

*Full Length Research Paper*

# Ethnobotanical survey of the uses of Annonaceae around mount Cameroon

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Accepted 5 March, 2011

**An ethnobotanical survey was carried out in eight villages around Mount Cameroon in the South West Region of Cameroon. It was focused on determining the uses of the members of the family Annonaceae in this region. Show and Tell Semi-structured Interviews employing a checklist of questions and direct observations were used. The results obtained enable the presentation of the rate of utilization of the members of that family in the study area. At least 70% of the 41 species recorded during field trips from the research area were found to be widely used in traditional medicine by local populations. Some 29 diseases were cured using 24 species. The bark and the wood of these species were the most commonly used plant parts. The check list and ethnomedicinal inventory was developed alphabetically by botanical name, followed by local name, part used, ethnomedicinal uses, mode of usage and information on species availability. Plant specimens were collected, identified, preserved, mounted and voucher was deposited in the Limbe Botanic Garden (SCA) for future references.**

**Key words:** Annonaceae, checklist, uses, Mount Cameroon.

## INTRODUCTION

Medicinal plants play a key role in human health care. Worldwide, humans currently use tens of thousands of plant species for multiple purposes such as food, fuel, fibers, oil, herbs, forage, and fodder for domestic animals. Forest ecosystems render some services of industrial, pharmaceutical, cultural and socio-economic importance to man, contributing billions of dollars yearly to the world's economy (WWF and IUCN, 1994, Mboh, 2001). Medicinal plants play a vital role most especially in the maintenance of human health throughout the world. About 80% of the world population relies on the use of traditional medicine, which is predominantly based on plant material (WHO, 1993, Ahmad, 1999). In the tropics alone, it has been estimated that 25,000 to 30,000 plant species are in use, of which 25,000 are used in traditional medicines (WWF and IUCN, 1994). Scientific studies

available on medicinal plants indicate that promising phytochemicals can be developed for many health problems (Gupta, 1994). Modern pharmaceuticals still contain at least 25% drugs derived from plants (Adewusi and Afolayan, 2010). Medicinal plants have various effects on living systems. Some are sedatives, analgesics, antipyretics, cardioprotectives, antibacterial, antiviral and antiprotozoal (Olaleye et al., 2006).

In Cameroon, medicinal plants are of critical importance especially in poor communities where even relatively cheap western medicines remain prohibitively expensive. These plants also play an important cultural role as well as an important economical role. Appreciation of the importance of medicinal plants at government level is increasing, and government policy now promotes the integration of traditional health systems with conventional health systems. An indication of the importance ascribed to medicinal plants is given by the existence within the Ministry of Health of a Director for Traditional Medicine. In addition, since 2001, when the Summit of the Organization of African Unity declared 2001-2010 as the Decade for African Traditional Medicine, African

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countries have been developing both research programmes on traditional remedies and legislation regulating their use. Within the context of Cameroon, the Government has set up a Traditional Medicines Database containing medical and botanical information on plants with healing properties, intended as a step towards setting safety standards. Legislation regulating the use of traditional medicine and a bill setting up a Traditional Health Practitioners Council, as well as a regulatory framework for traditional health practitioners and services has been passed. In Cameroon, as in many other tropical developing countries, knowledge of medicinal plants use is widespread and their efficacy is trusted, based on a long history of use. However, the indigenous traditional knowledge of herbal plants of communities where it has been transmitted orally for many years is fast disappearing from the face of world due to transformation of traditional culture.

The people, who are native to the area in which the plants occur, use around 90% of the medicinal species (Bele, 2003). This is indicative of the vast repository of knowledge of plant medicine that is still available for global use, provided of course that it does not get lost before it can be tapped or documented. Traditional and indigenous medical knowledge of plants, both oral and codified, are undoubtedly eroding. This is particularly strengthened by rapid habitat destruction and over-collection that make sources of medicinal plants become increasingly scarce. Most especially, for areas largely reliant on oral rather than written tradition, loss of medicinal plants means not only an immediate loss of effective remedies but also rapid erosion on knowledge of their use, a process that is then particularly difficult to halt. To ensure the continued availability and use of medicinal plants, action is therefore urgently required. Such action should contain measures that involve a variety of approaches including cultivation of plants in home gardens to remove pressure on wild populations, limiting trade in medicinal plants to sustainable levels, halting the destruction of plant habitats, and documenting and promoting medicinal plant use.

### The family: Annonaceae

Annonaceae, commonly known as the "Sour sop" family has been utilized from time immemorial by communities in forest areas where it is found (Letouzey, 1985). Its medicinal importance has been widely acknowledged (Cooper and Record, 1931; Ainslie, 1937; Dalziel, 1937; Aubréville, 1959; Oliver, 1960; Irvine, 1961; Walker and Sillans, 1961; Bouquet, 1969; Bouquet and Debray, 1974; Burkill, 1988; Adjanohoun et al., 1996). For instance, *Annona muricata* is a species with many superstitious attributes. The bark and roots are in general, used for dysenteries and as vermifuges, and the leaves for dysenteries and fevers in Burkina-Faso. A decoction

of roots is used as a poison-antidote in Ivory-Coast (Steentoft, 1988). The flowers and buds are used in Gabon and Ivory-Coast for coughs (Steentoft, 1988). Both flowers and fruit pods have been used for catarrh. *Xylopiya aethiopica* is used as cough medicine, a carminative, purgative and revulsive to counter pains in Ghana (Dalziel, 1937). Its fruit is a common ingredient of the Yoruba agbo (Steentoft, 1988).

In addition, *X. aethiopica* fruits are smoked like tobacco in Sierra Leone, and the smoke from a mixture of dried pulped fruit and tobacco is inhaled to relieve respiratory ailments in Liberia (Burkill, 1988). The economic importance of Annonaceae derives from the considerable range of non-timber products are obtainable from the tree. The non-timber products include the kernels (known as an important soup condiment), edible fruit, fruit-juice, and medicine. The wood is pale brown, fine-grained and is of good quality used for furniture and construction work. It is often valued for firewood and is very important in pharmaceuticals research because of the antifungal, bacteriostatic, and especially cytostatic capabilities of some chemical constituents of the leaves and bark (Chatrou, 1998). The strong bark can be torn off in characteristic longitudinal strips used for ropes, straps or thongs (Letouzey, 1986). The family includes many ornamental species. For instance, *Artabotrys hexapetalus*, *Monodora myristica*, and *Cananga odorata* are grown for their fragrant flowers. Such flowers yield Mascassar oil, which is a perfume (Burkill, 1988). The leaves of the mast tree (*Greenwayodendron longifolia*) are used in decoration. However, despite the acknowledgement of the importance of this family with regard to the usefulness of its species to the local communities in the study area, no ethnobotanical surveys have been conducted to assess this importance. This study was part of a project on the family Annonaceae in the Mount Cameroon region executed at the Limbe Botanic Garden Herbarium (SCA).

### Objective of the research

The objectives of the present research work were (1) to explore the ethnomedicinal knowledge of the local people around Mount Cameroon; (2) to enlist the indigenous medicinal plants of the family Annonaceae used by local people for common day ailments; (3) to create awareness among the local community about the protection of native medicinal flora; and (4) to collect medicinal plants within the Annonaceae family of the area for proper identification and future references.

As inhabitants of the study area cure a wide range of diseases mainly using traditional means transferred from generation to generation only through verbal means of communication, this research was therefore an effort to document and to preserve this folk asset. As a signatory to the Convention on Biological Diversity, Cameroon also has a responsibility to identify and monitor the state of

medicinal plants within the country, including *in situ* and *ex situ* conservation actions, to identify processes having an adverse impact on these plants, and to maintain and organize relevant data. In this line, this research work was to assist Cameroon in one way or the other to meet Article 6 of the CBD relating on integrated national plans and strategies for the protection of biodiversity; Articles 7, 8 and 9, were relating to national inventories and monitoring of biodiversity, data management and *ex-situ* conservation, respectively; Articles 12 and 13 on expanded research, training and education of irrelevant areas; and Article 26, the completion of national reports on actions the country has taken to meet CBD obligations.

## MATERIALS AND METHODS

In 2003, intensive ethnobotanical surveys were carried out around Mount Cameroon and were confined to collect, identify and document the indigenous knowledge of local people about medicinal uses of the members of the family Annonaceae. Eight villages were selected as representatives for more detailed study after a preliminary reconnaissance survey of the area. These villages were: Bimbia-Bonadikombo, Bakingili, Dibundscha, Bomana, Mapanja, Likombe, Bokwango, and Bonakanda.

### Study area

Mount Cameroon is located in the South-West Region of Cameroon, on the coastal belt of the Gulf of Guinea (Biafra) between 3°57'-4°27'N and 8°58'-9°24'E (Figure 1) (Tchouto, 1996; Fraser et al., 1998; Ndam, 1998). It has a humid tropical climate and the climatic pattern is sharply modified by the influence of the topography (Courade, 1972). The main annual rainfall of the area varies between 2085 mm near Ekona to 9086 mm at Debundscha (Fraser et al., 1998). The mean monthly temperature, at sea level, varies from 19 to 30°C with the maximum in March-April (Fraser et al., 1998). The mean annual temperature is about 25°C and this decreases by 0.6°C per 100 m of ascent, to 4°C at the summit (Boughey, 1955; Barry, 1992).

The air humidity remains at 75 to 80% throughout the year (Payton, 1993). Mt Cameroon is an active Hawaiian type volcano without a central crater, subject to continued fissure eruptions on the flank of the mountain that result in lava flows and small cinder cones (Benl, 1977; Cable and Cheek, 1998). The soil types are mainly volcanic and relatively fertile (CDC, 1977; Tchouto, 1996). Lying within the tropical rainforest of West Africa (Ambe, 1987), the vegetation and plant species of Mt. Cameroon, as well as its altitudinal zonation have been discussed by several authors, notably Mann (1864), Hooker (1864), Dalziel (1937), Maitland (1932), Haig (1937), Boughey (1955), Keay (1955, 1959), Richards (1963), Guillaume (1968), Letouzey (1968, 1985), Hall (1973), Benl (1976, 1977), Thomas (1985), Thomas and Cheek (1992), Thomas and Achoundong (1994), Tchouto (1995, 1996) and Cable and Cheek (1998). Burning for hunting purposes and farming activities, shifting cultivation or organized commercial plantations, mainly oil palms, banana, and rubber scattered over the southern slopes of the mountain from sea level to 950 m are the main threats to vegetation (Payton, 1993). The main tribal groups in the area are Bakweris (in the south), the Bombokos (in the west and north), and the Balondos (in the maritime north-west). The population is high around 300,000 and increasing, naturally, and through immigration, and people are poor. Consequently, the human

pressure on the resources of the area is extremely high and the overall biodiversity and a number of key species are under threat.

### Collection of medicinal data

In 2003, frequent field trips were carried out around Mount Cameroon in order to collect information about the folk knowledge of medicinal plants within the family Annonaceae used by the local people. Eight villages were selected as representatives for more detailed study after a preliminary reconnaissance survey of the area. These villages were: Bimbia-Bonadikombo, Bakingili, Dibundscha, Bomana, Mapanja, Likombe, Bokwango, and Bonakanda. During field trips, the Show-and-Tell/semi-structured questionnaire (Medicinal Plants Datasheet) and interview methods were conducted (Duncan et al., 1989).

Prior to the administration of the questionnaire, conversations with the informants were held to elaborate the objective of the study and to build on trust with the common goal to document and preserve the knowledge on medicinal plant. In each village, the survey targeted a wide range of people from elders, traditional healers, herbalists, to local inhabitants including both men and women, who were familiar with traditional uses of plants. In total, 110 informants including 70 men and 40 women were interviewed during survey. They were asked to give their knowledge about the plants they use against a disease, plant parts harvested, method of preparation of the remedy, details of administration and the dosage and their perception on the availability of the plant in the field.

### Collection and preservation of plants

Frequent field trips to the area were arranged to collect the live specimens. Throughout these trips, specimens of the reported medicinal plants were collected. The fully dried specimens were then mounted on herbarium sheets. The data taken in the field was transferred to the slip pasted on the herbarium sheets. Plants were identified with the help of available taxonomic literature, manuals and floras and comparing with the already identified plant specimens of the herbarium. Stereomicroscope was used for critical examination of the material. Identification was then confirmed by senior botanists of the Limbe Botanic Garden Herbarium. After correct identification, voucher specimens were deposited in Limbe Botanic Garden herbarium (SCA) for future references.

### Check list and ethnomedicinal inventory

Ethnomedicinal inventory was developed consisting of botanical name followed by their local name, part used, ethnomedicinal uses and their availability.

### Data analysis

The raw data was entered using BRAHMS (Botanical Research and Herbarium Management System) and managed using Microsoft Excel.

## RESULTS AND DISCUSSION

### Knowledge of informants and medicinal plants

Out of the 41 species of the family Annonaceae recorded during the inventory which fresh specimens were presented to local populations, only 28 were signalled as

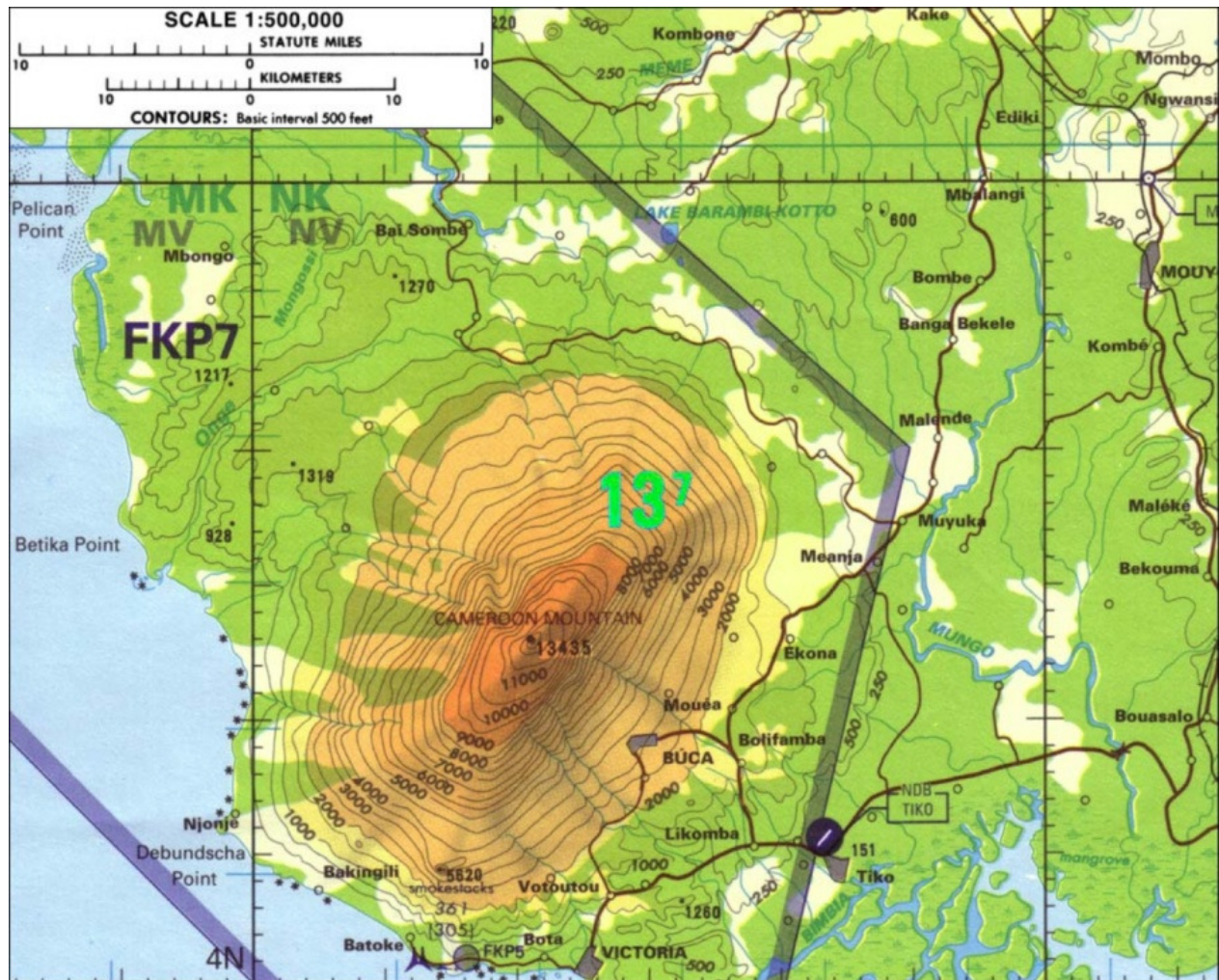


Figure 1. Map of the study area

being important or used in the surveyed area (Table 1). Of these 28 species, 24 were reported to cure some 29 diseases and were constantly used. This in fact indicated that most people continue to use traditional systems of health care including medicinal plants alone or in combination with modern pharmaceuticals. This continued reliance of many local populations on traditional medicines is partly attributable to economic circumstances, which place modern health facilities, services and pharmaceuticals out of the reach of the majority of the population. However, in many cases, it is also attributable to the widespread and strong belief in the effectiveness of many traditional therapies. In the rural areas, household remedies are being used for generations.

This is because medicinal plants used are variably available and relatively cheap and quite near to nature. Nearly all members of the surveyed villages use medicinal plants. The plants were either used singly or in combination with some other plants or plant parts (Figure 2). Some plant species were claimed to be quite effective

remedies for cutaneous affection of head, snake bite, diarrhoea, malaria, cough and cold, and stomach troubles etc. *Annickia chlorantha* was the most used species in the study area. As pointed out by many other authors (Dalziel, 1937; Oliver, 1960; Walker and Sillans 1961; Bouquet, 1969; Adjanohoun et al., 1996), the bark of *A. chlorantha* entered in numerous medical applications. It was used as a powder on sores and as scrapings on ulcers. Its bark-extracts were widely used as an antipyretic in treating fevers and acts as a homeostatic on wounds. A decoction of the bark was taken for fatigue and by mouth and vapour baths for rheumatism, intercostals pain and to facilitate conception. The stem-bark was used to treat jaundice and urinary tract infection. However, since the uses of medicinal plants are based on empirical knowledge, the scientific study of all these herbal drugs is highly desirable to establish their efficacy for safe use. Various parts of the plant were used in curing different ailments. Plant parts commonly used included bark, wood, fruit, and in some cases the entire

**Table 1.** Local/common names, parts used, uses, mode of usage/preparation.

Scientific name	Local/common name	Part (used)	Use (s)	Mode of usage/mode of preparation	Availability
<i>Annickia chloranta</i>	-mfo'o, njie (Ntoumou); -African yellow wood (c) - Moambe Jaune	Bark	-Treatment of sore -Treatment of ulcers -Antipyretic in treating fevers -Tuberculosis treatment -Against vomiting -Against fatigue -Rheumatism treatment -Treatment of jaundice and urinary tract infection	-Powder -Swapping -Crush bark and drink extract -Decoction -Decoction -Decoction in baths -Mouth and vapour baths -Decoction	Getting rare as it is over exploited
<i>Annona senegalensis</i>	- Wild custard apple (c) - Mvié élé	Bark Fruit	-Used in the treatment of fever and dysentery -Used as astringent for diarrhoea and dysentery; comestible	-Decoction -Unripe fruit and ripe fruit	Rare and is confined at the higher altitude
<i>Anonidium floribundum</i>	-Eboum, Libanga (Ntoumou) -Ebom	Fruit Root Root + bark Leaves	-Edible by animals -Poison-antidote -Used in the treatment of dysentery -Used in the treatment of dysentery and fevers	-Ripe and unripe fruit -Decoction -Decoction -Squeeze in water and drink as tea	Available
<i>Artabotrys arantiacus</i>	No information	No information	No information	No information	No information
<i>Artabotrys rhopalocarpus</i>	Bwasso (bakweri)	Sap	Used as aphrodisiac		Rare
<i>Artabotrys velutinus</i>	No information	No information	No information	No information	No information
<i>Boutiquea platypetala</i>		Leaves	To treat fresh wounds	Pounded fresh leaves	Rare
<i>Friesodelsia enghiana</i>	Lonkosso (Ntoumou)	Whole plant	Good for pains treatment	Prepared as decoction and taken as tea	Available
<i>Friesodelsia gracilipes</i>	Ntonda (Ntoumou)	- Bark -Wood	-Treatment of sore, ulcers, leprosy, skin infection, jaundice -Building	-Decoction -Planks from stems	Available

Table 1. Contd.

<i>Friesodelsia montana</i>	No information	No information	No information	No information	No information
<i>Greenwayodendron suaveolens</i>	- Black moambe (c) - Otounga (Ntoumou)	-Root -Leaves and bark -Whole	-Aphrodisiac and vermifuge -Treatment of areas feverish and rheumatism pains, -Treatment of headache, stomach ache constipation, hernia -Facilitate childbirth, make sterile women fertile -Ornamental	-Chew --Pulped leaves or bark mixed with the seed of <i>Aframomum meleguetta</i> (Zingiberaceae) and palm-oil -Juice from such a preparation is used as a nasal inhalation	Rare
<i>Isolona zenkeri</i>	No information	No information	No information	No information	Rare
<i>Meiocarpidium lepidotum</i>	No information	No information	No information	No information	No information
<i>Mischogyne elliotianum</i>	No information		No information	No information	No information
<i>Monanthotaxis foliosa</i>	No information	No information	No information	No information	Available
<i>Monodora brevipes</i>	-Yellow-flowered or flowering nutmeg (c) -Nom ending bilobi	-Bark -Seeds	-Used to prepare a purgative liquor -Used as condiment - medicine	-Decoction - Grind and put in the soup - seeds + <i>Xylopia africana</i>	Available
<i>Monodora crispata</i>	African nutmeg (c)	-Whole -Inflorescence Wood -Seed	-Ornamental -Decorative -Construction -Used as food-flavouring	Grind and use as spice	Available
<i>Monodora myristica</i>	-African nutmeg (c) -Ebom osoé petites feuilles	-Bark -Whole	-Treatment for hemorrhoids, stomach ache, and febrile pains -Ornamental	Prepared as a decoction	Available

Table 1. Contd.

<i>Monodora tenuifolia</i>	-African nutmeg (c) -Ebom osoé Grandes feuilles	-Fruit -Root -Bark and Root -Bark	-Edible -Used to treat toothache -Used to treat dysentery and fevers -Used as medicine for dogs	-Used as condiment -Clean the root, boil and rinse the mouth -Prepared as a decoction and used as enema	Available
<i>Pachypodanthium staudtii</i>	Ntuen, Ntom (c)	-Wood -Fruit -Bark	-Construction, plank, house poles, carpentry -Feed -Treatment of coughs -Arrow-poison ingredient	-Cut stems and use -Eaten by monkeys -Decoction -Add bark to arrow-poison mixture	Available
<i>Piptostigma fasciculata</i>	No information	No information	No information	No information	No information
<i>Piptostigma multinervum</i>		Bark	Arrow-poison ingredient	Add bark to arrow-poison mixture	Rare
<i>Piptostigma pilosum</i>		-Fruit -Bark	-Food -Construction of huts -arrow-poison ingredient	-Eaten by monkeys -Used pieces of the bark -Added to arrow-poison mixture	Rare
<i>Polyceratocarpus parviflorus</i>		Whole	-Wound treatment -Treatment for stomach pains -Gastric treatment	-Powder or poultice -Decoction and taken as enema Chew	Available
<i>Uvaria anonoides</i>	Iju, oko'aje (Igbo)	Root Root bark	Yellow fever treatment	Clean the root and root bark, boil them with spices and then the decoction drunk	Rare
<i>Uvaria baumannii</i>		-Fruits -Leaves -Bark -Whole	-Edible -Treatment of fever and jaundice -Treatment of gonorrhoea and cough -Used for bronchial trouble and for stomach ache -Old wound treatment	-Chew -Boiled with pepper ( <i>Capsicum frutescens</i> ) and rubbed on the skin -Decoction -decoction -powder or poultice	Rare
<i>Uvariastrum insculptum</i>	No information	No information	No information	No information	No information

Table 1. Contd.

<i>Uvariastrum pynaertii</i>	No information	No information	No information	No information	No information
<i>Uvariastrum zenkeri</i>	No information	Wood	Gun-stock		Very rare
<i>Uvariadendron connivens</i>	Igbere (Bakweri) Kwaadu (Ntoumou)	-Fruit -Leaves -Wood	-Lemon -Fever treatment -Gun-stock	-Steam bath -Stem	Very available
<i>Uvariadendron fuscum</i>	No information	No information	No information	No information	No information
<i>Uvariadendron giganteum</i>	Igbere (Bakweri)	Leaves	Fever treatment	Steam bath	Very available
<i>Uvariopsis barkeriana</i>	Ntala	-Wood -Whole	-Gun-stock -Firewood		Rare
<i>Uvariopsis dioica</i>	Ntala	Wood	Gun-stock		Rare
<i>Uvariopsis korupensis</i>		-Wood -Bark	-Gun-stock -Treatment of fevers and stomach-ache	-Decoction	Rare
<i>Xylopiya acutiflora</i>	Mbungu (Bakweri) Owongo (Ntoumou) Vini	-Bark -Wood	-Used to treat bronchio-pneumonia affections and for febrile pains -Used for paddles, to make doors, and partition of houses	- Prepared as a decoction	Available
<i>Xylopiya africana</i>	-African pepper, Guinea pepper (c) ( <i>Xylopiya aethiopica</i> ) -Hwenetia (Ghana)	-Fruit extract or bark -Bark	-Used in the treatment of bronchitis and dysentery conditions, medicine for febrile pains -Used to treat attacks of asthma, stomach aches and rheumatism	-Decoction -Bark steeped in palm-wine	Available
<i>Xylopiya quintasii</i>	Odjobi, odjobi nzam (Ntoumou)	Bark Fruit	Used for hut walls Treatment of broncho-pneumonia affections and febrile pains	Pieces of the bark Powder	Rare



Table 1. Contd.

<i>Xylopi</i>	-Odjobi, Odjobi nzam, Ntom (Ntoumou) -Fondé de marais (c)	-Bark -Wood	-Used as hut-walls -Hut construction		Rare
<i>Xylopi</i>	-Ntom, Odjobi (Ntoumou) -Bush pepper (c)	Bark	-Cold and headache treatment -Hut walls	-Powder -Pieces of the bark	Rare

The plant parts used were the bark, fruits, roots, leaves, wood, seeds, and flowers. In some cases, whole plants were used.

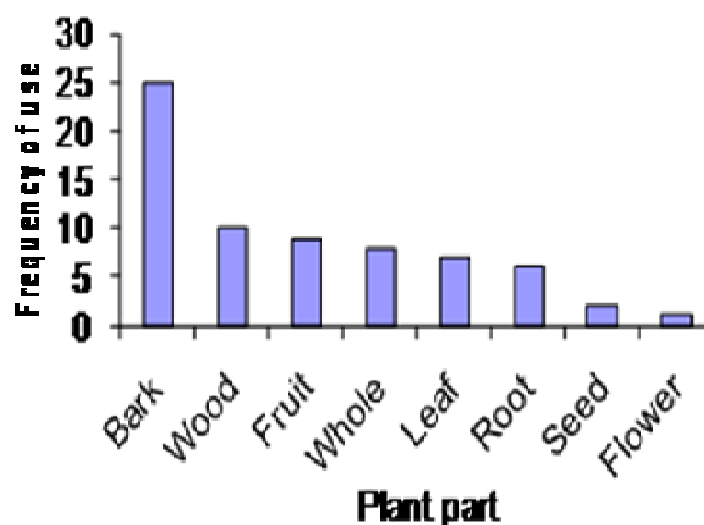


Figure 2. Frequency of usage of different plant parts.

plant (Figure 2).

The identification of wood as one of the parts most commonly used could be the reason of tree felling and so, leading to the threat of most of the species at various localities. During the research project it was also noted that some species, most especially *A. Chlorantha*, are under severe pressure due to their extensive uses. This plant is

common in the local markets. Since the forests in the study area falls outside the Permanent Forest Domain managed by the State, there is no check to conserve and protect these forests and the precious plant resources they contain. The area is highly disturbed and degraded due to fuel wood removal and most importantly to slash and burn agricultural practices.

Therefore, the area needs proper protection for the conservation and survival of bio-resources. Community participation could be initiated by creating awareness about the useful properties of medicinal plants and their commercial values. Moreover, to prevent rapid disappearance or extinction of some important medicinal species, efforts may be made to grow the sensitive species

such *A. Chlorantha*, *Uvaria anonoides*, by cultivating or domesticating them as many species can be considered as an asset for human beings (Hamayun et al., 2003). However, ethnodirected studies on other families as well as a nationwide survey of medicinal flora should be conducted to investigate and update the inventory of existing natural plants' resources of Cameroon.

### Preparation of medicinal remedies

Several methods were used in the preparation of traditional remedies. These included squeezing, grinding/ crushing, boiling (hot infusion), decoction, concoction, and paste.

The measurements used to determine the dosages were not standardized and depended on the age and physical appearance of the patient, sociocultural explanation of the illness, diagnosis and experience of individual herbalist. Children were given less than adults, such as, one fourth of a coffee cup (2 ml to 5 ml), whereas, an adult is given up to one glass (approximately 250 ml) depending on the type of illness and treatment.

The quantity of plant part used was measured by number of leaves, seeds and fruits, and length of root. The frequency of treatment depended on the type of illness and severity. In preparation of polyherbal medicines, each medicinal plant is dried, powdered and stored separately, and the amount taken from each for any given disease varies.

### Methods of application

Preparations from medicinal plants were either administered internally or externally.

#### Internal

This is through oral or inhaling vapour from decoction, infusion, or smoke. This form of administration is common for remedies for malaria, yellow fever, diarrhoea, dysentery, cough, anti-poison etc. The remedies are taken with water, skimmed milk, honey, and boiled coffee or fever grass.

#### External

This method of administration involves chewing and spitting, steam baths, compressing (plant part is crushed and applied directly to the skin), rubbing (plant parts are crushed and mixed with water or oil and rubbed on the body). This mode of application is commonly used in the treatment of swollen, fractures, abscesses, skin diseases, wounds, wedsors etc.

### Other uses

Apart of medicinal uses, some plants species were used in decoration and in construction (hut-wall). 13 species out of 41 were given no information.

### ACKNOWLEDGEMENTS

Special and heartfelt thanks go to all persons who contributed in one way or the other in making this work a success, most especially the local informants. We sincerely thank Nkakene Njoya Zouliatou for her useful comments especially English proof reading on early version of the paper. We are also very grateful to anonymous reviewers whose comments and suggestions have substantially improved the manuscript. Special thanks to the management of the Limbe Botanical and Zoological Gardens for their assistance, services, and facilities.

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