

Full Length Research Paper

Ethnobotany and phytomedicine of the upper Nyong valley forest in Cameroon

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This paper presents the results of an assessment of the ethnobotanical uses of some plants recorded in upper Nyong valley forest implemented by the Cameroon wildlife conservation society project (CWCS). Forestry transects in 6 localities, followed by socio-economic study were conducted in 250 local inhabitants. As results, medicinal information on 140 plants species belonging to 60 families were recorded. Local people commonly use plant parts which included leaves, bark, seed, whole plant, stem and flower to cure many diseases. According to these plants, 8% are use to treat malaria while 68% intervenes to cure several others diseases as described on. There is very high demand for medicinal plants due to prevailing economic recession; however their prices are high as a result of prevailing genetic erosion. This report highlighted the need for the improvement of effective management strategies focusing on community forestry programmes and aims to encourage local people participation in the conservation of this forest heritage to achieve a sustainable plant biodiversity and conservation for future posterity.

Key words: Conservation, ethnobotanical uses, diseases, posterity, Nyong valley.

INTRODUCTION

It is globally known that forest resources and its related environment should be managed in order to satisfy social, economic, ecological and cultural needs for the present and next generations. The problem of conservation includes research institutions, non-governmental organization (NGO), advocacy groups, etc. Regarding the non timber resources, forests are classified among the richest ecosystems and most stable of the planet (WWF, 2000). There is no doubt that forests world contain more than 50% of terrestrial biodiversity and the degradation of this heritage as their components continues at distressing rhythm (WWW, 2000; GFW, 2000; CIFOR, 2005). According to the forest degradation rhythm, many of these plant are subjected to run genetic erosion risk and are prone to disappear without being studied. The humid tropical forests are most destroyed because they undergo significant losses in living resources. In tropical countries the annual rate of deforestation is approximately 0.6%,

with a mean of about 7.3 million hectares (IUCN, 2007). At this rate, the humid tropical forests will be full destroyed within 160 years. In Cameroon, the upper Nyong vegetation has been greatly altered over the last two decade by natural events which increase climatic shifts. The major pressure arises from the manifold activities of man, which include uncontrolled timber exploitation, shifting agriculture and urbanization. There is enormous pressure on forest species as source of wood, food, medicine, traditional furniture, fuel wood, etc. as many people trade on their products (Jiofack and Ayissi, 2006). The rate of deforestation was put at about 250,000 ha per annum (Anonyme, 2000, 2006). Such large forest areas can not be dismissed as irrelevant to the conservation of species diversity because they support extensive biota. One of the problems of conservation is the large number of taxa, many seemingly of no practical value at the present. It is of common knowledge that a plant of known economic importance (such as food, folk medicine, shade etc) to a region is often not easily destroyed when clearing for agricultural or building purpose (Jiofack and Ayissi, 2006). With all the advances made in modern medicine,

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the practice of traditional medicine, as an adaptive self-reliant effort, is still very much alive and playing a very important role in the health care of Cameroonians. Although, there is very high demand for non forest timber products and timbers due to prevailing economic recession; however their prices are high as a result of prevailing genetic erosion. Hence it becomes very urgent to encourage the local people participation in the conservation of the forest heritage which is the source of these plants and their preservation for posterity of this cultural heritage. This paper therefore highlights some of the useful plants species recorded through the Cameroon wildlife conservation society (CWCS) project, and present their ethnobotanical uses, by the people in the upper Nyong valley to serve as a stimulus for the sustainable management of this valley through proper management policy.

METHODOLOGY

Site of study

The study was carried out within the two CWCS research areas. The first study sites were located near the villages Kwpanzé (04°23' 589" N and 012°37' 174" E) and Mbaka'a (04°02' 826" N and 012°23' 825" E) in the Ayos district, centre province of Cameroon. The second site was located in 4 villages of the upper Nyong division, east province of Cameroon. Specifically in the localities of Ndjibot (03°59' 031" N and 013°17' 559" E), Baiyong, (03°59' 972" N and 013°17' 084" E), Djamonmine (04°06' 942" N and 013°15' 105" E) and Oboul I (03°52' 875" N and 013°05' 503" E).

Floristic data sampling

The sampling mechanism based on transects allowed us to collect many plants species in each sites. These plants were displayed for enquiry from the guide or the village heads or any person familiar or have used the plants, the ethnobotany, local names and sometimes parts used and economic value if necessary. In addition, a certain number of information was recorded in our file, such as ecological data, geographic coordinates, biological type and useful status.

This sampling was supplemented by socio economic surveys carried out near the 1/3 of the households occupying these 6 localities. This allowed us to obtain ethnobotanical information from the villagers. At the end, to improve our sampling method, plants were collected from the forest and different sets of peoples such as traditional healers, old and knowledgeable people, family and village heads, farmers and others were interviewed. In each site, interviews carried out based on 40 local peoples and this permitted us to record more than 250 community interviewed peoples in these villages. Sometimes, visits were made to some communities botanical gardens around the valley to obtain information from them as well as different people who were interviewed.

Plants collected were identified directly in the field, the unknown plants were described using many books such as Vivien and Faure (1985), Letouzey (1985), Tailfer (1990), Wilks and Issembé (2000), Letouzey (1983, 1986), White (1989), Aubreville (1959), Pauwels (1993) and Blanc (1989). These scientific names were confirmed in the Yaounde national herbarium while the vernacular names were confirmed using the collection of vernacular names of some Cameroon woody species (Poame, unpublished)

RESULTS AND DISCUSSION

Inventories of 352 plants species belonging to 179 fami-

lies were recorded, as showed in Table 1.

Ranking the ethnobotanical values of the upper Nyong, the total number of medicinal plant was the highest (140 and 40%), followed by food plants (70 and 20%) and traditional furniture plants (47 and 13%) (Figure 1). Industrial plants inventory presented the following values (43 rubbers trees, 38 logged trees and 14 insecticidal plants, thus their respective % values were 12, 11 and 4%). According to the IUCN red data list (2007), 53 of these plants are endangered or threatened.

The Figure 1 above indicates the distribution of inventoried plants in the Upper Nyong valley during the survey. We can compare the size of distribution of all plants according to their useful or their ethnobotanical status. (n = 352 individuals for the total inventories). Medicinal plants were more represented (40%) in this inventory, followed by food plants as shown on graph (Figure 1).

However, the list is not exhaustive. The 40% representation of medicinal plants illustrates the abundant medicinal potentialities of the area. These medicinal plants were single, associated or mixed with other plants or drugs to cure several diseases, especially malaria, anaemia, abdominal painful, rheumatism, male sexual impotence, gonorrhoea, dysentery, headache, pneumonia, etc as shown in Figure 2. Malaria ranked highest amongst the ailments recorded with more than 8%, followed by abdominal pain (4%). Malaria has remained one of the greatest causes of debility and mortality in shifted zones of Cameroon, as well as over the world, despite all efforts being made to control it. In fact most of the villagers had some knowledge of using *Enantia chlorantha*, *Ageratum conyzoides*, *Bidens pilosa*, *Guibourtia tessmannii*, *Milletia sanagana*, *Picralima nitida*, *Rauvolfia vomitoria* and *Alstonia boonei* for the treatment of malaria, hence these plants ranked the highest amongst the ethnobotanical plants in the haut nyong valley. The percentage of 68% (Figure 2) is a proof that peoples of this regions use much of their biodiversity to cure several diseases, especially those named in Table 1.

Local populations following the example of Baka pygmies are true traditional healer because of their total useful of these diversified resources, which can be found in the natural habitat. More than 80% of them in the country, especially in forest regions cure themselves using indigenous plants. The trees ranked highest amongst the plant habits recorded in this work, probably because of their availability throughout the year, as well as different parts, such as stem-bark, root-bark, leaves and fruits being used, coupled by the fact that the valley is on the forest area, usually characteristic of a matured forest, followed by herbs because they are easily cultivated in home garden. In addition, vegetative parts were most commonly used in the medicinal application of ethnobotany. Than those reproductive parts as well as the whole plant parts. This observation is similar to that reported by Burkill (2000) and Adodo (2004). The practice of traditional medicine was relatively high because there was no

Table 1. Inventory of medicinal plants species used in traditional pharmacopoeia in the upper Nyong Valley.

Scientific names	Botanic families	Parts used	Therapeutic indications
<i>Abrus</i> sp.	Fabaceae	whole plant, leafy twigs, leaves	abdominal pains, metaphysical power, loss of appetite and intrauterine death
<i>Acanthospermum hispidum</i>	Asteraceae	leaves, leafy shoots	generalised oedema, amenorrhoea
<i>Acanthus montanus</i>	Acanthaceae	stem, leaves, tops	gonorrhoea, dysmenorrhoea, chronic ulcer, intestinal helminthiasis, pharyngitis, gastritis, epilepsy, dog bite
<i>Acnella caulirhiza</i>	Asteraceae	fruit	typhoid
<i>Aframomum melegueta</i>	Zingiberaceae	seeds, leaves	male sexual impotence, low abdominal pains, abscess, pneumonia, toothache, panacea for witchcraft and metaphysical power
<i>Azalia bella</i>	Caesalpinaceae	seeds	mumps
<i>Albizia adianthifolia</i>	Mimosaceae	leaves, bark, root	sterility, abscess, gonorrhoea and visual disturbance
<i>Albizia ferruginea</i>	Mimosaceae	leaves	pelvic inflammation diseases
<i>Albizia zygia</i>	Mimosaceae	leaves, stem bark	male sexual impotence, oedema and diarrhoea
<i>Alchornea cordifolia</i>	Euphorbiaceae	leaves, young shoot, stem	anaemia, dermatitis, panacea of witchcraft, malaria, dysentery and toothache
<i>Alchornea floribunda</i>	Euphorbiaceae	leaves	painful micturation in children
<i>Alchornea laxiflora</i>	Euphorbiaceae	leaves	dysentery, haemorrhoids and urinary tract infection
<i>Alstonia boonei</i>	Apocynaceae	bark, latex, leaves	malaria, hepatitis, intestinal helminthiasis, asthenia, panacea of witchcraft, snake bite and bronchitis
<i>Ampelocissus</i> sp.	Vitaceae	leaves and stem	menorrhagia and dystocia
<i>Amphimas pterocarpoides</i>	Caesalpinaceae	bark	napkin rash
<i>Anonidium mannii</i>	Annonaceae	stem bark	generalised oedema, dysmenorrhoea
<i>Anthocleista vogelii</i>	Loganiaceae	bark, leaves	diabetes and STD
<i>Antrocaryon klaineanum</i>	Anacardiaceae	bark	STD (sexual transmissible diseases)
<i>Aspilia africana</i>	Asteraceae	leaves, tops	protracted menstruation, gastritis, malaria and abdominal pains
<i>Azadirachta indica</i>	Meliaceae	seed, leaves, bark	malaria, typhoid and diabetes
<i>Baillonella toxisperma</i>	Sapotaceae	bark	anti-inflammation, male sexual impotence, lumbago, malaria, syphilis, hepatitis and anaemia
<i>Bidens pilosa</i>	Asteraceae	leaves	malaria, eyes painful and cough with grippe)
<i>Boerhavia coccinea</i>	Nyctaginaceae	leafy twig	Pneumonia
<i>Bridelia ferruginea</i>	Euphorbiaceae	bark	snake bite
<i>Bridelia micrantha</i>	Euphorbiaceae	young shoot, bark	constipation, abdominal pains
<i>Bryophyllum pinnatum</i>	Crassulaceae	leaves	splenomegaly, metaphysical powers
<i>Buchholzia coriacea</i>	Capparaceae	seed and leaves	malaria, dystocia
<i>Canarium schweinfurthii</i>	Burseraceae	latex, root	panacea of witchcraft, cough
<i>Canthium</i> sp.	Rubiaceae	stem	Ascariasis
<i>Capsicum frutescens</i>	Solanaceae	fruits	loss of appetite, abdominal pains, intestinal helminthiasis, wounds, panacea of witchcraft, toothache and gastritis
<i>Carapa procera</i>	Meliaceae	bark	Malaria
<i>Cayratia debilis</i>	Vitaceae	leaves and stem	Oligospermia
<i>Ceiba pentandra</i>	Bombacaceae	bark, leaves, root	AIDS, diabetes, abdominal pains and gastralgia

Table 1. contd.

<i>Centella asiatica</i>	Apiaceae	leaves	pharyngitis, dysmenorrhoea convulsion
<i>Chenopodium ambrosioides</i>	Chenopodiaceae	tops, leaves	malaria, epilepsy, abdominal pains, intestinal helminthiasis
<i>Chlorophora excelsa</i>	Moraceae	bark	eyes painful, abdominal pains, typhoid and malaria
<i>Cissampelos owariensis</i>	Menispermaceae	leaves	Wounds
<i>Cissus</i> sp.	Vitaceae	leaves	malaria and nappy / diaper rash
<i>Clerodendron splendens</i>	Verbenaceae	leaves	yellow fever, panacea of witchcraft
<i>Combretodendron macrocarpum</i>	Lecythidaceae	bark	dysentery in children
<i>Combretum hispidum</i>	Combretaceae	young leaves, leafy twig	urinary tract infection, diarrhoea
<i>Combretum smeathmannii</i>	Combretaceae	stem and leaves	Dysentery
<i>Commelina benghalensis</i>	Commelinaceae	whole plant	headache and typhoid
<i>Cordia platythirsa</i>	Boraginaceae	leaves	Convulsion
<i>Costus afer</i>	Zingiberaceae	rhizomes, leaves	cough, headache, eyes worm diseases, malaria, threatened abortion, fever, oedema, dermatitis and pharyngitis
<i>Crossopterix febrifuga</i>	Rubiaceae	leaves, bark	sterility, ovarian cyst, syphilis and threatened abortion
<i>Croton oligandrum</i>	Euphorbiaceae	bark	pneumonia and splenomegaly
<i>Cylicodiscus gabonensis</i>	Mimosaceae	bark	headache and rheumatism
<i>Desmodium adscendens</i>	Fabaceae	whole plant, leaves	cough, dysentery, abdominal pains, haemorrhoids and urinary tract infection
<i>Detarium microcarpum</i>	Caesalpiniaceae	stem bark	Vulvovaginitis
<i>Dichapetalum gabonense</i>	Dichapetalaceae	root bark	Toothache
<i>Dissotis rotundifolia</i>	Melastomataceae	tops, leaves	gastritis, diarrhoea, dysentery, abscess and pneumonia
<i>Dracaena deisteliana</i>	Agavaceae	stem	Toothache
<i>Drypetes</i> sp.	Euphorbiaceae	bark	reinforcing, bewitchment
<i>Elaeis guineensis</i>	Arecaceae	young leaves	syphilis, gonococci
<i>Emilia coccinea</i>	Asteraceae	leaves, leafy twigs	jaundice, abdominal pains, eye worm disease, gastritis, dysmenorrhoea gastritis and wounds
<i>Enantia chlorantha</i>	Annonaceae	stem bark	hepatitis, malaria, jaundice, urinary tract infection and typhoid
<i>Eremomastax speciosa</i>	Acanthaceae	stem, leaves, roots, aerial part	anaemia, irregular menstruation, dysentery, labour pain, fracture, metaphysical power, cough, constipation, haemorrhoids, urinary tract infection
<i>Eryngium foetidum</i>	Apiaceae	whole plant	poisoning, gastritis
<i>Erythrococca anomala</i>	Euphorbiaceae	leaves	Toothache
<i>Erythrophleum ivorense</i>	Caesalpiniaceae	stem bark	Wounds
<i>Funtumia elastica</i>	Apocynaceae	bark, stem	malaria, abscess
<i>Gambeya lacourtiana</i>	Sapotaceae	bark and leaves	male sexual impotence and
<i>Garcinia cola</i>	Clusiaceae	fruit	wounds gastritis, malaria,
<i>Gardenia aqualla</i>	Rubiaceae	roots	abdominal pain Dysmenorrhoea
<i>Globimetula braunii</i>	Loranthaceae	leaves, bark	gout, panacea of witchcraft, intestinal wounds
<i>Glyphea brevis</i>	Tiliaceae	young stem, leaves	panacea for metaphysical powers, poisoning and hepatitis
<i>Guarea cedrata</i>	Meliaceae	bark	stomach-ache, food poisoning and gonorrhoea, kidney pain, bleeding after childbirth, rheumatism and leprosy
<i>Guibourtia tessmannii</i>	Caesalpiniaceae	bark, leaves, fruit	malaria, anaemia, typhoid, haemorrhoids, lumbago, cancer, STD, hepatitis, panacea of witchcraft

Table 1. contd.

<i>Harungana madagascariensis</i>	Hypericaceae	root bark, stem bark	irregular menstruation, dysentery, female infertility and pharyngitis
<i>Hibiscus asper</i>	Malvaceae	whole plant	female infertility
<i>Hibiscus rosa-sinensis</i>	Malvaceae	leaves	Dystocia
<i>Hibiscus surattensis</i>	Malvaceae	aerial parts	Polyhydramnios
<i>Hyptis suaveolens</i>	Lamiaceae	stem with leaves	Epilepsy
<i>Kalanchoe crenata</i>	Crassulaceae	leaves, tops, stem	conjunctivitis, chest pain, deafness, cancer, haemorrhoids, male sexual impotence
<i>Klainedoxa gabonensis</i>	Irvingiaceae	bark	female infertility
<i>laggera alata</i>	Asteraceae	leaves	Fever
<i>Lannea welwitshii</i>	Anacardiaceae	bark	arterial hypertension
<i>Laportea ovalifolia</i>	Urticaceae	shoot	poison, fontanels, flatulence
<i>Lasianthera africana</i>	Icacinaceae	leaves	female infertility
<i>Lophira alata</i>	Ochnaceae	bark	Toothache
<i>Macaranga spinosa</i>	Euphorbiaceae	bark and leaves	Filariasis
<i>Mammea africana</i>	Clusiaceae	bark	constipation, threatened abortion, syphilis and gonorrhoea
<i>Margaritaria discoidea</i>	Euphorbiaceae	bark	Lumbago
<i>Milicia excelsa</i>	Moraceae	leaves, bark	splenomegaly, otitis, irregular menstruation and constipation
<i>Milletia sanagana</i>	Fabaceae	root	Malaria
<i>Momordica charantia</i>	Cucurbitaceae	whole plant, leafy twigs	epilepsy, abdominal pains, female infertility and headache
<i>Monodora myristica</i>	Annonaceae	stem bark	panacea of witchcraft
<i>Morinda lucida</i>	Rubiaceae	bark	abdominal pains, dysmenorrhoea and splenomegaly
<i>Myrianthus arboreus</i>	Cecropiaceae	bark, leaves	anaemia, cough, digestive disorder threatened
<i>Nauclea pobeguinii</i>	Rubiaceae	bark	abortion
<i>Newbouldia laevis</i>	Bignoniaceae	bark	Splenomegaly
<i>Octolobus angustatus</i>	Solanaceae	bark	male sexual impotence
<i>Olax gambecola</i>	Olacaceae	whole plant	Ovarian cyst
<i>Paulinia pinnata</i>	Sapindaceae	stem with leaves	generalized oedema and rheumatism
<i>Pennisetum, purpureum</i>	Poaceae	leaves, shoot	Epilepsy
<i>Pentaclethra macrophylla</i>	Mimosaceae	fruit, bark	cardio-vascular diseases, rheumatism, malaria, headache and snake bite
<i>Pentadiplandra brazzeana</i>	Pentadiplandraceae	leaves	diarrhoea
<i>Phragmantera capitata</i>	Loranthaceae	leaves	abscess, malaria, STD
<i>Physalis angulata</i>	Solanaceae	leaves, fruits	generalized oedema, amoebic dysentery and boils
<i>Picralima nitida</i>	Apocynaceae	bark, fruit	male sexual impotence, malaria, typhoid, poisoning, anaemia, jaundice and dysmenorrhoea
<i>Piper guineensis</i>	Piperaceae	whole plant	threatened abortion
<i>Piper umbellatum</i>	Piperaceae	leaves, tops, roots	poisoning, foetal malpresentation, filariasis, rheumatism, haemorrhoids, metaphysical power and dysmenorrhoea
<i>Piptadeniastrum africanum</i>	Mimosaceae	bark	rate, rheumatism, malaria, male sexual impotence and visual disturbance
<i>Polyalthia suaveolens</i>	Annonaceae	bark	Dysmenorrhoea
<i>Portulaca oleraceae</i>	Portulacaceae	shoot with leaves	headache, poisoning
<i>Premna quadrifolia</i>	Verbenaceae	leaves and stem	female infertility and haemorrhoids
<i>Psyidium guajava</i>	Myrtaceae	leaves	diarrhoea, amoebic dysentery, malaria and dermatitis

Table 1. contd.

<i>Pteridium aquilinum</i>	Densteidiaceae	flowers	Haemorrhoids
<i>Pterocarpus soyauxii</i>	Fabaceae	bark	anaemia and gastralgia
<i>Pycnanthus angolensis</i>	Myristicaceae	shoot, bark, leaves	fever, anaemia and dysentery
<i>Rauvolfia vomitoria</i>	Apocynaceae	stem bark, root, leaves	jaundice, malaria, dysmenorrhoea, intestinal helminthiasis, urinary tract infection and splenomegaly
<i>Ricinus communis</i>	Euphorbiaceae	leaves, tops	dizziness, poisoning and female infertility
<i>Rothmania octomera</i>	Rubiaceae	leaves and bark	urinary tract infection
<i>Scoparia dulcis</i>	Scrophylariaceae	leaves, aerial parts, whole plant	gastroenteritis, rheumatism, good luck charm, wounds and generalized oedema
<i>Scorodophleus zenkeri</i>	Caesalpiniaceae	stem bark	loss of appetite, abdominal pains
<i>Securidaca longepedunculata</i>	Polygalaceae	shoot bark, root	snake bite, ovarian cyst, gonorrhoea
<i>Senna alata</i>	Caesalpiniaceae	young leaves, stem bark	constipation, jaundice, intestinal helminthiasis, food poisoning, fever
<i>Senna hirsuta</i>	Caesalpiniaceae	leaves, roots	generalised oedema, malaria and hernia
<i>Solanum torvum</i>	Solanaceae	fruits and bark, leaves	female infertility, gastritis, poisoning and pneumonia
<i>Solenostemon monostachyus</i>	Lamiaceae	leaves	panacea of witchcraft in children and abdominal pains
<i>Sonchus angustissimus</i>	Asteraceae	tops, aerial parts, stem	menorrhagia, foetal malpresentation, male sexual impotence, haemorrhage
<i>Spathodea campanulata</i>	Bignoniaceae	bark, leaves	malaria, rate, cold, hepatitis, gastralgia
<i>Strychnos</i> spp.	Loganiaceae	bark	Asthenia
<i>Tapinanthus bangwensis</i>	Loranthaceae	leaves, shoot	snake bite, STD, panacea of witchcraft
<i>Tephrosia vogelii</i>	Fabaceae	bark	Menoxenia
<i>Terminalia superba</i>	Combretaceae	bark	Haemorrhoids
<i>Tetrapleura tetraptera</i>	Mimosaceae	fruit, root tuber	abdominal pains, placental retention, epilepsy, vomiting and poisoning
<i>Trema guineensis</i>	Ulmaceae	leaves	male sexual impotence
<i>Trichilia rubescens</i>	Meliaceae	bark, shoot	fever, gonorrhoea, antiseptic
<i>Trichilia</i> sp.	Meliaceae	root bark	STD, female infertility
<i>Uapaca</i> sp.	Euphorbiaceae	bark, root, fruit	malaria, panacea of witchcraft
<i>Urera cordifolia</i>	Urticaceae	leaves	urinary tract infection
<i>Urera gabonensis</i>	Urticaceae	stem	Abscess
<i>Vernonia guineensis</i>	Asteraceae	root	epilepsy, menoxenia, aphrodisiac
<i>Vitex doniana</i>	Verbenaceae	bark	Syphilis
<i>Voacanga africana</i>	Apocynaceae	leaves, seed, bark	deafness, STD, orchitis, poisoning, gonorrhoea
<i>Zanthoxylum zanthoxyloides</i>	Rutaceae	roots and root bark	toothache and cardiopathy
<i>Zanthoxylon gillettii</i>	Rutaceae	bark	defective lactation and male sexual impotence
<i>Zehneria scabra</i>	Cucurbitaceae	leaves, root, whole plant	abdominal pain, female infertility, dysmenorrhoea and urinary tract infection

standard hospital around this valley. In serious cases and when traditional medicine might have failed, the patients were rushed to the hospital. Obviously, the practice of traditional medicine is playing a very important role in the health-care of this region. The practice aims at taking care of oneself within one's own means. Most ethnobotanical plants in and around the valley were being harvested from their natural habitats, for various medicinal preparations and only a very few herbal practitioners had their plants in homestead. Such a practice coupled with the shift to traditional medicine has adverse effects on the forest resources and has also hiked the cost of herbal plants (Jiofack and Ayissi, 2006).

Conclusions

According to the abundant living resources of this valley, the results illustrate the crucial needs of a higher local sustainable conservation in order to increase food safety in this part of the country where, people depend more or less directly on the forest products. They use more than three hundred plants species to cure several current diseases. It is known that 25 % of compounds derive from living resources found in tropical forests; there is a new chance that they can shelter a great number of treatments against several diseases. There are still more secrets to be discovered in the humid tropical forest; how-

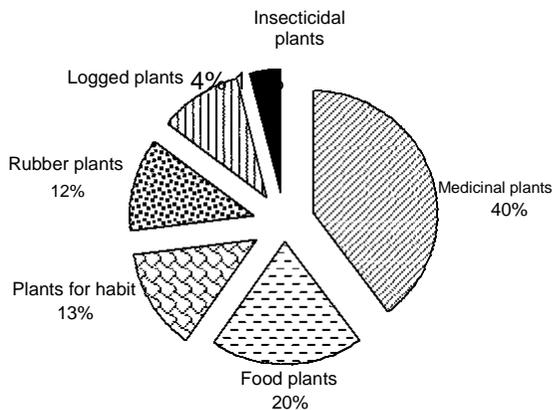


Figure 1. Ethnobotanical distribution patterns of plants inventorised in the Haut Nyong valley and its environs.

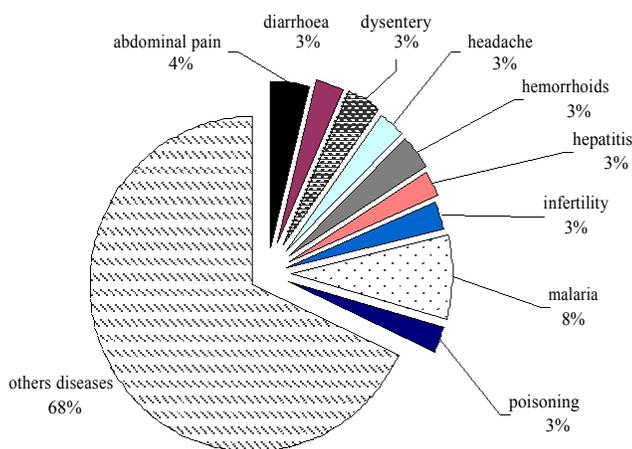


Figure 2. Ethnobotanical uses of some medicinal plant in upper Nyong valley.

ever the deforestation and destruction of these ecosystems due to various human activities increase the risk of disappearance of many species before even as they could be analyzed. This study shows the necessity to bring out an effective strategies or the adoption of an agricultural system of production to improve local development communities, which will facilitate sustainable management of these resources vis-à-vis the populations and will be used as mediators between peasants and other users, sensitizing, education, training and setting-up of exchanges networks.

The upper Nyong valley at the moment has no forest management policies involving the communities. There is the need for environmental education of the communities and their involvement in the valley management policy formulation and implementations. A good system of resources management should also be established by the creation of a community farms and the development of protected forest network, implying at the same time *in situ*

and *ex situ* conservation from the present resources. This system of management allows a sustainable conservation of living resources due to the fact that the direct bordering peoples do not have hand above and if that is the case, the exploitation remains controlled. That would be the same concerning any forest owners who must officiate according to the standards and regulations in force. However, according to these bases, this participative and monitoring system constitutes a saving support for the endangered biodiversity of the haut Nyong valley.

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