

Full Length Research Paper

Herbalism and resources for the development of ethnopharmacology in Mount Cameroon region

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Tropical forests are a biologically lavish and diverse ecosystem with plants whose potential value as a natural pharmacy is yet to be discovered. The native people have for centuries used plants as medicine. There is a need to stimulate traditional healers to evaluate the strong and weak aspects of indigenous knowledge base and to devise methods to test and improve knowledge. The study uses a combination of primary and secondary data to provide baseline knowledge on the concept of herbalism, endogenous knowledge of medicinal plants, pharmaceutical uses, marketing status and threats to sustainable development. It establishes an ethno-medicinal plant inventory consisting of a total of 30 plants with major ailments. In terms of life form, 70% were composed of trees, 6.6% shrubs, 10% climbers and 13.3% herbs. Some 70% of these plants are locally marketed and 66.6% have other non-medicinal uses. The paper identifies the stresses and vulnerabilities of the plants and the scope for western biomedical practitioners to assess this traditional knowledge, that is, methods of testing, refining and validating indigenous knowledge in traditional medicine in order to support the process of integration. It finally posits that since different paradigms of health and illness stand in the way of real integration, western biomedicine and African traditional medicine may remain apart as two parallel systems hence the need to locate and catalog these plants for the identification of their pharmaceutical properties.

Key words: Herbalism, ethno-pharmacology, medicinal plants, indigenous knowledge, threats, sustainability.

INTRODUCTION

Since the beginning of recorded history all or part of some wildlife plant species have been used as medicine (Miller, 1985). Traditionally, Africans use herbal and animal products as medicines, in-toxicans and poisons in their struggle for survival and in their quest for religious experiences. A healer's power is not determined by the number of medicinal plants he or she knows, but by the ability to apply an understanding of the intricate relation between the patient and the world around him or her (Bossard, 1996). Unlike a doctor trained in western biomedicine, the traditional African healer looks for the cause of the patient's misfortune in the relationship between the patient and the social, natural and spiritual environments (De Smet, 2000; Erdtsieck, 1997). Many healers are specialized in one or more biomedical aspects, such as herbalism, midwifery or surgery (De Smet, 1999, Juan et al., 2000; Darshan and Bertus, 2000; Ndenecho, 2008).

The United Nations Development Programme estimates the value of pharmaceutical products derived from

developing world plants, animals and microbes to be more than 30 million US dollars per year (Cunningham and Saigo, 2001). While these resources have been harvested for hundreds of thousands of years, today's increasing population, changing social, economic and political structures have removed most traditional controls on their exploitation. If wildlife is to continue to make contributions to the development of local economies through the provision of pharmaceutical products, there is the need to ensure the survival of species (Arnold and Rui-Perez, 1996). There is therefore a need to screen plant samples for medicinal applications and to locate and catalog most of the native flora using local herbal healers who have protected and nurtured the biodiversity on which these products are based (Morris, 1996).

The paper seeks to provide baseline knowledge on the concept of herbalism, endogenous knowledge of medicinal plants, feasible pharmaceutical uses, marketing status and the main threats to sustainable usage. Such knowledge is necessary for the development of a frame-

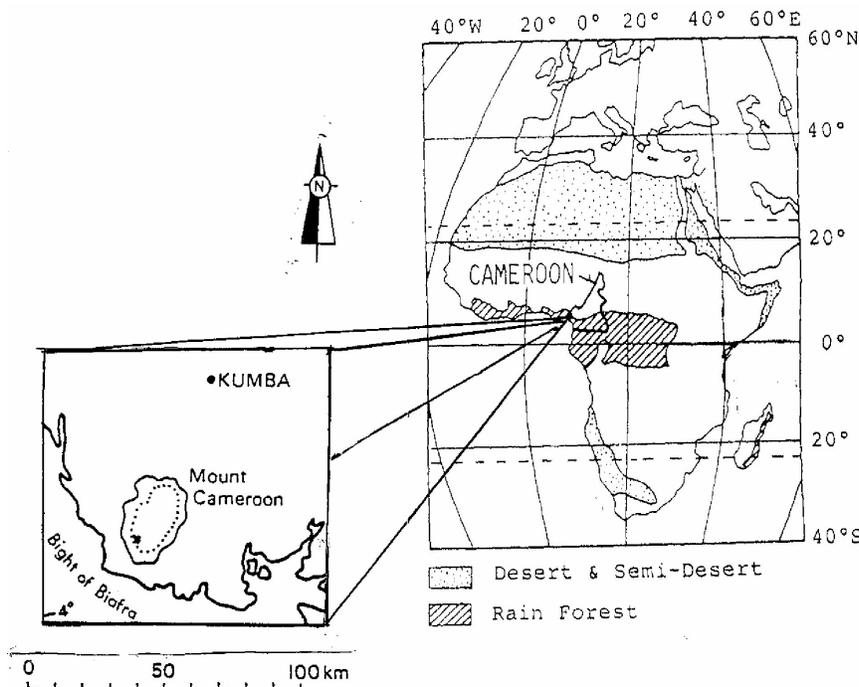


Figure 1. Location of the study area: Mount Cameroon Region. Source: Balgah, 2001.

framework for local community participation in resource management and generation of revenue from medicinal plants.

The study area is located between latitudes 4°N and 6° 20'N and longitudes 8° 50'E and 10°E. It covers an approximate land surface area of 24, 910 km² (Figure 1). The summit of Mount Cameroon is located at 9° 10'E and 4° 13'N. The base lies at sea level and the summit at 4095 m elevation. Average annual rainfall is 4000 mm which declines inland to 1800 mm. Mean temperatures are around 20°C due to the effect of altitude. Soils are andosols supporting lowland submontane and montane tropical forests, and a microcosm of tropical plantation agriculture. In White's phytogeographical classification (1983), the area falls within the afro-montane eco-region. Human activities are fragmenting, degrading and isolating the remaining forest patches despite conservation efforts (Figure 2).

METHODOLOGY

The study employed a combination of primary and secondary data collection methods. The primary data sources consisted of a series of semi-structured and informal interviews with traditional herbalists and staff of the Limbe Botanic Garden, experts of the Institute of Medicinal Plant research in Yaounde and urban and local market surveys. A comprehensive literature review preceded the fieldwork. In order to understand and appreciate the traditional health system a participatory assessment of the characteristics of the system was made through dialogue with local people and herbalists in the Bakweri and Oroko tribal areas. A total of 65 people from 15 villages were interviewed: 8 villages from the Bambuko forest area, 4 villages from the Mokoko forest area and 3 villages from the

Mbonge forest area (Figure 2). In each village the interviews were conducted with 3 herbal practitioners, who were judged by local people to be actively involved.

As a starting point, inventories of local medicinal plants were obtained from the archival material of the Limbe Botanic Garden where these plants are conserved in a herbarium. Information on these plants (use, ecology, local name and pharmaceutical uses) are held on a computer system called BRAHNS. The study had access to these data. In order to obtain ethno-botanical and medicinal data, a series of semi-structured interviews employing an open format that allowed conversational, two-way communication was undertaken in the 15 villages based on the established inventory.

Data on the commercial status of medicinal plant products was obtained through market surveys. A series of informal surveys were undertaken at markets in Fako and Mundemba areas. While these surveys do not comprise a wholly representative assessment of the conditions under which most medicinal plants and their non-timber forest products are traded (particularly with the influence of seasonality), they do provide a useful overview of products being traded and an indication of extraction pressure.

The data so collected enabled the identification of the scope for testing and refining practices to support the process of development of ethno-pharmacology and the establishment of feasible links with western medicine.

RESULTS

The traditional health system is composed of two main components; divination and herbalism.

Divination and healing are often practiced by the same person, who has the power to deal with the spiritual realm. They look for disturbing events in the past, which can cause misfortune if left untreated. Many Africans believe that life forces are manifest in everything. This spirit or power is the essence of every living creature, natural event or inanimate object. These forces all have their

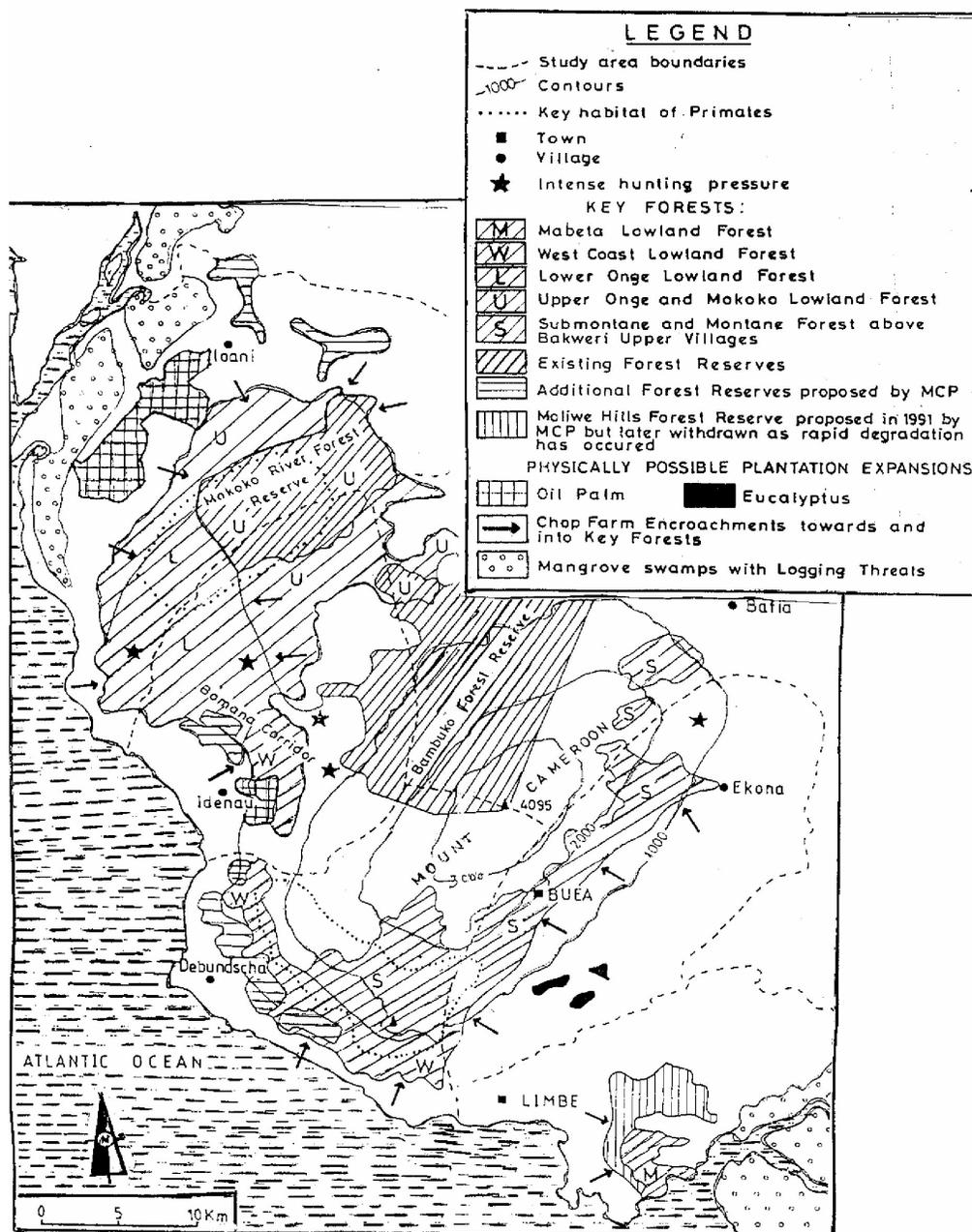


Figure 2. Distribution of natural habitats for medicinal plants and threats in the Mount Cameroon Region. MCP = Mount Cameroon Project.

own personalities and cosmic place. Therefore the preservation of health is impossible without them. Unlike a doctor trained in western biomedicine, the herbalist looks for the cause of the patient's misfortune in relation between the patient and his social, natural and spiritual environments. Divination and healing are often practiced by the same person. He therefore has the power to deal with the spirit realm. It is not surprising that diviners are often listed as the most important traditional healers.

Common ailments, such as headaches or coughs are considered to be diseases with natural causes. Their

symptoms are treated at the household level, without resorting to magical practices. For other illnesses, or when a common ailment persists, recourse is sought to divination in combination with herbalism. Herbal medicines are applied to every part of the body in any conceivable way. There are oral forms, enemas, fumes to be inhaled, vaginal preparations, fluids administered into the urinary tract, preparations for the skin and various lotions and drops for the eye, ear and nose. Table 1 presents a list of medicinal plants, life form, plant parts used and market status. The traditional healer knows the virtues of

Table 1. Medicinal plants of Mount Cameroon area: Plant parts used, life form and market status.

Plant species	Life form	Plant parts used	Observations
<i>Afromomum spp.</i>	Herb	Fruit, leaf, stem and seed.	Sold in local and regional markets
<i>Alstonia boonei</i>	Tree	Bark, latex and leaves.	Bark sold in local markets
<i>Ancistrocladus Korupensis</i>	Climber	Leaves.	Preliminary trials by scientists for the cure of AIDS and cancer
<i>Annickia chlorantha</i>	Tree	Bark and leaves.	Sold in local markets
<i>Baillonella toxisperma</i>	Tree	Bark and seed oil.	Sold in local markets
<i>Bryophyllum pinnatum</i>	Herb	Leaves and fruit.	Not sold in markets
<i>Canarium schweinfurthii</i>	Tree	Fruits, seed and resin.	Fruits sold on local markets + high value timber 40.000 CFA/m ³
<i>Ceiba pentandra</i>	Tree	Leaves, bark and roots.	Not sold in markets. Timber sold: 8000 CFA/m ³
<i>Cola spp.</i>	Tree	Seeds, leaves, bark and roots.	Sold locally and cola exported to Nigeria
<i>Costus aferker</i>	Herb	Stem, root, leaves and rhizomes	Not sold in markets
<i>Elaies guineensis</i>	Tree	Sap, wood, leaves, oil and trunk apex.	Oil, kernels, and fruits sold
<i>Eremomastax speciosa</i>	Herb	Leaves.	Generally not sold in markets
<i>Garcinia kola</i>	Tree	Seed, root, bark and latex.	Seeds and barks sold in local markets
<i>Garcinia mannii</i>	Tree	Branches for chewing sticks, bark, leaves and latex.	Bark sold. There is significant trade in chewing sticks
<i>Kigelia Africana</i>	Tree	Buds, bark and fruits.	Commonly sold in markets and regularly bought
<i>Milicia excelsa</i>	Tree	Exudates, bark, leaves and roots.	Not sold, wood used for poles and furniture
<i>Nauclea diderrichii</i>	Tree	Bark, root and fruits.	Branches sold for chewing sticks. Valuable timber
<i>Newbouldia laevis</i>	Tree	Bark, root and leaves.	Sold in local markets
<i>Physostigma venenosum</i>	Shrubby climber	Seeds	Not sold
<i>Piper guineensis</i>	Woody climber	Fruits, seeds, leaves and roots.	Commonly sold in local markets
<i>Prunus africana</i>	Tree	Bark	Bark traded in world market
<i>Pterocarpus soyauxii</i>	Tree	Stem, bark and leaves.	Leaves sold as vegetable, stem and bark sold
<i>Rauvolfia vomitoria</i>	Tree	Sap, seeds, leaves and bark.	Sold for industrial transformation
<i>Ricinodendron heudelotii</i>	Tree	Seeds, leaf, bark, root and kernel.	Seeds sold widely in markets
<i>Senna alata</i>	Shrub	Leaves and bark	Not sold in markets
<i>Spilanthes filicaulis</i>	Creeping herb	Leaves and flowers.	Not sold in local markets
<i>Strophanthus gratus</i>	Shrub	Leaves and roots.	Sold in the world market (exported)
<i>Tetrapleura tetraptera</i>	Tree	Fruit, seeds and bark.	Fruit sold as a spice. Bark not marketed.
<i>Voacanga Africana</i>	Tree	Seeds, latex, bark and root.	Sold to industries. Exported.

the native plants. Not everyone can cure everything. According to the lineage, this “depends on the hand of each traditional healer”. The belief is that the cure comes from something sacred and deep within the healer. For

this reason genuine healers never ask to be paid for their services. Their compensation depends on the discretion of the patient.

Table 1 presents the main plant parts harvested. These

include fruits, stems, seeds, leaves, barks, exudates, latex, seed oil, resin, roots, rhizomes, sap, kernel, flowers and woody tissues. These are either used fresh or dried for eventual use. When dry, they can be sold in local markets in whole parts or in powdered form. *Prunus africanus* is exported in the form of dried bark. Majority of the plant parts of other medicinal plants are traded in local markets. In terms of life form the plants are composed of 21 trees (70%), 2 shrubs (6.6%), 3 climbers (10%) and 4 herbs (13.3%). A total of 9 out of the 30 medicinal plants identified (30%) are commercialized, that is, 70% of the plants contribute to local economies, and have therefore attracted research interest in determining their pharmaceutical uses (Table 2).

Table 2 presents a partial list of medicinal plants. Hundreds of wild plants have medicinal value but this knowledge base remains secret. Few plants are used to cure a single illness or disease. The preparation of a mixture of several plants is common. These medicinal plants cannot be gathered at any time of the day; they have their proper time. This is because the spirits of the plants can only be found in their "bodies" at certain moments. Moreover, they must never be pulled or torn violently during harvesting; first, the healer must pray to the guardians of the plant using incantations. This mountain is a place with particular strength of medicinal plants. Table 2 presents the main endogenous uses of the medicinal plants, their role in the traditional health system, and their pharmaceutical uses as determined by researchers of the Limbe Botanic Gardens. Table 2 presents major diseases for which the plants are used. The main drawbacks of endogenous uses include incorrect diagnosis, imprecise dosage, low hygiene standards, the secrecy of some healing methods and the absence of written records about the patients. The diagnosis of disease by traditional healers is not limited to direct observation and tests. Many supernatural methods are also used, such as reading cola nut seeds and an egg or water filled in a clay pot. Despite these worst outcomes, herbal medicines are an essential part of traditional healing.

Table 3 presents the non-medicinal use value of the medicinal plants. Of the 30 medicinal plants 20 have non – medicinal uses (66.6%). These include timber and non-timber forest products. These uses support local livelihoods. There is therefore a risk of over-exploitation when a species occurs at low densities or has a restricted natural distribution. The removal of mature individuals from an area also poses a threat to local populations. The marketing of medicinal plant parts is an evidence of exploitation pressure. This may have impacts on the sustainability of these plants.

DISCUSSION

Traditional healers are the principal professionals in health care services for the large majority of people in rural areas. Surveys reported by Gareth (2000) and De

Smet (2000) show that most traditional healers are willing to cooperate to some extent with their biomedical counterparts. Herbal medicines are readily accepted and widely used in rural areas because they are cheaper than western synthetic pharmaceuticals.

The major medicinal uses of the plants identified include fevers, headache, colds and flu, wounds, measles, fractures and dislocations, intestinal parasites, hepatitis B, jaundice, conjunctivitis, hypertension, tooth ache, rheumatic pains, infertility and gynaecological problems, ulcers, skin diseases, burns, heart palpitations, menstrual pains, stomach problems, cough, convulsion, venereal diseases gastric pains, hernia, arthritis, haemorrhoid, bronchial infections, abdominal pains and madness.

A total of 30 medicinal plants were identified with indigenous uses and 22 with established pharmaceutical uses. In terms of life form, 70% were composed of trees, 6.6% shrubs, 10% climbers and 13.3% herbs. About 70% of these plants are marketed in rural and urban markets, and 66.6% have non-medicinal uses. This is an evidence of exploitation pressure. The main stresses and vulnerabilities are due to the exploitation of timber and non-timber forest products, agricultural encroachment, establishment of forest plantations and climate change. Increased concentrations of CO₂, the primary cause of climate change, are likely to affect the physiology of these montane plants. The exact outcomes are unclear, and will vary from species to species and be affected by factors such as inter-specific competition, physical site conditions and anthropic factors.

Enthnopharmacology is a form of western science that can bring to light which traditional plants are effective and safe for incorporation into the formal health care system. In this process, western drug developers must respect the intellectual property rights of the indigenous users of herbal medicines. They must provide adequate compensation for the sharing of that knowledge. Can we assume that western biomedical practitioners have the capacity and sensitivity to assess traditional knowledge? What methods exist to test and improve indigenous knowledge with a spiritual dimension? New techniques are needed to describe, analyse, validate and classify the beliefs and processes of the traditional knowledge system. Such validation can confirm the long process of observation, analysis and evaluation that determines each unique culture. It may also represent the basic point of reference in the process of exchange between western biomedicine and the local traditional healer. If irreplaceable genetic resources are lost, traditional medicines and indigenous knowledge will also disappear. To prevent this from happening, prompt action is required at every possible level: local initiatives, support from NGOs, scientific research and active governmental support.

Conclusion

Tropical montane forests constitute a natural pharmacy

Table 2. Plants of the Mount Cameroon region and their indigenous medicinal and pharmaceutical uses.

Botanic name	Indigenous medicinal uses	Pharmaceutical uses
ZINGIBERACEAE <i>Aframomum spp.</i>	Ritual uses; fruits are used to ward off evil spirits and witchcraft and to magnify the effects of other medicines; to treat fever, headache and measles, colds and flu; and to treat wounds.	Most parts of the plant seeds have been shown to contain zenoids ginerol, shagoal and paradol. The seeds of <i>Aframomum denielli</i> obtained from Cameroon contain labdane diterpenoids. The essential oils from the seeds have been shown to kill fungus and bacteria.
APOCYNACEAE <i>Alstonia boonei</i>	Malaria remedies; treatment of swellings, worms and other intestinal parasites; fractures or dislocations and inducing breast milk; treating rheumatism.	It contains several indole alkaloids-echitamine, echitamidine, akuammidine, picraline, quebrachidine and its esters, vincamajine and alstonine. The bark contains triterpenes bamyryne and lupeul and the leaves, ursolic acid.
ANCISTROCLADACEAE <i>Ancistrocladus korupensis</i>	Treatment of measles and fever; roots boiled and drunk as a laxative.	Scientists have proposed that extracts from this plant be produced to provide a locally affordable anti-HIV medicine. A few researchers in universities in Nigeria and Cameroon have begun to research this possibility. The major market for E compounds, however, has been the USA where the bulk of research on michellamine b has taken place
ANNONACEAE <i>Annickia chlorantha</i>	Yellow fever, jaundice, hepatitis B, malaria, typhoid; bark used to produce eye drop for conjunctivitis; ground wood used as dressing for infected wounds; bark applied to ulcers.	The main alkaloids from the roots and stem barks are quaternary protoberbines; palmatine, bebereline, jatrorrhizine, and columbamine. Palmine has been shown to reduce fever as well as slowing down the arterial blood pressure and the nervous system.
SAPOTACEAE <i>Baillonella toxisperma</i>	Treatment of infertility and gynaecological problems, rheumatic pains and skin inflammation.	
CRASSULACEAE <i>Bryophyllum pinnatum</i>	Used for protection to drive away witches to take oaths and to attract good fortune; antiseptic, treatment of boils, skin diseases and conjunctivitis; treatment of inflammatory skin problems, burns and external ulcers.	Preliminary clinical work has shown the presence of xanthenes, flavonoids, anthraquinones and traces of alkaloids. Potent cytotoxic bufadienolides, bryophyllin A and B, have been found isolated and found to be toxic to cattle and other farm stock. Cardiac glycosides, known as bryotoxins, are also present. This species should only be used externally.
BURSERACEAE <i>Canarium schweinfurthii</i>	Treatment of asthma, piles, stomach problems, jaundice, dysentery, chest pain, cough, skin infections and intestinal parasites.	Contains the terpene phellandrene. The pulp oil of the fruit is about 71% palmitic acid, 18% oleic acid and small amounts of several other fatty acids. The resin contains 8-20% of an essential oil, the main constituent of which is limonene. It is rich in phellandrenes, and also contains resins and a bitter principle. Composition is variable.
BOMBACACEAE <i>Ceiba pentandra</i>	Chest pain, purgative, heart palpitations, diabetes, diarrhea, headaches and rheumatism.	
STERCULIACEAE <i>Cola spp.</i>	Used as a stimulant; treatment of wounds and burns, chest pain, rheumatism, cough, menstrual pains, and conjunctivitis and stomach problems; used as an enema.	The species in Cameroon contain purines, caffeine and small quantities of theobromine. They also contain two phenolic substances kola-tin and kolatein, as well as catechols, epicatechol and kalonin. Prevents tiredness and encourages more sustained muscular effort.
COSTACEAE <i>Costus afer</i>	Treatment of fresh wounds, cough and sore throat, bronchitis, asthma, gonorrhoea and high blood pressure; used as a stimulant, aphrodisiac and eye drop.	The genus <i>Costus</i> is rich in steroidal saponins and sapogenins. The rhizome has been shown to contain various sapogenins, namely diosgenin, stigmasterol and costugenin.

Table 2. Contd.

ELAIES GUINEENSIS <i>Palmae</i>	Palm oil is used to mix and apply many medicines; palm wine is used to make alcoholic infusion. The kernel oil is used to treat convulsion. Young shoots are used for the treatment of hernia and venereal diseases, and swollen liver in children.	Palm oil contains, among other things, glycerides of fatty acids with high molecular weights, including oleic acid (40-50%), palmitic acid (0%), Linoleic acid (6-10%), stearic acid (5-6%), and myristic acid (1-5%). The oil is also rich in carotenoids and sterols.
ACANTHACEAE <i>Eremomastax speciosa</i>	Treatment of menstrual pains, gonorrhoea, appendicitis and dry burns; used as an anti-poison, to increase and purify blood.	
GUTTIFERAE <i>Garcinia kola</i>	Used as a stimulant, laxative, purgative, aphrodisiac and chewing stick; treatment of gastric pains, cough, sleeping sickness, tumours and venereal diseases.	Active ingredients are biflavonoids which produce anti-hepatotoxic, anti-viral, adaptogen plague inhibition properties. They also help to clear toxins accumulated from drinking alcohol. It contains the important antimicrobial benzophenone, kolanone. It has been shown to possess remarkable antihepatotoxic activity against a variety of experimental hepatotoxins. Other activities of the biflavonoid mixture include anti-inflammatory, anti-microbial, anti-diabetic, and antiviral properties. The biflavonoids also possess antidiabetic activity.
GUTTIFERAE <i>Garcinia mannii</i>	Used as chewing stick and laxative; treatment of stomach complaints, malaria, cough and joint pains; taken as an enema and aphrodisiac.	Flavonoid is the active ingredient.
BIGNONIACEAE <i>Kigelia africana</i>	Treatment of eye wounds, rheumatism, fever, snake bite, scabbies, waist pain, stomach problems, wounds and ulcers and arthritis.	
ANARCARDIACEAE <i>Magnifera indica</i>	Treatment of fevers, stomach problems, diarrhea, typhoid, malaria sore throat, blindness and filarial; used as an enema.	Its anthocyanidins are active in treating blood vessel troubles, eye complaints and diabetes. The seed active constituents of magiferin, ethyl-gallate, and pherynylpropanoids are antibiotic and used against worms.
MORACEAE <i>Milicia Excelsa</i>	Treatment of backache and toothache, stomach problems, cough, fever, heart burn, heart palpitations, venereal diseases, hepatitis, liver problems and haemorrhoids. Used to increase lactation and as a purgative.	
BIGNONIACEAE <i>Newbouldia laevis</i>	Treatment of venereal diseases, malaria, stomach problems, wounds, eye diseases and convulsions; used as an enema, aphrodisiac and to induce breast milk.	The active constituents of the harmine derivative, harmine and harmol, in the bark are thought to create the properties of this species that kill protozoa and worms.
RUBIACEAE <i>Nauclea diderrichii</i>	Treatment of typhoid, stomach problems, toothache, skin diseases, cough, caries and septic mouth, malaria, piles and headaches; eases blood flow and encourages urination.	Alkaloids isolated from species include harmine, pyridine and indole-pyridine alkaloids. Glycol-alkaloids present in the rootbark. These account in part for the fever-reducing and antidepressant pharmacological properties of these species.
PHYSOSTIGMA VENENOSUM <i>Legume-papilionaceae</i>	Used as a ritual and ceremonial plant; seeds are used to poison rats and fish.	Its poisonous effect is due to its long sedative action on the spinal cord. The lower limbs become paralysed and death occurs by loss of breath and in large dose, heart failure. In addition to physostigmine, the seeds contain eseridine, and several other alkaloids like eseramine, calabarine, and starch. They also yield albumen. Physostigmine is used in eye medicine due to its cell-destroying action – it inhibits the nervous system, thus, allows acetylcholine to exert its full effect on the smooth muscles, glands and heart.

Table 2. Contd.

		It is reported to be an antidote to strychnine, nicotine, curare and atropine. Eseridine is used in dyspepsia and as eye drops in glaucoma.
PIPERACEAE <i>Piper guineensis</i>	Used as a mixing agent for medicines and an enema; builds strength; treatment of stomach problems, cough, side pains, infectious diseases, gonorrhoea, syphilis, cold and bronchial infections; used to regulate menstrual cycle.	Several lignans have been reported including aschantine and yangambine. The roots yield piperine, trichostachine and lignans, and the leaves contain the lignan dihydrocubebin. The essential oil obtained from the berries has been shown to consist mainly of phellandrene, pinene, and limonene. The amides contained in the fruit have been shown to possess antimicrobial, anticonvulsant, antihypertensive, sedative, tranquilising and insecticidal properties. High doses have been reported to be toxic.
ROSACEAE <i>Prunus africana</i>	Treatment of chest pain, heart burn, madness, inflammation, prostate gland and kidney diseases and fever. Used as an aphrodisiac.	Contains compounds including sterols in free and glucosilated form, which help subdue fever and infections, pentacyclic triterpenes, with antioedema activity, and ferulic esters of long chain fatty alcohols and esters of fatty acids, with anticholesterolenic activity.
LEGUME-PAPILIONACEAE <i>Pterocarpus soyauxii</i>	Camwood used in ritual ceremonies and medicines and cosmetic mixture; treatment of side pain and cough.	
APOCYNACEAE <i>Rauwolfia vomitoria</i>	Treatment of Madness, malaria, worms, high blood pressure, stomach problems, smallpox, leprosy, jaundice and snakebite; encourages lactation in new mothers; used as eye drop and purgative.	Of main pharmaceutical interest are the alkaloids reserpine, rescinnamine, ajamaline, ajamalicine and reserpine, which are extracted from the root bark. Reserpine lowers high blood pressure and slows down the heartbeat.
EUPHORBIACEAE <i>Ricinodendron heudelotii</i>	Treatment of diarrhoea, stomach pain and venereal diseases; "increases blood"; used as a purgative and laxative.	
LEGUM-CAESALPINIACEAE <i>Senna alata</i>	Used as an enema to kill worms and as an antidote to snake venom; treatment of gonorrhoea, yellow fever, jaundice, hepatitis, fungal infection, diarrhoea and dysentery.	The major constituents are anthrones and anthraquinones, amino acids, and proteins. Research has confirmed the laxative properties. Used to treat fungal infections and a range of skin ailments, most commonly eczema and ringworm.
COMPOSITAE <i>Spilanthes filicaulis</i>	Treatment of chest pain, eczema, guinea worm, stomach problems, headache, cough and toothache; an enema for side pain; used to coagulate blood; rubbed on skin as a local anaesthesia.	The flowers contain a local anaesthetic substance, spilanthol, which is an iso-butylamide of decadenic.
APOCYNACEAE <i>Strophanthus gratus</i>	Used as heart tonic; treatment of ulcers and guinea worm; antidote for the bite of the black-necked cobra.	The seeds yield the cardenolides strophanthins k, g, etc, which act as heart tonics. They contain cardenolides and some of the most important cardiotonics.
LEGUM-MIMOSACEAE <i>Tetrapleura tetraptera</i>	To stimulate lactation; treatment of hypertension, stomach problems, convulsion in children, abdominal pain, venereal diseases, gonorrhoea and jaundice; used as post-partum tonic.	The saponins and coumanins produce anti-infective, tonic activities. The saponisides found in the fruit have been shown to be insecticidal. The saponisides contained in bark and roots have been shown to act on Lumbago and against coughs and fits.
APOCYNACEAE <i>Voacanga africana</i>	To promote lactation; treatment of toothache, madness, wounds, malaria, syphilis, sores; used as painkiller and in healing rituals.	Many indole alkaloids have been isolated from the bark of the stem and the root, 4 – 5% total alkaloids from the stem-bark and 5 – 10% from the root-bark. Seeds are currently used in large quantities for the production of a depressor of CNS activity.

Table 3. Non-medicinal use value of medicinal plants of the Mount Cameroon Region.

Botanic Name	Local Name	Non Medicinal Uses
<i>Aframomum spp.</i>	Bakweri: mbongo	Spice and flavouring.
<i>Anirickia chlorantha</i>	Bakweri: wolole,	Timber, yellow dye and chewing stick.
<i>Baillonella toxisperma</i>	Bakweri: wondololo, Oroko: bo njabe	Furniture wood, veneer and edible oil.
<i>Canarium schweinfurthii</i>	Bakweri: wotuwa, Oroko: bo alo	Timber, fuel wood, resin, used as incense and for mending pots and calabashes, edible oil and edible fruit.
<i>Ceiba pentandra</i>	Bakweri: wuma	Kapok used to stuff pillows and mattresses; insulin, wood, dye and oil production.
<i>Cola spp.</i>	Oroko: ubo,	Stimulant and restorative, appetite suppressant, beverages, edible arils and in handicraft.
<i>Costus afer</i>	Bakweri: mondanwany,	Edible stem.
<i>Elaies guineensis</i>	Bakweri: liya, Oroko: ndia	Palm wine, oil, soap making, edible fruit, construction wood and in handicraft.
<i>Garcinia kola</i>	Bakweri: nyai, Oroko: nye	Alcoholic drink and as an edible fruit.
<i>Garcinia mannii</i>	Bakweri: njondinga Oroko: esa	Hardwood used for carving and building.
<i>Kigelia Africana</i>	Bakweri: woloulay	Construction of tool handles, drums and stools.
<i>Milicia excelsa</i>	Bakweri: momangi	Construction wood, edible leaves and as pesticide.
<i>Newbouldia laevis</i>	Oroko: wendende,	
<i>Piper guineensis</i>	Bakundi: ndonga, Balung: bi	Spice, edible leaves, leaves used to embalm corpse, oil distilled for perfumery, soap-making and as insecticide.
<i>Prunus africanus</i>	Bakweri: wotangu	Production of handicraft wood, construction wood and charcoal.
<i>Pterocarpus soyauxii</i>	Bakweri: wobwea, Oroko: isologo,	Furniture wood, edible shoots and red dye.
<i>Rauwolfia vomitoria</i>	Ejagham: esaka, Nso: kitong	Live fence, wood carving, firewood and as a shade tree.
<i>Ricinodendron heudelotii</i>	Bakweri: wojanga sanga, Ejagham: oyok	Flavourings, carving wood, handicraft, musical instruments, oil.
<i>Tetrapleura tetraptera</i>	Korup: ekok,	Spice and oil from kernel used in perfumes.
<i>Voacanga africana</i>	Bakweri: itongongo	Carving wood and wood ash used as salt substitute.

with a stock of potential medicinal plant species yet to be discovered by modern science. There is a wealth of secret indigenous knowledge on these plants which can be tapped through the collaboration of scientist, herbalists and indigenous knowledge repositories. This will require the training of native people as practical "parataxonomists" to locate and catalog plants for the identification of their pharmaceutical properties. There is therefore a need to research for methods of testing, refining, and validating indigenous knowledge in traditional medicine in order to support the process of integration, since different paradigms of health and illness stand in the way of real amalgamation. This could be a good model for scientific information gathering and a way for tropical countries to benefit from these native plant resources. In this way the preservation of the plants will be promoted.

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