CHAPTER 52

PERCEPTION AND USE OF WILD YAMS BY THE BAKA HUNTER-GATHERERS IN SOUTH CAMEROON

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INTRODUCTION

A novice traveller wanting to observe a forest wild yam *in situ*, would be extremely disappointed by what would be presented to him in the forest understorey: he would see an inconspicuous, tiny liana stem, the sole sign that the plant is there. Nevertheless, this is a plant which is known to have been, and still is, of major importance in the diet of most tropical rain forest hunter-gatherers. It is not my intention here to discuss whether or not these starch-rich plants may have supported independent foraging strategies with no direct or indirect access to domesticated plants or animals (see special issue of *Human Ecology*, 1991). In this chapter, I propose to provide data on the empirical knowledge and perception of the Baka hunter-gatherers in Cameroon about forest wild yams.

The ethnolinguistic approach reveals that the Baka's extensive knowledge of the biology and ecology of yams is not only accurate, but also entails specific sociocultural rules governing gathering activities. The study of the Baka's perception of their environment shows that wild yams form part of religious life, as a key ritual object. The socio-symbolic ramifications involving yams are presented in the following chapter (Joiris, 1993, this volume).

The Baka population is estimated to be around 40 000 people, distributed over 75 000 km^2 in the rain forest of southeast Cameroon (see Figure 4.1 in Bahuchet, 1993, this volume, page 38), which is characterized as tropical semi-deciduous forest (Letouzey, 1985). Today the Baka live in permanent camps associated with farmers' villages. For several decades, the Baka have practised shifting cultivation with plantain as the major crop, and nowadays some of them are completely sedentarized and are

efficient cacao cultivators. Most of the Baka groups, however, still spend several months of the year in nomadic camps to hunt and to gather caterpillars. During these periods, wild food resources, especially wild yams, form the major part of the Baka diet.

YAMS WITHIN THE BAKA CLASSIFICATION OF PLANTS

Figure 52.1 shows how wild yams are included by the Baka in their plant classification system. The Baka nomenclature recognizes 10 taxa of edible wild yams. The herbarium specimens that we collected are still under study. For this reason, unidentified taxa, mentioned in Table 52.1, will be called by their Baka name (see Hladik and Dounias, 1993, this volume).

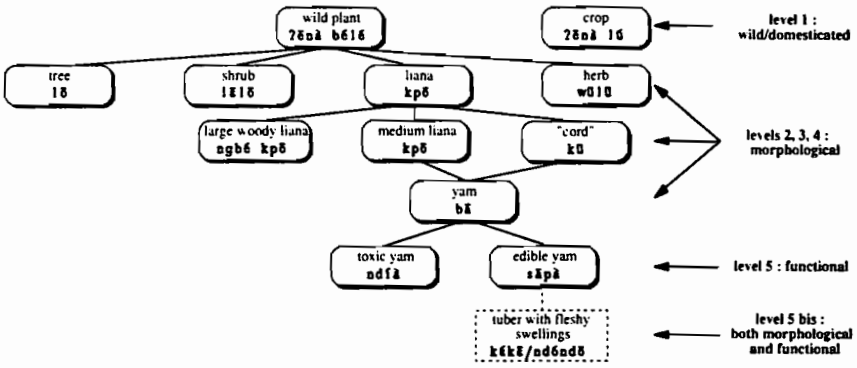

Figure 52.1 Position of yams among other plants in the Baka classification

Non-edible yams, which in fact are all yams of the forest edges and fallows (Hladik *et al.*, 1984; Hladik and Dounias, 1993, this volume), are grouped under the term n d í à[1]. Under this generic term, the Baka include only members of the genus *Dioscorea*, excluding from the group other toxic tuber-forming lianas that grow in similar forest types, e.g., *Asparagus warneckei* (Liliaceae), *Jateorhiza macrantha* (Menispermaceae) and *Stephania laetificata* (Menispermaceae). Thus they separate out toxic *Dioscorea* tubers from the group of otherwise similar toxic tubers.

[1] The Baka are Oubanguian speakers. For the transcription of Baka vocabulary, I use the International Phonetical Alphabet. For further linguistic information, see Bahuchet (1993, this volume)

By contrast, edible roots are grouped in a functional classification that includes two unrelated genera of plants: *Dioscorea* spp. and two species of *Dioscoreophyllum* (Menispermaceae). The latter genus is a group of non-woody lianas with hairy stems producing a shallow, aqueous, horizontal rhizome that cannot be confused with yams. The Baka call the whole group sāpà, from the name of one species within it, *Dioscorea praehensilis*, which produces annual and fleshy tubers, and which, of all the wild yams, resembles most closely a cultivated yam.

The edible group is further sub-classified according to the morphological criteria of its tuber, which are at once anatomical and functional: a woody head, more or less deeply buried, is extended into long fibrous parts which develop terminal fleshy edible swellings. These anatomical characteristics of species which are all included in the section Enantiophyllum (Hladik and Dounias 1993, this volume), have functional consequences for the method used to dig them up. Two generic terms are employed equally for this sub-group: kékē is taken from *Dioscorea burkilliana*, which is the largest species with this form of tuber production, and ndóndō (glans), which refers to the tuber anatomy (Figure 52.2).

Table 52.1 Wild yam nomenclature

	Baka term	Translation	Classification
Non edible yams	ndíà	toxic yam	Baka biological
Dioscorea bulbifera	ndíà mbòkē	porcupine's toxic yam	classification
Dioscorea dumetorum	ndíà ngègbè	giant toxic yam	parallels
Dioscorea preussii	ndíà pāmē (a)	bush pig's toxic yam	scientific
Dioscorea sansibarensis	mòlíbē-pē ndíà (b)	father of toxic yams	classification
Edible tuber plants	sāpà		
Dioscoreophyllum cumminsii	ngbí		
Dioscoreophyllum sp.	bīlángō		Classification
Dioscorea hirtiflora	sēndé - sēnjé		functional, based
Dioscorea semperflorens	sùmà - ?èsùmà		on
Dioscorea praehensilis	sāpà		edibility
Dioscorea mangenotiana	bà -?èkùlē (c)		
Dioscorea sp.	bɔ̄lì -sòpō		
Idem with terminal fleshy swellings	kékē/ndóndō		
Dioscorea burkilliana	kékē		Classification both
Dioscorea smilacifolia	bālɔ̀kɔ̀		functional and
Dioscorea sp.	njàkàkà - njyàkàkà		biological, based on
Dioscorea minutiflora	kūkū		tuber morphology
Dioscorea sp.	pàngē -?èpàngē		and edibility

(a) also named ndíà nā mbùndè (toxic yam with winged stem)

(b) the term for "father of toxic yams" was obtained *a posteriori*, and is probably an artefact of our interviews

(c) the term ?èkùle is used only in ritual context

YAMS AND HUMAN BODY PARTS

Figure 52.2 shows that the terminology for yam morphology mostly reflects human anatomy. Such a feature is common throughout folk systems of knowledge (e.g. Breton, 1989), but within Baka plant nomenclature, wild yams are the only plants to which the metaphor of the human body is applied.

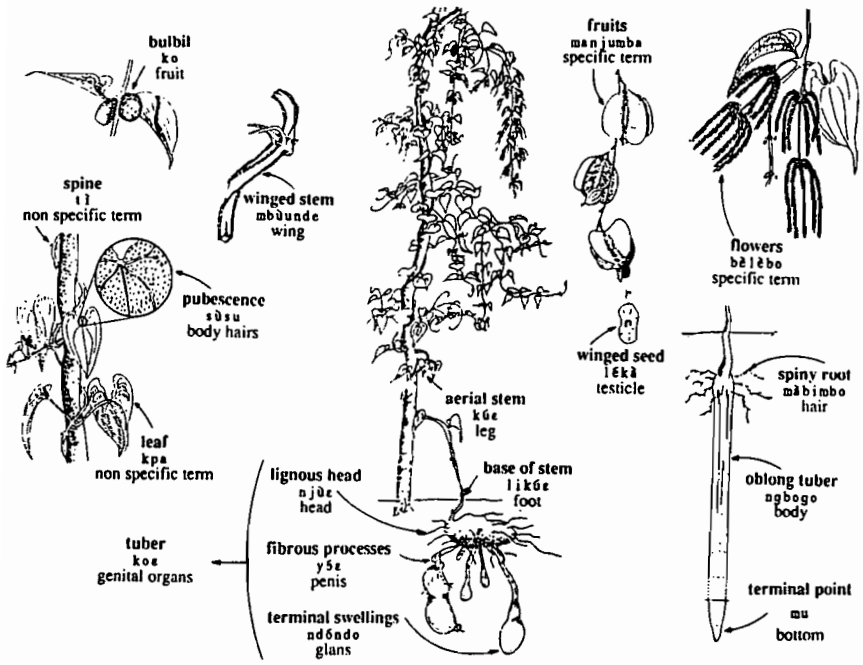

Figure 52.2 Baka terminology for yam morphology

The general Baka term for "flower" (ngōmā), is never applied to yams, and the term applied to the fruit of other plants (kō) is transposed to the yam bulbil (aerial tubers on the toxic forms). The Baka perceive yam flowers (mānjūmbā) and fruits (bèlèbō) as specific yam organs, indicating the sex of the "individual": the yam plants carrying flowers are called "female human being" (wɔ̄sè), whereas those carrying fruits are called "male human being" (mɔ́kɔ̀sè). The winged seed of these so-called "male" individuals is termed "testicle". There are indeed separate male and female plants (dioecious species), producing male flowers, or female flowers; and, of course, the fruits are carried by the female individuals.

However, the Baka perception of yam sexuality is based on tuber size: a yam plant carrying fruits is said to possess a more developed tuber and is thus perceived as male.

This perceived functional link between flower/fruit stage on the one hand, and tuber development on the other, justifies the comparison of the tuber with genital organs (Figure 52.2). When visible, fruit maturity is carefully noticed during yam collecting, to reduce the risk of wasted foraging. This appropriate perception of plant reproductive parts which are generally hidden up in the canopy, is probably the most significant expression of the elaborate Baka ethnoecology of yams.

BAKA PERCEPTION OF THE YAM GROWTH CYCLE

Specific terms that do not reflect human anatomy are used to describe the growth cycle of a yam plant (Table 52.2). They are applied to characteristics that indicate yam maturity, and these are carefully noted during foraging.

Several terms refer to the organoleptic properties of tubers: f ūmbō means that a good tuber is simultaneously "firm" and "tender". Another term, s à s à, explains that "tubers which are eaten raw catch the back of the throat". This irritating effect is due to the presence of raphide bundles of calcium oxalate (Ayensu, 1972), that are eliminated by cooking. The term s ā l è describes

Table 52.2 Baka terms referring to the growth cycle of yams

	Current Baka	Ritual Baka	Aka	Kola
Terms for major steps of growth cycle				
Dry, dehiscent fruit	màkāɲì*			
Fruit debris	māngānjō*			
Yellowing leaves	lìkōlōā*			
Dead stem	mōkɔ̄nɔ̄kɔ̄			
Spontaneous regeneration of stem base	mōyākī			
New stems	ngūkū			
Maturity	kōlō*			
Terms used specifically for *Dioscorea mangenotiana*				
General term	bā	ʔèkùlē	èkùlé	sa̱a̱
Stage 1: Young growth (inedible)	màpálá-líbòlò	ʔèkùlē	??	ānlwālō
Stage 2: Simple unique oblong tuber (edible)	bòkɔ̄kɔ̄lɔ̄	ʔèkùlē	bòbángá	sa̱a̱
Stage 3: Small woody, spiny tuber (edible)	bā	mòmbɔ̄ngò	èkùlé	bīsààsè
Stage 4: Large woody, spiny tuber (+/- edible)	pàpè	móngōndò	zíókò	péngyē
Stage 5: Dead (inedible)	màbùlùmàkà	móngōndò	bò.dùmàkà	péngyē

* Terms taken from Bahuchet (1989: 274)

the aqueous and fibrous stage of yam tubers during the rainy season. These tubers are not eaten, but only sucked as emergency food.

The yam species *Dioscorea mangenotiana* possesses a perennial tuber that undergoes great morphological change during its growth. The Baka (as well as the Aka of Central African Republic and the Kola of coastal Cameroon) use specific terms for each stage of maturation. Furthermore, the Baka use a second set of terms to denote the same stages of maturity of the plant in a ritual context (Joiris, 1993, this volume). *Dioscorea mangenotiana* is the only wild yam for which the Baka have developed oracles: Brisson (1988: 319) describes how the smoke from wood of a tree *Strombosia pustulata* (ɓɔ̀nbɔ̄ngɔ̄), Olacaceae, which has been placed on the watchfire, shows which direction gatherers should follow to find *D. mangenotiana* yams.

NON-FOOD USES OF WILD YAMS

The non-food uses of yams show that they have importance not simply as a starchy food, but at all levels of Baka culture (Table 52.3).

Table 52.3 Ethnomedical and other non-food uses of wild yams

Yam species	Pharmacopoeia	Prohibitions	Hunting poison
D. bulbifera	abcesses (plaster from bulbils)		crossbow hunting (bulbils)
D. bulbifera	snake bites (plaster from bulbils)		
D. dumetorum			crossbow hunting (tuber)
D. sansibarensis	hernia (purge from tuber decoction)		crossbow hunting (tuber)
D. sansibarensis	sterility (dish including cooked tuber)		
D. semperflorens		young hunter (forbidden as food)	
D. praehensilis	goitre (ashed tuber scarification)		
D. mangenotiana		initiation to cult of "jengi spirit" (forbidden as food)	
D. mangenotiana		elephant hunter (forbidden to carry tuber)	
D. mangenotiana		single man (forbidden as food)	
D. mangenotiana		symbolic object (see Joiris, following chapter)	
D. sp. *bɔ̄lì*		pre-pubescent child (forbidden as food)	
D. burkilliana	oxytocic (ashed tuber-scarification)	pregnant woman (forbidden as food)	
D. smilacifolia	(fibers + magical processes)	breast-feeding women and spouse (forbidden as food)	
D. sp. *njàkàkà*	splenomegalie (ashed tuber-scarification)	breast-feeding women (forbidden as food)	

PATTERNS IN SEARCHING AND EXTRACTING YAMS

The search for yams does not depend solely on chance, but on the contrary, takes place within circumscribed boundaries, in areas identified as being dense "edible yam groves" (bɛ̄lɛ̄ ā sāpà). The distribution of species according to forest types as perceived by the Baka (Table 52.4) suggests that yam distribution is accurately analyzed when studied at the scale of the actual territory of each Baka community.

Table 52.4 Baka perception of the distribution of edible tuber plants within the different forest types

	Forest edges gbā	Fallows ʔūndò	Swampy lowlands jàmbà	Seasonally flooded forest yālā	Hill forest kɛ̄ngà	Lighted undergrowth ʔɛ̀kànjà	Dense undergrowth sɛ̄lɛ̄	Chablis jānō ā kōlò
D. sansibarensis	+	+	-	-	-	-	-	-
D. bulbifera	+	+	-	-	-	-	-	-
D. dumetorum	+	+	-	-	-	-	-	-
D. preussii	+	+	-	-	-	-	-	-
D. hirtiflora	+	+	-	-	-	-	-	-
D. semperflorens	-	+	-	-	-	+	-	-
D. praehensilis	-	+	-	-	-	-	+	-
D. mangenotiana	-	-	-	-	-	+	-	+
D. sp. *bɔ̀lì*	-	-	+	-	-	-	-	-
D. burkilliana	-	+	-	-	-	-	-	+
D. smilacifolia	-	+	-	-	-	+	-	-
D. sp. *njàkàkà*	-		-	-	+	+	-	-
D. minutiflora	+	+	+	+	-	-	-	+
D. sp. *pàngɔ́*	-	-	+	+	-	-	-	-
Dioscoreophyllum spp.		+	-	-	-	-	-	+

The Baka choose between two different methods for digging up yams, depending on the morphology of the tuber.

The first method (nà mōgbō) leaves the woody part of the tuber on the ground after harvest. Regeneration of the tuber following nà mōgbō is a matter of chance, though the gatherer may place the "head" back in the hole and cover it with backfill. This method is mainly used for yams in the kɛ́kɛ̄ subgroup. Before the yam is dug up, the area around the base of the stem is tested with the point of a machete, to judge the maturity of the terminal swellings. For young *Dioscorea mangenotiana* and *Dioscoreophyllum* spp., the whole tuber is taken and nothing is left to regenerate. For these tubers, the first method causes the death of the plant.

The second method (nà jɛ̄) leaves the head carefully reburied and the upper part of the hole blocked with a mixture of humus and backfill. Regeneration is thus explicitly enhanced. I call these two practices, the

explicit purpose of which is to enhance regeneration, "paracultivation". This concept and its implications will be discussed later (see page 630).

The yam plant which has been replanted is called ndīá[2]. This method is used for *Dioscorea semperflorens*, *D. praehensilis*, and older *D. mangenotiana*, tubers that produce large quantities of edible swellings during the third stage of maturity (see Table 52.2).

Three types of tools are used by the Baka for digging up wild yams. A digging stick, ngbāpā, is used in soils that are heavy or rich in clay. It is also used as a lever to push out the large woody tubers of *D. mangenotiana* and *D. burkilliana*. In harder and stony soils, the Baka sometimes use a dibble, ngòsò, which has a metal point.

The third tool, the auger, is specially designed for digging up deep, vertical replanted tubers of *Dioscorea semperflorens* and *D. praehensilis*. The auger, bòdùngà, consists of a wooden handle made from a young slender trunk, with a drill whose tip is cut into four chamfered fingers. Woods from *Polyalthia suaveolens* (Annonaceae) , *Milletia sanagana* (Papilionaceae) or *Lasiodiscus mannii* (Rhamnaceae) are chosen by the Baka for their plasticity and resistance. This collecting cone makes it possible to extract the earth and the tuber in sections (called ndūkū). To reinforce the cone, the Aka insert wooden paddles, whereas the Baka sometimes use a coil of rattan, sometimes nothing. This ephemeral tool combines effectiveness and simplicity, and as Bahuchet suggested (1989: 278) it can be seen as the most significant expression of Aka and Baka adaptation to the forest environment.

The auger is particularly useful for digging up new tubers from the cavity of a replanted yam. The longer replanting the head is continued, the deeper the tuber grows, and the more indispensable the auger becomes to dig up the lower sections of the tuber.

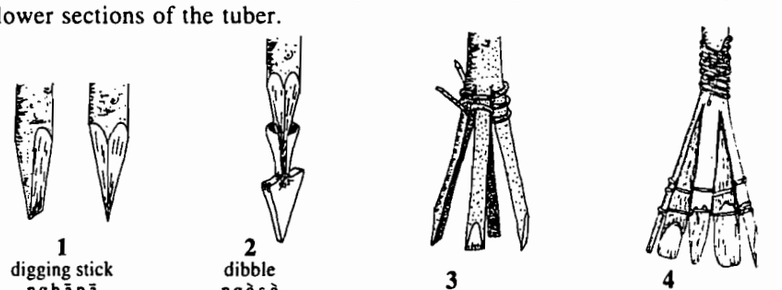

Figure 52.3 Yam digging tools

Furthermore, the production of a single plant of *Dioscorea praehensilis* or *D. semperflorens* can be doubled: one new tuber develops from the spiny part left near the surface, and a second, deeper tuber can form from

[2] Notice the different tones between ndī á (replanted yam) and ndí à (generic term for toxic yams).

the terminal point called "buttock" (mū) or "finger" (lɛ́è) which is deliberately left at the bottom of the hole made by the previous tuber (Figure 52.3). It is common to observe two stems emerging from a single replanted cavity, and the auger becomes essential to reach the lower tuber.

SOCIAL DIMENSIONS OF EXPLOITING WILD YAMS

As stressed by Joiris (in press), yam digging can be carried out equally well by men or women, who share the same ecological knowledge. Yams are usually dug up by "work groups" (wà-kūnō ā bèlà) varying in size and composition, but always based on affinity. Yam digging, like other gathering activities, is more than a simple search for food; it is a convivial social activity. Conviviality is also emphasized by Endicott and Bellwood (1991) in yam foraging among the Batek De' of the Malay Peninsula.

Groups of children also have their own digging activity, focused on the aqueous and shallow rhizomes of *Dioscoreophyllum* spp., which can be eaten raw.

The patterns of individual ownership of collected tubers vary according to the composition of work groups. Gathering partners help one another to dig up their respective ndīá, and the tubers are redistributed back at the camp as reciprocal gifts of cooked dishes. Replanted yam tubers are served as prestige food during festive events, or when receiving an important guest. Some Baka informants have specified that these tubers may also form part of bridewealth payments.

When a new yam plant is found (then called mòpìmā), its ownership is marked by snapping the surrounding shrubs (nà kākà tɛ̄ mbàngō). The owner adds magic protection (mà), intended to hide his acquisition from thieves: a branch of a shrub, *Microdesmis puberula* (pípī), Pandaceae, is tied in a loop to keep guard of the ndīá. Successive replantings of wild yam plants can last more than ten years, and can thus be inherited. When abandoned, these ndīá leave cavities for years in the undergrowth, which the Baka recognize and name "edible yam ancestor" (kōbō ā sāpà).

The theft of a protected yam generates conflict (wē), brought to the attention of the whole camp. The rule dictates that the thief has to pay as compensation one of his ndīá of the same species as the one stolen. The victim can also demand honey of the pɔ̄kī quality, which is the most highly valued of all honeys. In extreme cases, with the help of a sorcerer (wà-mbù), the owner of a ndīá may ultimately have recourse to kākī, a thunderclap, which strikes the thief dead.

To summarize, the gift or exchange of the product of a replanted yam reinforces respect (matrimonial exchanges, festive food), mutual confidence (the gathering partnership which overshadows individual ownership) and the creation, maintenance or restoration of healthy social relationships.

FROM PROTOCULTIVATION TO PARACULTIVATION

The term "protocultivation" is a translation of the French word "protoculture" borrowed from Chevalier (1936), who described the way that the Bongo peoples of Oubangui Chari used to replant wild *D. dumetorum* individuals near their habitats. Hladik *et al.* (1984) also use this term in respect to the Aka Pygmies of Central African Republic replacing the head of some wild yam species, in order to favour their regeneration. Such a process is described by Mouton and Sillans (1954) in terms of "semi culture", without reference to ownership or social implications.

Similar practices are reported on the Asian continent. Sandbukt (1988) and Dounias (1989) have mentioned the creation by Kubu hunter-gatherers in Sumatra of "hidden gardens" of two species of toxic wild yams used as food *(Dioscorea hispida* and *D. piscatorum).* The Kubu's aim is to store live food in anticipation of possible seasonal food shortages. Similarly, the Orang Asli of Malaysia rebury the top of the tuber of several yam species (Rambo, 1979). The Aborigines of northern Australia are also reported to reset the top of wild tubers of *Dioscorea transversa* (O'Dea, 1991: 235).

Earlier, Burkill (1953) and Radcliffe-Brown (1964) had already mentioned that Andaman islanders protected wild *Dioscorea glabra* individuals during their growth. The protection was reinforced with religious sanctions, for the nearly mature *D. glabra* tuber was said to be reserved for the monsoon God. Coursey (1976) puts Andaman ritual protections in the same category as those he and his co-worker reported from West African religious festivals dedicated to cultivated yams (Coursey and Coursey, 1971). Coursey sees such magico-religious celebrations as one of the major steps in the process of wild yam domestication by hunter-gatherers.

As distinct from Coursey's description of "protocultivation" as a succession of stages resulting in domesticated plants, I use the term "paracultivation" to define Baka practices aimed at managing the wild plants' production while keeping them in their original environment. The paracultivated yam is not simply cared for and protected, but, more intricately, owned, managed over time and eventually inherited as a private possession. Accordingly, as a marker of a whole socio-cultural strategy, the wild yam can be considered as a "cultural superfood" (Jellife, 1967) for these hunter-gatherers.

NEW PERSPECTIVES ON GATHERING ACTIVITIES

From the Baka plant classification, we can argue that paracultivation of wild yams is perceived not as an agricultural act, but as a gathering activity. Paracultivation lies at the interface between the domesticated and the wild, and thus opens up new perspectives around foraging strategy.

Beyond its primary function as food, the wild yam is, through its ownership, raised by the Baka to the full status of a cultural good. It appears in matrimonial payments, in prestige dishes, in the pharmacopoeia and finally as a ritual object. Paracultivation is the key aspect of an accomplished yam expertise: it is based on accurate observation of the plant within its natural environment, is accompanied by social rules protecting the rights of ownership, and has necessitated the technical design of a digging tool that is adapted to the constraints of nomadic life. The concept of paracultivation encourages us to reconsider some stereotypes of foraging societies, which are often seen as parasitic on the environment with *ad hoc* unpredictable gains as a result. The practice of paracultivation is a response to the heterogeneous distribution of yams within the forest and to the seasonal availability of the different species. By encouraging the regeneration of "natural yam plots", the Baka reduce the unpredictability of gathering. The difficulty lies less in finding the yam plants than in managing the production of the paracultivated plants over time, so that they are better used according to seasonal needs, which vary according to the optional activities carried out by each Baka community.

Such exhaustive knowledge complemented by socio-ritual ceremonial elaboration around wild yams enriches the idea of the "yam civilizations", first applied to yam cultivation in west Africa (Miège, 1954; Coursey, 1972) and Melanesia (Haudricourt, 1964; Barrau, 1970). For the Baka, paracultivation is a highly developed system employed by hunter-gatherers to suit the constraints of a nomadic way of life, by optimizing the exploitation of wild resources within their territory.

Certainly, paracultivation, as described here for wild yams, might exist or have existed for other wild forest food resources (honey trees, trees producing oil- and protein-rich seeds, caterpillar trees, etc.), and is probably an underestimated feature of long term management of forest resources by nomadic people (Balée, 1989). This profound cultural relationship between peoples and wild yams goes far beyond the satisfaction of the simple need for food: it gives an added dimension to the role that yams could have played in the past of the Baka hunter-gatherers.

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