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Diversity and Ethnomycological Knowledge of Wild Mushrooms Consumed by Indigenous People Living Near the Botambi Classified Forest in the Central African Republic

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Abstract This study aims to safeguard endogenous knowledge on the use of wild mushrooms from the classified forest of Botambi in the Central African Republic and to highlight the dietary importance of these biological resources for Ngbaka, Boffi, Issongo and Aka pygmies Aka pygmies indigenous peoples. To do this, field missions, based on the use of individual interviews using a Semi-structured questionnaire were carried out with only 60 people from May to October 2023. A total of 46 species have been recorded, divided into 25 genera and 18 different families. Of these species, 43 have been well identified while 3 have not been formally identified mycologically. The most represented genera are *Cantharellus* and *Termitomyces* with 6 and 5 species respectively. Four species including *Auracularia cornea, Aulacularia delicata, Cantharellus rhodophyllus* and *Schizophyllum commune* are used in traditional medicine to treat adolescent spleen disease, stomach ache, tooth decay, kidney failure. The results also showed that 4 species are the subject of barter activities and 11 are offered for sale. The habitat of these species includes forest, palm grove and coffee plantation. Cooking is the most commonly used method of preparation (93.47%). This study reveals that there is a high diversity of edible wild mushrooms in the Central African Republic. Many efforts must be made to enhance and safeguard this food heritage.

Keywords: *Endogenous knowledge, edible wild mushrooms, rural environment, Central African Republic*

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1. Introduction

Forest communities depend upon forest resources and have developed strong biocultural relationships over time. These relationships involve the use, care, and foster of diverse species used for food, fuel, and spiritual purposes [1,2].

Mushrooms are seasonal macrofungi occupying various niches in the forest environment [3]. They are most common during the rainy season, especially in forests where the dense tree canopy shadow creates a wet environment favorable for the germination and growth of mushrooms [4]**.** Edible wild mushrooms are an essential component of food security in many African countries. They grow in the wild and are cultivated for food and medicines worldwide [5]. For many years, mushrooms have accompanied humans both as food and medicine. Data from the literature indicate that, with the onset of hunting, mushrooms began to play an important role in the human diet [6]. They play a vital role in the lives of human beings in terms of food and health. Most tropical countries have a great diversity of these fungal resources. Mushrooms have many health-promoting benefits and applications in traditional medicines [7,8].

In recent years, there has been considerable interest in edible mushrooms worldwide. To date, there is very little knowledge about their nature and importance. Thus, efforts must be made for a better scientific knowledge of these food resources in order to integrate them into the food culture and consumption habits of the Central African populations in general.

Various studies have already been carried out on edible mushrooms in Africa. In the Central African Republic in particular, some studies were carried out among the Boffi

and Gbaya indigenous peoples [10,11,12,13]. However, there is still a lack of information to be filled, particularly on methods of preparation, different types of use, methods of nutrition and the periodicity of mushrooms. Also, among the Ngbaka, Boffi, Issongo and Aka pygmies indigenous peoples, no such study has yet been conducted. In addition, of all the existing literature on the mycoflora of the country, the peculiarity of the fungal resources consumed in the Ombella M'Poko, located in the south-western part of the CAR, remains unavailable. This study is a response to these major concerns. In fact, it is a contribution to previous mycological studies carried out in tropical African regions.

The aim of this study was to conduct an ethnomycological survey of Ngbaka, Boffi, Issongo and Aka pygmies indigenous peoples living near the classified forest of Botambi in the Central African Republic in order to collect endogenous knowledge inherent in edible wild mushrooms.The objectives were to determine the local taxonomy, preparation methods, availability period, habitat and uses of these natural resources. To our kind knowledge, this is the first study of its kind carried out in the territory of the Ombella M'Poko.

2. Methodology

2.1. Site

The study environment is the forest sector of Botambi, a peri-urban area, located about 18 km from the southern exit of the Central African capital. It is located in the Sub-prefecture of Bimbo, Prefecture of Ombella M'Poko (Figure 1). The hottest month is March, the coldest is August. Precipitation is abundant and amounts to 1600 mm. The soils are ferralitic, red or ochre sometimes beige. The Botambi area belongs to the forestry sector of the south-west of the Central African Republic belonging to the Guinea-Congo region, to the Congo Basin domain. The classified forest of Botambi occupies an area of 27962 ha. It is in the case of the conservation of vegetation with a view to safeguarding genetic resources that this forest was erected as a "classified forest" by the Central African Government during the colonial era, on 19 June 1950. The presence of this vegetation therefore ensures the maintenance of the balance of biophysics and also stabilizes the ozone layer of the micro climate of Bangui. This sector is home to important activities in the informal sector (gathering, hunting, fishing, food crops, livestock, trade). This work will focus on the classified forest of Botambi which is an integral part of the Congo Basin, one of the very rare relics of the dense humid formations of the South-West of the Central African Republic whose knowledge on edible wild mushrooms is still unknown from a scientific point of view.

2.2. Technical Equipment

The technical material for mycological investigations consists of a survey sheet, a camera, a tracking device (GPS) and a tool made of cardboard.

2.3. Biological Material

It consists of edible mushrooms growing in the wild recognized by the indigenous our study site. In the context of this work, edible wild mushrooms are referred to as mushrooms that can be eaten and whose consumption is not risky to human health. During the investigations, the samples were collected and stored at the Laboratory of the Ecole Normale Supérieure in Bangui.

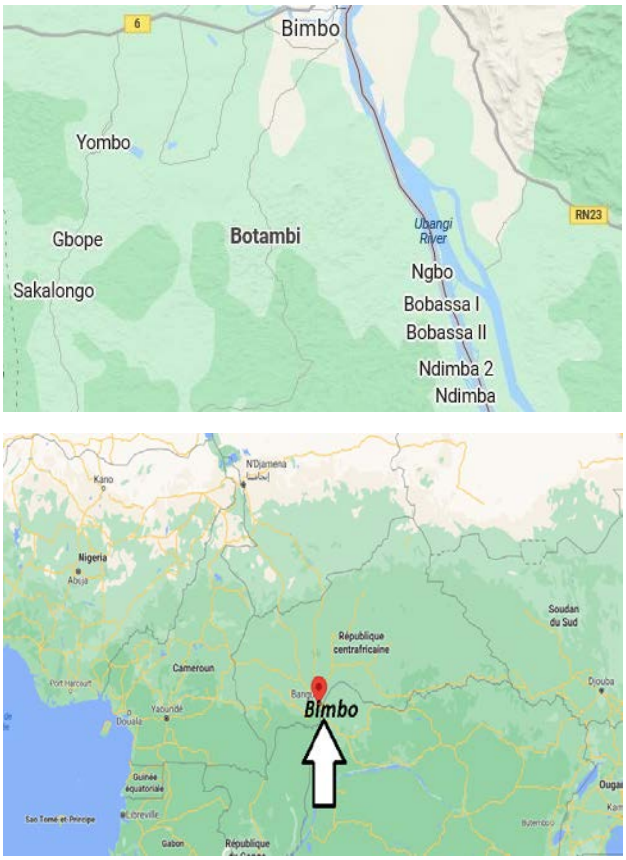

Figure 1. Study Area Rental Ma

2.4. Methods

To evaluate wild mushroom species, the descriptive method of Liezl et al [9] was used with modifications. On the sites, the species encountered during our research were noted and photographed. This approach was intended to provide a complete and detailed account of the fungus species present. The transect walking method allowed us a better understanding of the distribution of mushrooms and their abundance. This method was deemed appropriate for achievement of our study objectives by directly observing and Discover the species of wild mushrooms of study site.

Prior to mycological surveys, surveys were conducted in April 2023 in the study area for the selection of villages to be investigated and the identification of the Ngbaka, Boffi, Issongo and Aka pygmies ethnic group. Four villages were chosen according to their geographical positions, located near the classified forest of Botambi where many activities of harvesting and collecting edible wild mushrooms are practiced. These are Yombo, Yatimbo, Bombabia and Sebala. The actual investigation began in May 2023 and ended in October 2023. In each village, 15 individuals were interviewed, for a total of 60. For all surveys, the Semi-structured method was used to collect ethnomycological data, using the survey sheet,

based on the free consent of the respondents. In addition to the villages surveyed, the forest and plantations (coffee and palm trees) of the study environment were investigated. The field missions with the guides aimed to inventory wild edible mushrooms species in situ. Where possible, photographs were taken at harvest sites to support this identification (Appendix 1). The nomenclature aspects were checked in MycoBank (www.mycobank.org) and Index Fungorum (www.mycology.net).

2.5. Methods of Analysis

2.5.1. Inventoried Species

The incursions carried out in the forest and plantations with guides coupled with the surveys carried out at the level of the four villages made it possible to list edible mushrooms and to collect information on their vernacular names in Ngbaka, Boffi, Issongo and Aka pygmies, their uses, their methods of preparation. The periodicity, habitat and different types of substrate on which fungi grow were also recorded. We have thus drawn up a food mycoflora of the wild edible mushrooms of the study environment, taking into account all the species recorded in the field. All these data have been enriched by various books and articles whose names of authors and titles are referenced in the bibliography.

2.5.2. Statistical Treatment

After analysis of the survey sheets, the study parameters such as the category of uses, the methods of preparation, the periodicity, the habitat were treated. Excel – 2010, Statistica – 6.0 software was used to perform all calculations, statistical analyses accompanied by the presentation of graphs and tables and discussed.

3. Results

3.1. Inventoried Species

A total of 46 edible species were identified in the study environment. They were divided into 25 genera belonging to 18 different families. Of these species, 43 have been well identified while 3 have not been formally identified mycologically. This list of mycological flora gathers only the main species of edible mushrooms of nutritional interest frequently encountered in the Botambi sector. It is obviously only not exhaustive (Table 1). The most represented genera are *Cantharellus* and *Termitomyces* with 6 and 5 species respectively.

Table 1 below presents the correspondence between species and vernacular names (Ngbaka, Boffi, Issongo and Aka pygmies), together with details of mycological data recorded in the field and ecological characteristics.

Table 1. List of species collected and their periodicities

ESPECES	Family	Periodicity	Habitat	Substrat
Agaricus goosseensiae Heinem.	Agaricaceae	June – October	Coffee plantation	Earth
Amanita rubscens Pers. s.I.	Amanitaceae	June – September	Forest, coffee plantation	Earth
Armillaria heimii Pegler	Physalacriaceae	June – September	Forest, coffee plantation, palm grove	Dead wood
Armillaria mellea (Vahl ex Fr.) P.Kumm.	Physalacriaceae	September	Forest	Dead wood
Auricularia cornea Ehrenb	Auriculariaceae	August – September	Forest	Dead wood
Auricularia delicata (Fr.) Henn.	Auriculariaceae	May – july	Forest	Dead wood
Boletus sp.	Boletaceae	October	Forest	Dead wood
Cantharellus cibarius (Heinem.) Buyck	Cantharellaceae	May – June	Forest, palm grove	Earth
Cantharellerus congolensis Beeli	Cantharellaceae	August – September	Forest	Earth
Cantharellus floridulus Heinem.	Cantharellaceae	August – October	Forest	Earth
Cantharellus luteopunctatus (Beeli) Heinem.	Cantharellaceae	March – May	Forest	Earth
Cantharellus rhodophyllus Heinem.	Cantharellaceae	March – My	Forest	Earth
Cantharellerus rufopunctatus (Beeli) Heinem.	Cantharellaceae	June – September	Forest	Earth
Cookeina speciosa (Fr.) Dennis	Sacroscyphaceae	August- September	Forest	Dead wood
Craterellus aureus Berk.& M.A. Curtis	Cantharellaceae	March – May	Forest	Earth
Flammula carbonaria (Fr.) P.Kum	Agaricaceae	Augut – October	Forest	Dead wood
Gerronena hungo (Heinn.) Degreef & Eyi	Marasmiaceae	September	Forest	Dead wood
Goossensia cibarioides Heinem.	Cantharellaceae	August – October	Forest	Rotten trunk
Gymnopillus zenkeri (Henn.) Singer	Cortinariaceae	August – October	Forest, palm grove	Dead wood
Lactarius acutus Heim	Russulaceae	September	Forest	Dead wood
Lactarius inversus Gooss.–Font. & Heim	Russulaceae	October	Forest	Earth

Lactarius sesemotani (Beeli) Buyck	Russulaceae	June – october	Forest	Earth
Lentinus brunneofloccocus Pegler	Polyporaceae	Auust –September	Forest	Dead wood
Lentinus sajor – caju (Fr.) Fr.	Polyporaceae	August –September	Forest	Dead wood
Lentinus squarrosulus Mont.	Polyporaceae	September – October	Forest, coffee plantation	Dead wood
Macrolepiota daulichola (Berk. & Broome) Pegler & R.W. Rayner	Lepiotaceae	July –October	Forest	Earth
Macrolepiota procera (Scop.) Sing.	Lepiotaceae	Augut – September	Forest	Earth
Marasmius arborescens (Henn.) Beeli	Marasmiaceae	September	Forest, palm grove	Dead wood, plants debris
Marasmius bekolacongoli Beeli	Marasmiaceae	September – October	P alm grove	Plants debris, Earth
Marasmius buzungolo Singer	Marasmiaceae	June – September	Forest, palm grove	Plants debris, Earth
Maresmiellus inoderma (Berk.) Singer	Agaricaceae	June – October	Forest	Plants debris
Mycena sp.	Mycenaceae	September	Forest	Dead wood
Neonothopanus hygrophanus (Mont). De Kesel & Deggref, comb.nov.	Marasmiaceae	Augut – October	Forest	Dead wood
Pleurotus flabellatus (Berk. & Br.) Sacc.	Pleurotaceae	August –September	Forest	Dead wood
Pleurotus ostreatus (Jacq.) P.Kumm	Pleurotaceae	August – October	Forest	Dead wood
Pleurotus pubescens Peck	Pleurotaceae	Annual	Forest, coffee plantation, palm grove	Dead wood
Polyporus tenuiculus (P. Beauv.) Fr.	Polyporaceae	August – September	Forêt	Dead wood
Russula striatoviridis Buyck	Russullaceae	May - June	Forest, coffee plantation, palm grove	Earth
*Schizophyllum commune*Fr.	Schizophyllaceae	September – October	Forest	Dead wood
Termitomyces clypeatus Heim	Lyophyllaceae	September – October	Forest	Hypogeum termite mound
Termitomyces fuliginosus Heim	Lyophyllaceae	May - June	Forest	Epigean termite mound
Termitomyces globulus Heim & Gooss. – Front	Lyophyllaceae	September	Forest	Hypogeal termite mound
Termitomyces letestui (Huds.) Fr.	Lyophyllaceae	September – October	Forest	Hypogeal termite mound
Termitomyces mammiformis Heim	Lyophyllaceae	September – October	Palm grove	Hypogeal termite mound
Volvarriella bombacyna (Schaeff.) Singer	Pluteaceae	August – September	Forest	Dead wood
Volvarriella sp.	Pluteaceae	August – October	Forest	Dead wood

Table 2.Vernacular names of the species collected and methods of preparation

ESPECES	Vernacular names; Ngbaka, Boffi, Issongo and Pygmées Aka	Utilities	Methods of preparation	Meaning of vernacular names
Agaricus goosseensiae Heinem.	Touroulou	Food	Cooking	Mushroom that grows during the rainy season
Amanita rubscens Pers. s.I.	Glogoto	Food	Cooking	NM
Armillaria heimii Pegler	Ignéréké	Food	Cooking	NM
Armillaria mellea (Vahl ex Fr.) P.Kumm.	Toulou nzéwa	Food	Cooking	Mushroom having the same color of honey
Auricularia cornea Ehrenb	Moko dèdè	Nutraceutical	Cooking	Mushroom with the taste of beef meat
Auricularia delicata (Fr.) Henn.	Dédé, dèdè, indéré	Nutraceutical	Cooking	NM
Boletus sp.	Kpakpo	Food	Cooking	NM
Cantharellus cibarius (Heinem.) Buyck	Gbazin	Food	Cooking	NM
Cantharellerus congolensis Beeli	Mokpokpolo	Food	Cooking	NM
Cantharellus floridulus Heinem.	Nzapou	Food	Cooking	NM
Cantharellus luteopunctatus (Beeli) Heinem.	Tékpa mboka	Food	Cooking	Mushroom in the shape of a monkey's hand
Cantharellus rhodophyllus Heinem.	Toulou pè	Nutraceutical	Cooking	NM
Cantharellerus rufopunctatus (Beeli) Heinem.	Kpoukpou	Food	Cooking	NM

Cookeina speciosa (Fr.) Dennis	Tékéléké, tokoloko, mokolokoto	Food	Cooking	Funnel-shaped mushroom
Craterellus aureus Berk.& M.A. Curtis	Toulou pè	Food	Cooking	NM
Flammula carbonaria (Fr.) P.Kum	Mbèmbè	Food	Cooking	NM
Gerronena hungo (Heinn.) Degreef & Eyi	Toulou bô	Food	Cooking	Mushroom that grows in clumps at the base of *Musa paradisiacal*
Goossensia cibarioides Heinem.	Touloun go mbia	Food	Cooking	NM
Gymnopillus zenkeri (Henn.) Singer	Mbèmbè	Food	Cooking	Mushroom having the same color of forest snail
Lactarius acutus Heim	Ndokindo	Food	Cooking	NM
Lactarius inversus Gooss.– Font. & Heim	Boaya	Food	Cooking	NM
Lactarius sesemotani (Beeli) Buyck	Toulou gbangba	Food	Cooking	NM
Lentinus brunneofloccocus Pegler	Dôkpoukpou	Food	Cooking	NM
Lentinus sajor – caju (Fr.) Fr.	Mokpokporokpo	Food	Cooking	NM
Lentinus squarrosulus Mont.	Toulou gbadon, inguèrèkè, Mboua-té	Food	Cooking	Fungus that grows in clumps at the base of *Triplochiton scleroxylon*
Macrolepiota daulichola (Berk. & Broome) Pegler & R.W. Rayner	Boakouma	Food	Cooking, grilled	Fungus that grows very close to the ecological nests of wood snakes
Macrolepiota procera (Scop.) Sing.	Kpânoko, Gbin-keling, Ngomongona	Food	Cooking, grilled	NM
Marasmius arborescens (Henn.) Beeli	Crâ	Food	Cooking	NM
Marasmius bekolacongoli Beeli	Toulou baî	Food	Cooking	Mushroom that grows during the dry season
Marasmius buzungolo Singer	Mandonguè	Food	Cooking	NM
Maresmiellus inoderma (Berk.) Singer		Food	Cooking	NM
Mycena sp.	Nzakayaka	Food	Cooking	NM
Neonothopanus hygrophanus (Mont). De Kesel & Deggref, comb.nov.	Kakala, Kâkâla â	Food	Cooking	NM
Pleurotus flabellatus (Berk. & Br.) Sacc.	Toulou nzin	Food	Cooking	Fungus shaped like human ears
Pleurotus ostreatus (Jacq.) P.Kumm	Toulou ngombo	Food	Cooking	
Pleurotus pubescens Peck	Kolemandouè	Food	Cooking	
Polyporus tenuiculus (P. Beauv.) Fr.	Toulou kombo	Food	Cooking	Fungus that grows on dead wood of *Terminalia sperba*
Russula striatoviridis Buyck	Bouakouma	Food	Cooking	NM
*Schizophyllum commune*Fr.	Kâtrâ	Nutraceutical	Cooking, grilled	NM
Termitomyces clypeatus Heim	Sosso dèngbè, Ndokolobo, Mabokoloko	Food	Cooking	NM
Termitomyces fuliginosus Heim	Toulou kpâ	Food	Cooking	NM
Termitomyces globulus Heim & Gooss. – Front	Toulou dèngbè	Food	Cooking	Mushroom whose foot resembles antelope foot
Termitomyces letestui (Huds.) Fr.	Toulou sounou	Food	Cooking	
Termitomyces mammiformis Heim	Toulou tô, Boakolo	Food	Cooking	Fungus that grows on a hypogeum termite mound
Volvarriella bombacyna (Schaeff.) Singer	Toulou käou, Boikoyii	Food	Cooking	Mushroom having the same color of aquatic snail
Volvarriella sp.	Toulou Kâou	Food	Cooking	NM

NM: No meaning of vernacular names

3.2. Utilities

It appears from this Figure 2 that 42 species or 91.30 % of the mushrooms listed are consumed as food while 4 species, or 8.70% are nutraceuticals (both food and medicinal). These results reveal that indigenous Ngbaka, Boffi, Issongo and Aka pygmies peoples mainly use wild mushrooms for domestic consumption. Only four (4) species are used in traditional medicine. These include *Auricularia cornea*, *Auricularia delicata*, *Cantharellus rhodophyllus* and *Schizophyllum commune*. These include *Auricularia cornea*, *Auricularia delicata*, *Cantharellus rhodophyllus* and *Schizophyllum commune*. The infusion solution of the first two species (*Auricularia cornea* and *Auricularia delicata*) in boiling water treats spleen disease in adolescents. Of the 46 wild edible mushrooms species

identified, 4 are traded in the form of barter. They are: *Armilaria mellea*, *Marasmius buzungolo*, *Termitomyces letestui* and *Termitomyces mammiformi*. This barter is based solely on direct exchanges of these mushrooms with cooking salt, cigarettes, skill, sugars, coffee between the indigenous Ngbaka, Boffi, Issongo and Aka pygmies. Alongside these specimens, 11 mushrooms with very nutritious quality of commercial interest are sold on the Bimbo market. These are *Auricularia cornea*, *Auricularia delicata*, *Cookeina speciosa*, *Macrolepiota daulichola*, *Macrolepiota procera*, *Mycena* sp., *Termitomyces clypeatus*, *Termitomyces globulus*, *Volvariella bombacyna*, *Pleurotus pubescens*, *Boletus* sp. Figure 3 above shows photos of some mushrooms offered for sale in the Botambi market.

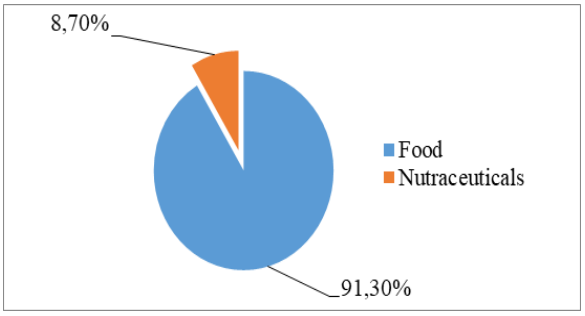

Figure 2. Proportions for these listed mushrooms

(a)

(b)

(c)

(d)

(e)

Figure 3. Auricularia cornea (a), Armillaria mellea (b) , Lentinus squarrosulus (c), Volvariella sp. (d), Termytomyces clypeatus (e), Auricularia delicata (f)

In the rainy season, we can hope to easily find these four mushrooms on the Bimbo market sold at 500 FCFA per package.

3.3. Methods of Preparation

From Figure 4, we note that cooking is the most used method of preparation (93.47%). However, 6.53% of mushrooms are cooked or grilled before being consumed.

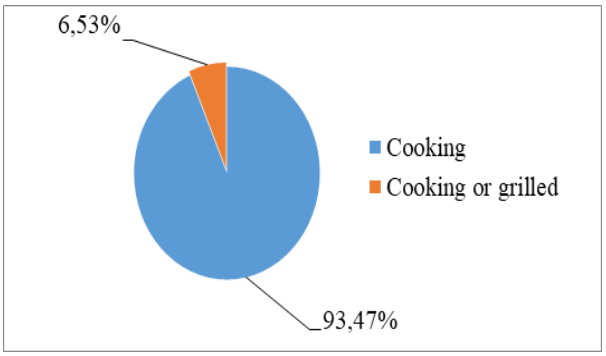

Figure 4. Proportions of the methods of the mushrooms listed

3.4. Periodicity

Although the species, *Pleurotus pubescens* is actually encountered throughout the year, other species of fungi have privileged periods of emergence.

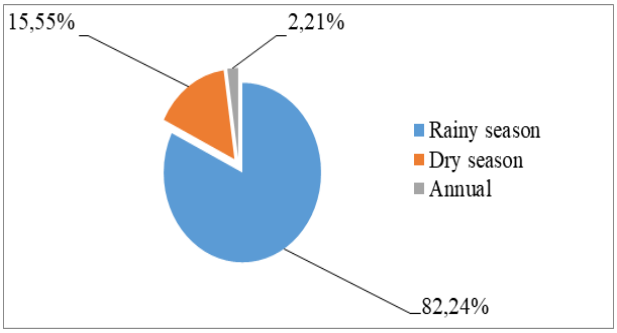

Figure 5. Information on the period of availability of the listed mushrooms

Figure 5 shows that 82.24% of mushrooms are available in the rainy season. On the other hand, 15.55% are in the dry season. However, only one species or 2.21% is annual. These include *Pleurotus pubescens.*

3.4. Habitat

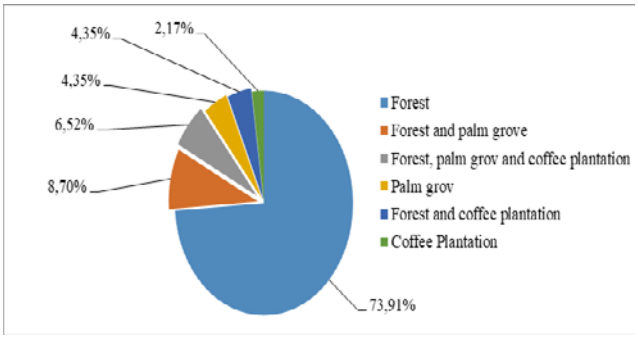

Figure 6. The proportions of species belonging to different habitats

In light of these results (Figure 6), we notice that the mushrooms listed are more found in the forest (73.91%). However, 8.70% are observed in the forest and palm grove, 6.52% are ubiquitous, 4.35% are found in the palm grove (plantation of *Elaeis guineensis*), as well as in the forest and coffee plantation (4.35%); and finally, a very small percentage of mushrooms (2.17%) is observed in the coffee plantation (plantation of *Coffea arabica*).

3.6. Mode of Nutrition

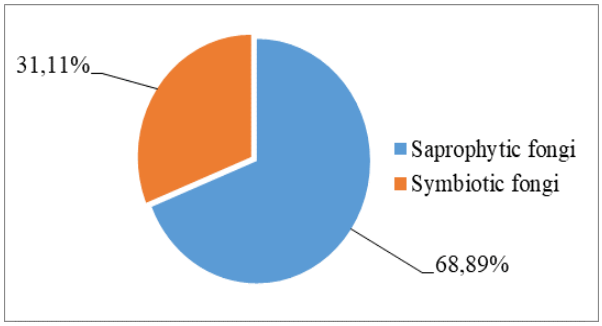

Figure 7. The proportions of the feeding patterns of the listed mushrooms

With regard to Figure 7, it emerges that 68.89% of the fungi listed are saprophytic, living on decomposing matter of more or less advanced to develop while 31.11% are symbiotic, growing in close association with certain trees to form a mixed symbiotic organ, mycorrhizae or termite mounds.

3.7. Meaning of the Local Nomenclature

Vernacular names are assigned to fungi based on synthetic resemblance to a plant or animal [19]. Table 1 and Table 2 provides details on the meaning of the vernacular names of some of the Wild edible mushrooms listed.

4. Discussion

The diversity of fungi and their cycle mean that throughout the year there are one or more wild edible mushrooms Wild edible mushrooms available in the mycoflora of the study area.

The present work shows Periodicity the high diversity of the genus *Cantharellus*, with 6 species of fungi consumed. This result corroborates the findings of [14] who stated that the genus *Cantharellus* is best represented in terms of specific diversity in the Republic of Congo. Inventories conducted in the study area revealed a high abundance and diversity of Wild edible mushrooms. These species grow wild in the forest and plantations of *Elaeis guineensis* and *Coffea arabica*. Saprophytic fungi are the best represented (68.89%). Then come symbiotic fungi (31.11%). All these species are therefore indispensable and vital for the classified forest of Botambi and the plantations of palm trees (*Elaeis guineensis*) and coffee trees (*Coffea arabica*). A total of 46 species have been recorded. This number is much higher than those obtained in other territories of this country: 29 species [11], 27 species [12], 24 species [10, 15, 16] and a little further from CAR, particularly in Benin, 25 species [16]. This total number of species, although high, is below 74

species listed in the Democratic Republic of Congo by Yorou et al [17]. The 60 species in Benin [17] and also the 60 species listed in the Gbaya Bodoé of Central Africa. In light of these results, it can be deduced that the number of species of mushrooms consumed varies according to local ethnic groups and study sites. However, this variation in consumption is reduced because of the cohabitation between ethnic groups.

As far as local taxonomy is concerned, all vernacular names Ngbaka correspond respectively to the 45 species listed. In some cases, there is frequently the radical "toulou" which means mushroom. This Ngbaka nomenclature is different from that of Boffi (boua which means mushroom) [18] as well as the name Gbaya (Kpouwa which also means mushroom) [19,20]. These results reveal that the vernacular names reported in various Central African territories on mushrooms vary according to ethnic groups. In addition, the significance of the local names of some edible mushrooms recorded during our investigation is identical to that already reported by other researchers [12,19,21] effectively corresponding to the same taxa. This is the case of various *Termitomyces* whose meaning in three different dialects (Boffi, Lissongos, Ngbaka) is identical. It is the same for *Macrolepiota procera* and *Termitomyces clypeatus* where the local names in these three dialects have the same meaning. This fact underlines the quality of the observations made by the various indigenous peoples of CAR. As for the collection of wild edible mushroomwild edible mushrooms, As for the collection of wild edible mushroomwild edible mushrooms, it is done by manual collection on the ground in the forest, palm groves and coffee plantation. Rural women are strongly involved. Rural women are strongly involved. Some species are found in the rainy season (82.24%) while others in the dry season (15.55%). Only one species (*Pleurotus pubescens*) or 2.21% is present throughout the year. These results show that mushrooms follow one another over the seasons following climate variations. Also, from one year to the next, harvests are highly variable, although some species seem less sensitive to interannual variations. The results of the preparation methods also showed that wild edible mushroomwild edible mushrooms are generally prepared cooked or grilled. The culinary practice of these resources calls on ancestral knowledge and traditional know-how that are transmitted from generation to generation. Women are the real owners. Of the 46 species listed, some have already been reported in inventories carried out in various African territories. Overall, however, *Armillaria mellea*, *Macrolepiota procera* and *Schizophyllum commune* are widely distributed worldwide. Hence the need to enhance and conserve these fungal resources.

In view of all these results, this study showed a good diversity of species in the study environment with 46Wild edible mushrooms wild edible mushrooms. The most beneficial potential of these biological resources is their nutritional and therapeutic properties. In addition to these uses, 11 mushrooms are marketed and 4 are the subject of barter activities. Also, they have great socio-cultural value in the study area. As such, they contribute both to food security and to the general well-being of the peoples surveyed. In this study, most of the respondents are women (87.5%). This is because in the Central African Republic, women play a leading role in the collection of Wild edible mushrooms in rural areas. In addition, they are skilled at making recipes in their homes, so they are directly responsible for the nutritional quality of the diet and the health of their family members. This is confirmed in various studies on dietary non-timber forest products for foodin Africa [22,23,24,25,26].

Starting from this good diversity of the resource, it is possible to argue that the indigenous Ngbaka peoples have a good knowledge of their forest environment and the fungal resources that interest them. They know perfectly well the different uses of the wild mushrooms they consume. They master well the precise months for the collection of these natural resources. It was noted that knowledge endogenous to Wild edible mushrooms is generally acquired as a result of transmission from one generation to the next. It should also be noted that the oral transmission of food culture is lost over time by adopting an increasingly westernized life, especially in urban areas. Strategies are needed to reverse the trend. Nowadays, the forests of CAR in general and that of Botambi in particular are under rapid and massive anthropogenic pressure. This affects the biological resources they support. Thus, efforts must be made to better understand wild edible mushrooms, their usefulness and their conservation. Similarly, such efforts concentrated on the basis of a certain political will could make it possible to safeguard the natural habitat and the biological resources that shelter there. Also, it would be necessary to carry out an experimental study of wild edible mushrooms in the laboratory in order to evaluate their nutritional and therapeutic potential. Such a study could lead to domestication trials and improved nutraceuticals for population health promotion. In addition, it could thus prevent possible risks of toxicity. The endogenous knowledge and traditional know-how held by the Ngbaka, Boffi, Issongo and Aka pygmies indigenous peoples are indeed very effective means for food valorization and the safeguarding of wild edible mushrooms.

He high diversity of wild edible mushrooms here shows the importance of edible mushrooms of mycology for indigenous peoples living near the Botambi forest sector where eating habits are still traditional. In human food, these mushrooms reveal the cultural and historical identity of this ethnic group. Indeed, the endogenous knowledge inherent in Wild edible mushrooms is conserved and transmitted from generation to generation. This favours on the one hand the conservation of these biological resources by the aforementioned peoples, and on the other hand also the preservation of their traditional food culture

5. Conclusion

This study showed a good diversity of wild edible mushrooms with nutritional and therapeutic potentials in the study area. The inventory of 46 species of wild edible mushrooms is eloquent proof of a good mycological knowledge in the south-western part of CAR. These fungal resources represent an acceptable source of food, mainly of interest to indigenous Ngbaka, Boffi, Issongo and Aka pygmies peoples living in self-subsistence in

rural areas. Also, they have a cultural aspect of paramount importance for these peoples surveyed. The results also showed that 4 species are the subject of barter activities and 11 are offered for sale. The period of abundance of these natural resources is the rainy season. In fact, the selected ethnic group has been able to preserve in the villages, endogenous knowledge of edible mushrooms, its own eating habits and has transmitted to its descendants. To this end, it constitutes the human group to be sensitized, educated and trained in any program for the development of these fungal resources. In view of the nutritional and rustic potential of these wild mushrooms, and faced with socio-economic, environmental and climatic challenges, the valorization of wild edible mushrooms is necessary and a priority. It will contribute to strengthening food security and increasing the quality and diversity of diets in rural areas.

Appendix 1. Illustration of some Wild edible mushrooms

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