

Knowledge, Aptitudes and Practice on Traditional Medicinal Plant use in Bafanji Village (Ngoketunjia Division, North West Region, Cameroon)

Manuscript Received: 15/01/2023

Manuscript Accepted: 16/02/2023

Article Published: 17/02/2023

PUNGONG Cyprian Soh pouh¹, LANGSI Dobgangha Jacob ^{*2}, FOTSO Bernard¹

¹Department of Biology, Higher Teachers' Training College, University of Bamenda, Bamenda, Cameroon

²Department of Biological Sciences, Faculty of Science, University of Ngaoundere, Cameroon, Ngaoundere, Cameroon

*Corresponding author: Email: langsijacob@gmail.com Orcid: <https://orcid.org/0000-0003-1070-7803>

DOI:10.36108/jbt/3202.20.0110

ABSTRACT

Bafanji village harbors a plethora of plants used in the treatment of several ailments. Alarmingly, traditional knowledge is quickly declining due to inadequate documentation and limited cross-generational transfer of knowledge. In this study indigenous medicinal plants were documented for their use, management and the threats affecting them. The study was carried out in Bafanji village between August 2015 and March 2016. Semi-structured questionnaires, interviews and field trips were used for data collection. Sample specimens were collected and identified. This study revealed that 6.06% of the population relied solely on medicinal plants for their health care while 15.14% do not use medicinal plants directly and 78.8% rely on both modern and traditional medicine for the treatment of their ailments. 92 plant species belonging to 51 families and 83 genera were documented. Family Asteraceae was the most represented (14.1%). More than one plant species is used to treat various ailments with the highest number of species (19) for malaria. Among the medicinal plant species recorded from the study area, the majority (55.4%) which were mainly herbs (70.7%) were collected from the wild. The leaves were the most commonly used plant part (44.5%). The principal method of remedy preparation was reported to be decoction. Oral administration was the most preferred mode. Knowledge of the use of plants as medicines was found to be confined to traditional healers and older folk. Documenting the eroding indigenous knowledge of medicinal plants and spurring youths to acquire traditional medicinal knowledge is recommended.

Keywords: Ailments, Bafanji, Ethnobotany, Indigenous, Knowledge, Medicinal Plants



Citation

Pungong, C.S., Langsi, D.J. & Fotso, B. (2023). Knowledge, Aptitudes and Practice on Traditional Medicinal Plant use in Bafanji Village (Ngoketunjia Division, North West Region, Cameroon). *Journal of Biotechnology* 2(1),1-21 <http://doi.org/10.36108/jbt/3202.20.0110>



INTRODUCTION

Ethnobotany involves the use of natural products with healing properties to treat diseases. It is as old as human civilization and plants have always been used by man for disease treatment and prevention (Rates, 2001). From history till the present even, irrefutable proofs have shown that medicinal plants represent the oldest and most popular spread form of medication, exploited by all peoples in all cultures (Halberstein, 2005). Presently, 80% of the world's population depends on plants for the treatment of diverse ailments; mostly as herbal concoctions (Muthu et al., 2006; World Health Organisation (WHO), 2003). Also, over 25% of prescribed medicine in industrialized countries is derived either directly or indirectly from plants.

Developing countries due to extreme poverty and the poor level of development of conventional medical facilities are leading in this practice. In all countries nevertheless, there exists basic traditional knowledge on how both human and animal health could be handled using locally available plants. Traditional medicine, therefore, relies on ancient, culturally based healthcare practices. It is different from allopathic or modern medicine; and it is commonly indigenous, unorthodox, alternative and largely orally transmitted from generation to generation.

Medicinal plants include plants which are only used by local traditional physicians as crude formulations of variable parts to provide some relief (WHO, 2003) or plants demanded by pharmaceutical companies for their active ingredients (De Silva, 1997). Locally available plants are gaining increasing popularity at the expense of modern conventional medicine due to increasing awareness of the curative properties of most plants (Junelle et al., 2022; Yembeau et al., 2022; Ngono Ngane et al., 2001).

Cameroon has a rich biodiversity of about 8,620 plant species. Furthermore, only 3 out of 20 patients can buy prescribed drugs, visit a hospital and only one out of every 1000 patients can see a specialist (Kuate and Effert, 2010). Traditional medicines, therefore, are very important in the management of diseases by the Bafanji people (North

West Region, Cameroon). Notwithstanding, traditional healers and elderly folk prefer secrecy and superstition and prefer to share knowledge only with trusted relatives. The young on the other hand hold a lot of misconceptions about traditional medicine with a preference for modern drugs. Nevertheless, numerous ethnobotanical studies have been done in Cameroon (Junelle et al., 2022, Yembeau et al., 2022; Simbo, 2010; Jiofack et al., 2009; Thornell and Sandberg, 2007; Yomi, 2001) but in this area, a systematic ethnobotanical survey has not been done.

It was with this in mind that we sought in this study to investigate and document local knowledge on the variety of plants used for medicinal purposes in Bafanji (North West Region, Cameroon). And specifically, to identify the main human ailments, medicinal plants available, importance and usage, risk factors on medicinal plant survival and their conservation in the study area.

METHODOLOGY

Study Location

Bafanji is a village in the Balikumbat Sub-Division (Ngoketunja Division, North West Region, Cameroon). It is located between 5° and 13°N and 10° and 55°E of latitude and longitude respectively; at 2289 m.a.s.l. The climate is of two distinct seasons: the rainy season (longer) and the dry season with annual precipitation ranging between 1700 mm to 2200 mm. The average daily temperatures range between 24.0°C and 27.0°C. The soils range from volcanic soils, and loam soils (in the plains) to ferritic reddish soils. Attitude ranges from 600-1500mm above the sea. Bafanji village is covered with grass with patches of secondary forest along the slopes. The population of mainly subsistence farmers is estimated to be about 21,000 inhabitants (Manu et al., 2014).

Data collection was done between the 8th of August 2015 to the 10th of September 2015 (rainy season peak) as well as from February 18th to March 20th (dry season peak). Semi-structured questionnaires, structured interviews, oral interviews, discussions and field observations to collect data were administered to willing recipients. Collected specimens were carefully wrapped in



newspapers (herbariums) and taken to Bamenda for identification.

Population of Study

The target population included people of all age groups except children below 15 years. The informants were grouped into three age groups; youths (15-24 years), adults (25-59) and the elderly (60 and above). A total of 165 respondents (97 males and 68 females) were targeted. Among the 165 respondents, were 10 key Traditional Medicinal Practitioners (TMP) selected randomly from the population. The interviews and discussions were done in Pidgin English and the local dialect (*Chufieh*) was for people who could neither read nor write. During the various interview sessions, the respondents' background, common human ailments, methods of disease diagnosis and treatment, medicinal plants exploited, site of harvest (wild/domesticated), availability of the said plant, plant part(s) used, methods of preparation and administration, threats and conservation practices, were carefully recorded.

Disease statistics recorded in the patients' register of the Presbyterian Health Centre (PHC) Bafanji from January 2015 to December 2015 were also collected.

In all: 152(76%) questionnaires were distributed to the local population, 10(5%) to TMPs, 20(10.0%) to local researchers on traditional medicines and 18(9%) to practitioners of western/modern medicines, including small pharmacy owners and nurses.

Plants collected (with known local names) were preserved as herbariums and taken to the National Herbarium at Mile 3 Nkwen (Bamenda) for identification.

Data treatment

Ethnobotanical data were arranged in order using Excel (Microsoft office 2013) and summarized using descriptive statistics. The spreadsheet data filter facility was employed to determine frequencies of citations to identify: the most common ailments in the study area, popularly used medicinal plant species and multipurpose plant species, to determine proportions of different variables like plant families, growth forms, source of collection, plant parts used, methods of preparation, route of administration and threats. The results were presented using tables, bar charts and pie charts.

RESULTS AND DISCUSSION

The age group of respondents

A majority of the respondents were adults between the ages of 25-59 with 70 (42.4%) respondents followed by the youths 15-24 years with 60 respondents (36.4%) and finally the elderly, 60 years and above with 35 (21.2%) respondents.

Knowledge of medicinal plants based on age group

Local age group-based knowledge on the use of plants as medicines showed that out of the 165 respondents, 122 cited at least a medicinal plant with 94.3% being the elderly (Fig 1).

The educational level of respondents

Out of the 165 respondents, 38.2% had not attained any formal education while 29.7% had attained secondary school, 21.2% primary school, 6.7% high school and 4.2% other higher institutions (Fig 2).



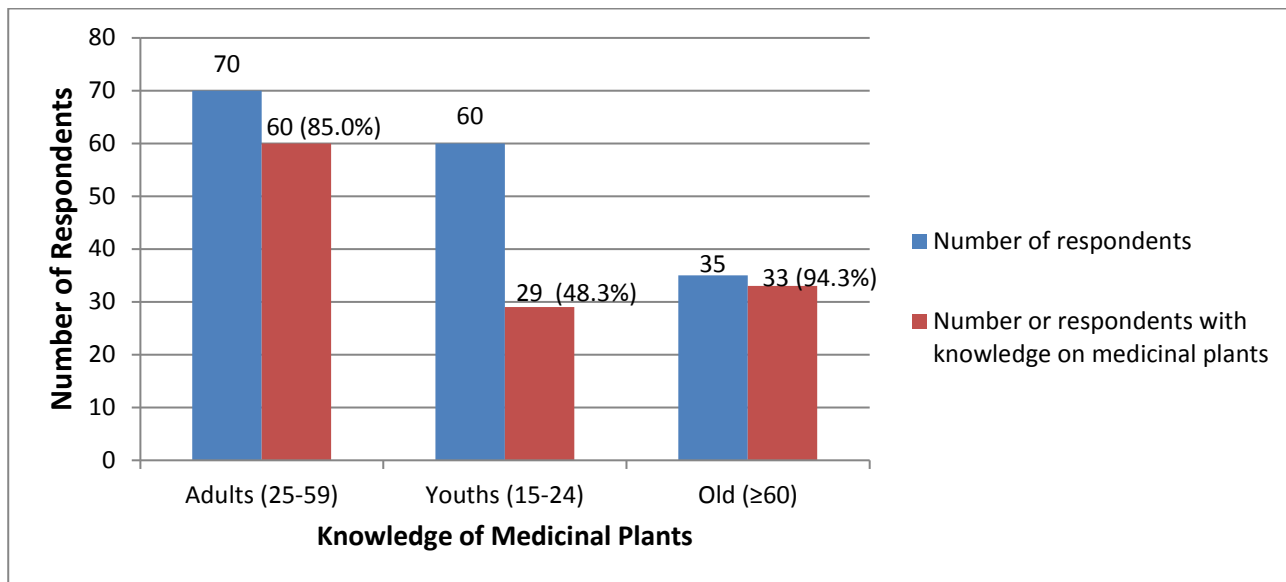


Fig 1: Knowledge of medicinal plants based on age group

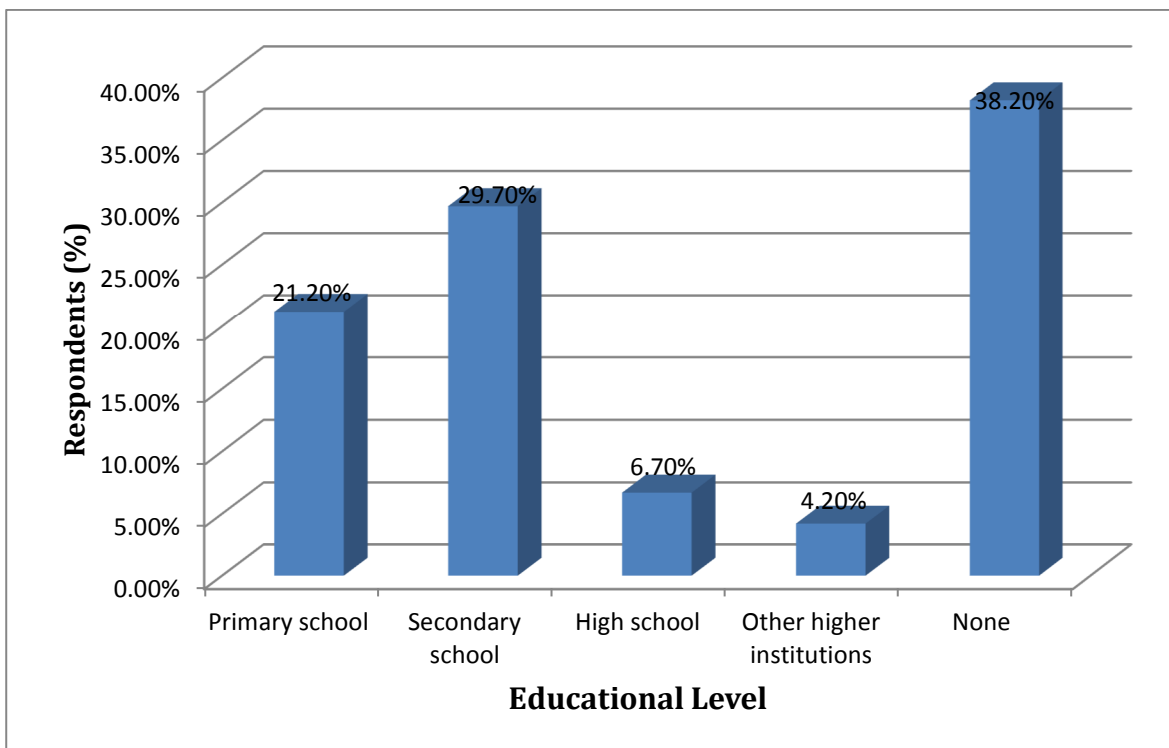


Fig 2: Educational level of respondents

Diagnosed ailments affecting human health in Bafanji

From the patient’s register of the Presbyterian Health Center Bafanji, 31 diseases were documented. Malaria had the highest number of patients (1042) followed by

hypertension (130), anemia (120) patients, typhoid fever (85), urinary tract infections (82) and the rest of the diseases were as represented below (Fig 3).

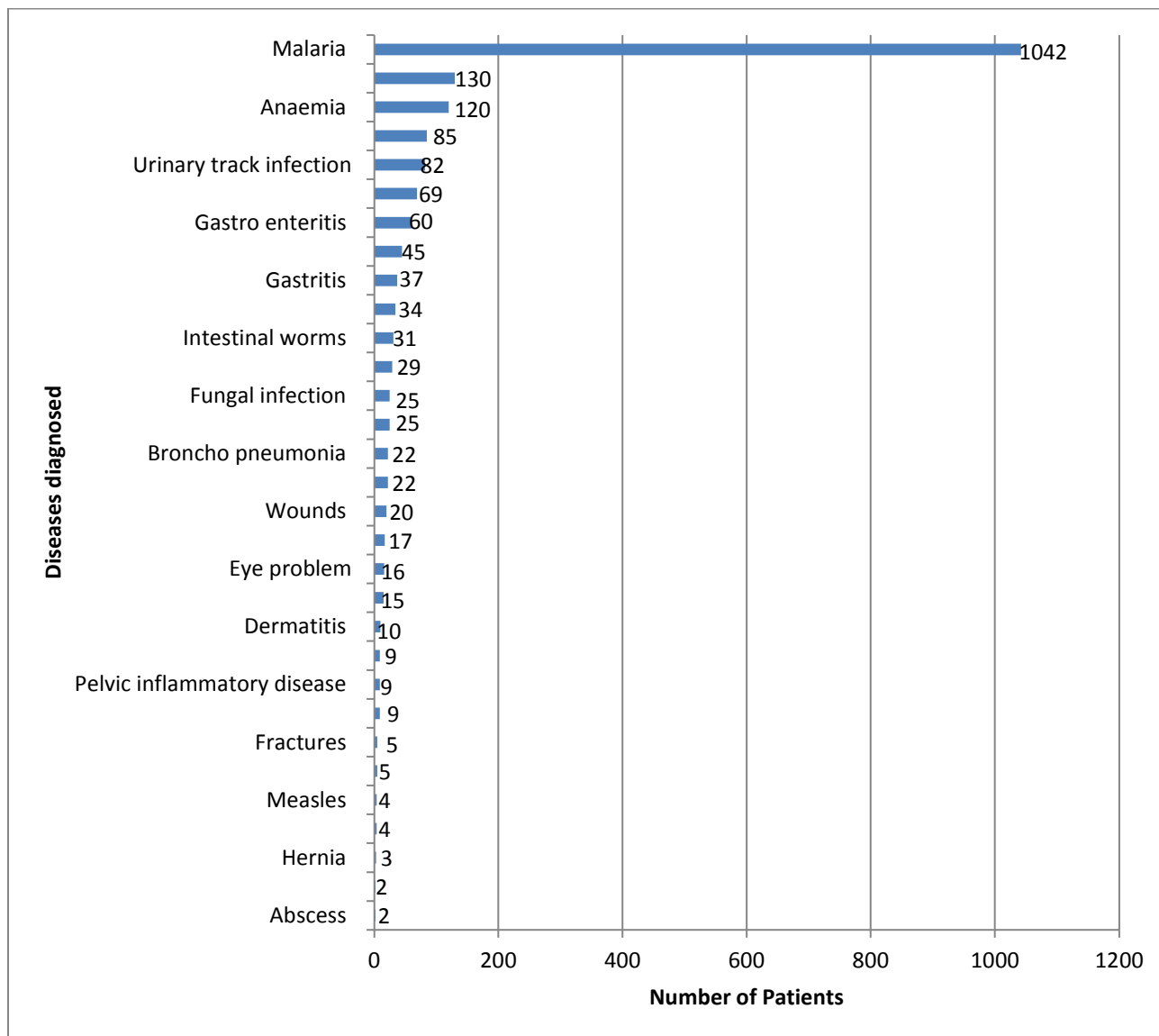


Fig 3: Total number of patients recorded in the Hospital for each disease from January to December 2015



Diversity of Medicinal Plants Used in Bafanji

Ninety-two medicinal plant species were identified to be used in the treatment of 107 human ailments. The plants belong to 51 families and 83 genera. The family Asteraceae was the most popular (14.1%), followed by Euphorbiaceae (6.5%), Poaceae (5.4%), Apiaceae, Malvaceae and Solanaceae (4.3%) each, Rutaceae and Curcubitaceae (3.3%) each. The remaining 43 families were each represented by one or two species (Table 1).

Medicinal plant species of great curative importance in Bafanji

Among the 92 plant species identified to be medicinal, many of the species are used to treat more than one

disease. The most common diseases include Malaria with 19 species (17.8%), followed by stomach ache with 12 species (11.2%), Typhoid with 11 species (10.3%), cough and Rheumatism with 6 species (5.5%) each, Diabetes, sexual weakness and wounds with 5 species (4.6%) each. The other diseases are treated with four, three, two and one species (Fig. 4). In some cases, two or more diseases are treated using the same plant. *Panax quinquefoliosus* is the highest, used to treat 7 different diseases, followed by *Eremomastax speciosa* with 5 different diseases, *Rauwolfia vomitoria* and *Psidium guajava* 4 different diseases each (Table 1). Diseases that could not be treated by TMPs with herbal remedies include; AIDS, Hernia, Leprosy and Cancer.

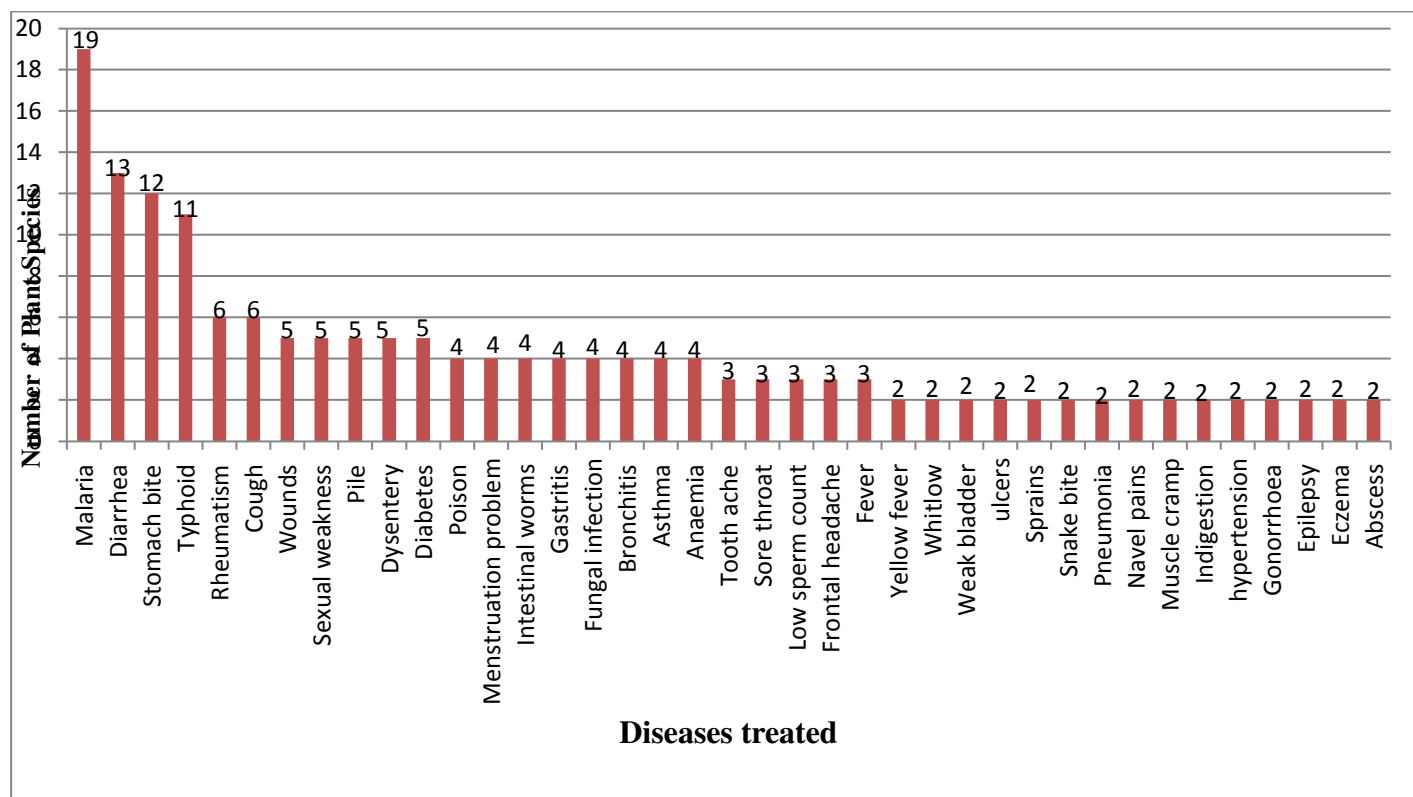


Fig 4: Diseases Treated and Number of Medicinal Plants Used in Bafanji



Table 1: Alphabetical List of medicinal plants used for human ailments in Bafanji

Family	Scientific Name	Local name	Disease(s) treated	Parts used	Method of Preparation	Route of Admin	Form
Acanthaceae	<i>Asystasia gangetica</i>	Creeping fox glove	rheumatism, stomach aches	Lv	Plt	Or, Tp	Hb
Acanthaceae	<i>Eremomastax speciosa</i>	puke jamoun	anemia, diarrhea, painful menses, enhances blood, clothing	Lv	De, Ma	Or, An	Hb
Amaranthaceae	<i>Amaranthus edulis</i>	Green	anti-microbial, anti-helminthic, anti-bronchitis	Lv	Mst	Or	Hb
Amaranthaceae	<i>Cyathula prostrata</i>	hembi	headache, jetyjety, septic wounds	Lv	De, Plt	Tp, An	Hb
Amaryllidaceae	<i>Allium cepa</i>	Anusi/ onion bulb	sprains, catarrh, asthma	bulb	Mst Ma	Tp, Or, nasal	Hb
Anacardiaceae	<i>Mangifera indica</i>	Mango	malaria, typhoid	Lv, Bk, Rt	De	Or	Tr
Anecaceae	<i>Apium graveolens</i>	Celery	lack of appetite, kidney failure	Lv	De	Or	Hb
Anonaceae	<i>Anona senegalensis</i>	Fefe	gastroenteritis, pneumonia	Lv, Ft Bk	De Mst	Or	Tr Sh
Apiaceae	<i>Eryngium foetidum</i>		navel pains	Lv, St	Ju	Or	Hb
Apiaceae	<i>Daucus carota</i>	carrot	poor vision, expel worms.	Rt	Mst	Or	Hb
Apiaceae	<i>Parsey carum</i>	Parsey	blocked urination, kidney problems.	Lf, St	De	Or	Hb
Apocynaceae	<i>Rouwolfia vomitoria</i>	nle	jaundice, malaria, chest pain, poison	Lv, Rt.	De, Mst	Or	Sh
Apocynaceae	<i>Voacanga africana</i>	paokind	fibroids, tumors, eczema	Lv, Bk	De, Ju	Or, Tp	Tr
Araceae	<i>Colocosia esculenta</i>	Cocoyam	pile (haemorrhoids)	St	Ma	An	Tuber
Araliaceae	<i>Panax quinquefolious</i>	Ginseng	sexual weakness, low sperm count, gonorrhea,	Lv Rt	De Mst	Or	Hb



			impotence, syphilis, malaria, fatigue		Inf		
Asteraceae	<i>Ageratum cornyzoides</i>	Mbengwen/king grass	frontal headache	Lv	Ma	Or	Hb
Asteraceae	<i>Aspilia africana</i>	African odine	night poison, gonorrhoea	St, Fl	Mst, Inf	Tp	
Asteraceae	<i>Bidens pilosa</i>	Whemipoh/Black jack	wounds, diarrhoea	Lv, St, Fl	Ju, Mst	Or, Tp	Hb
			typhoid, malaria	Lv	De	Or	Hb
				St, Fl			
Asteraceae	<i>Calendula officinalis</i>	Marigold	menstrual bite	Lv	De, Mst	Or	Hb
Asteraceae	<i>Chromolaena odorata</i>	Achacassara	waist pains, sprains, rheumatism	Lv	Ma, Plt	Tp	Hb
Asteraceae	<i>Emilia coccinae</i>	Rabbit grass	diarrhoea, gastritis	Lv	De, Mst	Or	Hb
Asteraceae	<i>Erigeron floribundus</i>	Early old an	diarrhoea	Lv	Mst	Or	Hb
Asteraceae	<i>Galinsoga ciliata</i>	Quick weed/allant soldiers	wounds, cuts, and bites	wh	Ma	Tp	Hb
					Ju		
Asteraceae	<i>Spilanthes ficaulis</i>	Eye for owl	toothache	Lv; Fl	Mst	Or	Hb
Asteraceae	<i>Taraxacum officinale</i>	Dandelion	laxative, sore throat	Lv	De	Or	Hb
Asteraceae	<i>Tithonia diversifolia</i>	Sun flower	yellow fever, malaria	Lv	De, Ju	Or	Sh
Asteraceae	<i>Tridax procumbens</i>	Pest weed	wound healing, stop bleeding, antibiotic	Wh	Ma, Ju	Tp, Or	Hb
Asteraceae	<i>Vernonia amydaline</i>	Bitter leaf	diabetes, stomach ache	Lv, St	Ju, Inf	Or	Sh
Balsaminaceae	<i>Impatiens sp</i>	Menyi-nenkoh	difficult labour, poison, tooth ache	Lv	Ju	Tp	Hb
				St	Pit	Or	
Basellaceae	<i>Basella alba</i>	Ndorre	child birth	Lv	Ju	Or	Hb
		kowe, mbeng	jetty jetty, epilepsy	St			
Bromeliaceae	<i>Ananas comosus</i>	Pineapple	malaria, typhoid, sexual weakness	Ft	De; Ju	Or	Hb
Caricaceae	<i>Carica papaya</i>	pawpaw	typhoid, malaria, intestinal worms	Lv	De	Or	Tr
				Ft			





Caryophyllaceae	<i>Drymaria cordata</i>	Nkuchicheng	abscess, broken bone, pneumonia	Lv St Rt, Fl	Mst Plt	Tp	Hb
Caryophyllaceae	<i>Sterlaria media</i>	Chick weed	whitlow, gallstones	Lv	De, Ma	Or	Hb
Clusiaceae	<i>Garcina cola</i>	Bitter cola	indigestion, stomach bite sexual weakness (use as aphrodisiac)	Ft	Mst	Or	Tr
Commelinaceae	<i>Commelina benghalensis</i>	gye pi	felicitates delivery, ringworm	Lv St	Ju Ma	Or Tp	Hb
Convolvulaceae	<i>Ipomoea batatas</i>	Sweet potatoes	Dysentery, anaemia	Lv	Ju	Or	Rn
Costaceae	<i>Costus afer</i>	gyezu	cough	St	Mst	Or	Hb
Costaceae	<i>Costus albus</i>	Monkey sugarcane	pile, irregular menstruation	Lv St	De Inf, Mst	Or An	Hb
Crassulaceae	<i>Bryophyllum pinnatum</i>	Life plant	ear problem, skin diseases, skin tumors	Lv, St	Ju, Plt	Tp, Au	Hb
Crassulaceae	<i>Kalanchoe crenata</i>	ndiza	ear pain, gastritis, malaria	Lv	Ju, Mst, Plt	Or, Au	Hb
Cucurbitaceae	<i>Curcubita pepo</i>	Pumpkin	ulcers, tape worms	Sd	Mst	Oral	Hb
Cucurbitaceae	<i>Telfairia occidentalis</i>	Okong obong	typhoid, malaria	Lv, St	Ju	Oral	Hb
Cucurbitaceae	<i>Zehnaria scabra</i>	lia	sexual weakness, prevent miscarriage and difficult labor	Lv	Ju	Or	Cl
Cupressaceae	<i>Cupressus lucitania</i>	Cypress	weak bladder, anti-diuretic	Lv, St	De	Or	Tr
Euphorbiaceae	<i>Alchornea cordifolia</i>	Nepweh	diarrhea, malaria, typhoid	Lv	Ma, De	Or	Sh
Euphorbiaceae	<i>Euphorbia forskalii</i>	ngay	stomach bite	Lv, St, Fl	Ju	Or	Hb
Euphorbiaceae	<i>Euphorbia hirta</i>	Asthma weed	Asthma, diarrhea	Lv; St	Mst; De	Or	Hb
Euphorbiaceae	<i>Mallotus oppositifolius</i>	Ferre	diarrhea, dysentery, stomach ache	Lv	Mst	Or	Hb
Euphorbiaceae	<i>Manihot esculentus</i>	cassava	anemia, measles, small pox	Lv, Rt	Mst	Or	Hb





Euphorbiaceae	<i>Ricinodendron heudeltii</i>	njangsa	cough, yellow fever, rheumatism	Bk, Sd	De, Plt	Or	Tr
Fabaceae	<i>Phaseolus vulgaris</i>	Mukon/beans	rheumatism	Sd	Ma	Or	Hb
Hypericaceae	<i>Harungana madagascarensis</i>	Haronga	stomach ache, dysentery, pile	Lv, Bk	De, Mst	Or	Tr
Lamiaceae	<i>Ocimum gratissimum</i>	Masepo	typhoid, malaria, gastritis	Lv, St	De, Ma	Or, Tp	Hb
Lauraceae	<i>Persea americana</i>	Pia / pear	diabetes	Lv ; Bk	De	Or	Tr
Leguminosea	<i>Glycine max</i>	Soybean	malaria, typhoid	Ft, Sd	Ma, Inf	Tp	
Liliaceae	<i>Allium sativum</i>	Garlic	snake bites, ulcer, kwashiorkor	Lv, Sd	De, Plt	Or, Tp	Hb
Liliaceae	<i>Aloe vera</i>	Aloe vera	hypertension, menstrual pains, cough	Rh	Mst, Ju	Or	Hb
Liliaceae	<i>Aloe vera</i>	Aloe vera	stomach ache, pile	Lv	Ma	Or	Hb
Loranthaceae	<i>Viscum album</i>	Mistle toe	diabetes, hypertension, hypotension	Lv, St	De, Inf	Or	Ep
Malvaceae	<i>Abelmoschus esculentus</i>	okra	bed wetting, weak bladder	Ft	Mst	Or	Hb
Malvaceae	<i>Hibiscus rosa sinensis</i>	Hibiscus	facilitates delivery	Lv	Ju	Or	Sh
Malvaceae	<i>Sida alba</i>	Nson eyi fufu	wounds, muscle cramp	Lv, Fl	Ma	Tp	Hb
Malvaceae	<i>Sida rhombifolia</i>	Nson eyi	diarrhea, muscle cramp	Lv	Ma	Or	Hb
Myrtaceae	<i>Eucalyptus globulus</i>	Fosigali/ Eucalyptus	asthma	Fl	Plt	Tp	
Myrtaceae	<i>Eucalyptus globulus</i>	Fosigali/ Eucalyptus	rheumatoid arthritis, diabetes, bronchitis.	Lv	De	Or	Tr
Myrtaceae	<i>Psidium guajava</i>	guava	dysentery, stomach ache, diarrhea	Lv Bk, Ft	De Mst, Plt	Or	Tr
Palmaceae	<i>Cocos nucifera</i>	Coconut	malaria				
Palmaceae	<i>Cocos nucifera</i>	Coconut	rehydration against diarrhea, heart burn	Ft	Ju Cha	Or	Tr
Palmaceae	<i>Elaeis guineensis</i>	Palm tree	convulsion, snake bite, poison	Ft	Ju	Or	Tr





Papilionaceae	<i>Arachis hypogea</i>	Muchu/ groundnut	insomnia	Lv	Inf	Or	Hb
Passifloraceae	<i>Passiflora foetida</i>	Passion plant	inflamed spleen (side pain), bronchitis, tuberculosis	Lv St, Fl	De Ma	Or Tp	Hb
Piperaceae	<i>Piper umbrellatum</i>	Nia que	pile, swellings	Lv	Plt	An, Tp	Hb
Poaceae	<i>Cassia tora</i>	AIDS vine	HIV-related bumps	Lv, St	De, Ma	Or, Tp	Hb
Poaceae	<i>Cymbopogon citratus</i>	Fever grass	malaria, high fever	Lv	De	Or	Hb
Poaceae	<i>Elusine indica</i>	Gung sein/ yard grass	influenza, retention of urine, protection from spiritual attack	Wh	De Tie and use	Or Tp	Hb
Poaceae	<i>Pennisetum purpureum</i>	Elephant grass	diarrhea, fresh wounds	Lv St	De Ju	Or Tp	Hb
Poaceae	<i>Zea mays</i>	Maize	enuresis	Silk	De	Or	Hb
Portulacaceae	<i>Portulaca oleracea</i>	Purslane	whooping cough , diarrhea	Lv St	De Ma	Or Tp	Hb
Rubiaceae	<i>Cinchona sp</i>	Quinine tree	malaria, typhoid, stomach bite	Bk	De	Or	Tr
Rubiaceae	<i>Spermacoce hispida</i>	mpea	overweight, urinary tract infection, headache	Wh Rt	Plt De	Or	Hb
Rutaceae	<i>Citrus lemon</i>	Lemon	cough, malaria	Ft	De, Ma	Or	Tr
Rutaceae	<i>Citrus sinensis</i>	orange	malaria, constipation, gastritis	Lv,Ft	De, Ju, Mst	Or	Tr
Rutaceae	<i>Zanthoxylum leprieurii</i>	Ulwole	chest pain, body pains, convulsion	Bk, Lv	Tr	De, Plt	Or,Tp
Solanaceae	<i>Capsicum frutescens</i>	Niah/ Pepper	Red digestion problems, <u>stomach</u> upset or intestinal gas, alcoholism	Lv Ft	Plt Ju	Tp Or	Hb
Solanaceae	<i>Solanum nigrum</i>	Fie	diarrhea, gastric ulcer, eczema	Lv, St, Sd	De Mst	Or Tp	Hb
Solanaceae	<i>Solanum torvum</i>	Egg plant	whitlow, abscess	Ft	Plt	Or	Hb





Solanaceae	<i>Solanum tuberosum</i>	Kukwa mekia/ irish potaoto	rheumatic pains	Bk	De	Or	Hb
Sterculiaceae	<i>Cola acuminata</i>	Pii/ colanuts	fever, sleeping sickness	Bk, Ft	Pt, Mst	Or	Tr
Ulmaceae	<i>Trema orientalis</i>	Charcoal tree	jaundice, dysentery, sore throat	Lv, Bk	De, Mst	Or	Tr
Umbeliferae	<i>Centella asiatica</i>	Gotu kola	stomach ache	Lv	Mst	Or	Hb
Urtricaceae	<i>Utrica dioica</i>	Common nestle	cough, blood cleanser body rashes	Lv St	Inf Ma	Or Tp	Hb
Verbenaceae	<i>Lantana camara</i>	Sun flower	filarial, epilepsy	Lv	De	Or	Herb
Zingiberaceae	<i>Zingiber officinale</i>	Ginger	Cough, gastritis, tooth problem	Rh	Inf Mst	Or	Hb
Zingiberaceae	<i>Aframomum malegueta</i>	Alacata pepper	increases potency of herbal preparations, poisoning, spiritual attacks	Sd	Mst Plt	Or Tp	Hb

Growth form: Tr = Tree; Sh = Shrub; Hb = Herb; Cl = Climber; Rn = Runner; Rh = Rhizome; Ep = epiphyte; Plant part used: Lv=Leaves; Bk= Bark; Rt=Roots; Fl=Flowers; Fr= Fruits; Sd=Seeds; Wh=Whole plant body; Method of preparation: De=Decoction; Inf=Infusion; Plt =poultice; Ma=maceration; Mst= mastication (eating), Cha =Charring; Route of administration: Or= Oral; Tp=Topical (external application); An= Anal (enema), Au= Auditory



Diagnosis and Treatment of diseases

Diagnosis and treatment were ailment dependent. This was done mainly by an interview and visual inspection. Of the 165 respondents, 6.1% of TMPs reported that they were able to diagnose and treat themselves solely with medicinal plants when sick. 15.14% of respondents will visit a hospital and do not use medicinal plants directly,

while 78.8% depend on the hospital and medicinal plants for the treatment of their ailments (Fig 5).

Sources of medicinal plants in Bafanji

Among the cited plant species, the majority (55.4%) is wild, 40.2% are both domesticated and wild and a few species (4.4%) were indicated as domesticated (Fig 6).

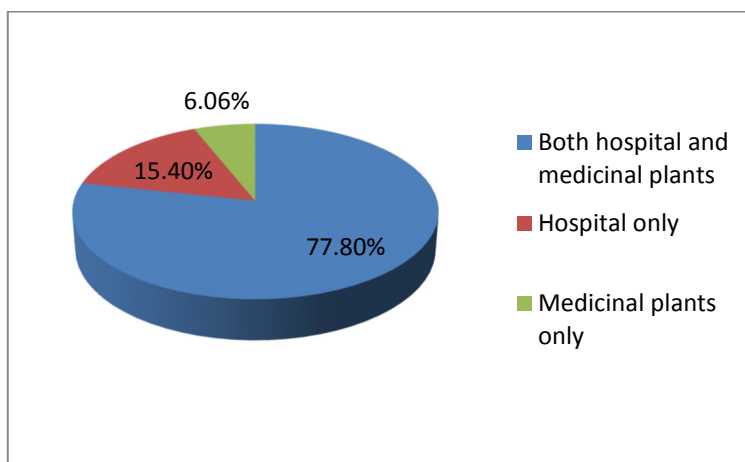


Fig 5: Reported methods of diagnosis

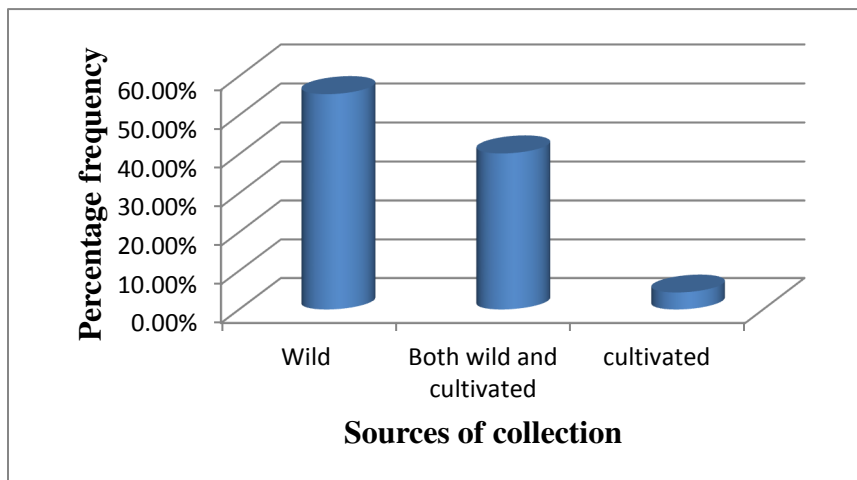


Fig 6: Reported sources of collection of Medicinal plants (%)



The growth form of medicinal plants in Bafanji

Herbs were the most popular (70.7 %), followed by trees (19.5 %), shrubs (6.5 %), climbers, runners and epiphytes (3.3 % each) (Fig 7).

Plant parts used for Herbal remedies in Bafanji

The plant parts used include leaves, stems, roots, flowers, fruits, seeds, plant bark, rhizome and whole plant. The leaves were most commonly used (44.5%), followed by stems (17.80%), the fruits (10.3%), Bark (6.85%), flowers (5.5%) seeds (4.8%), roots (4.10%), whole plant (3.4%) rhizome (1.4%) and finally other plant parts (1.35%). (Fig 8)

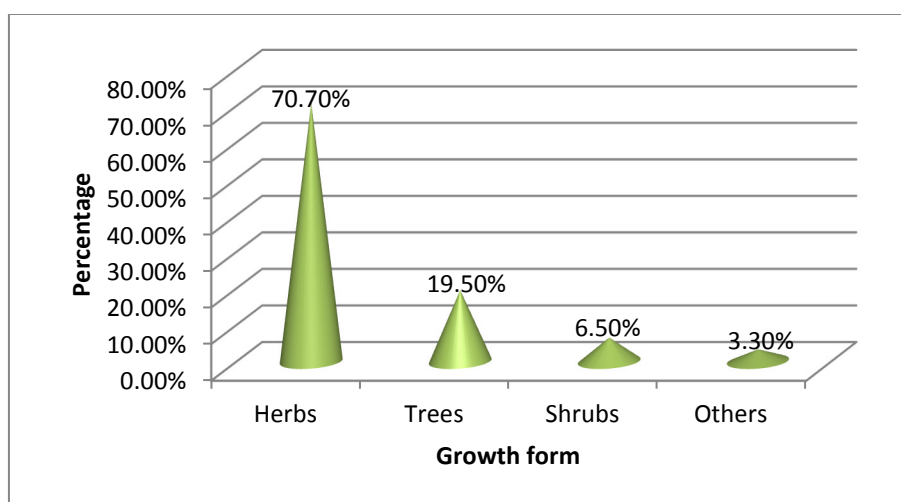


Fig 7: Reported growth form of medicinal plants

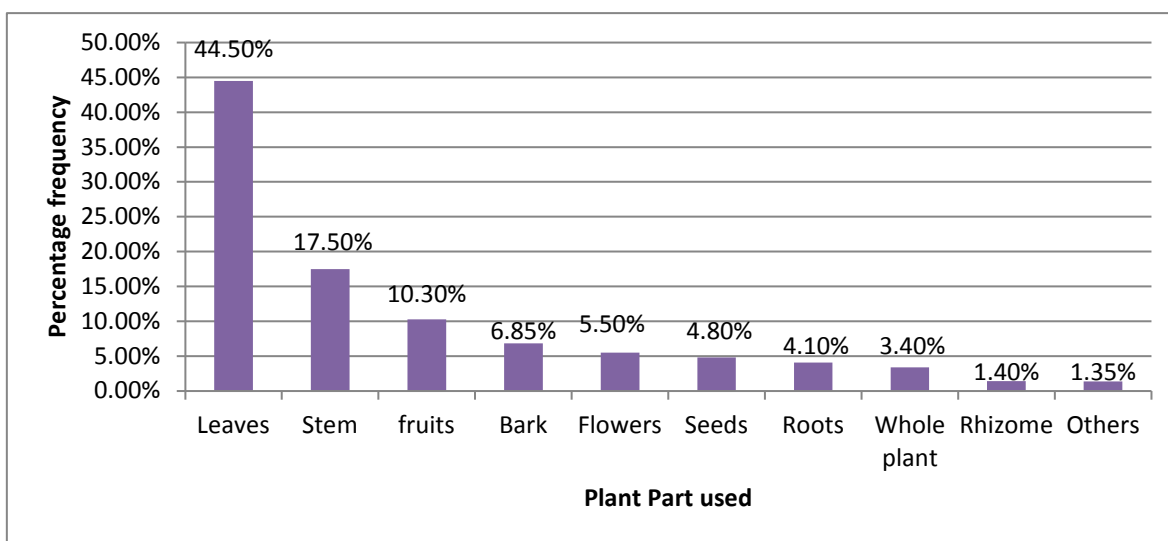


Fig 8: Frequency (%) of plant parts used for treatment



Methods of preparation of herbal remedies in Bafanji

Methods include; decoction, poultice, tincture, infusion, maceration, and mastication (chewing). The principal method is decoction (29.5%) followed by mastication (20.8 %) (Fig 9).

Methods of application of herbal medicine in Bafanji

Administration depends on the location of the ailment which could be oral, topical or dermal, anal, ocular or auricular routes. However, the oral route was predominant (68.57%), followed by topical application (24.0 %), and anal route (5.0%) auditory (1.7%) and other routes (0.7%) (Fig 10).

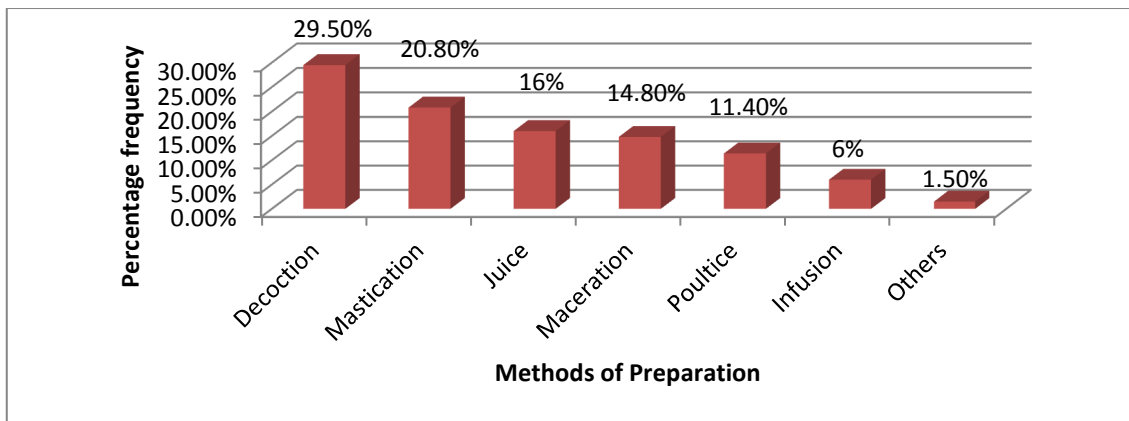


Fig 9: Reported methods of preparation of medicinal plants

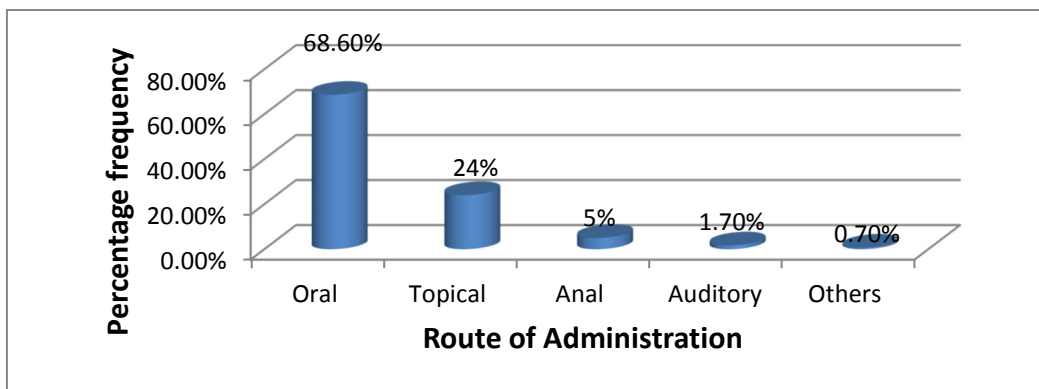


Fig 10: Reported routes of administration of medicinal plant remedies



Added Values of Medicinal Plants

Most of the medicinal plant species apart from serving as medicine were also used as food (32.60%), firewood (18.50%), and construction material (8.70%). For example, wood from *Anona senegalensis*, *Eucalyptus globulus*, *Harungana madagascarensis*, etc. are used as construction material, tool handles and furniture while *Annanas sativa*, *Carica papaya*, *Citrus sinensis*, *Mangifera indica*, *Persea americana* and *Psidium guajava* are common edible fruits. A few species (40.2%) were used only as medicine (Fig 11).

Threats to Medicinal Plants

The most mentioned threats to medicinal plants in the study area were deforestation (59%), agricultural expansion (28%) and wildfire (13%). (Fig 12) Interestingly, less than 2% of the medicinal plants were reported as rare. All the plants reported as rare are trees exploited by timber companies and local timber dealers. eg. *Cylicodiscus gabonensis*, *Etandrophragma candollei* etc.

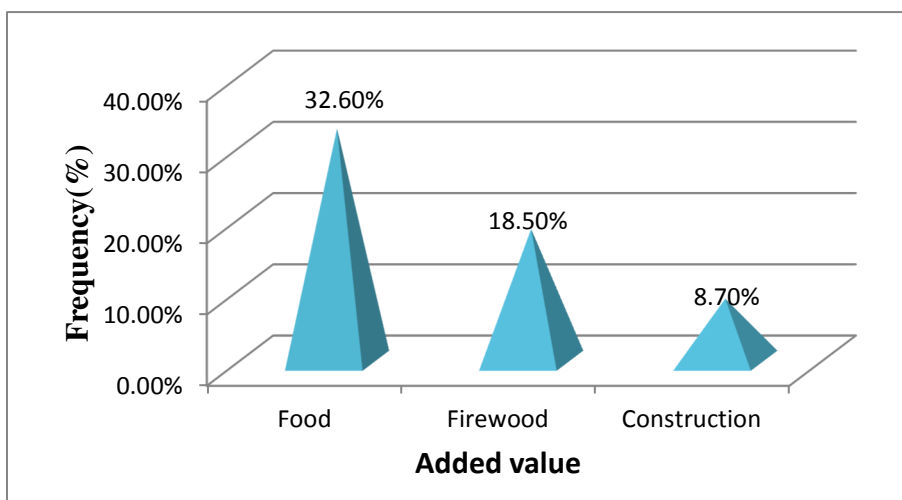


Fig 11: Added values of traditional medicinal plant species

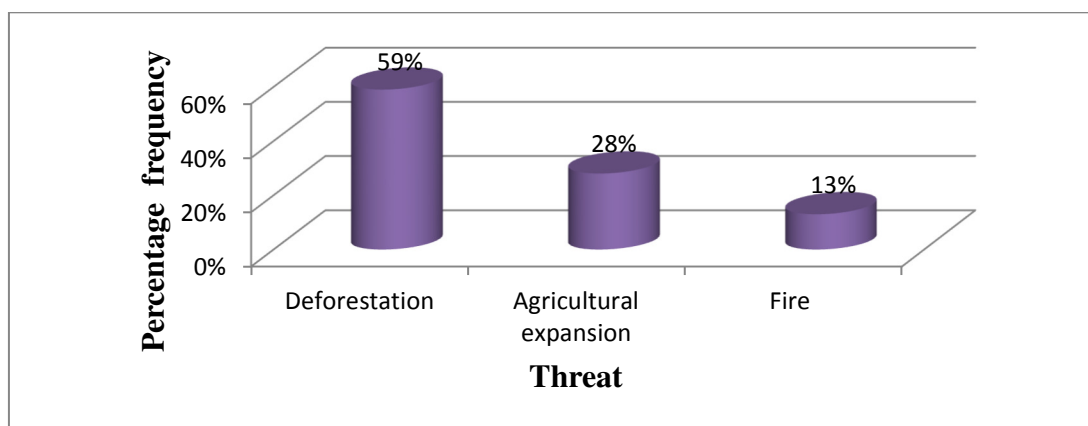


Fig 12: Reported threats to medicinal plant species of the study area

Importance of Medicinal Plants to Respondents

Over 85% of respondents accepted they had used medicinal plants. 74% said it was very important, 24% rated it important, and 2% said that it was not important (Fig 13). Most respondents gained their knowledge of

traditional medicines from parents; only 2 respondents had learned about it from traditional healers. Only about 9% of respondents reported that they do transmit their knowledge of medicinal plants to their children and younger relatives.

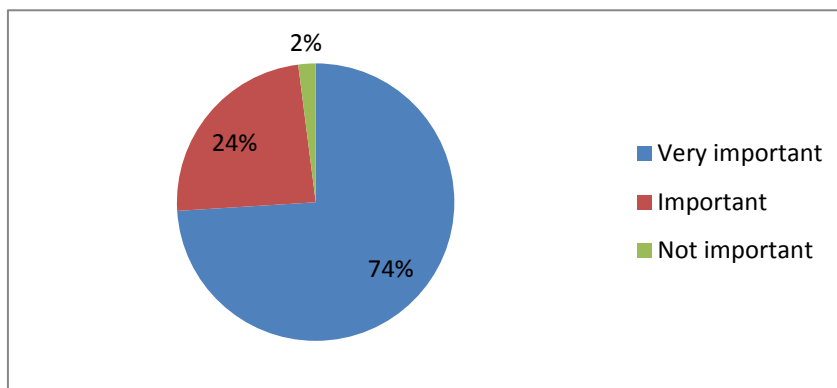


Fig 13: Importance of traditional medicine to respondents

Top ten popularly used Medicinal Plants in Bafanji

In Bafanji, the most commonly used plants in terms of frequencies of citation were *Cymbopogon citratus* followed by *Ageratum conyzoides*, *panax quinquofolius*, *Ocimum*

gratissimum, *Aframomun melegueta*, *Aspilia Africana*, *Eremomastax speciosa*, *Spilanthes filicaulis*, *Carica papaya* and *Aloe vera* (Table 2).

Table 2. Popularly used medicinal plants in the Bafanji

Scientific name	Frequency of citation
<i>Cymbopogon citratus</i>	149
<i>Ageratum conyzoides</i>	138
<i>Panax quinquofolius</i>	130
<i>Ocimum gratissimum</i>	92
<i>Aframomun melegueta</i>	90
<i>Aspilia Africana</i>	82
<i>Eremomastax speciosa</i>	79
<i>Spilanthes filicaulis</i>	73
<i>Carica papaya</i>	62
<i>Aloe vera</i>	53



Information concerning the knowledge and use of medicinal plants varied among the age groups. The knowledge was high in the age group 60 and above. Older people showed a lot of enthusiasm and cited more medicinal plants than the young. This result is congruent with other works carried out in Uganda on the elderly dominance of such knowledge (Tabuti *et al.*, 2003). Out of secrecy and superstition surrounding medicinal plants, healers are often reluctant to hand on their knowledge to anyone other than close and trusted relatives. Also, there is widespread apathy among the younger folk as they have the misconception that traditional medicine is a field for the uncivilized, uneducated and poor people. This knowledge will disappear if it is not promptly documented since oral transmission is poor. Similar results were gotten among the Igede people of Nigeria (Igoli *et al.*, 2005).

Low level of education was preponderant among the traditional healers and the elderly folks who presumably show more dedicated interest in issues of medicinal plants than youths who had some formal education and have relegated this practice to the background for greener pastures in big towns making transmission of this knowledge inefficient.

Diagnosed diseases from the hospital indicate that malaria is the most prevalent ailment in the study area. The high prevalence of malaria may be because the bushes and many swamps that surround the villages serve as hiding places and breeding grounds for the malaria vectors. Also in most cases, people (especially farmers) do not put on protective clothing to avoid mosquito bites. This finding corroborates those reported by Jiofac *et al.* (2009) and Junelle *et al.* (2022) in other areas of Cameroon. The scarcity of potable water in Bafanji also favors the occurrence of water-borne diseases such as typhoid.

Amongst the plants found, Family Asteraceae, with 13 species was the most represented. Focho *et al.* (2009) working in Aguambu-Bamumbu (Lebialem highlands, Southwest Region, Cameroon) also found similar results. This high representation could be elucidated by the fact that Asteraceae contains a wide range of bioactive

compounds, and also because of the large biodiversity of members of this family (Thomas *et al.*, 2009).

More than one plant species were mostly used as remedies for ailments. The most common diseases for which different species are used include Malaria, stomach problems, Typhoid, cough, Rheumatism, Diabetes, sexual weakness and wounds. This could be attributed to synergistic effects among the combinations during ailment treatment (Igoli *et al.*, 2005; Simbo, 2010).

78.8% of the respondents depended on both the hospital and medicinal plants for the diagnosis and treatment of their ailments. Common ailments such as typhoid, jaundice, malaria, hemorrhoids, piles and female infertility could be treated using both available modern drugs; supplemented with traditional formulations.

Plants exploited were more wild types than domesticated ones, this could be due to the fact that wild plants possess more active secondary metabolites than domesticated plants as well as local beliefs that wild plants possess some mystical curative powers because they grow in dark/wild natural habitats: Cameroon (Jiofac *et al.*, 2009) and Uganda (Tabuti *et al.*, 2003)

Herbs made up the highest proportion. This could be associated with their all-year-round availability, relative abundance, as well as the ease of their harvest compared to shrubs and trees (Simbo, 2010; Yineger *et al.*, 2007) as well as their higher content in bioactive active compounds compared to woody plant forms, (Thomas *et al.*, 2009).

Furthermore, leaves were the most used plant parts. This is in agreement with the observation of Okoli *et al.* (2007). This could be linked to the fact that the leaves being the aerial parts of the plant are more easily accessible. In addition, the leaves are soft and can easily be prepared by simple and quick methods such as squeezing and grinding. Leaves are primary organs of plant wastes elimination; mainly the highly bioactive secondary metabolites such as inulins, tannins, flavonoids, terpenoids, sterols, saponins, and alkaloids (Okoegwale and Omefezi 2001). These may be responsible for their



various medicinal properties, hence explaining their wide use. These results are harmonious with the findings of similar studies carried out in Cameroon and elsewhere (Focho *et al.*, 2009). Harvesting of roots and bark could directly lead to the death of the plant, hence threatening local plant populations. A sustainable harvesting strategy is hence needed.

The decoction was the most popular method of preparation. This could be due to the belief among the local people that when plants are boiled most of their active components are efficiently extracted while at the same time killing all potentially dangerous germs. Water was the preferred solvent, likely due to its availability, cost and solvent power on active components (Focho *et al.*, 2009).

The oral application was most popular as the route of administration followed by topical or dermal application. This could be accounted for by the fact that the people of the study area believe that most ailments emanate from the digestive system. Similar findings were also gotten by Jiofack *et al.* (2009); Betti (2004), Yomi (2001), and Yembeu *et al.* (2022).

Most of the medicinal plants also served purposes other than medicine. This gives further proof of plant versatility. Plants are autotrophic and animals depend solely on plants for food since they cannot manufacture their food due to a lack of chlorophyll.

Deforestation was reported to be the greatest threat to the survival of medicinal plants. *Panax quinquefolius* was reported to be the most threatened of all the species. This may be due to the fact that it is a highly marketable and multipurpose plant species.

74% of the respondents rated medicinal plants as very important. Poverty is usually the greatest driving force behind the use of Traditional medicine (TM). This is usually because they are unable to access or afford the cost of allopathic medicines. This leaves TM as an important pivot in the healthcare systems of developing countries (WHO, 2003).

Only a small proportion of the respondents indicated that they do transfer indigenous knowledge to their children or other younger folk, likely due to their non-interest, the secrecy of the elders or the little concern regarding the value of indigenous knowledge transfer (Simbo, 2010).

Conservation methods in Bafanji were observed to be very poor. Domestication efforts are still very poor. Only about 4.4 %, of the medicinal plants collected, were reported as domesticated at-home gardens for the sole purpose of medicine. These include plants like *Ocimum gratissimum*, *Cymbopogon citratus*, *Spilanthes filicaulis*, *Eremomastax speciosa*, and *Justica insularis*. This can be attributed to some traditional beliefs that certain medicinal plants do not do well if domesticated.

This work was however limited in terms of the area covered and the extent of therapeutic application. A more interesting result could have been gotten if the work was expanded to cover the entire sub-division or even the North West region; nevertheless, financing was not sufficient for such span of work. Furthermore, due to secrecy, respondents could not give full details on methods of application and dosages of administration of the different medicines.

CONCLUSION

In Bafanji, 92 plant species of medicinal importance are currently being exploited for the treatment of 107 human ailments. They are used in combination with modern medicine to treat locally common diseases including malaria, hypertension, anemia, typhoid fever and urinary tract infections. *Cymbopogon citratus* is widely believed to increase the potency of other medicinal plants used to treat malaria. Conservation efforts need to be stepped up to enhance the availabilities of these plants.

ACKNOWLEDGMENT

The authors are deeply indebted to the University of Bamenda and the authorities of the Higher Teachers' Training College for provision of work space for carrying out this research work as well as all collaborative field agents who aided in data collection.



AUTHORS' CONTRIBUTIONS

Pungong, C.S.: Conceived and carried out field work,
Langsi, D.J.: Drafted the manuscript,
Fotso, B.: Did general supervision.
All authors did follow up, data management and editing of draft.

FUNDING

The work was self-funded

COMPETING OR CONFLICTING INTERESTS

The authors declare the non-availability of any conflicts of interest

REFERENCES

- Betti, J. L. (2004). An Ethnobotanical Study of Medicinal Plants among the Baka Pygmies in the Dja Biosphere Reserve, Cameroon. *African Study Monographs*, 25(1), 1-27.
- De Silva, T. (1997). *Industrial utilisation of medicinal plants in developing countries, Non- wood Forest Products II: Medicinal plants for forest conservation and healthcare*, FAO, Rome, Italy.
- Focho, D.A., Ndam, W. T. and Fonge, B.A. (2009). Medicinal plants of Aguambu-Bamumbu in the Lebialem highlands, Southwest province of Cameroon. *African journal of pharmacy and pharmacology* 3(1), 1-13
- Halberstein, R.A. (2005). Medicinal plants: Historical and cross-cultural usage patterns. *Ann Epidemiol.* 15(9), 686-699. <https://doi.org/10.1016/j.annepidem.2005.02.004>
- Igoli, J.O., Ogali, O.G., Tor-Anyiin, T.A. and Igoli, N.P. (2005). Traditional medicine practice among the Igede people of Nigeria. *African Journal of Traditional medicine.* 2(2), 134-152
- Jiofack, T., Ayissi, I, Fokunang, C., Guedge, N., and Kumeuze, V., (2009). Ethnobotany and phytomedicine of the Nyong valley forest in Cameroon. *African Journal of pharmacology.* 3, 144 – 150
- Junelle, M., Gautier, N.P.W., Severin, N., Yossa, N.I.B., Ngouana, V., Clotex, T.V. and Emmanuel, N. (2022) Traditional use of medicinal plants in the town of Mbanga (Littoral- Cameroon), *International Journal of Scientific Research Updates.* 4(2), 173–190.
- Kuete, V., and Efferth, T. (2010). Cameroonian Medicinal plants: Pharmacology and derived natural products. *Frontline pharmacology.* 1,123
- Manu, I.N., Tarla, D.N., and Chefor, G.F. (2014). Effects of improved maize (*Zea mays* L.) varieties on household food security in the North West Region of Cameroon. *Scholarly Journal of Agricultural Science* 4(5), 265-272.
- Muthu, C., Ayyanar, M., Raja, N., and Ignacimuthu, S. (2006). Medicinal plant used by traditional healers in Kancheepuram District of Tamil Nadu, India. *Journal of Ethnobiology and Ethnomedicine.* 2, 43
- Ngono Ngane, R.A., Koanga Mogtono, M.I., Tchinda, T.A., Magnifouet, N.H., Motso Chiefo, P.R., Mballa, B.Z., Ebelle Etame, R.M., Ndifor, F., Biyiti, L., and Amvam Zollo, P.H. (2001). Ethnobotanical survey of some Cameroonian plants used for treatment of viral diseases. *African Journal of plant Science.* 5(1), 15-21
- Okoegwale, E.E. and Omezezi, J.U. (2001). Some herbal preparation among the people of Isoko clan of Delta state, Nigeria. *Journal of Applied Science* 4, 2350-2371
- Okoli, R.I., Aigbe, O., Ohaju-Obodo, J.O., and Mensah, J.K. (2007). Medicinal Herbs used for Managing Some Common Ailments among Esan people of Edo state, Nigeria. *Pakistan Journal of Nutrition* 6(5), 490-496.
- Rates, S.M.K. (2001). Plants as a source of drugs. *Toxicology.* 39, 603-613
- Simbo, D.J., (2010). An Ethno botanical survey of medicine plants in Babungo, North West Region, Cameroon *Journal of Ethnobiology and Ethnomedicine.* 6, 8
- Tabuti, J.R.S, Lye, K.A, and Dhillion, S.S. (2003). Traditional herbal drugs of Bulamogi, Uganda: plants, use and administration. *Journal of Ethnopharmacology,* 88,19-44.
- Thomas, E., Vandebroek, I., Sanca, S., and Van Damme, P. (2009): Cultural significance of medicinal plant families and species among the Quechua farmers in Apillampampa, Bolivia. *Journal of Ethnopharmacology.* 122, 60-75



Thornell, C., and Sandberg, F. (2007). A comparison of medicinal and magic uses of wild plants in Central Africa, collected and identified in the 1960s and 2000s. *Cameroon Journal of Ethnobotany*, 2, 5-28

World Health Organisation (WHO) (2003). *Traditional medicine*. Fact sheet No 134.

Yembeu, N.L., Nya, P.C.B., Pieme, C.A., Tchouane, K.D., Fotsing, C.B.K., Nkwikeu, P.J.N., Feudjio, A.F., and Telefo, P.B. (2022). Ethnopharmacological Study of the Medicinal Plants Used in the Treatment of Sickle Cell Anemia in the West Region of Cameroon,

Evidence-Based Complementary and Alternative Medicine, Article ID 5098428.

<https://doi.org/10.1155/2022/5098428>

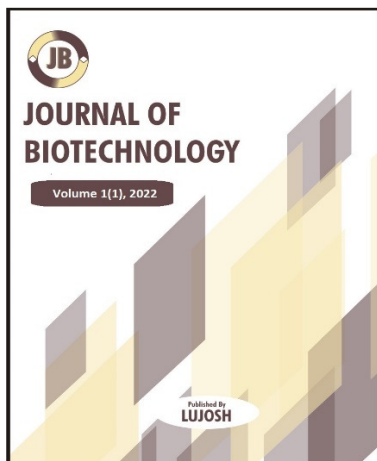
Yineger, H., Kelbessa, E., Bekele, T., and Lulekal, E. (2007). Ethnoveterinary medicinal plants at Bale Mountains National Park, Ethiopia. *Journal of Ethnopharmacology*, 112, 55–70.

Yomi A (2001). *Phytotherapie de la dysenterie amibienne à Bazou (NDE) et à Foto (Menoua) au Cameroun*. (pp. 67), Mémoire de Maîtrise, Université de Yaoundé I.

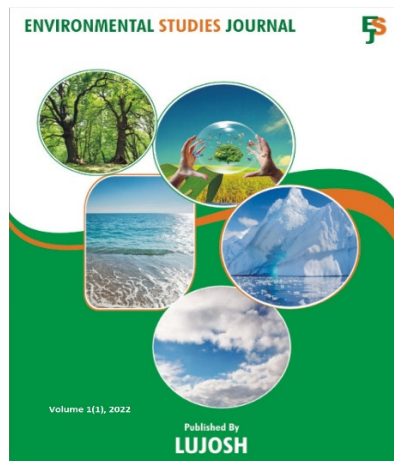


Journal currently Publish by the Publisher (Lujosh)

Kindly publish your research with us



Journal of Biotechnology



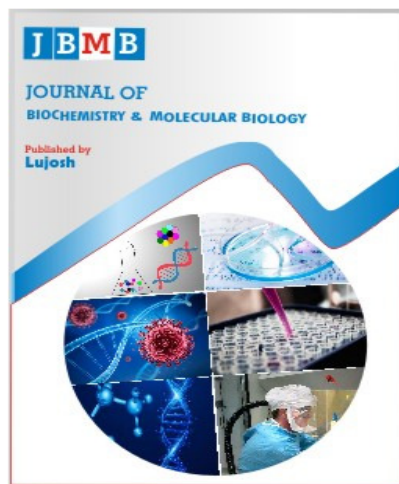
Environmental Studies Journal



International Journal of Biosafety,
Biosecurity & Bioscience



Journal of Agricultural
Sciences & Technology



Journal of Biochemistry
& Molecular Biology



Plant Science Journal