding of plant food sharing in terms of social significance as follows.

If CT was motivated simply to feed on lemon, he could have easily done so on his own in the same area. However, he chose to stay beside XP and continued to peer at her mouth. Interestingly, he did not recognize the piece of fruit that XP put in his foot as having been shared, or given, by her. Within 1 h before this event, CT had groomed XP for approximately 10 min unilaterally and followed XP intermittently, showing his strong motivation to interact with XP. These observations suggest that it was important for CT to receive from XP what she was eating, not what she put aside when eating. Case 1 supports the suggestion by Slocombe & Newton-Fisher (2005) that plant food sharing between adults may not always be explained by nutritional benefits, but by social significance.

Food sharing in Case 2 can be interpreted as a forceful event because (1) BD resisted by screaming and attempted to reclaim the food and (2) RJ showed a threatening attitude toward BD. This can be assumed as theft, which is one of the 6 types of food transfer interactions defined by Boesch & Boesch (1989). The availability of *T. pachysiphon* fruits is not so high because chimpanzees check and try to select ripe fruits. Thus, these fruits may have been so attractive that RJ took them from BD. Theft

accounted for 31.0% (44 out of 142 captures) of contests over prey following capture in chimpanzee predation on mammals during the 1991–1994 period (Hosaka *et al.* 2001). *T. pachysiphon* fruits might have been as attractive to RJ as meat that she snatched it in Case 2.

No data are available on the social rank of BD and RJ. Both immigrated to the M group at the same period in 2010 (Hayakawa *et al.* 2011) and have often traveled in the same nomadic party. Furthermore, BD has taken care (*e.g.*, carrying) of RJ's infant frequently (Sakuragi, unpublished data). It is notable that this forceful food transfer occurred between relatively close individuals.

Previous studies on chimpanzee food sharing have focused on meat sharing and have found that possessors gain fitness benefits from sharing (*e.g.*, Gilby 2006). However, the two cases shown in this study reveal that food-related interactions in chimpanzees are quite diverse. The first case especially calls for reevaluation of the possessor–recipient dichotomy regarding food transfer. It is difficult to reach any general conclusion from these two cases alone; more detailed descriptions and analyses of interactions related to food transfer are required to elucidate the concept of “possession” of food in chimpanzee societies.

ACKNOWLEDGMENTS

Permission to conduct this research was provided by the Tanzania Wildlife Research Institute (TAWIRI), Tanzania Commission for Science and Technology (COSTECH), and Tanzania National Parks (TANAPA). We are grateful to the Mahale Mountains National Park (MMCRP) and Mahale-Gombe Wildlife Research Centre (MGWRC) for logistic support. We thank all our research colleagues and local assistants of the Mahale Mountains Chimpanzee Research Project (MMCRP) for their continuous help and support. The present study was financially supported by MEXT KAKENHI (#24255010); JSPS KAKENHI (#14J00562 & #16J03218); and the Leading Graduate Program in Primatology and Wildlife Science, Kyoto University.

REFERENCES

- Boesch C, Boesch H 1989. Hunting behavior of wild chimpanzees in the Tai National Park. *Am J Phys Anthropol* **78**:547–573.
<https://doi.org/10.1002/ajpa.1330780410>
- Gilby IC, 2006. Meat sharing among the Gombe chimpanzees: Harassment and reciprocal exchange. *Animal Behav* **71**:953–963.
<https://doi.org/10.1016/j.anbehav.2005.09.009>
- Hayakawa T, Nakashima M, Nakamura M 2011. Immigration of a large number of adolescent female chimpanzees into the Mahale M group. *Pan Afr News* **18**:8–10.
<https://doi.org/10.5134/143527>
- Hockings KJ, Humle T, Anderson JR, Biro D, Sousa C, Ohashi G, Matsuzawa T 2007. Chimpanzees share forbidden fruit. *PLOS One* **2**:e886.
<https://doi.org/10.1371/journal.pone.0000886>
- Hosaka K 2015. Hunting and food sharing. In: *Mahale Chimpanzees 50 Years of Research*. Nakamura M, Hosaka K, Itoh N, Zamma K (eds), Cambridge University Press, Cambridge, pp. 274–290.
- Hosaka K, Nishida T, Hamai M, Matsumoto-Oda A, Uehara S 2001. Predation of mammals by the chimpanzees of the Mahale Mountains, Tanzania. In: *All Apes Great and Small*. Galdikas BMF, Briggs NE, Sheeran LK, Shapiro GL, Goodall J (eds), Springer, Boston, pp. 107–130.
- Isaac G 1978. The food-sharing behavior of protohuman hominids. *Sci Am* **238**:90–108.
<https://doi.org/10.1038/scientificamerican0478-90>

- Jaeggi AV, van Schaik CP 2011. The evolution of food sharing in primates. *Behav Ecol Sociobiol* **65**:2125.
<https://doi.org/10.1007/s00265-011-1221-3>
- McGrew WC 1975. Patterns of plant food sharing by wild chimpanzees. In: *Contemporary Primatology*. Kondo S, Kawai M, Ehara A (eds), Karger, Basel, pp. 304–309.
- Nakamura M, Hosaka K, Itoh N, Zamma K (eds) 2015. *Mahale Chimpanzees 50 Years of Research*. Cambridge University Press, Cambridge.
<https://doi.org/10.1002/ajpa.23293>
- Nakamura M, Itoh N 2001. Sharing of wild fruits among male chimpanzees: Two cases from Mahale, Tanzania. *Pan Afr News* **8**:28–31.
<https://doi.org/10.5134/143398>
- Nishida T, Turner LA 1996. Food transfer between mother and infant chimpanzees of the Mahale Mountains National Park, Tanzania. *Int J Primatol* **17**:947–968.
<https://doi.org/10.1007/BF02735296>
- Ohashi G 2007. Papaya fruit sharing in wild chimpanzees at Bossou, Guinea. *Pan Afr News* **14**:14–16.
<https://doi.org/10.5134/143471>
- Slocombe KE, Newton-Fisher NE 2005. Fruit sharing between wild adult chimpanzees (*Pan troglodytes schweinfurthii*): A socially significant event? *Am J Primatol* **65**:385–391.
<https://doi.org/10.1002/ajp.20123>

Received: 8 February 2018

Accepted: 15 April 2018

Following Fifi: My Adventures among Wild Chimpanzees: Lessons from Our Closest Relatives

By John Crocker

New York: Pegasus Books, 269 pp.

Published in 2017

ISBN: 978-1-68177-568-5, \$27.95 (USA), hardback

Among Chimpanzees: Field Notes from the Race to Save Our Endangered Relatives

By Nancy J Merrick

Boston: Beacon Press, 254 pp.

Published in 2014

ISBN: 978-0-8070-8074-0, \$18.00 (USA), paperback

William C McGrew

*School of Psychology and Neuroscience, University of St Andrews, Scotland, UK
(E-mail: wcm2@st-and.ac.uk)*

In the early 1970s, under the leadership of Prof. David Hamburg, Stanford University had a programme that sent to Tanzania small batches of undergraduates majoring in human biology. At Gombe they spent months acting as research assistants in ongoing studies of chimpanzees and baboons. On the chimpanzee front, most students focussed on the mother–infant study, collecting detailed data on the daily lives of female apes with dependent offspring. Two of these students, Nancy Merrick and John Crocker, went on to become physicians, and now, decades later, each has written a memoir, and Jane Goodall has supplied a foreword to each book. Their books are enlightening (for after all, how often do such young persons get such a golden opportunity?), but the results are very different. (Necessary disclosure: I was at Gombe at the same period in 1972–73 as these two authors, so my first-hand knowledge may be similarly impressionistic to theirs.)

Crocker's is the more focussed of the two, going into depth, in a three-part structure. Part One is a detailed recollection of his experience, from arrival at Gombe onwards, for eight months in the field. It covers the first 104 pages, and Chapter 3 is a graphic account of a typical day in the life of a student researcher doing focal-subject follows of chimpanzee mothers and offspring. He captures the nuances of the experience, as well as the data collection. In the process, he formed a close friendship with one of the Tanzanian field assistants, Hamisi Matama, to the unusual extent that they later ending up going up Mt. Kilimanjaro together. Part Two describes how Crocker, as a family physician in Seattle, makes use of 'lessons learned' about parental nurturing, as acquired from time spent with Fifi, one of Gombe's most famous and influential individual chimpanzees. He shows how the simple basics of intimate interaction as practiced by our nearest

living relations can be applied to the day-to-day practice of family medicine. This is a modest application of such knowledge, by comparison with more prominent and newsworthy aspects of modelling the evolutionary origins of human behaviour, such as aggression, technology, social structure, diet, etc., but insights abound. Part Three of the book is Crocker's return to Tanzania and Gombe, 36 years later, in 2009, accompanied by his eldest son. Their journey combines curiosity about what has happened in the meantime to Gombe and the chimpanzees, introducing his son to the African bush, but most importantly, reunion with Hamisi, and introduction to his family, after decades apart. This is done most movingly and contributes to the overall feel-good tone of the book.

The book is illustrated with 37 good colour plates from past and present and has a useful 9-page index. However, it gives no scientific references, even to Jane Goodall's basic work, so that readers who want such background information must look elsewhere (see below).

Merrick's is a much more wide-ranging effort, although the two authors have much in common. She too gives a personal, detailed account of her student time at Gombe in 1972, taking part in the same study of mother-infant pairs as did Crocker. Her account of her first day in the field shows her to be an articulate story-teller. This opportunity for comparison of that research project in action is unusual, for example, in terms of allowing a sort of inter-observer reliability. She too later takes her family to Africa, for many of the same reasons, and her response to 'progress' (that is, the development of tourism) at Gombe provides a useful and confirmatory judgement. But Merrick goes on to make several trips and not just to see chimpanzees; an abortive trip to Karisoke to meet with Dian Fossey must have been frustrating. Her accounts of smuggling a young chimpanzee out of Gombe and of the

Gombe kidnapping by rebels from Zaire make compelling reading.

The book then opens up in a variety of ways that end of being an overall ‘state of the union’ assessment of *Pan troglodytes*. Wild chimpanzees, especially those in fragmented forest segments, such as at Bulindi, Uganda, get coverage that otherwise is scarce, by comparison with populations in well-known national parks. Refuges for confiscated or orphaned chimpanzees, both in Africa and in the West, get coverage, as do zoological gardens, especially Los Angeles Zoo (although its Mahale exhibit, which has no connection to the wild chimpanzees of western Tanzania, is not explained). All the major conserva-

tion problems facing wild chimpanzees are aired, such as the bush meat trade, and Merrick provides a useful list of 10 things that an individual person can do to help in ameliorating them.

The book has a useful 10-page index and nine pages of chapter-by-chapter endnotes, in the form of references. Disappointingly, it has no photographs, and the single illustration, a map, is problematic, failing to name Burkina Faso and denying chimpanzees to Niger.

In summary, both books have much to offer as first-person accounts by committed and insightful observers taking a long-term view. Anyone wondering what it was like to be a student in Gombe’s heyday of the 1970s will learn more here than from any other source.

Received: 13 February 2018

Accepted: 14 March 2018

A Female Bonobo Sleeping on the Ground after Daytime Birth and its Implications

Heungjin Ryu

Pan Africa News **24(2)**, 9–13 (2017)

Owing to a technical error, corresponding e-mail address was typed incorrectly as ryu.heungjin.26v@st.kyoto-u.ac.jp instead of ryu.heungjin.26v@kyoto-u.jp in the print and the KURENAI versions. This error has been corrected in the HTML version at [http://mahale.main.jp/PAN/24_2/24\(2\)_01.html](http://mahale.main.jp/PAN/24_2/24(2)_01.html).

Starting 7 May 2018, Pan Africa News (PAN) has adopted the “Online First” service that enables submitted manuscripts to be published online at http://mahale.main.jp/PAN/online_first.html, before print publication following peer review and acceptance. Along with this change, we have adopted a new format of PDF and print version of PAN in which each paper begins at the top of a new page.

The adoption of the Online First service means that the deadlines of manuscripts are virtually no longer necessary. If you wish to publish your manuscript in PAN, you should submit it anytime. It could be published online ahead of print within a month if your communication with a reviewer proceeds fast and smoothly. Appropriate numbers of pooled Online First papers are selected to be compiled into a print issue twice per year in June and December.

Finally, please note that DOI (Digital Object Identifier) of each paper is not available at the time of online first publication, because we chose the system where DOIs are assigned by Crossref to all PAN papers published in the course of a year only once per year in December. Thus, in the year following print publication, you can search for DOIs of published PAN papers at free DOI lookup in the Crossref website (<https://www.crossref.org/guestquery/>). For the detail about how to get DOI, please see the Instructions to Authors at <http://mahale.main.jp/PAN/instruction.html>.

We hope that you like this new service. We look forward to receiving your good research and conservation about chimpanzees and bonobos as submissions to PAN!

Kazuhiko Hosaka, on behalf of the PAN Editorial Team



A 6-year-old male, Omali (left), and a 7-year-old female, Upepo (right), playing with each other. Photo taken by Kazuhiko Hosaka on 17 August 2017 at Mahale Mountains National Park, Tanzania.