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Non-lethal handling of a captured duiker by a bonobo (*Pan paniscus*) at Wamba: Implications for prey image in bonobos

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INTRODUCTION

Wild bonobos hunt and consume the meat of small to medium-sized terrestrial mammals such as anomalures (e.g., *Anomalurus derbianus, Anomalurus beecrofti*), forest antelopes (e.g., bay duikers [*Cephalophus castaneus*], blue duikers [*Philantomba monticola*]), and other primates (e.g., galagos [*Galago demidovii*], red-tailed monkeys [*Cercipithecus ascanius*], and wolf guenons [*Cercopithecus wolfi*]) (Fruth & Hohmann 2002; Hohmann & Fruth 2008; Surbeck & Hohmann 2008; Sakamaki *et al.* 2016; Samuni *et al.* 2020). However, there are some differences in hunting and meat-eating behaviors among allopatric bonobo populations (Hohmann & Fruth 2003). As mentioned above, prey consumed by bonobos at some field sites include monkeys and duikers (Fruth & Hohmann 2002; Hohmann & Fruth 2008; Sakamaki *et al.* 2016; Samuni *et al.* 2020). On the other hand, at Wamba, in the Luo Scientific Reserve, Democratic Republic of the Congo, hunting and meat-eating behaviors by bonobos have been infrequent compared to those at other study sites (Hohmann & Fruth 2003; Sakamaki *et al.* 2016), and at this site bonobos have never been observed to hunt for mammals other than anomalures (*Anomalurus* spp.) (Ihobe 1992; Kano 1992; Hirata *et al.* 2010). Moreover, a recent study showed that there was a group preference for duiker or anomalure hunting even in a sympatric bonobo population (Samuni *et al.* 2020).

Some previous studies have described hunting and consuming other mammals that are recognized as food as *prey image* in the *Pan* genus (Boesch & Boesch 1989; Ihobe 1992). Boesch & Boesch (1989) suggested that chimpanzees at Taï Forest, Côte d'Ivoire, have a specialized prey image in which monkeys, mostly colobus, are recognized as food, citing an observation that a juvenile male chimpanzee accidentally caught a blue duiker and handled with it as a toy, not as food. Therefore, these differences of prey profile between and within bonobo populations may likely be affected by prey image per respective population. Environmental conditions also contribute to the prey profile across bonobo populations (Wrangham 1975; Sakamaki *et al.* 2016), which suggests the necessity of studying predator–prey interactions at the specified population level.

Understanding the differences in prey images or prey preference in bonobos may be useful for interpreting the variety of bonobo cultures that previous studies have described (Hohmann & Fruth 2003; Samuni *et al.* 2020). Here, I report the first case of an adult female bonobo at Wamba capturing a blue duiker and carrying it around, alive, for approximately 30 min. This case report is important because it contributes to our understanding of the differences in prey profiles, inter-species interactions, and prey image among allopatric bonobo populations.

METHODS

Observations were made at Wamba, where long-term studies on bonobos have been conducted since 1973 (Kano 1980; Furuichi 2011). At this time, there were three identified and fully habituated groups of bonobos at Wamba (E1, PE, and PW) (Sakamaki *et al.* 2018). In July 2018, the E1 group comprised of 41 individuals, including 12 adult females (parous, or ≥ 15 years old), and 2 adolescent females (nulliparous, 8 to < 15 years old), 8 adult males (≥ 15 years old), and 5 adolescent males (8 to < 15 years old) (age classes were categorized by Hashimoto 1997). An adult female known as Zn, who captured the duiker, immigrated to the E1 group from another group (not PE or PW) in October 2011 and was estimated to be 16 years old in 2018.

OBSERVATIONS

The duiker capture occurred on July 25, 2018, during regular *ad libitum* observations of bonobos in the E1 group. At 6:07 h two local assistants and I found a group of bonobos at the location where they had made their night beds the day before. There were ten adult females, two adolescent females, four adult males, and four adolescent males in this group.

At 6:30 h, while I was observing the bonobos at this location, I heard the shriek of a blue duiker and found that Zn was in a tree, grasping an immature blue duiker (Video 1 available online at http://mahale.main.jp/PAN/2021/002.html). Zn lightly swung the duiker in her right hand for a few minutes. While Zn was in the tree with the duiker, other bonobos watched her from other trees or from the ground, and they attempted to approach her but did not interfere. Zn then left the tree and wandered around on the ground, carrying the duiker, for approximately 30 min. The duiker continued to shriek throughout the incident. Zn did not try to eat the duiker during our observations. Several group members (five adult females, two adolescent females, one adult male, and one adolescent male) followed Zn as she moved about, but Zn seemed to run away from these individuals. During observations, I did not observe any aggressive behaviors (e.g., hit, kick, bite) by Zn toward the captured duiker. At 7:00 h, Zn was

lost from sight. At that time, the two local assistants and I verified the presence of all group members that had been seen at the beginning of observations, with the exception of Zn, one adolescent female, and one adolescent male. When I found Zn again at 8:50 h, she did not have the duiker anymore. There was no blood or duiker fur around her mouth, on her hands, or on her body. During the observations, I did not hear any specific bonobo vocalizations expressing anxiety, stress, or social tension (Hayashi *et al.* 2012; Yokoyama & Yasumoto 2019).

DISCUSSION

In the current case, the female bonobo seemed to manipulate the duiker in a manner that might be described as play, which was similar to the bonobo and chimpanzee behaviors described in previous studies (Sabater-Pi *et al.* 1993; Hirata *et al.* 2001; Carvalho *et al.* 2010). Thus the duiker did not seem to be included in the prey image of bonobos at Wamba, although they captured and toyed with it.

Bonobos at Wamba have been observed in non-lethal interactions with other primates, including mutual grooming between bonobos and red colobus (*Colobus badius*) (Ihobe 1990) and a bonobo carrying the corpse of a red-tailed monkey (Toda *et al.* 2017). In addition, there was a single previous report of bonobos interacting with, but not killing or eating, a trapped blue duiker (e.g., approaching, sniffing, touching) (Hayashi *et al.* 2012). Multiple similar incidents have been observed in the habituated groups at Wamba (N. Tokuyama, personal observation; T. Yokoyama, personal observation). A case report at Lilungu (Ikela), Zaire by Sabater-Pi *et al.* (1993) described three observed incidents of bonobos handling, but not eating, captured primates: an angola colobus (*Colobus angolensis*), and a red-tailed monkey (*Cercipithecus ascanius*). In the case of chimpanzees, at Bossou, Guinea, they captured western tree hyraxes (*Dendrohyrax dorsalis*, order Hyracoidea) and West African wood-owls (*Ciccaba woodfordi*), but did not eat them (Hirata *et al.* 2001; Carvalho *et al.* 2010).

Continuing observations of hunting and carnivorous behaviors among bonobo populations will shed light on the factors that cause local differences in prey images in bonobos. Variations in social and ecological factors (e.g., food availability, overlapped range areas among species, human interference) among field sites might affect the different prey images in bonobos that are part of their local traditions or cultures. This case report will be helpful in confirming the differences in prey images and interspecies interactions among allopatric bonobo populations.

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