

Short Communication: Diversity of medicinal plants used to treat human ailments in rural Bahir Dar, Ethiopia

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Abstract. Mazengia E, Beyene T, Tsegay BA. 2019. Short Communication: Diversity of medicinal plants used to treat human ailments in rural Bahir Dar, Ethiopia. *Asian J For* 3: 75-82. Survey of traditional medicinal plants used to treat human ailments by the rural community of Bahir Dar City Administration was conducted from November 23, 2017 to May 30, 2018 with the aim of identifying and documenting plants and the associated knowledge used to treat humans. We collected data from six study sites using semi-structured interviews, field observation and group discussion. Data analyses were made using preference ranking, direct matrix ranking and fidelity level index. A total of 77 medicinal plants were identified. The majority of plants (58.4%) were harvested from the wild. The largest number of plants were herbs (42.6%) followed by shrubs (32.6%). The most frequently used plant parts in human disease treatments were leaves (54%) followed by roots (18%). Most remedies were prepared by pounding and mixing (concoction) (36%). The remedial administration was mostly oral (51%) followed by dermal (31%). *Allium sativum* and *Ocimum lamifolium* were the most frequently used. The community in the study area used considerable diversity of plant species for maintaining their health care system. Nonetheless, conservation for those plants whose roots are harvested is necessary.

Keywords: Ethnobotany, ethnomedicine, *ex-situ*, *in-situ*, traditional healer, use value

INTRODUCTION

People have used plants for multiple purposes, i.e., as sources of food, medicines for human beings, livestock fodder, and as materials for household utensils, fuel, etc. Traditional medicine is culturally-based cure system different from modern (scientific) medicine and is usually considered as indigenous, alternative or folk medicine, which is largely transmitted by words of mouth from elders to the young generation (Martin 1995). Most people in the world (70-90 %) use herbal remedies as their primary healthcare system (Nair and Nathan 1998).

Ethiopia is endowed with a wide range of topographic features enabling it to have a variety of ecosystems. These varied ecosystems possess high diversity of flora and fauna which include good number of potentially useful medicinal plants (Abebe 1986; Seid and Tsegay 2011). Majority of Ethiopians (about 80%) use herbal medicine as their primary healthcare system (Giday 1999). However, high rate of land-use conversion (deforestation for agricultural land expansion), over-harvesting and/ or indiscriminate harvesting and unmanaged population growth with increasing demand and consumption are the principal problems that aggravate the rate of disappearance of medicinal plants from their habitat and the consequent loss of significant number of plant species (Seifu et al. 2006).

All culturally useful medicinal plants have not been surveyed and documented in Ethiopia. The traditional knowledge and practices around Bahir Dar City are part of

the non-surveyed ones. This study aimed to identify and document the medicinal plants used by the rural community of Bahir Dar and the associated knowledge used to treat humans. Such a study would be of paramount importance in conserving the plants and ensuring their sustainable use. Moreover, bequeathing the traditional knowledge to the next generation and developing it for new insights is necessary.

MATERIALS AND METHODS

Study location

Ethnomedicinal study was conducted in Bahir Dar rural *kebeles* (smallest administrative units in Ethiopia) (Figure1) from November 23, 2017 to May 30, 2018. Bahir Dar is located at 11°59' North latitude and 37°39' East longitude as determined from the city center. The elevation ranged from 1650 m.a.s.l at Tisabay to 2100 m.a.s.l at Meshenti. From the 26,295 hectares area of the rural *kebeles*, 19,969 hectares of the land is being cultivated (ANRS RLUM, 2018 personal communication). According to fourteen years' metrological data obtained from Bahir Dar city weather station, the study area received mean annual rainfall and temperature of 1423.2 mm and 27.5°C, respectively (ANRS RLUM, 2018 personal communication).

Informant selection

Six *kebeles* (small local administrative units) were selected purposely based on the availability of local healers as advised by community elders (Figure 1). Totally 72 informants, consisting of 35 men and 37 women, were selected for this study. Seven key informants, one from each *kebele* except 2 from TisAbay, were selected based on the advice from local authorities, traditional healers and local farmers. The remaining 65 general informants were randomly selected.

Ethnobotanical data collection

The primary data were collected directly from the informants in the study area by semi-structured interviews, group and individual-focused discussions, field visits and informal conversations. During group discussion, necessary information related to medicinal plants, mode of preparation, method of application, types of disease treated, plant parts used for preparation of remedies were documented to obtain detailed quantitative and qualitative data. The plants were identified using different volumes of “*Flora of Ethiopia and Eritrea*” (<https://www.nhbs.com/series/flora-of-ethiopia-and-eritrea>)

(Edwards et al. 2000; Hedberg and Edwards 1989, 1995; Hedberg et al. 1995, 1997, 2003, 2007, 2009a, 2009b; Tadesse. 2005), as well as Bekele-Tesemma (2007) and Dagne (2009). Online references were also used (Table 1).

Data analysis

Descriptive statistics (Microsoft Excel 2010) was used to analyze data. Information provided by respondents was determined using preference ranking, direct matrix ranking and fidelity level index following the method from Alexiades (1996) and Martin (1995).

RESULTS AND DISCUSSION

Most of the medicinal plants used by the traditional healers in rural *kebeles* of Bahir Dar are presented in Table 1. Seventy-seven (77) ethnomedicinal plant species belonging to 75 genera and 42 families were collected with the guidance of local healers. Out of the 77 species, 58.4% were from the wild and 27.3% were cultivated while 14.3% were both wild and cultivated.

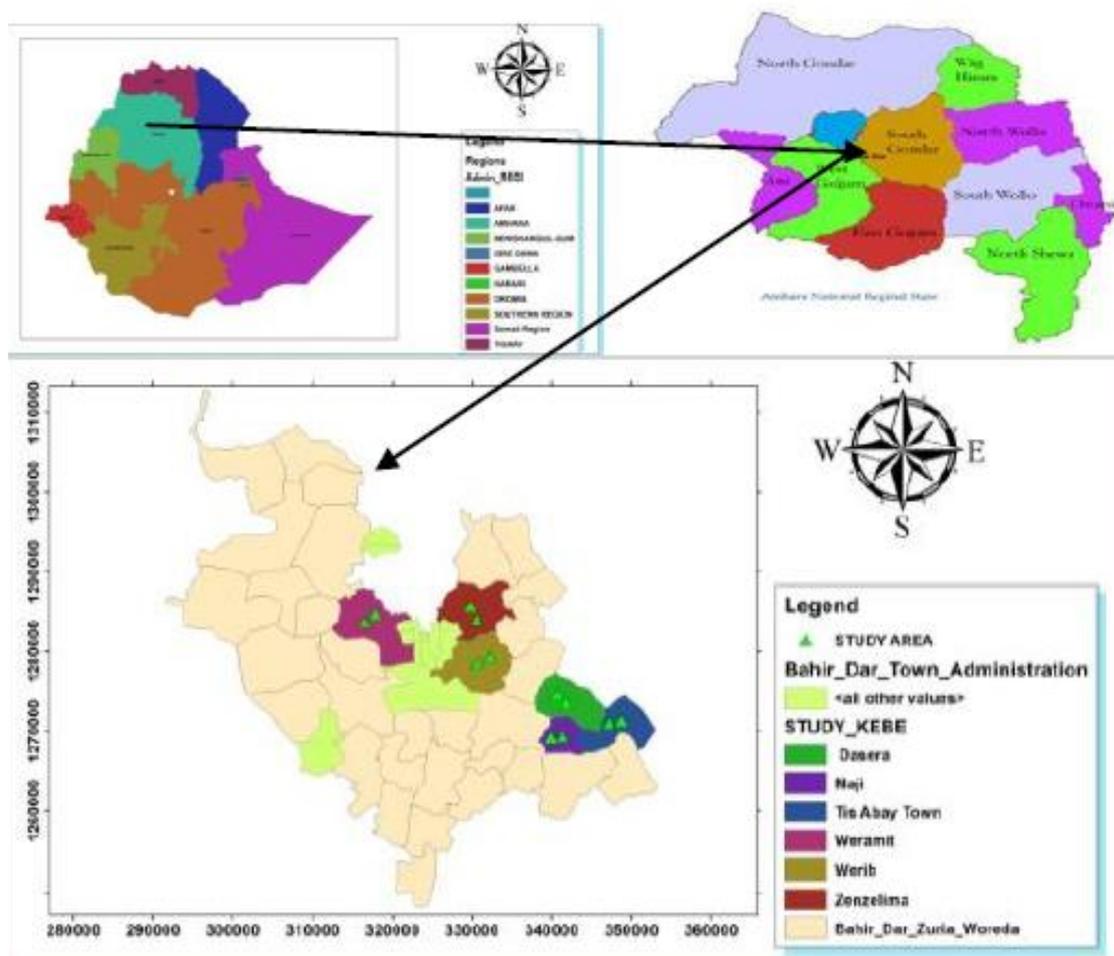


Figure 1. Map of the study area (drawn by Andargachew Baye, member of the GIS team, Amhara National Regional State, Ethiopia)

Table 1. List of major traditional medicinal plants used to treat human ailments in rural community of Bahir Dar City Administration, Ethiopia. In total there were 77 medicinal plants recorded.

Botanical and family name	Online reference	Local name (Amharic)	Ailment treated	Part used for preparation and their application as reported by healers.
<i>Achyranthes aspera</i> L. (Amaranthaceae)	https://keys.lucidcentral.org/keys/v3/eafrinet/weeds/key/weeds/Media/Html/Achyranthes_aspera_(Devils_Horsewhip).htm	Telenge	Hemorrhoids	The leaf is pounded, squeezed and then creamed on infected part.
<i>Allium cepa</i> L. (Alliaceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Allium+cepa+L.	Kei shinkurt	Stomach complaints, Cough	Pound the stem and mix with <i>A. sativum</i> , <i>R. chalepensis</i> and honey. Then eat them every morning until getting recovered.
<i>Allium sativum</i> L. (Liliaceae)	https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/allium-sativum	Nech shinkurt	Malaria	Pound, mix with <i>Cicer arietinum</i> for night long and eat them in the morning.
<i>Argemone mexicana</i> L. (Papaveraceae)	https://plants.usda.gov/core/profile?symbol=arme4	Yaheya eshoh	Wound	Apply the latex on the wound or use it as massage cream.
<i>Artemisia abyssinica</i> Shc. Bip. ex. A. Rich. (Asteraceae)	https://www.prota4u.org/database/protav8.asp?g=psk&p=Artemisia+abyssinica+Sch.Bip.+ex+A.Rich.	Chikugn	Stomach complaints (ache) with diarrhea	Dried leaf is ground & mixed with water and drunk.
<i>Arundo donax</i> L. (Poaceae)	https://www.invasive.org/browse/subinfo.cfm?sub=3009	Shenbeko	Rh factor “shotelay”	The root of <i>Arundo donax</i> is tied to neck.
<i>Brassica carinata</i> A. Braun (Brassicaceae)	http://www.africanplants.senckenberg.de/rot/index.php?page_id=78&id=3529#	Yabesha gomen	Placental retention (delay)	Roasted and grounded, then mixed with leaf juice of <i>Ziziphus spina-christi</i> in hot water. Then drink or place it in vagina.
<i>Brucea antidysenterica</i> J.F. Mill. (Simaroubaceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Brucea+antidysenterica+J.F.Mill.	Waginose	Wound	The leaf of <i>Brucea antidysenterica</i> is pounded, squeezed and then creamed on wounded part until getting recovered.
<i>Carica papaya</i> L. (Caricaceae)	https://florafaunaweb.nparks.gov.sg/Special-Pages/plant-detail.aspx?id=2785	Papaye	Swelling	Split the fruit and remove seeds and their content. Use the pulp as massage cream on the infected body part
<i>Carissa spinarum</i> L. (Apocynaceae)	https://www.gbif.org/species/5536282	Agam	Devil disease	Boil fruit and mix with roots of <i>P. schimperi</i> , <i>C. macrostachyus</i> & <i>A. schimperiana</i> and drink the suspension.
<i>Catha edulis</i> (Vahl) Forssk. ex Endl. (Celastraceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Catha+edulis+(Vahl)+Forssk.+ex+Endl.	Chat	Asthma/Coughing	The leaf powder is mixed with melted butter and drink it in the morning until getting recovered.
<i>Chenopodium ambrosioides</i> (Chenopodiaceae)	http://bioweb.uwlax.edu/bio203/2011/mccarthy_mega/Medicinal_uses.htm	Amedmado	Infection on swelling	Pounded plant is mixed with <i>Datura stramonium</i> L & <i>Kalanchoe</i> sp and bandages them on the swelling.
<i>Coffea arabica</i> L. (Rubiaceae)	http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:747038-1	Buna	Wound sore	The seed is roasted & pounded (powdered) and put on the wound until it is healed.
<i>Croton macrostachyus</i> Hochst. ex Delile (Euphorbiaceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Croton+macrostachyus+Hochst.+ex+Delile	Bisana	Face fungus (<i>Tinea faiei</i>)	Mixed leaf extract with <i>A. sativum</i> & honey. Then apply it on the infected body.
<i>Cucurbita pepo</i> L. (Cucurbitaceae)	http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:292416-1	Duba	Tape warm	Powdered seed is mixed with butter and eaten

<i>Cyathula polycephala</i> Beker (Amaranthaceae)	http://www.villegge.ch/musinfo/bd/cjb/africa/details.php?langue=an&id=34	Chegogot	Skin rash (“chiffee”)	The leaf of <i>Cyathula polycephala</i> is crushed, squeezed and the pure solution is applied to affected body part until getting recovered
<i>Dovyalis abyssinica</i> A.Rich. (Salcaiaceae)	https://www.pfaf.org/user/Plant.aspx?LatinName=Dovyalis+abyssinica	Koshm	Abdominal pain	Eat six to ten fruits
<i>Embelia schimperi</i> Vatke (Myrsinaceae)	http://www.westafricanplants.senckenberg.de/root/index.php?page_id=14&id=3116	Inkoko	Tapeworm	drink water with powdered seed
<i>Euphorbia ampliphylla</i> L. (Euphorbiaceae)	WCSP (World Checklist of Selected Plant Families)	Qulquale	STDs	The drop of latex is collected, mixed with <i>Eragrostis teff</i> powdered and backed and then eaten before any food for 3 days
<i>Foeniculum vulgare</i> Miller (Apiaceae)	https://www.hindawi.com/journals/bmri/2014/842674/	Inslal	Gonorrhoea	Leaf is mixed with <i>Lepidium sativum</i> (seed) and eaten.
<i>Justicia schimperiana</i> (Hochst.ex A. Nees)T.Ander (Acanthaceae)	http://www.africanplants.senckenberg.de/root/index.php?page_id=78&id=5715	Smiza	kuruba’ stomach ache	The leaf is crushed and drink the leaf latex
<i>Kalanchoe petitiiana</i> A.Rich (Crassulaceae)	http://www.africanplants.senckenberg.de/root/index.php?page_id=78&id=5657	Endehula	‘Ebach’(lymphadenopathy)	head leaf dressing on the infected part until the tumor is removed
<i>Len scularis</i> Medik (Fabaceae)	http://eol.org/pages/647510/overview	Misir	Diabetes	Eat the seed of <i>Len scularis</i> in the morning
<i>Lepidium sativum</i> L. (Cruciferae)	http://www.tela-botanica.org/bdtfx-nn-75217-synthese	Feto	Stomach complaints	Ground seed is mixed with water and then eat
<i>Linum usitatissimum</i> L. (Linaceae)	http://swbiodiversity.org/seinet/taxa/index.php?taxon=2472	Telba	Retained placenta	The seed of <i>Linum usitatissimum</i> is mixed with water and boiled and then drink the solution after being cooled.
<i>Lonchocarpus laxiflorus</i> Guill.Perr (Leguminosae)	http://www.westafricanplants.senckenberg.de/root/index.php?page_id=14&id=1989	Amera	Diabetes	Boil a leaf and drink it without sugar
<i>Lycopersicon esculentum</i> Mill. (Solanaceae)	http://www.theplantlist.org/tpl/record/tro-29602513	Timatim	Eye disease	The seed of <i>Lycopersiconesculentum</i> is eaten
<i>Mentha x piperita</i> L. (Labiatae)	https://www.avogel.ch/en/plant-encyclopaedia/mentha_x_piperita.php	Nana	Diarrhea	Pound the leaf and mix with <i>A. sativum</i> , <i>R. chalepensis</i> , and drink them
<i>Moringa oleifera</i> L. (Moringaceae)	http://www.africanplants.senckenberg.de/root/index.php?page_id=78&id=1115#image=57870	Shefrahu	Tumor	Pound the leaf and apply on the tumor
<i>Optica ficus-indica</i> (L) Mill. (Moraceae)	http://www.theplantlist.org/tpl1.1/record/ke-w-2391911	Beles	Ringworm (<i>Tinea corporis</i>)	Add leaf secretion on the infected skin
<i>Otostegiaint egrifilia</i> Benth. (Lamiaceae)	https://botany.cz/cs/rydingia-integrifolia/	Tinjute	Stomach-ache	Juice the leaf with water and drink it
<i>Phytolacca dodecandra</i> L. (Phytolaccaceae)	http://tropical.theferns.info/viewtropical.php?id=Phytolacca+dodecandra	Endod	Miscarriage (abortion of unwanted pregnancy)	Pound, squeeze and mix with water then drink it
<i>Piper nigra</i> L. (Piperaceae)	http://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:682369-1	Qundoberbere	Stomach complaints	Pound the seed and mix with <i>N.sativa</i> , <i>Z.officinalis</i> , <i>R. chalepensis</i> & <i>A.sativum</i> ; then leave for 7 days and eat every morning during pain

<i>Podocarpus falcatus</i> (Thunb) R.Br.ex Mirb. (Podocarpaceae)	http://pza.sanbi.org/podocarpus-falcatus	Zegba	Sudden sickness	The leaf of <i>Podocarpus falcatus</i> is squeezed and drink it
<i>Rhamnus prinoides</i> L Her (Rhamnaceae)	http://pza.sanbi.org/rhamnus-prinoides	Gesho	Tonsillitis	Pound the seed mix with <i>Artemisia rehan</i> then squeeze and drink it
<i>Ricinus communis</i> L. (Euphorbiaceae)	https://plants.usda.gov/core/profile?symbol=rico3	Gulo	Amoeba	Dried seed is chewed during stomach ache
<i>Rumex abyssinica</i> Jacq. (Polygonaceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Rumex+abyssinicus+Jacq.	Mekmeko	'Dembizat' (Hypertension)	The leaf powder is boiled with water and drink the juice
<i>Rumex nervosus</i> Vahl. (Polygonaceae)	https://www.prota4u.org/database/protav8.asp?g=psk&p=Rumex+nervosus+Vahl	Embuacho	Hepatitis	A leaf is pounded & boiled and drink a cup of it before breakfast
<i>Ruta chalepensis</i> L. (Rutaceae)	http://www.maltawildplants.com/RUTA/Ruta_chalepensis.php	Tenadam	Stroke (Syncope) or Cerebral hypoxia	The leaf is pounded or ground, mix it with water and drink it every morning
<i>Senna singueana</i> Deal Lock (Fabaceae)	https://www.researchgate.net/figure/Photographs-of-Senna-singueana-Del-Lock-Fabaceae-and-the-collected-leaves_fig2_273791660	Gufa	Swelling	Dried leaf, stem, root, bark powder are mixed with butter and applied on swelling part
<i>Sida tenuicarpa</i> Vollesen (Malvaceae)	https://botany.cz/cs/sida-tenuicarpa/	Chifrig	Erectile dysfunction	Boil leaf, mix with <i>N. Sativa</i> & leaf of <i>Withania</i> sp., <i>A. Sativum</i> & honey and eat the mixture at a time of necessity
<i>Sida rhombifolia</i> L. (Malvaceae)	https://keyserver.lucidcentral.org/weeds/data/media/Html/sida_rhombifolia.htm	Gorgegit	Wound	Leaf paste is applied on skin diseases and wound; as anti-inflammatory
<i>Solanum dasyphyllum</i> Schumach & Thonn. (Solanaceae)	http://www.westafricanplants.senckenberg.de/root/index.php?page_id=14&id=2608	Embuay	Physical damage	The root is crushed, squeezed, and mix it with water and drink the suspension
<i>Thymus schemperi</i> Ronniger. (Lamiaceae)	http://www.africanplants.senckenberg.de/root/index.php?page_id=78&id=4789	Tosign	Cough	Boiled in water and drink it like tea until the symptom is recovered
<i>Tragia cinerea</i> (pax) M.G.Gillbert & Radcl.-SM. (Euphorbiaceae)	http://www.tropicos.org/Name/12806195?tab=images	Aleblabet	Evel eye	Dried or fresh root is consumed orally
<i>Trigonella foenum-graecum</i> L. (Leguminosae)	http://flora.org.il/en/plants/TRIFOE/	Abish	Diabetic	Dried seed is ground & mixed with water and drink the suspension in the morning.
<i>Triumfetta pilosa</i> Roth. (Tiliaceae)	https://www.prota4u.org/database/protav8.asp?g=pe&p=Triumfetta+pilosa+Roth	Shemgegit	Evel Eye	Seeds are worn by women as necklace to prevent evil attack
<i>Urtica simensis</i> Host. ex Steudel (Urticaceae)	https://plants.jstor.org/stable/history/10.5555/al.ap.specimen.hal011_0249	Sama	Heart failure	Fresh leaf, stem vapor is used nasally to fumigate the whole body
<i>Vernonia amygdalina</i> Del. (Asteraceae)	https://www.yumpu.com/en/document/view/41885798/vernonia-amygdalina-asteraceae-del-world-agroforestry-centre/2	Girawa	Ascariasis	Eating the crushed leaf when the disease occurred
<i>Withania somnifera</i> (L) Dunal (Solanaceae)	http://flora.org.il/en/plants/WITSOM/	Gizawa	Babies Disease	Bathing with crushed leaf
<i>Zingiber officinale</i> Rosc. (Zingiberaceae)	http://www.globinmed.com/index.php?option=com_content&view=article&id=102052:zingiber-officinale-rosc&catid=209&Itemid=143	Zinjibile	Common cold	Pounding & boiling the rhizome and drink it like drinking tea

Among all plants recorded, Fabaceae was the most dominant family containing 8 species (10.4%) followed by Euphorbiaceae (6 species (7.7%), Liliaceae (6.5%) and Asteraceae (4 species (5.2%), respectively. In terms of plant habitus, the majority (42.8%) was herbs followed by shrubs (32.6%), trees (20.8%) and climbers (3.8%).

Parts and conditions of medicinal plants used

Results revealed that the greatest proportion used as medicine are leaves (54%) followed by roots (18%). Other parts include seeds (16%), latex (7%), stem/bark (3%) and whole plant (2%). The majority of medicinal plants are harvested from wild vegetation that indirectly shows the presence of high pressure on wild vegetation. Wild vegetation is the source of medicinal plants in many places of Ethiopia as shown by Giday (1999) and Amenu (2007) in Lake Ziway and Ejaji areas, respectively.

Method of remedy preparation and application

Traditional healers in the study area used various types of preparations in which pounding/pulverizing (36%) is the major type followed by cooking (14%), squeezing (10%), chewing (7%) and others (33%). Preparations were administered by different routes: oral (51%) dermal (31%), nasal (9%), eustachian (2%), ocular (1%) and fumigation (6%) based on the type of the disease.

Fidelity Level (FL) of medicinal plants

Medicinal efficacy of a species was determined by calculating fidelity level index. In this study, *Pterolobium stellatum* and *Echinops kebercho* have high medicinal value against Evil eye and Devil disease, respectively (Table 2). *Withania somenifera* is reported by 54% of informants, with FL value of 0.50 is found to be the second species next to *Pterolobium stellatum* (FL=0.80) used in the medication of Evil eye.

Preference and direct matrix rankings

Different plant species are used for the treatment of different ailments. In such cases, local people showed preference towards plant species on the basis of their healing power against a given disease. Key informants

were asked to show their preference from eight selected plant species on the basis of treating several diseases and they showed that *Allium sativum* is the most preferred one followed by *Ruta chalepensis* (Table 3).

Medicinal plant species that have multiple purposes could be screened using direct matrix. In this study, ten multipurpose species were selected out of the total medicinal plants and eight use-categories were listed for 7 selected key informants to assign use values to each species. The informants listed *Cordia africana* to be highly used by local community for multiple purposes. *Juniperus procera*, *Ficus carica*, and *Carissa spinarum* stood at 2nd, 3rd and 4th position, respectively (Table 4). However, the unsustainable use of these plant species for multiple uses made them scarce in the locality.

Major human diseases and corresponding number of plant species used

In the study area, a total of 36 human diseases and health defects (like injuries) are documented. Of these, 30 ailments (83%) are treated using two or more medicinal plant species while 6 ailments (17%) are treated using only one plant species (Table 5). Treatment of ailments by more than a single species was reported by researchers in some parts of Ethiopia (Amenu 2007).

Table 2. Fidelity level index for plant species used to treat Evil eye and Devil disease in the study area

Ailments	% of informants	Species	Np	N	Fidelity index (Np/N)
Evil eye	54	<i>Withania somenifera</i>	18	36	0.5
	9	<i>Pterolobium stellatum</i>	5	6	0.8
	6	<i>Triumfetta pilosa</i>	1	4	0.25
	7	<i>Tragia cenera</i>	1	5	0.20
Devil disease	42	<i>Capparis tomentosa</i>	12	28	0.43
	9	<i>Echinops kebercho</i>	3	6	0.50
	9	<i>Rosa abyssinica</i>	1	6	0.20

Table 3. Preference ranking of eight selected medicinal plants on the degree of healing several ailments by key respondents

Species	Family	Respondents							Total	Rank
		A	B	C	D	E	F	G		
<i>Allium sativum</i>	Liliaceae	8	8	7	7	6	7	7	50	1
<i>Ruta chalepensis</i>	Rutaceae	8	8	6	6	7	6	8	49	2
<i>Nigella sativa</i>	Ranunculaceae	8	7	5	7	6	5	7	45	3
<i>Zingiber officinale</i>	Zingiberaceae	8	6	3	6	4	5	6	38	4
<i>Clusia abyssinica</i>	Euphorbiaceae	7	6	4	5	3	5	6	36	5
<i>Euphorbia ampliphylla</i>	Euphorbiaceae	6	6	2	4	2	5	5	30	6
<i>Rumex nervosus</i>	Polygonaceae	4	4	3	4	3	4	4	26	7
<i>Carica papaya</i>	Caricaceae	3	3	2	4	2	2	4	20	8

Note: A-G: key respondents

Table 4. Direct matrix analysis of selected medicinal plants based on a general use-value

Species	Use-category									Rank
	Medicine	Food	Fencing	Forage	Firewood	Charcoal	Construction	Furniture	Total	
<i>Acacia abyssinica</i>	3	0	4	1	4	3	1	0	16	6 th
<i>Croton macrostachyus</i>	4	0	3	2	3	0	3	3	15	7 th
<i>Piper nigrum</i>	4	0	3	1	3	0	3	3	17	5 th
<i>Arundo donax</i>	4	0	0	2	1	0	0	3	10	9 th
<i>Pterolobium stellatum</i>	4	0	3	2	0	0	0	0	9	10 th
<i>Ocimum lamiiifolium</i>	4	0	2	1	3	1	1	0	12	8 th
<i>Cordia africana</i>	4	2	1	3	3	3	3	5	24	1 st
<i>Ficus carica</i>	4	0	2	3	3	2	3	3	20	3 rd
<i>Carissa spinarum</i>	3	3	4	3	3	2	1	0	19	4 th
<i>Juniperus procera</i>	4	0	4	1	4	1	4	4	22	2 nd

Table 5. Lists of major human diseases and the corresponding medicinal plant species used by rural people of Bahir Dar

Diseases (injuries)	Medicinal plants (number)	Diseases (injuries)	Medicinal plants (number)
Stomach complaints	17	Swelling	4
Devil' disease	7	Tonsillitis	2
Diarrhea	4	Ascariis	2
Eczema	4	Miscarriage (abortion)	1
Hepatitis	4	Infection on swelling	1
Hair fungus	2	Heart disease	1
Febrile (fever)	2	Diabetic	7
Malaria	8	STDS	2
Hemorrhoid	4	Broken leg/hand	3
'Evil eye'	7	Eye disease	2
Erectile dysfunction (Impotence)	3	Sudden sickness	4
Cancer	3	Skin rash	4
Snake biting and scorpion bite	1	Face fungus	2
Ringworm	3	Boil	1
Cough	4	Allergic	1
Wound sore	6	Common cold	5
Headache	4	Tumor	4
Placental retention (delay)	4	Hypertension	2

In conclusion, this study revealed the use of medicinal plants by rural community of Bahir Dar City for maintaining their primary health care. The use of herbals has been an age-long practice in the area. Despite their irreplaceable use, the future existence of medicinal plants resource and the associated knowledge is under question because of the ongoing practice of urbanization, deforestation, agricultural encroachment, overgrazing and overexploitation. So, *in-situ* and *ex-situ* conservation strategies of medicinal plants should be adopted and implemented by training the practitioners. The local government should organize medicinal practitioners in association(s) in such a way that their valuable knowledge can be used along with modern medicine.

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