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Traditional Medicine and Ethnobotanical Use of Wild Plants by the Mundani People of Wabane, South West Region, Cameroon

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DS: Dschang, CNHY: Cameroon National Herbarium-Yaounde, IUCN: International Union for Conservation of Nature

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Abstract

This study is to document and evaluate the traditional medicinal use of wild plants and other ethnobotanical application of these resources by the Mundani people of Wabane Subdivision, Lebialeme Division, Cameroon. Extensive ethnobotanical field investigations were conducted across the villages inhabited by the Mundani communities in the lebialeme highlands. Through the use of semi-

structured questionnaires and personal interviews during field trips, information on the different medicinal uses of plants was recorded. The investigation revealed that the indigenous people and traditional healers used 128 plant species distributed in 119 genera belonging to 53 families to treat various diseases. The documented medicinal plants were mostly used to treat digestive ailments, female infertility/ gynecology, urinary tract infections, malaria, typhoid fever, male sexual dysfunctions, liver problems and diabetes. It was also found that 40 species had other ethnobotanical applications mostly for house construction, craft and arts, household utensils, bridge construction and fencing. The research thus stresses the importance for the documentation of the traditional medicinal use of plants by the Mundani people in order to uncover some of the hidden treasures of the forest that can serve as a potential source of new plant drug for mankind. The indigenous people should be educated on the importance of conservation of traditional knowledge and biodiversity.

Citation:

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1. Introduction

1.1. Background

For biodiversity conservation to be successful, it needs the involvement of the people living and dependent on the surrounding ecosystem for their livelihood, as such indigenous knowledge has been recognized worldwide not only because of its intrinsic value but also because it has a potential instrumental value to science and conservation. (Cunningham, 2001). Plants is an integral part of life in many indigenous communities. In the African communities it provides building materials, fodder, weapons and other commodities, and is

used as traditional medicines (Sidigia et al., 1990). Western style healthcare supplied by the government has expanded in the last decades, but is still often not readily available, and many regions remain completely underserved. The Mundani tribal area in Wabane is an Example (Focho et al., 2009). Consequently, most communities still use herbal remedies as a readily and cheaply available alternative (Bussmann et al., 2006). Although they are affected by overgrazing and over-exploitation leading to a decline of resources particularly in the

lebialem highlands they still remain vital to the indigenous communities (Focho et al., 2009).

Tropical forests are being destroyed at an alarming rate. The result will be extinction not only of plants and animals but of human societies that have, over thousands of years, developed an intimate knowledge of the forest and the natural products (Davis, 1995). Ethnoecological studies have provided models for profitable and environmentally sound multiple uses of land management programs, while ethnobotanists have invoked considerable economic potentials for undiscovered or undeveloped natural products (Balick, 1985). In the field of medicine alone, between 25 and 50 % of the modern drugs armamentarium is derived from natural products and most of these compounds were first used as medicines or poisons in a folk context (Holmstedt and Bruhn, 1983).

The lebialem highland is a key conservation priority area due to its smooth transition from lowland rainforest, piedmont forest, submontane and savannah vegetation stretching from an elevation of 250 m at Bechati to an elevation of 2550 m above sea level at Magha (Nkembi, 2004), though the biodiversity richness had been hidden over the years. Its importance is gradually being recognized even though high human pressure is causing a rapid fragmentation of the landscape and destruction of the last niches of endemic species (Harvey et al., 2010). Very little progress has been made on the survey and taxonomy of plants of the highland in recent years. The first ethnobotanical documentation of plants of the region was conducted some years ago (Focho et al., 2009) and was followed by rapid surveys by Royal Botanic Gardens, Kew and the National Herbarium of Yaounde, Cameroon which led to the publication of a plant checklist of the Lebialem highlands (Harvey et al., 2010). Subsequently, other ethnobotanical studies were conducted (Fonge et al., 2012) and they continue to affirm the high species diversity of the entire region.

1.2 Study site

Lebialem division is located in the North Eastern part of the South West Region of Cameroon. The division is bounded to the East by Menoua Division of the West Region, to the West by Manyu Division. It shares the Northern frontier with the North West Region and the South with Kupe-Manenguba Division of the Southwest Region. It is situated between latitudes 5°38' N and 5°43' N of the equator and between longitude 9°58' E and 10°27' E. It is a hilly region that covers a surface area of about 1,323 km² with an estimated population of 160,000 inhabitants composed of Nweh (Bangwa) and Mundani clans. The division is made up of three subdivisions: Alou, Fontem and

Wabane. Wabane subdivision which is the study site is inhabited by the Mundani people of the Lebialem highlands within the Bamboutos caldera. It is located between latitudes 5° 11' to 5° 45' north of the equator and longitudes 9° 50' to 10° 08' east of the Greenwich meridian. Wabane has a surface area of about 298 km² with an estimated population of 46,644 inhabitants. The climate of this region is characterized by high winds and low sunshine. The average daily temperature varies very much with season and ranges from 17 to 32°C (Nkembi, 2004). The average annual rainfall is between 2000 and 3000 mm. There are a few patches of montane forest dotted within the topographical range of 1600 to 2550 m and the dominant vegetation is grassland.

The Mundani people constitute eight major villages (Bamumbu Fondom, Bechati, Banti, Egumbu, Folipi, Besali, Bangang and Nkong) (fig 1) which spread across different altitudinal belts (Lower belt, Middle belt and the Upper belt) and speak Mundani. They mostly rely on agricultural cultivation of garden crops and animal rearing for survival. The lower belt that is made up of the other 7 major villages is diverse in vegetation types spreading from 250 m to 1900 m altitude. The vegetation types range from lowland forests, submontane to montane forests. With the favorable climatic conditions and increase in population density, there is massive deforestation in favor of improved palms and cocoa plantations which are the main cash crop grown in this area.

1.3 Objective of the research.

The aim of the research was to document and evaluate the use of wild plants by the Mundani people in traditional medicines for treatment of diseases and other ethnobotanical applications in the region.

1.4 Justification of research

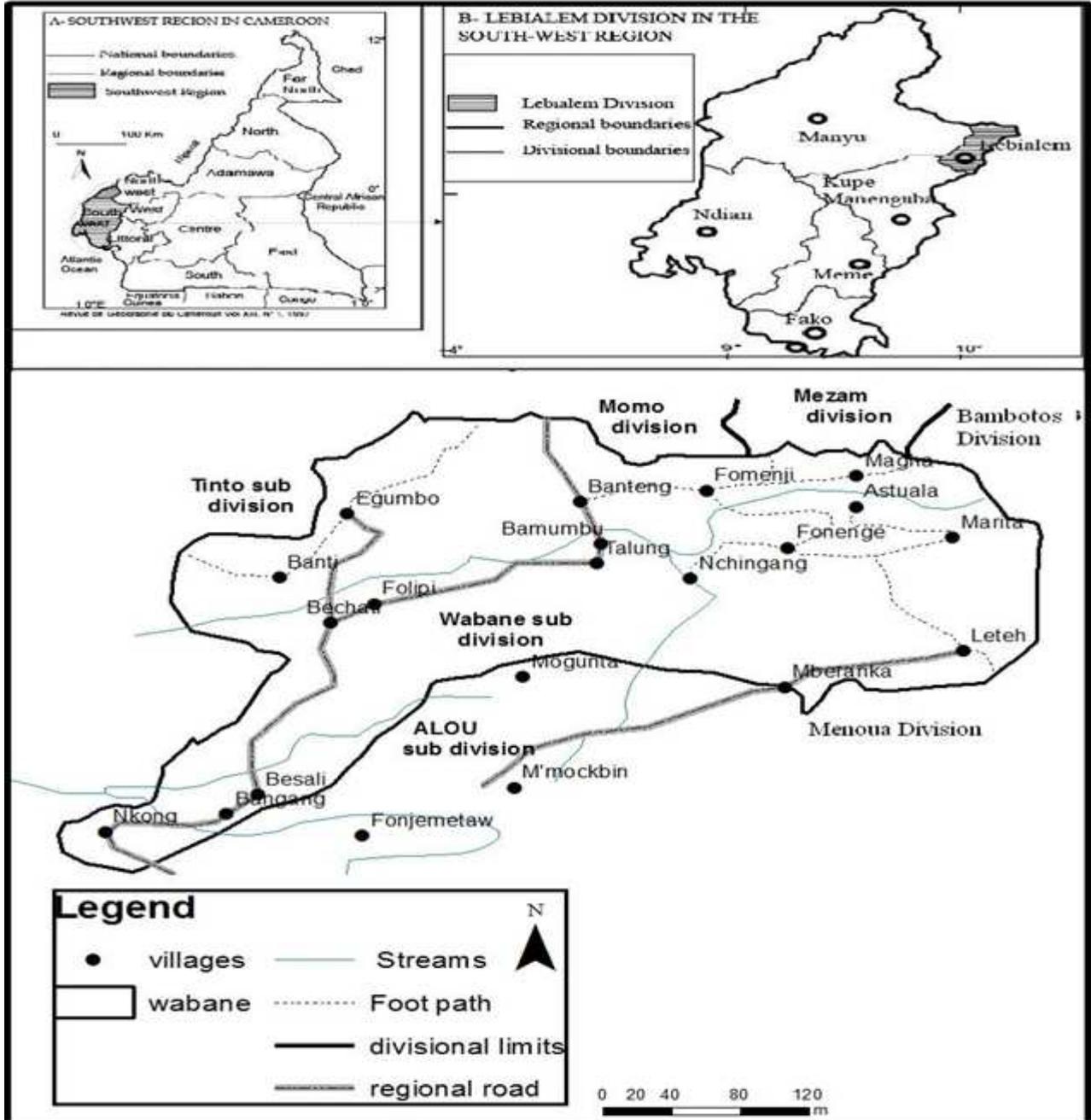
Indigenous communities that inhabit forest areas of high plant biodiversity hold enormous traditional knowledge on the use of plants as medicines, foods, arts and craft, house construction and financial earnings. Very little has been done in this region in terms of plant studies irrespective of the high flora diversity. This investigation has led to the documentation of some rare medicinal plants that have never been recorded in Cameroon. Also, due to increase in western lifestyle in these communities, indigenous traditional values with regard to plant use are disappearing and there is therefore need to document them.

2. Methodology

The ethnobotanical field investigation was carried out during regular field trips from November 2011 to October 2013 in the eight villages inhabited by the Mundani people (Bamumbu, Bechati, Banti, Egumbo, Folipi, Besali, Bangang and Nkong). Ethnobotanical data was collected following

informed consent of the respondents using semi-structured questionnaires and open ended conversations as adapted from Jovel et al, (1996). Information was gathered through interview of experienced rural folk traditional herbal medicine practitioners who are having knowledge of traditional healing. The interview focused on basic

Figure 1: Map of Wabane



questions concerning the respondent's knowledge on the uses of plants. Participant observation, free listing and use of herbarium specimens were also employed to enrich the information gathered. As part of the interview a guided tour technique was employed, consisting of walking through the forest with one or more respondents to observe the plants

cited, take photographs and to collect samples for posterior botanical identification (Albuquerque & Lucena, 2004a). A total of 235 respondents were interviewed amongst which were 134 men and 101 women. The data collected included local names of the plants, uses, modes of preparation and administration of medicine, and the plant parts

used. Traditional uses of other useful plant species were also recorded. The working language for the study was the Mundani dialect and the authors faced no problem since one of them was a native of the region.

2.1 Identification of plant specimens

During field trips, plant specimens were collected following standard methods of sample collection, drying, mounting and preservation. Plants were first identified in the field by their vernacular names and later validated at the Cameroon National Herbarium in Yaoundé: (CNHY). Voucher specimens are deposited at the University of Dschang Teaching Herbarium (UDs)

2.2 Data analysis

Data on plant species, families, vernacular names, parts used, traditional use and modality of use were recorded and entered into an excel worksheets. The percentages and frequencies were calculated. The data was summarized as proposed by Cock (1995).

3. Results

3.1 Respondents interviewed

During the survey the highest respondents percentage were mostly adults (57%), followed by the elderly (28%) and then the youths (15%) (Table 1). In terms of gender the men were 57 % and the females 43 % (Table 2). It was also found that most of the specialized traditional healers in the area were very old and the youths are unwilling to pursue the trade as they instead want to rely on lucrative jobs out of the region or in the area.

3.2 Medicinal plants reported and diseases treated.

The study revealed that 128 plant species were identified to be used by the Mundani people in their traditional health care system to treat various ailments (Table 3). The scientific name/voucher number, family, local name, part(s) of plant used, mode of preparation and administration of medicine, and diseases treated, were identified. One hundred and twenty seven species belong to 119 genera and 53 families were identified. The families best represented were Fabaceae, Euphorbiaceae and Meliaceae with 10 species each, followed by Rubiaceae and Asteraceae with 7 species each, then Guttiferae (5), Moraceae and Bignoniaceae with 4 species each. The Apocynaceae, Rutaceae, Dracaenaceae, Verbenaceae, Piperaceae, and Urticaceae had 2 species each (Fig. 2). Some of the plants are reported for the first time as medicinal plants in the region and in Cameroon. They were *Ternstroemia* sp (Nov) and *Trichilia* sp (Nov), that were used together in the region to treat several diseases. Figure 4 gives the number of plants species that

were used to treat different ailments. Since the region is rural with no good sources of portable water, diseases of the digestive system were very prevalent; as such 35 species were used to handle them. This was followed by female infertility/gynecology (22), problems of urinary tract (11), Malaria/typhoid/yellow fever (11), male infertility/sexual dysfunction (9), inflammation/ gout/ rheumatism (8), hepatitis and liver problems (7) and diabetes (5).

3.3 Plant parts used and plant habit

Different parts of the plants were used in the preparation of the medication as show in figure 3. The barks of plants were the most used parts with 47% followed by the leaves (32%) and roots and rhizomes (11 %). Fruit and seeds (5%), sap (3 %), liana (1 %), stem (1 %) and whole plant (1 %) were the least used plant parts. The barks used were mostly from trees and leaves from herbs. Also most of the plants reported in the study were trees (62 species), followed by herbs (12), shrubs (12) and lianas (8) The people are forest dwellers and rely mainly on trees for easily available medication.

3.4 Methods of drug preparation and modes of administration

Considering the different methods of preparations, decoction was the most commonly used with 37%, infusion (30%), maceration (16%), powder (9%), paste (6%) and concoction (2 %) was the least (fig. 6). The oral route was the most used mode of administration of medicines with 91% followed by topical (5%), anal (2%) and inhalation (1%) was the least (fig.7).

3.5 Other plants of ethnobotanical importance to the Mundani people.

Table 4 presents a list of 40 plants that had other ethnobotanical uses for the Mundani people such as spices, house and bridge construction, arts and craft, household utensils, and for fencing. It results that some plants that are used as medicinal plants in the area had other traditional applications. They include: *Albizia zygia*, *Bambusa vulgaris*, *Canarium schweinfurtii*, *Croton macrostarchyus*, *Cyathea maniana*, *Cylicodiscus gabunensis*, *Dracaena arborea*, *Dracaena diesteliana*, *Entandrophragma angolense*, *Girardinia diversifolia*, *Makhamia lutea*, *Morinda lucida*, *Newbouldia laevis*, *Polyscias fulvia*, *Shirakiopsis ellipticum* and *Zanthoxylum tessmannii*. 13 other plants not cited as medicinal plants were recorded for other uses. They include: *Afrostryax lepidophyllus* as a spice, *Albizia adianthifolia*, *Allophyllus bullatus*, *Beilschmiedia* sp, *Lophira alata*, *Parkia bicolor* and *Piptadeniastrum africanum* for house construction and bridges, *Bridelia micrantha*, *Carapa grandifolia*, *Diospyros*

crassiflora and *Salacia staudtii* for tool handles, crafts and arts, and musical instruments, *Crescentia cujete* for taping utensils, *Ectadiopsis oblongifolia*, *Eremospatha macrocarpa*, *Raphia gentiliana* for tying of houses, weaving of baskets, fishing nests and thatches for roofing. Also, the people have diverse wild resources on which they depend seasonally for food and financial earnings such as *Recinodendron heudelotii* and *Afrostryax lepidophyllus*. While other resources like *Bambusa vulgaris*, *Eremospatha macrocarpa*, *Prunus*

africana and *Ternstroemia* sp have become rare due to overexploitation for sale to neighboring markets. Due to increase in population and agricultural activities, there is an immense pressure on the forest resulting to its destruction and depletion. Fuel wood has become almost rare and people have to trek long distances to collect it. As such people rely on fast growing shrubs like *Adenocarpus mannii* and *Erica mannii* for this important resource.

Table 1: Percentage of respondents interviewed

Age group (years)	Number of respondents	Percentage of respondents (%)
Youths (18-35 yrs)	35	15
Adults (35-55 yrs)	135	57
Elderly (55 and above)	65	28

Table 2: Percentage of respondents interviewed

Gender	Number of respondents	Percentage of respondents (%)
Male	134	57
Women	101	43

Table 3: Ethnomedicinal use of wild plants by the Mundani people of the Lebiale Highlands

	Scientific name and voucher number	Family	Local names/ Mundani	Parts used	Mode of preparation and use of medicine.
1	<i>Abrus precatorius</i> L DS427	Fabaceae	Abameka'a	Leaves	Leaves are chewed for stomachache.
2	<i>Acanthus montanus</i> (Nees.) T. Anders DS312	Acanthaceae	Nsumelab	Leaves	Leaf powder is mixed with red oil and eaten, then apply topically for swollen legs.
3	<i>Aguaria salicifolia</i> (Comm. ex Lam.) Hook. f. ex Oliv. DS111	Myrtaceae	Achane	Bark and leaves	Maceration of leaves is taken orally for venereal infections. Squeezed bark juice and leaf powder are applied topically to treat sores and wounds
4	<i>Albizia zygia</i> (DC.) J.F Mac. DS43	Fabaceae	Alie-kephe	Bark	Decoction of bark is taken orally and as a vaginal wash to treat vaginal discharge.
5	<i>Alchonea cordifolia</i> DS516	Euphorbiaceae	Tafam	Leaves	Decoction of leaves is use as mouth wash for toothache.
6	<i>Alchonea laxiflora</i> (Benth.) Pax & K. Hoffm. DS220	Euphorbiaceae	Kelou	Leaves	Decoction of leaves is taken orally 6 months after pregnancy for weak cervix and threatened abortions.
7	<i>Alstonia booei</i> De Willd. DS591	Apocynaceae	Ntong	Bark	Decoction of bark is taken internally on empty stomach for diarrhea and dysentery.
8	<i>Anchomanes difformis</i> (Blume) Engl DS521	Araceae	Alateune	Root	Decoction of root is taken orally and as an anal wash to treat fallopian tube blockage and ovarian cyst. Prepared in yellow soup and taken for swollen stomach

9	<i>Annickia chloranta</i> (Oliv.) Set & Maas DS178	Annonaceae	Mewet	Bark	Decoction of bark is prepared and taken orally for 2-3 weeks to treat yellow fever, bile and gastritis and for 3 months for liver problems
10	<i>Anthocleista scandens</i> DS511	Loganiaceae	Ajou	Bark	Decoction of bark is taken morning and evening to treat diabetes.
11	<i>Asystasia gangetica</i> (L.) T. Anderson DS213	Acanthaceae	Toulesot	Leafy-twigs	Infusion of leafy-twigs is taken internally against anemia and excessive bleeding during menses.
12	<i>Bambusa vulgaris</i> Schrad. ex J.C. Wendl DS266	Poaceae	Nfur	Young shoots	An infusion prepared from pounded young shoots is taken internally to treat swollen and aching joints.
13	<i>Begonia preusii</i> Warb DS367	Begoniaceae	Alomawane	Leaves	Fresh leaves are chewed for gastritis. Maceration of leaves is taken orally to facilitate delivery.
14	<i>Bersama abyssinica</i> Fresen DS212	Meliantaceae	Nsan	Bark	Infusion of 1 teaspoon bark powder in a glass of water is taken orally for 3 days.
15	<i>Biophytum talbotii</i> (Baker f.) Hutch. & Dalziel DS238	Oxalidaceae	Npheneneu	Leaves	Leaf paste mixed with palm kernel oil is taken orally
16	<i>Bridelia artroviridis</i> (Hochst.) Baill. DS196	Euphorbiaceae	Ntsi	Bark	Decoction of bark is taken orally sweetened with honey for cough and asthma.
17	<i>Brucea antidysenterica</i> J. F. Mill DS137	Simaroubaceae	Awum	Bark	Decoction of bark is taken orally for worms, dysentery and diarrhea.
18	<i>Canarium schweinfurthii</i> Engl DS315	Burseraceae)	Nfeurt	Seeds	Powder of burnt seeds is mixed with oil and eaten for hemorrhoids
19	<i>Canthium mannii</i> Hiern DS326	Rubiaceae	Alon	Bark	Bark decoction is taken internally for backache
20	<i>Carapa dinklagei</i> DS333	Meliaceae	Nbenedum	Bark	Bark decoction is taken orally against malaria and fevers.
21	<i>Carapa procera</i> Harms. DS359	Meliaceae	Kewen	Bark	Concoction with bark of <i>Trichilia</i> sp is taken orally for typhoid fever and rheumatism.
22	<i>Ceiba pentandra</i> (L.) Gaertn. DS52	Bombacaceae	Mayam	Bark	Decoction of bark is taken orally and as an anal wash for protracted menstruation and secondary infertility.
23	<i>Centella asiatica</i> L DS517	Apiaceae	Batasi	Leaves	Infusion of leaves is taken for high blood pressure.

24	<i>Chlorophora excelsa</i> (Welw.) Benth.DS234	Moraceae	Abang	Bark	Decoction of bark is used as a mouth wash against toothache.
25	<i>Cissus aralioides</i> (Welw. ex Bak.) Planch DS211	Vitaceae	Nlig-akom	Liana	Decoction of the liana is taken orally just after conception to prevent miscarriage and for urinary tract infection.
26	<i>Clausena anisata</i> (Willd.) Hook. f. ex Benth. DS106	Rutaceae	Asababagone	Roots and leaves	Infusion of leaves and root bark is taken orally for insomnia and body pains.
27	<i>Clematis hirsuta</i> (D. C.) Hutch.DS155	Ranunculaceae	Nchina	Leaves and root	Juice from warm leaves and roots is inhaled for headache and sinusitis.
28	<i>Coleus blumei</i> Benth. DS88	Lamiaceae	Kwenekam	Leaves	Cold maceration of leaves is taken orally against uterine inflammation in women
29	<i>Commelina diffusa</i> L.DS515	Commelinaceae	Awuwub	Whole plant	Leaves are squeezed in cold water and juice taken orally against nail fungi infection.
30	<i>Conyza aegyptiaca</i> (L.) TW523	Asteraceae	Toushum	Leaves	Infusion of leaves is taken orally three times daily for diabetes and stomachache.
31	<i>Conyza sumatrensis</i> (Retz.) E. H. Walker DS73	Asteraceae	Kwakwan	Leaves	Infusion is used as mouth wash against mouth thrush in children and taken orally against uterine bleeding.
32	<i>Cordia platythyrsa</i> DS328	Boraginaceae	Gum	Bark	Maceration of bark is taken orally against rheumatism.
33	<i>Croton macrostachyus</i> Hochst et Del.DS133	Euphorbiaceae	Lumayite	Bark	Bark powder is chewed directly or infused and taken orally against stomachache and flatulence.
34	<i>Cyathea maniana</i> Hook DS210	Cyatheaceae)	Ntseu	Stem	Powder is taken directly mixed with pure honey for low sperm count.
35	<i>Cylicodiscus gabunensis</i> (Taub.) Harms DS144	Fabaceae	Elame	Bark	Decoction with palm wine is taken internally for waist pain and venereal infections and as an enema for broken vertebral column after a fall from a palm tree.
36	<i>Desmodium ascendens</i> (Swartz) D. C DS257	Fabaceae	Mbayanambe a	Leafy-twigs	Infusion of leafy - twigs is taken 1 glass, 3 times daily for jaundice, liver problems and diarrhea.

37	<i>Dissotis rotundifolia</i> (Sm.) Triana DS492	Melastomathaceae	Nghebetawum	leaves	Leaves are eaten directly for gastritis and cough. Paste is applied on fire burns.
38	<i>Dorstenia barteri</i> L DS338	Moraceae	Elignjab	Roots	Root powder is used to prepare yellow soup and taken orally for loss of appetite.
39	<i>Dracaena arborea</i> (Willd.) Link DS182	Dracaenaceae	Nlup	Bark	Maceration of bark is used for gargling to stimulate salivation and improve breathe in sick patients.
40	<i>Dracaena diesteliana</i> Engl DS162	Dracaenaceae	Nkeung	Root	Decoction of roots is used for gargling and mouth wash.
41	<i>Dryopteris kirbi</i> Hook et Grav. DS242	Dryopteridaceae	Kejiene	Root	Maceration of roots is taken orally on empty stomach for worms and twice daily for hemorrhoids.
42	<i>Echinops giganteus</i> C. D. Adams DS14	Asteraceae	Ayilagwem	Root	Infusion of roots is taken orally for flatulence and bloody stool.
43	<i>Embelia rowlandii</i> Gilg DS97	Myrsinaceae	Nphenyeate	Fruits & leaves	Leaves and fruits are eaten for worms and gastritis
44	<i>Emilia coccinea</i> (Sims.) G.Don DS612	Asteraceae	Takuteu	Leafy-twigs	Infusion of leafy twigs is taken orally against protracted menstruation and gastritis.
45	<i>Entada africana</i> Guill. & Perr DS26	Fabaceae	Njamjam	Root	Root decoction is taken before meals for obesity.
46	<i>Entandrophragma angolense</i> (Welw.) C.DC DS266	Meliaceae	Nphie	Bark	Decoction of bark is taken orally and as an anal wash for lower abdominal pain and infertility.
47	<i>Eremomastax speciosa</i> (Hochst.) Cufod DS14	Acanthaceae	Nkwanekam	Leaves	Infusion of a mixture with <i>Justicia insularis</i> is taken orally for 5 days before menstruation against dysmenorrhea.
48	<i>Eryngium foetidum</i> DS243	Apiaceae	Apie	Leaves	Leaf paste is mixed with palm kernel oil and salt, and eaten regularly for food poisoning.
49	<i>Ficus asperifolia</i> Miq DS144	Moraceae	Ntob	Bark and fruits	Decoction of bark is taken orally 5 days before menstruation against protracted menstruation Infusion of fruit powder is taken internally for infertility treatment.
50	<i>Ficus thonningii</i> Blume. DS109	Moraceae	Adie	Sap	Maceration of sap is taken orally for 5 days against yellow fever.

51	<i>Galium simense</i> Fres. DS403	Rubiaceae	Njiekuba	Leafy-twigs	Juice from fresh leaves is used for gargling against goiter. Leaf infusion is taken internally for benign prostatic hyperplasia.
52	<i>Garcinia kola</i> Heckel DS419	Guttiferae	Nnyei	Bark and fruits	Powder is eaten directly against gastritis and flatulence.
53	<i>Girardinia diversifolia</i> (Link.) Friso.DS28	Urticaceae	Meje	Leaves	Infusion of leaves is taken orally for anemia, inflamed pancreas and diabetes. Leaf powder is applied on scarifications for edema.
54	<i>Gladiolus aequinoctialis</i> Herb.DS401	Iridaceae	Nlameghene	Bulbs	Bulb powder is mixed with palm kernel oil is eaten against inflamed pancreas and food poisoning.
55	<i>Gmelina arborea</i> Roxb DS162	Verbenaceae	Afor	Leaves	Infusion of leaves is taken orally to treat tuberculosis and bronchial infection.
56	<i>Gouania longipetala</i> Hemsl. DS363	Rhamnaceae	Alamawaseun	Leaves	Leaf infusion is taken internally against malaria.
57	<i>Guarea cedrata</i> Pellegr DS188	Meliaceae	Ayilatung	Bark	Bark powder is used to prepare yellow soup and taken orally to stop bleeding after child birth.
58	<i>Guarea glomerulata</i> Harms DS192	Meliaceae	Ayilatung	Bark	Decoction of bark is taken orally to treat epilepsy, food poison and for massage against stroke.
59	<i>Hallea stipulosa</i> J. F.Leroy DS392	Rubiaceae	Ayala	Bark	Decoction of powdered bark is taken orally for treatment of urinary tract infection.
60	<i>Hannoa klaineana</i> Pierre ex Engl DS451	Simaroubaceae	Ntsiphe	Bark	Decoction of bark is taken orally against typhoid fever and malaria.
61	<i>Harungana madagascariensis</i> Lam. ex Poir. DS435	Guttiferae	Ntouné	Bark and leaves	Infusion of bark and leaves is taken orally for gastritis, bile and yellow fever. Powdered bark is applied topically to treat sores.
62	<i>Hypericum lanceolatum</i> Lam. DS621	Guttiferae	Mekaneghene	Leaves	Leaf infusion is taken internally for vaginal discharge and menopausal problems, and applied topically for herpes zoster.
63	<i>Hyptis suaveolens</i> (L.) Poit DS449	Lamiaceae	Tinyakih	leaves	Maceration of leaves is taken orally, twice daily for intestinal fungi.

64	<i>Ilex mitis</i> (L.) Radlk DS226	Rhizophoraceae	Nkenekephe	Bark	Decoction of bark is taken orally and as enema against pelvic inflammatory disease and infertility.
65	<i>Justicia insularis</i> T. Anders DS25	Acanthaceae	Toulesot	Leaves	Infusion of leaves with those of <i>Eremomastax speciosa</i> is taken orally 5 days before menstruation against infertility and irregular menstruation.
66	<i>kigelia africana</i> (Lam.) Benth. DS646	Bignoniaceae	Ngong	Bark and fruits	Decoction of fruit is taken orally for scrotal inflammation.
67	<i>Laportea ovalifolia</i> (Schum.&Thonn.) Chev.DS515	Urticaceae	Yuba	Leaves	Infusion of leaves is taken orally to treat swollen articulations and pains.
68	<i>Macaranga spinosus</i> (Müll.-Arg.) Müll.-Arg DS192	Euphorbiaceae	Ayangwe	Bark	Decoction of bark is taken orally for 21 days against urinary tract infections
69	<i>Markhamia lutea</i> (Benth.) K. Schum DS382	Bignoniaceae	Berna	Bark	Decoction of bark is taken orally for hemorrhoids..
70	<i>Millettia laurentii</i> De Wild.DS314	Meliaceae	Meufofahgi	Bark	Decoction of bark is taken orally against hernia.
71	<i>Mondia whitei</i> (Hook. f.) Skeel DS212	Asclepiadaceae	Nganghelu	Root	Powder is eaten directly or infused in water and taken orally as a sexual arousal and loss of appetite.
72	<i>Morinda lucida</i> Benth. DS517	Rubiaceae	Nfie	Bark and roots	Root and bark decoction is taken internally for typhoid and diabetes. Bark powder mixed with palm kernel oil is taken for poisoning.
73	<i>Musanga cecropioides</i> R. Br. ex Tedlie DS219	Moraceae	Carabout	Bark	Maceration of bark in palm wine is taken orally before menses against female infertility and uterine inflammation.
74	<i>Mussaendra tenuiflora</i> Wernh DS124	Rubiaceae	Ntuabala	Leaves	Leaf infusion is taken orally and as a hot bathe against epilepsy and mental illness.
75	<i>Neobourtonia glabrescens</i> Prain DS301	Euphorbiaceae	Atung	Root	Root powder is used to prepare yellow soup and taken internally against kidney problems and constipation.
76	<i>Newbouldia laevis</i> (P. beauv) seem DS315	Bignoniaceae	kiete	Bark	Powder is applied on the affected parts of the body to treat eczema and sores.
77	<i>Paullina pinnata</i> Linn.DS343	Sapindaceae	Abijou	Leaves	Leaf powder with pap is taken orally for dysentery and diarrhea.

78	<i>Pennianthus camerounensis</i> DS222	Menispermaceae	Ketie	Root bark	Root bark powder mixed with palm kernel oil and salt is eaten against snake bite.
79	<i>Pennianthus longifolia</i> Miers DS712	Menispermaceae	Ketie	Root	Root bark powder is taken directly for impotence.
80	<i>Pennisetum purpureum</i> Schumach DS177	Poaceae	Keshung	Young shoots	Water pressed from shoots is put into the ear to treat otitis due to meningitis attack.
81	<i>Pentadesma butyracea</i> Sabine DS260	Guttiferae	Ayene	Bark	Bark decoction is taken orally for 10 days for treatment. fever
82	<i>Phoenix reclinata</i> Jacq. DS533	Arecaceae	Mekeune	Sap	Sap is used as eyes wash against watery eyes and ache.
83	<i>Phyllanthus muellerianus</i> (O. Ktze.) Excell. DS291	Euphorbiaceae	Chakalum	Bark and leaves	Infusion of leaves or bark is taken orally for dysentery, diarrhea and flatulence.
84	<i>Picralima nitida</i> Stapf DS413	Apocynaceae	Mbenedum	Bark and fruits	Decoction of bark and fruits is prepared and taken orally for 10 days against typhoid fever, poor sexual drive and dysmenorrhea.
85	<i>Piper guinense</i> Linn.	Piperaceae	Kefob	Liana	Infusion of liana is taken orally against infertility, amenorrhea, and impotence.
86	<i>Piper umbellatum</i> L DS77	Piperaceae	Nlamewa	Leaves	Paste of leaves is applied on the head of young babies against fontanel.
87	<i>Pittosporium mannii</i> Hook.f. DS162	Pittosporaceae	Abidong	Bark	Bark powder mixed with honey is eaten for cough and food poisoning. Infusion of bark powder mixed with honey is taken for asthma and pneumonia.
88	<i>Polyscias fulva</i> J. R. & G. Forst. DS113	Araliaceae	Nfeum	Bark	Cold maceration of bark is taken 3 tablespoons, 3 times daily for 1 month against liver inflammation
89	<i>Prunus africana</i> (Hook. f.) K. Schum. DS513	Rosaceae	Nleh	Bark	Decoction of bark is taken orally against kidney and difficulty to urinate in aged persons.
90	<i>Pseudospondias macrocarpa</i> DS49	Anacardiaceae	Ngume	Bark	Bark maceration in raffia wine is taken a glass, 3 times daily before menstruation for 10 days against secondary infertility.

91	<i>Psorospermum densipotatum</i> DS269	Guttiferae		Leaves	Leaf infusion is taken internally against yellow fever.
92	<i>Pterocarpus soyauxii</i> Taub DS159	Fabaceae	Nbeu	Bark	Bark decoction is taken internally for anemia and as an enema for infertility.
93	<i>Pycnanthus angolensis</i> (Welw.) Warb.DS50	Myrsinaceae	Nsan	Bark	Bark decoction is taken orally for liver infections.
94	<i>Quarsia sylvestris</i> Herm DS310	Simaroubaceae	Ntobe	Bark	Root bark infusion is taken orally for venereal infections.
95	<i>Rauwolfia macrocarpa</i> L DS501	Apocynaceae	Ntong	Bark	Infusion of 1 teaspoon of bark powder in a glass of water is taken orally, 3 times daily for 5 days to treat diarrhea and dysentery.
96	<i>Rauwolfia vomitoria</i> Afzel.DS511	Apocynaceae	Nto-aniene	Bark	Decoction of bark is taken orally for stomachache and hemorrhoids.
97	<i>Ricinodendron heudelotii</i> (Baill.) Pierre ex Heckel DS294	Euphorbiaceae	Keseh	Bark	Bark decoction is taken orally with milk against sickle cell and anemia.
98	<i>Rothmania macrophylla</i> (R.Br. ex Hook.f.) BremeDS462	Rubiaceae		Bark	Decoction of bark is taken internally to treat urinary tract infections.
99	<i>Rumex abyssinica</i> Jacq. DS222	Polygonaceae	Madunghab	Roots	Decoction of roots is taken orally against jaundice, bile and liver problems.
100	<i>Rumex bequaertii</i> De Wild DS118	Polygonaceae	Teuteluko	Roots	Infusion of root powder is taken orally for gastritis and bile.
101	<i>Sansiviera liberica</i> Ger. et Labr. TW516	Dracaenaceae	Nlamewa	Leaves	Maceration of leaves is taken orally and to bathe against body itches.
102	<i>Scorodophloeus zenkeri</i> Harms DS566	Fabaceae	Kelu	Bark and fruits	Powder of bark and fruit is added to food against flatulence or improve taste.
103	<i>Shirakiopsis elliptica</i> (Hochst.) Esser DS401	Euphorbiaceae	Aseune	Bark	Bark infusion is taken orally or chewed directly against filariasis, worms and stomachache.
104	<i>Solanum torvum</i> SW DS529	<i>Solanaceae</i>	Keshipong	Leaves	Infusion of leaves is taken as tea against internal inflammations. Leaf juice is given to new born against navel-ache.
105	<i>Spathodea campanulata</i> P. Beauv DS452	Bignoniaceae	Nkiete	Bark	Decoction of bark is taken orally for 10 days every month against diabetes and fatigue.

106	<i>Spermacoce saticola</i> K. Schum DS	Rubiaceae	Tekatechuo	Leaves	Leaf paste mixed with salt and red oil is eaten and applied locally on swollen testes
107	<i>Spilanthes filicaulis</i> (Schum et Thonn) C. D. Adams DS180	Asteraceae	Nghiko	Leaves	Infusion of leaves is used as mouth wash for tooth ache. Warm leaves put in a leaf funnel are squeezed into the eye for cataract.
108	<i>Taraxacum officinale</i> (L.) Weber ex F.H.Wigg DS97	Asteraceae	Teuneteua	Roots and leaves	Infusion of whole plant is taken orally as tea against bile and liver problems..
109	<i>Tephrosia vogelii</i> Hook. f. DS77	Fabaceae	Mbayandum	Leaves	Leaf paste is applied topically for abscesses. Leaf infusion is taken orally for diabetes.
110	<i>Ternstroemia sp (Nov)</i> DS102	Ternstroemiaceae	Nkene	Bark	Decoction of bark with milk is taken for anemia and sickle cell. Concoction with bark of <i>Trichilia</i> sp is taken orally for pelvic inflammatory disease and infertility.
111	<i>Tetrapleura tetraptera</i> Taub DS224	Fabaceae	Babetat	Bark	Bark decoction is taken internally before menstruation against amenorrhea and menopausal problems.
112	<i>Tragia benthamii</i> Baker DS311	Euphorbiaceae	Natua	Leaves	Paste of leaves is applied on the head and infusion taken internally for fontanel in children
113	<i>Trema orientalis</i> (Linn.) Blume TW44	Ulmaceae	Feung	Bark	Decoction of bark is taken orally against sleeping sickness.
114	<i>Trichilia gilgiana</i> Harms DS612	Meliaceae	Nkwane	Bark	Decoction of bark is taken orally for 10 days against typhoid fever
115	<i>Trichilia heudelotii</i> DS501	Meliaceae	manjunga	Bark	Infusion of bark powder is taken orally for gastritis and internal ulcers.
116	<i>Trichilia monodelpha</i> DS514	Meliaceae	Majunga	Bark	Decoction of bark powder is taken orally for liver problems.
117	<i>Trichilia sp (Nov.)</i> DS518	Meliaceae	Nkwane	Bark	Concoction with bark of <i>Ternstroemia</i> sp is taken orally and as an anal wash for infertility and urinary tract infection.

118	<i>Tristemma mauritianum</i> J.F. Gmel. DS256	Melastomathaceae	Nghebetawum	Leaves and roots	Decoction of mixture of roots and leaves is taken twice daily to prevent miscarriages and treat venereal infections.
119	<i>Urena lobata</i> (L.) Borss. Walk. DS342	Acanthaceae	Tihtebi	leaves	Leafy twigs maceration is taken internally, three times daily for threatened abortions.
120	<i>Vepris loursii</i> Gilb. DS128	Rutaceae	Keti	Bark	Decoction of bark is taken orally for 10 days against fungi infection and worms.
121	<i>Vernonia calvoana</i> Hook. f. DS162	Asteraceae	Ntoun	Leaves	Maceration of leaves is taken orally for stomach ache and as an anal wash for navel ache in children.
122	<i>Vernonia guineensis</i> Benth DS671	Asteraceae	Atsine	Roots	Decoction of roots is taken internally for gastritis and stomach ache.
123	<i>Vitellaria paradoxa</i> C.F. Gaertn DS452	Sapotaceae	Nkeuhla	Bark	Decoction of bark powder in palm wine is taken orally for hernia and infertility in women.
124	<i>Vitex rivularis</i> DS291	Vitaceae	Kisti	Bark	Bark decoction is taken orally for hemorrhoids
125	<i>Xylopia staudtii</i> Engl. & Diels DS432	Annonaceae	Bitita	Bark	Bark powder is added to food and eaten to stimulate appetite and prevent flatulence.
126	<i>Zanthoxylum tesmannii</i> Harms. DS305	Rutaceae	Ndune	Bark	Bark powder infusion is taken orally sweetened with honey for asthma, chest pain and fatigue. Bark is chewed for toothache.
127	<i>Zanthoxylum gillettii</i> DeWilld. DS250	Rutaceae	Ndune	Bark	Infusion of bark powder is taken orally twice daily against body pains.
128	<i>Zehneria scabra</i> (L.f.) Sond DS226	Curcubitaceae	Mbogheleniang	Leaves	Infusion of leaves is prepared and taken orally for 5- 10 days for urinary tract infection and navel ache in children.

Table 4: Other plants of ethnobotanical importance to the Mundani people

No	Scientific name, family and voucher number	Local name	Other uses
1	<i>Afrostryax lepidophyllus</i> Mildbr (Huaceae) DS777	Kelum	Spices
2	<i>Albizia adianthifolia</i> (Schum.) W. Wight (Fabaceae) DS233	Alie-mebang	House construction and furniture
3	<i>Albizia zygia</i> (DC.) J.F Mac. (Fabaceae) DS43	Alie-kephe	House construction and furniture
4	<i>Allophyllus bullatus</i> Radlk (Sapindaceae) DS655	Alitafeung	Planks and furniture

5	<i>Bambusa vulgaris</i> Schrad. ex J.C. Wendl (Poaceae) DS266	Nfur	Construction of huts and mud houses and fences, musical instruments, climbing ladders, cups, beds and chairs.
6	<i>Beilschmiedia sp</i> (Lauraceae) DS822	Anedub	Construction of huts, local mud houses and fences
7	<i>Bridelia micrantha</i> (Hochst.) Baill. (Euphorbiaceae) DS149	Ntsi	Tool handles
8	<i>Canarium schwienfurtii</i> Engl (Burseraceae) DS315	Nfeurt	Construction, fruits as food, and essence is burnt to drive away bad spirits.
9	<i>Carapa grandifolia</i> Harms. (Meliaceae) DS321	Kewen	Carving of drums, gongs and xylophones
11	<i>Crescentia cujete</i> L (Bignoniaceae) DS910	Ateuh-ayite	Making of palm tapping containers
12	<i>Croton macrostachyus</i> Hochst. ex Del. (Euphorbiaceae) DS133	Lumayite	Planks for furniture and doors
13	<i>Cyathea maniana</i> Hook (Cyatheaceae) DS210	Ntseu	Poles for construction of huts, traditional houses and bridges
14	<i>Cylicodiscus gabunensis</i> (Taub.) Harms (Fabaceae) DS144	Nlame	Bridge building, carving of mortars and drums
15	<i>Diospyros crassiflora</i> Hiern (Ebenaceae) DS731	Ayilakephen	Carving of works of arts and crafts
16	<i>Dracaena arborea</i> (Willd.) Link (Dracaenaceae) DS182	Elub	Poles for hut and fence construction
17	<i>Dracaena diesteliana</i> Engl (Dracaenaceae) DS162	Nkeung	Leaves folded and send to someone carries a message of urgency and a branch held up is a sign of peace.
18	<i>Ectadiopsis oblongifolia</i> (Meisn.) Schltr (Apocynaceae) DS813	E boung	Ropes for tying in huts and bridge construction
19	<i>Elaeis guineensis</i> Jacq (Arecaceae) DS622	Nghebebi	Weaving of baskets and fishing nests,
20	<i>Entandrophragma angolense</i> (Welw.) C.DC (Meliaceae) DS266	Nphie	Planks for construction and furniture.
21	<i>Eremospatha macrocarpa</i> (Mann & Wendl.) Wendl (Arecaceae) DS724	Nkeub	Ropes in huts and local bridge construction, weaving baskets, mats, fishing nests, musical instruments and local household utensils.
22	<i>Ficus asperifolia</i> Miq DS144	Ntob	Poles for construction of huts
23	<i>Girardinia diversifolia</i> (Link.) Friso. (Urticaceae) DS28	Meje	Robes for dress making and tying of other works of arts
24	<i>Lophira alata</i> Banks ex C.F.Gaertn (Ochnaceae) DS627	Nkhame	Planks for the construction of bridges.
25	<i>Markhamia lutea</i> (Benth.) K. Schum (Bignoniaceae) DS382	Berna	Poles for hut construction
26	<i>Markhamia tomentosa</i> (Benth.) K. Schum DS259	Berna	Poles for hut construction
27	<i>Morinda lucida</i> Benth. (Rubiaceae) DS517	Nfie	Planks for furniture
28	<i>Newbouldia laevis</i> (P. beauv) seem (Bignoniaceae) DS315	Kiete	Poles for hut and fence construction
29	<i>Parkia bicolor</i> A. Chev (Fabaceae) DS634		Planks for furniture and bridge construction
30	<i>Pentadesma butyracea</i> Sabine (Guttiferae) DS260	Ayene	Planks for construction
31	<i>Phoenix reclinata</i> Jacq. (Arecaceae) DS533	Mekeune	Leaves are used to weave mats, and thatches
32	<i>Piptadeniastrum africanum</i> (Hook.f.) Brenan (Fabaceae) DS713	Akubando	Planks for construction and furniture
33	<i>Polyscias fulva</i> J. R. & G. Forst. (Araliaceae) DS113	Nfeum	Carving of mortars
34	<i>Pterocarpus soyauxii</i> Taub (Fabaceae) DS159	Nbeu	Design of doors and furniture, drums, xylophones, mortars and works of arts like masks and artifacts.
35	<i>Pycnanthus angolensis</i> (Welw.) Warb. (Myristicaceae) DS50	Nsan	Planks for construction
36	<i>Raphia gentiliana</i> De Wild (Arecaceae) DS471	Magho	Leaves for weaving of thatches for roofing
37	<i>Salacia staudtii</i> Loes (Celastraceae) DS561	Tierna	Carving of walking sticks and drums
38	<i>Shirakiopsis ellipticum</i> (Hochst.) Esser	Aseune	Poles for hut construction and planks

	(Euphorbiaceae) DS401		
39	<i>Vepris loursii</i> Gilb. (Rutaceae) DS128	Keti	Carving of walking sticks
40	<i>Zanthoxylum tessmannii</i> Harms. (Rutaceae) DS305	Ndune	Use as a spice, planks for furniture and doors, and wood for drums, xylophones, mortars and works of arts like masks and artifacts.

Figure 2: Plant families and used categories

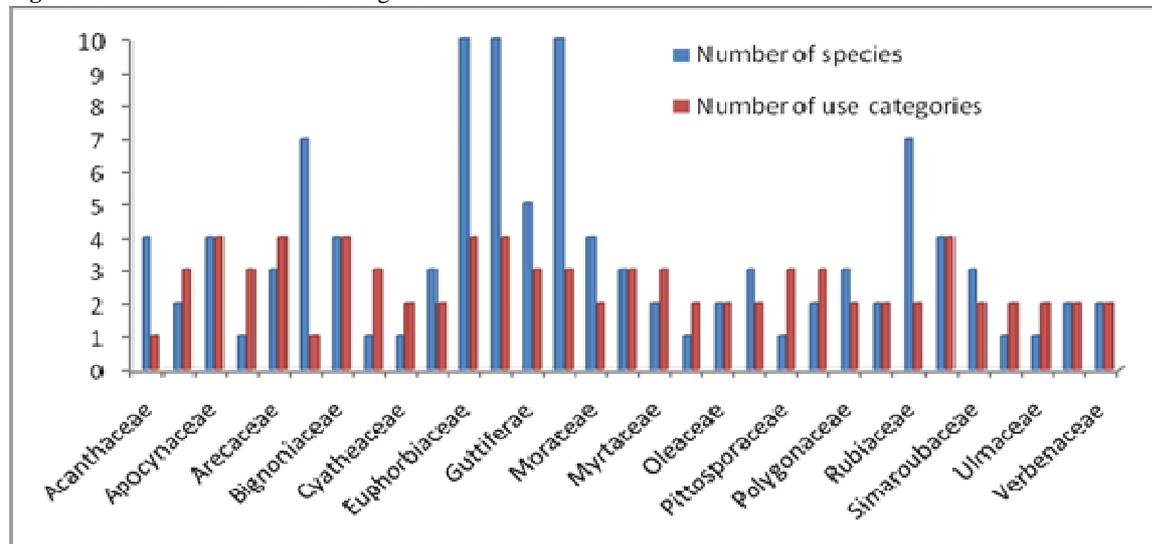


Figure 3: Percentages of plant parts used

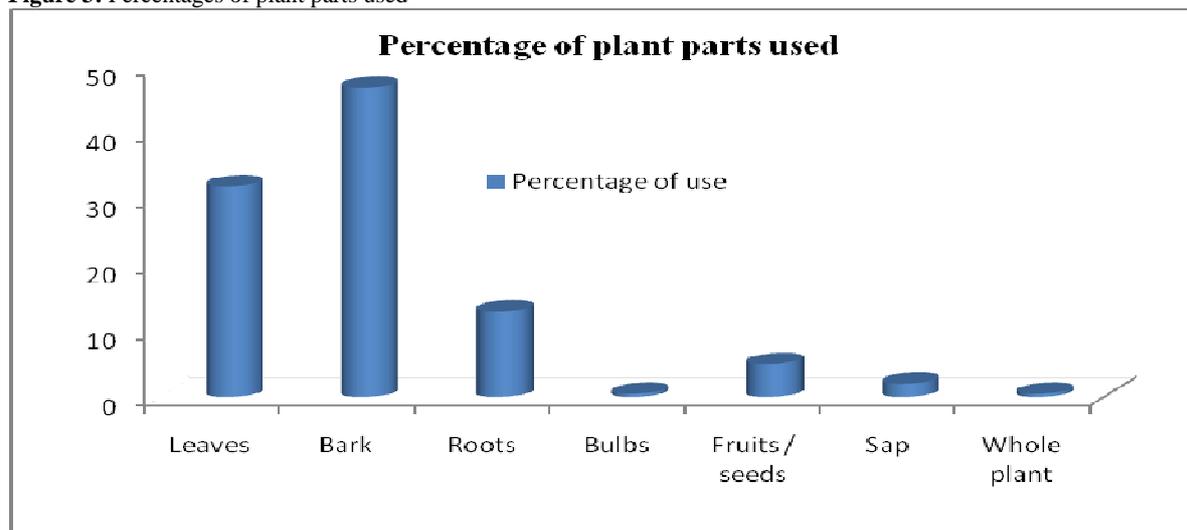


Figure 4: Status of plants used to manage different ailments

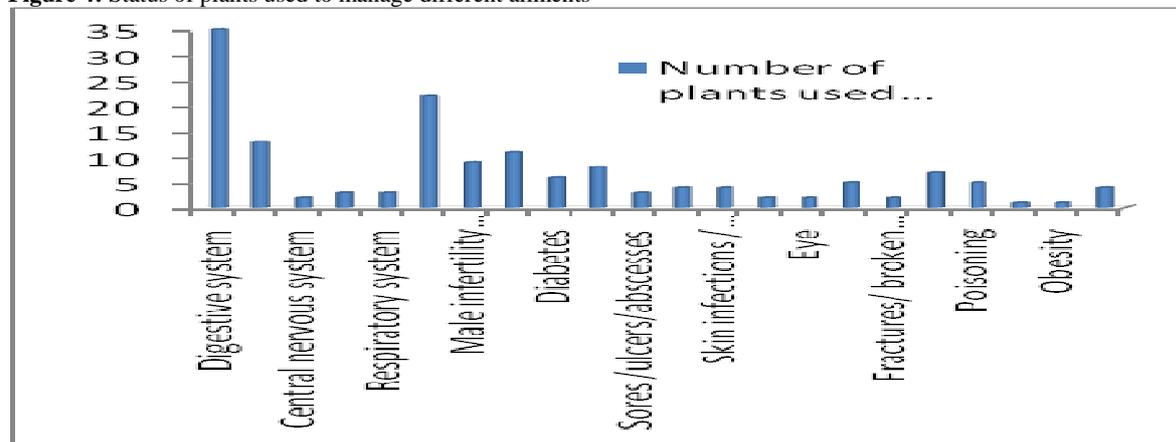


Figure 5: Status of plant life form in the study area

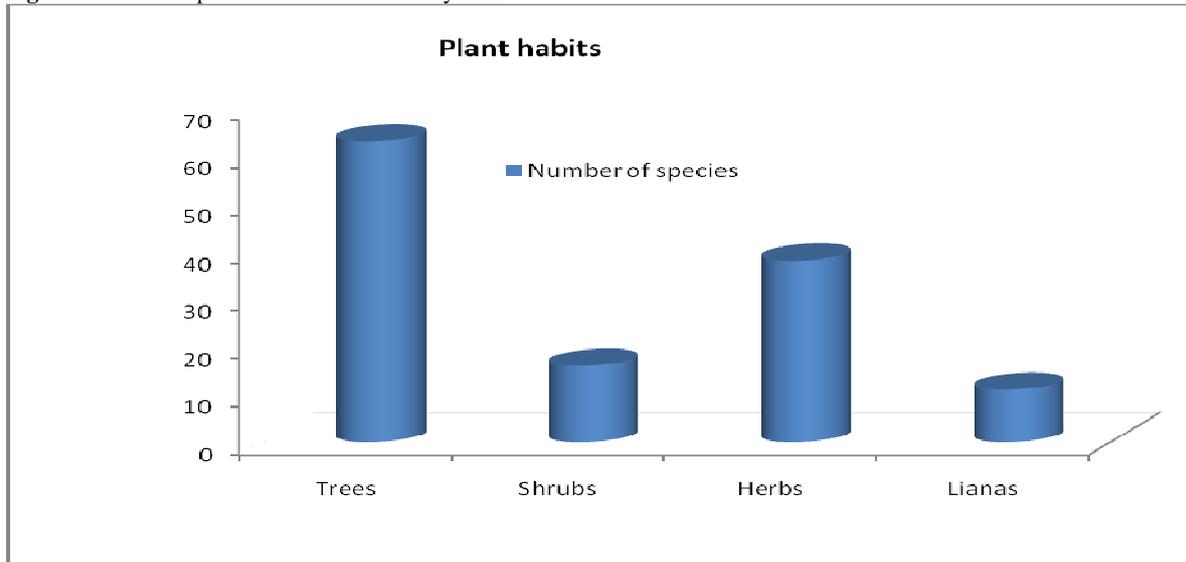


Figure 6: Status of modes of preparation of drug in the study area

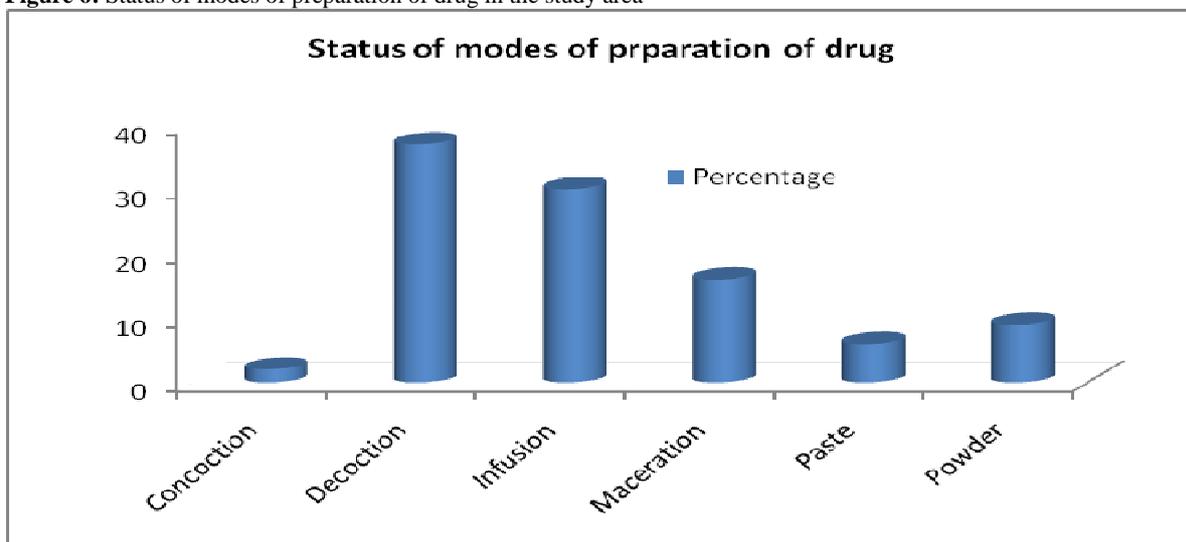
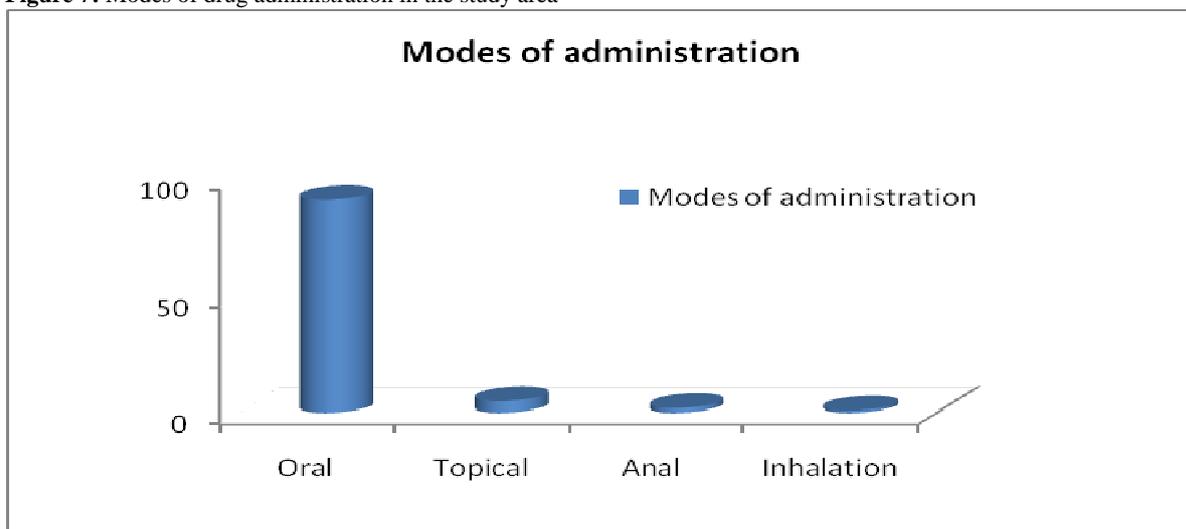


Figure 7: Modes of drug administration in the study area



4. Discussion

4.1 Traditional knowledge on medicinal plants

The Study revealed that the Mundani communities still hold a wealth of traditional knowledge on plant used as they exploit over 128 medicinal plants in their health care system. They are also dependent on the forest to meet various livelihood needs like house construction materials, production of musical instruments and household utensils, arts and craft. Most of the traditional healers and persons having folk knowledge were found to be above 35 years. Women of these communities have little knowledge on plant use. Indigenous knowledge has been transferred from generation to generation and in family lines. Some treatments were reputed to be done only by members of certain families. There was much secrecy involved in acquiring information from respondents coming from such families unless after financial motivation. It was also noted that the traditional healers, traditional birth attendants and midwives and other persons having folk knowledge don't keep records but pass on information only orally from generations to generation. The road network of the subdivision is being developed and this has resulted to the development of western lifestyle and also improves on agricultural activities in the region. Hence the youth (15 %) of this region are no longer interested in traditional use of plants and there is fear that this indigenous knowledge about traditional use of plants is dwindling and may be lost with time. This fear has also been reported by other authors like in the Lewoh-Lebang communities of Lebialem in Cameroon (Fonge et al., 2012), Aguambu-Bamumbu in Wabane (Lebialem) (Focho et al., 2009) and the Upper Nyong Valley in Cameroon (Jiofack et al., 2009).

4.2. Medicinal plants used to treat different diseases

One hundred and twenty eight plant species from 53 families were documented to be used by the Mundani people to meet various livelihood needs. Plants of the Asteraceae, Euphorbiaceae, Fabaceae and Apocynaceae were the most used families, because they contain a wide range of biologically active compounds and are some of the largest families in the plant kingdom (Heinrich et al., 1998). The plants were used to treat complex pathological disorders relating to gastro-intestinal diseases, cardiovascular, respiratory and nervous system ailments, and problems of the urinary system. The digestive system had the highest number of plants used for its treatment (35), followed by gynecological/ infertility (22), and urinary –genital system (11) while 11 plants were used to treat malaria, typhoid and yellow fever. The high prevalence of gastro-intestinal diseases may be due to the lack of portable water in the area

leading to the frequent occurrence of water borne diseases. In these rural communities where child birth is of primary importance, several plants were used to manage ailments related to the reproductive system. *Albizia zygia*, *Anchomanes difformis*, *Cylicodiscus gabunensis*, *Galium simense*, *Ternstroemia sp* and *Trichilia sp* that have been reported for the first time as medicinal plants in Cameroon were used to treat all forms of uterine inflammations in women like pelvic inflammatory disease, ovarian cyst, blockage of the fallopian tube and growth. Other plants like *Eremomastax speciosa*, *Asystasia gangetica*, *Ficus asperifolia* and *Justicia insularis* were used to treat protracted menstruation. Contious of the prevalence of HIV/AIDS opportunistic infections in the region like herpes zoster and chronic venereal infections plants including *Hypericum lanceolatum*, *Hypericum riparium*, and *Opuntia vulgaris* were used to manage them.

Most of the plants used by the Mundani people have been reported in other regions with similar or different uses; 14 species are used in Babungo (Simbo, 2010), 11 species are used in the Upper Nyong valley in Cameroon (Jiofack et al., 2009), 24 species in the neighboring Aguambu- Bamumbu (Focho et al., 2009) and only 8 species have been cited in lewoh-lebang in Lebialem (Fonge et al., 2010). Thirteen species were cited in kenya (Bussmann et al., 2009). The use of medicinal plants across cultures and a wider geographic regions has been discussed as prove validating their medicinal properties (Lelupal et al., 2008). *Rumex bequaertii*, *Raphia hookeri*, *Ilex metis*, *Hypericum riparium* and *Conyza aegyptiaca* have been reported for the first time as medicinal plants in Cameroon (Ajanohoun et al., 1998). The use of some of the plants as medicines has been validated by recent pharmacological research. The use of *Rauvolfia vomitoria* traditionally for treatment of high blood pressure has been confirmed by science indicating that it contains *reserpine* and *ajmalicine* which lowers blood pressure and slows down heart beat (Hostettmann et al., 2000). *Hypericum* species have been shown to contain *hypericin*, which has strong anti-viral properties and *Ternstroemiaceae* has been shown to contain a wide number of saponins, tannins, caffeine and fixed oils (Iwu, 1993). This explains the wide utilization of *Ternstroemia sp*, *Hypericum lanceolatum* and *Hypericum riparium* for the treatment of complex disease condition in the region of study.

There was variation in plant form used by the Mundani people depending on altitudinal changes and vegetation types. At high altitudes herbs were mostly employed and in the forest areas trees and shrubs were used. The high use of herbs in traditional medicine has been linked to their higher

likelihood of containing pharmacologically active compounds compared to woody plant forms (Thomas et al., 1998). Leaves (32 %) and bark (47 %) were most reported as plant parts used. The leaves and bark of plants have been reported to accumulate, inulins, tannins and other alkaloids (Okoegwale and Omezezi, 2001), which may be responsible for their medicinal properties, explaining their wide use. Other studies have reported the leaves as the most widely used plant parts (Focho et al., 2009a; Focho et al., 2009b and Fonge et al., 2010).

4.3. Indigenous classification of plants

There was remarkable indigenous classification of plants as almost all plants had a local name. Plants of the Apocynaceae had a similar indigenous name 'ntong' referring to the white sap that characterizes this family. Also, *Spilanthes filicaulis* was termed 'ng'hi-nko' meaning the chicken's eye which is characteristic of the flower. Also all herbs are termed 'mephe' while the trees are called 'ayite'. On the other hand, all plants of the *Salacia* genera were called 'tierna' irrespective of the species in the Mundani dialect.

4.4. Plant exploitation and conservation challenges

The use of the bark of *Prunus africana*, *Ternstroemia* sp, *Trichilia* sp, *Aguaria salicifolia*, *Annickia chloranta* and *Pittosporium viridiflorum* in local traditional medicine and exploitation for commercial purposes has caused some of the species to become rare or extinct from the wild. The bark of *Prunus africana* was once harvested and sold to PLATECAM, a company which exported the bark for the manufacture of drugs used to treat benign prostatic hyperplasia sold under the brand name 'Tadenan' (France) or 'Pygenil' (Italy) (Cunningham and Mbenkum, 1993). This plant has been listed on the IUCN red list of threatened species (IUCN, 2009) for conservation. *Ternstroemia* sp and *Trichilia* sp are species that are also overexploited for sale locally in neighboring markets and have been thought to be extinct (Tchiengue et al., 2010). These activities of large scale exploitation of tree barks have depleted these natural resources that were once the major vegetation cover in the region. In order to maintain sustainability, the people in this region should be educated on the sustainable collection of wild plant resources to enhance their use for the present and future generations.

Apart from their medicinal use, plants were also used for construction of houses, arts and technology or exploited for financial earnings. They include *Carapa grandifolia*, *Albizia adianthifolia*, *Entandrophragma angolense*, *Cylicodiscus gabunensis*, *Pentadesma butyracea*

and *Zanthoxylum tesmannii*. The over exploitation of some of these plants like *Cylicodiscus gabunensis* and *Lophira alata* for bridge construction in the region has led to scarcity. Also the collection of rattan (*Eremospatha macrocarpa*) for the weaving of baskets, fishing and kitchen utensil is hindering the regeneration of this important resource. Huts construction is a tradition of the Mundani people and require the over collection of *Ectadiopsis oblongifolia*, *Bambusa vulgaris* and *Beilschmiedia* sp putting these materials almost threatened. Leaves of *Raphia gentiliana* are also widely collected for making of thatches for roofing of houses and huts. The wild collection of roots of *Mondia whitei* and *Echinops giganteus* for food and medicine is also preventing them from resilience. The people must resort in the cultivation of these plants for sustainability in the near future. The plants whose seeds are collected seasonally have no threat from exploitation.

Conclusion

Based on the results obtained in this study, it is concluded that the Mundani people possess a wealth of traditional knowledge on use of plants for treating ailments and for other livelihood needs. This research also revealed some plants that are new to science and endemic to the Lebialem highlands like *Ternstroemia* sp (Nov) and *Trichilia* sp (Nov) that should be subjected to phytochemical screening and testing as a potential source of new plant drug. Since the Mundani people still rely on the collection of plants from the wild and in a destructive manner, they should be educated on environmental and sustainable exploitation methods of resources. There is therefore the need for the conservation of these species. However there should be indebt ethnobotanical survey of the entire region with the application of quantitative methods.

Research Highlights

The present study reveals that the Mundani people use 128 plants distributed in 119 genera belonging to 53 families in their health care system to treat several ailments in the area. These plants were used to treat diseases affecting all the major body systems ranging from reproductive, nervous, circulatory to the digestive and excretory systems. They also showed that, 40 plants had other ethnobotanical uses for livelihood needs in the region.

The results of this study confirm that the flora of this area is very diversified and consist of several endemic species like *Ternstroemia* sp (Nov) and *Trichilia* sp (Nov). Also *Rumex bequaertii*, *Raphia hookeri*, *Ilex metis*, *Hypericum riparium* and

Conyza aegyptiaca have been reported for the first time as medicinal plants in Cameroon.

There is fear that traditional knowledge on plant use in the region is dwindling due to western lifestyle and failure of the youths to practice the tradition.

Limitations

This research was limited only to qualitative investigation and documentation of plant use and quantitative ethnobotanical methodologies were not applied thereby failing to relate the plant use to species abundance and biodiversity conservation. The species listed as new to science and endemic to the region still have to be investigated systematically and their description and naming made to facilitate pharmacological analysis to validate their potency.

Recommendation

Quantitative ecological sampling methods should be applied to the collection of data on plant use.

Funding and policy aspects

Considering the difficulty to conduct extensive field surveys, exchange of and financial motivations required in ethnobotanical investigations, funding from government and private institutions can greatly substantiate research efforts and improve on the results obtained. Also, the continuous search for new aromatic flavors and bioactive plants can only be discovered if we have to venture in research of the wild and unexploited forests vegetation. This can be achieved only if funds are available for the necessary preparation and field investigation. Therefore funding for researchers in ethnobotany will be primordial to facilitate information gathering and stay in the field for improved and exploitable results.

Authors' Contribution and Competing interests

The authors declare that there is no competing interest in the study and all of them participated in the field survey and analysis of data.

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