
<NOTE>**A Louse Egg Left on a Leaf.***Koichiro Zamma**Primate Research Institute, Kyoto University***INTRODUCTION**

Chimpanzees are known to squash ectoparasites placed on the forearm¹ (Taï, Côte d'Ivoire), the palm² (Bossou, Guinea), leaves^{1, 3} (Gombe and Mahale, Tanzania), and to inspect them on leaves⁴ (Budongo, Uganda). Although it is difficult to identify ectoparasites due to their small size, an adult louse, which was recovered from a leaf used in leaf-grooming behavior, was identified³. I will report an egg of a chimpanzee louse as the second identified ectoparasite left on a leaf used for leaf-grooming. I will also discuss the ectoparasite removal techniques of chimpanzees who use their teeth.

METHODS

Behavioral observation was conducted from August to November, 2003 at the Mahale Mountains National Park, Tanzania. I followed one of nine focal animals each day and recorded grooming behavior on video tape. I also focused on leaf-grooming behavior by investigating whether ectoparasites or something else remained on the leaves used for leaf-grooming.

RESULTS

I recovered a louse egg from a leaf used for leaf-grooming by Orion, a 12-year-old male. At 10:05:22 on August 21, 2003, Orion picked up a leaf with his right hand after he finished grooming Carter, an adult male. Orion transferred a small object from his lower lip to the leaf and folded the leaf using his right

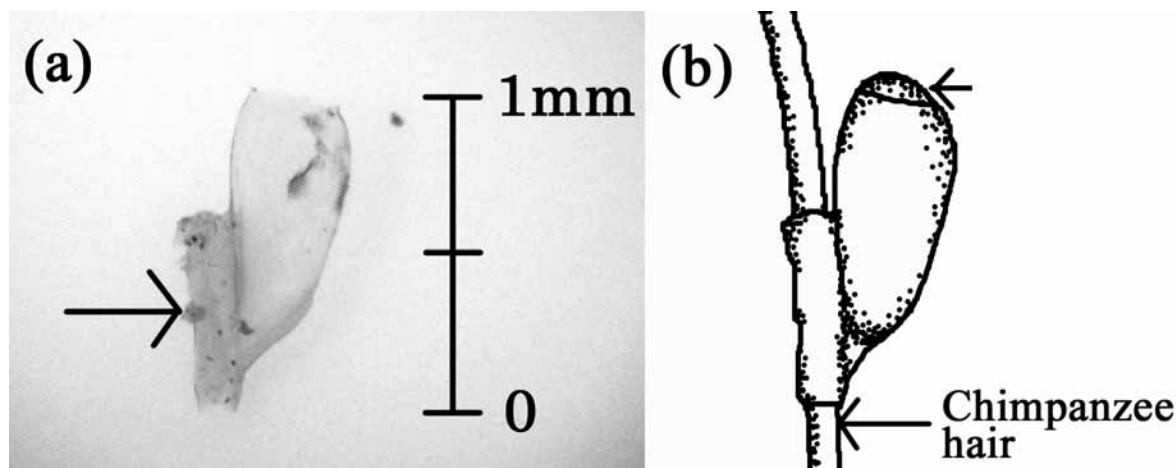


Fig. 1. Egg of a chimpanzee louse. (a) Louse egg left on a leaf used for leaf-grooming by Orion. (b) Unhatched louse egg glued to chimpanzee hair. Tip of unhatched louse egg (upper arrow) is different from the hatched one (a).

hand and lower lip. He pressed the folded side of the leaf with the thumb of his left hand, opened the leaf, and returned the object to his lower lip. After transferring the object from his lower lip to the leaf again, he accidentally dropped the leaf. He picked up the leaf again and tried to return the object to his lower lip. After that he dropped the leaf and went away. I recovered the leaf and found a louse egg left on it (Fig. 1a).

The louse egg measured 1.0 x 0.4 mm (Fig. 1a). The louse egg had already hatched, and the inside of the eggshell was empty. There were no dents on the eggshell, although it had been pressed between a folded leaf when Orion leaf-groomed. The adhesive cement of the louse egg (indicated by arrow in Fig. 1a), which was attached to the chimpanzee hair, had a bead shape. This indicates that the cement was not broken but was pulled through the hair.

Orion started grooming Carter's back at 10:04:33, 49 seconds before the leaf-grooming described above. Orion stroked Carter's hair 37 times with his hands and lips and touched Carter's back with his lips. At 10:05:09, Orion pinched and pulled Carter's hair between his upper and lower teeth. It seemed that he removed a louse egg stuck to a hair from Carter's back. Then Orion stroked the hair twice more with his left hand and stopped grooming at 10:05:15. After that he turned around, brought his hand to his mouth, and

extracted something from it. It looked as if he pulled a hair with his hand and removed the louse egg that was pinched between the upper and lower teeth. Then he started leaf-grooming (as described above).

DISCUSSION

It has been suggested that chimpanzees remove ectoparasites such as lice and ticks⁵. An adult louse, which was removed during grooming and handled during leaf-grooming, was identified³. This study clarifies that chimpanzees also have the skill to remove louse eggs as well as adult lice. Japanese macaques are known to have techniques for handling louse eggs using the thumb and finger⁶, but it has not been confirmed whether monkeys or apes can really remove ectoparasites using the mouth and teeth. This study also revealed that chimpanzees can use their teeth to remove louse eggs.

The good shape of the eggshell refutes the idea that the middle of the egg was pushed out when the chimpanzee squashed it in the folded leaf. Therefore, the egg probably hatched before Orion removed it. It is unnecessary to remove hatched eggs from the viewpoint of the hygienic functions of grooming. Chimpanzees may be incapable of discriminating between hatched and unhatched eggs (Fig. 1b). In my case, I could not judge whether the egg had hatched without a microscope.

Why did Orion squash the louse egg in the folded leaf? If the louse was in the adult stage, squashing and/or killing is a reasonable way to prevent it from parasitizing again. However, the louse egg was not likely to return to the host again even if it was not crushed. I do not know the reason. Orion might leaf-groom as ritualized behavior following removing movements.

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