

## Leopards Attempted to Hunt Wild Chimpanzees at Mahale

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### INTRODUCTION

The relationship between chimpanzee and leopard (*Panthera pardus*) is threefold: chimpanzee intimidates, attacks, and/or kills leopard (Gandini & Baldwin 1978; Hiraiwa-Hasegawa *et al.* 1986; Boesch 1991); leopard attacks and/or preys upon chimpanzee (Boesch 1991, 2009; Nakazawa *et al.* 2013); and chimpanzee scavenges the prey hunted by leopard (Nakamura *et al.* in prep.; Hasegawa *et al.* 1983; Nishida 1994, 2012). Understanding the relationship between chimpanzee and leopard (or other potential predators) has been considered important in order to reconstruct human evolution. Social structure may be affected by predator–prey relationships, feeding strategies, and cooperation against predators, but direct observation of encounters between chimpanzee and leopard have been few, since leopard is rarely habituated to human observers and thus tends to be elusive (Gandini & Baldwin 1978; Boesch 1991, 2009; Pierce 2009; Nakazawa *et al.* 2013). Here I report a case in which two leopards attempted to hunt an adult female chimpanzee and her two offspring at Mahale, Tanzania.

### METHODS

I did my field research on the M group chimpanzees at Mahale in August 2018 (See Nakamura *et al.* 2015 for the details of the M group chimpanzees and the research site at Mahale). The chimpanzees who barely escaped from being hunted by leopards were an adult female, Omo (estimated 22 years old), and her two sons, Omali (7 years old) and a 17-months-old infant (yet unnamed, hereafter OM17). Most members of the M group ranged and stayed high up in the mountain area to the east of the M group's home range, and a few chimpanzees were observed in the lower, flatter area through this month.

### OBSERVATION: 25 AUGUST 2018

The main party of M group chimpanzees still seemed to be ranging in the mountainous area on this day, since we had heard no calls nor found any signs of chimpanzees, as I and a research assistant, Bakari Rashidi, had been searching for chimpanzees in the flatter area of the M group's home range since morning.

At 9:50 h, we heard a “faw!” bark about 50–100 m away from where we walked. We supposed it to be a chimpanzee bark, but while we walked along the research trail with noisy footsteps in dry leaves, the bark was too sharp and short to pinpoint its source.

Then, we separated, seeking to find the chimpanzee

who had emitted the bark. After a while, I heard another “faw!” bark from the direction in which the assistant had headed, and then I followed it into the bush, while hearing the barks again and again.

At 10:02 h, I found Omo, with OM17 ventral, and Omali on a bough of a tree about 3 m above the ground. At the same time, the assistant came out from the bushy undergrowth and told me that, when he had arrived there, he had seen a leopard on the ground under the tree in which Omo family stayed. The leopard had looked up the Omo family sitting on the bough and thus seemed to attempt to hunt them in the tree, but Omo had managed to repel it by persistently emitting barks. He also saw the leopard run into the bush on my arrival, although I did not notice that. After that, Omo sitting on the bough ceased to emit barks, and kept staring carefully into the bushes where the leopard had concealed itself.

At 10:03 h, a growl of a leopard like “grururu...” was heard from the bush about 10 m away from us where we stood by the tree. Omo, still with OM17 ventral, and Omali on the bough silently stared toward the bush. At 10:06 h, another growl came from the same place in the bushes. Omo and Omali kept silent on the bough staring in that direction.

At 10:09 h, the Omo family silently started to move southward through the trees.

At 10:10 h, another roar of a leopard like “gwa-gwa-gwa” was heard from the bush about 10 m away from the first growl, while the first growl still continued, so we realized that there were two leopards present! At 10:13 h, the leopards remained growling there. At 10:14 h, as the Omo family went out of our sight, we stopped observing and retreated to a research trail nearby.

At 10:21 h, we arrived at a research trail and still heard the leopards' growls from the bush. Then, we left there to search for other parties of chimpanzees; however, we did not find any other chimpanzees nor hear any calls of chimpanzees, until we saw the Omo family again at 14:18 h. They were then about 500 m north of the tree where the leopards had attempted to hunt them. We were relieved to see them again without any wounds.

### DISCUSSION

This report presents the first direct observation of leopards' attempted hunting wild chimpanzees from East Africa, although some cases have been reported from West Africa (Boesch 1991, 2009). Although previous re-

ports from eastern and central Africa have provided fecal evidence and some indirect observation of leopard predation on wild chimpanzees (Furuichi 2000; Nakazawa *et al.* 2013), it has been difficult to observe such cases directly, perhaps because leopards have not been habituated to humans. In this case, however, two leopards stayed close to human observers; further, they growled and roared at us, although they hid themselves in thick undergrowth upon my arrival. This twofold reaction of the leopards to human observers, threatening and concealing themselves, may reflect the recent progress of leopard habituation to humans in Mahale (Nobuko Nakazawa, unpublished data). As a result, they now can confront or even threaten humans on encounter, though they still seem somewhat afraid of humans, concealing themselves in the bush. Thus, our arrival at the place where leopards were attempting to hunt chimpanzees might deter leopards from persisting in attempting to hunt chimpanzees (Boesch 1991, 2009). Accordingly, we might have saved the lives of the Omo family.

Previous studies have discussed to what extent leopard predation pressure on chimpanzee affects their social structure (Boesch 1991, 2009). Our observation indicates that chimpanzees are vulnerable to leopard predation, at least when they are in small parties or when they have dependent offspring. Since chimpanzees have flexible fission-fusion association, they often disperse in small parties or even alone. When chimpanzees range alone or only with their dependent offspring, predation risk by leopards may increase. In particular, infants and juveniles may risk being hunted easily by leopards, unless they obtain enough support from adult apes, such as their mothers and adult males. On the other hand, when they are in a large party including adult males, they outnumber a leopard, thus they deter it from attempting to hunt them or even chase away it, as suggested in some previous studies (Nakamura *et al.* in prep.; Boesch 1991, 2009; Pierce 2009). This incident indicates that leopard predation pressure on chimpanzees may affect their association patterns, possibly making Mahale chimpanzees, especially females with dependent offspring, more gregarious than those in other populations without sympatric leopards or other predators.

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