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New Evidence of Honey-Stick Use by Chimpanzees in Southeast Cameroon.

Deblauwe Isra

1. Centre for Research and Conservation (CRC), Royal Zoological Society of Antwerp (RZSA)
2. University of Antwerp (UA), Department of Biology

INTRODUCTION

The use of sticks to obtain honey by chimpanzees is widely known^{1, 2, 3, 4, 5, 6, 7, 8}. Both arboreal and underground nests of stinging (*Apis* sp.) and stingless bees (Meliponini) are opened to extract the honey, often together with larvae, pupae and adult bees. Chimpanzees can dig for honey with their hands³, but often use one tool^{4, 7, 8} or a tool-set^{2, 5, 6}. This tool behaviour varies across sites and within sites across bee species^{4, 5, 7, 8}. It is important to continue recording tool-use at new sites, as it will enlarge our knowledge about different tool technologies and cultural variations among chimpanzee populations⁸.

The present study reports the first evidence of stick use to obtain honey at the northern periphery of the Dja Biosphere Reserve (DBR) in Southeast Cameroon.

STUDY SITE AND METHODS

The study site (“La Belgique”) in Southeast Cameroon, at the northern periphery of the DBR (13,11°–13,17° E and 3,37°–3,45° N)

is officially unprotected and situated in the southwest corner of the logging concession 10 047 of the Fip.cam company. Secondary forest covers more than half of the area. The density of chimpanzees is conservatively estimated at 0.9 individuals/km²⁹. They are not habituated to human observers. Indirect data were collected during chimpanzee tracking and other activities from April to July 2002, May to August 2003 and September 2004 to April 2005.

RESULTS

Twice (April 2002 and June 2003) evidence of chimpanzees digging for honey of stingless bees (Meliponini) was found along chimpanzee traces (footprints) in the study site, next to which no tools were found. Probably chimpanzees dug for honey with their hands. Pieces of the bee nest, with honey and chimpanzee hair sticking on them, were lying next to the holes. Both traces were less than one week old.

Four times (December 2004 (2 sticks), February 2005 (2 sticks), April 2005 (5 sticks) and April 2005 (4 sticks)) honey digging sticks were collected at holes in the ground during chimpanzee tracking (Tab. 1). In total 13 sticks were found next to (12 sticks) or still fixed in (1 stick) four underground bee nests. The sticks were less than one week old. They were straight and sturdy and sometimes both stick ends were used. The plant species used as materials were: *Oxyanthus* spp. (23%, *O. unilocularis* and *O. speciosus*), *Rinorea* sp.

Tab. 1. Measurements of the holes, sticks, remaining stalks and discarded top pieces of the honey digging traces (mean ± standard deviations, number and range between brackets).

	Depth/Length (cm)	Diameter (cm)	Distance to hole (m)
Hole (n = 4)	47.3 ± 16.9 (25 – 65)	9.8 ± 6.4 (3 – 18)	
Stick (n = 13)	69.7 ± 13.7 (50.0 – 94.5)	1.41 ± 0.27 (0.95 – 1.82)	
Remaining stalks	92.8 ± 43.4 (55 – 166) (n = 9)		2.2 ± 1.1 (0.1 – 3.0) (n = 11)
Discarded top pieces (n = 9)	124.6 ± 51.0 (85.7 – 264)		2.2 ± 0.8 (1.0 – 3.0)

(15%), *Maesobotrya klaineana* (15%), *Alchornea floribunda* (8%) and unknown species (39%). Seven sticks (54%) had one (5 sticks) or two (2 sticks) brushes. The remaining stalks and/or discarded top pieces of 11 sticks were found back (Table 1). At two sites also a bigger stick was found next to the hole with on one side clumped soil, which seemed to be caused by digging. One stick was very long (2.3 m long and about 4 – 5 cm of diameter) and had a side branch starting in the middle. It was the remaining piece of a small tree (*Maesobotrya klaineana*), cut a long time ago by a tracker with a machete (this honey digging site was found on one of our transects). According to the trackers the chimpanzees used the sharp end of this cut stem to make or enlarge the hole in the ground. The other big stick was also more than 1 m long and about 4 cm in diameter and seemed to be used by the chimpanzees, though the trackers were not sure of this.

Of 138 faecal samples analysed (methodology see 10), only four (3%) contained heads of Meliponini bees. The abundance score was rare (3 faecal samples) or few (1 faecal sample).

DISCUSSION

No evidence was found of feeding on honey of *Apis* sp. or stingless bees in trees, which chimpanzees do at most other sites^{4, 5, 6, 7, 8}. Chimpanzees in the periphery of the DBR only seem to use tools to dig for honey from stingless bee nests underground. Still, *Apis mellifera* is present at our study site (pers. obs.). First, the raiding of bee hives in trees could have been overlooked as chimpanzees are not habituated and could not be followed continuously, and the tools might have been left in the tree, which is easy to miss. Second, chimpanzees may take honeycomb pieces from undisturbed beehives in trees with their hands³, what does not leave many traces. Third, the few heads of stingless bees found in the faecal samples were not identified to genus or species and might be from species nesting in trees. Still, the lack of *Apis* heads in the faecal samples suggests that chimpanzees do not eat honey from *Apis* hives in trees.

The honey digging sticks found in this study are similar to sticks found in Gabon⁵ and Uganda (Bwindi)⁷ to get honey from *Meliponula* and/or *Apis* hives in trees, and to those found in Central African Republic (CAR)⁸ to get honey from stingless bees underground. At other sites, tools used to dig for honey of stingless bees underground are much shorter^{1, 4}. The difference in tool characteristics for underground beehives between the sites is interesting in terms of cultural variation.

Since not all long brush ends were used, they did not seem to be manufactured by the chimpanzees. Still, at all four sites at least one brush end was inserted in the hole, next to compacted ends. Therefore, we cannot exclude the possibility that brush ends might have a special function to absorb honey⁵.

The two big sticks found next to the smaller sticks at two honey digging sites are longer but similar in diameter to the stout chisels found in Congo⁶ and the large tools from CAR and Congo⁴. Since they were found together with the smaller sticks and were as old, it could be that chimpanzees used them as a tool-set (in the same bout in sequence) to obtain honey. This, together with the possible special function of the brush sticks, would represent the first tool-set (of two or three tools) to dig for honey from underground bee nests. However, more evidence needs to be collected to be able to speak of 1) cultural variation in bee species eaten and in tool-use, and 2) honey tool-set use by chimpanzees at the periphery of the DBR. Still, this small contribution to the available data on honey extraction shows how widespread and complex this behaviour can be.

ACKNOWLEDGMENTS

The author thanks the RZSA, Durell Wildlife Conservation Fund, the logging company FIP.CAM, MINRESI (Ministère de la Recherche Scientifique et de l'Innovation, Cameroon), MINFoF (Ministère de Forêt et de la Faune, Cameroon) and the 'Service de Conservation de la Reserve de Faune du Dja' for supporting this project. Fieldwork was funded by the L.S.B. Leakey Foundation, the King Leopold III fund for Nature Exploration

and Conservation (RBINS), the Flemish Inter-University Council (VLIR), the Father Louis Bruyns Foundation (UA) and the Fund to Promote Scientific Research in Africa (NBG, Meisse). The first author was supported by a grant (BOF) from the UA and the RZSA and thanks the Flemish Government for structural support to the CRC of the RZSA.

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