American Journal of Primatology 53:93–97 (2001)

Capturing and Toying with Hyraxes (*Dendrohyrax dorsalis*) by Wild Chimpanzees (*Pan troglodytes*) at Bossou, Guinea

SATOSHI HIRATA[1*], GEN YAMAKOSHI[2], SHIHO FUJITA[1], GAKU OHASHI[1], AND TETSURO MATSUZAWA[1]
[1]*Primate Research Institute, Kyoto University, Aichi, Japan*
[2]*Graduate School of Asian and African Area Studies, Kyoto University, Kyoto, Japan*

Chimpanzees (*Pan troglodytes verus*) were observed capturing and toying with western tree hyraxes (*Dendrohyrax dorsalis*, Order Hyracoidea) at Bossou, Guinea. An adolescent female carried one hyrax for 15 hr, slept with it in her nest, and groomed it. The captive was not consumed. Nearby adults ignored the hyrax. In another case, two adolescent males timidly inspected a small hyrax. These observations indicate that the chimpanzees at Bossou do not regard the hyrax as a prey animal, supporting the idea that lack of opportunity does not seem to be the only reason that chimpanzees do not consume an individual of a potential prey species. Am. J. Primatol. 53:93–97, 2001.

Key words: chimpanzee; hyrax; hunting; tool use

INTRODUCTION

Predation on mammals by chimpanzees has been observed in populations throughout Africa, indicating that eating meat is a general habit of chimpanzees [Uehara, 1997]. Systematic studies at several long-term research sites have provided detailed information on the characteristics of predation by the chimpanzees of each population [Goodall, 1986; Boesch & Boesch, 1989; Uehara et al., 1992; Stanford et al., 1994; Mitani & Watts, 1999]. Comparison of the accumulated data has revealed local differences in chimpanzee predation across populations in terms of prey selectivity, hunting frequency, cooperative hunting, killing technique, and tendency to share meat [Boesch & Boesch, 1989; Uehara, 1997]. For example, chimpanzees at Mahale, Tanzania, hunt more often and consume more types of prey than do chimpanzees at Bossou, Guinea. At Mahale, 100 predation episodes were observed over 729 study days in 1983–1990, and the chimpanzees consumed 10 mammalian species [Uehara et al., 1992]. At Bossou, however, only five episodes of predation on mammals were observed over 441 study days in 1976–1987, and in every case the prey species was the tree pangolin (*Manis tricuspis*) [Sugiyama, 1987, 1989].

Although the availability of potential prey may play some role in such interpopulation differences, several cases have been reported in which wild chimpan-

Contract grant sponsor: Ministry of Education, Science, Sports, and Culture, Japan; Contract grant numbers: 07041135; 07102010; 12301006.

*Correspondence to: Satoshi Hirata, Primate Research Institute, Kyoto University, Inuyama, Aichi, 484-8506 Japan. E-mail: hirata@pri.kyoto-u.ac.jp

Received 26 May 2000; revision accepted 6 November 2000

zees captured but did not eat potential prey [e.g., van Lawick-Goodall, 1968; Teleki, 1973; Hiraiwa-Hasegawa et al., 1986]. Boesch and Boesch [1989] observed a case, for example, in which chimpanzees captured but did not eat a duiker, which is one of the favorite prey items at Mahale. Therefore, lack of opportunity does not seem to be the only reason that chimpanzees do not consume an individual of a potential prey species. The present report provides further support for this point: although consumption of a species of hyrax (*Heterohyrax brucei*) has been witnessed on two occasions at Mahale [Nishida & Uehara, 1983], the chimpanzees at Bossou have twice been observed to abandon western tree hyrax (*Dendrohyrax dorsalis*) that they had surrounded or captured.

METHODS

A group of wild chimpanzees (*Pan troglodytes verus*) at Bossou, located in the southeastern corner of the Republic of Guinea, West Africa (7° 39′ N, 8° 30′ W) has been studied since 1976 [Sugiyama & Koman, 1979]. Their home range covers about 15 km^2 of primary and open secondary forests that are surrounded by cultivated and abandoned fields. All the individuals have been identified since the start of the study. The group size has remained around 20 (range: 16–22) throughout the study period [Sugiyama, 1999]. Case 1 in this report was observed by G.Y. and a field assistant, Pascal Goumy. Case 2 was observed by S.F., S.H., G.O., P.G., and T.M. It was recorded on videotape, supplementing the direct observations. The carcass of the hyrax killed in Case 2 was roughly examined by dissection after it had been abandoned in order to detect the cause of its death.

RESULTS

While following chimpanzees in the forest, we recorded two cases in which chimpanzees captured a western tree hyrax (*Dendrohyrax dorsalis*, Order Hyracoidea).

Case 1

On 8 January 1995, we (G.Y. and P.G.) heard several chimpanzees screaming from a patch of forest on the southeastern side of Gban hill. We arrived at the site 7 min later. The chimpanzees, still excited and screaming, were in a tall *Chlorophora exelsa* tree. The party consisted of a full-adult alpha male (TA), a 14-year-old male (FF), two adolescent males (NA, VI; 9 and 8 years old, respectively), and two adult females (Ka, Vl; Vl was with her 3-year-old infant, Vv). Abruptly, at 1049 hr, a small western tree hyrax fell out of the *Chlorophora* tree, just in front of us; we both slowly retreated until we were about 10 m from the animal. Soon afterwards, all the chimpanzees descended from the tree, apparently interested in the fallen animal. The hyrax did not move to escape. At 1052 hr, two adolescent males approached the hyrax and started displaying toward it. VI rushed at the hyrax and slapped the ground nearby with both hands. Then NA approached to within centimeters of the hyrax, and performed the same behavior. The hyrax responded with slow movements each time it was threatened. At 1056, NA grabbed and repeatedly bent a nearby sapling (about 2 m high) with one hand in such a way that the tip of the sapling flailed the ground and hit the hyrax. NA hit the hyrax five times in succession, paused and stared at the hyrax, and then hit it three more times. VI and Vv remained nearby, while the other chimpanzees observed the scene from a distance. At 1057 hr, NA suddenly retreated from the hyrax and joined the other

members of the party, already leaving the site. Although the hyrax did not move, we did not try to capture and measure it since it was still alive. By eye, its crown-rump length was about 25 cm; it appeared immature, and its sex was indeterminate. It is uncertain whether the hyrax caused the initial excitement and screams, or if the incident we observed started with the sudden fall of the hyrax at 1049 hr. NA's use of a sapling to hit the hyrax may have functioned as the use of a tool to flail an unfamiliar animal, possibly as a means of investigation, although the sapling was not uprooted.

Case 2

On 18 January 2000, at 1704 hr, we (S.F., S.H., G.O., and P.G.) observed members of our focal group in *Ficus umbellata* and *Carapa procera* trees. At 1705 hr, we heard a scream from a neaby bush. An 8-year-old male (YL) emerged, climbed a tree, and then descended again into the bush below. At 1706 hr, YL climbed the same tree again, together with an adult male (TA). At this point, a total of 13 individuals were observed in the vicinity, including two adult males (TA and FF), five adult females (Fn, Jr, Ka, Vl, and Yo), one adolescent male (YL), two adolescent females (Vv and Ft), one juvenile female (Ju), and two infants (Fl and JJ). At 1707 hr, YL descended into the bush once more. Thirty-nine sec later he climbed the tree with a live western tree hyrax in his hand. Ju, a 6-year-old female, followed him immediately, and stayed close to YL for 103 sec. YL swung the hyrax in the air, beat it against branches several times, and wandered about in the tree with a play face. The adults did not seem to be interested in the hyrax, and continued to feed on fruits and leaves. At 1709 hr, YL dropped the hyrax into the bush, then immediately descended, followed by Ju. Between 1709 and 1726 hr, sounds suggesting that at least one chimpanzee was hitting the hyrax were heard from the bush; the hyrax screamed intermittently 11 times. At 1726 hr, Vv, an 8-year-old female with sexual swelling at the time, emerged from the bush, hyrax in hand, and climbed a nearby tree. No screams or active movement of the hyrax were observed subsequently: it looked dead from this point. Between 1726 and 1746 hr, Vv tapped her hand or foot on the hyrax about 30 times, swung it in the air, and moved about in the tree, carrying the hyrax on her shoulder or between her thigh and abdomen. Ft and Fl (adolescent and infant females) approached Vv and stayed close to Vv for 149 and 155 sec, respectively. At 1743 hr, Vv swaggered towards Ft and held the hydrax out toward her. At 1727, 1736, and 1744 hr, three adult females, including Vv's mother (Vl), passed Vv in succession, but none showed interest in the hyrax. At 1746 hr, Vv moved to another tree with the hyrax and made a nest. At 1759 hr, Vv abandoned this first nest, carried the hyrax to a tree 30 m away and prepared a second nest. Between 1746 and 1847 hr, Vv showed the following behaviors toward the hyrax in her nests: holding it in her hand or between her thigh and abdomen; plucking its hairs with her mouth without biting the skin; flapping it; pressing on it with her hands; beating it against the nest; putting it on her shoulder in the quadrupedal position; poking it with her fingers; grooming it with her fingers and mouth intermittently for 502 sec in total; raising it into the air with her hands and feet; and fluttering her hands and feet while holding the hyrax. At 1831 hr, PK, a 3-year-old male, came close to Vv and the hyrax, and observed them for 313 sec. At 1847 hr, we stopped making observations.

The next morning, 19 January 2000, at 0728 hr, we found Vv with the hyrax in a tree near her nest of the previous night. She groomed the hyrax with her mouth and fingers intermittently for 698 sec in total. At 0748 hr, PK and his 12-

year-old mother, Pl, approached Vv and the hyrax, and observed them for 59 sec and 77 sec, respectively. At 0803 hr, Vv descended from the tree and traveled with three other individuals, carrying the hyrax with her hand or between her thigh and abdomen. At 0816 hr, Vv began to travel again and we lost track of her until 1036 hr, when she no longer had the hyrax. We (T.M. and P.G.) later found the hyrax at 1430 hr, on the ground about 300 m away from the tree that Vv had first climbed with it. The hyrax was an adult male, weighing 2.3 kg. Its crown-rump length was 42 cm. It had several minor lacerations, probably caused when the chimpanzees smashed it on the ground and against tree branches, but no specific external or internal cause of death was found. There was no sign that the chimpanzees had tasted its flesh. Throughout this episode, all of the individuals interested in the hyrax or the holder were less than 8 years old, except one adult female.

DISCUSSION

In both of these cases, chimpanzees did not eat the western tree hyraxes. Probably chimpanzees at Bossou do not regard the western tree hyrax as prey. Interestingly, the adolescent female who held the dead hyrax for 15 hr in Case 2 was present at the scene of Case 1 when she was 3 years old, and watched the adolescent males' treatment of that hyrax. In Case 2, two infants approached the hyrax holder and watched her hold the hyrax without eating it; these infants may also come to disregard the hyrax as prey.

In fairness, the low frequency of predation exhibited by the Bossou chimpanzees must be considered in the context of an ecological feature at Bossou: the density of mammals other than chimpanzees is very low. Duikers and other small and medium-sized animals are only occasionally observed in the home range of the chimpanzees; forest-dwelling monkeys, the most likely prey of chimpanzees, live in a peripheral area that the chimpanzees seldom visit [Sugiyama, 1981, 1989]. Even so, Bossou chimpanzees were once observed to capture a duiker (*Cephalophus spp.*), which they did not eat (Matsuzawa and Sakura, unpublished data). This case, together with the two cases reported in the present work, shows that a lack of opportunity is not the only reason for an absence of predation. Sugiyama [1989] has proposed that meat-eating behavior has not been established and propagated in the Bossou population because the low availability of potential prey species does not allow for the opportunity to exercise predation on a regular basis.

The treatment of the hyrax by the adolescent chimpanzees can be considered as a kind of play [Hayaki, 1985]. Goodall [1986] described various episodes of playful behavior between young chimpanzees and sympatric olive baboons (*Papio anubis*), although baboons are often the target of predation at other times. Similar behaviors have been witnessed in bonobos (*Pan paniscus*) with respect to their treatment of sympatric forest monkeys. [Sabater Pi et al., 1993; Ihobe, 1990]. Sabater Pi et al. [1993], for example, observed an adult bonobo carry a red-tailed monkey (*Cercopithecus ascanius*), which had died from violent treatment, and groom the animal as if it were another bonobo. This example is similar to our observations, in which an adolescent female carried a dead hyrax into her nest, slept with it for one night, and groomed the animal before abandoning it later the next morning.

ACKNOWLEDGMENTS

This study was carried out with the collaboration of people in Bossou, the Direction National de la Recherche Scientifique et Technique, and l'Institute de

Recherche Environnementale de Bossou, République de Guinée. We thank Y. Sugiyama, who gave us the opportunity to study at Bossou, where he has conducted field research since 1976. Special thanks are also due to J. Koman, G. Goumy, T. Camara, P. Cherif, and P. Goumy for their assistance in the field. K. Hosaka and A.J. Tosi provided helpful comments on a draft of this article. This study was financed by grants from the Ministry of Education, Science, Sports, and Culture, Japan (No. 07041135 to Y. Sugiyama; Nos. 07102010 and 12301006 to T. Matsuzawa).

REFERENCES

Boesch C, Boesch H. 1989. Hunting behavior of wild chimpanzees in the Taï National Park. Am J Phys Anthropol 78:547–573.

Goodall J. 1986. The chimpanzees of Gombe: patterns of behavior. Cambridge, MA: Harvard University Press. p 673.

Hayaki H. 1985. Social play of juvenile and adolescent chimpanzees in the Mahale Mountains National Park, Tanzania. Primates 26:343–360.

Hiraiwa-Hasegawa M, Byrne RW, Takasaki H, Byrne JME. 1986. Aggression toward large carnivores by wild chimpanzees of Mahale Mountains National Park, Tanzania. Folia Primatol 47:8–13.

Ihobe H. 1990. Interspecific interactions between wild pygmy chimpanzees (*Pan paniscus*) and red colobus (*Colobus badius*). Primates 31:109–112.

Mitani JC, Watts DP. 1999. Demographic influence on the hunting behavior of chimpanzees. Am J Phys Anthropol 109:439–454.

Nishida T, Uehara S. 1983. Natural diet of chimpanzees (*Pan troglodytes schweinfurthii*): long term record from the Mahale Mountains, Tanzania. Afr Study Monogr 3:109–130.

Sabater Pi J, Bermejo M, Illera G, Vea JJ. 1993. Behavior of bonobos (*Pan paniscus*) following their capture of monkeys in Zaire. Int J Primatol 14:797–804.

Stanford CB, J Wallis, H Matata, J Goodall. 1994. Patterns of predation by chimpanzees on red colobus monkeys in Gombe National Park, 1982–1991. Am J Phys Anthropol 94:213–228.

Sugiyama Y, Koman J. 1979. Social structure and dynamics of wild chimpanzees at Bossou, Guinea. Primates 20:323–339.

Sugiyama Y. 1981. Observation on the population dynamics and behavior of wild chimpanzees at Bossou, Guinea, in 1979–1980. Primates 22:435–444.

Sugiyama Y. 1987. A preliminary list of chimpanzees alimentation at Bossou, Guinea. Primates 28:133–147.

Sugiyama Y. 1989. Description of some characteristic behaviors and discussion on their propagation process among chimpanzees of Bossou, Guinea. In: Sugiyama Y, editor. Behavioral studies of wild chimpanzees at Bossou, Guinea. Primate Research Institute, Kyoto University: Report for the Grant-in-aid of the Ministry of Education, Science, Sports, and Culture, Japan. p 43–76.

Sugiyama Y. 1999. Socioecological factors of male chimpanzee migration at Bossou, Guinea. Primates 40:61–68.

Teleki G. 1973. Notes on chimpanzee interactions with small carnivores in Gombe National Park, Tanzania. Primates 14: 407–412.

Uehara S, Nishida T, Hamai M, Hasegawa T, Hayaki H, Huffman MA, Kawanaka K, Kobayashi S, Mitani JC, Takahata Y, Takasaki H, Tsukahara T. 1992. Characteristics of predation by the chimpanzees in the Mahale Mountains National Park, Tanzania. In: Nishida T, McGrew WC, Marler P, Pickford M, de Waal FBM, editors. Topics in primatology, vol. 1: human origins. Tokyo: University of Tokyo Press. p 143–158.

Uehara S. 1997. Predation on mammals by the chimpanzee (*Pan troglodytes*). Primates 38:193–214.

van Lawick-Goodall J. 1968. The behavior of free-living chimpanzees in the Gombe stream reserve. Anim Behav Monogr 1: 161–311.