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Research Article

ETHNO PHARMACOLOGICAL SURVEY IN THE MIFI DIVISION (CAMEROON)

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Abstract

Our study took place in the Mifi Division, western Cameroon. The aim of this study was to identify the medicinal plants used in this Division. To carry out this survey, we used three methods to collect data: the field study, the comparative study and the interview of traditional healers from a pre-established list. We interviewed 15 traditional healers who were recommended to us by traditional chiefs, some churchmen and health workers. The interviews with 15 traditional healers yielded 39 plants in Bafoussam, 62 plants in Baleng, 20 plants in Bamougoum, 12 plants in Bapi and 16 plants in Badeng. There is a similarity in magnitude in the use of herbs between infectious, childhood and general traumatic pathologies respectively 17.54% and 15.78%. This represents the highest percentage of plant use in this Division. Gynaecological and obstetrical diseases come in third place with 14.03% of plants used. Then come the pathologies of the otorhinolaryngological system with a use of 10.52% of plants. Nervous system pathologies use 7.01%. Parasitic pathologies are treated by 5.20% of the plants. Dermatological and cardiovascular pathologies use 3.50% of plants respectively. Finally, viral and gastro-enteritis diseases are treated with 5.20% of plants each. The Plants species collected will certainly contribute to the production of the original traditional pharmacopoeia. The 149 plants mentioned above would form the basis for the development of improved traditional medicines for start.

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Introduction

Traditional medicine is the total sum of the knowledge, skills and practices that are based on the theories, beliefs, and experiences of a culture and that are used to maintain human health and to prevent, diagnose, treat and cure physical and mental illnesses [1]. Ethnopharmacology can be defined as "the interdisciplinary scientific study of all materials of plant, animal or mineral origin, and related knowledge or practices, that vernacular cultures use to modify the states of living organisms for therapeutic, curative, preventive, or diagnostic purposes. It is based, among

other things, on ethnology, Botany and History [2]. Currently, it is estimated that 80% of the world's population relies on the resources of local flora and pharmacopoeia for their treatment; this is by choice, but too often because they lack access to the benefits of scientific medicine [3].

In Africa, medicinal plants are a valuable resource for most rural populations who use more than 80% of these resources for their health care. In Cameroon, medicinal plants are of considerable wealth. In addition to their great diversity, their location and use in the most remote areas of the country are generally associated with cultural and ethnic groups. In the Western region of Cameroon and in the Mifi Division in particular, the practice of traditional medicine remains in force. Ethnopharmacological and ethnobotanical studies have already been carried out in many areas of the territory by many researchers. The ethnobotanical studies undertaken in Cameroon by Mapi J. 1988 in the Moundou (Nkongsamba)

have made it possible to list 62 plants belonging to 34 families [4]. Mbemkumet *al* carried out an ethnopharmacological study in 1990 in the South-West region of Cameroon. Their study showed that 50 plants were used for therapeutic and nutritional purposes by the population of this region [5]. Foutseand *al* in an ethnopharmacological study in the Ndé Division showed that 167 plants were used in numerous recipes [6], Chagamand *al* listed 137 plants in the Haut-Nkam Division [7]. Yepndoand *al* recorded 107 species of medicinal plants in the Noun Division [8]. Dongmoand *al* grouped 150 medicinal plants in the Menoua Division [9]. In last, Kouamand *al* grouped 150 medicinal plants in the Hauts Plateaux Division [10].

To continue this important mapping of medicinal plants in Cameroon, we undertook to carry out an ethnopharmacological study in the Mifi Division. It is with this in mind that we are going to carry out an ethnopharmacological survey in the Mifi Division.

Description of the study area

The Mifi Division is in the Western region of Cameroon with the city of Bafoussam as its capital. It lies between 5° 28' 45" North, 10° 25' 11" East. It is bordered to the North by the Bamoutos, to the South by the Menoua, to the East by the Noun, and to the West by the Nkong-khi. It is made up of four (04) Sub-Divisions: Bafoussam (Urban) Bafoussam (Rural), Bamougoum, Lafé-Baleng.



Figure 1: Map of the West Cameroon region [11].

Selection of study sites:

The Division of Mifi has the town of Bafoussam as its capital; it is in the West Cameroon Highlands, with an area of 2,600 hectares, a population of 3,607,45 inhabitants in 2005, between latitudes 5°26' and 5°31' North; and longitudes 10°21' and 10°30' East [11].

We used a non-probability sampling method known as purposive selection. The villages were selected for the most part based on their accessibility and location to obtain representative information in the Division. The groups

chosen were: Badeng, Baleng, Bafoussam, Bapi and Bamougoum.

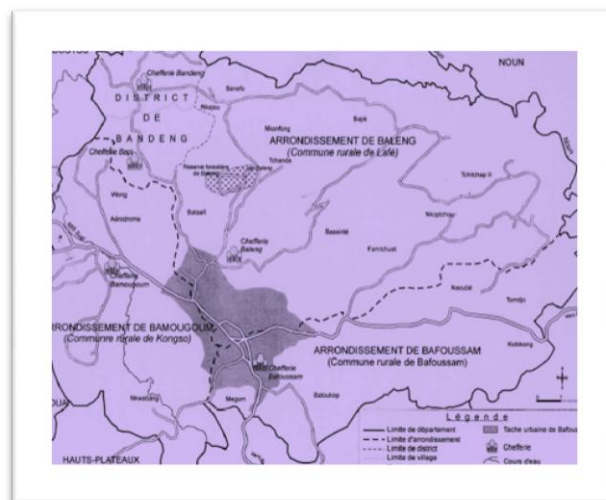


Figure 2: Geographical map of the Mifi Division and different groupings [11].

Methodology

The ethnobotanical survey was conducted among traditional healers in different localities of the Mifi Division. For this study, conventional equipment was used to collect the different information, and to collect and preserve the plant samples. Survey sheets, secateurs, newspaper, cardboard folders, wooden presses and a digital camera were used.

The questionnaire was administered upon informed consent and availability of the traditional healers. Once in the field, the photographs of the plants were made before their collections. grasses, trees, shrubs and vines were the main plant materials. These materials were kept either inside clean paper or in press for identification and authentication at the Cameroon National Herbarium. The data analysis began with the entry of the different recipes and their characteristics by site and respondent in an Excel spreadsheet version 3.0.; the statistical analysis of the different data was then done accordingly.

Survey approach: The survey began with an administrative approach, during which the prefect of the Mifi department authorized the research to the health district chiefs and traditional chiefs in order to obtain the list of traditional practitioners in each group.

Meeting with traditional practitioners: Several actors of the traditional pharmacopoeia were met according to their availability with a survey form established; including questions on the local name of the species, the organs or parts of the plant used, their modes of preparation, the administration of the recipes, the state of use (fresh or dry) and the diseases treated. We provided a guide-interpreter to meet and collect these plants from the traditional healers. All of them received gifts in kind or in cash as a token of their thanks.

Collection of plants: The samples were collected, then the plates were made for identification at the National Herbarium of Cameroon with a specialized Botanist.

Some information was obtained using bibliographic data; the survey was conducted from 02 February to 24 April 2017 using a survey form.

Data processing: The data collected on the survey forms were of two types, socio-demographic data and ethnobotanical data. At the end of the study, all these data were entered into Microsoft Excel, which was also used for graphing.

RESULTS

After describing all the methods, we used to complete our survey in the department of Mifi, we will now pronounce the results obtained.

III.1- NUMBER OF TRADIPRATICIANS SURVEYED

The survey methods we used allowed us to meet with 15 traditional healers, 14 men and one woman, who were recommended by village chiefs, clergymen and doctors in the department who had a perfect knowledge of the traditional healers in the five villages surveyed. The number of traditional healers surveyed per village is shown in Figure 3.

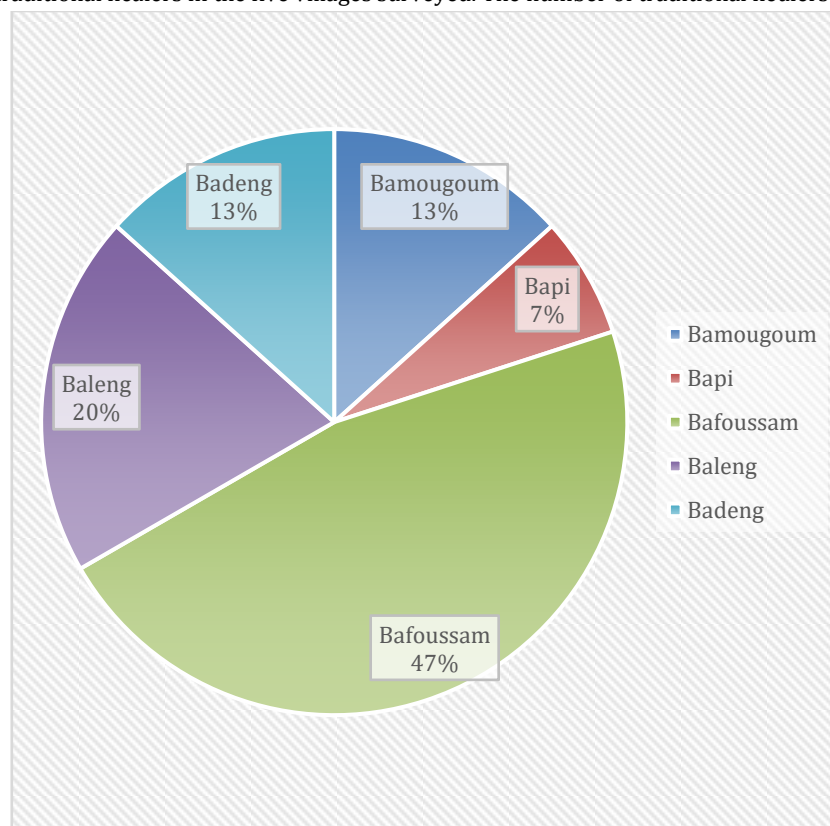


Figure 3: Representation of the number of traditional healers surveyed per village.

III.2 - LISTED MEDICINAL PLANTS

The interviews with the ten or so traditional practitioners made it possible to identify 149 species belonging to 50 families. We present here the repertoire of medicinal plants collected in the villages surveyed, with recipes, added ingredients, parts used and dosage.

Table 1 : Bafoussam Village

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
<i>RothamanniaThung.</i>	Coffee	<i>Rubiaceae</i>	Leaf	Painful monthly period	-	Boil the leaves with water	1 glass morning and evening for a maximum of 3 days
<i>Lantanacamara</i> Linnaeus	Toufoum	<i>Verbenaceae</i>	Sheets	Antianemic and antiasthmatic	Sprouting salt	Boil the leaves with water and add a small amount of germ salt	One desert spoon in the morning and evening
<i>Platycerumangolense</i>	Guy	<i>Polypodiaceae</i>	Sheets	Antihypertensive	-	Boiling the leaves	One glass a day for 2 weeks
<i>Acmella caubirhiza</i> delite.	Mint	<i>Asteraceae</i>	Leaves and stems	Nervous disorders	-	Boiling the leaves	One glass morning and evening
<i>Acanthus montanus</i> .Andersson	Charcoal	<i>Acanthaceae</i>	Sheets	Cases of hepatitis	-	Boiling the leaves	One glass morning and evening
<i>Crepidaria haw.</i>	No mentioned	<i>Asteraceae</i>	Sheets	Dental stamper	Lemon	Crush the-leaves and mix with lemon	Scrub the teeth with a brush once a day
<i>Phaulantus</i> Ridl.	Oumtse	<i>Malastomataceae</i>	Sheets	Antianemic		Boiling the leaves	1 glass morning and evening
<i>Amarantus</i> Adans.	Guetchou	<i>Amaranthaceae</i>	Sheets	Antibiotics		Boiling the leaves	1 glass morning and evening
<i>Ludvigiasp.</i> Linaerus		<i>Onagraceae</i>	Sheets	Antibiotics		Mixwithwater when cold	One glass morning and evening

<i>Emilia coccinea</i> . Don george	Rabbit grass	<i>Asteraceae</i>	Sheets	Antibiotics		Boiling the leaves	One verse morning and evening
<i>Chenopodium</i> L.	Not mentioned	<i>Amaranthaceae</i>	Leaves and roots	Anti helminthics	honey	Boil the leaves and add the honey	One drink a day
<i>Asystasiagangetica</i> .Andersson Thomas	Picendi	<i>Acanthaceae</i>	Sheets	Venereal infection		Dry the leaves and boil in about 4L of water	1 drink per day
<i>Cyphostemma</i> Gen.Pl .	Djou	<i>Araceae</i>	Sheets	Urinary tract antibiotic	Raffia wine	Cut the leaves and boil, adding the raffia wine	½ glass morning and evening
<i>BrillantaisiaOwariensis</i> P.Beauv.	Not mentioned	<i>Acanthaceae</i>	Sheets	Antifungal		Washing the leaves properly	Chew the morning evening and leaves
<i>Solenastemon</i> Vidensk . sp	Not mentioned	<i>Lamiaceae</i>	Sheet	chicken pox		Wash and boil the leaves	Rub on the body every evening after bathing
<i>Ocimumgratissium</i> L.	Messep	<i>Lamiaceae</i>	Sheets	Buttock red	percujum	Crush the leaves and extract the juice before adding the percujum	1 teaspoon morning and evening
<i>Arachis hypogaea</i> .L	Peanut leaves	<i>Fabaceae</i>	Sheets	Antianemic		Crush the leaves and extract the juice and drink	One glass morning, noon and night
<i>Centella asiatica</i> Urban (L)Urb	Mor'o	<i>Apiaceae</i>	bark	Analgesic and antimalarial		Cut off the bark; boil	One glass morning and evening
<i>Phaselluslanatus</i> Medk.	Jou'ouu	<i>Fabaceae</i>	Sheets	Antibiotics	Palm kernel oil	Crush the-leaves and add palm oil	1 drink per day

<i>Piper umbellatum</i> . L.	Muddy	<i>Piperaceae</i>	Sheets	Testicular pain			Massage the testicle with the leaves
<i>Ipomoeella</i> A.Chev.	White potato leaves	<i>Convolvulaceae</i>	Sheets	Analgesics		Boiling the leaves	1 glass morning and evening
<i>Dichlocephala integrifolia</i>	Cardin	<i>Dichlocephalaceae</i>	Leaves and flower	Analgesic		Washing leaves and fruit	One skin application per day by massage
<i>Cissus quadrangularis</i> L.	Not mentioned	<i>Vitaceae</i>	Sheets	Diuretics	Palm wine	Boil the leaves and mix with palm oil	A ½ glass a day
<i>Impatiens</i> ssp L.	Not mentioned	<i>Balsaminaceae</i>	Sheets	Against La Ernie		Boiling plants	1 glass morning and evening
<i>Pharagnanthera</i>	Kwetchou	<i>Loranthaceae</i>	Sheets	Antibiotics		Boiling the leaves	1 glass morning and evening
<i>Chromalaena Adorata</i>	Not mentioned	<i>Asteraceae</i>	Sheets	Healing		Crush the juice and press it onto the wound	Apply to the wound 1-2 times a day
<i>Piper umbellatum</i> L.	Not mentioned	<i>Piperaceae</i>	Sheets	Antispasmodics		Mace rate the leaves	2 drinks per day
<i>Helichrysum adenocarpum</i> DC.	Ba'ha	<i>Asteraceae</i>	Sheets	Rheumatism and malaria		Maceration	1 glass morning and evening for both cases
<i>Ficersexasperata</i>	Tchuet	<i>Floraceae</i>	Sheets	Antitussive		Maceration	One glass morning and evening
<i>Commelinnabenghalensis</i> L.	Lewouwou	<i>Commelinaceae</i>	Sheets	Against amoebic dysentery		Crush and grind in the mortar	One glass morning and evening

<i>Bidens pilosa</i> L.	Gwawa	<i>Asteraceae</i>	Sheets	Malariaand cramp	Papaya leave- sand herbal tea	Mix the differ- ent leaves and then boil	2glassesinthe morning taken once
<i>Bryonia scabra</i> L.f.	The Lom- cram	<i>Cucurbits</i>	Sheets	Tummy cleansing for babies		Boiling the leaves	A morning and evening cocoa
<i>Sansevera</i> Bot.	Fouwoupet	<i>Dracaenaceae</i>	Sheets	antimalarial		Boilthe leaves with water	One glass morning and evening
<i>Markhamia tomentosa</i> (Benth.)	Lewou	<i>Bignoniaceae</i>	Bud	Antihypertensive		Maceration of the buds	1glass morning and evening
<i>Cordia platythyrsa</i> Barker.	Neulo	<i>Boraginaceae</i>	Whole plants	Antispasmodic		Infusion	One glass morning and evening; or purge the child every morning
<i>Physicias fulva</i>	Koc	<i>Arabiaceae</i>	Barks	S Sinusitis		Squeeze the peel and re- move the juice	1 to 2 drops in each nostril
<i>Pterinumaquillinum</i>	Not men- tioned	<i>Denstaendiaceae</i>	Sheets	Anti-cancer drugs and yeast		Grind the slope and boil it with water	One glass morning and evening
<i>Lobelia columnaris</i> Hook.f	Trun	<i>Camphanu- laceae</i>		Ritual plantprotect sinhabitants against spirits			
<i>Ludwigia abyssinica</i> L.	Not men- tioned	<i>Onagraceae</i>	Sheets	Antihypertensive and Anticancer		Boil the leaves with water	One glass morning and evening

Table II: Baleng village

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
<i>Sidarthombifolia</i> L.	Chipre	<i>Malvaceae</i>	Sheets	Vitamins		We crush until it's sticky	½ glass twice a day
<i>Crassacephalumbiafrae</i> S. Moore	Five fingers	<i>Asteraceae</i>	Sheets	Antibiotics in pregnant women		The leaves are macerated	The amount taken depends on the state of pregnancy but in general at the beginning of pregnancy it is one glass morning and evening and from six months of pregnancy it is ½ glass
<i>Asystasia</i> sp	Percujum	<i>Acanthaceae</i>	Sheets	Antifungals in children	Messep	Wash then press and add the messep	One tea spoon morning and evening
<i>Annona muricata</i> L.	Soursop leaves	<i>Anonaceae</i>	Sheets	Nerve pain		Boiling the leaves	1 glass morning and evening
<i>Bidens pilosa</i> L.	Kingne	<i>Asteraceae</i>	Sheets	Analgesic		Boil or macerate the leaves	One glass morning, noon and night
<i>Centella asiatica</i> L.	Mouse ears	<i>Apiaceae</i>	Sheets	Laxative		Infusion	1 glass morning and evening
<i>Drymaria cocordata</i> I.M.	Lomtokia	<i>Caryophyllaceae</i>	Sheets	Anticonvulsant		Squeeze the juice from the leaf	1 glass after each convulsion
<i>Kalanchoe crenata</i> (Andrew).	Fam	<i>Crassulaceae</i>	Sheets	Antitoxic		Wash well and chew raw or boil	Chew raw 1 to 2 times a day

<i>Euphorbia hirta</i> L.	Not mentioned	<i>Euphorbiaceae</i>	Sheets	Against inflammation of the spleen	Palm oil	Dry and crush to a powder and mix with oil	Licking 2 to 3 times a day
<i>Euphorbia tirucali</i> L.	Lètsetse	<i>Euphorbiaceae</i>	Sheets	Poison Control	Twenty of palm	We cut the sheet and put it in the twenty	One glass morning and evening
<i>Harungnamadagascariensis</i> Lam .	Keto'o	<i>Haruginaceae</i>	Leaves and bark	Malaria		Mix leaves and bark and boil	1glass morning and evening
<i>Crinum</i> sp	Mlé	<i>Amaryllidaceae</i>	Sheets	Antispasmodic		We battery with water	1glass morning and evening
<i>Sonchus albanus</i> (Steven).	Tsetse	<i>Asteraceae</i>	Sheets	Antidiabetics	vegetable	We prepare with the vegetable	Diabetic meal noon, morning, evening
<i>Ricinus communis</i> L.	Chidjan	<i>Euphorbiaceae</i>	Sheets	Filaria, haemorrhoids	Sprouting salt	Decoction add germ salt	½ glass morning and evening for 3 months
<i>Croton macrostachyus</i> L.	Pouetchom	<i>Euphorbiaceae</i>	Sheets	Against yellow fever	Yellow sauce	Crush the leaves and add to the yellow sauce	Drink from a plate once or twice a day
<i>Dichrocephala integrifolia</i> subsp. <i>integrifolia</i>	Rigam	<i>Asteraceae</i>	Sheets	Angina		Rubbing and mashing	We eat raw in the morning and evening
<i>Solanecionandensis</i> (S.Moore)C.	Wound grass	<i>Asteraceae</i>	Sheets	Antibiotic		Crush into a paw shape	Apply to the wound morning and night for a fortnight
<i>Taraxacum officinale</i> L.	Pork grass	<i>Asteraceae</i>	Sheets	Antibiotic		Crush and apply to the wound	Two applications per day
<i>Kalanchoe crenata</i> (Andrews) Haw	Djou	<i>Crassulaceae</i>	Sheets	Antalgic and antibioticology		Infusion	A twice-daily auditory application

<i>Asystasia sp</i> Blume.	foukemétse	<i>Acanthaceae</i>	Sheets	Inflammatory and venereal disease		Infusion (wash leaves and boil at a moderate temperature)	One application morning and evening or one glass morning and evening
<i>Senna alata</i> L.		<i>Azanthaceae</i>	Fruit	Against chickenpox		Crush the seeds	Apply every evening before going to bed
<i>Aspilia africana</i> C.D.Adams	Not mentioned	<i>Asteraceae</i>	Sheets	Antiseptics	Salt	Crush the leaves and add the germ salt	Two applications per day
<i>Solanum nigum</i> L	Tomdjap	<i>Solanaceae</i>	Sheets	Nervoussystem disorders		Maceration	Pass through the nostrils once a day
<i>Acmellacaulirhiza</i> Rich.exPers	Guegap	<i>Asteraceae</i>	Sheets	Antispasmodics	Jujubes		Eat the leaves mixed with jujubes twice a day
<i>Phisalis peruviana</i> L.	Ma'a hum yi	<i>Solanaceae</i>	Sheets	Against bile		Boiling the leaves	One glass morning and evening
<i>Costusaferkew</i> Bull .	Twin cane	<i>Costacées</i>	Sheets	Antitussive	honey	Boiling the leaves	½ cocoa per day for children and one cocoa per day for adults
<i>Hibiscusmalacopermus</i> (Turcz.).	Chi-square	<i>Malvaceae</i>	Sheets	Vaginal antibiotics		Crush the leaves	One vaginal application per day
<i>Ageratum conyzoides</i> L.	lenungwui	<i>Asteraceae</i>	Sheets	Antifungal, Night Poison	Jujube and salt sprouts	Toasting to a powder ointment Rub 7 leaves in water and add 7 grains of jujube and a little salt germ	One application morning and evening Drink one glass a day for two days
<i>Eryngium foetidum</i> L.	picket	<i>Apiaceae</i>	Sheets	Bill, nausea and hepatitis	Palm, kernel oil	Chew the leaves raw or toast the leaves to obtain the powders add the palm kernel oil	Take cac for 7 days

<i>Alframomum</i> sp	Not mentioned	<i>Giberaceae</i>	Stem	Fatigue		Crush the stem and extract the juice	Take one glass a day for 3 days
<i>Chenopodium Ambrosoides</i> L.	Fouméne	<i>Ulmaceae</i>	Sheets	Intestinal worms	Sugar	Crush and put in water and add sugar	Drink 1 glass young for 3 days
<i>Trema orientalis</i> L.	Hai	<i>Malvaceou s</i>	Sheets	Language button		Put the leaves on the child's tongue	1 time per day
<i>Vernonia conferta</i> Benth.	Not mentioned	<i>Asteraceae</i>	Sheets	Cirrhosis of the liver		Crush the leaves	Consume morning and evening
<i>Celosia</i> sp L.	Not mentioned	<i>Amaranthaceae</i>	Fruit	Bacterial infection	Sprout salt and jujube	Soak the fruit in water and add 7 grains of jujube and a pinch of salt germ	Drink 1 glass a day for two days
<i>Oxalis corniculata</i> L.+ <i>Emilia coccinea</i> (Sims) G. Don+ <i>Ocimum gratissimum</i> L. var. <i>gratissimum</i>	Gouanvou+ Vinlapin+ racine- cotermandja	<i>Oxalidaceae</i> + <i>Asteraceae</i> + <i>Lamiaceae</i>	Sheets	Diaper rash		Rub the mixture of leaves and water and filter	Purge the child 3 times a day
<i>Hibiscus asper</i> L.	Not mentioned	<i>Malvaceae</i>	Barks and Leaves	Malaria	White wine	Boil the mixture in white wine	Drinking at bedtime
<i>Sida veroniciflora</i> (Lam).	Not mentioned	<i>Malvaceae</i>	Sheets	Snake venom			
<i>Tithonia diversifolia</i> (Hemsl).	Jealousy flower	<i>Asteraceae</i>	Root	Dewormer	Sugar	Cut the roots and boil them in water and sugar	1 drink per week 1 month
<i>Phaulopsis imbricata</i> (Forssk.) Sweet	Not mentioned	<i>Acanthaceae</i>	Leaves and roots	Anemia	Rub the leaves and put in water	Drink half a glass a day for 3 days	Drink half a glass a day for 3 days

Table III: Bamougoum Village

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
<i>Oxalis corchiculata</i> L.	Not mentioned	<i>Oxalidaceae</i>	Sheets	Bile and vomiting and also facilitates childbirth		Rubin water and Wait 30 minutes and filter	Drink 1/2 glass a day
<i>Solanum aculeastrum</i> L.	Wilderness Inn	<i>Solanaceae</i>	Whole-fruit	Spleen, lung infection, venereal disease		Place the fruit in the heated ash, wash and squeeze.	Drink one glass morning and evening
<i>Culcasia angolensis</i> Welw. ex Schott	Not mentioned	<i>Araceae</i>	Sheets	General fatigue	White wine and jujube	Boil the leaves and jujube in white wine	Chew one leaf and one grain of jujube, eat once a day
<i>Spinacia oleracea</i> L.	Douet	<i>Chenopodiaceae</i>	Sheets	Oedema in pregnant women		Rub the leaves and put in water and filter	Drink one glass a day for a week
<i>Justica adhatoda</i> L.	Toulé	<i>Acanthaceae</i>	Sheets	Painful rule		Boil in water	Drink a glass twice a day
<i>Hibiscus esculentus</i> L.	Ancro	<i>Malvaceae</i>	Fruit	Bed wetter	Cooking salt	Cut up the fruit and boil in water, add a pinch of salt	Drink 1 glass twice a day for one week
<i>Asytasians Gangetica</i> Enum.	Not mentioned	<i>Acanthaceae</i>	Sheets	Fatigue in pregnant women		Rub the leaves in water	Drink one glass twice a day for two weeks from the first day of the rule
<i>Ageratum conifertum</i> Baker.	King of herbs	<i>Asteraceae</i>	Sheets	Cough			Chew the leaves raw 2 to 3 times a day

<i>Baselleobovata. Kunt</i>	Not mentioned	<i>Asselaceae</i>	Sheets	Infertility		Boil the leaves	1 drink per day
<i>Concalismelananthasp</i>	Not mentioned	<i>Apiaries</i>	Sheets	Treatment of asthma	Jujube	Boil the leaves with water and add the jujube	Drink one glass twice a day
<i>HibiscusrosasinensisL.</i>	Not mentioned	<i>Malvaceae</i>	Sheets	Poison Control	beers	Rub the plant into a beer and filter	Drink half a glass a day
<i>PsidiumguayavaMem.</i>	Aromatic guava leaves	<i>Myrtaceae</i>	Sheets	rheumatism		Take 20 leaves, make an infusion and filter	Drink one cup after the evening meal for one month
<i>Bambusavulgaris schard. Ex. J. C.</i>	Chinese bamboo	<i>Poaceae</i>	Stem	Joint pain		Cut the stems, crush them, make an infusion and sieve	Drink one glass morning and evening for one month
<i>Drassicaderaceaespp</i>	Cabbage	<i>Brassicaceae</i>	Sheets	First and second degree burns		Crush the leaves	Put the product on the compress and apply to the burn once a day
<i>Kalanhoepinnata(lam) pers.</i>	Joujoum	<i>Crassulaceae</i>	Sheets	Coughs and ear infections		Heat the leaves and extract the juice	Put 3 drops in each ear once a day. 1 cas 3 times a day in case of Cough for 5 days
<i>CommelinabenghalensisL.</i>	Not mentioned	<i>commelinaceae</i>	Sheets	Bacterial infection	Village egg and un-sweetened milk	Heat the leaves and extract the juice, add the milk and egg	Drink 1 glass 3 times a day
<i>CymbopogonSect.citratuL.</i>	Fibergrass herb	<i>Poaceae</i>	Whole plants	Obesity and oedema	lemon	Boil the plant and	Add the lemon

Table IV: Badeng Village

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
<i>Centella asiatica</i> L.	Not mentioned	<i>Apiaceae</i>	Whole plant	Diaper rash		Rub the leaves in water and purge the child with	
<i>Coryza bonariensis</i> L.	Neukgop	<i>Asteraceae</i>	Sheets	Tonsillitis		Chewing the leaves	Chew the leaves twice a day
<i>Ficus exasperata</i> Vahl	Not mentioned	<i>Moraceae</i>	Stem	Ringworm in children		Break the stem and rub the sap on the infected area	Apply twice a day
<i>Lantana camara</i> L.	Not mentioned	<i>verbenaceae</i>	Sheets	Wire treatment	Jujube and unsweetened milk	Crush the leaves with 7 pungent jujube seeds and add the unsweetened milk	Take 1 case 3 times a day
<i>Cathartus-rhoseus</i> G. Don	Not mentioned	<i>Apocynaceae</i>	Sheets	Abdominal pain, colic, strangulated hernia	palms	Rub the leaves in water with 7 crushed palm kernels	Drink one glass 3 times a day
<i>Hibiscus rosasinensis</i> L.	Hibiscus flower	<i>Malvaceae</i>	Sheets	Facilitates child birth and abscesses		Crush the leaves, add water to drink and purge, apply to the infected area	Drink 1 glass twice a day and purge twice a day.
<i>Eremomastax speciosa</i> (Hochst.) Cufod.	Penzemmo	<i>Acanthaceae</i>	Sheets	Fontanelle		Crush the leaves and add the water	Drink 1 glass 3 times a day for 1 month; apply to the child's fontanel twice a day and make the child drink 1 cup twice a day
<i>Commelinabenghalensis</i> L.	Gougou	<i>Commelinaceae</i>	Stem and leaves	Ringworm and facilitates childbirth		Rub the leaves in the water, filter and purge	Purge from the 5th month of pregnancy once every fortnight for delivery break the stem extract the juice and apply the infected part

<i>Chlorophytum andongense</i> Baker	Not mentioned	<i>Anthericaceae</i>	Sheets	Cramps	Jujube	Rub the leaves with water and add the crushed jujube	
<i>Vernonia</i> sp. Schreb	Not mentioned	<i>Asteraceae</i>	Stem	Gastric illness	Honey	Remove the sap and mix with water	1 cac morning and evening
<i>Scoparia dulcis</i> L.	Jujube	<i>Scrophulariaceae</i>	Sheets	Congested airways	Palm nuts		Eating raw with palm nuts
<i>Euphorbia lateriflora</i> et Schum Thonn .	melansesor	<i>Euphorbiaceae</i>	Whole plant	Lung infection, chlamydia, cough		Crush and mix with honey	Adult 1 case three times a day Child : 1 case twice a day
<i>Cyperus sphacelatus</i> L.	chengeu	<i>Cyperaceae</i>	Sheets	Facial care and tummy ache		Crush extract the liquid	Apply to the face once a day. In case of stomach pain, drink a glass morning and evening.
<i>Cyperus sphacelatus</i> L.	chengeu	<i>Cyperaceae</i>	Sheets	Facial care and tummy ache		Crush extract the liquid	Apply to the face once a day. In case of stomach pain, drink a glass morning and evening.
<i>Hibiscus sabdariffa</i> L.	metsap	<i>Malvaceae</i>	Sheets	Female infertility and anaemia	Unsweetened milk	Rub the leaves into the water and wait 24 hours before adding the unsweetened milk	Drink half a glass morning and evening and during menstruation drink 1 glass twice a day.

Table V: Bapi Village

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
<i>Bidens pilosa</i> + <i>Emilia cocinea</i>	Tsisecneuk + Vinlapin	<i>Asteraceae</i> + <i>Asteraceae</i>	Sheets	Malaria, Yellow fever	Sprouting salt	Boil the mixture and add a pinch of rock salt	Drink 1 glass twice a day for 7 days
<i>Eromomastax speciosa</i> + <i>Justicia cfadhatoda</i>	Pendemmo'o + Toulesuet	<i>Acanthaceae</i> + <i>Acanthaceae</i>	Sheets	Heavy periods		Rub the 2 in water and wait 45 minutes then filter	Drink 1 glass twice a day
<i>Ageratum conizoides</i> L.+ <i>Bruceaguinensis</i> G.D on + <i>Schefflera barteri</i> (Seem.) Harms + <i>Ficus thonningii</i> Blume + <i>Musaparadisica</i> L.+ <i>Psidium guajava</i> L.+ <i>Cymbopogon citratus</i> (DC.) Stapf + <i>Bidens pilosa</i> L	Tchouamo + Lecak + Derte + Tsia + Quedon + Goya +Fatty fiber + Tsitseneuk	<i>Asteraceae</i> + <i>Simarubaceae</i> + <i>Araliaceae</i> + <i>Musaceae</i> + <i>Myrtaceae</i> + <i>Moraceae</i> + <i>Poaceae</i> + <i>Asteraceae</i>	Sheets	Typhoid	Pineapple wall	Boil the mixture in water	Drink 1 glass twice a day Sucking up steam under a blanket
<i>Vernonia conferta</i> Benth	Not determined	<i>Asteraceae</i>	Sheets	Cirrhosis of the liver		Crush the leaves and extract the juice	Drink 1 glass a day
<i>Drocaemas</i> p	White pear tree	<i>Dracaenaceae</i>	Whole plant	Epilepsy	Jujube, rooster meat	Crush the plant in combination with the jujube, mix the product with the meat of the rooster	Use the product in the morning and evening
<i>Vernonia amygdalina</i> Delile	Ndolé	<i>Asteraceae</i>	Sheets	Hypertension		Boil with water	Drink 1 glass a day

<i>Murdannia simple</i> X Vahl.	Lynwoum	<i>Cammelinaceae</i>	Sheets	Urinarytract- infection in women, lower ab- dominal pain		Boil with water	Drink 1 half glass a day
<i>Celosiasp</i> L.	Not mentioned	<i>Amaranthaceae</i>	Fruit	Bacterial infection	Jujube, Sprouting salt	Soak the fruit in water, add 7 crushed jujube seeds and a pinch of salt	Drink 1 glass a day for 2 days
<i>Eremomastax speciosa</i> (Hochst.) Cufod.	Penzemzém'o	<i>Acanthaceae</i>	Sheets	Dysentery, Diaper rash	Palm kernel oil	Grill in the pot until powdery and add palm kernel oil (diaper rash) Rub the leaves and put in water	Drink 1 glass twice a day for 3 days Take 1 tsp twice a day for 7 days
<i>Vernoniasp</i> Schreb.	Fouyu	<i>Asteraceae</i>	Sheets	Bile, Aga inst nausea, Hepatitis		Rub in water and wait a few minutes	Drink 1 glass twice a day for 3 days
<i>Acmellacaulirhiza</i>Delile.	Pentrou	<i>Asteraceae</i>	Leaves and flowers	Fontanelle	Menthol	Crush the flowers, add menthol and rub the upper and inner part of the mouth Rubbing the leaves in water	Apply twice a day for 3 days Purge the child twice a day for 3 days Drink 1 glass twice a day (Okey)
<i>Hibiscus sabdariffa</i> L.	Douetmetsap	<i>Malvaceae</i>	Sheets	Female infer- tility, Ane- mia, Tubal cleansing	Unsweet- ened milk or village egg	Rub the leaves into the water and wait 24 hours Add the other compo- nents (anaemia)	Drink half a glass twice a day during your period Drink 1 glass twice a day
<i>Scoparia dulcis</i> L.	Deudeu wine	<i>Scrophularia- Céés</i>	Sheets	Palpitation		Chew raw and drink water, then also rub the chest	Chew 7 leaves twice a day for 3 days and rub the chest twice a day
<i>Apocynum</i> L.	Not mentioned	<i>Apocynaceae</i>	Sheets	Stomach ache		Boil with water	Drink 1 glass in the morn- ing
<i>Bidens pilosa</i> + <i>Emilia cocinea</i> (sims) G.	Tsisecneuk + Vinlapin	<i>Asteraceae</i> + <i>Asteraceae</i>	Sheets	Malaria, Yel- low fever	Sprouting salt	Boil the mixture and add a pinch of rock salt	Drink 1 glass twice a day for 7 days

<i>Catharanthus roseus</i> G.Don	Bian flower	<i>Apocynaceae</i>	Sheets	Sexual weakness	Bitter ko la And little Guinness	Rub the leaves in 1.5 litres of water and add the crushed bitter kola and Guinness	Drink half a glass in the morning and one glass in the evening for 7 days
<i>Eryngium foetidum</i> L.	Piquet	<i>Apiaceae</i>	Sheets	Counter poi- son	Palm ke rnel oil	Chew the leaves raw or toast the leaves to a powder and add the palm kernel oil	Take 1 teaspoon for 7 days, wait 7 days and repeat for 1.5 months
<i>Schefflera</i> sp J.R.	Hopcon	<i>Aralikeae</i>	Stem	Psychological abnormali- ties	Village egg	Remove sap; mix with beaten egg; tie in plastic and boil	Eat once a day at sunset
<i>Croton micraster</i> L.	Tchon	<i>Euphorbiaceae</i>	Sheets	Against con- stipation			
<i>Mangifera indica</i> L. + <i>Psidium guajava</i> L. + <i>Carica papaya</i> L. + <i>Persea americana</i> Mill + <i>Dacryodes edulis</i> (G. Don) H.J. Lam + <i>Ageratum conyzoides</i> L. + <i>Cymbopogon citratus</i> (DC.) Stapf..	Treumangrou + Goya +Papaya + Pia +Kup +Tchouamo + Fatty fibre	<i>Aracardiaceae</i> + <i>Myrtaceae</i> + <i>Caricaceae</i> + <i>Aracardiaceae</i> + <i>Burseraceae</i> + <i>Asteraceae</i> + <i>Poaceae</i>	Bark	Epilepsy		Boil the mixture in 7 litres of water and leave to boil until you have 5 litres	Drink 1 glass twice a day for 7 days

After having obtained the authorization of the district chief of the department who put us in contact with the different traditional chiefs of the said department, they allowed us to meet these different traditional practitioners. The interviews with 15 traditional leaders enabled us to collect 39 plants in Bafoussam, 62 plants in Baleng, 20 plants in Bamougoum, 12 plants in Bapi and 16 plants in Baden. The figure below shows the number of plants collected per village.

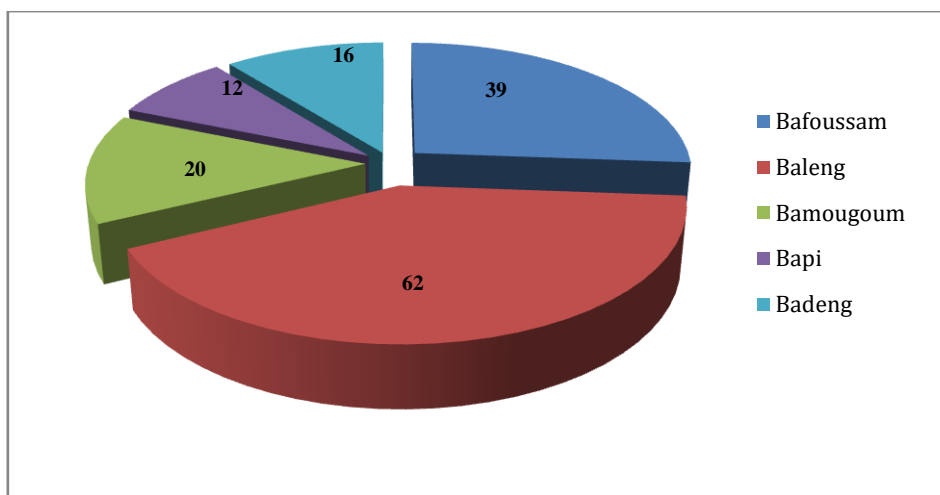


Figure 4: Representation of the number of plants harvested per village

The analysis of the species listed shows 149 plant species that are used for therapeutic purposes. They are divided into 50 botanical families. Among the families listed, the most represented are the *Asteraceae* (25 species, i.e. 16.77%), the *Acanthaceae* (15 species, i.e. 10.06%), the *Euphorbiaceae* (6 species, i.e. 4.02%), the *Crassulaceae* (4 species, i.e. 2.6%), *Apiaceae* (5 species, i.e. 3.35%), *Commelinaceae*, *Fabaceae*, *Lamiaceae* (3 species, i.e. 2.6%), and *Piperaceae*, *Oxalidaceae*, *Myrtaceae* and *Poaceae* (2 species, i.e. 1.34%) and others (89 species, i.e. 59.73%). After identifying the species, we classified them into families (figure 5).

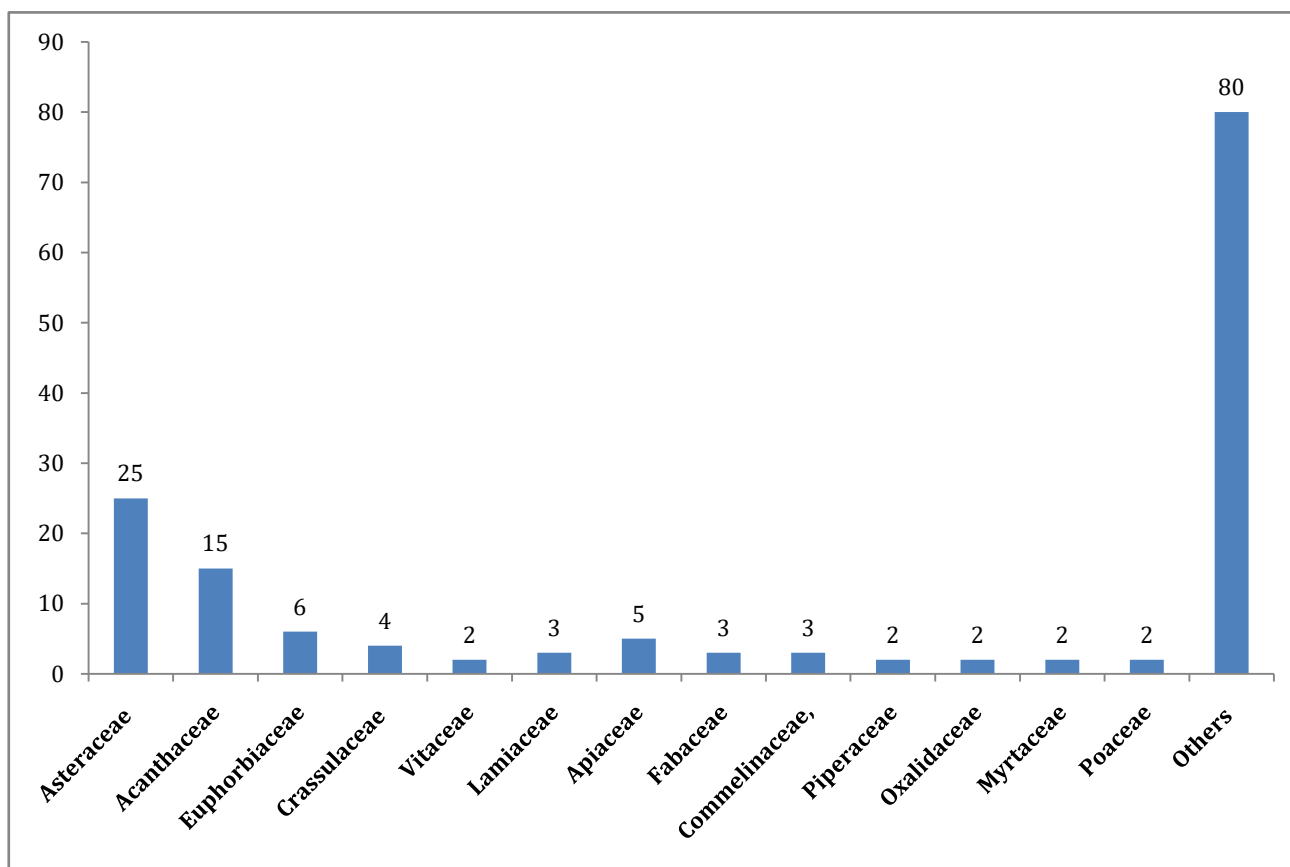


Figure 5: Representation of the plants collected by family

Parts of plants used

We have listed 08 plant parts used in descending order of importance. The plant parts used are shown in the table opposite:

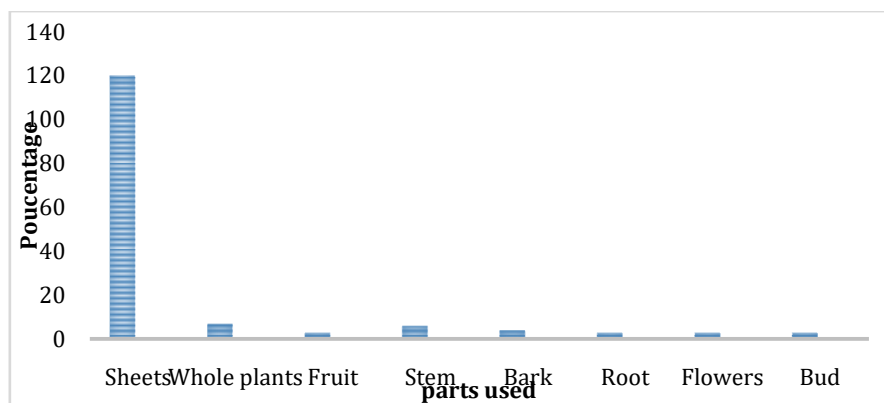


Figure 6: Parts of the plant used

Preparation method

In the course of our work, we obtained several preparation methods used for the preparation of traditional products. The graph below summarises these different preparation methods.

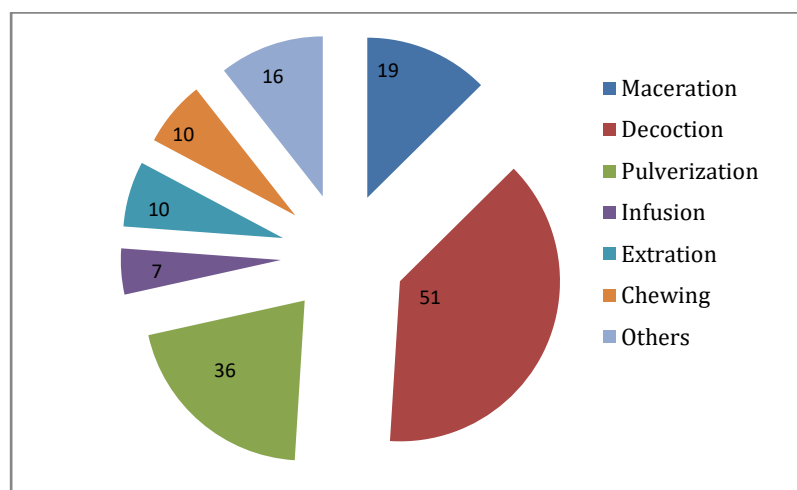


Figure 7: Graphical representation of the preparation methods used

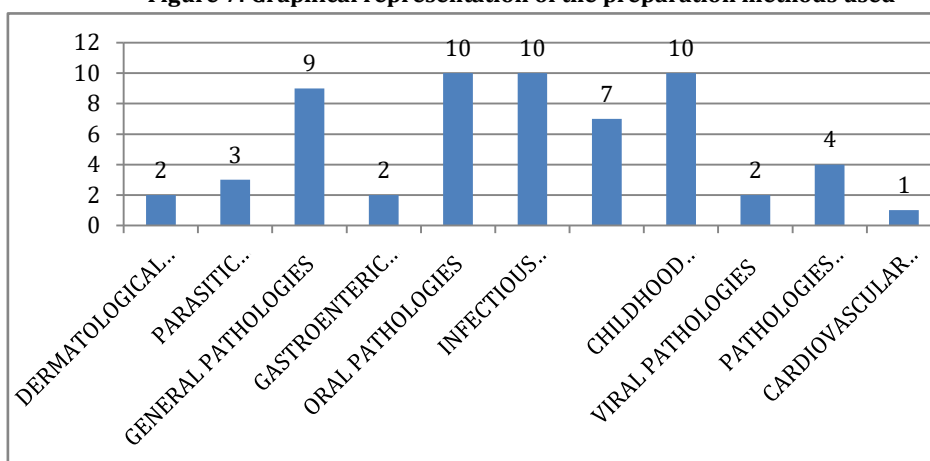


Figure 8: Graphical representation of pathologies by Group

In addition to the recipes obtained in this department, it appears that traditional practitioners, commonly known as healers, orient traditional medicine more towards treatment based on leaves, barks and roots, often accompanied by incantations and certain rites which are practices that do not exist among herbalists. With regard to the mode of acquisition of medical knowledge by traditional healers, oral transmission encompasses knowledge acquired verbally from grandparents, parents, spouses or friends, while written transmission is the acquisition of knowledge through the writings left by a traditional healer. The table VII below shows the different practices carried out during the treatments.

Table VII: Directory of medicinal practices

Pathologies	Scientific name	Family	Medicinal practice	Place of harvest
Malaria	<i>Bidens pilosa</i>	<i>Asteraceae</i>	Cover yourself with a sheet with your head towards the pot of product and suck in the vapours	Bafoussam
Intestinal worms with rib-pain in children	<i>Chenopodium</i>	<i>Euphorbiaceae</i>	First the prayer is said	Baleng
Fever	<i>Cymbopogon citratus</i>	<i>Poaceae</i>	after bathing, throw the rubbish under a banana tree	
Spleen infection	<i>Coinum jagus + Solanum aculeastrum</i>	<i>Amaryllidaceae + Solanaceae</i>	Scarification	
Cramps	<i>Anthericeae chlorophytum + macrophyllum</i>	<i>Simarubaceae</i>	Punching the affected area with a stick	
severe headache	<i>Erigeron floribundus</i>	<i>Zingiberaceae</i>	the patient sits outside in the morning at sunrise with the container in front of him	
Infections in the mouth (teeth)	<i>Acmella caulirhiza</i>	<i>Asteraceae</i>	throwing a silver coin on the ground	

Medicinal plants usually used in the country:



Figure 9: *Oxalis corniculata* L.



Figure 10: *Aloes* sp L



Figures 11: *Hibiscus sabdariffa* L



Figure 12: *Euphorbia lateriflora* Schum



Figures 13: *Vernonia baldwini* Torr



Figure 14: *Cyperus Sect. sphacelati*



Figure 15 : *Eryngium foetidum L.*

Discussion

To conduct this ethno-pharmacological study in the Mifi Division, we interviewed 15 traditional practitioners, including one woman and 14 men, in five villages. The latter had been recommended to us by traditional chiefs, some churchmen and health practitioners. During these interviews, we collected 149 plants of therapeutic interest as in another Division [6-9].

Regarding the number of traditional healers and the quantities of plants harvested during our study, Figures 3 and 4 show that the majority of plants were harvested in Ba-foussam and Bamougoum. We thanks to the cooperation of a large number of traditional healers. This contrasts with Bapi and Badeng, where the cooperation of traditional practitioners was less.

Figure 4 shows the 150 species of plants listed and used in the department. There is a similarity of magnitude in the use of plants between infectious, infantile and general traumatic pathologies respectively 17.54% and 15.78%. This represents the highest percentage of use of plants in the department. Gynaeco-obstetrical pathologies come in second place with 14.03% of plants used. Then come the pathologies of the otorhinolaryngological system with a use of 10.52% of plants. The pathologies of the nervous system as for them use 7.010%. Parasitic pathologies are treated by 5.2% of plants. The dermatological and cardiovascular system pathologies use respectively 3.5% of plants. Finally come the viral pathologies and gastroenteritis with a use of 5.2% of plants each.

These results reflect somewhat the general health profile of Africa, which is dominated by infectious diseases [13]. This observation is corroborated by the hygiene situation, especially the lack of clean running water. The high frequency of sexually transmitted infections is justified by the change of authorized or unauthorized partners, in addition to the lack of respect for preventive measures. The percentage of digestive pathologies here is explained by the non-respect of food hygiene rules (eating freshly harvested products...). The rate of genitourinary pathologies could be explained by the poor treatment or neglect of patients. The lack of qualified specialists leads to a high frequency of pathologies of the otorhinolaryngological system.

We note that, in the Mifi Division, traditional healers use certain plants to treat a multitude of diseases. This is the case of *Aloe sp*, *Vernonia sp*, *Oxalis corhiculata*, *Euphoria lateriflora*, *Eryngium foetidum*, *Cyperus sphacelatus*, *Hibiscus sabdariffa*.

On the other hand, we had difficulties in applying the Convergent Method (which allows us to objectively determine a plant of therapeutic interest) during our study. This was due to the fact that traditional practitioners in this department use the same plant to treat a multitude of diseases. Nevertheless, we noted as a plant of therapeutic interest in the department. It would therefore be wise in the coming years to continue research on this plant (to determine its active ingredient) and to make it available to patients in the form of improved traditional medicine.

We noticed during our study, the parts used on all 150 species are the leaves, the barks, the roots, the stems, the sap or even the whole plant. The leaves are the most solicited in the medicinal preparations because they are easy to take and easy to handle.

These parts are prepared by decoction, maceration, trituration, or even infusion, the most common mode of preparation in traditional medicine treatments in this Division is the decoction form, widely used by the populations of Ivory Coast [14].

The conservation of these drugs is generally done during one week at most for the drugs obtained by maceration, two weeks to one month for those obtained by decoction and by trituration. For dried preparations (dry drugs) the shelf life can be up to 2 years. The decoction owes its shelf life to the fact that unlike maceration, its preparation is done at high temperature thus reducing microbial contamination.

Conclusion

This study made it possible to take stock of the medicinal plants used by the Mifi traditional healers. It showed that 149 species of medicinal plants are used by the local population to treat themselves. The most represented families are *Asteraceae*, *Acanthaceae* and *Solanaceae*. All parts of the plants are used to treat various ailments. However, the leaves, the whole plant and the roots are the most prized organs and the decoction is the most commonly used method of preparation. These plants have been classified by therapeutic group and that of general pathologies has been the most represented, followed by gynaeco-obstetrical pathologies and ENT, which contains all infectious diseases. There is a correlation for some plants between the use in MIFI and the use found in the literature. All that remains is to approve the veracity of what the traditional practitioners say about the other plants through in-depth research. This will allow us to achieve our overall objective (to produce a conventional pharmacopoeia that would allow for the production of improved traditional medicines).

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Informed Consent

Informed consent of traditional healers.

Ethical Statement

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Author Contribution

All authors have contributed for achievement of this work.

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