

*Full Length Research Paper*

# Ethnobotany and phytopharmacopoea of the South-West ethnoecological region of Cameroon

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**This study highlight the use, commercialisation, cultivation, and conservation status of the major medicinal plants within the South-West and Littoral ethnoecological regions of Cameroon. The methodology was generally based on direct interview or discussion with the main stakeholder. More than 177 plants (lianas, trees, shrubs and herbs) belonging to 80 families are being used as medicine, several are sold as crude material. The propagation and domestication of the very useful medicinal plants, including the threatened species (*Prunus Africana*), in the region is neglected. It is important to initiate programs for the establishment of medicinal plant gardens both for livelihood improvement as well as for conservation purposes.**

**Keys words:** Phytopharmacopoea, medicinal plants, ethnoecological region, herbal market, threatened species.

## INTRODUCTION

Medicines derived from plants play an important role in traditional health care systems as well as in international herbal and pharmaceutical markets. History provides numerous examples of how this has led to the over exploited and extinction of plant species.

In Africa, traditional medicine occupies an important place in our socio-economic lives; about 70% of the population in our African countries depends on traditional medicine. In Cameroon, commercialisation of traditional medicine is still not organised. Its integration in the health system is not effective, despite the numerous herbalists and the increasing number of modern traditional clinics (Nkongmeneck et al., 2007).

This Ethnobotanical study in the South West and the Littoral provinces involve the uses, commercialisation, domestication, distribution, and conservation status of medicinal plants. The paper aims to identify important

plants to be conserved in the region, with reference to the International Union of Conservation of Nature (IUCN, 2007) list and to build up a state-of-knowledge on medicinal plant gardens in the region.

## METHODOLOGY

The present study takes place in two ethnoecological region of Cameroon between 08°-11°02' E and 03°68'-05°47' N (Figure 1). Information on past research or surveys on medicinal plants and related issues such as general non timber forest product (NTFP) and ethno botany surveys respectively was gathered from the libraries of individuals and institutions such as the Limbe Botanic Garden (LBG), Forests, Resources and People (FOREP), World Botanical Exchange and Services (WBES) and the Centre for the Environment and Rural Transformation (CERUT).

Structured questionnaires were further applied to three main classes of people involved in medicinal plants, these include; traditional practitioners or herbalists, medicinal plants gardeners and medicinal plant traders. This methodology however, had modifications according to the field conditions. In areas were the people are not welcoming or comfortable with questionnaires, more of informal discussions were held with such and this occurred very

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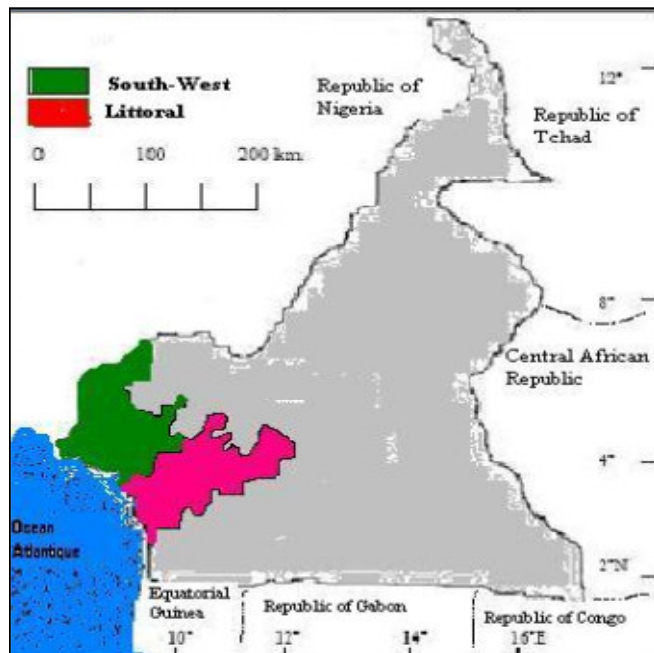


Figure 1. The research areas

often. As such, most of the information gathered was through informal discussions and observations, resulting to limited quantitative data.

## RESULTS AND DISCUSSIONS

A total number of 177 medicinal plants have been recorded within more than 80 botanic families (Table 1). Medicinal plants are harvested from the forests, fallow and farmland and sometimes in home gardens around the compounds. Usually all the parts, such as leaves, stem, seeds, bark, fruits, roots and sometimes flowers of the plant are used (Table 2). But this depends on the user and the particular need and to some extent the type of plant. Herbs for example are most often used whole meanwhile only some parts of large trees, such as; the bark, the leaves and the roots are used. These parts are sometimes ground fresh or dry, boiled with water and/or palm wine in different mixtures and proportions, consumed raw, mixed with palm oil or honey or processed industrially for the production of medicines. The final products could be drunk, applied to the skin or wounds as paste, tied around the body, inhaled or used for bathing. Dosages vary, depending on the end product and they are not standardised.

### Types of plants used as medicine

Almost 100% of the herbalists visited use very common herbs and trees around the houses and farmland for medicine. Some also use very commonly cultivated vege-

tables and fruits such as; onions, ginger, garlic, pawpaw, lemon, limes, bitter leave and other leafy vegetables. About 80% of the herbalists make use of barks of forest trees such as Pygeum (*Prunus africana*), king stick, mahogany and yellow canda (*Enantia chlorantha*) as well as roots of trees such as ebony (*Diospyros* sp) (Nkuinkeu, 1998, 2000).

Generally a mixture of more than one plant is administered to the patients. This also is the case with the herbalists operating 'modern traditional clinics' who actually package their herbs separately or blended together (e. g: Doctor's Prince Aimé and Moherbs). The composition of these packets is ambiguous (Jiofack et al, 2007). Only the species names of plants such as 'africana' or 'aethiopica' are indicated, which is obviously shared by many different plants of the region (Comesky et al., 2003).

Some herbalist mentioned that they used basically common vegetables cultivated around farms and home gardens (Table 1, 2). Some plants are widely used locally in most parts of these regions; e.g. *E. chlorantha* is widely known for its ability to treat 'fevers' and therefore is mentioned as medicine in most villages (Sunderland et al., 2002; Cheek et al., 2004; Cox, 1991; Duncan et al., 1989). Common herbs such as *Emilia coccinea*, *Argemone conyzoides* and *Ocimum gratissimum* are also widely known for their medicinal values (Nkuinkeu et al., 2007). Also, many plants can be found and harvested according to the traditional healer recommendation or suffering pathology (Nkongmeneck et al., 2007).

### Diseases and illnesses treated

Here, 12 therapeutic indications such as child diseases, digestive diseases, eyes worm pains, female sexual diseases, male sexual diseases, musculo-skeletal diseases, nervous diseases, respiratory diseases, skin diseases, snake bite, STD and others have been defined previously. In very rare cases the herbalists are specialised in the treatment of certain illness such as madness and broken bones. Majority acknowledge that they treat all sorts of illnesses. It was also realised that some categories of herbalist treat patients according to directions from their 'spiritual leaders'. In such cases, the same illness in two different people is treated with different herbs (Adjanohoun et al., 1996). That is if a particular herb worked for patient A with fibroid, it might not necessarily work for patient B with the same complain (Raponda and Sillans, 1961).

### Commercialisation

Twenty four plants are recognized as commercialised plants in these regions (Table 2). Within the area, there are different categories of people involved in the commercialisation of medicinal plants. It is very common to find people in public places and markets selling different variety of plants. This category sells ordinary (unprocessed)

**Table 1.** Keck-list of medicinal plants species inventoried during the survey.

Scientific names of plants	Diseases	Parts used	Mode of preparation	Therapeutic indications
<i>Abrus precatorius</i>	Cough, Catarrh	Fruit, leaves	decoction, infusion	respiratory diseases
<i>Acalifa</i> sp.	Toothache, fever, dermatitis	leaves	decoction	digestive diseases
<i>Acanthus montanus</i>	Abdominal pains, boils, abscess	Leaves	decoction	digestive diseases
<i>Acmella caurlirhiza</i>	Typhoid, boils, toothache	fruits	maceration	digestive diseases
<i>Aframomum limbatum</i>	Wounds	Fruit, leaves	plasters	others diseases
<i>Aframomum melegueta</i>	Magnifies the uses of other medicines, typhoid, infected wound, stimulant	Seeds, leaves, rhizome, fruits, roots	decoction	others diseases
<i>Afzelia bipindensis</i>	heart ache, ear ache	bark	decoction	others diseases
<i>Agelanthus djurensis</i>	Menopause, cancer, fibroids	leaves	decoction	female sexual diseases
<i>Ageratum conyzoides</i>	Headache, night poison, quick delivery, gastritis	leaves	decoction	others diseases
<i>Albizia zygia</i>	Boils, diarrhoea, fracture	Stem, leaves	decoction	skin and cutaneous diseases
<i>Alchornea cordifolia</i>	Toothache, ear ache, excess amniotic fluid	Stem, bark	decoction	skin and cutaneous diseases
<i>Alchornea floribunda</i>	Anaemia, lumbago, arthritis	Stem, leaves	maceration	others diseases
<i>Allanblackia floribunda</i>	Hernia, oedema	Fruits, seeds	maceration	male sexual diseases
<i>Allium cepa</i>	Sexual weakness, rheumatism	rhizome	decoction	male sexual diseases
<i>Allium sativum</i>	hypertension	rhizome	decoction	others diseases
<i>Aloe Vera</i>	Malaria, wounds, dermatitis, poisoning	Leaves	decoction	others diseases
<i>Alsodeiopsis weissenborniana</i>	Venereal diseases, headache, fever	Leaves	infusion	STD
<i>Alstonia boonei</i>	Malaria, worms, fracture, lactation failure, chest pains, diarrhoea	Bark, latex, leaves	decoction	others diseases
<i>Anthocleista vogelii</i>	Diabetes, wounds, inflammation, venereal diseases	Stem bark, leaves	decoction	others diseases
<i>Harungana madagascarensis</i>	Haemorrhoids, colds	bark	decoction	digestive diseases
<i>Artemisia annua</i>	Malaria, fatigue	Leaves, stem	infusion	others diseases
<i>Artocarpus altitis</i>	Malaria, typhoid, haemorrhoids	fruits	decoction	others diseases
<i>Aspilia africana</i>	Fever, worms, backage	Leaves, stem	decoction	others diseases
<i>Asystasia gangetica</i>	Vomiting	whole plant	decoction	digestive diseases
<i>Azadirachta indica</i>	Malaria, mosquito repellent, typhoid, intestinal worms	Seeds, leaves, bark	decoction	others diseases
<i>Baillonella toxisperma</i>	Related to child birth, rheumatism	Fruit, bark	decoction	child diseases
<i>Begonia</i> sp	Night poison	Fruit, bark	decoction	others diseases
<i>Bidens pilosa</i>	Periodic fever, malaria	Leaves, branches	decoction	others diseases
<i>Biophytum</i> sp	cough	Fruit , leaves , bark	decoction	respiratory diseases
<i>Bridelia micrantha</i>	Dermatitis, conjunctivitis, rheumatism	Whole plant	powder	skin and cutaneous diseases
<i>Bryophyllum pinnatum</i>	Antiseptics, ear and eye infection, boils, abscess, headache, cough	Leaves, roots	maceration	others diseases
<i>Caladium bicolor</i>	Vaginal inflammation	Leaves, tuber	decoction	female sexual diseases
<i>Canarium schweinfurthii</i>	Gastritis, asthma, dermatitis	Leaves, bark, rhizome	decoction	digestive diseases
<i>Capsicum frutesens</i>	Purgative, enhancer of other herbs, blood circulation	fruits	decoction	digestive diseases
<i>Carapa procera</i>	Rheumatism,	fruits	decoction	musculo-skeletal diseases

Table 1.contd

<i>Carica papaya</i>	Hypertension, malaria, worm expeller	Whole plant	decoction	others diseases
<i>Cassia occidentalis</i>	Fever , typhoid, laxative, malaria	Seeds, leafy stem	decoction	others diseases
<i>Cassia alata</i>	Expels worms, eyes worm diseases, fever, fast delivery, yellow fever	leaves	decoction	digestive diseases
<i>Ceiba pentandra</i>	AIDS, chest pains, purgative, heart palpitations, diabetes gastritis	Bark, leaves, roots	decoction	STD
<i>Centella asiatica</i>	Vomiting, appendicitis	Whole plant	decoction	digestive diseases
<i>Chlerodendron scandens</i>	convulsion	Leafy stem	decoction	child diseases skin and cutaneous diseases
<i>Chromolaena odorata</i>	Fresh wounds	Leaves, sap	plasters	diseases
<i>Cinnamomum verum</i>	cough	bark	decoction	respiratory diseases
<i>Citrus medica</i>	Filariasis, kidney inflammation, rheumatism	fruits	decoction	skin and cutaneous diseases
<i>Clausena anisata</i>	gastroenteritis	Leaves stem	decoction	digestive diseases
<i>Cleome ciliata</i>	Irregular menstrual cycle, breast infection, heart ache	Leafy stem	decoction	female sexual diseases
<i>Coffea robusta</i>	Change of sex at child birth	flower	decoction	child diseases
<i>Cola nitida</i>	Stimulant, worm expeller, gastritis, rheumatism, chest pains	Seed, leaves, bark, roots	eating	nervous diseases
<i>Commelina benghalensis</i>	Ease child birth, ring worms, typhoid, blood clotting, headache	Whole plant	decoction	child diseases
<i>Corchorus olitorius</i>	childbirth	leaves	infusion	child diseases
<i>Costus afer</i>	Conjunctivitis , cough	Leafy stem	decoction	eyes worm pains musculo-skeletal diseases
<i>Coula edulis</i>	Rheumatism, dermatitis	fruits	eating	diseases
<i>Crinum purpurascens</i>	Wounds, dysentery , piles	tuber	powder	others diseases musculo-skeletal diseases
<i>Croton longiracemosus</i>	Measles, gastritis, dermatitis	Seed and leaves	decoction	diseases
<i>Crudia senegalis</i>	ear ache, antiseptics	leaves	decoction	others diseases
<i>Cucurbita maxima</i>	Aphrodisiac, sexual stimulant	leaves	decoction	nervous diseases
<i>Cymbopogon citratus</i>	Malaria, typhoid, cough	leaves	decoction	others diseases
<i>Cynodon dactylon</i>	Dizziness, hypertension, rib pains	leaves, bark, roots	decoction	nervous diseases
<i>Dacryodes edulis</i>	Snake bite	leaves	plasters	snake bite
<i>Desmodium sp</i>	Dysentery, piles	Stem, leaves	decoction	digestive diseases
<i>Dichrocephala integrifolia</i>	eyes worm diseases, conjunctivitis	Stem, leaves	decoction	others diseases
<i>Diospyros sp</i>	madness	roots	decoction	nervous diseases
<i>Dissotis rotundiflora</i>	Cough, dysentery, conjunctivitis, enteritis, catarrh	Leafy stem	decoction	respiratory diseases
<i>Dorstenia sp</i>	Aphrodisiac, sexual stimulant	Root	eating	nervous diseases
<i>Drynaria cordata</i>	Malaria, diabetes	Leaves, root	decoction	others diseases
<i>Elaeis guineensis</i>	Syphilis, gonorrhoea	Young palm leaves	decoction	STD
<i>Eleusine indica</i>	wound dressing, cough, fatigue	Whole plant	decoction	skin and cutaneous diseases
<i>Elytraria marginata</i>	wounds	leaves	powder	skin and cutaneous diseases
<i>Emilia coccinea</i>	Gastritis, ear ache, convulsion	leaves	decoction	digestive diseases
<i>Enantia chlorantha</i>	Malaria	bark	decoction	others diseases
<i>Entandophragma angolense</i>	Diarrhoea, bellyache	bark	decoction	digestive diseases
<i>Eremomastax speciosa</i>	generalised pains, dermatitis	leaves	decoction	others diseases
<i>Erythrina excelsa</i>	Catarrh, arthritis	Stem, leaves	decoction	others diseases

Table 1.contd

<i>Eryngium foetidum</i>	Abscess, boils	Leaves	plasters	skin and cutaneous diseases
<i>Erythrococca africana</i>	Gastritis, dysentery	Roots, leaves seeds	decoction	digestive diseases
<i>Eucalyptus Camaldulensis</i>	Cough, catarrh	Leaves	decoction	respiratory diseases
<i>Eulophia horsfalli</i>	Bleeding piles	stem bark	decoction	others diseases
<i>Euphobia hirta</i>	Diarrhoea, gastritis, poisoning, diabetes	Whole plant	decoction	digestive diseases
<i>Ficus exasperata</i>	Heart ache, ear ache, poisoning	leaves	decoction	others diseases
<i>Gambeya africana (Chrysopyllum delevoiy)</i>	Malaria, constipation, typhoid	fruit	infusion	others diseases
<i>Garcinia kola</i>	Cough, gastritis, sleeping sickness, stimulant, gastroenteritis, speeds lactation	Bark, seeds, roots	decoction	respiratory diseases
<i>Garcinia lucida</i>	Indigestion, flatulence, stimulant, diarrhoea, gastritis, gastralgia	Bark, seeds, leaves	decoction	digestive diseases
<i>Garcinia mannii</i>	Gastralgia, malaria, laxative, joint pains, cracks in foot	Fruit, leaves, bark, roots, latex	decoction	digestive diseases
<i>Gnetum africanum</i>	Widlow, Ease child birth	Leaves	decoction	others diseases
<i>Gossypium arboreum</i>	Typhoid	Leaves	decoction	digestive diseases
<i>Guibourtia tessmannii</i>	cancer	bark	decoction	others diseases
<i>Harungana madagascariensis</i>	Poisoning, diarrhoea	leaves	decoction	others diseases
<i>Helianthus annuus</i>	Piles	Leaves, flowers	decoction	others diseases
<i>Hibiscus rosa-sinensis</i>	Diarrhoea, dysentery	leaves	decoction	digestive diseases
<i>Hibiscus surattensis</i>	Palpitation, gastralgia	Leaves, flower	decoction	others diseases
<i>Impatiens sp</i>	Infertility, dysmenorrhoea	Stem, leaves	decoction	female sexual diseases
<i>Impomea sp.</i>	colds	leaves,	powder	skin and cutaneous diseases
<i>Jateorhiza micrantha</i>	dysmenorrhoea	Stem	decoction	female sexual diseases
<i>Jatropha curcas</i>	Rheumatism, dermatitis	Stem, sap	maceration	musculo-skeletal diseases
<i>Kalenchoe crenata</i>	Pneumonia, nose bleeding	leaves	infusion	respiratory diseases
<i>Kigelia africana</i>	Waist pain, breast infection	fruit	decoction	others diseases
<i>Laccosperma opacum</i>	Rheumatism, cough, fracture	Vines	decoction	musculo-skeletal diseases
<i>Lantana camara</i>	Ear ache, filariasis, Anaemia, low calcium, fibroids, dermatitis	Leafy stem	decoction	others diseases
<i>Laportea aestuans</i>	Poisoning, fontanels, flatulence, tongue pains	Leaves, stem, roots	decoction	others diseases
<i>Laportea ovalifolia</i>		Leafy stem	decoction	digestive diseases
<i>Leea guineensis</i>	abdominal pains, malaria	Leaves, stem, seeds, flower	decoction	digestive diseases
<i>Leonotis spp</i>	Dysentery, filariasis, fever	leaves	decoction	digestive diseases
<i>Lepidium meyenii</i>	Rheumatism	leaves	maceration	musculo-skeletal diseases
<i>Leucaena leucocephala</i>	Ease conception	leaves, fruits	decoction	female sexual diseases
<i>Lippia multiflora</i>	Fever, typhoid	leaves	decoction	others diseases
<i>Lophira alata</i>	Stops vaginal discharge	bark	decoction	female sexual diseases
<i>Macaranga occidentalis</i>	stomach wash for pregnant women	Stem, leaves	decoction	female sexual diseases
<i>Mangifera indica</i>	Rheumatism	bark	decoction	musculo-skeletal diseases
<i>Markhamia lutea</i>	Syphilis	leaves	decoction	STD

Table 1.contd

<i>Melanthera scandens</i>	Gastralgia, appendicitis	Leafy stem	decoction	digestive diseases skin and cutaneous diseases
<i>Millicia excelsa</i>	generalised pains, typhoid, malaria	bark	decoction	
<i>Mentha piperita</i>	carminative (stomach upset)	leaves	decoction	digestive diseases
<i>Microglossa sp</i>	Enema for babies, gastralgia	Leaves	decoction	child diseases skin and cutaneous diseases
<i>Mimosa ruidica</i>	Dermatitis, sexual weakness	Leafy stem	decoction	respiratory diseases
<i>Momordica balsamina</i>	Chest pains, side pain, rashes	leaves	decoction	
<i>Morinda lucida</i>	stomach wounds	Stem, bark, leaves, roots	decoction	digestive diseases
<i>Momordica charantia</i>	calms contraction pains at child birth	Fruit, stem, leaves	decoction	child diseases
<i>Momordica foetida</i>	threatened abortion, gastralgia	leaves	decoction	female sexual diseases
<i>Musa paradisiaca</i>	Vomiting, gastritis	leaves	decoction	digestive diseases skin and cutaneous diseases
<i>Musanga cecropiodes</i>	generalised pains, cough	stem	decoction	
<i>Neoboutonia manii</i>	Wounds, gastritis	bark, leaves	decoction	others diseases
<i>Nephrolepis biserrata</i>	lower abdominal pains	frond	decoction	digestive diseases
<i>Nicotiana tabacum</i>	Headache, dermatitis , stimulant	leaves	plasters	others diseases
<i>Origanum marjorana</i>	Stress, colds	leaves	fumigation	nervous diseases
<i>Ocimum basilicum</i>	Delayed menstruation, indigestion, mosquito bites	Leaves, flowers	decoction	female sexual diseases
<i>Ocimum gratissimum</i>	Gastritis, fever, frontal headache, constipation, conjunctivitis	Leaves, stem, flowers	decoction	digestive diseases
<i>Palisota hirsuta</i>	Conjunctivitis, gastralgia, boils	stem	decoction	others diseases
<i>Panax sp</i>	Epilepsy, irregular menstrual cycle	roots	maceration	nervous diseases
<i>Pausinystalia johimbe</i>	Constipation, stimulant, sexual weakness	bark	maceration	others diseases
<i>Pennisetum purpureum</i>	epilepsy	Leaves, stem	maceration	nervous diseases
<i>Pentaclethra macrophylla</i>	Cardio-vascular disease, gonorrhoea	fruit	maceration	others diseases
<i>Persea americana</i>	antihelmintic	Bark, leaves	maceration	others diseases
<i>Piper guineensis</i>	Cough, stimulant, enema	Whole plant	maceration	respiratory diseases
<i>Piper umbellatum</i>	Change of sex at child birth, piles, breast infection, calms birth pains	Flower, leaves	decoction	child diseases
<i>Plectranthus decurrens</i>	Enema for pregnant women, ease delivery,	Whole plant	decoction	others diseases skin and cutaneous diseases
<i>Plectranthus glandulosus</i>	Dermatitis, venereal diseases, bellyache	Leaves, sap	plasters	
<i>Portulaca oleracea</i>	Frontal headache, poisoning	Leafy stem	decoction	others diseases
<i>Prunus africana</i>	Malaria, gastralgia, chest pains, heart burn, madness	bark	decoction	others diseases skin and cutaneous diseases
<i>Psidium guajava</i>	Wounds, diarrhoea	leaves	plasters	
<i>Pycnanthus angolense</i>	Fever, toothache	Stem, bark, leaves	decoction	others diseases
<i>Rauwolfia vomitoria</i>	Typhoid, antihelmintic, heart ache	leaves	decoction	others diseases
<i>Rauwolfia macrophylla</i>	heart ache, infectious diseases	Bark, roots	decoction	others diseases
<i>Ricinus communis</i>	Sterility in women	Leaves, stem, roots, fruits	decoction	female sexual diseases
<i>Rinorea dentata</i>	Headache, diarrhoea	Fruits ,stem	decoction	others diseases

Table 1.contd

<i>Scoparia dulcis</i>	Sores, stroke, measles, sexual weakness	Leaves, branchlets	maceration	skin and cutaneous diseases
<i>Selaginella myosurus</i>	headache	Whole plant	maceration	others diseases
<i>Selaginella vogelii</i>	Kidney problems	Whole plant	maceration	others diseases
<i>Setaria megaphylla</i>	Wounds, eczema	leaves	powder	skin and cutaneous diseases
<i>Sida javanensis</i>	Ease delivery, liver disorders, boils	Fruit, leaves	decoction	female sexual diseases
<i>Solanecio biafrae</i>	Rheumatism, cough	Leaves	decoction	musculo-skeletal diseases
<i>Solanum gilo</i>	migraine	Whole plant	decoction	others diseases
<i>Solanum incanum</i>	Poisoning, heart ache, lower abdominal pains	leaves	decoction	others diseases
<i>Solanum macrocarpon</i>	Diarrhoea, fever	leaves	decoction	digestive diseases
<i>Solanum melongena</i>	Waist pain	Fruits, leaves	decoction	others diseases
<i>Solenostemon monostachyus</i>	Ease child birth, frontal headache	Leafy stem	decoction	child diseases
<i>Spathodea campanulata</i>	Crooked eye problem	leaves	decoction	others diseases
<i>Spilantes filicaulis</i>	Poisoning, eczema, cancer	Whole plant	decoction	others diseases
<i>Stanfieldiella imperforata</i>	Wound dressing, antihelminthic, headache	Leaves	powder	skin and cutaneous diseases
<i>Starchytarpheta angustifolia</i>	Laxative, fever, cough, toothache	leaves	decoction	others diseases
<i>Symphitium officinalis</i>	Diabetes, gastritis, rheumatism	leaves	decoction	others diseases
<i>Tapinanthus globiferus</i>	Convulsion, diabetes, arthritis, antidote	Leaves, flower	decoction	child diseases
<i>Taraxacum officinale</i>	Liver disorders, kidney problems, spleen problems, diuretic	Whole plant	decoction	others diseases
<i>Telfairia occidentalis</i>	Typhoid, dermatitis	leaves	decoction	others diseases
<i>Tetrapleura tetraptera</i>	stimulates lactation, convulsion, gastralgia	Fruit, stem	decoction	female sexual diseases
<i>Thaumatococcus daniellii</i>	Liver disorders, laxative	Leaves, fruits	decoction	others diseases
<i>Tragia volubilis</i>	Urethritis, abortion enema, infertility, generalised pains, antimicrobial diseases	Stem, leaves	decoction	others diseases
<i>Treulia africana</i>	dermatitis	Leaves, bark	powder	skin and cutaneous diseases
<i>Trichilia rubescens</i>	Antiparasitic diseases, fever, gonorrhoea, enema, antiseptics	Bark, stem	decoction	others diseases
<i>Triumfetta tomentosa</i>	stomach wash after childbirth	leaves	decoction	female sexual diseases
<i>Uapaca spp</i>	Wounds, diarrhoea	Leaves , stem	powder	skin and cutaneous diseases
<i>Uvariadendron connivens</i>	Dermatitis, liver disorders, bronchial congestion, inflammation of bladder	Fruits, seeds	decoction	skin and cutaneous diseases
<i>Valeriana officinalis</i>	Nervous disorders, epilepsy, hysteria	leaves	decoction	nervous diseases
<i>Vernonia amygdalina</i>	Piles, poor digestion, poisoning, diabetes	leaves	decoction	others diseases
<i>Vernonia stellulifera</i>	stops miscarriage, dysentery, tetams	Whole plant	decoction	female sexual diseases
<i>Voacanga africana</i>	Treats madness, gonorrhoea	Leaves, seeds	decoction	female sexual diseases
<i>Zea mays</i>	Worm expeller, bladder problems	Seed, silk	decoction	digestive diseases
<i>Zingiber officinale</i>	rheumatism	roots	decoction	musculo-skeletal diseases

plants to those who will go ahead to process for particular treatments as well as to any other person in the public (Nkuinkeu et al, 2007). On the other hand, there are modern traditional clinics in almost all major towns within the regions. Most of these clinics sell drugs based on the prescription of the herbalist in charge and as mentioned above, are usually a combination of more than one plant for a particular disease. The other groups of persons involved are those in the villages who are contracted by the plant users to supply plants to them from time to time. This is not often done on regular bases, except for industrialised plants such as the Pygeum, *Prunus Africana* (Rosaceae); voacanga seeds, *Voacanga Africana* (Apocynaceae); Yohimbe, *Pausinystalia johimbe* (Rubiaceae); *Strophantus gratus* (Apocynaceae) and *Rauwolfia vomitoria* (Apocynaceae) which are exploited for export, (CERUT/AID Environment, 1999, Achoundong et al., 2003; Nkuinkeu, 1998). The commercialized plants materials are barks, fruits, seeds, rhizomes, leaves, inflorescences, tubers, roots and latex.

### Domestication and cultivation

During this survey, it was realised that the cultivation of medicinal plants for commercial purposes is very limited in these ethnoecological regions. All the commercial plant gardens visited during this period revealed that none of these actually took interest in the cultivation of medicinal plants. According to one of the gardeners, the only reason for lack of medicinal plants in this garden is because of lack of market for them. The demand for them is not as high as the ornamental plants. However, medicinal plants are being cultivated in smaller scales and this is done mainly in home gardens around compounds.

It was also realised that most of the plants domesticated are exotic. In most cases the plants cultivated are those that could not be easily found in the immediate locality of the user, especially *Cinnamomum verum*, *Taraxacum officinale*, *Cymbopogon citratus*, *Solanum melonguena*, *Alliums sp*, *Zingiber officinale*, *Panax sp*, *Origanum marjorana*, *Mentha piperita*, *Artemisia spp*, *Cassia alata*, *Valeriana officinalis*, *Azadirachta indica*, *Cochorus olitorius*, *Ocimum basilicum* and others (Mbile et al., 2003; Nkuinkeu et al., 2007).

The indigenous plants such as *P. africana* and *V. africana* are the only highly used and traded plants that are currently being cultivated by some individuals in villages. The motivating factor behind the cultivation of these plants does not come from it being used locally but rather because they are highly exploited for export (Mbile et al., 2003). Other indigenous plants such as *E. chlorantha*, *Aframomum flavum*, *Pachypodium staudtii*, *Bersama abyssinica*, *Pseudospondias spp* are exploited for trade but not yet cultivated (Ndive pers.comm., 2007). Others such as *V. africana* are seen spotted in farms and compounds. There are also some exotic trees such as

the nymph plant (*A. indica*) which is increasingly being planted as a shade tree around compounds and also used as a treatment for malaria and typhoid.

The group of common herbs or weeds is highly used but not cultivated. A good example of this is the *A. conyzoides*, which is popularly known as the 'king plant' and is used by almost a 100% of all the herbalists. According to the herbalists there are no current or even future threats on plants such as these, there is therefore no need to actually go into their cultivation. They are however domesticated by some individuals to ease access whenever they are needed.

Some herbalists however admitted to the fact that they have made trials towards the cultivation and domestication of some of these wild forest plant species, but some cases have been unsuccessful, probably due to habitat change or differences. The primary idea for this attempt is not because they want to sell these plants, but rather for them to easily get them when the need arises (Tongo and Ekwalla, 2003).

The Limbe Botanic Gardens in recent years have built a collection of quite a wide range of medicinal plants, especially those used around the Mount Cameroon region. This institution through the 'conservation through cultivation (CTC) programme, carried out propagation of some of the very useful and threatened medicinal plants such as *P. africana*, *E. chlorantha*, *Garcinia kola*, and *Diospyros spp* some of which were distributed to other interested persons or groups ( Nkuinkeu, 1998). Presently the World Botanical Exchange and Services (WBES) has an established nursery for the propagation of medicinal plants which it supplies to local farmers through the Mount Cameroon. Prunus common initiative group (MOCAP CIG), a local group currently responsible for the harvesting and trade of the *P. africana* around the Mt Cameroon region.

### Threatened or endangered species

Generally plants become threatened when they are over harvested (exploited) for either medicine or timber or when human activities such as agriculture and infrastructural development destroy them. It was realised that for larger medicinal plant trees, mostly the barks and roots are used, therefore collection requires stripping off of the bark and digging out of roots. These parts are very important for the survival of the plant. As such, if they are taken off in an unsustainable manner the plant dries off. Unlike those that mainly the seeds and leaves are collected like *G. kola*, *V. africana* and *Strophantus spp*, plants such as *P. africana*, *E. chlorantha*, *Pausinystalia johimbe* and others that the barks are being stripped off suffer dryness and die easily. *P. africana* has in recent years suffered over-exploitation in all the areas where it occurs because of its high demand internationally, it has therefore been listed in the IUCN list as an endangered species, (IUCN, 2007).



**Table 2.** Commercialized plants species in the study areas

Scientific Names	Families	Part exploited
<i>Aframomum flavum</i>	Zingiberaceae	Leaves and fruits
<i>Aframomum melegueta</i>	Zingiberaceae	Fruit
<i>Ageratum conyzoides</i>	Asteraceae	Whole plant
<i>Aloe vera</i>	Liliaceae	Leaves
<i>Azadirachta indica</i>	Meliaceae	Leaves, bark
<i>Baillonella toxisperma</i>	Sapotaceae	Fruit, bark
<i>Bersama abyssinica</i>	Melanthaceae	bark
<i>Carica papaya</i>	Caricaceae	Whole plant
<i>Cassia alata</i>	Caesalpinaceae	Leaves
<i>Dosternia mannii</i>	Moraceae	roots
<i>Enantia chorantha</i>	Annonaceae	bark
<i>Eremomastax speciosa</i>	Acanthaceae	leaves
<i>Garcinia kola</i>	Clusiaceae	seed
<i>Lippia multiflora</i>	Verbenaceae	Leaves
<i>Newbouldia laevis</i>	Bignoniaceae	bark
<i>Ocimum basilicum</i>	Lamiaceae	Leaves, stem
<i>Pachypodantium staudtii</i>	Annonaceae	bark
<i>Panax sp</i>	Panaceae	Roots
<i>Pausinystalia johimbe</i>	Apocynaceae	bark
<i>Prunus africana</i>	Rosaceae	bark
<i>Pseudospondias microcarpa</i>	Anacardiaceae	bark
<i>Pycnanthus angolense</i>	Myristicaceae	Leaves
<i>Solanum melongena</i>	Solanaceae	fruit
<i>Vernonia amygdalina</i>	Asteraceae	Leaves

There is other category of plants mentioned by the herbalists as very useful for medicine, but quite rare, these include; njabe (*Baillonella toxisperma*), ebony (*Diospyros* sp), pepper or iron wood (*Lophira alata*), black afara (*Terminalia* sp), king stick (*Guiburtia tessmannii*) and soap tree (*Treculia africana*) (Nkuinkeu et al., 2007; Vivien et Faure, 1985). These are highly sort after timber species, as such explaining the reason for their being rare or scarce. Most of the interviewees mentioned that there are particular forests where they go to look for particular plants, and the plants are always available and do not seem threatened. Some mentioned that they have cultivated the frequently used plants, for a more reliable supply thus contributing to their conservation (Check et al., 2004).

## Conclusion

Due to the multi-usefulness of plant, the list below is not exhaustive in the region. The plant users contacted generally process their plants in one way or the other before sales or administration.

According to the stakeholders, nothing good or beneficiary to them has ever come out from such surveys, as such they would not want to get into it again. That is the opportunity to organize a regional workshop which could enhance the understanding of the local practitioners.

Also the two main institutions that were involved in the propagation and distribution of medicinal plants in the South-West (LBG and Plantecam Medicam) have long ceased to carry out these activities, therefore the promotion and support of the establishment of medicinal plant gardens by the government or other institutions is of absolute necessity. In the other way, the trade benefits are focused in the informal economy, long term monitoring should be implemented both to determine the impacts of harvesting on threatened and high value medicinal plants and to aid in devising guidelines for sustainable management of these resources; thus the necessity to introduce cultivation of some high value and threatened species.

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