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Ethnobotanical survey of indigenous leafy vegetables consumed by the populations of the prefecture of Lobaye in the Central African Republic

Madiapevo Stephane Nazaire[1], Ndotar Michel[2], Worowounga Xavier[3], and Mandago Jean Bedel[2]

[1]Faculty of Sciences, University of Bangui, Central African Republic

[2]Ecole Normale Supérieure, University of Bangui, Central African Republic

[3]Laboratoire d'Analyse, d'Architecture et de Réactivité des Substances Naturelles (LAARSN), Faculté des Sciences, Université de Bangui, BP 908, Bangui, Central African Republic

ABSTRACT: Several nations have integrated food security for a long time, thus undertaking a fight against malnutrition in all its forms. This work aimed to inventory the indigenous leafy vegetables of the prefecture of Lobaye in the Central African Republic. To do this, an ethnobotanical survey was conducted among 144 people. The survey was carried out during the period from May to October 2022. In total, sixty-three (63) species were identified, grouped into forty-six (46) genera and belonging to thirty-one (31) botanical families. The sub-prefecture of Pissa totals 56 species, that of Boda 54 and 48 for that of M'baïki. The most represented families are Tiliaceae (6 species) and Moraceae (5 species). The analysis of ethnobotanical data revealed that the leaf is the most used organ (95.24%); 66.67% of leafy vegetables are consumed as complementary nutritional sources while 33.33% are functional foods. Cooking is the most used method of preparation (98.41%). The biological forms that produce more leaves consumed are herbs (38.09%). The habitat of these species is in particular the forest, fallow land and fields. The well-known species (50 to 100%) are fourteen (14) in number or 22.22% of the total specimens. In addition, the results showed that fourteen (14) LFI species are subject to significant trade in local markets. This study showed that there is still a high diversity of LFI species in the prefecture of Lobaye in the Central African Republic.

KEYWORDS: Ethnobotany, indigenous leafy vegetables, rural environment, Lobaye (Central African Republic).

1 INTRODUCTION

The tropical rainforests of Central Africa cover 241 million hectares, more than half of which represents the Congo Basin and is the largest forest of this type existing in the world, after that of the Amazon [1]. They are rich, made up of a significant proportion of Non-Timber Forest Products of plant origin. Several nations have integrated food security for a long time [2], thus undertaking a fight against malnutrition in all its forms [2], [3].

Corresponding Author: Worowounga Xavier

Fig. 1. Package of Gnetum africanum leaves (a), hin strips of Gnetum africanum leaves (b)

Photo S.N. MADIAPEVO, 2022

In the Central African Republic, particularly in the prefecture of Lobaye, leafy vegetables from wild species occupy a prominent place in the diet of rural populations. The collection and sale of these products provide significant benefits, especially to women, and help reduce poverty in rural areas. To date, there is very little knowledge about the nature and importance of these resources, even though they should be better known to be more valued. The aim of this work was to conduct an ethnobotanical survey to identify the indigenous leafy vegetables consumed by the rural populations of the prefecture of Lobaye in the Central African Republic. The specific objectives were to determine the local taxonomy, habitat, method of preparation and use made of these native leafy vegetables. To our knowledge, this is the first time that such a study of this kind has been carried out in the aforementioned prefecture.

1.1 STUDY SITE

La Lobaye is one of the sixteen (16) prefectures of the Central African Republic. It is located in the south-west of the country, bordering the Republic of Congo and the Democratic Republic of Congo. It covers an area of 19,235 km^2 with a population of 246,875 inhabitants [4] for a density of 12.83 inhabitants per km2. The main ethnic group is made up of the Ngbaka, alongside the Gbaya, Mandjombo, Mbati and Bofffi. Lobaye is bounded to the north and east by the Ombella M'Poko; to the south-west by the Oubangui River which marks the border with the Democratic Republic of Congo; to the west by Sangha-Mbaéré; and to the North-West by Mambéré-Kadéï. The climate is of the humid tropical type, characterized by the alternation of the dry season and the rainy season. The average temperature is 27°C with an average annual rainfall of 1,800 millimetres. The soil is of the ferralitic type. The flora is represented by large tropical forests. It belongs to the Guinean-Congolese region, to the Congo Basin domain. Figure 1 gives the geographic location of the study area.

Fig. 2. Map of the location of the study area

2 MATERIALS AND METHODS

2.1 BIOLOGICAL MATERIAL

The biological material consists of leaves and buds from wild species consumed by the different ethnic groups of the prefecture of Lobaye. Reference herbaria were compiled and stored at the Plant and Fungal Biology Laboratory of the University of Bangui according to the techniques and methods of Schnell [5]. Photos were also taken in the field to support this identification.

2.2 SAMPLING

Surveys based on the Semi-Structured Interview method [6], [7], were conducted among 108 consumers (90 women and 18 men) and 36 sellers of market LFIs. A total of 144 individuals were surveyed. The questionnaire focused on the following five (5) main points: (i) the non-vernacular; (ii) uses; (iii) housing; (iv) morphological types; (v) method of preparation. These surveys were carried out both in the dry period and in the rainy period from May to October 2023.

2.2.1 CONSUMER SURVEY

The consumer survey was carried out in three sub-prefectures, chosen according to their geographical positions and the high sale of LFIs in their market. These are Pissa (69 km from the city of Bangui), M'baïki (107 km from the city of Bangui) and Boda (192 km from the city of Bangui). In each sub-prefecture, three (3) villages were selected as sites for ethnobotanical investigations. The survey was based on the interview of 12 people per village, chosen at random, i.e. a total of 108 people surveyed.

2.2.2 SURVEY CARRIED OUT AMONG SELLERS

The survey among vendors took place in three (3) local markets, namely the markets of Pissa, Boda and M'baïki. For this survey, 12 saleswomen per market were interviewed, making a total of 36 people interviewed. The criterion of the LFI sellers essentially resided in the richness of their following display of at least three (3) different types of LFI per display. Some samples of the LFIs sold were purchased in order to motivate respondents to cooperate and actively participate in the interview granted.

2.3 ANALYTICAL METHODS

2.3.1 SPECIES INVENTORIED

A list of LFI species in the Lobaye prefecture has been drawn up. The data collected in the field have been supplemented and enriched by the work of authors such as Letouzey [8], Chenu et al [9].

2.3.2 LEVEL OF KNOWLEDGE

In order to better present the results obtained, we deemed it necessary to use the criteria of knowledge and effective consumption according to Ambé [10]. The level of relative village knowledge (Cr. %) for each species was estimated by the ratio between the number of people knowing the species (n) and the total number of people questioned (N). It is translated by the following formula: Cr = (n/N) x 100

The method of Dajoz [11] made it possible to divide the species into three groups: the first group, from 50 to 100%, includes the best known species; the second group, from 25 to 50%, contains moderately known species, and the third group, from 0 to 25%, includes little known species.

2.4 STATISTICAL ANALYZES

The survey sheets were analyzed manually and the data was processed and analyzed using Excel software.

3 RESULTS

3.1 SPECIES INVENTORIED

The ethnobotanical survey made it possible to identify 63 LFI species, distributed in 46 genera and 31 families. Among these species, 61 have been fully determined at the specific level, 02 at the generic level. The sub-prefecture of Pissa totals 56 species, that of Boda 54 and 48 for that of M'Baïki. The most represented families are Tiliaceae (6 species) and Moraceae (5 species). The list of botanical species and families is presented in Appendix II, along with ethnobotanical data and ecological characteristics.

3.2 LEVEL OF KNOWLEDGE OF LFIS

The species recorded in the field are distributed in Table 1 below.

Table 1. Distribution of species by frequency of recognition in the different localities

Scientific names	PISSA	M'BAÏKI	BODA	Absolute frequency	(%)	
Gnetum africanum Welw.	48	48	48	144	100,00	Well known species
Gnetum bucholzianum Welw.	48	48	40	136	94,44	
Dorstenia scaphigera Bureau;	40	43	36	119	82,64	
Hilleria latifolia (Lam.) Walter	40	41	35	116	80,56	
Talinum triangulare L.	40	40	35	115	79,86	
Portulaca oleracea L.	38	34	24	96	66,67	
Combretum mucronatum Schum.& Thom.	24	30	35	89	61,81	
Dorstenia brieyi De Wild.	28	34	25	87	60,42	
Corchorus olitorius L.	24	37	22	83	57,64	
Amaranthus dubius Mart. Es Thell	24	36	21	81	56,25	
Amaranthus spinosum L.	24	36	21	81	56,25	
Corchorus tridens L.	23	24	34	81	56,25	
Fagara heitzii De Wild Cyuin.	28	30	15	73	50,69	
Fagara macrophylla (Aubr & Pellegr.) Waterman	27	32	13	72	50,00	
Corchorus aestuans L.	22	19	30	71	49,31	Moderately known species
Hibiscus acetosella Welw. Ex hiern	25	27	19	71	49,31	
Solanum nigrum L.	23	13	31	67	46,53	
Bombax buonozensis P. Beauv	14	30	22	66	45,83	
Solanum indicum L.	22	12	31	65	45,14	
Capsicum frutrescens (L.)	28	18	17	63	43,75	
Borreria verticillata (Linn.) G.F.W. Mey	18	18	25	61	42,36	
Costus afer Ker gawl.	27	18	14	59	40,97	
Ocinum basilicum L.	23	20	11	54	37,50	
Ocinum gratissimum L.	24	19	11	54	37,50	
Lippia adoensis Hochst. ex Walp.	19	18	10	47	32,64	
Piper guineense Schum. & Thonn.	19	24	4	47	32,64	
Pteridium aquilium (L) Kuhn (Bracken)	17	22	5	44	30,56	
Piper umbellatum L.	11	27	5	43	29,86	
Myrianthus arboreus P. Beauv.	19	21	2	42	29,17	
Trilepisum madagascariensis DC	10	18	14	42	29,17	
Portulaca quadrifida L.	22	19	0	41	28,47	
Xylopia aethiopica (Dunal) A. Riches	5	24	12	41	28,47	
Aframomum melegueta (Rosc.K. Schum)	23	9	7	39	27,08	
Megaphrynium macrostachyum (Benth.) Milne - Redh	12	14	13	39	27,08	
Abrus precatorius L.	14	14	6	34	23,61	Moderately known species
Cissus ibuensis (Hook.f.)	14	13	0	27	18,75	
Lycopodium phlemaria L.	3	0	22	25	17,36	
Ficus sycomorus L.	13	9	0	22	15,28	
Cissus debilis (Baker)	14	8	0	22	15,28	
Momordica charantia L.	1	0	17	18	12,50	
Chenopodium sp.	0	0	17	17	11,81	
Macaranga sp.	2	14	0	16	11,11	
Cassia tora L.	4	2	10	16	11,11	
Colocassia esculenta L.	2	0	14	16	11,11	
Marsilea crenata L.	4	0	12	16	11,11	
Tetrapleura tetraptera (Schum. & Thonn.) Taub.	10	4	1	15	10,42	

Hibiscus asper Hood	2	0	13	15	10,42	
Solanum torvum SW.	2	0	12	14	9,72	
Chlorophora excelsa (Welw.) Beauv.	0	12	1	13	9,03	
Ceiba pentandra (L) Gaerth	2	0	10	12	8,33	
Telfairia occidentalis Hook.f.	1	0	10	11	7,64	
Cucumerospsis mannii Naud.	0	0	11	11	7,64	
Paullinia pinnata L.	7	4	0	11	7,64	
Tretracera alnifolia Willd.	1	0	8	9	6,25	
Cassia occidentalis L.	5	3	0	8	5,56	
Celosia laxa Schum & Thonn.	2	0	6	8	5,56	
Psychotria brevipaniculata De Wild.	1	7	0	8	5,56	
Triumphetta pubescens R. Wilczek	0	0	7	7	4,86	
Triumphetta cordifolia A. Riche.	0	0	6	6	4,17	
Triumphetta rhomboides Jack.	0	0	6	6	4,17	
Vitex grandifolia Gûrke	2	0	4	6	4,17	
Triplochiton scleroxylon K. Schum	0	2	1	3	2,08	
Momordica foetida Schumach	2	0	0	2	1,39	

It appears from Table 1 above that the species best known by 50 to 100% of the respondents are 14 in number, i.e. 22.22%. Then, the species whose level of knowledge is between 25 to 50% are 20 in number, or 31.74% of the whole. Finally, the species that were indicated by 25% of respondents are 29 (46.04%). The proportions of these three levels of knowledge are shown in Figure 3 below.

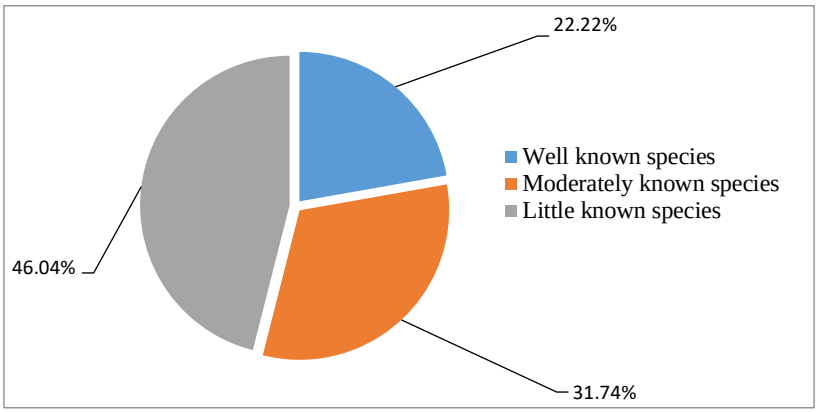

Fig. 3. The proportions of these three levels of knowledge

This figure shows that the best known species represent 22.22%, the moderately known species 31.74% and the little known species 46.04%,

3.2.1 Most Known Species

The best known species are 14 in number, or 22.22% of the total specimens. Their level of knowledge varies between 50% and 100% (Table 1). They are: *Gnetum africanum, Gnetum bucholzianum, Dorstenia scaphigera, Hilleria latifolia, Talinum triangulare, Portulaca oleracea, Combretum mucronatum, Dorstenia brieyi, Corchorus olitorius, Amaranthus dubius, Amaranthus spinosum, Corchorus tridens, Fagara heitzii, Fagara macrophylla*. The 144 people interviewed admit having consumed these species at least once. Among these best-known species, the leaves of *Gnetum* spp. are the most sought after.

Their food appreciation seems to be nutritional quality, taste and cultural value. These leaves are permanent on vines in the forest. Once harvested in its habitat, they can be stored more easily in the open air in the sun. This is why they are available almost all year round in the markets surveyed. The leaves of Talinum triangulare, *Portulaca oleracea, Hilleria latifolia, Corchorus olitorius, Amaranthus dubius, Amaranthus spinosum* are seasonal. Once these fresh leaves are harvested from the wild, they

are used for home consumption. The sale of these products remains limited in local markets for conservation reasons. The following figure shows some of the more well-known LFIs sold in local markets.

Fig. 4. Leaves of Gnetum bucholzianum (a), Leaves of Gnetum africanum (b), Leaves of Talinum triangulare (c)

3.2.2 MODERATELY KNOWN SPECIES

The moderately known species are 20 in number, or 31.74% of the total number of species recorded. Their level of knowledge is between 25 and 50% (Table 1). However, some of them are sold in local markets. These include Hibiscus acetosella, Solanum nigrum, Lippia adoensis, Solanum indicum and Piper guineense. Their availability is seasonal in the markets surveyed. However, 15 species (*Corchorus aestuans, Bombax buonozensis,* Solanum *indicum, Capsicum frutrescens, Borreria verticillata, Costus afer, Ocinum basilicum, Ocinum gratissimum, Piper guineense, Pteridium aquilium, Piper umbellatum, Myrianthus arboreus, Trilepisum madagascariensis, Portulaca quadrifida, Xylopia aethiopica, Aframomum melegueta, Megaphrynium macrostachyum)* are locally and seasonally consumed. The consumption of leaves of *Solanum nigrum* and those of *Corchorus aestuans* is important in the sub-prefecture of Boda, as well as the leaves of *Bombax buonozensis* in the sub-prefecture of M'Baïki. The leaves of *Ocinum gratissimum,* the buds of *Megaphrynium macrostachyum,* the young leaves and buds of *Myrianthus arboreus* are presented in figure 4 below.

Fig. 5. Leaves of Ocimum gratissimum (a), Buds of Megaphrynium macrostachyum (b), Young leaves and buds of Myrianthus arboreus (c).

3.2.3 LITTLE KNOWN SPECIES

Little-known species are 29 of the 63 taxa, or 46.04%. Their level of knowledge is between 0 and 25% (Table 1). Almost all of these species have a limited range and are the subject of domestic consumption. In this group, *Triumphetta cordifolia* is the only species that is sold despite being mentioned less often. These leaves are used in the preparation of sauces to which they give them a sticky consistency. They also change the texture of sauces by giving them a mild taste.

3.3 ORGANS CONSUMED

In general, the leaves are the most consumed. They represent 95.24% of the species encountered. The buds are only 4.76%.

3.4 MODE OF PREPARATION OF LFIS

According to the method of preparation, 62 species are to be cooked before their consumption, i.e. 98.41%, while one species (1.59%) is eaten raw (*Abrus precatorius* L.).

3.5 Categories Of Use

Regarding the categories of use, 66.67% of LFIs are consumed as sources of nutritional supplements while 33.33% are functional foods.

3.6 Morphological Type

The listed species are represented by 38.09% of grasses, shrubs account for 28.57%, trees total 19.04% and lianas represent only 14.30%.

3.7 Habitat

The different ecological environments hosting the inventoried species are presented in Appendix II. In the forest, 26 species have been listed, i.e. 41.15% of the taxa. Ubiquitous species are represented by 11.11% as well as species harvested from fallow land (11.11%). The species found both in forests and fallows are represented by 14.85%. In the fallows and in the fields, 12.30% of the species were counted. Four (4) species were recorded from forests and fields, three (3) species found in wetlands and finally one species (1) on the edges of forests. Four (4) best known species (*Hilleria latifolia, Talinum triangulare, Amaranthus dubius, Amaranthus spinosum*), one (1) moderately known (*Myrianthus arboreus*) and two (2) little known (*Triplochiton scleroxylon, Ceiba pentandra*) are found in all ecological environments. They are therefore ubiquitous.

3.8 Distribution Of Species According To Ethnic Groups

Figure 5 below presents the distribution of species according to ethnicity.

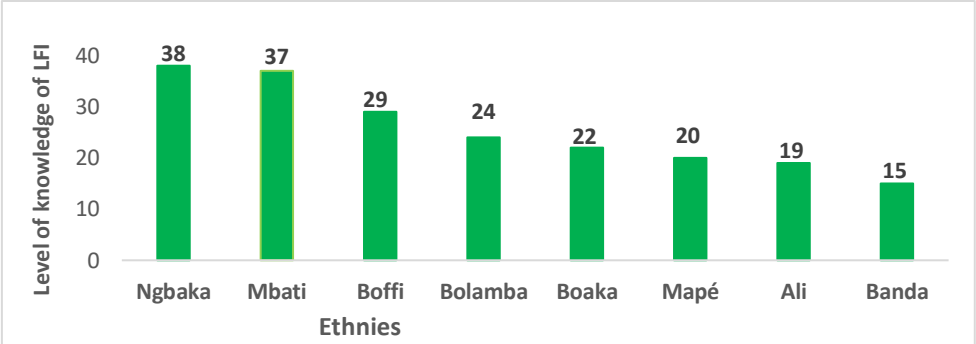

Fig. 6. Level of knowledge of LFI according to ethnicity

It appears from this figure 5 that the Ngbaka ethnic group, which gave the large number of LFI species (38), followed by the Mbati ethnic group (37). On the other hand, 15 species were cited by the Banda ethnic group. However, the Ngbaka ethnic group was the most representative with 60 respondents and the Banda ethnic group was represented by 3 respondents. The representativeness of the ethnic group could influence the number of LFIs known to each of them.

3.9 Harvest And Periods

Harvesting of LFIs is done in forests, fallows and fields. Periods vary depending on phenology and species availability. However, rural populations can obtain LFI from rural markets. The method for preserving LFIs is sun drying. The transformation of the leaves into powder remains the best practice for better conservation but also for a good concentration of nutrients. Overall, the transformation of dry LFIs is a strategy for livelihoods, marketing and strengthening food security during lean or shortage periods and even in the most difficult periods.

4 Discussion

Various ethnobotanical studies in tropical Africa have shown the importance of wild food plants (fruits, leaves, roots) in the diet of rural populations. As part of this work, 63 species have been listed, distributed in 46 genera and 31 botanical families.

This result testifies to a great potential for diversity in terms of LFI in the Central African Republic, particularly in the prefecture of Lobaye.

From a floristic point of view, the locality that produces more species of LFI to the villagers is the sub-prefecture of Pissa (56 species), followed by Boda (54 species) and finally M'baïki (46 species). The low number observed in this last sub-prefecture is explained on the one hand by the non-consumption of certain species mentioned, and on the other by the degradation of the forests can also be one of the causes. Regarding the level of knowledge, the 63 species identified have been divided into three different groups: the first group of 50 to 100%, includes the best known species which are 14 in number, or 22.22%; the second group, from 25 to 50%, contains 20 moderately known species (31.74%), and the third group, from 0 to 25%, includes 29 little known species (49.06%). Most of these species come from the forest (41.15%). This is eloquent proof that rural populations are highly dependent on the forest for their survival. These results corroborate with the thesis according to which the life of the local population depends intimately on the forest because it harvests NWFPs and PFLs [12]. In addition, the results show that 14 species (*Gnetum* spp., *Talinum triangulare, Portulaca oleracea, Hilleria latifolia, Corchorus olitorius, Amaranthus dubius, Amaranthus spinosum, Hibiscus acetosella, Solanum nigrum, Lippia adoensis, Solanum indicum, Piper guineense, Triumphetta cordifolia*) are heavily marketed.

The activity of selling LFIs provides necessary income to rural women and allows them to meet various social obligations. More specifically, *Gnetum* spp. (koko and kani) have higher commercial values than other LFIs sold [13]. Gnetum is also, according to the conclusions of an international meeting on NWFPs held in Limbé in Cameroon [14], the first of the NWFPs with a high value both for domestic consumption and for marketing. The sales activity of these sheets contributes to the promotion of cross-border trade in Central Africa. These products are also sold in France and Belgium [15].

The picking of LFIs is done in the wild, occasionally depending on the period. Other previous studies revealed the same conclusion and agree on the period of abundant availability of leafy vegetables in the rainy season which are dried and reduced to powder and preserved to cover the dry season or lean periods [16], [17], [18], Additionally, herbs offer more LFIs (38.09%) to rural communities than other biological forms, thus easily picked by women and children. However, it should be emphasized that overexploitation endangers the survival of wild leafy plants that are eaten. It is therefore essential to avoid excessive harvesting to ensure regular collection throughout the year and to protect the species. According to Van Zonneveld et al [19], the diversity of traditional plants is threatened particularly in Africa, and measures must be taken to conserve and use these species wisely. In addition, 23 species or 33.33% are not only food, but they are also used as medicine (foodstuffs: 33.33%). These leaves therefore turn out to be vegetative organs which would contain the appropriate active principles. Phytotherapists are also interested in these resources for the medical treatment of certain diseases. Among these therapeutic LFIs, the leaves of *Ocimum gratissimum* and *O. basilicum* have already been scientifically validated as vegetative organs with appropriate active ingredients by some authors [20], [21]. Regarding the mode of consumption, the results revealed that 62 LFI species (98.41%) are consumed cooked. However, only one species, or 1.59%, is occasionally eaten raw (Arbrus precatorius). When chewed, the raw leaves of this species give a characteristic sweet taste. However, the Nbgaka ethnic group followed by the Mbati ethnic group are identified as consumers of most of these LFIs. This result is not so surprising because the Ngbaka ethnic group is the largest in Lobaye in terms of demographics. Also, the choice of purchase, the way of preparing the LFIs vary according to the villages, the ethnic groups and also according to the beliefs. During ceremonies in the villages, the LFI dish plays a special role.

During field investigations, it was found that farmers keep 8 species in their fields and fallows with multiple uses and functions. These are *Myrianthus arboreus, Ceiba pentandra, Abrus precatorius, Triplochiton scleroxylon, Tetrapleura tetraptera, Hilleria latifolia, Fagara macropylla* and *Fagara hetzii*. Thus, these species can therefore be easily proposed for domestication.

5 CONCLUSION

This study made it possible to show that the Central African flora abounds in a significant wealth of LFI species. Consumers use them mainly for the preparation of sauces and for therapeutic needs. Women are the most users. The habitat of these species is in particular the forest, the fields, and the fallows. The biological forms that produce more leaves consumed are herbs (38.09%). The best known species (50% to 100%) are 14 in number, or 22, 22%. Cooking is the most used method of preparation (98.41%). Also, each LFI is prepared according to a traditional process that is specific to it. The consumption of these LFIs reflects the historical and cultural diversity of the populations surveyed. The Ngbaka ethnic group and the Mbati ethnic group were identified as consumers of most of these LFIs. In addition, the results obtained show that 14 species are subject to significant commercialization. The purchase prices of these products are low and offer greater ease of access to rural households to obtain supplies. The activity of selling LFI contributes to the reduction of poverty in rural areas.

LFIs are perishable products where the problem of conservation has been acute for a very long time in the Central African Republic. It is important to implement strategies that would contribute to food security, nutrition, health and economic development. For this, it will be necessary to:

- make an accurate inventory of wild species by region;
- harvesting and analyzing the organs consumed;
- popularize the consumption of LFI as a local food;
- study the commercial importance of LFIs at the national level;
- promote agronomic research and investment in these resources;
- create botanical gardens for wild species with eaten leaves

The realization of all the above requires the constitution of a multidisciplinary group of geneticists, biochemists, economists, physiologists and botanists.

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ANNEX I. ILLUSTRATIONS OF A FEW SAMPLES OF THE LFIS SURVEYED

Leaves of *Gnetum bucholzianum*

Leaves of *Gnetum africanum*

Leaves of Talinum bucholzianum

Leaves of *Ocimum gratissimum*

Leaves of *Corchorus olitorius*

Leaves of *Colocassia esculenta*

Bundle of *Dostenia scaphigera* leaves

Bundle of *Gnetum africanum* leaves

Bundle of *Gnetum bucholzianum* leaves

Hin strips of *Dostenia scaphigera* leaves

Hin strips of *Gnetum africanum* leaves

Hin strips of *Gnetum africanum* leaves (b)

ANNEX II. ETHNOBOTANICAL AND ECOLOGICALL DATA OF THE LISTED AREAS

N°	Scientific name	Vernacular names	Family	Organs Consumed	Categories of use	Form biological	Habitats	Method of preparation
1	*Abrus precatorius* L.	mbounga	Leguminosae	Leaves	Food	Liana	Forest, fallow	Believed
2	*Aframomum melegueta* (Rosc.K. Schum)	tondo	Zingiberaceae	Buds	Food	Grass	Forest	Cooking
3	*Amaranthus dubius* Mart. Es Thell	ngboudé	Amaranthaceae	Leaves	Food	Grass	Forest, fallow land, field	Cooking
4	*Amaranthus spinosum* L.	mbounguélé	Amaranthaceae	Leaves	Food	Tree	Forest, fallow land, field	Cooking
5	*Bombax buonozensis* P. Beauv	bouma	Bombacaceae	Leaves	Food	Tree	Forest, fallow	Cooking
6	*Capsicum frutrescens* (L.)	mbolé dongo	Solanaceae	Leaves	Food	shrub	Jachère, champ	Cooking
7	*Cassia occidentalis* L.	kabodo	Leguminosae	Leaves	Food	shrub	Forest, field	Cooking
8	*Cassia tora* L.	kotomaféré	Leguminosae	Leaves	Food	shrub	Forest, fallow	Cooking
9	*Ceiba pentandra* (L) Gaerth	guila	Bombacaceae	Leaves	Food	Tree	Forest, fallow land, field	Cooking
10	*Celosia laxa* Schum & Thonn.	mokongangou	Amaranthaceae	Leaves	Food	shrub	Forest, fallow	Cooking
11	*Chenopodium* sp.	gouin	Chenopodiaceae	Leaves	Food	shrub	Forest edge	Cooking
12	*Chlorophora excelsa* (Welw.) Beauv.	mokoko	Moraceae	Leaves	Food	Tree	Forest	Cooking
13	*Cissus debilis* (Baker)	kangaï	Vitaceae	Leaves	Food	shrub	Forest	Cooking
14	*Cissus ibuensis* (Hook.f.)	malo	Vitaceae	Leaves	Food	Liana	Forest	Cooking
15	*Capsicum frutrescens* (L.)	mbolé dongo	Solanaceae	Leaves	Food	shrub	Fallow, field	Cooking
16	*Colocassia esculenta* L.	langa	Araceae	Leaves	Food	shrub	Wet area	Cooking
17	*Combretum mucronatum*Schum .& Thom.	kinkéliba	Combretaceae	Leaves	Food	Liana	Fallow, field	Cooking
18	*Corchorus aestuans* L.	goussa	Tiliaceae	Leaves	Food	shrub	Fallow	Cooking
19	*Corchorus olitorius* L.	déni	Tiliaceae	Leaves	Food	shrub	Fallow	Cooking
20	*Corchorus tridens* L.	déni ngôn	Tiliaceae	Leaves	Food	shrub	Fallow	Cooking
21	*Costus afer* Ker gawl.	ndanga–ndogo	Costaceae	Leaves	Food	shrub	Forest	Cooking
22	*Cucumerospsis mannii* Naud.	sindo	Cucurbitaceae	Leaves	Food	shrub	Forest, fallow	Cooking
23	*Dorstenia brieyi* De Wild.	nguézédé	Moraceae	Leaves	Food	Arbuste	Forest	Cooking
24	*Dorstenia scaphigera* Bureau	gbin	Moraceae	Leaves	Food	Grass	Forest	Cooking
25	*Fagara heitzii* De Wild Cyuin.	mbolongo	Rutaceae	Leaves	Food	Grass	Forest	Cooking
26	*Fagara macrophylla* (Aubr & Pellegr.) Waterman	badombé	Rutaceae	Leaves	Food	Grass	Forest	Cooking
27	*Ficussycomorus* L.	akaya	Moraceae	Leaves	Food	Grass	Forest	Cooking
28	*Gnetum africanum* Welw.	gba koko	Gnetaceae	Leaves	Food	Liana	Forest	Cooking
29	*Gnetum bucholzianum*Welw.	kani	Gnetaceae	Leaves	Food	Liana	Forest	Cooking

30	*Hibiscus acetosella* Welw. Ex hiem	zima	Malvaceae	Leaves	Food	Shrub	Forest	Cooking
31	*Hibiscus asper* Hood	koumba	Malvaceae	Leaves	Food	Shrub	Fallow	Cooking
32	*Hilleria latifolia* (Lam.) Walter	soumba	Phytolacaceae	Leaves	Food	Shrub	Forest, fallow, field	Cooking
33	*Lippia adoensis* Hochst. ex Walp.	kpakoro	Verbenaceae	Leaves	Food	Grass	Forest	Cooking
34	*Lycopodium phlemaria* L.	ngbélé	Lycopodiaceae	Leaves	Food	Grass	Forest	Cooking
35	*Macaranga* sp.	bassala	Euphorbiaceae	Leaves	Food	Shrub	Forest	Cooking
36	*Marsilea crenata* L.	kpâ ngo	Marsileaceae	Leaves	Food	Grass	Wet area	Cooking
37	*Megaphrynium macrostachyum* (Benth.) Milne - Redh	kpâ ngongo	Marantaceae	Leaves	Food	Grass	Forest	Cooking
38	*Momordica foetida* Schumach	wansaï	Cucurbitaceae	Leaves	Food	Grass	Forest, fallow	Cooking
39	*Momordica charantia* L.	mbombo	Cucurbitaceae	Leaves	Food	Grass	Fallow	Cooking
40	*Myrianthus arboreus* P. Beauv.	modiki	Cecropiaceae	Buds	Food	Grass	Forest, fallow, field	Cooking
41	*Ocinum basilicum* L.	matété	Lamiaceae	Leaves	Food	Shrub	Forest, field	Cooking
42	*Ocinum gratissimum* L.	ngbanda	Lamiaceae	Leaves	Food	Shrub	Forest, field	Cooking
43	*Paullinia pinnata* L.	tékoro	Sapindaceae	Leaves	Food	Liana	Forest	Cooking
44	*Piper guineense* Schum. & Thonn.	nguéréto	Piperaceae	Leaves	Food	Liana	Forest	Cooking
45	*Piper umbellatum* L.	éni	Piperaceae	Leaves	Food	Shrub	Forest, fallow	Cooking
46	*Portulaca oleracea* L.	lala	Portulacaceae	Leaves	Food	Grass	Forest, field	Cooking
47	*Portulaca quadrifida* L.	nzoakoko	Portulacaceae	Leaves	Food	Tree	Forest, field	Cooking
48	*Psychotria brevipaniculata* De Wild.	molo	Rubiaceae	Leaves	Food	Shrub	Forest	Cooking
49	*Pteridium aquilium* (L) Kuhn (Bracken)	ndéé	Hypolepidaceae	Leaves	Food	Tree	Fallow, field	Cooking
50	*Solanum indicum* L.	nganghô	Solanaceæ	Leaves	Food	Shrub	Fallow	Cooking
51	*Solanum nigrum* L.	ndoki	Solanaceæ	Leaves	Food	Grass	Fallow	Cooking
52	*Solanum torvum* SW.	solé	Solanaceae	Leaves	Food	Shrub	Forest, field	Cooking
53	*Talinum triangulare* L.	moyégbé	Portulacaceae	Leaves	Food	Grass	Forest, fallow, field	Cooking
54	*Telfairia occidentalis* Hook.f.	gbassa	Cucurbitaceae	Leaves	Food	Liana	Foret, shurd	Cooking
55	*Tetrapleura tetraptera* (Schum. & Thonn.) Taub.	kanga yéyé	Legumonosae	Leaves	Food	Tree	Foret	Cooking
56	*Tretracera alnifolia* Willd.	gbéli	Dilleniaceae	Leaves	Food	Liana	Forest, fallow	Cooking
57	*Trilepisum madagascariensis* DC	pongui	Moraceae	Leaves	Food	Grass	Forest	Cooking
58	*Triplochiton scleroxylon* K. Schum	gbadon	Sterculiaceae	Leaves	Food	Grass	Forest, fallow land, field	Cooking
59	*Triumphetta cordifolia* A. Riche.	diolo	Tiliaceae	Leaves	Food	Shrub	Forest	Cooking
60	*Triumphetta pubescens* R. Wilczek	dongo	Tiliaceae	Leaves	Food	Shrub	Forest	Cooking
61	*Triumphetta rhomboides* Jack.	yandji	Tiliaceae	Leaves	Food	Shrub	Forest, field	Cooking
62	*Vitex grandifolia* Gûrke	mbringo	Verbenaceae	Leaves	Food	Grass	Forest	Cooking
63	*Xylopia aethiopica* (Dunal) A. Riches	nzagué	Annonaceae	Leaves	Food	Grass	Forest	Cooking