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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.

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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 modifycations 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

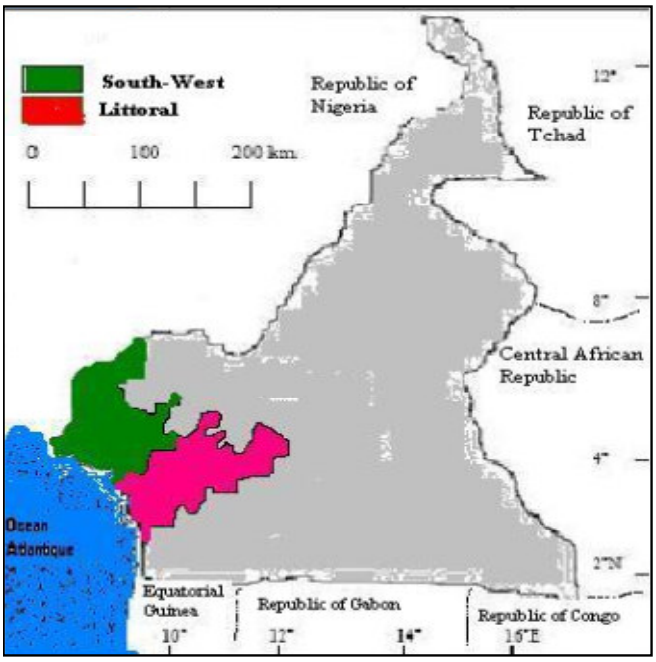

Figure 1. The research areas

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

Table 1.contd

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

Table 1.contd

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

Table 1.contd

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

Table 1.contd

Scoparia dulcis	Sores, stroke, measles, sexual weakness	Leaves, branchlets	maceration	skin and cutaneous diseases
Selaginella myosurus	headache	Whole plant	maceration	others diseases
Selaginella vogelii	Kidney problems	Whole plant	maceration	others diseases
Setaria megaphylla	Wounds, eczema	leaves	powder	skin and cutaneous diseases
Sida javanensis	Ease delivery, liver disorders, boils	Fruit, leaves	decoction	female sexual diseases
Solanecio biafrae	Rheumatism, cough	Leaves	decoction	musculo-skeletal diseases
Solanum gilo	migraine	Whole plant	decoction	others diseases
Solanum incanum	Poisoning, heart ache, lower abdominal pains	leaves	decoction	others diseases
Solanum macrocarpon	Diarrhoea, fever	leaves	decoction	digestive diseases
Solanum melongena	Waist pain	Fruits, leaves	decoction	others diseases
Solenostemon monostachyus	Ease child birth, frontal headache	Leafy stem	decoction	child diseases
Spathodea campanulata	Crooked eye problem	leaves	decoction	others diseases
Spilantes filicaulis	Poisoning, eczema, cancer	Whole plant	decoction	others diseases
Stanfieldiella imperforata	Wound dressing, antihelmintic, headache	Leaves	powder	skin and cutaneous diseases
Starchytarpheta angustifolia	Laxative, fever, cough, toothache	leaves	decoction	others diseases
Symphitium officinalis	Diabetes, gastritis, rheumatism	leaves	decoction	others diseases
Tapinanthus globiferus	Convulsion, diabetes, arthritis, antidote	Leaves, flower	decoction	child diseases
Taraxacum officinale	Liver disorders, kidney problems, spleen problems, diuretic	Whole plant	decoction	others diseases
Telfairia occidentalis	Typhoid, dermatitis	leaves	decoction	others diseases
Tetrapleura tetraptera	stimulates lactation, convulsion, gastralgia	Fruit, stem	decoction	female sexual diseases
Thaumatococcus daniellii	Liver disorders, laxative	Leaves, fruits	decoction	others diseases
Tragia volubilis	Urethritis, abortion enema, infertility, generalised pains, antimicrobial diseases	Stem, leaves	decoction	others diseases
Treculia africana	dermatitis	Leaves, bark	powder	skin and cutaneous diseases
Trichilia rubescens	Antiparasitic diseases, fever, gonorrhoea, enema, antiseptics	Bark, stem	decoction	others diseases
Triumfetta tomentosa	stomach wash after childbirth	leaves	decoction	female sexual diseases
Uapaca spp	Wounds, diarrhoea	Leaves , stem	powder	skin and cutaneous diseases
Uvariodendron connivens	Dermatitis, liver disorders, bronchial congestion, inflammation of bladder	Fruits, seeds	decoction	skin and cutaneous diseases
Valeriana officinalis	Nervous disorders, epilepsy, hysteria	leaves	decoction	nervous diseases
Vernonia amygdalina	Piles, poor digestion, poisoning, diabetes	leaves	decoction	others diseases
Vernonia stellullifera	stops miscarriage, dysentery, tetams	Whole plant	decoction	female sexual diseases
Voacanga africana	Treats madness, gonorrhoea	Leaves, seeds	decoction	female sexual diseases
Zea mays	Worm expeller, bladder problems	Seed, silk	decoction	digestive diseases
Zingiber officinale	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 domesticcated 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 verrum, Taraxacum officinale, Cymbopogon citratus, Solanum melonguena, Alliums sp, Zingiber officinale, Panax sp, Origanum marjorana, Mentha piperita, Arthemisia 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, Pachypodiatum staudtii, Bersam*a *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 domesticcation 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
Aframomum flavum	Zingiberaceae	Leaves and fruits
Aframomum melegueta	Zingiberaceae	Fruit
Ageratum conyzoides	Asteraceae	Whole plant
Aloe vera	Liliaceae	Leaves
Azadirachta indica	Meliaceae	Leaves, bark
Baillonella toxisperma	Sapotaceae	Fruit, bark
Bersama abysinica	Melianthaceae	bark
Carica papaya	Caricaceae	Whole plant
Cassia alata	Caesalpiniaceae	Leaves
Dosternia mannii	Moraceae	roots
Enantia chorantha	Annonaceae	bark
Eremomastax speciosa	Acanthaceae	leaves
Garcinia kola	Clusiaceae	seed
Lippia multiflora	Verbenaceae	Leaves
Newbouldia laevis	Bignoniaceae	bark
Ocimum basilicum	Lamiaceae	Leaves, stem
Pachypodantium staudtii	Annonaceae	bark
Panax sp	Panaceae	Roots
Pausinystalia johimbe	Apocynaceae	bark
Prunus africana	Rosaceae	bark
Pseudospondias microcarpa	Anacardiaceae	bark
Pycnanthus angolense	Myristicaceae	Leaves
Solanum melongena	Solanaceae	fruit
Vernonia amygdalina	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 (*Guiburttia 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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