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

Table 1. contd.

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

Table 1. contd.

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

Table 1. contd.

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

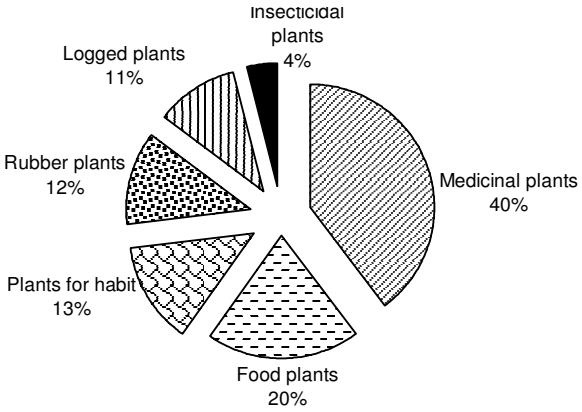

Figure 1. Ethnobotanical distribution paterns of plants inventorised in the Haut Nyong valley and its environs.

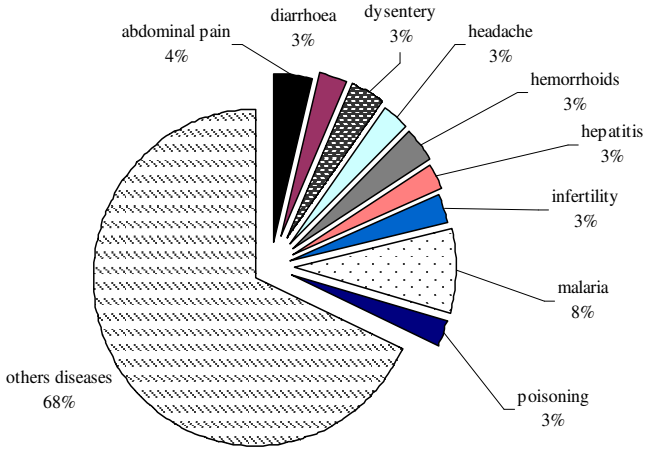

Figure 2. Ethnobotanical uses of some medicinal plant in upper Nyong valley.

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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