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Ethnobotanical survey on plants used in the treatment of infectious diseases in the Bamboutos division (Cameroon)

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Abstract
The objective of this work is to carry out an ethnopharmacological survey of the medicinal flora of the Bamboutos department in the West Cameroon region. More precisely, plants were collected in 16 groups of the Bamboutos department. These collected plants were identified at the National Herbarium of Cameroon. The survey methodologies used were: field evolution, comparative study and interview of traditional practitioners, herbalists and other elderly people using a questionnaire. The interview was conducted with 26 traditional healers. At the end of this survey, 167 plants in 58 families were identified. *Asteraceae* 30%, *Acanthaceae* 16% and Solanaceae 14% were the most represented. Of the 167 plants collected, 69 came from the Mbouda Sub-Division, 46 from Batcham, 29 from Babadjou and 23 from Galim. Specifically in the following villages: Bamesingué 16, Babeté 8, Bamesso 8, Bamendjida 18, Bamenkobo 12, Bafunda 7, Bamendjio 18, Batcham 17, Bamoughong 4, Bagang 7, Bagam 5, Bati 9, Bamenyam 9, Balatchi 9, Bamendjin 8, Babadjou 12. The pathologies encountered were general pathologies (19%), gynaecological-obstetrical pathologies (16%), otorhinolaryngological pathologies (13%) and nervous system pathologies (12%). Fungal and parasitic pathologies 10%. Concerning the mode of preparation, decoction 45%, infusion 25% were the most solicited and the leaves 45%, the roots 11%, the whole plant 11%, were the most used parts in the preparations. This work will enable us to envisage the development of Improved Traditional Medicines (ITM) in the short term.

Keywords: Ethnopharmacology, traditional medicine, medicinal plants, traditional practitioners, Bamboutos

Introduction
Modern medicine is growing all over the world. However, a large portion of the population in developing countries relies on traditional healers (THs), medicinal plants and herbal medicines for their basic health care (WHO, 1998) [1]. Many species, especially those growing in the forests of South-East Asia, South America, the Pacific Islands or the forests of Africa are still poorly known.

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 West of Cameroon, and in particular in the Bamboutos department, the practice of traditional medicine remains in force [2]. Ethno-pharmacological and ethnobotanical studies have already been carried out in many areas of the country by many researchers; following the example of Mapi J. in 1988 [3] in the Moungo (Nkongsamba), 62 plants belonging to 34 families were identified (Mapi., 1998) [3]. Mbenkum *et al* carried out an ethnopharmacological study in 1990 in the South-West region of Cameroon where 50 plants were used for therapeutic and nutritional purposes by the population (Mbenkum *et al*., 1990) [4]. Similarly, other general surveys were carried out by Foutse in the Ndé Division where 167 plants were listed with numerous recipes (Yimta., 2009) [5], as well as in the six other departments of the western region [5]. Biodiversity constitutes the largest reserve of active substances, and more than 80% of the African population in general and Cameroonians in particular use traditional medicine for treatment (WHO, 2002 and 2009).

It is within this framework that this study was conducted among traditional practitioners in order to list the medicinal plants used by the latter while specifying the infectious diseases treated, accompanied by recipes and modes of administration.

Description of the study area

The Bamboutos Division is located in the Western region of Cameroon with the city of Mbouda as its capital. It lies between 5° and 6° North latitude and between 9° and 11° East longitude. It is bordered to the North by the Mezam, to the South by the Mifi and the Menoua, to the East by the Menoua and the Manyu, and to the West by the Noun. It is made up of four (04) Sub-Divisions: Mbouda, Galim, Batcham, Babadjou and includes 16 groups [16].

Fig 1: Map of the West Cameroon region [15].

Selection of study sites:

We used a non-probability sampling method known as purposive selection. The villages were selected for the most part on the basis of their accessibility and location in order to obtain fairly representative information in the Division. The groups chosen were: Babadjou, Bamessingué, Bamenya, Bagham, Bamedjin, Balatchi, Banendjinda, Bamessoh, Bati, Bangang, Bameghong, Babeté, Bamékombo, Batcham, Bamedjio and Bafounda.

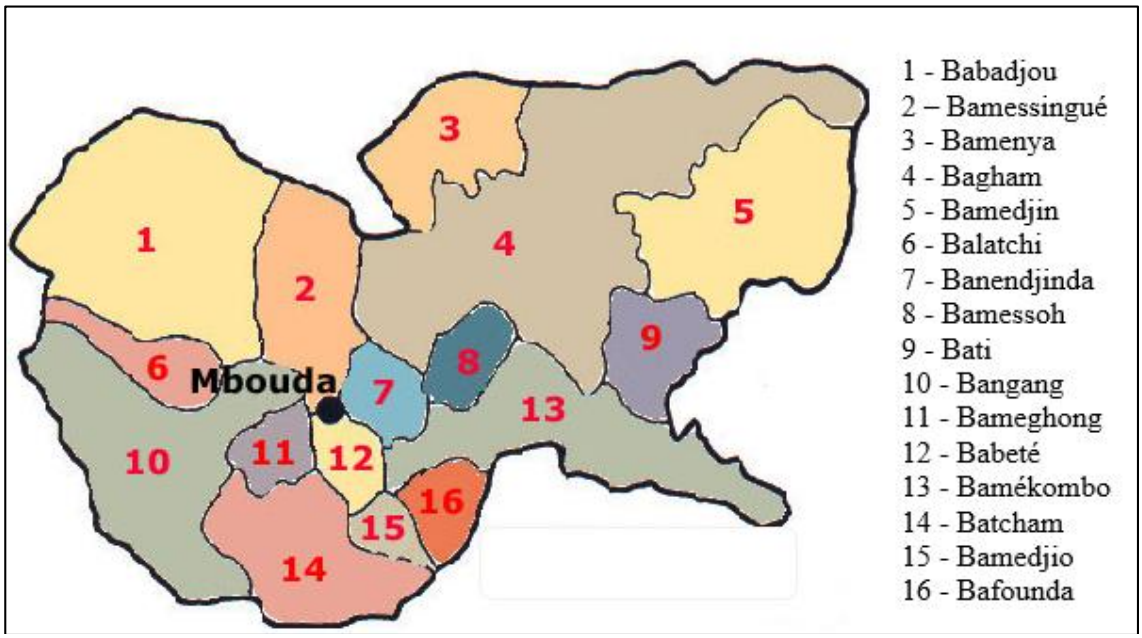

Fig 2: Geographical map of the Bamboutos Division and different groupings [15].

Methodology

The ethnobotanical survey was conducted among traditional healers in different localities of the Bamboutos 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 Bamboutos 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

Ethnobotanical survey

Socio-demographic profile of traditional healers

The present study identified 26 traditional practitioners in 16 groups in the Bamboutos Division. The average age was 40 ± 17 years and 67± 10 years. This profession is practiced by both men and women. This criterion is of paramount importance because a young woman would more readily confide in a female traditional practitioner than in a man. Of the 26 traditional healers who participated in the study, 23 were male (88%) and 3 were female (12%) (Figure 1).

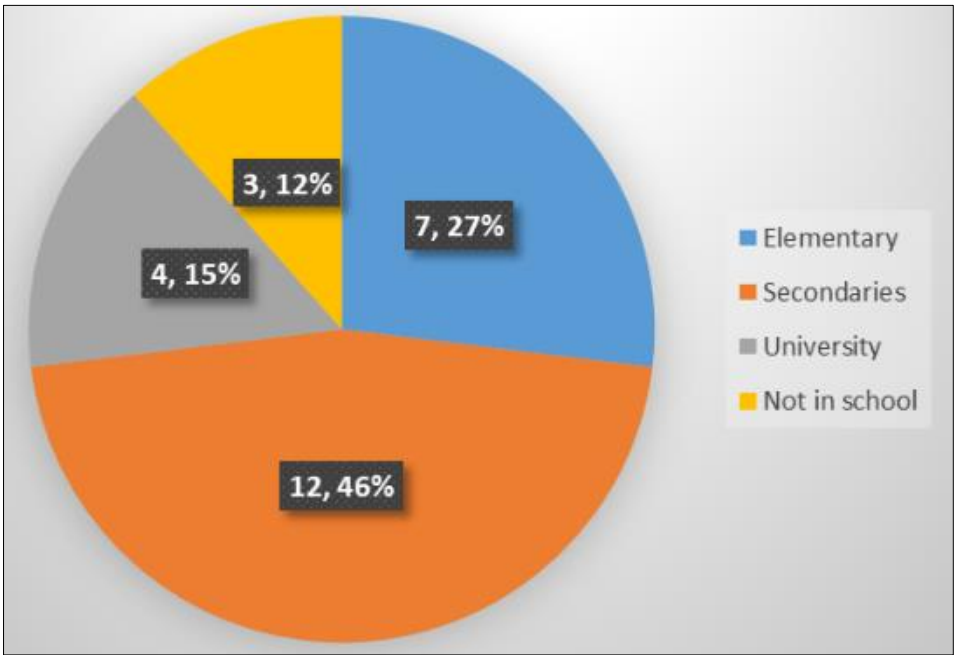

Fig 3: Educational profile

Concerning the level of education, 46% had reached secondary school, 27% primary school, 15% university level and 12% had never attended school.

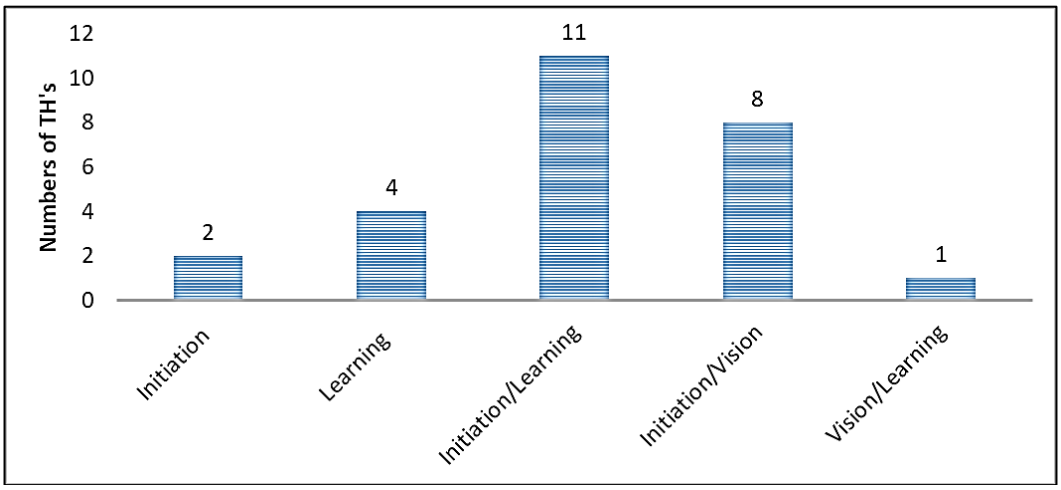

Fig 4: The main ways of acquiring knowledge in Traditional Medicine

The means of acquiring knowledge about TM are varied; 42% of our PTs were initiated and learnt, 31% received an initiation and visions. 15% acquired their knowledge through learning at seminars, conferences or by self-discovery. 8% were satisfied with the initiation received and 4% combined vision and learning.

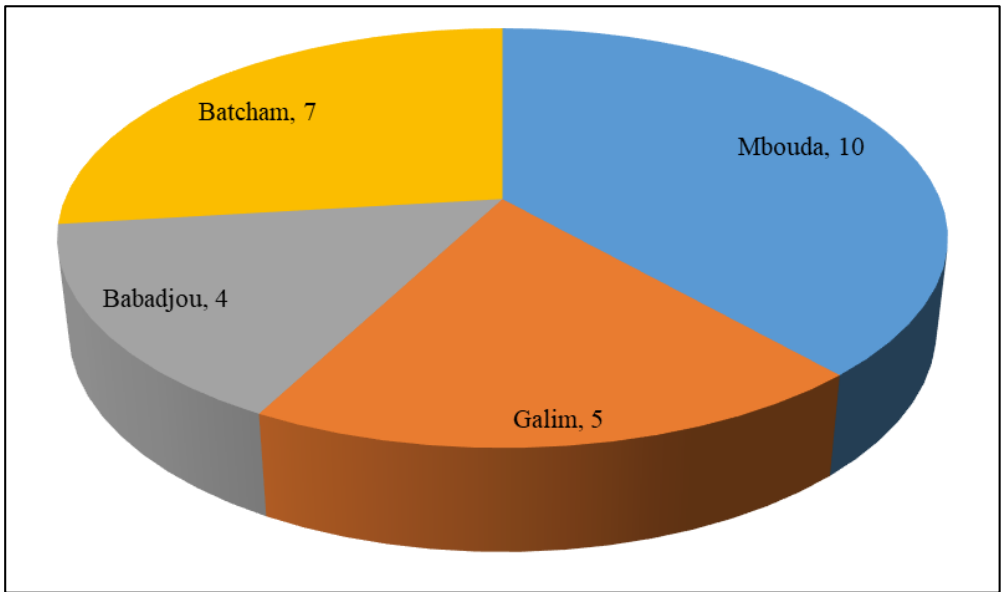

Fig 5: Representation of traditional healers by district.

Of the traditional practitioners we met, 39% come from the district of Mbouda, 27% from Batcham, 19% from Galim and 15% from Babadjou.

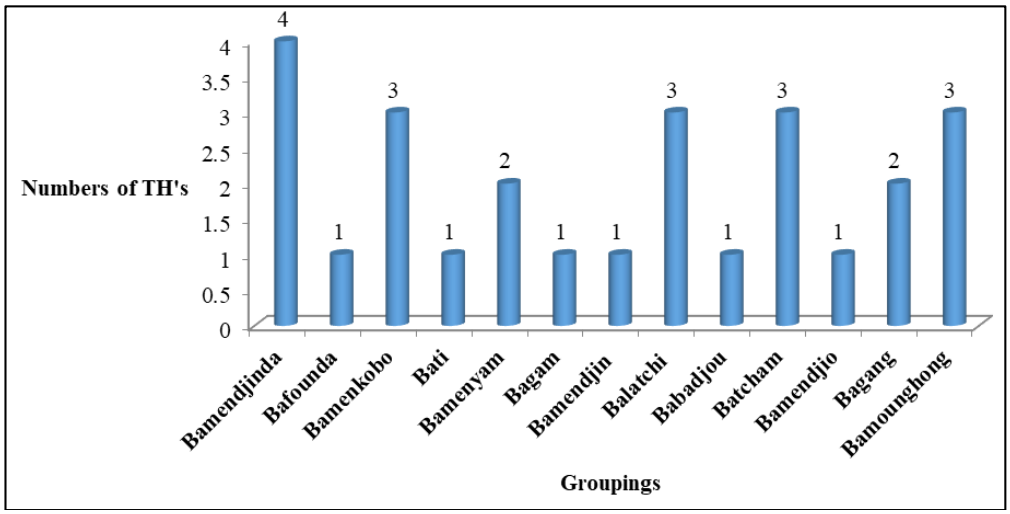

Fig 6: Representation of traditional healers by grouping

Species diversity

The ethnobotanical survey made it possible to inventory 167 species used as medicinal plants in the Bamboutos department. These plants belong to 58 families. The families with the most species are the *Asteraceae* (30%), the *Acanthaceae* (16%) and the *Solanaceae* (14%).

In 2006 in the Ndé Division, Yimta *et al* inventoried 160 medicinal plants (Yimta *et al*; 2009) [5] belonging to various families.

Tables I to XIV show the plants collected in the 16 Bamboutos groups and Figure 7 shows the distribution of plants by family.

Table I: Batcham Sub-Division: Bamendjio grouping

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Portulacaoleracea L.	Not mentioned	*Portulacaceae*	Root, Leaves	Anti-poison	Nothing	Maceration of the leaves	Drink a glass 3 times a day
Brillantaisia P. Beauv.	Not mentioned	*Acanthaceae*	Leaves	Anti-fungal and anti-histamine	Nothing	Infusion of young leaves	One drink a day
Persea americana Mil.	Teh pieh	*Lauraceae*	Leaf, fruit, bark	Anti-hypertensive, anti-diabetic	Nothing	Decoction of 15 leaves in a litre of water (HTA), grate the avocado stone and squeeze to obtain the juice	One glass per day or 1 tsp per day
Cupressus sempervirens L.	Sapin	*Cupressaceae*	Bark, leaves, fruit	Hernia, dysentery, oedema	Black palm kernel oil	Decoction of the leaves, roasting the leaves and fruits	One glass/day or 1 tbsp twice a day
TaraxacumWeber ex F.H.Wigg.	Not mentioned	*Asteraceae*	Root, Leaf latex	Warts and diuretic	Nothing	Decoction of the leaves and roots, and pressing to extract the latex	2 applications/day and a glass twice a day
Microglossa angolensis O. Hoffm.	Mehmonié	*Asteraceae*	Whole plant	Utero tonic	Nothing	Maceration of the whole plant	One glass twice a day
Phaseolus natus L.	Not mentioned	*Fabaceae*	Leaves	Topical infection	Nothing	Massage of the infected area with the leaves	2 massages/day
Lactuca capensis L.	Shihia	*Asteraceae*	Leaves, whole plant	Anti-hypertensive, analgesic, antidiabetic	Black palm kernel oil	Dry and spray then mix with palm kernel oil or macerate and drink	1 tsp three times a day or a glass three times a day
Cola nitida (Vent.) Schott & Endl.	Lefeh	*Sterculiaceae*	Seed	Sexual weakness, sedation,	Nothing	Just chew the kola nuts	1 to 2 nuts
Senna occidentalis (L.) Link.	ganhitogblé	*Caesalpiniaceae*	Leaves, acini	Febrifuge, cholagogue, depurative and antibiotic	Nothing	Infusion or decoction of the leaves or roots	5 ml, 3 times a day
Cassia sieberiana DC.	sindeh	*Caesalpiniaceae*	Roots	Tonic, diuretic, laxative and aphrodisiac	Nothing	Leave 100 grams of roots scraped from their bark to macerate in a litre of water and leave for 24 hours. the leaves grow hair when used as an ointment	Drink 1 glass per day in the evening after a meal
Cassia alata L.	beteh	*Caesalpiniaceae*	Leaves, roots	Mycoses, vaginitis, hypertension and constipation	Nothing	Apply the juice of the fresh leaves obtained by trituration to the lesions. -Hypertension and constipation. Drink a decoction or infusion of the leaves.	2 applications 2/dr or 1 glass 2/dr
Cassytha filiformis L.	dehte	*Lauraceae*	Liana	Azoospermia	Nothing	Decoction	Drink 1 glass twice a day
Chassalia kolly (Schum. & Thonn.) Hepper	Atindjè	*Rubiaceae*	Roots	Constipation, female infertility, dirty periods	Nothing	Make a decoction of the roots	Drink 1 glass 2/day
Cassia tora (L.) Roxb.	kendjeh	*Cesalpiniaceae*	Leaves, roots	Insomnia and unblinding	Nothing	Infusion of fresh leaves	Drink 1 glass 3/day
Carpolobia lutea G. Don.	Avate	*Polyganaceae*	Roots	Aphrodisiac	Nothing	Roots in decoction or maceration in alcohol	Drink 1 glass 2/day
Carissa edulis Vahl.	/	*Apocynaceae*	Roots	Female infertility	Nothing	Decoction of the roots	Drink 1 glass 3/day
Cassia italica Mill.	/	*Caesalpiniaceae*	Leaves	Laxative	Nothing	Infuse the leaves in 5 litres of water. Boil until only 3 litres remain	Drink 1 glass 2/day for the first month and then 3 times/week

Table II: Batcham Sub-Division: Batcham grouping

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Hibiscus Maldae L.	Klu-khieh	*Malvaceae*	Leaves	Vaginal itching, hemorrhoids	Nothing	Crush the leaves into a leg	Make a ball and introduce at night at bedtime 2 applications/day
Asystasia gangetica (L.) T. Anderson.	Picendi	*Acanthaceae*	Leaves	Venereal infection	Nothing	Infuse 1 kg of leaves in 4 litres of water	3 1 glass*3/day
Cyphostemma(Planch.) Alston.	Djouh	*Vitaceae*	Bark	Utero tonic	Palm wine	Cut off the bark and boil	Drink ½ in one go /day
Costus afer	Ken efeh	*Costaceae*	Leaves	Dry cough, whooping cough, asthma	Honey	Make a decoction of the leaves and add honey	Drink ½ c to c/day
Ageratum conyzoides L.	/	*Astéraceae*	Whole plant	Antifungal	Palm kernel oil	Toast and pulverise, then add palm kernel oil	1 application 2/day
Mentha piperita L.	Menthe	*Lamiaceae*	Whole plant	Agitation, delirium	Nothing	Crush and sniff	Humming 3/day
Markhamia Seem ex Baill.	Leona	*Bignoniaceae*	Buds	Palpitation, headaches hypertension	Nothing	Pick 7 infused buds and drink in one go	1 glass/day
Thymus vulgaris L.	Thym	*Lamiacae*	Whole plant	Depression, asthenia, cold, cough, ear infection, sore throat	Nothing	Heat and apply to painful areas, dry and infuse	Drink 2 glasses 2/dr Or 2 massages/dr
Caucalis melananthaBenth. & Hook.f.	-	*Saturnidaceae*	Leaves	Asthma	Nothing	Mix all the plants and boil in water	Drink 1 glass per day
Solanum dasyphyllum Schumach. & Thonn.	Teoum	*Solanaceae*	Leaves	Lung infection	NaCl	Boil with a pinch of salt	Drink 2 glasses per day
Basella alba L.		*Basellaceae*	Leaves	Infertility	Nothing	Infusion of the leaves	Drink 3 glasses 1/d
Spermacoce monticolaMildbr. ex Hutch. &Dalziel	-	*Rubiaceae*	Leaves	Reptile Venom	Palm kernel exudate	Extract the sap and mix with the palm kernel juice	Drink freely after a bite
Hibiscus rosa-sinensis. L.	-	*Malvaceae*	Leaves	Anti-poison	Beer	Rub the 2 in the beer, wait a few minutes and then filter	half glass /day for 4 days
Euphorbia miliiDes Moul.	-	*Euphorbiaceae*	Leaves	Cysts	Pure honey	Crush the leaves and sugar cane in a mortar and filter	Drink ½ /day for 2 weeks
Brassica L.	Chou	*Brassicaceae*	Leaves	Burns	Nothing	Crush the leaves and use as a poultice	1 application/day until healing
Physalis sp L.	Pion	*Solanaceae*	Leaves	Gout	Nothing	Decoction of the leaves	Drink 1 glass twice a day
Bambusa vulgaris Schrad.	Bambou de chine	*Poaceae*	Stem	Rheumatic Diseases	Nothing	Cut the knots, crush, brew and sieve	Drink 1 glass 2/day for 1 month

Table III: Batcham Sub-Division: Bamoughong grouping**.**

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Cordia platythyrsa Bak.	Lelow	*Borraginaceae*	Bud	Asthma, bronchitis	Honey	Harvest 7 buds, crush and macerate	Drink 1 glass 2/day
Solanum sp L.	Shichifon	*Solanaceae*	Fruit	Fresh wound	Ashes	Crush and extract the juice	5 drops/affected area
Chenopodium ambrosioides L.	Not mentioned	*Chepodiaceae*	Leaf, fruit	Anti-spasmodic and anti-depressant, diuretic	Mint	Dry the leaves, pulverise and infuse	Drink 1 glass 2/day
Solanum macrocarpon L.	Dzap mekwan	*Solanaceae*	Leaves	Diabetes	Garlic	Jumping like a vegetable	Eat 1 bowl/day

Table IV: Batcham Sub-Division: Bangang grouping**.**

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Pharagmanthera capitata (Sprengel) S	Kwetchou	*Loranthaceae*	Leaves	Soreness, fever, headaches	Nothing	Decoction of the leaves after cutting	Drink 1 glass per day
Laggera pterodonta (de Candolle) Sch-Bip.	Not mentioned	*Asteraceae*	Leaves	Bronchitis	Nothing	Decoction of the leaves	Drink 1 tsp 3/day
Impatiens sp L.	Not mentioned	*Balsaminaceae*	Leaves, seeds,	Agitation, delirium	Nothing	Decoction	Eat 2 seeds or put 2 drops 2/d

			flowers				
Cissus quadrangularis L.	4 cotés	*Vitaceae*	Leaves	Edema, diuretic	Palm wine	Infusion of leaves + palm wine	Drink 2 glasses 3/day
Ipomoea L	Meton'h	*Convolvulaceae*	Leaves	Utero tonic	Nothing	Infusion of the leaves	Drink 1 glass 2/day
Piper umbellatum. L	Bou'nbre	*Piperaceae*	Leaves	Lowering the testicles into the bursa	Nothing	Collect a handful of leaves and massage the testicles with	2 massages/day
Chromolaena odorata (L.) R.M.King & H.Rob.	Benjamin	*Asteraceae*	Leaves	Anti-septic	Nothing	Pick a dozen leaves, wash them well, crush and squeeze out the juice	2 applications /day

Table V: Galim Sub-Division: grouping Bagam

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Hibiscus syriacus. L.	Not mentioned	*Malvaaceae*	Leaves	Laxative, anti-HTA, sedative	Nothing	Maceration of the flowering parts	Drink 1 glass per day
Ocimum basilicum L.	Basilic	*Lamiaceae*	Leaves	Antispasmodic, sedative, narcotic, repellent	Nothing	Infusion, poultice of the leaves and flowering tops	Drink 1 tsp/day
Zea mays. L.	Kesseh	*Poaceae*	Maize beard, maize cobs	Anti HTA;	Nothing	Infusion of beards and powder	Drink 1 glass 3/day
Cola acuminata (P. Beauv.) Schott & Endl.	Leveuh	*Sterculiaceae*	Barks	Sexual stimulant, hypolipidemic, antidepressant, analgesic.	Nothing	Spray the dried leaves and brew or eat some kola	Drink 1 glass per day
Daucus carota L.	Carotte	*Apiaceae*	tuber	Anti-anaemic, anti-diarrhoea	Nothing	Grate the carrot; extract the diluted juice and drink	1/4 to ½ glass 2/Jr

Table VI: Galim Sub-Division: grouping Bati

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Combretum micranthum G. Don	Not mentioned	*Combrétaceae*	Leaves	Anti-malarial, antibiotic, jaundice, fever, typhoid, anti-HTA	Nothing	Cut the fruit into small pieces and make a decoction, dry the leaves and infuse	Drink 1Drink 2/Day
Cymbopogon citratus (DC.) Stapf	Fipper grassi	*Poaceae*	Leaves	Anti-malarial, antipyretic, normolipidemic	Nothing	Make an infusion of the leaves decoction of the sliced stem	1 glass/day
Mangifera indica L.	Manglowoua	*Anacardiaceae*	Bark and leaves	Typhoid fever,	Nothing	Decoction of bark with other plants	1 Glass*2/Day for 1 week
Allium sativum L.	Not mentioned	*Alliaceae*	Bulb	Anti-thrombotic, antirheumatic, appetite stimulant, anti-biotic, hypotensive, antihelminthic, hypoglycaemic	Honey	Mastication poultice infusion in combination with other plants	Varies
Panax ginseng C.A. Mey.	Ginsen	*Araliaceae*	Root	Oral anti-diabetics; sexual stimulant; anti-influenza	Nothing	Decoction maceration infusion	Varies
Citrus ×limon (L.) Burm. f.	Not mentioned	*Myrtaceae*	Fruit	Oral anti-diabetics, antiseptic	Nothing	Extract the juice and drink by diluting in water	1 Glass*3/Day diluted in water
Passiflora edulis Sims	Krouh	*Passifloraceae*	Leaves, whole plane	Anti HTA, sedative antispasmodics, asthma, burns	Nothing	Infusion of the whole plant	1 glass*3/day
Carica papaya. L.	Popoya	*Coriaceae*	Root, leaves	Analgesic, sedative, antipyretic, anti-wart	Nothing	Take 5 seeds with meals, boil leaves and roots for 10 minutes	4Grains/day or 5grains/day or 3 Applications/day
Opuntia ficus-indica (L.) Mill.	Lah tcheph'	*Cactaceae*	Barks, stems	Anti-diarrhoeal	Nothing	Decoction of the stem	1 glass/day

Table VII: Galim Sub-Division: grouping Bamenyam

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Ipomoea batatas (L.) Lam.	Meton'hn	*Convolvulaceae*	Leaves	Stomach ache and colic	Nothing	Collect the full leaves in a 5 L pot, add 5 L of water and bring to the boil	1 glass *3/day for adults and half a glass *3/day for children
Combretum micranthum	Quinkelibat	*Combrétaceae*	Fruit	Malaria, typhoid fever, jaundice	Nothing	Cut up 1 kg of fruit and add 5 L of water and boil	1 glass */day

G. Don						until 3 L is left	
Dacryodes edulis H.J. Lam	Safou	*Buseraceae*	Leaves	Healing agent	Cabbage leaf	Either dry and spray or crush the fresh leaves to make a poultice	1 dressing *2/Day
Persea americana Mill.	Teh pieh	*Lauraceae*	Leaves	General fatigue, sexual stimulant	Ginseng	Decoction of a considerable amount of leaf	1 to 2 glasses*2/day for 2 weeks
Rumex crispus. L.	Pepan	*Polygonaceae*	Root, whole plant	Jaundice, anaemia	Yellow sauce	Crush the tuber, mix with the rest of the plant, add the yellow sauce after infusion	1 to 2 glasses*2/day for 2 weeks
Zehneria scabra (L.f.) Sond.	Lelap	*Cucurbitaceae*	Whole plant	Colic, infertility	Nothing	Macerate the whole herb, drink and purge (for colic in children)	One quarter glass*3/day and one purge/day (In children) or 1 glass*2/day (adult)
Polyscias fulva(Hiern) Harms	Keko'oh	*Araliaceae*	Bark	Sinusitis	Nothing	Crush the bark, add a few drops of water and squeeze the juice into the nostrils	2- drops/narine 3/day
Brillantaisia P. Beauv.	Tepanzemsemo'oh	*Acanthaceae*	Leaves	Painful periods, anaemia, red buttocks	Unsweetened milk, palm kernel oil	Infuse the leaves and add unsweetened milk, or toast the leaves and then pulverise, add palm kernel oil and let the child lick it	1 glass*2/day or 1 tsp*2/day
Pteridium aquilinum (L.) Kuhn	Sessenhadzon ou fougere aigle	*Dennstaedtiaceae*	Whole plant, rhizome, leaves	Anti-cancer, stomach ache, diarrhoea, bronchitis, sexual stimulant	Ginger powder	Chew the rhizome raw, or brew the leaves and beers	Chew a piece of rhizome/day or half a glass/day

Table VIII: Babadjou Sub-Division: grouping Balatchi

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Bidens pilosa. L.	Tsetsenneck	*Asteraceae*	Root, leaves, whole plants,	Anti-malaria, hypotensive, amoebic dysentery, anti-inflammatory, diuretic		Make an infusion with the different parts of the plant	1-2 drinks 2-3 times/day
Adansonia digitata L. +Delonix regia	H'hum	*Bombacaceae+ fabaceae*	Bark	Clogged tubes, hemorrhoids, epilepsy	Juice from the flamboyant	Cut 1 Kg of bark into small pieces + 1L of water or Crush the bark and extract the juice	1 glass 2/day
Adansonia digitata L.	H'hum	*Bombaceae*	Bud	Epilepsy	Nothing	Infusion of young buds	Half glass/day
Amaranthus hybridus. L.	Dzep suehsueh	*Amarantaceae*	Leaves, stem	Diabetes	Spices	Stir-fry like vegetables, avoiding the Palm oïl	One bowl 1 to 2 times a day
Ficus exasperata Vahl	Tsuet	*Moraceae*	Leaves	Asthma, coughing expectoration	Nothing	Pick a dozen leaves, wash and macerate and drink	Half glass 2/day
Crinum asiaticum. L.	N'seun	*Amaryllidaceae*	Leaves	Jaundice, stomach ache	Jujube	Wash the leaves, macerate and add the jujube	1 drink/day
Physalis peruviana L.	Djijieh	*Solanaceae*	Leaves and fruit	Jaundice, bile and bacterial infection	Nothing	Chew 2 to 3 fruits/day or crush a handful of leaves, add water and drink	2-4 fruits/day or 1 glass 2/day

Table IX: Babadjou Sub-Division: grouping Bamendjin

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Tanacetum vulgare. L.	Not mentioned	*Asteraceae*	Leaves	Anti-helminthic, anti-spasmodic	Nothing	Make an infusion of the leaves	1 glass/day
Emilia coccinea George Don	Not mentioned	*Asteraceae*	Leaf, whole plant	Yellow fever, anti-biotic, anti-malarial	Natron	Infusion of the leaves	1 glass 2/day
Cissus rhombifolia Vahl	Not mentioned	*Vitaceae*	Leaves	Arthritis, syphilis, gonorrhoea, vaginal itching,	Nothing	Maceration of the leaves	1 glass 3/day
Physalis	Not	*Solanaceae*	Fruit	Gout, anti-HTA,	Nothing	Crush the fruit and apply it	2 applications/day or

alkekengi L.	mentioned			anaesthetic, haemorrhoids		to the anus or drink a decoction of the fruit	drink 1 glass 3/day
Zingiber Mill.	Not mentioned	*Zingiberaceae*	Rhizome	Hepatitis, cough, flu	Honey or sugar	Crush the rhizome and add water and honey or sugar	1 glass 3/day

Table X: Babadjou Sub-Division: grouping Babadjou

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Harpagophytum procumbens (Burch.) DC. ex Meisn.	Koup seta	*Pedeliaceae*	Rhizome	Rheumatism, back pain, appetite stimulant	Honey	Dry the rhizome, pulverize and infuse or grind the rhizome and make a decoction	1 tsp 3/ Jr or 1 glass 2/ Jr
Dryopteris filix-mas (L.) Schott	Not mentioned	*Dryopteridaceae*	Whole plant, rhizome	Anti-helminthic, anti-mycotic, anti-infectious	Palm oil	Infusion of the whole plant or infusion of the dried rhizome	1 tbsp 3/d for children or 1 glass 3/d
Eucalyptus globulus Labill.	Klatouseh	*Myrtaceae*	Leaf, fruit	Bronchitis, cold, flu, cough, malaria, sinusitis, antibiotic	A bit of sugar	Decoction of 30 leaves + 3 L of water	1 glass 3/days
Viscum album L.	Tsapla	*Viscaceae*	Leaf, stem	HTA, epilepsy, insanity, palpitation, diarrhoea	Nothing	Infusion of young leaves, pick 2 leaves to make the message	2 massages/day or 1 drink/day
Irvingia gabonensis (Aubry-Lecomte ex O'Rorke) Baill	Mangue sauvage	*Irvingiaceae*	Bark, leaf, fruit	Typhoid fever, obesity,	Other plants	Decoction of the bark, or infusion of the seeds	1 glass 3/days
Eremomastax speciosa (Hochst.) Cufod.+ *Justicia Adhatoda* L.	Pendemmo'o + Toulesuet	*Acanthaceae +Acanthaceae*	Leaves	Dysmenorrhoea		Rub the 2 into the water and wait 45 minutes then filter	1 glass/day for 5 days
Eucalyptus L'Hér. + *Carica papaya*. L. +*Musa* × *paradisiaca* L. + *Psidium guajava* L. + *Combretum micranthum*. G. Don		*Myrtaceae+ Caricaceae +Musaceae+ Myrtaceae + Combretaceae*	Leaves+ Fruit	Typhoid fever	Nothing	Boil the mixture in 5 litres of water 1 glass*2/day	1 glass 2/day
Chlorophytum comosum (Thunb.) Jacques + *ustroblechnum microphyllum* C.Chr.		*Anthericaceae + Blechnaceae*	Leaves	Cramps	Nothing	Frotter les feuilles mettre dans l'eau et y ajouter 3 grains de jujube écrasés	Massage the affected area
Ageratum conyzoides L. + Brucea guineensis *G. Don+Schefflera barteri* (Seem.) Harms +*Ficus thonningii* + Musa ×*paradisiaca*. L. +*Psidium guajava*. L.+ *Cymbopogon citratus* (DC.) Stapf +*Bidens pilosa* L.	Tchouamo + Lecak + Derte + Tsia + Quedon + Goya +Fiber grasse + Tsitseneuk	*Asteraceae + Simaroubaceae + Araliaceae + Musaceae + Myrtaceae + Poaceae + Asteraceae*	Leaves	Typhoid	Nothing	Maceration of the mixture + unripe pineapple stems	2 drinks/day and a fumigation
Oxalis corniculata L. +*Emilia coccinea* George Don + *Ocimum gratissimum* L.	Gouanvou + Vinlapin + Cotemandjo	*Oxalidaceae+Astéraceae + Lamiaceae*	Leaves	Diaper rash	Nothing	Rub the leaf mixture into the water and filter	Purge the child 3 times a day for 3 days
Celosia sp L.		*Amaranthaceae*	Fruit	Bacterial infection	Nothing	Soak the fruit in water, add 7 crushed jujube seeds and a pinch of salt	
Bidens pilosa l. +Emilia coccinea George Don	Tsisecneuk + Vinlapin	*Asteraceae + Astéracéae*	Leaves	Malaria, Yellow fever	Nothing	Boil the mixture and add a pinch of rock salt	Drink 1 glass twice a day for 7 days

Table XI: Mbouda Sub-Division: grouping Bamessingué

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Zea mays L.	Nguessen	*Poaceae*	Wick, spikes	Anti-rheumatic, diuretic, cough	Palm kernel oil	Infuse the wick with one liter of water, dry the cob, crush and infuse	Half glass 1/day or 1tsp 3/day or 1tsp 3/day
Sida rhombifolia L.	Tcipreh'n	*Malvaceae*	Whole plant	Joint tonic, flu, respiratory distress	Sugar or honey	Crush until it becomes sticky add the ingredients	1 tsp 2/dr or 1c to s 2/dr
Crassocephalum biafrae	Cinq doigts	*Asteraceae*	Leaves	Utero tonic, diuretic	Nothing	Trituration then addition of water	Half glass in one take

S. Moore							
Asystasia Blume.	Percyum	*Acanthaceae*	Leaves	Gluteal erythema	Nothing	Crush the leaves and make them drink	Half-1 glass 3/d
nnona muricata. L.	Pas mentionné	*Acanthaceae*	Leaves	Nervousness	Nothing	Make a decoction of the leaves	1 glass 2/day
Drymariacordata Willd. ex Schult.	Bandokieh	*Caryophyllaceae*	Whole plant	Anti-convulsant	Nothing	Decoction of the whole plant	2 glasses 3/day
Euphorbia tirucalli L.	Letsetse	*Euphorbiaceae*	Whole plant or leaves	Anti-poison	Palm wine	Decoction of the whole plant or the leaves, let it cool and add a glass of palm wine	Half a glass/day
Euphorbia hirta L. + Cymbopogon citratus (DC.) Stap		*Euphorbiaceae + Poaceaes*	Bark + Whole plant	Azoospermia	Palm wine	Boil both in white wine	Drink 1 glass at bedtime
Crinum jagus (J.Thomps.) Dandy + Solanum aculeastrum Dunal		*Amaryllidaceaes + Solanaceae*	Leaves	Injury, Infection of liver, spleen, pancreas and lung	Lemon	Crush leaves and pistachio added palm kernel oil then boil in white wine Crush the leaves of *Cinum jagus* with the clay from the marigot 1 glass of calabash pistachio then boil with palm kernel oil and red oil (cancer)	Take 1 glass 3 times a day for 3 months Take 1 tablespoon 4 times a day for 6 months
Colocasia Akongoloi Schott.	Pah	*Araceae*	Leaves	Asthenia	Palm wine	Boil the mixture in the white wine	
Psorospermum febrifugum Spach.	feufeh	*Hypericaceae*	Leaves	Intestinal worms		Infusion of 100 grams of leaves in 3 litres of water	10 ml*2/day
Tristemma mauritianum J.F.Gmel.	Pas mentioné	*Melastomataceae*	Leaves	Bacterial and fungal infections		Decoction of the leaves in 5 litres of water	1 drink*2/day
Podocarpus milanjianus Rendle	deke	*Podocarpaceae*	Leaves	Headache		Rub the leaves and use them to massage the whole head	2 massages/day
Pseudospondias microcarpa A. Rich.	Not mentioned	*Anacardiaceae*	Leaves, bark	Skin rash, painful periods, bloating and jaundice		In combination with other plants, roast some of the leaves and crush some of them, then mix them together and drink.	3 glasses/day
Triumfetta pentandra A. Rich.	teht fenh	*Poaceae*	Bark, root, stem, leaves	Burns, Diarrhoea	Black palm kernel oil	Make a poultice from the leaves, or a decoction of the roots or extract the juice from the leaves. Apply the juice of the fresh leaves obtained by trituration to the lesions. -Hypertension and constipation. Drink a decoction or infusion of the leaves.	2 applications *2/day or 1 glass 2/day
Desmodium Adscendens (Swartz) D.C.		*Fabaceae*	Stem	Toothache, Diarrhoea		Make a decoction of the stem, or a cataplasm	2 applications *2/day or 1 glass/day

Table XII: Mbouda Sub-Division: grouping Babeté

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Piper umbellatum L.	Bebeh	*Piperaceae*	Leaves	Cough	Nothing	Make an infusion of 25 leaves in 1 L of water	1 drink*2/day
Catharanthus roseus (L.) G. Don	Not mentioned	*Apocynaceae*	Leaves	Chronic wound, Diabetes	Thyme powder	Make an infusion of the fresh leaves or the powder obtained from the dried leaves	1 App/day
Eucalyptus globulus. Labill.	Klatussé	*Myrtaceae*	Leaves	Cough, malaria		Make an infusion of the fresh or dried leaves	1 drink*3/day
Impatiens L.	Not mentioned	*Balsaminaceae*	Leaves	Growth promoter	Grapefruit juice	Maceration of leaves + grapefruit juice	1 drink*3/day
Luolwigia sp	Not mentioned	*Ongraceae*	Bark	Bacterial infection	Lemon juice	Maceration of leaves + grapefruit juice	1 drink*2/day
Emilia coccinea George Don	Not mentioned	*Asteraceae*	Leaves or whole grass	Chronic wet cough, bacterial infection	Honey	Decoction of the leaves or the whole herb	1 drink*2/day
Commelina benghalensis L.	Lewouwou	*Commelinaceae*	Whole grass	Amebic dysentery, ringworm	Nothing	Cut the herb and rub the serve on the plate, or brew the fresh herb and drink	2 applications/day or half a glass*2/day
Zehneria scabia	Le lomcrom	*Cucurbitaceae*	Leaves	Amebic dysentery	Nothing	Triturate, macerate a handful	2 purges/day

(Lour.) Keraudren						of leaves and use as a purge	(morning and evening)

Table XIII: Mbouda Sub-Division: grouping Bamesso

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Garcinia kola. Heckel	Bitter kola	*Sterculiaceae*	Fruit	Sexual stimulant, ovarian cysts, painful menstruation, bureli ulcer, chronic wound, analgesic, anti-spasmodic	Honey	Chewing the fruit, crushing the fruit to make a paw and using as a poultice	Chew 2-4 pieces of fruit in case of pain or do 2 applications per day
Ricinus communis. L.	Mehtchie'h	*Euphorbiaceae*	Seeds	Obesity, epilepsy, constipation	Palm oil	Emulsify the seeds in the palm oil	Quarter glass in +2 seeds/week
Senna alata (L.) Roxb.	Fohpeuh	*Caesalpinioideae*	Leaves	Haemorrhoids, jaundice, scabies, mycosis	Nothing	500 G of leaves + 5L of water or crush a handful of leaves and use as a poultice	1 drink*3/day or 2 app/day
Euphorbia latifoliaC.A.Mey. ex Ledeb	Lelanseseuk	*Euphorbiaceae*	Entire plant	Cough, chlamydia, lung infection	Honey	Crush the fresh or dried plant and add honey	1 tsp*3/day
Elaeis guineensis. Jacq.	Leteoh	*Arecaceae*	Root, leaf, fruit	Anti-rheumatic, anti-cancer, cardioprotective, gonorrhea	Charcoal	Decoction of root and leaves, crushing of palm nuts + charcoal	2 app/day or 2 tsp*3/day
Cocos nucifera L.	Koukounet	*Arecaceae*	Root, fruit	Anti-helminthic, eczema, laxative, anti-ulcer, anti-hemorrhoidal, ADO, antibiotic	Nothing	Decoction of roots, infusion of leaves, extraction of coconut oil	1 glass*3/day or drink the juice contained in a walnut in one go/week
Theobroma cacao L.	Kakah	*Stercullariaceae*	Fruit	Depression, asthenia, hypertension	Sugar	Dry the beans, pulverize and macerate	1 drink*2/day
Musa paradisiaca. L.	Kedong	*Musaceae*	Leaves, flower	Anti-infectious, healing, diuretic	Nothing	Extract the serve and apply to the wound, infuse the flowers and drink	2 apps/day or 1 drink/day

Table XIV: Mbouda Sub-Division: grouping Bamendjida

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
(Manihot esculenta Crantz	Kassalah	*Euphorbiaceae*	Whole plant	Measles, chicken pox, snake repellent, hernia, fever, cold	Nacl + Natrons	Maceration of the leaves + water, filtered + natrons or grate the surface part of the bark + 1 drop of cresil	1 Glass 2/day or two applications/day or sprinkle a pinch at the entrance of the reptile hole
Dichrocephala integrifolia (L.f.) Kuntze	Bacseh	*Asteraceae*	Whole plant	Muscle relaxant	Nothing	Macerate the whole herb and add other herbs	1 glass in one take
Kalanchoe pinnata (Lam.) Pers.	Ajoujou'h	*Crassulaceae*	Leaves	Headache, otitis, wounds, antiseptic	Nothing	Squeeze the leaf juice into the ear, scoop out the leaves + honey and infuse apply as a dressing	2 dressings/day
Zingiber officinale. Roscoe	Didja	*Zingiberaceae*	Rhizome	Antispasmodic, Proton Pump Inhibitor, cough suppressant, amenorrhea painful periods, depression, anxiety, flu	Yes lemon juice honey	Tea, infusion	1Glass 2 to 3/day
Scoparia dulcis L.	Dileseh	*Scrophulariceae*	Whole plant	Antispasmodic		Wash, macerate and extract the juice	one take in 1glass
Euphorbia tirucalli L.	Nguanwefo	*Euphobiaceae*	Whole plant	Muscle relaxant, utero tonic	Nothing	Macerates the whole herb	1 glass in one take
-	Melamonieh	*Apocynaceae*	Whole plant	Muscle relaxant, utero tonic	Nothing	Macerate the whole herb	one take in 1glass
Acanthus montanus (Ness) T.Anderson, J. Proc. Linn. Soc., Bot.	Not mentioned	*Acanthaceae* + *Acanthaceae*	Leaf, Roots, Stem	Hepatoprotective, Antiemetic, Cardiotonic	Nothing	Make a decoction of all these parts	1 glass 3/day
Terminalia mantaly H.Perrier	Not mentioned	*Combretaceae*	Leaves, stem, bark	Asthma, jaundice, epilepsy, dizziness, peptic ulcer	Nothing	Make a decoction of the leaves, roots and bark	Drink 1 to 3 glasses 3/day

Cyphostemma adenocaule (Planch.) Alston	Not mentioned	*Vitaceae*	Leaves, stems, bark, roots	Malaria, syphilis, diarrhea, sore throat, deworming, abortion prevention, ophthalmia		Decoction, infusion and maceration of the different parts, the leaves can also be heated for swelling	Drink 1 glass 2 /day
Clerodendrum sp L.	Not mentioned	*Lamiaceae*	Leaves	Hemostatic, Anti diarrheal		Decoction	Drink 1 glass twice a day
Ficus mucosa L.	Not mentioned	*Moraceae*	Leaves	High blood pressure, Diabetes, Obesity		Infusion of the leaves	Drink 1 glass twice a day
Ficus ovata Vahl.	Not mentioned	*Moraceae*	Leaves	High blood pressure		Infusion of the leaves	Drink 1 glass twice a day
Ficus sp L.		*Moraceae*	Leaves	Bacterial and fungal infection		Infusion of the leaves	Drink 1 glass*2/day
Vitex doniana L.	teh nguem	*Lamiaceae*	Leaves, root, fruit, bark	Colic, dysmenorrhea, deworming, diarrhea		Infusion, decoction, eating dried or fresh fruit (Diarrhoea), Malnutrition	1 to 2 glasses*2 to 3 /day or 10-30 fruits/day
Laportea ovalifolia (Schum. & Thonn.) Chew	Nguem	*Urticaceae*	Fruit, leaves, root	Anti-leprosy, and antiseptic, Diarrhea and colic, dysmenorrhea		Decoction of the leaves and roots for at least 30 minutes, or just eat the fruit	Drink 1 glass twice a day
Datura candida (Pers.) Saff.		*Solanaceae*	Leaves, roots, fruit	Hemostatic, headache, dysmenorrhea		Decoction of the roots with or without peanuts, apply the leaves to the injured parts	Drink 1 glass twice a day
Piper sp L.	flower mo	*Piperaceae*	Flower and leaves	Sedative, arthritis, rheumatism, madness		Infusion of the leaves or maceration of the flowers	5 ml 2/day

Table XV: Mbouda Sub-Division: grouping Bamenkobo

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Phragmemtera spJuss. + Musa paradisiaca L. +Bidens pilosa. L.	Tsorpla (guy)+kadong+ Tsetseneck	*Loranthaceae + Musaceae + Astéraceae*	Leaves + whole plant	Typhoid fever	Nothing	Decoction of the different parts after cutting and boiling until the colour changes	1 glass 3/day
Ficus thonningii Blume	Tsia	*Moraceae*	Leaves	Palpitation, HTA,	Nothing	Make a leaf infusion (fill a 5L container with the leaves and add 5L of water	1 glass 2/day
Crimum sp L.	-	*Amaryllidaceae*	Leaves	Narrows the cervix	Nothing	Trituration then addition of water	1 glass 2/day
Tribulus terrestris. L.	-	*Zygophyllaceae*	Leaves and flowers	Poison Control	Nothing	Extract the essential oil or make an infusion of the leaves	1 glass/day
Tribulus terrestris. L. +Panax ginseng C.A. Mey. +Zingiber Mill.		*Zygophyllaceae.+ araliaceae+ Zingiberaceae*		Sexual stimulant, sedative,	Nothing	Decoction	Drink 1 glass twice a day
Dracaena fragrans (L.) Ker Gawl.	Pas mentioné, ginseng+djidja	*Asparagaceae*	Leaves+bark+bulb	Stimulant sexuel, anti dépresseur, HTA		Mix 10 grams of powder of the 3 components in 3 litres of water, boil until only 1 litre remains and drink 5	2 glasses/day
Dracaena fragrans (L.) Ker Gawl. +Panax ginseng C.A. Mey. +Citrus ×limon (L.) Burm. f.	Feken+lemon+gingsen	*Asparagaceae +Araliaceae+ Rutaceae*	Roots	Epilepsy	Honey	A handful of root + 10 lemons + honey	2,5 ml 2/day
Hibiscus sabdariffa L.	Foleré	*Malvaceae*	Root + fruit + tuber	HTA	Honey	Make a powdered mixture of the different components. Boil, filter, add honey	5ml 3/ day

						and drink	
Hibiscus sabdariffa L. +ocimum gratissimum L.	Foleré+ masep	*Malvaceae+ Lamiaceae*	Leaves	Epilepsy, loss of consciousness	Nothing	Decoction or infusion of the leaves	1 glass 3/day
Ocimum gratissimum L.	Massep	*Lamiaceae*	Leaves	Painful menstruation		Infusion of the leaves	2 purges/week
Citrus aurantium. L.	Kouma	*Rutaceae*	Leaves	Lung infection		Extracting the essential oil	1 glass 2/day
Cannabis sativa L.	Depah beuh	*Cannabaceae*	Zest	Insomnia, epilepsy, gastritis		Infusion of the flowering tops	

Table XVI: Mbouda Sub-Division: grouping Bafounda

Scientific name	Vernacular name	Family	Part used	Therapeutic indication	Added ingredient	Preparation method	Dosage
Harungana madagascariensis. Lam.	Keto'o	*Hypericaceae*	Barks	Malaria	Nothing	Cut into small pieces and make a decoction	1 glass 3/day
Coffea arabica. L.	Cofi	*Rubiaceae*	Leaves, seeds	Headache, migraine, antiparkinsonian, psychotropic, oral antidiabetic	Sugar or honey	Infusion of the leaves, infusion of the pulverised seed	1 glass 2/day
-	Meventouptoup		Flower	Antibiotic	Nothing	Flower chewing	
-	Demseh		Whole plant	Antispasmodic, antibiotic	Nothing	Flower chewing	Five leaves 2/Jr
Sonchus oleraceus. L.	Tsétsé	*Asteraceae*	Leaves	Filariasis, haemorrhoids, Oral antidiabetics, Arterial hypertension	Nothing	prepare as vegetable	
Terminalia superbaEngl. & Diels		*Combretaceae*	Leaves, roots, bark	Hemorrhoids, coughs, dysentery, sores, diarrhea, vomiting	Nothing	Infusion, decoction and maceration of leaves, barks and roots	2,5 ml 1/day
Senecio biafrae Oliv. & Hier.,	Krap	*Asteraceae*	Stem, leaves, bark	Female infertility	Nothing	Decoction of bark and stems or leaves	1 glass 2/day

After two (02) months of work in the department of Bamboutos with a view to identifying the maximum number of plants used for therapeutic purposes, we were able, thanks to the collaboration of 26 traditional practitioners, to collect 167 plants: 69 in the district of Mbouda, 46, 23 and 29 respectively in the Sub-division of Batcham, Galim, and Babadjou

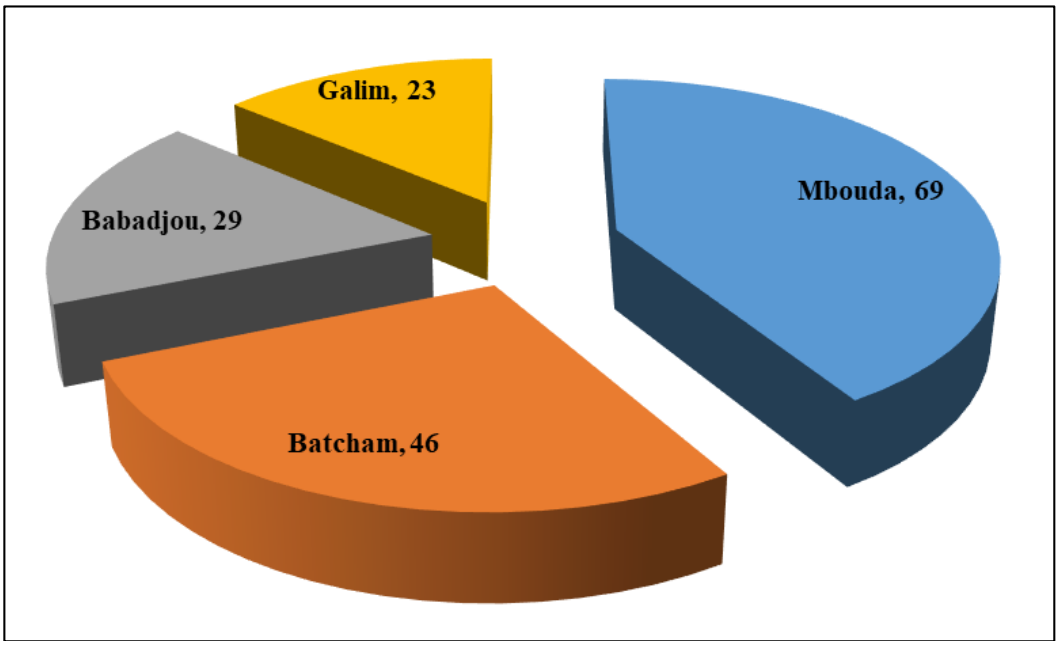

Fig 7: Representation of collected plants by district

Parts used

The survey revealed that the main parts used to make the recipes are leaves (45%), roots and whole plants (11%), fruits (9%), trunk bark (8%), stems (4%), flowers (3%), rhizomes (2%) and others (latex, buds, seeds) (7%) (Figure 8).

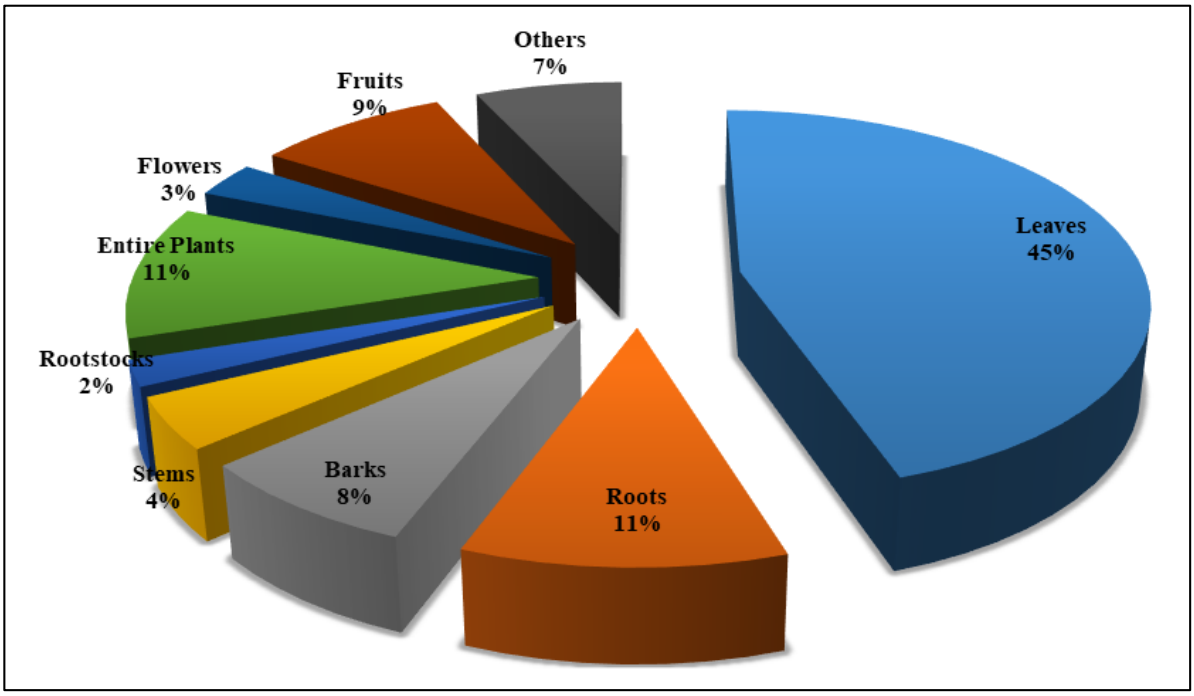

Fig 8: Plant organs used

Preparation method

The methods of preparation of medicinal plants used in the Bamboutos Division are diverse. Four main methods were observed: decoction, infusion, maceration and trituration (Figure 9). It is important to note that several modes can be used for the same indication. However, a preference for decoction was observed with 58% of cases, followed by preparations made by infusion (54%), then trituration and maceration come respectively with 12% and 11% of cases. Extraction, pulverisation and mastication remain the three methods least used by the populations of the department.

The shelf life ranges from one week at the most for drugs obtained by maceration, two weeks to one month for those obtained by decoction and trituration. For dried preparations (dry drugs) the shelf life can be up to 2 years.

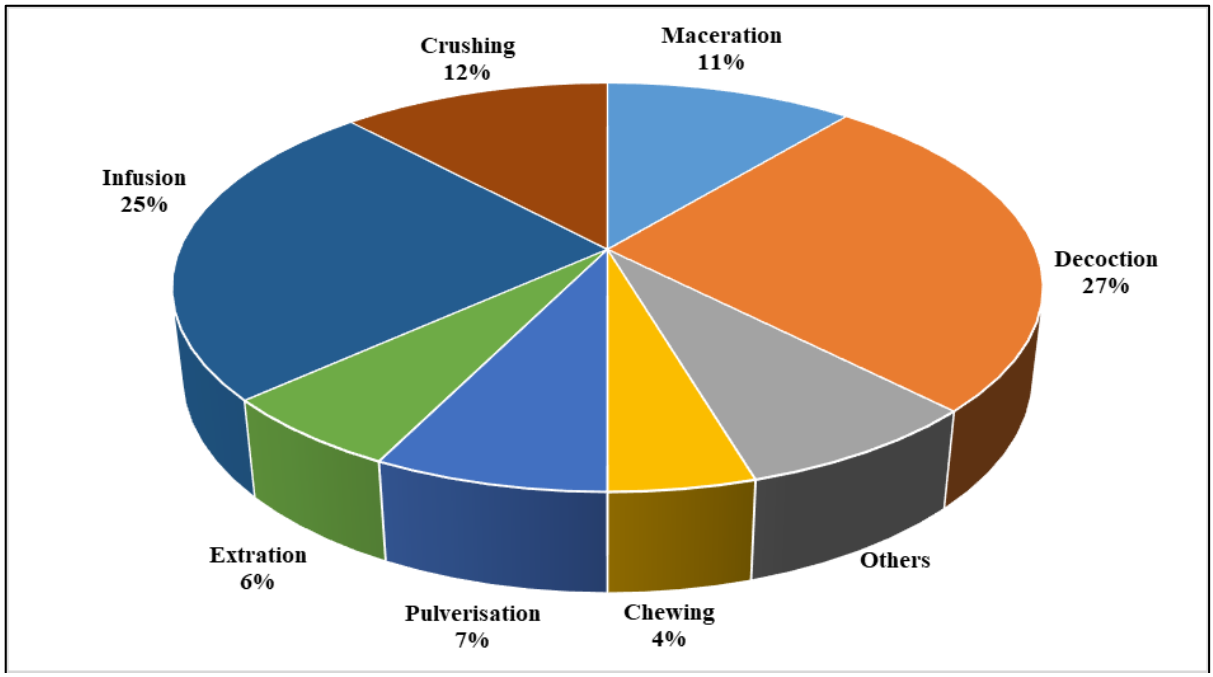

Fig 9: How to prepare the plants

Pathologies indicated by plants

The survey being generalist, we classified the plants by pathological groups, thus, of the 167 plants collected, we note a very varied use: General pathologies (19%), gynaeco-obstetrical pathologies (16%), ENT pathologies (13%) those of the nervous system (12%) and others (Figure 10). Although visually this is not in line with the health profile of our country (infectious diseases), it should be noted that each system includes its own infectious pathologies. For example, coughs and infectious pneumonia are included in the ENT system. Thus, infectious diseases remain the main target of traditional practitioners in this department. There is also a great similarity in the use of plants from one group to another. This is the case of *Bidens pilosa* L. and *Aloe vera* L REF.

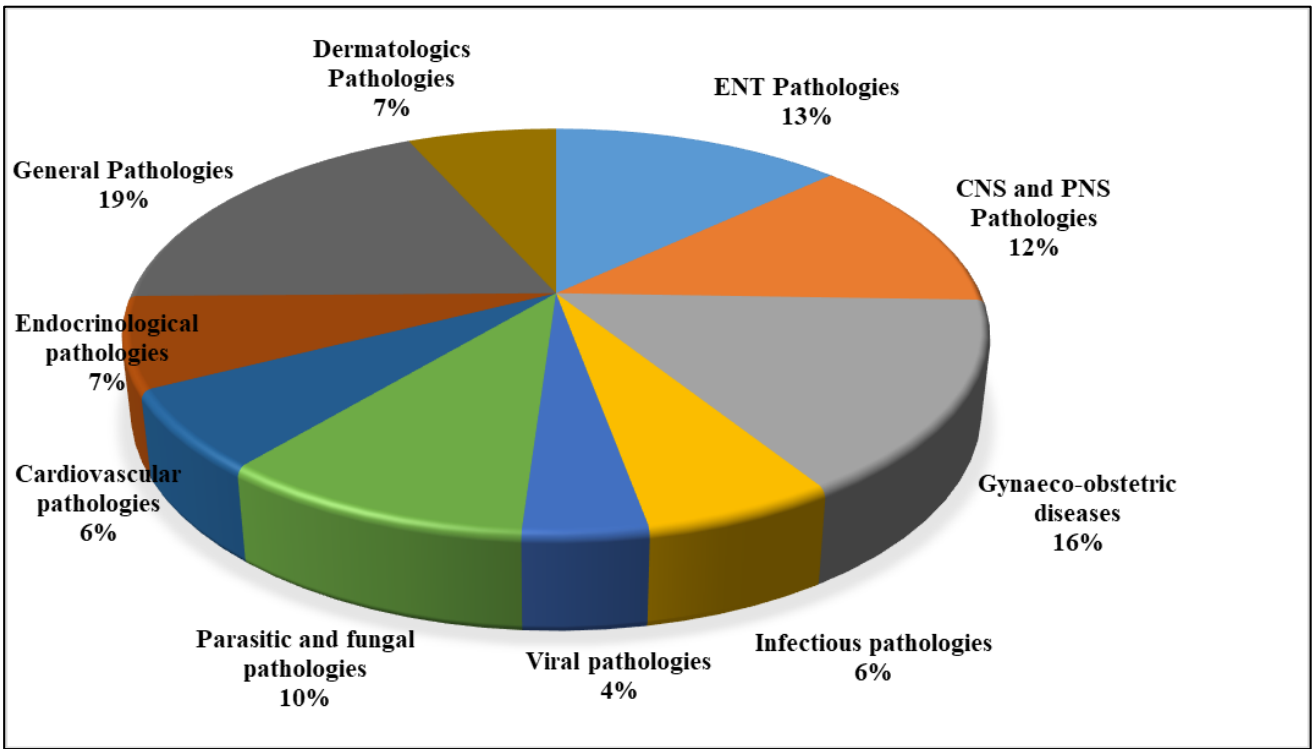

Fig 10: Conditions treated by traditional healers

Discussion

The realization of this ethnopharmacological exploration in the department of Bamboutos, Western Region of Cameroon was made possible thanks to the collaboration of several actors including 26 Tradipraticians (23 men and 3 women) recommended to us by the heads of groups, natives and other resource persons such as churchmen, health executives and other anonymous persons. Foutse, Dongmo and Chagam in 2006, 2010 and 2012 surveyed 10 (Ndé), 15 (Menoua) and 12 (Haut-Nkam) traditional practitioners respectively. 88% of this population is male in a department where the population is mostly female [6–8].

The various interviews conducted with these 26 TPs coupled with field visits enabled us to collect 167 plants divided into 58 families. In 2006 in the Ndé Division, Foutse surveyed seven villages and interviewed ten traditional healers to finally collect 160 medicinal plants [9]. In 2012 in the Haut-Nkam Division, Chagam Larissa interviewed 12 traditional healers in 7 villages and recorded 137 medicinal plants [7]. Yepndo Sirine recorded 107 species of medicinal plants in the Noun department [9]. Dongmo Cathy identified 150 medicinal plants in the Menoua Division [8]. On this basis, we can say that we have made our modest contribution to this survey in the western region by collecting 167 suspected medicinal plants. Mbouda is the arrondissement that provided us with the most TP (Figure 4) and the Bamendjida and Batcham groups are the groups in which we encountered the most TP (Figure 5). Similarly, 69 and 46 plants were collected in Mbouda and Batcham arrondissements respectively, with Bamendjida and Bamendjio leading the way with 11% each. Galim and Babadjou came last with 23 and 29 plants each. Bamoughong and Bamendjin are last with 6 and 7 plants respectively. These results are understandable insofar as the Mbouda district is more populated and larger with a very large number of clusters [10] whereas Galim and Babadjou have only 6 clusters. In addition, there is a problem of accessibility to the other districts, which is not the case in Mbouda.

Of the 167 plants collected, a wide variety of uses can be noted. General pathologies come first, followed by gynaeco-obstetrical pathologies, ENT and nervous system pathologies come fourth. This does not seem to be in line with the health profile of our country, and with the results of previous studies, which gave infectious diseases first place. In fact, this is only an impression; it is due to the fact that we have chosen to classify the pathologies first by system. And within each system are included its infectious diseases. Like coughs, infectious pneumonia, but which are rather found in the pathologies of the ENT system. In fact, infectious pathologies remain the main target of TP, ahead of gynaeco-obstetrical pathologies (51), ENT pathologies (43), central and peripheral nervous system pathologies [11], and parasitic and fungal pathologies (33). There is also a great similarity in the use of plants from one group to another. It is tempting to believe that there has been some homologation of the indications of certain plants. And sometimes these indications are corroborated by those in the literature. This is the case for *Bidens pilosa* L. and *Aloe vera* L. The results obtained speak volumes about the general health profile of our country and more specifically of the Bamboutos department. In a context where the lack of water is glaring, the respect of hygiene and sanitation measures can only be mediocre, thus opening the door to infections of all kinds. The lack of quality and quantity of sanitary infrastructures associated with the lack of personnel forces some people to resort to PT even for very serious pathologies such as CNS, PNS and Cardiovascular pathologies. The possibility of having recourse to several partners, even legally, combined with the lack of respect for preventive measures, justifies the high rate of gynaeco-obstetric pathologies. This also explains the fact that PTs are heavily solicited to treat them. In addition to the fact that many of these pathologies are stigmatizing and that patients prefer in all discretion to go and be treated by a PT because it would guarantee a little more privacy. The presence of certain pathologies is justified by the above-mentioned causes (lack of respect for hygiene measures, lack of infrastructure, etc.).

It was more difficult for us to apply the convergence theory (which allows us to objectively determine a plant of therapeutic interest) during our investigation. This can be explained by the fact that the same plant could be used to treat a very large number of pathologies, sometimes having no elements in common. However, some plants caught our attention, notably Datura candida, Physalis peruviana (djidjieh), Markhamia tomentosa (leoua) and *Datura candia* (flower mah), and we believe that it would be beneficial in the near future to step up research on these plants with a view to identifying the active ingredients in order to market TAMs.

Of our 167 plants harvested, leaves, roots and the whole plant represent the most used parts with respectively 45%, 11%, followed by fruits (9%), bark (8%) and others (7%). Other parts include seeds, latex and buds. We also have stems (4%) and rhizomes (2%). This can be explained by the fact that leaves are easily accessible and present most of the time and on all plant types, hence their dominance. While flowers and buds appear only for a short time and not on all plant types, many plants do not have a stem or rhizome. Fruits are also in demand because they are often eaten as food and because of their pleasant taste.

These parts are prepared by decoction, maceration, trituration or even infusion. The most common method of preparation in traditional medicine treatments in this department is decoction. This information confirms those of previous studies. But in our study, the second most common method of preparation is infusion, which is not the case observed in previous studies where maceration came second. Nevertheless, it should be noted that elsewhere, decoction remains the preferred method of preparation of traditional medicines, as in Ivory Coast [12].

These drugs are generally stored for a maximum of one week for drugs obtained by maceration, two weeks to one month for those obtained by decoction and trituration. For dried preparations (dry drugs) the shelf life can be up to 2 years. Decoction owes its shelf life to the fact that unlike maceration, its preparation is done at high temperature, thus reducing microbial contamination. Further studies on the microbial contamination of TAMs may tell us more.

Conclusion

This study made it possible to take stock of the medicinal plants used by the Bamboutos traditional healers. It showed that 167 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.

The data from this study could form a database for further research in the field of phytochemistry. Some of the plants that caught our attention were Datura candida, Physalis peruviana (djidjieh), *Markhamia tomentosa* (leoua), *Datura candia* (flower mah) and will be beneficial in a TAM manufacturing project.

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Additional notice: The authors declare that this work is devoid of any conflict of interest

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