

ECOLOGICAL AND SOCIOLOGICAL IMPORTANCE OF HONEY TO THE MBUTI NET HUNTERS, EASTERN ZAIRE

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I. INTRODUCTION

Honey has been known as a prized food since long time ago. One of the oldest evidences of honey collecting dates away back to the Paleolithic era. A cave drawing from Arana in Spain gives a vivid picture of honey collecting by a paleolithic man (Bodenheimer, 1951). It can be well understood from this picture how important honey was at such an old time.

The importance of honey as food lies primarily in its nutritive value. Honey produces 280–330 Cal per 100 g eaten (Bodenheimer, 1951), and is easily absorbed in the human body. It is an excellent food for the production of working energy. Moreover, when eaten with maggots and pollen which supply various vitamins and minerals as well as rich fat and protein, honey is classified as well-balanced food. It is also one of a few concentrated sweets which seldom exist in the wild state and is always highly valued by the people who have no manufactured sugar.

There are not a few tribes, such as Guayaqui of Amazon (Bodenheimer, 1951), or Vedda of Ceylon (Spittel, 1924) who give special importance to honey. In these tribes, honey plays a vital role not only in their ecology, but also in their social lives. However, very little information is available on the ecology of honey collecting. We have scant knowledge about how the natural environment is, how they collect honey under such environment, and how their social lives are actually influenced by the honey collecting activities.

From 1974 to 1975, an ecological and anthropological research was carried out on the Mbuti Pygmies of the Ituri Forest, Eastern Zaire (Fig. 1). As the study on their subsistence activities, diet and social life advanced, the importance of honey to the Mbuti's life became clear. Honey is the most favorite food of the Mbuti. In the honey season they lead a life mainly relying on honey. In addition to its importance to their diet, honey provides the key to the understanding of their social life.

The Mbuti are aboriginal inhabitants of the Ituri Forest. They were traditionally hunter-gatherers until they have established a symbiotic relationship with the Bantu or Sudanic agriculturalists who immigrated into the Forest several centuries ago. The agricultural villagers provide the Mbuti with farm products and metal works and the Mbuti provide the villagers with meats from the forest and labor forces needed for various agricultural works. This symbiotic relationship is now undergoing serious change by the impact of meat trading (Hart, 1978, Ichikawa, 1979). The Mbuti are now providing meat not only for the villagers with whom they are in the symbiotic relationship, but also for the people of the broader world. The Mbuti are strongly attracted by such luxuries as cassava flour, rice and colorfully printed clothes brought by the traders, and the craving for these luxuries has accelerated their hunting effort beyond the immediate subsistence need. They have become to hunt not only for eating but also for trading. However, once the honey season begins, they enter into the forest in

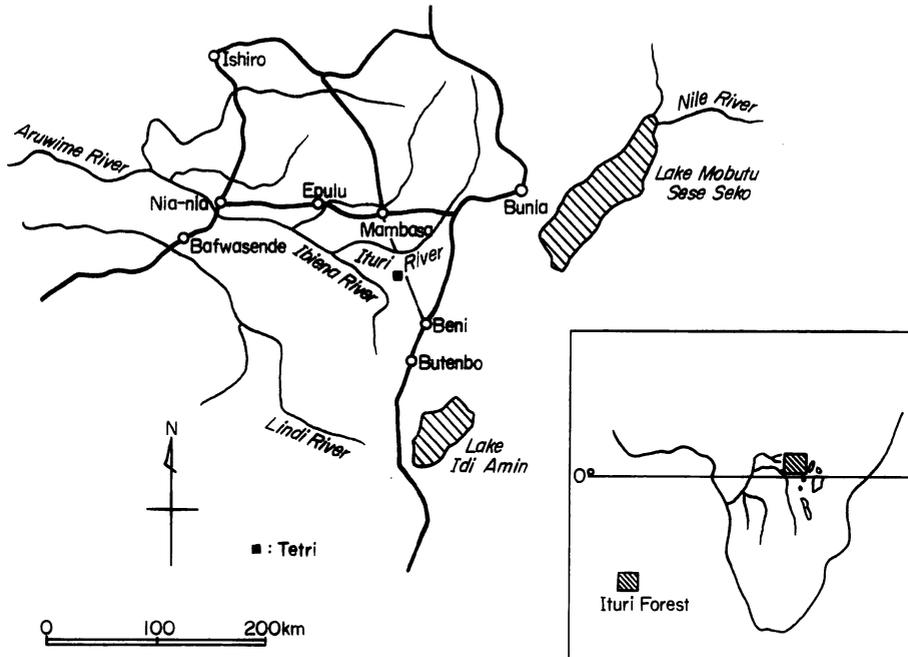


Figure 1. The Ituri Forest.

search of honey, suppressing their strong desire for clothes and agricultural foods*. Some Mbuti stay more than a month in the forest depending almost solely on honey. According to the Mbuti, honey is their real food, and because of honey they feel strong attachment to the forest.

II. HONEY-STORING BEES, NECTAR SOURCES AND HONEY SEASON

The Mbuti collect honey from more than ten species of bees (Table 1). The most important honey is *boki*, that of honeybees (*njoki*, *Apis mellifera adansonii*), which supplies the bulk of the honey collected by the Mbuti. Other kinds of honey of quantitative significance are the honey of *apiso* (*Meliponula bocandei*) and that of *bangengelya* (a generic name for four kinds of lesser stingless bees), which are usually fermented and taste sour. The Mbuti say that too much ingestion of the honey of these stingless bees may cause *mbenda*, a sickness of joints and bones, which is possibly caused by some toxic substances in the nectar collected by the bees.

The honey season depends on the flowering seasons of the major nectar sources in the Ituri Forest. First, with the blooming of *ekima* (*Alstonia bovei*), *anja-ke* (*Combretum smeathmanii*), and *taha* (*Erythrophleum guineense*), in late January to February, the honey of *apiso*, *bangengelya* and other stingless bees become available. But in this season, the Mbuti collect honey only when they encounter it by chance while walking in the forest.

The vegetation of the Ituri Forest is characterized by three types of climax forest, namely the forest of *tembu* (*Cynometra alexandrii*), that of *eko* (*Brachystegia laurentii*) and that of

*Honey is not the object of trading in the Tetri region where this study was carried out.

Table 1. Honey-storing bees in the Ituri Forest.

English name	Vernacular name	Scientific name
Honeybee	njoki	<i>Apis mellifera adansonii</i>
	apiso	<i>Meliponula bocandei</i>
	aundo	<i>Pleiella lendiana</i>
	keku	<i>Dactylurina staudingeri</i>
	pelepele	<i>Hypotrigona braunsi</i>
	sambo	? <i>Hypotrigona araujor</i>
	patinanbouko	<i>Hypotrigona</i> sp.
Stingless bees	amapiso	<i>Axestotrigona simpsoni</i>
	balongo*	<i>Apotrigona</i> ref. <i>komiensis</i> OR <i>Axestotrigona</i> ref. <i>ferruginea</i>
	akpula*	
	abisi*	
	kou*	
	podo	Unidentified
	kpodou	Unidentified
	pakpedikongo	Unidentified
	pendilindele	Unidentified

* Incomplete identification owing to the mixture of the specimens.

mbau (*Gilbertiodendron dewevreii*) (Harako, 1976). It is not until the flowering of these three species that *boki* (honey of honeybees) become available. When the rainy season begins in late March *tembu* first comes into bloom. Following *tembu* comes *mbau* which flowers from May to June. The peak of *eko* flowering occurs from June to July. The systematic honey collecting as will be described below is carried out only during the flowering seasons of these dominant

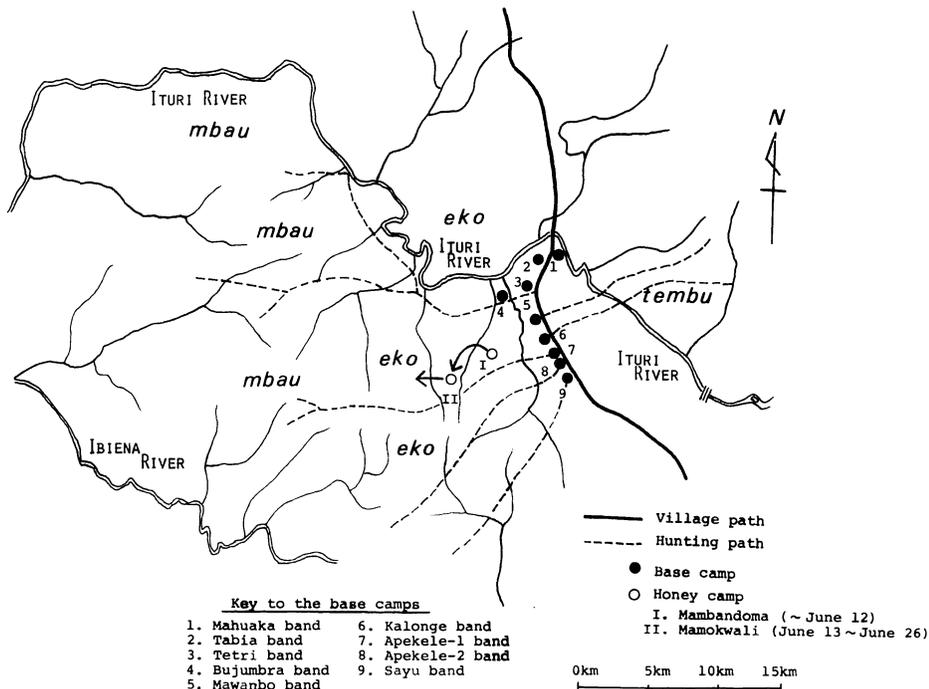


Figure 2. The Tetri region.

tree species. In the earlier flowering period of *tembu*, the honey of honeybees is less important, because it takes about six weeks for honeybees to grow from the egg stage to the imago to visit flowers (Frisch, 1969).

According to Smith (1958), one of the characteristic habits of African honeybees (*Apis mellifera adansonii*) is that they migrate or swarm more frequently than European domesticated honeybees. The honey season is also influenced by this migratory and swarming habit of bees. In the Tetri region, *Cynometra* forest occurs on the northern side of the Ituri River, *Gilbertiodendron* forest in the west and northwest parts of the region, while *Brachystegia* forest is found throughout the region but especially conspicuous in the south and southwest (Fig. 2). Owing to the distribution of these climax forests, the honey season first begins in April in the *Cynometra* forest on the northern bank of the Ituri River, then moves to the *Gilbertiodendron* forest in the northwest part of the region, and finally comes to the *Brachystegia* forest in the west. When *Brachystegia* and *Gilbertiodendron* begin to flower in late May, the buzzing of swarming and migrating bees from east to west can be heard everyday. Since most of the primary forest is covered with *Brachystegia* and *Gilbertiodendron* in the Tetri region, the systematic honey collecting begins only after hearing this buzzing of migrating bees. Once the search for honey begins, net hunting which has been so enthusiastically practiced during the dry season declines. Most meat traders disappears from the Mbuti's camp, since it is difficult to obtain much meat in the honey season.

III. HONEY COLLECTING ACTIVITIES

1) Search for Natural Hives

Except *aundo* (*Pleiella lendiana*) which make nests underground, or *keku* (*Dactylurina staudingeri*) which make nests in the air, most bees make their nests in natural hollows in tree trunks. Such natural hives are usually found at several to thirty meters high from the ground. It requires good hearing and visual senses to find out such hives. Excellent climbing skill is also needed to get to such height. Honey collecting is possible only by exercising these excellent sensory abilities and climbing skill of the Mbuti.

In the honey camp Mbuti men individually go out into the forest in the morning twilight with a half-burned log in hand, in order to seek for beehives. At dawn, bees are still buzzing in or just around their nests and it is easier to locate them at this time. While walking in the forest, the Mbuti strain their ears. Once they catch the buzzing of bees, they follow it until they get to the tree with a beehive. Hearing is most important to the search for beehives, and only when they make sure of the location of the hive by recognizing flying bees around the hive, they depend on eyesight.

The Mbuti seek for honey for 1–2 hours every early morning. During this rather short time, they find out 2–3 hives per person on the average. The hives thus found out are rarely cut and opened on the spot. They usually return once to the camp and afterward in the daytime they go to collect honey at their need, accompanied with their friends and family members.

The neighboring agriculturalists sometimes happen to find out beehives. However, they find them only by chance and never walk about in the forest to search for beehives in a systematic way as the Mbuti do. Moreover, when agriculturalists find beehives they do not collect the honey by themselves, but ask the Mbuti to collect it.

When a Mbuti finds out a beehive he breaks the underbushes around the tree with the beehive, or slash a piece of bark, to make a finder's mark (*bunde*). A beehive thus marked is regarded to belong to the finder and no one else can collect the honey without the permission of the owner. The owner has the right as to when to collect honey and how to distribute it to

other members of the camp. Honey is not the object of trading, but Mbuti sometimes exchange this ownership among themselves for tobacco or *bangi* (*Canabis sativa*). For example, in the Tetri region three hives are exchanged for a pinch of *bangi*, which is equivalent to one blue duiker (*Cephalophus monticola*) worth about 20 *makuta* (120 yen).

2) Honey Collecting Method

The instruments used for honey collecting are 1) an axe (*palobo*)*, 2) a vine-and-leaf honey container (*anboi*)* made of Maranthaceae plants, 3) a smoking tube (*bumba*) made of leaves of Maranthaceae plants, and 4) a vine (*nupe*) used for climbing a tree or supporting a human body in a tree. Except an axe (*palobo*) which is specially designed to cut a deep hole in order to take out honey from a beehive, these instruments are made of the materials available at the honey collecting site and thrown away after the use.

The Mbuti are skillful climbers. There are few trees that the Mbuti can not climb. A small tree or vine of less than 2–3 cm in diameter is climbed by being nipped between the big and second toes. A larger tree is climbed by pushing a trunk from both sides with the feet and embracing the trunk with the arms. A pair of climbing vines (*nupe*) are used as adjustable stirrups to climb a big tree without branches. If a beehive is too far to reach to, or bees are too excited and aggressive to cut their hive, the Mbuti fell the whole tree with an axe. Once the Mbuti find out a beehive, they never fail to collect the honey from it, however difficult it may be.

When a beehive is cut and opened, the Mbuti smudge out stinging bees by blowing a smoking tube (*bumba*). African honeybees (*Apis mellifera adansonii*) is said to be more aggressive than European domesticated bees (Smith, 1958). Many traditional beekeepers in Africa collect honey at night owing to this aggressiveness of African honeybees (Brokensha and Riley, 1971, Crosse-Upcott, 1956). But the Mbuti do not seem to suffer so much from sting and they collect honey in the daytime.

The honey of honeybees is classified into three kinds according to the state of honey storage. *Anbodo* is new, fluid honey filled in a new, white comb. *Masoso* is one which occupies only part of an old comb. Heavy honey filled and sealed in a comb is called *nyamei*. Maggots (*baipo*) and pollen (*anbondo*) are also eaten by the Mbuti. Of these products of bees, *anbodo* and *nyamei* are most valued. When the Mbuti evaluate the quality of a beehive, they only take into consideration the quantities of *anbodo* and *nyamei*, neglecting other products of bees. If a beehive yields nothing but *baipo* and *masoso*, that hive is said to be empty (*bule*). At the honey collecting site these less important parts are thrown to the people looking up from the ground, but *nyamei* and *anbodo* are carefully put in a container (*anboi*) and carried down. Most of them are wrapped with Maranthaceae leaves and brought back to the camp.

3) Input and Output

The Mbuti try to find out honey within a radius of 3–4 km from their camp, that is within the range of one-hour-walk. When it gets difficult to find out hives in this area, they move to a new camp. The average stay at one camp is about two weeks in the honey season. Since the period of stay at one camp ranges from two weeks to two months in the hunting season (Ichikawa, 1978), they migrate more frequently in the honey season. To give an example, the honey collecting group consisting of the members of the Mawanbo and Kalonge bands stayed at Manbandoma camp for about two weeks in June, 1975, then moved about 3 km to Mamokwali camp where they spent 15 days, after which they moved westward to the third camp (Fig. 2).

The time required for honey collecting is about one hour during which they prepare instru-

*These instruments are of the same types as those described in Turnbull, 1965a.

Table 2. Amount of honey brought to the camp.

Date	Honeybee		Stingless bees	
	No. of hives opened	Amount (kg)	No. of hives opened	Amount (kg)
June 12	2	6.0	1	6.0
June 13	4	17.5	0	0
June 14	5	5.5	0	0
June 15	4	32.5	0	0
June 16	1	9.5	1	5.0
June 17	3	ca14*	1	ca6*
June 18	5	31.0	1	7.0
June 19	4	ca18*	0	0
June 20	1	7.0	0	0
June 21	3	7.0	0	0
June 22	10	32.0	0	0
June 23	3	25.0	0	0
Total	45	205.0	4	24.0
Average per day	3.75	17.1	0.3	2.0

* Not weighed directly.

ments such as a honey container (*amboi*), climbing vines (*nupe*) and a smoking tube (*bunba*), and cut a hive to take out the honey. If the honey obtained from the first hive does not fill their need on that day, the second and the third ones are cut. But it is rare that more than four hives are cut by one person in one day. So, the total working time of a Mbuti spent in honey collecting seldom exceeds 6–7 hours including 1–2 hours to search for hives in early morning and 1–2 hours for the travelling time from and to the camp. The rest of the time is spent in each one's own way, such as chatting, singing, eating, making simple wooden stools, or sleeping. When the night falls they make a big fire in the center of the camp and sing honey songs (*nyimbo la boki*) around the fire. In the honey season they seem to lead quite comfortable life.

In June, 1975 when the research was carried out at Mamokwali camp, about 10 km west from Mawanbo base camp (Fig. 2), *eko* (*Brachystegia laurentii*) was in the height of flowering. Everywhere in the forest the buzzing of honeybees flying over the flowers could be heard. The fresh honey (*ambodo*) had a subtle flavor of *eko* flowers.

Table 2 shows the amount of honey collected during 12 days at Mamokwali camp. Altogether 45 hives of honeybees and 4 of stingless bees were cut and a total of 229 kg was brought back to the camp. Brood (*baipo*), pollen (*ambondo*) and honey of low quality (*masoso*), which are consumed at the collecting site, are not included in this table. So, the total honey yield is more than the amount shown in Table 2. The average yield per hive is 4.5 kg for honeybees and 6 kg for stingless bees. The hives of honeybees were developing at this time and many combs were still to be filled with honey and sealed, while those of stingless bees were fully developed. In the height of the honeybees' season, it was not uncommon that more than 10 kg of honey were collected from one hive. The average yield per day was 19 kg, which were collected by six men. Thus, the average amount collected per person per day was 3.32 kg.

IV. DIET AT THE HONEY CAMP

Honey is eaten raw by sucking out directly from a comb. Sometimes a little water is mixed with combs and heated, then cooled, in order to separate honey from wax. Pure honey thus separated from combs is kept in a bottle, but it is usually consumed within a few days. *Baipo*

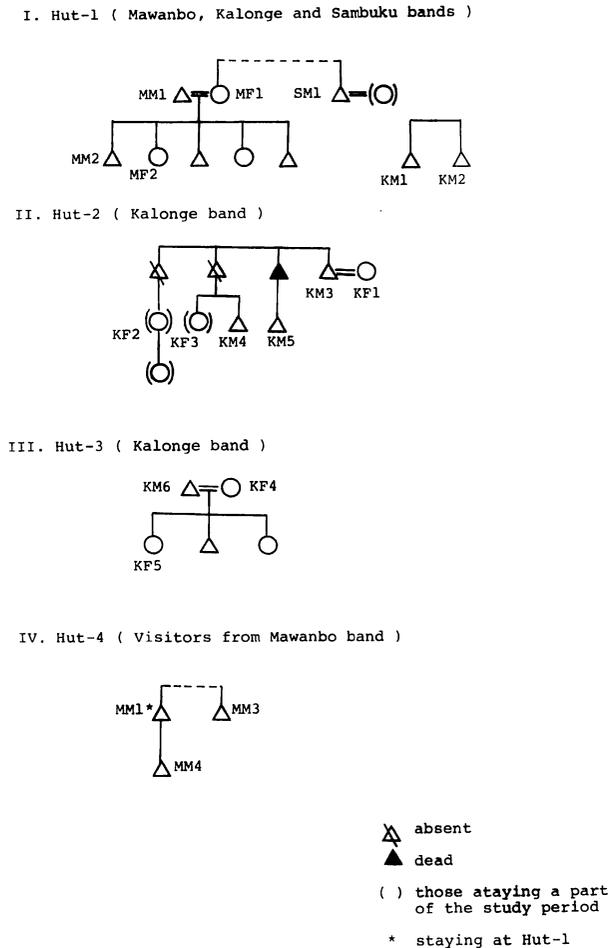


Figure 3. Composition of Mamokwali Camp. (June 12, 1975–June 23, 1975)

is also eaten raw, but often wrapped with Maranthaceae leaves and roasted. Neither the Mbuti nor the neighboring agriculturalists (the Bira and the Lese) brew any alcoholic drinks from honey.

As mentioned before, 229 kg of honey were consumed at Mamokwali camp during 12 days. As the mean group size was 23 persons (see Fig. 3 and Table 3), 0.83 kg of honey were consumed per person per day on the average. Estimating the waste part (mainly wax) as one-fourth of the total weight consumed, 0.62 kg of pure honey were eaten per person per day. In addition to this, *baipo*, *masoso* and *anbondo* were eaten at the collecting site. If these were fully absorbed, honey provided more than 1900 Cal per person per day.

Net hunting was also carried out at this time, although in a limited scale. During 12 days at Mamokwali camp net hunting was done for 6 days, and 9 blue duikers (*Cephalophus monticola*), one Gabon duiker (*Cephalophus leucogaster*), one pygmy antelope (*Neotragus batesi*), and three other animals were obtained from the hunt (Table 4). About two-thirds (47 kg) of

Table 3. Size and composition of Mamokwali camp.

	Adult		Youth		Infant	
	M.	F.	M.	F.	M.	F.
Hut-1	2	2(1)	3	1	1	2
Hut-2	1	2(1)	2	1(1)	0	1(1)
Hut-3	1	1	0	1	1	1
Hut-4*	2	0	0	0	0	0
Total	6	5(2)	5	3(1)	2	4(1)

* Visitor's hut

() Number of people staying during a part of the study period

Mean group size = $\frac{\text{total man-days of stay}}{12 \text{ days}} = 23 \text{ persons}$

the catch were eaten at the camp and the rest was exchanged for farm products. In the net hunting season from December to February, net hunting is done almost every day and the catch is 5–6 animals (about 40 kg) per day on the average (Ichikawa, 1976). The net hunting in the honey season is only of secondary importance.

Honey is, as mentioned before, the most favorite food of the Mbuti and comprised the bulk of the food taken at Mamokwali camp. However, too much ingestion of honey may sometimes cause diarrhoea. In fact, some children or other suffered from diarrhoea at Mamokwali camp. Moreover, it seems to meet their taste to add some other non-sweets to their diet. For these reasons, they did net hunting to supply meats and farm products which were obtained in exchange for the meat.

The foodstuffs eaten at Mamokwali camp during 12 days were listed in Table 4. From this table it is concluded that the Mbuti depended on honey as much as 70% of their diet in weight or 80% in calories.

Table 4. Foodstuff taken at Mamokwali camp.

Food item	Amount consumed (kg)	Wastage ratio	Cal/100 g eaten	Total Cal (%)
Honey	229	0.25	300	515250 (81.9)
Meat (total)	47	0.4	150	42300 (6.7)
blue duiker	26	—	—	
Gabon duiker	14	—	—	
Pygmy antelope	2	—	—	
giant rat	3	—	—	
Guinea fowl	1	—	—	
black francolin	1	—	—	
Farm product (total)	50	—	—	69000 (11.0)
cassava	30	0.2	100	
kidney bean (fresh)	15	0	200	
peanut (half-dried)	3	0	400	
maize (fresh)	2	0	150	
Wild vegetable (total)	6	—	—	2880 (0.5)
"aduaka" root*	2	0.2	120	
"kisonbi" root**	1	0.2	120	
"essele" nut***	negligible	—	—	
"essenge" nut****	negligible	—	—	
"essenge" nut****	negligible	—	—	
mushrooms	3	—	—	
Total caloric intake (23 persons × 12 days)				629430 (100.1)

Dioscorea sagittifolia*, *Ipomoea chrisochaeta*, ****Irvingia gabonensis*, ****Unidentified

V. SOCIOLOGICAL ASPECT OF HONEY AND HONEY COLLECTING

1) Distribution of Honey

As has been mentioned, honey belongs to its finder. However, apart from the rare occasion that only a little honey is available, Mbuti usually do not consume their honey by themselves. Anyone that accompanies the owner to the honey collecting site takes his portion. Honey brought back to the camp is always distributed to some members of the camp. To the Mbuti honey is the food which should be shared with others. Honey is more than a food which supplies nutrition. It plays an important role in the social life of the Mbuti.

First, honey distribution is seen when an owner asks someone else to collect his honey. As women and children do not collect honey, they must ask adult men to collect the honey they find out. Moreover, even adult men ask others to collect their honey in their place. These practices take place quite often and they facilitate the distribution of honey, since the collector should be given his portion of the honey collected.

From 31 beehives out of 49 cut during 12 days at Mamokwali, honey was collected by the people other than the owners (Table 5). Especially, the visitors are most frequently asked to collect honey, since they have not their own honey and they are the persons with whom the camp members should make smooth social relationship. But apart from this, there seems to exist no definite rule nor clear tendency in this practice of exchange of labor in honey collecting. In 15 cases, the owners and the collectors belonged to the same band (in only 2 cases they belonged to the same nuclear family), while in the remaining 16 cases the labor exchange occurred between the members of different bands (Table 5).

Secondly, honey distribution also occurs at the camp. Most of the honey of higher quality (*anbodo* and *nyamei*) is wrapped with Maranthaceae leaves and carried back to the camp. These packs of honey are distributed to other camp members in an informal way. Visitors, affinal relatives and family members take the share more often, but honey is distributed also to other members of different bands. This type of distribution is best expressed by the term "general reciprocity", according to Sahlins' usage (Sahlins, 1965). Namely, although they give honey to other persons with the expectation of its return, they never do so based on the strict calculation of the amount given and taken. Rather, this distribution is based on the vague assumption that the frequent distribution has the overall levelling effect on the amount given and taken in the long run.

The following is an example of such distribution of honey at the camp. On June 18, 1975, four parties went honey collecting and brought back a total of 38 kg of honey. KM6* (Kalonge band) first came back to the camp with 7 kg of *apiso*, 3 kg of which were given to MF1* (Mawanbo band) who remained at the camp. MM3* (Mawanbo band) and KM1* (Kalonge band) arrived next with 7 kg of honey (*boki*), 4 kg of which were the portion of KM1. KM1 gave his whole portion to MF1 who served him meals in this period. KM6 came to see the honey, and MM3 gave KM6 1 kg from his portion. Third, MM1 (Mawanbo band) and SM1* (Sambuku band) brought 13 kg of *boki*, all of which originally belonged to SM1. SM1, who was offered the sleeping room and served meals in the hut of MM1 and MF1, gave MF1 all the honey he brought. MF1 in turn brought 2 kg of honey to KF4, KM6's wife, and another 2 kg to MM4, who was her son and a temporary visitor to the camp. KM3's party (Kalonge band) arrived last with 11 kg of *boki*, of which 4 kg were brought to KF4's hut. The amount given and taken by each family and each hut is shown in Table 6 and Fig. 4. From Table 6 and Fig. 4 it is understood that honey was distributed to the people who were not in

*See also Fig. 3.

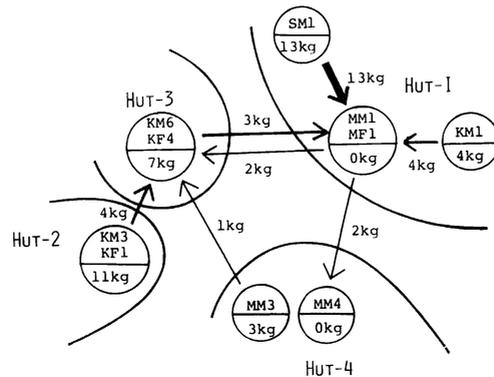
Table 5. Owners and collectors of the honey.

Collector	M band					S band	K band									Total
	Hut-1			Hut-4		SM1	Hut-1			Hut-2			Hut-3			
Owner	MM1	MM2	MF2	MM3	MM4		SM1	KM1	KM2	KM3	KF1	KM5	KF3	KM6	KF4	KF5
MM1	<u>2</u>			1	6	1										10
MM2						1										1
MF2	1					1										2
MM3				(M band)												0
MM4																0
SM1					2	<u>7</u>										9
KM1				1									1			2
KM2				1												1
KM3		1		3	1			1	<u>4</u>				1			11
KF1					1											1
KM5									2							2
KF3													1			1
KM6				2									<u>5</u>			7
KF4									(K band)			1				1
KF5						1										1
Total	3	1	0	8	10	11	0	1	6	0	0	0	9	0	0	49

Notes: 1. The underlined figures show the number of beehives cut by the owners themselves.
 2. M: Mawanbo band, K: Kalonge band, S: Sambuku band.

Table 6. Distribution of honey between huts.

	amount of honey (kg)		number of person
	before distribution	after distribution	
Hut-1	17	16	10
Hut-2	11	7	4
Hut-3	7	11	5
Hut-4	3	4	2

**Figure 4.** Distribution of honey among camp members on June 18, 1975 (The figures in the circles show the amounts of honey possessed before the distribution).

short of honey at the moment. In this case the social aspect was more important than the nutritional aspect. In other words, honey functions as the lubricant of the social relation.

It is well possible to collect honey all alone without other's help. But independent activities may sometimes accelerate the separatism of the individuals concerned. Family-based honey collecting may cause friction or even antagonism between the families comprising a single band. The exchange of labor in honey collecting or distribution of honey to other camp members, as described above, has the sociological effect that compensate such separatism which might occur at the honey camp.

2) Formation of Honey Collecting Groups

Turnbull (1965b) has pointed out that the honey season is important to the Mbuti's life not only from nutritional viewpoint but also from the "structural" standpoint. According to him, when the honey season begins in the area around Epulu where he studied, the large camp formed during the net hunting season quickly disbands into small groups each of which lives on honey. Turnbull (1965b, 1968) and Biccheri (1969) have pointed out that social advantage of life in small groups is that it helps in the settlement of the various disputes which normally arise when many people live together during the net hunting season. In the Epulu region the honey season thus functions as the safety bulb for a face-to-face group not to collapse.

Among the Tetri Mbuti, unlike those observed by Turnbull, there is not always a division into small groups for particular activities. Many bands, though in a limited scale, continue net hunting after the honey season has begun, and in some cases the net hunting groups do not disband, as illustrated by the following examples of group formation observed during the 1975 honey season:

(1) Mahuaka band consisted of 79 persons comprising 14 families. In the net hunting season, 62 persons or 10 families formed the hunting group*, which retained the same configuration

*As for the formation of hunting groups in the Tetri region, see Ichikawa, 1978.

even during the honey season. In 1975, there were so few *Gilbertiodendron* flowers that until the end of May honey could not be obtained. Then in June, when *Brachystegia* bloomed and honey became available, net hunting activity declined.

(2) Tabia band consisted of 13 families or 72 persons. In the net hunting season most members entered the forest camp with a few families remaining in the base camp*. When the honey season began, those who remained in the base camp joined the others for honey collecting and base camp was empty. However, at the beginning of June there was a trouble over a woman who slept with the men of her own lineage, and the large group divided up into three small groups each of which depended on honey collecting. About twenty days later, a group of traders from Mambasa (Fig. 1) came to the forest camp to buy meat. The three groups then reunited and began net hunting, except 5 families that left their hunting nets at the main camp to collect honey and wild plants.

(3) Tetri band consisted of 17 families or 77 persons. In the hunting season, 9 families (23 persons) formed the hunting camp. When the honey season began all of those who had previously remained in the base camp (mainly infants and the old) joined the other members in the forest. At the end of May, a woman sickened and died, and a quarrel arose among the members over the cause of death. A man and his wife were censured by other members of the band, the surface reason for which was that a village witchdoctor (belonging to the Nande) said that the death of the woman was due to the jealousy of this wife. So, the man and his father separated from the main camp to form a small camp composed of their two families. Two other families also split off to engage in intensive honey collecting, as these two families did annually. Although the main camp thus became less active, net hunting still continued.

(4) Mawanbo band was composed of 14 families or 67 persons. In the net hunting season 9 families or 45 persons stayed at the forest camp. At the end of April, all members returned to the base camp. At the end of May, when the honey season began, a family of seven formed the honey camp together with the Kalonge Mbuti, and until the end of June they lived in the forest and collected honey. Other families made daily trips from the base camp into the forest to collect honey.

(5) Kalonge band consisted of 10 families or 47 persons. In the hunting season 6 families joined the Amalutu Mbuti to do net hunting. But in April when this joint hunting group moved to the Amalutu territory, three families returned to the base camp. During the honey season, two families joined the Mawanbo Mbuti to set up the honey camp. The others continued hunting in the Amalutu territory, or made daily trips to collect honey from the base camp.

(6) Apekele-1 band consisted of 13 families or 55 persons. In the hunting season everyone went into the forest, leaving the base camp empty. During the honey season, some continued net hunting at the main camp, but 4 families split off to collect honey and subsisted almost entirely on honey and wild plants.

These examples show that in the Tetri region net hunting continues when the honey season begins, though reduced in degree. In this respect, they are fundamentally different from the Epu Mbuti studied by Turnbull.

Sociologically speaking, the important characteristic of the honey collecting activity is that it takes place in small groups without the cooperation of many people. It is more efficient for small, decentralized groups to search for honey over a wide range than for a large group to form a single camp and go searching around in a smaller area. Conversely, for net hunting, cooperation among a large number of people is indispensable. For this reason, among the Tetri Mbuti, they maintain the main camps without splitting completely into small groups,

*A village camp near the villager's settlement (Ichikawa, 1978)

so that cooperative net hunting may be continued. At the same time, if it does not cause severe interference with net hunting, a few families go off from the main camp to subsist on the results of their own honey collecting efforts.

As Turnbull has pointed out, this separating into small groups has the effect of dispelling disputes which arise in the larger group. But the Tetri Mbuti do not have this fixed system of division into small groups. With group quarrels, they prefer to handle each situation individually. In the actual cases observed among Tabia and Tetri bands, the situation was such that after trouble occurred the hunting groups that had functioned up until then broke up into small groups. The honey collecting season is very important for the Mbuti social life, because at that time division is possible at any time, and the life nonetheless goes on. The ambiguities in their group formation in the honey season result from their dependencies on two subsistence activities which demand mutually contradictory group formations, and therefore the Mbuti must adopt a flexible attitude to meet the demand of each particular situation.

VI. SUMMARY AND DISCUSSION

The importance of honey to the Mbuti life is summarized from ecological and sociological viewpoints.

Before mentioning ecological importance of honey, it should be noted that collecting wild honey is, so far as Africa is concerned, a characteristic subsistence activity in the tropical rain forest. In many parts of Africa, especially in East Africa, artificial beehives are set in trees to attract honeybees. However, this traditional beekeeping is limited to such vegetation zones as the woodland, savanna, montane forest, and never found in the tropical rain forest. The reason for this is, as has been suggested in the earlier paper dealing with the beekeeping of the Dorobo in East Africa (Ichikawa, 1980), an ecological one. Bees are likely to find artificial hives or some other suitable places for hive-building by chance. So, if there are so many natural hollows suitable for beehives, the probability that bees successfully settle in artificial hives may decrease. In the tropical rain forest there are, in tree trunks, a plenty of such natural hollows mainly made by termites, and beekeeping with artificial hives is not efficient. Collecting wild honey, as the Mbuti do, is more adaptive to the tropical rain forest environment in Africa.

In the Ituri Forest, no people other than the Mbuti collect honey in a systematic way as described here. Honey collecting requires the deep knowledge of the surrounding natural environment, clear visual and hearing senses, and highly developed climbing skill. Without these capacities the Mbuti would not be able to collect honey in the forest.

During the honey collecting season of about one to two months from May to July, honey collecting is their main subsistence activity and some Mbuti depend as much as 80% of their caloric intake (or 70% of the total food in weight) on honey. Honey season is the time when the Mbuti are least dependent on farm products. In other words, they lead far more self-sufficient life in this season than the life in the hunting season. Daily working time needed for honey collecting seldom exceeds 6–7 hours, so the life is by no means difficult in the honey season.

In the Mbuti life, honey functions as the medium by which their social relations are regulated. Although honey belongs to the individual who finds it out, it is not consumed by the owner alone. It is distributed to other members of the camp. The owners often ask the other men to collect their honey. In this case, honey is distributed as the result of labor exchange in honey collecting. These practices of honey distribution and labor exchange compensate the separatism among the camp members which is liable to occur during the honey season. Namely, honey facilitates the unity of the people who live in a small honey collecting groups.

Conversely, the honey season functions as the time when small groups may separate from each other. When the disputes or friction arise among the band members, they are dissolved by separating the people into small honey collecting groups. Such group fission is possible only under the socio-ecological conditions of honey collecting activity. Namely, honey collecting takes place in small groups or even individually without the other's help, and it is more efficient for small, decentralized groups to seek for honey over a wide range than for a large group to form a single camp.

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REFERENCES

- BICCHERI, M. G. 1969. The Differential Use of Identical Features of Physical Habitat in Connection with Exploitative, Settlement, and Community Patterns: The Mbuti Case. In Damas, D. (ed.) *Ecological Essays*, Ottawa, pp. 65-72.
- BODENHEIMER, F. S. 1951. *Insects as Human Food, A Chapter of the Ecology of Man*. Dr. W. Junk Publishers, The Hague.
- BROKENSHA, D. and Riley, B. W. 1971. Bee-keeping among the Mbeere and Some Notes on Tharaka. *Mila*, vol. 2, no. 1, pp. 13-24.
- CROSSE-UPCOTT, A. R. W. 1956. Social Aspects of Ngindo Bee-keeping. *JRAI*, vol. 86, pp. 81-109.
- FRISCH, K. von 1969. *Aus dem Leben der Bienen*. Springer-Verlag, Berlin-Heidelberg.
- HARAKO, R. 1976. The Mbuti as Hunters. *Kyoto University African Studies*, vol. 10, pp. 37-99.
- HART, J. 1978. From Subsistence to Market: A Case Study of the Mbuti Net Hunters. *Human Ecology*, vol. 6, pp. 325-353.
- ICHIKAWA, M. 1976. The Hunting Life of the Mbuti Pygmies (in Japanese). *Shizen*, vol. 31, no. 4, pp. 26-35.
- 1978. The Residential Groups of the Mbuti Pygmies. *Senri Ethnological Studies*, vol. 1, no. 1, pp. 131-188.
- 1979. The Net hunting of the Mbuti Pygmies (in Japanese). *Kikan-Minzokugaku*, no. 8, pp. 99-104.
- 1980. Beekeeping of the Suiei Dorobo in East Africa (in Japanese). *Kikan-Jinruigaku*, vol. 11, no. 2, pp. 117-152.
- SMITH, F. G. 1958. Beekeeping Observations in Tanganyika 1949-1957. *Bee World*, vol. 39, no. 2, pp. 29-36.
- SPITTEL, R. L. 1924. *Wild Ceylon, Describing in Particular the Lives of the Present Day Veddas*, Ceylon (H.R.A.F.).
- TURNBULL, C. 1965a The Mbuti Pygmies: An Ethnographic Survey. *Anthropological Papers of the American Museum of Natural History*, 50(3), pp. 139-282.
- , 1965b *Wayward Servants: The Two Worlds of the African Pygmies*. Natural History Press, New York.
- , 1968. The Importance of Flux in Two Hunting Societies. In Lee, R. B. and DeVore, I. (eds.), *Man the Hunter*. Aldine Publishing, Chicago, pp. 132-137.