Wild edible mushrooms depict a dissimilar biogeographical distribution in humid forests of Cameroon.

Abstract
For millennia, wild edible mushrooms (WEM) had always been considered as substantial food and medicinal sources, for local communities, both Bantu and autochthonous people. However, few information and sparse data are available on useful mushrooms of Cameroon. A study was undertaken to update the checklist of WEM in humid forests of Cameroon. From mushroom excursions, surveys and inventories, thousand fungal specimens were collected *in situ*, described and identified using key features and references.
Wild edible mushrooms were recruited in three trophic groups. They denoted a dissimilar biogeographical national distribution. Saprophytes and *Termitomyces* were encountered throughout the country; ectomycorrhizal mushrooms occurred in forest clumps, only in three regions: South, Southeast and Southwest. 108 WEM were listed belonging to 17 families and 43 genera, including nearly 15 *Termitomyces*, 30 ectomycorrhizal and 63 saprophyte species. 15 WEM were also claimed to have medicinal properties. This vast mushroom diversity related to various specific habitats and ecological niches. Five fungal groups were considered as excellent edibles. *Amanita* and *Boletus* species were seldom consumed. Most mushroom species were harvested solely for home consumption, with the exception of *Termitomyces*, the only mushroom market. *In fine*, the diversity of WEM was very high but poorly known and weakly valorized. To fulfill the Nagoya convention, it is recommended to pursue mycological inventory of macrofungi in Cameroon, including molecular tools and to harness local wild edible saprophyte mushrooms amenable to cultivation.
Key words. ***Amanita-Boletus*-Chanterelles-Ectomycorrhizae-Saprophytes- *Suillus granulatus*- *Termitomyces***

Introduction

For millennia, sedentary Bantu and native people of humid forests called Baka in East and Bagyeli in South Cameroon have been eating wild edible mushrooms (WEM), to supplement and diversify their diet (Buyck, 1994, Boa, 2006). In this context, consumption and integral utilization of wild mushrooms constitute long-term traditional and cultural practices. However, communities of wild edible mushrooms (WEM) of Cameroon that represents an important food biodiversity source remain poorly known, weakly valorized and imperceptibly capitalized.
In sub-Saharan Africa, about 2500 species of wild edible macrofungi have been identified (Mueller et al. 2007). A first literature review published usages and relevance of edible mushrooms on diet of local populations of sub-Saharan Africa (Rammeloo et Walleyn, 1993). Several studies reported the abundance of mushroom in Burundi, Ghana and Tanzania (Härkonen et al. 1993, 1994, Buyck, 1994, Townson, 1995,Yongabi et al 2004.). Mushroom significance and usage have been described for the Yoruba community in Nigeria and the pygmies of Central African Republic (Heim, 1936, Oso, 1977, 1975). Data exist on the nutritive value of mushroom species of the Miombo dry forest (Parent & Thoen, 1977,Malaisse, 1997,). Knowledge and utilization of edible mushrooms by Bantu and Bagyeli populations in the rainforests of South Cameroon have been recorded along seasons of the year (Dijk et al. 2003). The nutritive and the medicinal effect of WEM are thus well-known in sub-Saharan Africa since immemorial times. WEM are rich in vitamins (almost the entire B complex, folic acid, ergostérine (pro-vitamin D), thiamin, riboflavin), in minerals such as potassium, phosphorus, cupper, sodium, iron, manganese, calcium, in digestive fibers

(mannoses, polysaccharides, cellulose, chitin fibers), and in proteins of value higher than the best legumes (Buyck, 1996, Oei, 1996).

Wild edible mushrooms are also economically important. For example, in most developed countries, mushroom cultivation in North America, Europe and Asia is an important revenue source (Oei, 1996). In these countries, they are as well picked up in autumn by amateur and professional mycologists for selling in large supermarkets and restaurants, thus constituting an old multibillionaire industry in American dollars. In Burundi, women claim rights on portions of land were *Termitomyces* begin to fruit (Buyck, 1994). In Cameroon, old women attentively watch over termite mounds on their land vicinity and forbid anyone to carry away even a piece of mud from it, to prevent *Termitomyces* mushroom running away. Moreover, a particular group of edible mushrooms, symbiotic with roots of some endemic timber species of humid forests (*GIlbertiodendron*, *Microberlinia*, *Tetraberlinia, Uapaca*…) have an international worthy market, thus offering an opportunity to develop a mushroom export value chain as well as insuring forest protection and environmental education. Many WEM are used in traditional pharmacopeia in Africa and Asia, to cure blood pressure, tumors and viruses. The edible species *Tremella fuciformis* (locally called "Biyae" in Bulu) and *Tricholoma matsutake* (Called Shi'itake in Chinese) cure leukemia in 65% of patients; polysaccharides of *Lentinula edodes* species constitute an immunological stimulant used to cure viral hepatitis and to protect the liver; species of *Ganoderma lucidum* and *Tremella fuciformi*s, have anti diabete and anti oxydant effects (Oei, 1996, Yongabi et al. 2014).

For Cameroon, the first discoveries of wild edible mushrooms can be traced back up to the 19th century (Hennings, 1895, Heim 1936, 1941, 1942). The first four recognized wild edible species were *Lepiota discipes*, *Marasmius* spp ; *Mycena* spp and *Lactarius gymnocarpus* in Ebolowa, South Cameroon. Since then, numerous inventories have been carried out on wild edible macrofungi with or without medicinal effect. These studies had approximately two major periods, from colonial era to the end of the 20th century, and from the first 10 years of the third millennium till nowadays. The objective of this study was to update the checklist of WEM of humid forests in Cameroon, in the bid to contribute to help Cameroon complying with the Nagoya Convention on biodiversity.

2. MATERIALS AND METHODS

2.1. Study sites

Numerous mycological and ethnomycological studies have been carried out on wild edible mushrooms in humid forests of South Cameroon. It is a vast area, below parallel 7th south, with scattered savanna enclaves, small food farms, fallows of *Chromoleana odorata* and *Imperata cylindricum*, small cocoa farms, secondary forests at different stages of forest regeneration, skid trails and wood lot parks. It covers six administrative regions, namely, Centre, East, Littoral, North-west, South and South-west (Fig. 1).

Mushroom excursions and inventories were conducted in portions of the dense evergreen humid forests (Letouzey, 1985), including Mount Cameroon mountain forests, Northwest rocky forests (near Fundong), Southwest lowland rainforest, lowland humid forest of the Bipindi-Lolodorf-Akom II triangle, the forest-savanna transition area, along the Obala-Batchenga road, lowland secondary forest of the Centre zone, lowland savannas of the Mbam, highland savannas of Western Highland Plateaus, and lowland Southeast rainforests, near Ngoïla (Fig. 1).

Nearly 40 localities were covered, namely, Abong-Mbang, Abu, Bafia, Bafoussam, Bantoum, Begni, Bipindi, Bintom, Bitchoka, Bityili, Bokito, Buéa, Diba, Doumé, Ebebda, Ebimimbang, Ebom, Ebolowa, Foumban, Fundong, Gribe, Kedia, Koutaba, Lambi, Lobo, Lolodorf, Lomié, Ngoïla, Ngovayang, Ngoumou, Nkongabok, Nkongzok, Ntui, Nyangong, Okola, Obala, Tchékos, Tobagne, Ngat, Touké, Zoka, Zoulabot …

Climate is hot and humid, with ample rainfalls, varying with altitude and latitude. Relative humidity is generally above 80%, year round (Olivry 1986). Geologically, the area varies from Precambrian metamorphic rocks to recent volcanic intrusions n (Franqueville 1973). Physico-chemical soil features as well vary from Andosols rich in P to ferralitic soils, poor in N, P, and K.

2.2. Ethnic groups

During field works, several ethnic groups were encountered, notably, Bantu people of Bakweri, Bakossi, Bamoun, Bamileké, Bassa, Bulu, Ewondo, Eton, Fang, Kom, Konabembe, Manguissa, Maka-kozié, Ngumba, Osananga, Osananga, Yambassa, and two autochthonous (often called pygmies) Baka and Bagyeli people, living mainly in forest settlements. While the Bantu people live on shifting cultivation and collection of Non timber forest products (NTFP) like wild fruits and WEM, during harsh periods, and, native people live on gathering and hunting NTFP (mostly WEM) as their main subsistence activities.

2.3. Ethnomycology survey

Since 1996 to 2015, surveys were undertaken in numerous villages and forest settlements, with the aid of field assistants. They were selected and trained to assist in conducting ethnomycologycal surveys and to serve as field guides. The survey to assess local perceptions and endogenous knowledge on WEM began with a display of a compendium of identified local WEM. Thereafter, using a questionnaire, an interview is passed individually to a larger number of representative people (men and women as well as youth and old), and to traders in nearby markets with experience on local WEM trading.

2.4. Mushroom collection, description and preservation

Mushroom excursions took place during both rainy seasons (March-June and September-November). Various collecting grounds used by local populations and forest clumps were covered, including undisturbed forest, secondary forests, cocoa plantations, food crop fields, bush fallow, farmers' trails and home gardens. Sometimes, some people spontaneously brought collected specimens for identification when we stayed in a village.

Collected specimens were macroscopically described, photographed in fresh state with daylight, dried for 2-3 days at around 40°C in locally made plywood drier. Some specimens were kept fresh in 50% alcohol in a local herbarium. Microscopic examination was later carried out on dried exsiccates. A database of identified WEM was set up and partial description keys developed for each trophic fungal group.

3. RESULTS

3.1. Diverse habitats

Wild edible mushrooms were collected in various habitats, including: home gardens, young fallow lands, new agricultural fields, small cocoa farms (mostly *T.microcarpus*), secondary forests (mostly saprophytes), primary forests outside (saprophytes) and inside the crown of forest clumps (Uniquely ectomycorrhizae). Substrates also varied including firm soil land, litter (*Armillaria katangensis*), mud close to rivers, decomposing wood (various saprophytes), termite mounds (Most *Termitomyces*), decomposing palm tree trunks (*Volvariella voyacea*) and tree roots (Ectomycorrhizae).

3.2. Dissimilar biogeography

Three trophic groups of wild edible mushrooms were found, with saprophytes and *Termitomyces* occurring all over the country. Symbiotic-tree mushrooms (ectomycorrhizal mushrooms) were found only in the South, East and South-west regions. Ectomycorrhizal mushrooms were associated with various "Ekop"[1] *Uapaca* tree species, *Gilbertiodendron* spp

[1] The word "Ekop" refered to a group of unnamed Caesalp tree species by forest prospectors (Mouranche and Letouzey 1952.

and *Microberlina bisiculcata*, respectively. In these areas, they formed small to large forest clumps, sometimes as large as 20 km long stretch X 1-3 km depth, like on the road Lomié to Ngoïla, after crossing the Dja river, in South-east region.

3.3. Vast abundance and diversity

One hundred and eight (108) species of wild edible mushrooms were listed from Cameroon humid forests, belonging to 17 families and 43 genera, including 63 saprophyte, 30 ectomycorrhzal mushroom and *Termitomyces* 15 species (Table 1).

Five groups of wild edible mushrooms were considered excellent edibles, including *Armillaria katangensis*, the 15 *Cantharellus* and *Termitomyces* species, and *Volvariella volvacea.* Good edibles were some species of eight genera *Cookeina, Flammulina, Lentinus, Macrolepiota, Marasmius, Psathyrella, Pleurotus,* and *Tremella*. Less collected mushrooms included species of 13 genera: *Collybia, Daldinia, Gymnopilus, Mycena, Pluteus, Polyporus, Ramaria, Russula*, *Sarcosoma, Schyzopyllium, Sparassis, Stereum,* and *Trametes*. Mushroom species rarely or never collected were genera of *Amanita, Boletus*, *Craterellus, Gomphus, Lactifluus, Phlebopus, Russula, Suillus,* and *Strobilomyces* species (Table 1).

In general, collected mushrooms were cooked and eaten. Only *Termitomyces* species in year of abundance were sold, fresh or dried, along roadsides and in urban markets. No WEM of Cameroon were sold on supermarkets, restaurants and hotels.

Fifteen species of wild edible mushrooms were also collected for their medicinal properties, including the following genera: *Agaricus, Auricularia, Cookeina, Cyathus, Daldinia, Flavolus, Ganoderma, Pleurotus, Tremella, Termitomyces* and *Russula.*

Only one mushroom species was recognized by populations of the Mount Cameroon area, *Chlorophyllum molydbites*, as provoking hallucinations and, sometimes used for mystic incantations by traditional healers (Table 2).

4. DISCUSSION

More than one hundred species of wild edible mushrooms, belonging to three trophic groups, were listed from humid forests of Cameroon. This vast diversity included 58% saprophyte, 28% ectomycorrhizal and 14% *Termitomyces* species. It is the first time that such a high biodiversity in WEM is reported from Cameroon. Our results largely contradict FAO reports (Boa, 2006, Douanla-Meli, 2007, Tonjock et a. 2011, Ebge et al. 2013). In fact, inventory reports on wild edible mushrooms of Central Africa seem largely inaccurate and deserve to be rapidly updated, with regard to rapid deforestation and genetic erosion of biodiversity in this region. Rural populations of Baleng, near Bafoussam in West Cameroon, seemingly collected a specimen of *Termitomyces titanicus* in the mid-1990s. Ten years later when we visited the locality, they claimed not have seen it again since. One of the authors did observe similar trends with the exotic ectomycorrhizal edible mushroom, *Suillus granulatus*, occurring on pine roots, in Yaoundé and Dschang (Onguene, pers.obs, 2014). Such observations related to the disappearance of wild edible mushrooms were also made in Burkina Faso (Guissou et al. 2008). This phenomenon of mushroom disappearance may suggest early events due to global warming for Cameroon humid forests.

This mushroom inventory was far from complete because it did not include wild edible mushrooms of the Adamaoua and North regions neither exhaustive in several localities. Quite a few collected mushrooms could not be identified to species level. Indeed, our results are limited by lack of a national inventory on wild edible mushrooms of Cameroon, using molecular tools. Therefore, the biodiversity of WEM in Central Africa largely remains ill-known (Onguene 2000, Eyi & Degreef, 2014).

Cameroonian mycological cuisine differed from that of Europeans and Asians. While the latter eat more ectomycorrhizal mushrooms, Cameroon forest-dwellers feed on a mixture of saprophytes, *Termitomyces* and only, two groups of ectomycorrhizal mushrooms. Strikingly,

they seldom collected for consumption *Amanita, Boletus* and most ectomycorrhizal mushrooms. Cameroonian WEM basket is nearly similar to that of several sub-Saharan countries such as Burundi, Gabon, Nigeria, DR Congo and Rwanda (Boa, 2006, Degreef et al. 2016, Eyi et al. 2011). Cameroon forest-dwellers feed on three trophic mushroom groups, thus allowing diet complementation and diversification for local populations, year round and, full harnessing of ecosystem continuum in various habitats. Hence, mushrooms' exploitation fosters local populations' strategy for sustainable natural resource management.

The major interest in mushrooms lies in their matchless flavor. It is the essential reason for their success for gourmets and gastronomes. But their palatability is differently appreciated. Four criteria can be used to evaluate mushroom's palatability: Consistency, aroma, taste and aspect (Becker, 1945, Buyck, 1994). Excellent mushrooms have the four qualities. When one of these qualities is missing, the mushroom is qualified as good comestibles. Those with two qualities are ordinary mushrooms and those with only one quality are hardly edible. In humid forest of Cameroon, five mushroom groups from local populations' perceptions are considered as excellent comestibles, notably, the 15 *Cantharellus* and all *Termitomyces* species, the straw mushroom, *Volvariella volvacea* and the saprophyte *Armillaria katangensis*. Our results differ from those of earlier workers of Central African Republic (Kouagou et al. 2016). Several saprophyte species were considered as good comestibles like saprophyte species of the following seven genera *Auricularia, Cookeina, Lepiota, Lentinus, Marasmius, Pleurotus, and Tremella*. Ordinary edible mushroom species included the majority of species (Table 1). One species, *Favolus brasilensis*, the Brazilian polypore, locally called « Ongo », with a slim and tough flesh, not modified upon cooking, was mostly used as a potage during wet evenings. In general, *Amanita, Boletus* species and most ectomycorrhizal mushrooms are seldom collected for consumption by local populations. Autochthonous pygmy people considered that changing color of Boletes after bruising or exposure to air is an obvious sign for their strong toxicity. Such a remark was also claimed in Tanzania (Härkönen, 2002). Toxicity of local mushrooms has been a quest throughout our inventories. During three years of intensive mushroom excursion in the same plots, both authors did not record toxic or poisonous mushroom (Onguene & Kuyper, pers.obs. 2010). Only *Chlorophyllum molybdites* was strongly claimed as a poisonous mushroom by local Bakweri people in the Mount Cameroon region. In the same area, *C. molybdites* was also considered to provoke some deteriorations and hallucinations, or even used for mystic practices by traditional healers (Tonjock et al. 2011). When kept in 50% alcohol, this whitish large mushroom became murky and the solution totally dark.

The habitats and ecological niches of wild edible mushrooms highly varied. For example, the straw mushroom grows only on decomposing palm oil trunk; the unique habitat of *Pleurotus tuberregium* is its grayish sclerotium; *Armillaria katangensis* is readily identified in the field as an under-wood mushroom growing on a whitish velvety mycelia carpet; chanterelles and *lactarius* species grow symbiotically on roots of Ceasalps or *Uapaca*'s roots only in specific forest clumps, in rain forests of South, Southeast and Southwest regions (Onguene, 2000, Onguene et Kuyper 2001, Ba et al. 2014, Ebenye et al. 2016). Other edible ectomycorrhizal mushrooms not eaten by local populations of Cameroon were also collected and described from forest clumps, independently of soil types and climate conditions. This attests the strong ecological specificity of ectomycorrhizal edible mushrooms with endemic tree species: no mushrooms, no trees. This simple ecological principle should serve for environmental education in Central Africa in order to boost humid forest conservation and environmental education. Such a pre-emptive action is required since there is no sound technical approach available for artificial regeneration of endemic ectomycorrhizal timber species of tropical humid forests.

Edible ectomycorrhizal mushrooms are potentially high in number in Cameroonian humid forests, largely unknown, though. In this case, 15 *Cantharellus* species are highly appreciated. Local Bantu and Pygmy people systematically eat all chanterelles and give them several local names (in "Bulu dialect") according to substrate, habitat and taste, namely "Bingobindong, Otsetsa, Otoe, Mebem, Otoye mebem". In a systematic plot sampling for three years, more than 1000 ectomycorrhizal fungal species were collected and nearly 200 species identified from ectomycorrhizal forest clumps. However, most of them are not collected and eaten by local people like species of the following genera *Afroboletus, Amanita, Boletus, Craterellus, Lactarius, Lactifluus, Russula, Tuboseat* consumed elsewhere in Africa, Europe and Asia, though (Onguene 2000, Boa 2006, Ebenye et al. 2016). In the context of preventing food insecurity in the midst of poverty, these symbiotic mushrooms could serve as an alternative food source for local populations. In addition, wild edible ectomycorrhizal mushrooms could spur a new value chain in exports of WEM from humid forests of Cameroon, thus providing additional income to poor rural farmers. One kilo of Chanterelle is worth slightly 19 650 FCFA (30€) in Europe. Hence, a new wild edible mushroom value chain has potential to contribute to forest preservation and ecotourism.

Termite-mutually associated mushrooms, *Termitomyces,* are highly valued by local populations. All *Termitomyces* species are systematically collected and eaten after cooking. Across the country, these species depicted a particular size distribution along ecosystems. Small size *Termitomyces* species prevailed in forest ecosystem while middle size *Termitomyces* species abounded in grass savannas of Highland Plateaus of West Cameroon. (Mossebo et al. 2009). The large sized *Termitomyces schemperi* species showed a strong zonal specificity. They occurred only in the forest-savanna transition road, between the cities of Obala and Ebebda (Fig. 1). *T. schemperi*, have been largely observed in sub-Saharan Africa, notably in Benin, Burkina Faso, Gabon, Mozambique, Central African Republic, DR Congo, Senegal, The Gambia, Zambia and Zimbabwe (Walleyn & Rammeloo, 1994, Uaciquette et al. 1996, Boa et al. 2000, Yorou et al. 2002, Eyi et al. 2011, Degreef et al. 2016). In Cameroon it has been observed so far only in a very restricted area, the forest–savanna transition zone, along the Obala-Ebebda road. Confining of *T. schemperi* was also observed in the Kerala state in West India (Kurun and Sridhar 2013). The symbiosis of fungus-growing termites and their associated mutualistic fungi, *Termitomyces,* has a single African origin and secondary domestication of other fungi or reversal of mutualistic fungi to a free-living state has not occurred, thus leading to co-evolution or co-cladogenesis (Rouland-Lefèvre *et al*. 2002, Aanen et al. 2002, 2007, Wade 2007). Thus, *T. schemperi* together with its associated termite, *Termes bellicosus*, or *Macrotermes michaelsen* (Westhuizen and Eicker, 1991) developed a strong local ecological niche, likely related to particular rainfall patterns.

Wild edible mushrooms collected are readily eaten after cooking owing to their unpredictability in time and nature. However, *Termitomyces* species are harvested, dried and sold by women and children along road sides and in urban markets. In urban markets of Yaoundé, one specimen of *T. schemperi* is sold fresh 100 – 200 CFA francs (Onguene, Obs.pers, 2014). Hence, the local market of WEM is dominated by *Termitomyces* species. Yet, supermarkets, restaurants and hotels seldom sell local WEM. *Termitomyces* species are also sold fresh on road sides and dried in markets in other cities in sub-Saharan Africa (Buck, 1994, Yorou et al. 2002).

The majority of wild edible and medicinal mushrooms are saprophytes. They belong to 31 genera and 63 species, all potentially amenable to cultivation. Accounting for the high agricultural potential of Cameroon, this plethora of wild edible saprophytes implies a huge potential in valorization of the numerous agricultural wastes, such as maize cobs, rice straw,

cotton crabs, sugar cane trashes or coffee kernels. Therefore, edible saprophyte species could have immediate effects on job creation, trading and increasing agricultural revenues to rural women and young unemployed people (Martinez-Carrera et al. 2001). In Vietnam, the straw mushroom is integrated to rice production (Boa, 2006. But, there is still a large deficiency in mushroom spawn, thus limiting cultivation of wild saprophyte mushrooms and valorization of agricultural wastes in Cameroon.

Some species of wild edible mushrooms can have medicinal properties. In this study, 15 such species were recorded as having medicinal virtues. In general, this function always was considered secondary and information detained only by few interviewers. In tropical Africa, usages and practices of WEM in traditional pharmacopeia involve comestics, dyes, fumigation of traditional attic, and to tie jewelry (Rammeloo and Walleyn, 1994, Dijk et al. 2003). For Bantu people, *Pleurotus tuberregium* sclerotium could improve lactation in breast feeding women and heals heart palpitations. In East Cameroon, these sclerotia are collected in the forest, and sold by Konambembe Bantu and Baka pygmies to Nigerian traders who export them in Nigeria for trading to traditional healers. In Nigeria and Madagascar, *Pleurotus tuberregium* sclerotium is used as anti poisonous remedy, to make charms for young ladies and to heal chest pains. In Burundi, termite nests are used to heal heart attack (Buyck 2004). *Cookeina sulpices*, *C. tricholoma* and *T. lignilosius* can also heal ear inflammation and mumps. Other WEM also relieve numerous pains and aches but information was not released. Our results are consistent with earlier workers (Hem, 1936, Oso, 1977, Oei, 1996; Walleyn and Rammeloo, 1994, Tonjock et al. 2013). In Benin, Nigeria and Madagascar, several species indicated in Cameroon, seemed to prevent or even heal many diseases such as ear inflammation, mumps, rheumatism, women infertility, even cancers (Oei, 1996).

In fine, diversity and abundance of useful mushrooms appears very high but poorly known and weakly valorized. To fulfill the Nagoya convention signed by Cameroon, it is recommended to pursue mycological inventory of macrofungi of Cameroon, including molecular tools and, to harness local wild edible saprophyte mushrooms amenable to cultivation.

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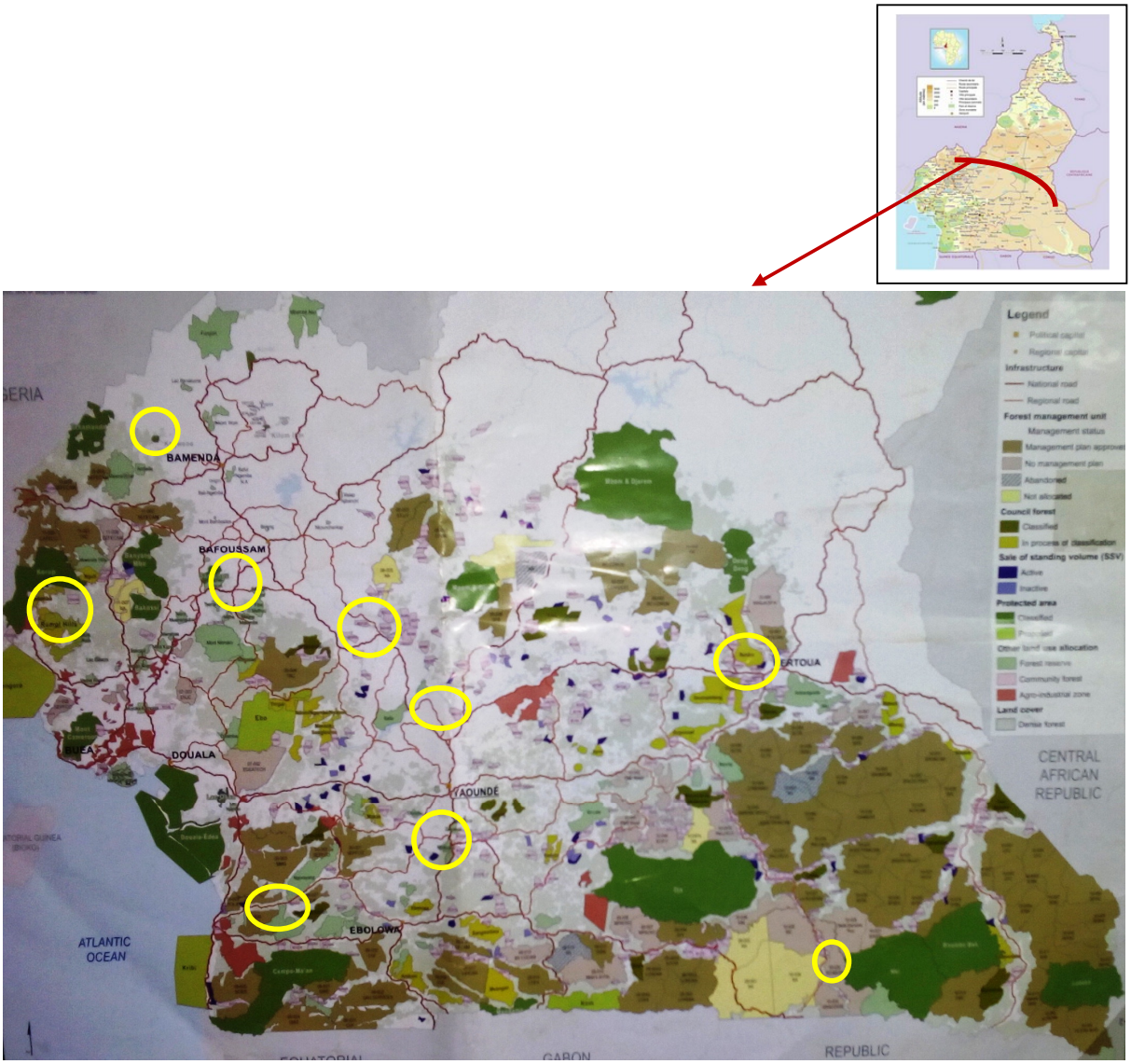


Figure 1: Map of localization sites of mushroom excursions in Grand-South Cameroon (Yellow circles)

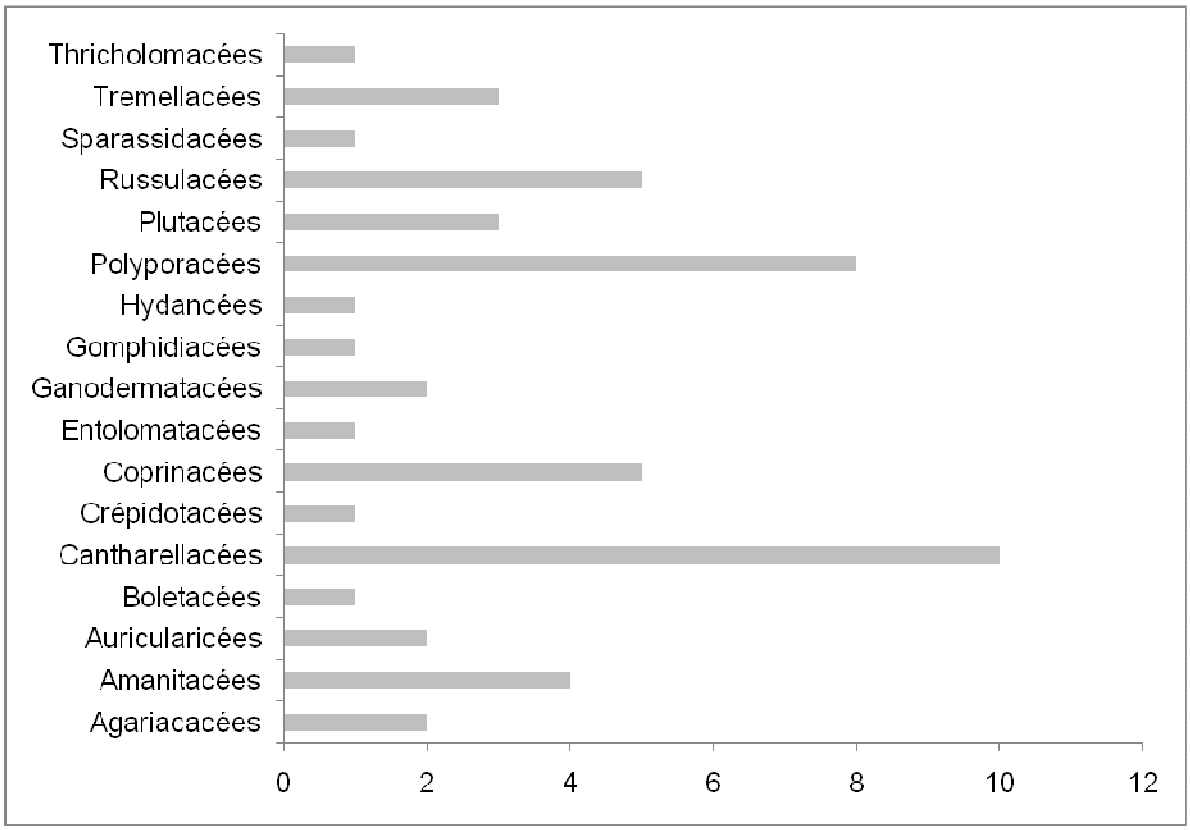


Figure 2: Relative abundance of species of wild edible mushrooms of humid forests of Cameroon

Table 1: Non-exhaustive checklist of wild edible mushrooms of humid forest of Grand-South Cameroon

63 saprophyte species *A. goossesens* ; A. silvatica* ; Armillaria camerunensis ; Auricularia auricula-judae* ; Auricularia cornea ; A. polytricha* ; Chlorophyllum molybdites** ; Collybia cf. allegretti; Cookeina sulpices*; C. tricholoma*; C. occidentalis*; C. brunneofibrollus; C. comatus; C. brunneofibrillosus; Cyathus striatus*; Dacryopinas spathularia; Daldinia concentric*; Dictyotophora spp. Flammulina velutipes; Flavolus sp 1*, F. brasiliensis ; Leliopta bekuassubu ; Ganoderma applanatum* ; G. lucidum*; Grifola frondosa ; Gymnocarpus aureobruneus ; Laetiporus sulphureus ; Lentinus brunneofloccosus ; L. citrinopeleatus ; L. polychrous ; L. sajor-caju ; L. tigrin; L. squarrosolus; Lepiota sp 1; L. cristata*; L. disciples; Macrolepiota procera ; Marasmius katangensis ; M. hungo; Mycena aschi; Mycena bipindensis; Psathyrella arrombonatus ; P. candolleie ; P.* cf. *ovaticystis; Pleurotus flabellatus ; Pleurotus cystidiosus ; P. ostreatus ; P. pulminarium ; P. tuber-regium* ; P. squarrosolus; Pluteus cf.griseoroseus ; Sarcosoma globosum ; Schyzophyllum commune ; Sparassis crispa; Stereum hirsutum ; Trametes spp ; Tremella fuciformis*; T. mesenterica* ; Tremella versicolor*; Volvariella caesiotincta ; V. esculenta ; V. gloiocephala ; V. volvacea*
15 Termitomyces species*** *Termitomyces. aurianticus ; T. clypeatus ; T. filiginosus ; T. globullus ; T. heimii ; T. lanatum ; T. Le Testui ; T. mammiformis ; T. mboudaeina; T. microcapus; T. pantherina (nov); T. robustus; T. schimperi ; T. striatus f. grisumboïdes; T. Titanicus*
30 ectomycorrhizal species *Amanita vaginata; A. rubescens; Cantharellus camerunesis ; C. cibarius var roseocarius ; C. congolensis; C. dichrous; C. miniatescens; C. densifolius ; C. flondulis; C. isabellinus;C. luteopunctatus ; C. miniatescens; Cantharellus microcibarius; C. platyphyllus; C. pseudocibarius ; C. pseudocibarius; C. rufopunctatus; Craterellus cornucopioïdes ; C. crispus; Gomphus brunneus; Lactarius gymnocarpus; L. longipes; L. rubroviolascens; Lactifluus gynocarpoides ; Phlebobus sudanicus; Russula cellulata*; R. meleagris*; R. striatoviridis*; Suillous granalatus; Strobilomyces stabilaceous*

NB: * Species with medicinal potentials, based on local populations and autochthonous people. **This species was cited as a tasty edible mushroom in Ngoumou, near Yaoundé but Bakweri populations in Mount Cameroon deny its appetence because it causes hallucinations and deteriorations and is used by traditional healers for incantations. ***Some Termitomyces species, with the exception of *T.microcarpus*, are used to drive away bad spirits, to heal rheumatisms and paralysis, and as love charms. ****The sclerotium of *Pleurotus tuberregium* is used as a love charms, antipoison and chest pain.

Table 2: Some wild edible mushrooms with medicinal properties according to local populations

Species of wild edible mushrooms involved	Types of treatments in traditional medicine	Other usages
Auricularia auricular-judae	Reinforce immune system	Aphrodisiac
Chlorobium molybdites		Causes deteriorations and provokes hallucinations and is used for mystic incantations by Nigerian traditional healers
Cookeina sulpices	Treat ear inflammation and mumps	
C. tricholoma		
Coprinus spp	treat woman infertility	
Daldinia concentrica	Heals skin diseases and scars	Used for dyes and decoration
Dictophora indusiata	Causes whitfow	Apparently toxic
Flavolus spp		Provokes hallucinations and used for mystic incantations
Ganoderma spp	Treats cancer and heart problems as tea	Used for dyes and decoration
Lentinus squarrosolus	Heals baby navel	
Lepiota cristata	Heals convulsions in young children	
Pleurotus tuber-regium	Improve lactation of breastfeeding women ; the sclerotium heals heart palpitations Heals paralysis	Love charm with sclerotium ; talisman made by Nigerian traditional healers
Russula spp	Heals hemorroids and children rib pains	
Termitomyces sp	Treat ear inflammation and rheumatism pains	Chase bad spirits
Trametes versicolor	Treat internal growth and baby navel	

Photo n°1: Photograph of some wild edible of humid forest of Cameroon

Wild edible mushrooms of humid forest of Cameroon by trophic group
From top to bottom: Saprophytes, *Termitomyces* and Ectomycorrhizae

Armillaria camerunensis

Sarcosoma globosum

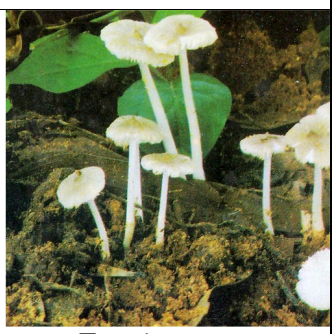
Ganoderma applanum

Volvariella volvacea

Termitomyces schimperi

Termitomyces striatus

Termitomyces robustus



Termitomyces microcarpus

Cantharellus rufopunctatus

Suillus granalutus,

Lactarius gymnocarpus

Cantharellus miniatescens