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Ethnobotany Survey of the Wonegizi, Ziama Clan-Lofa County, Liberia

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Research Article

Abstract

Background: Wonegizi landscape is one of the poorest areas in Liberia; lacks basic social services including road network, or inaccessible. The knowledge of indigenous medicine by these people has not being recorded separately, though some botanical research works have occurred. We conducted this research to record local knowledge on what plant resources are used daily for the well-being of Wonegizi people. The main objective is to draw attention to traditional practice of medication, providing a comprehensive list of indigenous medicinal plants of potential for the cure of diseases and wounds in Wonegizi, which will serve as the beginning of a systematic recording of medicinal plants in Ziama Clan separate from the previous works conducted in Liberia by western botanists.

Methods: The survey was conducted during May-June 2014 using photographic documentation of indigenous medicinal plants. The use of key-informants, community consultations, transects and articles and books on West Africa flora were used.

Results: A total of 101 plants of medicinal potential were surveyed belonging to 48 families and 97 genera. Accessed plants are used for treatment of 11 categories of different diseases and disorder common in Wonegizi area. The majority recorded were cure to internal complications and others for external body parts. Trees were the primary source for treatments of diseases and ailments followed by herbs and liana/climbers.

Conclusion: The Wonegizi survey demonstrated significant role of unique traditional medicinal practitioners whose beliefs prohibited the collection of plant specimens during field work. They believe their

ancestral spirits must be consulted on the exclusive collection of medicinal plant parts through sacrificing cattle. Hence, traditional medicine continues to be extremely important for the people of Wonegizi in meeting their basic health services.

Keywords: Wonegizi; Ethnobotany; Indigenous knowledge; Health services; Recording.

1. Introduction

Ethnomedicinal healing systems vary across cultures [1]. In Africa, 70–80 percent of the vast majority of people still consult traditional medicinal practitioners [2]. Special families are responsible for traditional medication referred to as 'Zoes' in Wonegizi community. The introduction of synthetic medicine has never replaced the indigenous healing system, and traditional healers continue to be consulted for a variety of reasons in Africa [3].

There have been several botanical studies conducted in parts of Liberia beginning in the 1960s, viz. national forests of Liberia (Sapo National Park, Proposed and Protected Areas of Liberia including Wonegizi, Nimba and Grand Gedeh Counties) [4-7]. Yet many parts of the country remain unexplored exclusively for medicinal plants. In fact, the idea of plant collection is poorly understood by the country side, let alone their medicinal plants.

In general, this study sought to showcase the significant role of Traditional Medicinal Practitioners (TMPs) of Wonegizi in providing sustainable fundamental healthcare services for the community wellbeing.

Specifically, this study aimed to:

1. Assess, classify, and record indigenous medicinal

plants (MPs) and their traditional uses using local, common, and scientific names, after comparing specimens with field guides and manuals.

2. Make recorded information available to the community, local and national government, and all concerned stakeholders for decision making in support of indigenous medicinal plants conservation.

2. Material and methods

2.1 Site description

Wonegizi landscape is located in Ziama Clan, Zorzor

District, Lofa County- Liberia, and is host to the Wonegizi Proposed Protected Area (WPPA) (Figure 2). It has a population of 40,000 people distributed in 16 major towns and 47 satellite villages. The landscape is proposed suitable conservation area due to its diverse biodiversity presence [8]. It is located in the northwest of the country and covers 37,979 hectares of forestland that hosts remnants of African forest elephants (*Loxodonta cyclotis africana*), and other threatened and endangered species. Wonegizi forms a trans-boundary conservation corridor between Liberia and Guinea. The area is recognized internationally as key biodiversity conservation hotspot, and includes Liberia's highest peak, Mt Wutevi (1,424m) [9] (Figure 1 and 2).

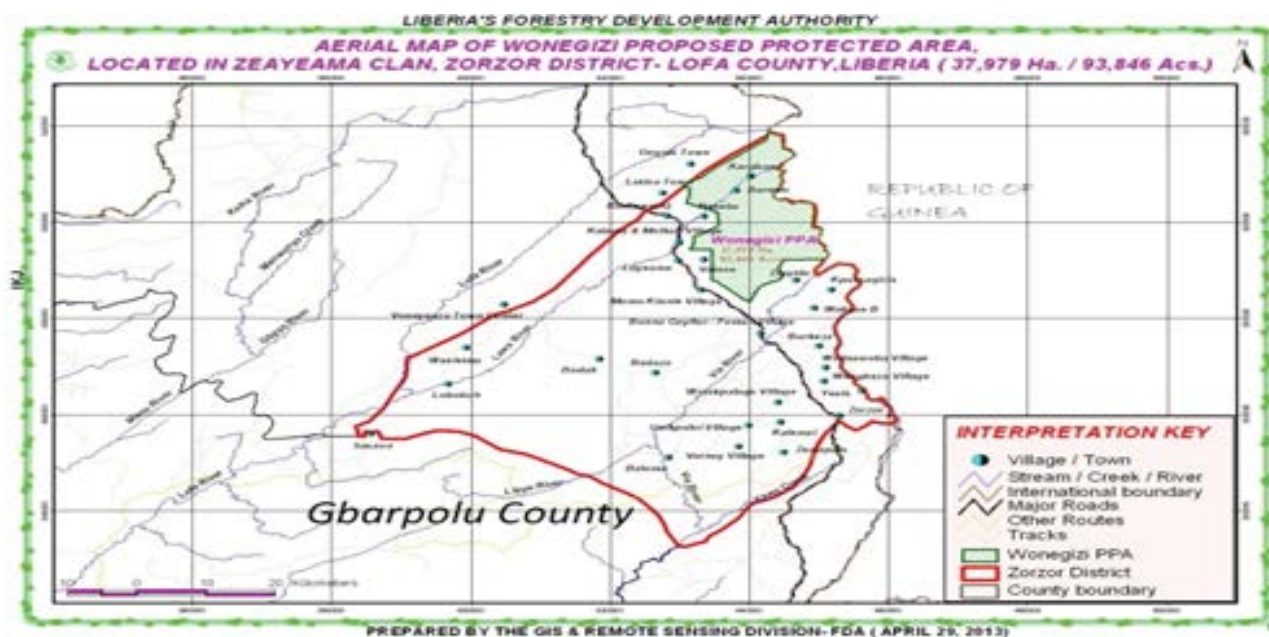


Figure 1. Map of Ziama and WPPA (FDA GIS Division 2013) [10].

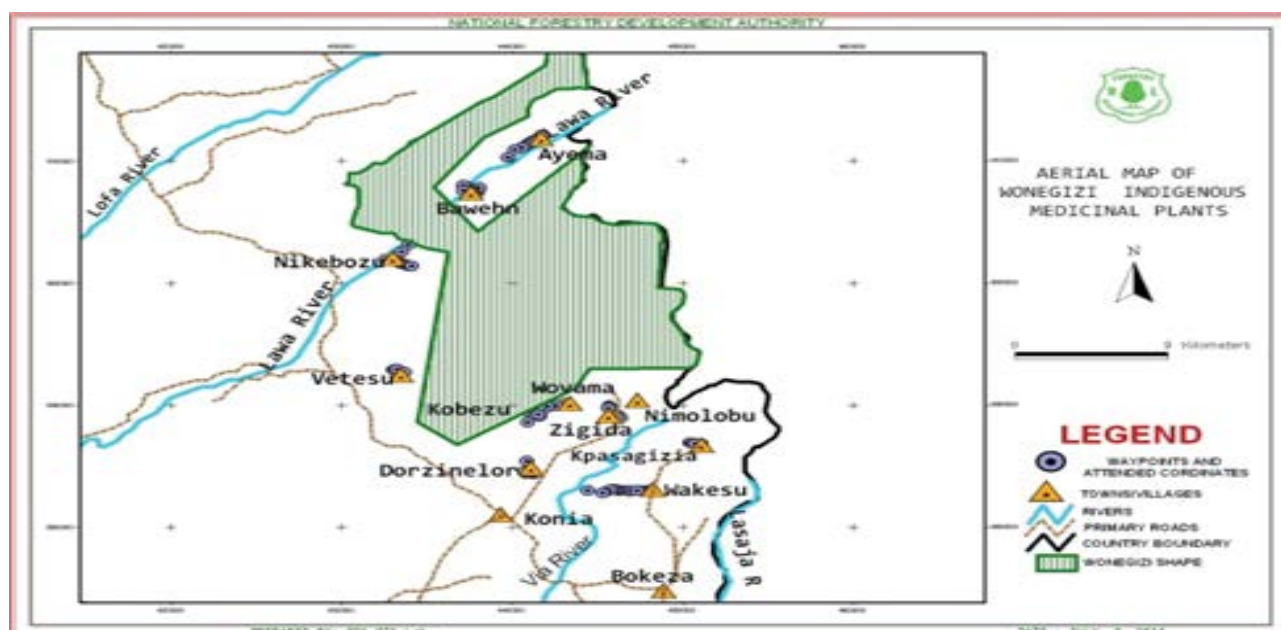


Figure 2. Towns surveyed around WPPA (FDA GIS Division 2014) [11].

The landmark contains the lone intact example of transitional vegetative type between lowland and montane rainforest in Liberia [11,12]. Liberia has a tropical climate; average temperature ranging from 70°F (21°C), with relatively small variations between day and night, and never exceeding 37°C. Its average rainfall is 170 inches (4.320mm) inland including Ziama land [13].

2.2 Ethnography of Ziama-Wonegizi

Ziama Clan was defined based on tradition, and cultural beliefs. There are only two major groups (Nephews and Uncles) of people in the Clan. Majority of people in Ziama belong to the nephew group called “*darbey*”. This group occupies 11 of the 16 major towns. The towns are Amah, Barwen, Barzewen, Boi, Borgeza, Kpassagizia (Lokpo), Konia, Luyeama, Nikebouzu, Zeleemai and Zulor. Kpassagizia (Lokpo Massa) is the most senior brother town to the 11 by virtue of the Ziama tradition, and not the history for which town was built first; nor is the largest. The role of Lokpo Massa in Ziama tradition is to provide traditional medical security. In other words, Kpassagizia is the lead herbalist town referred to as the Zoe town. Lokpo Massa is assisted by the 10 nephew towns that refer to Lokpo as “*dea-zayzay*”, big-brother. The name Lokpo Massa is exclusive title called by the uncle towns, and not others when they refer to the people of Kpassagizia. They are direct nephews to Ziggida (Vesseh), which proxies for Wozi (Loleye).

The second segment consists of the 5 uncle towns, which are responsible for the traditional administration of the clan. They are Dorzenilor, Warkesu, Wozi, Vetesu, and Ziggida. Vesseh administers on behalf of Loleye (senior uncle town) on traditional matters.

2.3 Ethnobotanical survey

A total of 46 well-informed indigenous medicinal practitioners (18 females and 28 males) between the ages of 30 and 80 participated from the 8 towns as key informants along with our team (Table 1). The towns’ people chose herbalists based on experience and commitment to good services for their community. These men and women played important role in society apart from being herbalist. Some informants were senior local citizens, educators,

traditional midwives and etc (Table 2). Data were collected through interview, transects, consultation, participation and disclosure.

2.4 Medicinal plants survey

Respecting Ziama tradition, we were not allowed to collect specimens in physical form. They believe this could be a bridge between them and their ancestral spirits who gave them the power to use the plant resources. A way of obtaining medicinal plants specimens required sacrifice with cattle to ancestral spirits, and approval through the lead Zoe, who performs the oracles of the land. Besides, medicinal plants or plant parts were not seen on both Borgeza and Konia general market-grounds for sale during the research. Informants told us that consultation with TMPs in Ziama was at the homes of “zoes”.

Medicinal plants were identified by touched from informants, which in most cases was captured through photograph. They were identified and initially authenticated by comparing [14-16]. Finally, plants surveyed were compared to specimens stored at the ArcelorMittal’s temporary herbarium in Yekepa, for their authentication. Dr. William D. Hawthorne, an Oxford University Professor who did lot of recent collections in West Africa also made huge collections in Liberia stored in Yekepa. Plants surveyed around 8 towns of Ziama provide treatments against diseases in Ziama. Majority medicinal plants recorded were used as same treatment against diseases in the 8 towns. This notably indicated that medicinal plants recorded were the most effective and intensive used in the landscape (Table 2).

3. Results and Discussion

3.1 Medicinal plants surveyed and family with highest count

The survey began in Kpassagizia on 5 May 2014. Kpassagizia provides traditional medical assistance to Ziama, by virtue of the practice and norm of their ancestral kinsmen. Traditional medical fees are very minimal, if paid. Our initial plan was to work with one female and two male herbalists. The women herbalists didn’t send their selected for the first day in keeping with the respect and dignity of their culture. The men were to start out first to soften the bush

Table 1. Team of recorders.

No	Name	Sex	Age	Occupation & Position	Institution
1	James T. Kpadehyea	M	47	Student & Survey Team Leader	University of the Philippines Los Baños
2	Francis K. Kpadeh	M	55	Forester & Asst. Manager	Forestry Development Authority
3	Kokuloku Sali	M	45	Forester; Conservation Zone Warden Wonegizi Proposed Protected Area (WPPA)	Forestry Development Authority

Table 2. Informants of Wonegizi indigenous medicinal plants.

No	Name	Sex	Age	Occupation & Position	Town
1	Gayduo Taloma	F	55	Chairlady; herbalist	Kpassagizia
2	Kebbeh Yanquoi	F	45	Herbalist	Kpassagizia
3	Flomo Yougie	M	40	Herbalist	Kpassagizia
4	Dudu Zaza	M	73	Herbalist/Elder	Kpassagizia
5	Woikpadeh Kpabee	M	35	Herbalist	Kpassagizia
6	Forkpa Zaza	M	38	Herbalist/Asst. town Chief	Kpassagizia
7	Kruba N'yanvee	F	73	Herbalist/Zoe-elder	Kpassagizia
8	Abraham Kolubah	M	32	Herbalist	Kpassagizia
9	Alexander Oua	M	41	Escort	Kpassagizia
10	Kolubah Monzubah	M	59	Herbalist/Zoe elder	Warkesu
11	Kebeh Seveh	F	55	Herbalist	Warkesu
12	Larwuo Gbarwolee	F	35	Herbalist	Warkesu
13	Joseph T. Daniels	M	47	Herbalist/Town Chief	Warkesu
14	Mulba Zumo Gain	M	39	Herbalist/ builder	Warkesu
15	Kolubah Dorbor	M	49	Herbalist/Zoe	Warkesu
16	Gayduo Bolowolee	F	67	Herbalist/Women Zoe	Ziggida
17	Zoebadeh Gbolumah	M	76	Herbalist/Elder	Ziggida
18	Korboi-yallah Youngor	F	64	Herbalist	Ziggida
19	Gayflor Vamuwu	M	50	Herbalist/Former Town Chief	Ziggida
20	Mulbah Sakwe	M	36	Herbalist	Ziggida
21	Tetelma Zaza	F	54	Herbalist	Ziggida
22	Kruba Suah	F	36	Herbalist	Ziggida
23	Tarnue Velewuzeye	M	51	Herbalist	Ziggida
24	Zoeballah Forkpa	M	60	Herbalist	Barwen
25	Kpadeh-koi	M	43	Herbalist	Barwen
26	Kebbeh Leayai	F	59	Herbalist/Women Zoe	Barwen
27	Kolubah Zubah	M	53	Herbalist	Barwen
28	Kruba Yourwuo	F	61	Herbalist	Barwen
30	Zubayea Kolor	M	42	Herbalist	A-mah
31	Forkpa Pumah	M	55	Herbalist/Zoe	A-mah
32	Zoekpadeh Zoewei	M	51	Herbalist	A-mah
33	Forkpayea Zokubah	M	61	Herbalist/Grand-zoe	A-mah
34	Mawolei Sali	F	43	Herbalist/traditional mid-wife	Nikebouzu
35	Yamah Kolu	F	64	Herbalist/Women Zoe	Nikebouzu
36	Gayflor Boiboi	M	54	Herbalist/Hunter	Nikebouzu
37	Tokpa Kolli	M	63	Herbalist/Elementary Teacher	Nikebouzu
38	Oliver Zaza	M	57	Herbalist/Chief hunter	Vetesu
39	Kebbeh Youwu	F	54	Herbalist/Women Chief	Vetesu
40	Kruba Gonoe	F	47	Herbalist/Town's mid-wife	Vetesu
41	Oldman-Forkpayea	M	79	Herbalist/Land Lord	Vetesu
42	Tarnue Kezelee	M	40	Herbalist/Asst. Town Chief	Dorzenilor
43	Yamah Gbatolo	F	59	Herbalist/Mid-wife	Dorzenilor
44	Sorbor Kezelee	F	48	Herbalist	Dorzenilor
45	Forkpa Viewu	M	44	Herbalist/Nephew	Dorzenilor
46	Mulbah Gayflor	M	38	Herbalist	Dorzenilor
47	Mama Samah	F	62	Herbalist/Chairlady	Dorzenilor

before women enter. On May 6, all three women herbalists joined their male counterparts to help us with the recording of plant resources they worked with. The women general focus was on birth attended traditional medication and children treatment. Most traditional medicines recorded for treatment of illnesses that affected their children were mentioned

by women; though they were also kin on menstrual disorders.

The people of Kpassagizia and the 7 other towns worked with our team in good faith; acknowledging that plant parts were forbidden to be extracted during field exercises. Total medicinal plants documented

amounted to 101 species belonging to 48 families and 97 genera. Species amount per individual family with their respective local name, and parts used are mentioned in Table 3.

The family Fabaceae had the highest count (14 species), equivalent to 13.86% of plants recorded. Two reasons responsible for Fabaceae topping could be that the family is large, and are common in various vegetation types visited. This commonality allowed easy access as areas visited were informants' chosen sites. Fabaceae was followed by Euphorbiaceae and

Rubiaceae each at 9 species (8.91%). Apocynaceae family was the third with 5 species (4.95%), closely followed by Meliaceae and Moraceae each at 4 species (3.96%).

Out of 101 species surveyed in various habits, trees (50) stood at 49.5%. This indication further raised conservation concerns as the remaining fragmented forests continue to be destroyed due to competing interests in forest resource use. Concomitantly, forest resource usages were shifting cultivation, logging, mining, gathering, hunting and these furthered by

Table 3: Ethnomedicinal plants of Wonegizi.

Botanical name	Family	Wonegizi name (Vernacular name)	Parts used/Usage
<i>Acacia kamerunensis</i> Gand.	Fabaceae	tarnagie	Leaves: chew; cures leprosy; cancer
<i>Adenia rumicifolia</i> Engl. & Harms,	Passifloraceae	terrboyalui	Leaves: boil, keep extract in mouth 3-5 minutes, cures toothache; drunk to cure swollen neck
<i>Aframomum atewae</i> Lock & J.B.Hall.	Zingiberaceae	ponitorfoi	Leaves: collect 4 shoots, smoke cake plus tea spoon full of melegueta pepper seeds; pound, put in cone of leaves, pour water, put droplets in nose to heal epilepsy
<i>Aframomum melegueta</i> K.Schum.	Zingiberaceae	taakeezagie	Fruit, Seeds: chew 4 seeds 3X daily, cures sore-throat; headache; fresh-cold; spice
<i>Agelaea paradoxa</i> Gilg,	Connaraceae	gaasava-yansai	Leaves: cure for snake bite
<i>Ageratum conyzoides</i> (L.) L.,	Asteraceae	beleezaawee	Leaves: crush, apply on skin disease; snake bite; leprosy
<i>Albizia adianthifolia</i> (Schum.) W.Wight	Fabaceae	kpakpaboigie	Bark: boil, decoction drunk to cure cough
<i>Albizia zygia</i> (DC.) J.F.Macbr.	Fabaceae	gbanangie	Leaves: chew, cures heartache; for ear infection, add <i>Combretum cuspidatum</i> young leaves, roast and squeeze to put droplets in affected ear
<i>Alchornea cordifolia</i> (Schumach. & Thonn.) Müll.Arg.,	Euphorbiaceae	zokai	Leaves: boil, serve decoction to cure chest pain; cough; Pith: chew pith for cough
<i>Amphimas pterocarpoides</i> Harms,	Fabaceae	kozee	Bark: roast bark, steam foot fungus ; cancer
<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	kevegie	Fruit: boil when green, serve decoction to cure yellow jaundice; typhus
<i>Anchomanes difformis</i> (Blume) Engl,	Araceae	gorvialukpoi	Rhizome: roast to steam foot fungus
<i>Anthonothea macrophylla</i> P.Beauv	Fabaceae	bebee	Leaves: chew young leaves against amoebic dysentery; diarrhea
<i>Artocarpus altilis</i> (Parkinson ex F.A.Zorn) Fosberg	Moraceae	weeteyangului	Roots: boil, serve to cure hypertension Leaves: boil, serve decoction to cure diabetes; typhus
<i>Aspilia africana</i> (Pers.) C.D.Adams	Asteraceae	wukugie	Leaves: crush, place on baby head, joins skull bones; extract put in children ear to heal ear problems
<i>Asplenium nidus</i> L.	Drynariaceae	yanfulargie; sevelagie	Leaves: collect 4 each from different plant or 3 for man and woman respectively; boil; keep extract cool for bath to remedy infection
<i>Asystasia gangetica</i> (L.) T.Anderson,	Acanthaceae	pelewobai	Leaves: cook fresh leaves with palm-oil to be eaten by woman who just gave birth to recover from profuse bleeding; heal internal sore Fruit: patch, add palm-oil, eat to stop chest pain

<i>Axonopus compressus</i> (Sw.) P.Beauv.	Poaceae	teteforfoi	Plant: wash, roast to massage fractured leg; arm
<i>Bertiera spicata</i> (C.F.Gaertn.) K.Schum.	Rubiaceae	kpuvuluma-woligie; zea gbengan	Leaves: boil, drink extract to remedy constipation
<i>Blighia welwitschii</i> (Hiern) Radlk,	Sapindaceae	poai	Leaves: crush in bucket of water, bath with decoction to cure epilepsy
<i>Bridelia grandis</i> Pierre ex Hutch.	Euphorbiaceae	kuwui	Bark: boil, serve decoction to cure ulcer Seeds: add 1 teaspoon melegueta pepper dust to a liter of water, serve decoction 4 times daily to cure typhus
<i>Brillantaisia owariensis</i> P.Beauv.	Acanthaceae	koalameelefai	Leaves: chew young leaves, remedy to poison
<i>Bussea occidentalis</i> Hutch.	Fabaceae	kpebelee	Bark: boil, wash feet 3-4 times daily to treat fungus; drink decoction twice as worm treatment.
<i>Caladium bicolor</i> (Alton) Vent.	Araceae	gaybadeh-lefai; gaybadeh-boutegie	Rhizome: pound with <i>Musanga cecrpioides</i> bark to treat skin cancer
<i>Callichilia subsessilis</i> (Benth.) Stapf,	Apocynaceae	gillehwolo-worloryeze-yengie	Root: add water or palm-wine, serve extract as remedy to constipation; gonorrhea
<i>Canarium schweinfurtii</i> Engl.	Burseraceae	savawului	Bark: pound, apply to cure leprosy; ringworm
<i>Canna indica</i> L	Cannaceae	gor-lor-leleh	Shoot: crush, add water; sieve to serve half glass of extractive to remedy fever; boil, serve to cure jaundice
<i>Capsicum frutescens</i> L.	Solanaceae	kezegie	Fruits: crush, apply on affected rheumatism area
<i>Carapa procera</i> DC.,	Meliaceae	kovei	Bark: chew inner bark, place on fresh wound, stops bleeding; bacteria repellant
<i>Carpolobia lutea</i> G.Don,	Polygalaceae	sakewulugie; dervervalakpakugie	Root: roast, chew to cure heartache; chest pain
<i>Cercestis afzelii</i> Schott	Araceae	berbergie	Stem: tie hip of woman in labor-pain, prolongs delivery for hospital service Leaves: chew young leaves to treat cough
<i>Cissus producta</i> Afzel.,	Vitaceae	saliwuloba- lefai	Stem: cut stem into pieces and add lime fruit to boil, give extract as remedy to poison.
<i>Clerodendrum formicarum</i> Gürke	Verbenaceae	arwolai	Leaves: crush, add water, drop extract in patient's mouth to cure liver infection
<i>Combretum cuspidatum</i> Planch. ex Benth.,	Combretaceae	kpoloyaingie-sai	Leaves: boil, serve decoction to cure thrush; diarrhea
<i>Costus afer</i> Ker Gawl.,	Costaceae	torfoi	Inflorescence: pound, add water, drop on eye to cure cataract; Stem: chew stem, boil, drink decoction to cure malaria, yellow jaundice; pound inflorescence mixed with melegueta pepper to cure piles; for gonorrhea and all internal infections treatment, add <i>Costus spec. stem</i> to <i>Dracaena praetermissa roots</i> , 7 rep fruits of <i>Capsium frutescens</i> , <i>Adenia rumicifolia stem</i> , <i>Zingiber officinale rhizome</i> and pour wine to drink extract
<i>Craterispermum caudatum</i> Hutch.	Rubiaceae	gbengan; yemeedoi	Bark: pound to dust for sore or cut treatment Leaves: boil, serve decoction against yellow jaundice
<i>Cyathula prostrata</i> (L.) Blume,	Amaranthaceae	darlagie, derlagie	Leaves: boil leaves, serve extracts to cure fever, yellow jaundice, heartache, thrush and to initiate normal menstrual cycle
<i>Dalbergia saxatilis</i> Hook.f.	Fabaceae	kpelegogo-boi	Leaves: crushed leaves to apply on boil for pus removal
<i>Dendrobium sp.</i> ,	Orchidaceae	gulubalama-boblogie	Leaves: crush, apply extractive on boil for fast relief
<i>Desmodium adscendens</i> (Sw.) DC.,	Fabaceae	dorbor-leyangie	Leaves: crush, add water, serve extract to cure cough, asthma; boil, serve extract to remedy dysentery and ulcer; dry plant, boil as tea for children having cough

<i>Dichrostachys cinerea</i> (L.) Wight & Arn.,	Fabaceae	<i>dadai</i>	Bark: tie the fibrous bark in climber rope as snake repellent
<i>Elaeis guineensis</i> Jacq.	Arecaceae	<i>torkpoi; dorwului; tuwuwului</i>	Cabbage: grand, apply on fresh sore as anti-bacteria
<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	<i>teteforfor-zenai; dovogui; etelorlevegui</i>	Plant: boil, drink decoction against yellow jaundice; typhus
<i>Englerina gabonensis</i> (Engl.) Balle,	Loranthaceae	<i>teneegui</i>	Leaves: boil, wash head against severe headache
<i>Entada gigas</i> (L.) Fawc. & Rendle,	Fabaceae	<i>tuwuvegui</i>	Sap: sore eye medicine
<i>Entandrophragma cylindricum</i> (Sprague)	Meliaceae	<i>kpetelegui</i>	Bark: chew inner bark, add palm-wine for sexual stimulant
<i>Entandrophragma utile</i> (Dawe & Sprague) Sprague	Meliaceae	<i>kpetelee-kpoigie</i>	Bark: chew inner bark, add palm-wine for sexual stimulant; potential
<i>Eremomastax speciosa</i> (Hochst.) Cufod.	Acanthaceae	<i>borlor-bordai</i>	Leaves: eat to stop poison
<i>Ficus exasperata</i> Vahl	Moraceae	<i>nyanlai-wolegie; koliwoligie</i>	Leaves: crush, add water, serve decoction to remedy worm, ring-worm and skin cancer
<i>Ficus sur</i> Forssk.,	Moraceae	<i>nyanlai-boigie</i>	Leaves: crush, add water, serve decoction to remedy worm; add <i>Milicia</i> spp. to cure chronic skin disease
<i>Fleroya stipulosa</i> (DC.) Y.F.Deng,	Rubiaceae	<i>porwor-wului</i>	Bark: pour water, palm-wine, serve decoction to cure ulcer
<i>Funtumia africana</i> (Benth.) Stapf,	Apocynaceae	<i>borlorworleh-zyneh'</i>	Bark: soaked in water, extract drunk to cure diarrhea Latex: drunk to stop prolonged menstrual cycle
<i>Garcinia kola</i> Heckel,	Guttiferae	<i>doloyangui</i>	Bark: extracts from bark cures pressure Fruit: aphrodisiac, cures pressure Root: cure for yellow jaundice
<i>Geophila afzelii</i> Hiern	Rubiaceae	<i>koawee</i>	Plant: wash, fry with red-oil, serve 3Xs every 4hrs to cure heartache, eat fresh after washing; add palm-wine, treat jaundice, chronic gonorrhea; serve as appetizer;
<i>Gongronema latifolium</i> Benth.	Apocynaceae	<i>yeneyai-yensai</i>	Sap: drunk by baby-ma, to instill healthy breast-milk
<i>Harungana madagascariensis</i> Lam. ex Poir.	Guttiferae	<i>kpodogui</i>	Leaves: crush to cure ring worm; eat against dysentery Bark: scrape, soak in water, serve decoction to cure yellow jaundice Sap: applied to cure ringworm
<i>Heisteria parvifolia</i> Sm.	Olacaceae	<i>kpada-wee</i>	Flower: eat to relief headache; cough and cold
<i>Ipomoea involucrata</i> P. Beauv.	Convolvulaceae	<i>zowei-kpolor-yansai</i>	Leaves: chew to cure cough; steam against rheumatism; Root: add <i>Aframomum</i> root plus water, palm wine, extract drunk to instill good menstrual cycle
<i>Landolphia dulcis</i> (Sabine ex G.Don) Pichon,	Apocynaceae	<i>kinnegui</i>	Leaves: boil with <i>Pterocarpus</i> spec. bark , serve decoction to cure dysentery; STI;
<i>Macaranga heterophylla</i> (Müll. Arg.) Müll.Arg.	Euphorbiaceae	<i>zea-lakolegui; wonsamee-gbaloi</i>	Leaves: tie 3 bundles, boil, serve extract to the pregnant to relief pain from hot liquid that disturbs fetus
<i>Macaranga hurifolia</i> Beille,	Euphorbiaceae	<i>darkolegui</i>	Leaves: boil, serve extract to initiate sperm fertility; chew young <i>Macaranga</i> and <i>Microdesmis</i> against cough
<i>Maesobotrya barteri</i> (Baill.) Hutch.	Euphorbiaceae	<i>doloyangui</i>	Bark: pound with clay, produce chalk to treat high-fever, malaria, chest pain; free lungs by eating fruits
<i>Manniophyton fulvum</i> Mull.Arg.	Euphorbiaceae	<i>foinworgui</i>	Laves: eat to cure dysentery; ulcer
<i>Mareya micrantha</i> (Benth.) Müll.Arg.	Euphorbiaceae	<i>wanawanagui</i>	Leaves: cure snake bite; cook, add salt to kill worms in stomach

<i>Massularia accuminata</i> (G.Don) Bullock ex Hoyle,	Rubiaceae	dorbor-lee	Bark: pound with melegueta pepper, rub to cure jaundice Leaves: boil, extract drunk for malaria cure; tea
<i>Microdesmis keayana</i> J.Léonard	Pandaceae	nikée	Leaves: eat to cure dysentery
<i>Milicia regia</i> (A.Chev.) C.C.Berg,	Moraceae	semagui; kodawului	Bark: pound, mix with Ageratum, white clay rub externally to treat leprosy, severe skin disease; chew cambium as aphrodisiac
<i>Mimosa pudica</i> L.	Fabaceae	zenatavazui	Plant: boil, serve to cure thrush
<i>Momordica cissoides</i> Planch. ex Benth.	Cucurbitaceae	golowopokpoloi Climber/Wild/Often	Leaves: crush, add water, drunk to treat tongue trouble; treat severe headache
<i>Monodora tenuifolia</i> Benth.	Annonaceae	vornehgului	Bark: chew inner bark, put wine, drunk as aphrodisiac; add <i>Trichiliabark</i> , peeled <i>Costusstem</i> and <i>Aframomum root</i> , boil with palm-wine, drunk for normal menstrual cycle
<i>Morinda morindoides</i> (Baker) Milne-Redh.	Rubiaceae	suolehmia; kojolobo	Leaves: boil, serve extract to cure worms; jaundice; body pain; malaria and fever
<i>Musa x paradisiaca</i> L.,	Musaceae	yemeegai	Leaves: slash shoot, add water, cures cholera
<i>Musanga cecropioides</i> R.Br. ex Tedlie,	Cecropiaceae	tozugui; gozugui	Bark: Chew as cough cure; heartache
<i>Mussaenda elegans</i> Schumach. & Thonn	Rubiaceae	terzyneh-la-boi-gui	Leaves: add Sclera spec. crush, serve decoction to stop vomiting
<i>Mussaenda erythrophylla</i> Schumach. & Thonn.	Rubiaceae	terzyneh-labelle- boi-gui	Leaves: add Sclera spec. crush, serve decoction to stop vomiting
<i>Myrianthus libericus</i> Rendle	Cecropiaceae	gbaloii	Leaves: boil, serve decoction to induce blood
<i>Newbouldia laevis</i> (P.Beauv.) Seem.	Bignoniaceae	torloi; yootefai'	Leaves: crush, apply extract on piles; chew leaves to cure dysentery; slice, fry with palm-oil, eaten by barren for pregnancy
<i>Newtonia aubrevillei</i> (Pellegr.) Keay,	Fabaceae	keleigului	Bark: chew as aphrodisiac
<i>Octoknema borealis</i> Hutch. & Dalziel	Olacaceae	korlorquillegui	Bark: add water, served extract against constipation
<i>Palisota hirsuta</i> (Thunb.) K.Schum.	Commelinaceae	phonigie; foenigui	Stem: extract cures gonorrhea; ear ailments and all that affect the head
<i>Pentaclethra macrophylla</i> Benth.	Fabaceae	kovelei	Bark: extract served to cure trash; skin cancer
<i>Petersianthus macrocarpus</i> (P.Beauv.) Liben,	Lecythidaceae	teveagui	Bark: boil, serve decoction against worms; ulcer; thrush
<i>Phyllanthus muellerianus</i> (Kuntze) Exell	Phyllanthaceae	woniwolo-zaingui	Leaves: crush, add water to treat fire burnt
<i>Portulaca oleracea</i> L.,	Portulaccaceae	borborlor-quee	plant: roasted to massage baby to remedy ribs pain
<i>Pterocarpus santalinoides</i> DC.	Fabaceae	kpatoi	Bark: extract cures dysentery; ulcer; worms
<i>Pycnanthus angolensis</i> (Welw.) Warb.	Myristicaceae	kporsoi	Bark: boil, serve decoction to cure dysentery; ulcer; worms
<i>Rauvolfia vomitoria</i> Afzel.	Apocynaceae	kalazulugui	Leaves: crush fresh, squeeze to treat snake-bite; Bark: dry, pound with clay, rub to cure leprosy
<i>Ricinodendron heudelotti</i> (Baill.) Heckel,	Euphorbiaceae	kploi	Bark: add to bark of <i>Distemonanthus benthaminus</i> , boil to steam skin cancer
<i>Rutidea depuisii</i> De Wild.	Rubiaceae	kolu-lefai; lorweifazai'	Leaves: crush fresh leaves, apply to abate bleeding
<i>Scleria boivinii</i> Steud.	Cyperaceae	garvai	Sap: drop sap to cure sore-eye

<i>Sherbournia calycina</i> (G.Don) Hua.	Rubiaceae	<i>kenegbowuloi</i>	Fruit: boil, strain, drink 1 glass of decoction every 3hrs against yellow jaundice; keep in mouth 5-8 minutes after every 3hrs to cure toothache; gum swollen
<i>Smeathmannia pubescens</i> Sol. ex R.Br.	Passifloraceae	<i>zolowo-darkai</i>	Leaves: boil, serve extract to remedy thrush
<i>Sterculia tragacantha</i> Lindl.	Malvaceae	<i>kovagui</i>	Leaves: boil dry leaves, steam patient with rheumatism
<i>Terminalia ivorensis</i> A.Chev.	Combretaceae	<i>bazee</i>	Leaves: boil, keep extract in mouth for 5-10 minutes to cure tooth bacteria
<i>Tetracera affinis</i> Hutch.	Dilleniaceae	<i>dopawongui</i>	Sap: cut stem, drop sap on eye, cures sore-eye Leaves: crush <i>Aframomium</i> shoot and <i>Tetracera</i> leaves, drop extract on cataract affected eye as cure
<i>Tetrorchidium didymostemum</i> (Baill.)Pax & K.Hoffm.	Euphorbiaceae	<i>selewoligui;</i> <i>sewewoligui</i>	Leaves: boil, serve extract to stop constipation
<i>Tiliacora leonensis</i> (G.F.Scott-Elliott) Diels	Menispermaceae	<i>kpein-yansai</i>	Stem: slash, add water or palm-wine, drunk to cure yellow jaundice; kidney problems
<i>Trema orientalis</i> (L.) Blume	Ulmaceae	<i>wonboi</i>	Bark: chew inner bark to cure hopping cough; TB and chest pain
<i>Trichilia monadelpha</i> (Thonn.) J.J. de Wilde	Meliaceae	<i>zaawoi;</i> <i>zakpanigui</i>	Bark: scrip, boil with <i>Xylopia aethiopica</i> bark, serve decoction to induce fertility in woman
<i>Vismia guineensis</i> (L.) Choisy	Guttiferae	<i>kpodo-senai</i>	Leaves: boil, serve extracts to cure thrush Bark: thrush medicine
<i>Zanthoxylum gillettii</i> (De Wild.) P.G.Waterman	Rutaceae	<i>voai</i>	Bark: chew to cure cough; TB Leaves: boil with bark, keep warm extract in mouth for 3-8 minutes to cure toothache; swollen gum

natural occurrences. Herbs and lianas/climbers were the second most mentioned. There were 19 cases of each. Shrubs, Grass and Epiphytes were among the least mentioned, with six, four and three respectively (Table 4). Wonegizi people high depend on Trees for medicine (Table 4). The mentioned are mega representative of the bulk to be surveyed. In effect, there is a greater need to form common ground between various interests in forest resource use, taking in to account the result of this exercise conducted in one month. Trees are the most important source of good health in Wonegizi.

3.2 Bio-medical terms for diseases with symptoms treated by tmps in wonegizi

There were 11 categories of sicknesses with attended descriptions in the Ziama Lorma that roam Wonegizi. The most common and devastating was malaria, followed by sexually transmitted diseases (STDs), and tuberculosis (Table 5).

3.3 Plant part(s) used as medicine

Plant parts utilized showed that leaves were the most applied, and mostly prepared at fresh though. This was followed by Bark, Root, Fruit, Sap, and Stem respectively (Table 6). Although all parts of the plants were used in fresh form, it was also reported that all, depending on the sickness, were used in dried forms either pounded to obtain desire results .

4. Conclusion

TMPs of Wonegizi still remain the most easily accessed and consulted in providing health services to their communities. Survey result showed that the people are heavily dependent on indigenous medicinal plants for their survival. This is critical, due to the numerous competing interests for natural resource use; flora being among the highest through logging and shifting cultivation as further fragmentation medium. Few elders knowledgeable in medicinal plant use are willing to teach the youths who are not willing due to modern exposure. Hence, conservation concerns for the wealthy knowledge and attended plant resources.

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Table 4. Habit of medicinal plants recorded.

Category	Tree	Shrub	Liana/Climber	Herb	Grass	Epiphyte	Grand Total
Total	50	6	19	19	4	3	101

Table 5. Disease indicators suggested by Wonegizi TMPs and corresponding bio-medical terms.

Category Of Sickesses	Bio-Medical Names	Local Term (Ziama Lorma)
Fevers	Ordinary fever Diaphoretic Malaria (***) Typhoid	<i>korleh-velai</i> <i>kolor-kpademai</i> <i>kpeen-koloi</i> <i>kai-wonoi</i>
Urinal-genital problems	Sexual debility Infertility Leucorrhoea Gonorrhea Menstrual disorders Frequent urination Aphrodisiac STD (**)	<i>towozaa-zeebeh; buzaa-zeebeh</i> <i>to-kpaan-zeebeh</i> <i>zea-wolegie</i> <i>kalayan-kpoigie; kalayan kolegie elewolehzu</i> <i>guea-taamai</i> <i>towo-zubagie</i> <i>Geh-so-ga-pa' zeebeh</i>
Respiratory Diseases	Common cold Cough Asthma Bronchitis Chest pain TB (*)	<i>korleh</i> <i>kor-zorgie</i> <i>fer-boi worzorgie</i> <i>kaka-wonneh'</i> <i>keke-wonneh'</i> <i>zee-ma-bolo kor-zorgie</i>
Oral and dental disorders	Toothache Mouth sore	<i>yeengeh-wonneh'/yeengehlabah</i> <i>daa-valah</i>
Skeletal-muscular pain and swelling	Body ache Rheumatism Head ache Sprain Swelling	<i>kolorsu-labaai</i> <i>kalai</i> <i>woon-tabai</i> <i>kowor-lebe-zeebeh'</i> <i>fe-say-beh</i>
Ear, Nose, Throat problems	Earache Throat sore Nose bleeding	<i>gwee-labai</i> <i>pala-folei-zu</i> <i>sopka-niningie-goloi</i>
Cardio-vascular disorders	Cardiac Blood pressure	<i>zee-labai</i> <i>fordor-leeh-zeebeh'</i>
Mental disorders	Mental tonic Epilepsy	<i>bolowa-zeebeh'</i> <i>voin-zeebeh'</i>
Dermatological disorders	Wounds Boils Skin rushes Ring worm Leprosy	<i>pala-zeebeh'</i> <i>dovolo-zeebeh'</i> <i>dorwor-zeebeh'</i> <i>mon-oiegie</i> <i>gii</i>
Gastro-intestinal disorders	Diarrhea Dysentery Constipation Vomiting Stomach ache Intestinal worms Piles	<i>kuzuwuloi</i> <i>kuzuweigie</i> <i>kuzuvoi</i> <i>woonpiligie</i> <i>kuzulabai</i> <i>kpeen-kuzu-zeebeh'</i> <i>puzywulo-zeebeh'</i>
Others	Diabetes Fracture Eye problems	<i>kpolo-zeebeh'</i> <i>kai-yali-zeebeh'</i> <i>gaazolaba-zeebeh'</i>

Table 6. Different parts of plant used.

Part	Plant	Flower	Fruit	Stem	Rhizome	Root	Bark	Leaves	Sap	Seed	Others
Total 132 counts	5	1	6	6	3	7	36	57	6	2	3

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