Ethnobotanical Study of Medicinal Plants in Borecha Woreda,Buno Bedele Zone, Southwestern Ethiopia

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Abstract: *In Ethiopia the use of medicinal plants as traditional medicine to treat human and livestock disease has been started from the ancient period. An ethnobotanical study was conducted from January to May 2016. Semi-structured interviews, field observations, focus group discussion and various ranking and comparison methods were employed. Data was collected from 91(85 M and 6F) informants. These included 15 key informants and 76 randomly selected other informants from households. Collected data entered into MS- Excel and quantitative data were summarized using descriptive statistical methods such as frequency and percentages and the rest qualitative data were narrated. Eighty one plant species representing 75 genera and 42 families were collected. The most plant species were belong to family Fabaceae 9 (11.1%) followed by Lamiaceae 7 (8.6%) and Asteraceae 5 (6.2%). Most of the species 62(76.5%) were collected from the wild followed by home gardens15 (18.5%). Thirty one (38.3%) which constituted the highest number were shrubs followed by trees 26 (32.1%) and herbs 17 (20.9%). Leaves were the most commonly used part of the medicinal plants 30 (37%) followed by barks 15 (18.5%) and roots 12 (14.8%). Sixty nine (85.2%) plant species were mentioned for the treatment of 30 human diseases, 4 (5%) species were used to treat 4 livestock diseasesand10 (12.3%) species for both human and livestock disease treatment. The most common method of preparation of medicine was pounding and mixing 42 (51.9%) and the common route of administration was oral 52 (64.2%). Irythrina abyssinicawas highly preferred for treating wound and Cordia africana was the top multipurpose medicinal plant species. Agricultural expansion, cutting of trees for different purposes wildfire and settlement were threat to medicinal plants.Awareness creation campaign, traditional medicine knowledge transfer by healers, conserving medicinal plants in their natural habitat and home garden are conservation strategy of medicinal plants for sustainable use.*

Keywords: Ethnobotany, medicinal plant, traditional healers, traditional medicine

1. Introduction

Ethnobotany is the study of direct interrelation between human and plants [1]. It is also described as a unit of ecological study specializing in the interaction of people and the plant world [2]. The focus of ethnobotany is on how plants have been or are used, managed and perceived in human societies and includes plants used for food, medicinal, rituals, social life and others. The relationship between plants and human cultures is not limited to the use of plants for food, clothing and shelter but also includes their use for religious ceremonies, ornamentation and health care [3]. Plants have always played a major role in treatment of human traumas and diseases worldwide [4].

The population living in Sub-Saharan Africa continues to suffer from infectious as well as non-infectious and deficiency diseases [5]. Because of these and other problems, a large number of people of Africa die daily of preventable and curable diseases due to the lack of simple primary health care [6].The ratio of medical doctors to patients in Africa is not fair; in Ethiopia, for example, there is one doctor to 33,000 patients and in Malawi one doctor to 50,000 patients [7]. Because of this, human beings use different plant species known in ancient traditional medicine instead. Traditional medicine has been applied by humans for the healing of different diseases since a long time before the beginning of conventional medicine and up to this time serves the health care needs of the majority of the people of Africa [8].

Thus, traditional medicine remains popular for both historical and cultural reasons. It is estimated that 80% of the African people depend on traditional medicine to meet up their care needs [9]. Like other parts of sub-Saharan countries, 70% of human and 90% of livestock population of Ethiopia rely on traditional medicine for primary health care [10]. In addition to the lack of availability of modern medicine, there are also culturally linked traditions. The communities have trust in the medicinal values of traditional medicine which can also be obtained at a relatively low cost as compared to the modern ones [11].

Estimated floras of 6500 to 7000 species of higher plants are of medically important and out of these medicinal plants 12% are endemic to Ethiopia [12]. The traditional knowledge in Ethiopia is passed verbally from generation to generation and valuable information can be lost whenever a traditional medical practitioner passes without conveying his traditional medicinal plants knowledge [13]. In addition, the loss of valuable medicinal plants due to population pressure, agricultural expansion and deforestation is widely reported by different workers [14]. As a result, the need to perform ethnobotanical researches and to document the medicinal plants and the associated indigenous knowledge must be an urgent task [15]. The majority of the population that lives in the rural and the poor people in urban areas rely mainly on traditional medicines to meet their primary health care needs. However, the traditional knowledge of medicinal plant in Ethiopia is not compiled [16, 17].Traditional medical knowledge of medicinal plants and their use by indigenous cultures are not only useful for conservation of cultural traditions and biodiversity, but also healthcare and drug development in the present and future [18]. The studies conducted on the traditional medicinal plants in Ethiopia are very limited when compared with the multiethnic cultural

diversity and the diverse flora of Ethiopia [19].In Ethiopia, ethnobotanical studies of medicinal plants have been reported from different part of the country. For instance, from eastern part by [20, 21], from western Ethiopia by [22],fromnorthern part of the county by [23] and fromsouthern Ethiopia by [24]. Even though traditional knowledge of medicinal plants is very crucial to treat different diseases of human being and livestock, there is no study conducted in Borecha Woreda. Hence, the present study was designed to identify and document medicinal plant species and traditional medicinal knowledge of the traditional health practitioners in study area.

2. Materials and Methods

Description of the study area
Borecha woreda is one of the eleven woredas of Buno Bedele Zone, which is found in Oromia regional state, southwest Ethiopia. It is located between 7^0 9' to 8^0 15' North latitude and 37^0 5' to 40^0 00' East longitude, at an altitude of 1392 - 2580m. a. s. l. and has a distance of 507km from Addis Ababa. Borecha isbordered by Didessa woreda to eastern, Bedele woreda to western, Jimma Zone to Northern, and Gechi woreda to southern.

The long-term weather information (2010-2015) revealed that the area has a unimodal rainfall pattern, and has 1360 mm mean annual rain fall. The rainy season covers April to September, and maximum rain received in the months of June, July and August. The woreda has moist and warm to hot climate, the mean minimum and mean maximum air temperature is 13.6°c, 28.9°c respectively. It has three agro ecological zones; among 33 kebeles of the woreda, 2 kebeles are Dega, 20 kebeles are woyinadega and 11 kebeles are kola (Borecha Woreda Agricultural Rural Development office, 2016).

The woreda has total population of 104,712 (64350 M and 40362 F), the community is native to the woreda except population of 7 out of 33 kebeles who are settlers from east and west Hararge Zone. The main socio-economic activities of the local communities of the woreda is mixed farming, these are cultivation of staple crops (maize and sorghum), oil crops (Groundnut and Sesame), cereal crops (Wheat, Barley, Teff, Bea Pea), cash crop (coffee), Bee keeping and animal rearing. The study kebeles (Yanfa, Dana Teko and Goljo kebeles) are among 33 kebeles found in Borecha woreda and their agro ecology is Dega, woyinadega and kola respectively.

Based on the information gathered by a preliminary survey, three kebeles (study sites) were purposefully selected for collection of ethnobotanical data. These three study sites were Yanfa, Dana Teko and Goljo. The sites were selected based on the availability of traditional healers.

Selection of informants
For the ethnobotanical study the key informants were traditional healers. Thus,based on reconnaissance survey the healers in each study site (Yanfa 3 M and 1 F, Dana Teko 5 M and Goljo 6 M, totally 15 healers) were selected. These healers were selected purposively due to their traditional medicine knowledge. The other informants other than

healers (71 M and 5F = 76) above age 20 years were selected randomly by lottery method from the local people. Generally, 91 (85 M and 6 F) informants were samples of the study.

Determining sample size
In order to collect ethnobotanical data, men and women household informants with different age were selected from three kebeles, and the sample size was determined using Cochran's sample size formula as indicated by Bartlett *et al.*, [25].

$$n = \frac{N}{1 + N * (e)^2}$$

where *n* is the sample size of the research, *N* is the total number of households in the woreda (18624), e is the maximum variability of making error 5% (0.05), and 1 is the probability of event occurring.

$$n = 18624/1+18624(0.05)^2$$

n=392 which is based on the total number of households of the woreda. Therefore, the sample size for each kebele was calculated using the proportion of the number of households in each kebele to the total number of the household in the woreda (Table 1).

Table 1: Number of informants of the study area

Kebele	Total households	Key informants			Other informants			Total
		M	F	Total	M	F	Total	
Yanfa	3409	3	1	4	65	3	68	72
Dana Teko	533	5	-	5	5	1	6	11
Goljo	381	6	-	6	1	1	2	8
Total	4323	14	1	15	71	5	76	91

Data collection instruments
Ethnobotanical data were collected from January to May 2016 through semi-structured interviews, field observation, guided field walk, and focus group discussion.

Semi-structured interview
The semi-structured interview questions were prepared beforehand in English language and translated into Afan oromo that is the mother language of the informants. Semi-structured interviews were employed to obtain ethnobotanical information such as medicinal plants common names, sources, parts used, condition in which it used, growth habit, methods of preparation, dosage, disease (human, livestock or both) that treated by traditional medicine and status of medicinal plants.

Group discussions
Group discussions were made with five to seven informants at each study site that comprises knowledgeable traditional healers in order to collect information about the knowledge transfer, status, threats and conservation activities of medicinal plants after checklist of questions prepared beforehand in English and translated to Afan oromo language.

Guided field walk
Guided field interview were carried out with the assistance of local guides and key informants and all relevant data including the vernacular names of medicinal plants, growth

habit, source of the plants, the parts used and to gather medicinal plant specimens in the study sites.

Medicinal plant specimen collection and identification
During the field investigation, plants with medicinal value were collected from home gardens, wild and farmland areas. Essential information such as local name and habit of growth was recorded. For medicinal plant identification, the Flora of Ethiopia and Eritrea [26-30] was used. The accuracy of the identifications was confirmed by the comparison with the deposited authenticated specimens from Addis Ababa University Herbarium and by the help of taxonomists.

Data Analysis
The collected ethnobotanical data were analyzed both qualitatively and quantitatively. Data entered into MS- Excel and quantitative data were summarized using descriptive statistical methods such as frequency and percentages and presented by tables and figures. The rest qualitative data were narrated.

Informant consensus
In order to evaluate the reliability of information during the interview, informants were contacted at least 2-3 times for the same ideas and the validity of the information was proved and recorded. Consequently, if the idea of the informant deviates from the original information, it was rejected since it is considered as unreliable. Only the relevant ones were analyzed. This method was adopted from [31].

Preference ranking
Preference ranking was conducted following [1] for five most important medicinal plants used for treating wound. Ten informants were selected to identify the best preferred medicinal plant species for treatment of wounds. Each informant was provided with five medicinal plants reported to cure this disease with leaves of medicinal plant used being paper tagged name and asked to assign the highest value (5) for the most preferred species, against this disease and the lowest value (1) for the least preferred plant and in accordance of their order for the remaining ones. The value of each species was summed up and the rank for each species was determined based on the total score. This helped to indicate the rank order of the most effective medicinal plants used by the community to treat the disease.

Direct matrix ranking
Direct matrix ranking draws explicitly upon multipurpose dimensions of medicinal plant species. Direct matrix ranking was performed following the method of [32] to medicinal plant species for their multipurpose use and to relate this to the extent of its utilization versus its dominance. The values of each use diversity for a species were taken and the value of each species was summed and ranked.

3. Results

Ages of informants
Out of 91 total informants involved in the present study,48 (52.7%) were within the age group of 36-50, 32 (35.2%) of

them were age above 50, and 11 (12.1%) of them were within age group of 20-35 (Table 2).

Table 2: Ages of informants in the study area

Age category	Number of Informants			Percentage
	M	F	Total	
20-35	10	1	11	12.1
36-50	45	3	48	52.7
Above 50	30	2	32	35.2
Total	85	6	91	100

Marital and educational status of informants
Majority of informants 80 (87.9%) were married whereas 11(12.1%) were divorced and single. More than half of the informants were literate 62 (68.2%) and the rest 29 (31.8%) were illiterate (Table 3).

Table 3: Marital and educational status of informants

Marital and educational Status of informants		Sex		Total	Percentage
		M	F		
Marital status	Married	48	32	80	87.9
	Single	1	-	1	1.1
	Divorced	5	5	10	11
	Total	54	37	91	100
Educational status	1-8	32	20	52	57.1
	9-12	9	-	9	10
	>12	1	-	1	1.1
	Illiterate	12	17	29	31.8
	Total	54	37	91	100

Families of medicinal plants
Eighty one plant species collected from the study sites were belong to 42 families and 75 genera. The result revealed that out of 42 families, the most plant species 9 (11.1%) used for traditional medicinal purpose were belong to family Fabaceae followed by Lamiaceae 7 (8.6%) and Asteraceae 5 (6.2%), Euphobiaceae and Rutaceae 4 (5%) each, Rubiaceae, Oleaceae, Solanacea and Cucurbitaceae 3(3.7%) each, Rosaceae, Anacardaceae,Compositae, Loranthaceae, Polygonaceae, Myrisinaceae and Simarubiaceae 2 (2.5%) each and other families were consisted one representative species 26 (32%) (Table 4).

Table 4: Diversity of medicinal plant belonging to each plant family

Plant family	Number of plant species	Percentage
Fabaceae	9	11.1
Lamiaceae	7	8.6
Asteraceae	5	6.2
Euphobiaceae	4	4.9
Rutaceae	4	4.9
Rubiaceae	3	3.7
Oleaceae	3	3.7
Solanaceae	3	3.7
Cucurbitaceae	3	3.7
Rosaceae	2	2.5
Anacardaceae	2	2.5
Compositae	2	2.5
Loranthaceae	2	2.5
Polygonaceae	2	2.5
Myrisinaceae	2	2.5
Simarubiaceae	2	2.5
Other families	26	32
Total	81	100

Source of medicinal plants

As identified by healers, medicinal plants species used for human and livestock disease treatment were collected from different sources, from collected medicinal plant species, the majority 62 (76.5%) were collected from the wild vegetation and the rest were collected from home garden 15 (18.5%) and 4 (5%) was collected from farmland (Fig. 1).
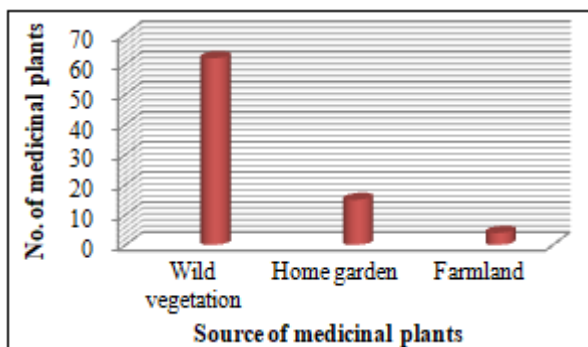

Figure 1: Sources of medicinal plants in study area

Growth habit and part of plants used for traditional medicine

Medicinal plant species collected from study kebeles have diverse growth habit. Out of total 81 medicinal plants, 31 (38.3%) which constituted the highest number were shrubs followed by trees 26 (32.1%) and herbs 17 (20.9%). Leaves were the most commonly used part of the medicinal plants that accounted for 30 (37%) followed by barks 15 (18.5%), roots 12 (14.8%), seed 9 (11.1%), stem 4 (5%) and the others (areal part, fruit and shoots) accounted 7(8.7%). Four (5%) plant species have medicinal value in more than one of their parts (Table 5).

Number of medicinal plants used for disease treatment

Out of the total number of assembled medicinal plants 69 (85.2%) of medicinal plants were used for human disease treatment, 6 (7.4%) for livestock disease treatment only and 10 (12.3%) forboth human and livestock disease treatment (Fig.2).

Disease treated by medicinal plants

In the study area 30 human diseases were recorded and 69 medicinal plants were identified to treat the diseases. The results revealed that single plant species used to treat more than one disease and single disease was treated by many medicinal plant species. For example, wound can be treated by 10 medicinal plants and abdominal crump by 8, ascaris and menstrual pain can be treated by 5 medicinal plant species. Four livestock diseases were recorded and 6 plants were identified to treat these diseases. In addition to these, 4 types of both human and livestock diseases were recorded and 10 medicinal plants were identified to treat the diseases (Table 6).
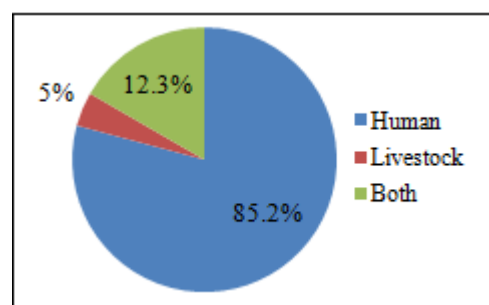
Figure 2: Number of medicinal plants used for disease treatment

Table 5: Growth habit and parts of plants used in traditional medicine

Growth Habit	Parts of plants used									Total	Percentage
	Leaf	Bark	Root	Seed	Stem	Aerial part	Fruit	Shoot	>One part		
Shrub	17	1	5	4	-	-	2	1	1	31	38.3
Tree	6	13	1	2	1	-	-	1	2	26	32.1
Herb	5	1	4	3	1	2	-	-	1	17	20.9
Climber	2	-	2	-	-	1	-	-	-	5	6.2
Epiphyte	-	-	-	-	2	-	-	-	-	2	2.5
Total	30	15	12	9	4	3	2	2	4	81	
Percentage	37	18.5	14.8	11.1	5	3.7	2.5	2.5	5		100

Table 6: Diseases treated by medicinal plants

Different diseases treated by medicinal plants					
Human disease		Livestock disease		Both human and livestock disease	
Human disease	Number of Plant species used	Livestock disease	Number of Plant species used	human and livestock disease	Number of Plant species used
Wound	10	Faciola	2	Snake bite	5
Abdominal crump	8	Leech	1	Rabies	3
Ascaris	5	Babesia	1	Fracture	1
Menstrual pain	5	blackleg	2	Ceratoconjuctivitis	1
Tape worm	4				
Gonorrhea	3				
Teeth ache	3				
Herpeszoster	3				
Gastritis	3				
Epilepsy	3				
Diarrhea	2				
Allergic	2				
Evil eye	2				

Scabies	2				
Malaria	2				
Kin tarot	2				
Others	14				

Condition in which medicinal plants used

As shown in (Table 7), during preparation of traditional medicine by healers majority of medicinal plants 37 (45.7%) were used in fresh condition, the rest 28 (34.5%) and 16 (19.8%) were used in dry and both fresh and dry condition respectively.

Table 7: Condition in which medicinal plants used

Condition	Number of plant	Percentage
Fresh	37	45.7
Dry	28	34.5
Both fresh and dry	16	19.8
Total	81	100

Method used in preparation of traditional medicine

In the study area, the healers used various methods of preparation of traditional medicines for different types of diseases. Variation in preparation based on the type of disease treated. The principal methods of preparation which accounted the highest portion was pounding and mixing 42 (51.9%) followed by crushing and mixing 12 (14.8%), squeezing 5 (6.2%), powdering and crushing or pounding 4 (5) each, crushing and boiling 3 (3.7%) and others were accounted (13.3%) (Table 8).

Table 8: Methods of preparation of traditional medicine

Preparation	Frequency	Percentage
Pounding and mixing	42	51.9
Crushing and mixing	12	14.8
Squeezing	5	6.2
Pounding	4	5
Crushing or pounding	4	5
Crushing and boiling	3	3.7
Crushing	2	2.5
Melting	1	1.2
Decoction	1	1.2
Socking	1	1.2
Juice	1	1.2
Pounding or Squeezing	1	1.2
Crushing or Squeezing	1	1.2
Squeezing or Juice	1	1.2
Trickling	1	1.2
As it is	1	1.2

Ingredients and solvents used for traditional medicine preparation

The result showed that traditional medicines used by local people need different ingredients and solvents to be medicine during preparation. Out of collected 81 medicinal plants species, 62 (76.5 %) were needed ingredients and solvents whereas 19 (23.5%) were prepared without any additive. The major solvent was water that accounted for 42 (76.5%), butter 8 (9.9%), honey 7 (8.6%), and coffee 3 (3.7%) (Table 9).

Table 9: Ingredients and solvents used for preparation of traditional medicine

Solvents and ingredients	With ingredient		Without ingredient	
	Frequency	Percentage	Frequency	Percentage
Water	42	51.9		
Butter	8	9.9		
Honey	7	8.6	19	23.5
Coffee	3	3.7		
Others	2	2.5		
Total	62	76.5	19	23.5

Route (mode) of administration and dosage frequency

Traditional medicines prepared by healers were administrated through different route. Fifty two (64.2%) of traditional medicines were administered orally followed by external mode 18 (22.2%), both orally and external were 3 (3.7%), nasal were 3 (3.7%) and the other routes were 5 (6.2%). Majority of traditional medicines that accounted 70 (86.4%) were administered more than one time and 11 (13.6%) were administered once while treating diseases (Table 10).

Table 10: Route of administration and dosage frequency of traditional medicine

Route (mode)	Frequency		Total	Percentage
	Once	More than one		
Oral	9	43	52	64.2
Eternal or dermal	-	18	18	22.2
Nasal	-	3	3	3.7
Both oral and external	-	3	3	3.7
Teeth surface	2	-	2	2.5
Eye	-	2	2	2.5
Both oral & Nasal	-	1	1	1.2
Total	11	70	81	
Percentage	13.6	86.4		100

Informant consensus

The result showed that some medicinal plants are popular and have highest informant consensus. Among collected medicinal plant species *Irythrina abyssinica* was cited by 63 informants (69.2%). The popularity of this medicinal plant is due to people preference for the species to treat wound in the community. *Zingiber officinale* is cited by 59 informants (64.8%) to treat abdominal crump, *Ricinus communis L* cited by 58 informants (63.7%) to treat snake bite and others were cited as showed in(Table 11).

Table 11: Listof medicinal plants and the corresponding informants

Scientific name	Local name	Number of informants	Percentage of informants
Irythrina abyssinica	Beroo	63	69.2
Zingiber officinale	Jinjibila	59	64.8
Ricinus communis L.	Kobboo	58	63.7
Premna schimperi L.	Urgeessaa	58	63.7
Vernonia amygdalina	Eebicha	53	58.2
Ehretia cymosa	Ulaagaa	51	56
Cucurbita pepo	Buqqee	51	56

Croton macrostachyus	Bakkannisa	49	53.8
Embelia schimperi	Hanquu	48	52.7
Centella asiatica L.	Gurraa	48	52.7
Rumex abyssinica	Dhangaggoo	47	51.6
Linum usitatissimum L.	Talbaa	46	50.5
Calpurina aurera	Ceekaa	42	46.2
Ocimum gratissimum	Damakasee	42	46.2
Withania somnifere L.	Gizaawwaa	41	45
Ximenia Americana	Hundhaa	40	43.9
Croton macrostachyus	Bakkannisa	39	42.8
Schinus molle L.	Qundbarbaree	38	41.8
Olea yeuropae	Ejersa	38	41.8
Securidaca longepedunculata	Xabanayi	38	41.8
Carissa sponarum	Agamsa	37	40.6
Albizia schimperiana	Ambabessa	36	39.6
Coffea Arabica	Buna	35	38.5
Maesa lanceolota	Abbayyii	34	37.4
Justicia schimpercna	Dhummugaa	33	36.3
Phytoloccad decandra	Andoodee	33	36.3
Acacia abyssinica	Sondii	33	36.3
Trigonella foenum	Sunqoo	31	34
Millettia ferruginea	Sootalloo	30	32.9
Colocasia esculenta	Goodarree	29	31.9
Citrus limon	Lomii	28	30.8
Ruta chalepensis L.	Xenaddaama	27	*29.7*
Cordia africana	Waddeessaa	26	*28.6*
Maytenus senegalensis	Kombolcha	21	23.1
Carica papaya L.	Pappayaya	20	21.9
Echinops hispidus	Qabarichoo	20	21.9
Vernonia myriantha	Rejjii	18	19.8
Prunus africana	Oomii	16	17.6
Giardenia ternitolia	Gambeela	14	15.4
Dodanaea anguestifaia L.	Itacha	12	13.2
Cassia arereh	Botoroo	12	13.2

Erythrina brucei	Waleensuu	12	13.2
Rhus ruspolii	Xaaxessaa	11	12.1

Preference ranking

Preference ranking of 6 medicinal plants that were reported for treating wound was conducted after selecting ten key informants. Thus, the result showed that *Irythrina abyssinica* scored 50 and ranked first. This indicate that it is the most effective in treating wound followed by *Croton macrostachyus* and the least effective was *Guizotia scabira* (Table 12).

Direct Matrix ranking

The result of direct matrix showed that *Cordia Africana* stood first in being the most multipurpose medicinal plant followed by *Eucalyptus globulus*, *olea europaea,Premna schimperi L,Croton macrostach, Ximenia americana, Giardenia ternitolia, Terminalia laxiflora,* and *Calpurina aurera* was the least multipurpose medicinal plant (Table 13).

Show medicinal plants freely. Way of transfer from generation to generation is orally as a secret to the selected family member at old age. In addition, the young do not have willing to practice traditional medicinal knowledge due to modernization and changeof life style. For these facts, knowledge transfer in the study area is in challenge.

Threats to medicinal plants

The causes of threats to medicinal plants in the study area were associated with anthropogenic factors. The discussants were agreed that medicinal plants are primarily threatened due to agricultural

Table 12: Preference ranking of medicinal plants used for treating wound

List of medicinal plants	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	Total	Rank
Croton macrostachyus	6	5	6	6	5	4	5	2	1	3	43	2nd
Phytoloccad decandra	1	2	3	4	4	5	3	5	2	6	35	3rd
Irythrina abyssinica	5	6	4	2	6	6	6	6	4	5	50	1st
Carica papaya L.	4	4	1	3	1	2	4	4	6	4	33	4th
Guizotia scabra	3	1	2	1	3	3	1	1	3	2	20	6th
Bersama abyssinia	2	3	5	5	2	1	2	3	5	1	29	5th

R=Respondent

Table 13: Direct matrix ranking for nine specie and their main uses

Main use	*Croton macrostachyus*	*Eucalyptus globulus L*	*Terminalia laxiflora*	*Olea yeuropae*	*Giardenia ternitolia*	*Ximenia americana*	*Premna schimperi L*	*Cordia africana*	*Calpurina aurera*
Medicine	46	42	32	46	34	40	40	44	41
Fire wood	44	43	34	41	34	33	39	39	43
Charcoal	9	23	27	12	27	28	36	22	19
Fence	32	44	31	31	28	23	43	38	35
Hose construction	17	46	32	40	35	24	21	44	21
Furniture	16	14	13	20	18	-	-	46	-
Food	-	-	-	-	-	45	-	40	-
Shade	46	45	21	38	15	14	37	46	19
Total score	210	257	190	228	191	207	216	319	178
Rank	5th	2nd	8th	3rd	7th	6th	4th	1st	9th

Status of medicinal plants

Regarding the status of medicinal plants in the study area, the result revealed that 53 (65.4%) medicinal plant species showed decrement whereas only those cultivated by local community 11 (13.6%) were showed increment and the rest 17 (21%) were not showed change (Fig. 3).
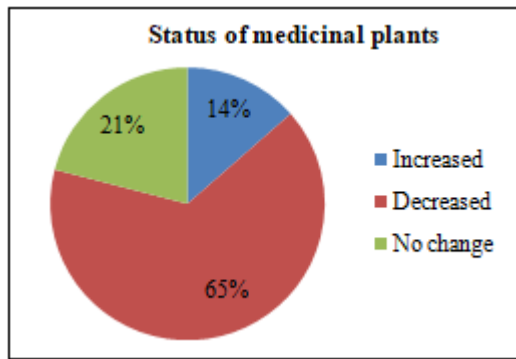
Figure 3: Status of medicinal plants in study site

Traditional medicine knowledge transfer

Concerning traditional medicinal knowledge transfer, focus group participants' responses indicated that traditional healers do not expansion followed by deforestation or cutting of trees for different purposes (Fire wood, charcoal, timber, construction and fence), wildfire and settlement. Finally they were suggested some conservation strategies. These are: (i) awareness creation campaign and educating the community about the importance of different medicinal plants (ii) transfer of traditional medicine knowledge, (iii) conserve medicinal plants in their natural habitat and (iv) conserving medicinal plants in homegarden for sustainable use.

4. Discussion

In this study, a total of 81 medicinal plant species belonging to 42 families and 75 genera were identified and documented in the study area. The result revealed that out of 42 families, the most plant species 9 (11.1%) used for traditional medicinal purpose were belong to family Fabaceae followed by Lamiaceae 7 (8.6%). Similarly, different studies in Ethiopia by [33, 34, 35], showed that Fabaceae was the dominant family among the others, whereas in other studies Asteraceae was the dominant one among others [22, 36, 37].

In the present study area most of the medicinal plants (76.5%) were collected from the wild vegetation followed by(18.5%) from home garden and (5%) from farmland. The finding is in keeping with studies in other different part of Ethiopia and abroad in which the sources of medicinal plants were mostly from wild vegetation [19, 21, 38, 39, 40]. This indicated that the practice of cultivation of medicine plants for their medicinal purpose in homegardens of most of the country is low although many plants are cultivated for other purposes, mainly for food. In a similar way, people in the study area have less effort to cultivate medicinal plants in their homegardens rather go to the nearby or far places and harvest the plants [22].

Medicinal plants in the study area had diverse growth habit; the results revealed that out of total collected medicinal plants, shrubs constituted the highest number (38.3%) followed by trees (32.1%) and herbs (20.9%). This is in accord with work done by [33].Whereas different studies conducted in Ethiopia by [20, 22, 41, 42] indicated that herbs and shrubs were the highest portion of medicinal plants used. In addition, the result of [21] showed that

different trees species were predominantly used for traditional medicine. In the present study, all plant parts were not equally used for remedies. The finding showed that different parts of medicinal plants were used for preparation of traditional medicine. Among, leaves were the most commonly used part followed by barks and roots. Similarly, several studies [23, 43, 44, 45, 46] have revealed that the leaves of medicinal plants were repeatedly used for traditional medicine preparation. On the other hand, [47] reported as the roots were a widely utilized medicinal plant part to treat different ailments.

From collected medicinal plant species, the highest (85.2%) was used to treat human diseases. The results revealed 30 human diseases, 4 livestock disease and 4 both human and livestock diseases were treated by traditional medicinal plants. In the same way, [48] reported 53 human and 17 livestock ailments in Wondo Genet natural forest and adjacent kebeles, Sidama Zone, SNNP Region, [49] identified 40 human and 17 livestock ailments, [23] reported 74 human, 23 livestock, and 15 both human and livestock ailments in Ganta Afeshum District, Eastern Zone of Tigray. While preparation of traditional medicine, healers of the study area were used majority of medicinal plants (45.7%) in fresh condition, whereas (34.5%) and (19.8%) were used in dry and both fresh and dry condition respectively. The result is in line with the results of [40, 50] in which fresh parts of medicinal plant were used more than dry or dry or fresh plant parts.

In study area, the healers used various methods of preparation of traditional medicines for different types of diseases. The principal method of preparation was pounding and mixing (51.9%) followed by crushing and mixing (14.8%), squeezing (6.2%), pounding and crushing and pounding (5%) each, crushing and boiling (3.7%) and others were accounted (13.3%). A similar study showed that different preparation methods of medicinal plants were reported by [22, 45, 51]. Traditional medicines of the study area were prepared with solvents and ingredients, such as water, honey, butter, coffee, sesame oil and milk. A similar study was conducted in Debark Wereda, North Gondar Zone, Amhara Regional State by [52] who reported that traditional healers used solvents and additives like water, butter, honey, milk, sugar, "tella", "tej", kerosene, 'teff' flour, oil, boiled coffee or tea and citrus juice for traditional medicine preparation.

Traditional medicines prepared by healers were administrated through different route. Oral administration was constituted (66.2%) the highest portion followed by external or dermal (22.2%) and (3.7%) were both oral and dermal and nasal, applying on teeth surface and eye were the others administration rout constituted few portion. This finding is in agreement with the work of [33, 47, 53] in which oral administration was the predominant rout of administration. In contrast, dermal administration was a common way in the reported of [54]. Concerning dosage of traditional medicines prepared by healer; its determination was a big problem in the study area because there is no standardized known unit of measurements. However, the dose was determined by using homemade instruments like cup, glass, bottle and spoon. The dosage is generally

dependent on the age and degree of thediseases. This is in line with report of ethno-medicinal plant knowledge and practice by [55, 56].

Preference ranking of 6 medicinal plants that were reported for treating wound was conducted in the study area. The finding showed that *Irythrina abyssinica* scored first rank and *Croton macrostachyus, Phytoloccad decandra, Carica papaya L., Bersama Abyssinia and Guizotia scabra* scored second to sixth rank. In a study from north Gondar Zone, Amhara Regional State by [52], *Plantogo lanceolata* scored first rank for treating wound and report from Ganta Afeshum District, Eastern Zone of Tigray, Northern Ethiopia by [35], *Cordia africana* scored first rank as the most effective for treatment of febrile illness.

The direct matrix ranking showed that *Cordia Africana, Eucalyptus globulus andolea europaea* scored first to third rank. This indicates that the most multipurpose medicinal plant threaten due to overutilization by local community. The others *Premna schimperi L, Croton macrostach, Ximenia americana, Giardenia ternitolia, Terminalia laxiflora,* and *Calpurina aurera* scored fourth to ninth rank. This finding in agreement with the finding reported by [43] from Goma Wereda, Jima Zone of Oromia Region, *Cordia africana* was the most preferred and first ranked multipurpose plant species and similarly finding by [54] indicated *Cordia africana, Eucalyptus globules, Opuntia ficus-indica,* and *Dodonia angustifolia* as the most preferred multipurpose plants by the local people.

Traditional healers do not have willingness to transfer their indigenous knowledge of traditional medicine and to show medicinal plants freely. Way of transfer of the knowledge from generation to generation is orally as a secret to the selected family member at old age. This is consistent with report of [21, 57]. In addition, the young of the study area do not have willing to practice traditional medicinal knowledge due to modernization and change of life style. This is also in accord with [58, 59].

The discussants were agreed that the threats of medicinal plants increase from time to time in study area. The causes of threats to medicinal plants were associated with anthropogenic factors. Medicinal plants are primarily threatened due to agricultural expansion and deforestation or cutting of trees for different purposes (Fire wood, charcoal, timber, construction and fence), wildfire and settlement was also cause of threat. The finding is in keeping with other findings [41, 60]. In other study from Northwest Ghana and Uganda [61] reported that drought, overgrazing, bush fires had apparently affected a significant number of medicinal plant species. Therefore, awareness creating and educating the community about importance of natural resource, traditional medicine knowledge transfer by healers for generation, conserving medicinal plants in their natural habitat and home garden are conservation strategy of medicinal plants for sustainable use

5. Conclusions

The ethnobotanical study of medicinal plants indicates that the study area is rich in its medicinal plant composition & the associated indigenous knowledge. Eighty one medicinal plants were recorded of which 69 species were noted to treat human diseases while 6 species are documented to treat livestock ailments & 10 species are used to treat both livestock & human ailments. Medicinal plant species collected & identified from the wild vegetation were 62 species, those from home gardens were 15 species & 4 species were from farmland. In the study area, 38 diseases were reported (30 for human, 4 for livestock and 4 for both human & livestock). Most of traditional medicinal plants are prepared in fresh condition (45.7 %) & in dried condition (34.5%). Shrubs are highly utilized (38.3%) for medicinal purpose than trees & herbs. Leaves (37%) are used for medicinal purpose more than other plant parts for preparation of human & livestock diseases. Traditional medicines are prepared in different methods. Pounding and mixing (51.9%), crushing and mixing (14.8%), squeezing (6.2%) and medicines are prepared with different solvents and ingredient. Among, water is more frequently used for preparation. Most of the medicinal plants are administered orally (64.2%). The major threats to medicinal plants are agricultural expansion, deforestation or cutting of trees for different purposes (Fire wood, charcoal, timber, construction and fence), wildfire and settlement. Therefore, awareness creation campaign and educating the community about importance of natural resource, traditional medicine knowledge transfer by healers for generation, conserving medicinal plants in their natural habitat and home garden are conservation strategy of medicinal plants to ensure its sustainable use.

6. Acknowledgements

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Appendix 1. List of medicinal plants: scientific name, family name, local name, part of plant used, condition in which medicinal plant used, method of preparation and dosage of traditional medicine

Collection number	Scientific Name	Family Name	Local name	Part used	Condition of plants	Method of preparation	Dosage
GT1	*Carissa sponarum*	Apocynaceae	Agamsa	R	D	Pounded & its powder is mixed with water	Half of tea cup 3 times a day for a week
GT2	*Maesa lanceolota*	Myrisinaceae	Abbayyii	B	D	Pounded and mixed with butter	Ointment until cure
GT3	*Guizotia scabra*	Asteraceae	Adaa	L	F	Squeezed and its drop is prepared	Introduced on wound till cure
GT4	*Phytoloccad decandra*	Phytolacacace	Andodee	L F R	F	Squeezed	2-3 drop is taken 1 glass a day for 1 week.
GT5	*Albizia schimperiana*	Fabaceae	Ambabessa	L	F	Pounded & tied with a piece of cloth and warmed by fire	Rubbing affected part till it cure
GT6	*Ajugar intogrifolia*	Lamiaceae	Armaguusee	Ap	F	Pounded and mixed with nut oil.	Taken one cup a day for three days
GT7	*Capparis fascicularis*	Capparidaceae	Arangemaa Guraacha	R	D	Pounded & its powder is mixed with water.	1 tea cup once/day for a week 1 bottle for livestock
GT8	*Datur stromonium*	Solanaceae	Asaangira	L	F	Squeezed and its drop is prepared	Washing with drop/dropping on it until cure.
GT9	*Euphorbia abyssinica*	Euphorbiaceae	Adamii	St	F	Cutting the stem	Trickling the sap on wound till cure
GT10	*Croton macrostachyus*	Euphorbialeae	Bakkannisa	L B	D	Pounded & its powder is prepared Pounded & its powder is prepared and mixed with water	Apply on it (wound) One tea cup three times a day for a week
GT11	*Kalanchoe laciniata L*	Crassulaceae	Bosoqqee	L	F	Melting	1 tea cup is taken once
GT12	*Dracaena steudneri*	Dracaenaceae	Bubbiftuu	B	F&D	Pounded and mixed with water	1 cup a day for 14 days.
GT13	*Coffee arabica*	Rubiaceae	Buna	S	D	Pounding	Ointment until cure
GT14	*Cucurbita pepo*	Cucurbitaceae	Buqqee	S	D	Pounded & its powder is mixed with water and filtered	1 tea cup a day for a week
GT15	*Cassia arereh*	Fabaceae	Botoroo	B	F&D	Pounded & its powder mixed with water (conc.)	Drink 1/2L per a day for a week, 1L for livestock
GT16	*Eucalyptus globulus L*	Myrtaceae	Baargamoo Adii	L	F	Boiled in water	Steam bath for week
GT17	*Irythrina abyssinica*	Fabaceae	Beroo	L B	D	Pounded & its powdered is prepared	Introduced on wound till cure
GT18	*Calpurina aurera*	Fabaceae	Ceekaa	L	F&D	Pounded & its powder mixed with water Crushing leaf	3 times a day for a week Rubbing the rush
GT19	*Justicia schimpercna*	Acanthaceae	Dhummugaa	L	F	Crushed and mixed with water and filtered	1 glass 3 times a day for a week
GT20	*Ocimum gratissimum*	Lamiaceae	Damakasee	L	F	Squeezed and its drop is prepared	Small drop it taken
GT21	*Tapinanthus globifer us*	Loranthaceae	Dheertuu Bakkannisaa	St	F&D	Pounded & its powder mixed with water	1 glass per day for a week
GT22	*Tapinanthus globifer us*	Loranthaceae	Dhertuu Bunaa	St	D	Pounded & its powder mixed with water	1 tea cup a day for a week
GT23	*Terminalia laxiflora*	Combertaceae	Dabaqqaa	B	F&D	Pounded and mixed with water.	1 tea cup/day for a week
GT24	*Rumex abyssinica*	Polygonaceae	Dhangaggoo	R	F	-	Rubbing the affected place with it till cure
GT25	*Rumex nepajensis sprena.*	Polygonaceae	Dhangaggoo saree	R	F	Pounded & its powder filtered with water	Small portion taken during the problem
GT26	*Achyranthes asperal L.*	Amaranthaceae	Darguu	R	F	Pounded and filtered with water	1/2 tea cup taken during pain
GT27	*Acacia etbaica*	Fabaceae	Doddota	B	F&D	Crushed and boiled and then filtered	1 glass per a day for a week
GT28	*Olea yeuropae*	Oleaceae	Ejersa	L	F	Decoction pounded and boiled with honey	1 tea cup per day for 3 days
GT29	*Vernonia amygdalina*	Asteraceae	Eebicha	L	F	Crushed and boiled in water mixed with honey	1 tea cup is taken per a day for 3 days
GT30	*Clematis hirusuta*	Ranunculaceae	Fitii	L	F	Pounded & its powder mixed with coffee residue	1L/day is taken for 1 week
GT31	*Cucumis fietolius A.*	Cucurbitaceae	Fechwaa	R	D	Pounded & its powder is introduced in coffee Its powder mixed with water	1 tea cup/day once for a week 1/2L per day for a week
GT32	*Giardenia ternitolia*	Rubiaceae	Gambeela	B	F&D	Crushed with white onion & water	1 tea cup 3 times/day for a week

GT33	*Withania somnifere L.*	Solanaceae	Gizaawwaa	L	F	Crushed with Tenadam and mixed with water	1 tea cup/ day for 3 days.
GT34	*Tragia brevipes*	Euphobiaceae	Gurgubbee	R	D	Prepared in the form of coffee	1/2 bottle is taken once/day for a week
GT35	*Nicotiam tabacum L.*	Solanaceae	Goofichoo	L	F&D	Pounded and its solution is prepared with water	Few drop is taken for 3 days
GT36	*Centella asiatica L.*	Apiaceae	Gurraa	L	D	Pounded its powder mixed with butter	Introduced to the affected place till cure
GT37	*Rhamnus prinoides L*	Rhamnaceae	Geeshoo	L	F	Crashed	2-3 drop until cure
Gt38	*Colocasia esculenta*	Araceae	Goodarree	L	F	Crashed and mixed with butter	1glass until removed
GT39	*Urera hypselodendron*	Urticaceae	Hida Antuuta	R	F	Crushed and mixed with water (conc.)	1L/ day for a week
GT40	*Solanum giaanum*	Colanaceae	Hiddi Gurracha	R	F	Pounded & its powder mixed with water	1 tea cup is take during pain
GT41	*Embelia schimperi*	Myrsinaceae	Hanquu	S	D	Pounded & its powder is mixed with water	1/2 cup is taken once
GT42	*Hageria abyssinia*	Rosaceae	Hexoo	L	F	Pounded & its powder mixed with water then filtered	1 tea cup is taken once
GT43	*Ximenia americana*	Olacaceae	Hundhaa	S F	F	Juice	1tea cup /day for a week
GT44	*Dodanaea anguestifaia L.*	Sapindaceae	Itacha	L	F&D	Pounded & its powder mixed with water and filtered	1 glass per a day for 3 days
GT45	*Tynura pseudochina L..*	Compositate	Jiniraas	L	F	Pounded & its powder mixed with water.	1glass during pain for three days
GT46	*Zingiber officinale*	Zingebiraceae	Jinjibila	R	D F	Pounded & its powder mixed with water	1 cup is taken /day for 7 days
GT47	*Maytenus senegalensis*	Celastraceae	Kombolcha	L	D	Squeeze	1 drop till cure morning and night
GT48	*Helichrysum spp.*	Asteraceae	Loosee	L	F	Crushed and tied with clean cloth & warming it.	Warming with it till cure
GT49	*Bersama abyssinia*	Melianthaceae	Lolchiisaa	L	F	Squeezed and its drop is prepared	Introducing 2-3 drop till cure
GT50	*Citrus limon*	Rutaceae	Loomii	L	F	Squeezed and its juice is prepared	1/2tea cup /day for week
GT51	*Bidens Pilosa L.*	Compositae	Maxxanneguracha	Ap	F	Pounded & mixed with water and filtered	1 glass/day for 3 days
GT52	*Clerodondrum myricodes*	Lamiaceae	Marasisaa	L	F	Crushed	Putting on teeth
GT53	*Shrebera alato*	Oleaceae	Onunu	B	D	Pounded & its powder is introduced in to a tea cup of milk	1 tea cup is taken once
GT54	*Carica papaya L.*	Caricaceae	Pappayaa	L S	D	Pounded & its powder mixed with water	Applied the powder 1/2 tea cup is taken once
GT55	*Brucea antiducentrica*	Simarubiaceae	Qomonyoo	S	D	Pounded & its powder mixed with butter	Ointment till cure
GT56	*Crinum abyssimicam*	Amaryllidaceae	Kulubbii warabessaa	ST	D	Pounded & its powder mixed with butter	4 tea spoon is taken during pain
GT57	*Salvia marjame.*	Lamiaceae	Kolankolee	L	F	Pounded & its powder mixed with water and filtered	1 glass/day for 3 days
GT58	*Echinops hispidus*	Asteraceae	Kaberichoo	B	D	Pounded & its powder mixed with water	1 cup /day for 7 days
GT59	*Ricinus communis L.*	Euphorbiaceae	Qobboo	R B	F D	Pounded & its powder mixed with water	1 tea cup /day for a week take once 1bottle for a week
GT60	*Prunus africana*	Rosaceae	Oomii	B	F&D	Crushed and boiled and them filtered	1 glass /day for a week
GT61	*Schinus molle L.*	Anacardaceae	Qundobarbarree	S	D	Pounded & its powder mixed with water	1 cup 3 times/day for 3 days
GT62	*Vernonia myriantha*	Asteraceae	Rejjii	R	F&D	Pounded & its powder mixed with water (conc.)	1 spoon/day for a weak is taken
GT63	*Kedrostis leloja*	Cucurbitaceae	Saroo bofaa	Ap	F	Crushed and mixed with butter	Ointment till cure
GT64	*Senna schimperi*	Lamiaceae	Sanamekii	L	F	Pounded & its powder mixed with water	1 glass /day for a week is taken
GT65	*Brassica nigra L.*	Cruciferae	Shinfaa	S	D	Pounded & its powder mixed with honey	1 glass 3 times/day for 5 days
GT66	*Olea capensis*	Oleaceae	Soole	B	D	Pounded & its powder is prepared Crushed and added to coffee residue	Applied on wound 1/2L/day for a week
GT67	*Pentas scimperiana*	Rubiaceae	Suruma	L	D	Pounded & its powder is mixed	1 glass 3 times/day till cure.

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						with barley powder and prepared in soup form	
GT68	*Acacia abyssinica*	Fabaceae	Sondii	B	F	Pounded & its powder mixed with water (conc.)	1L/day till cure
GT69	*Trigonella foenum*	Fabaceae	Sunqoo	S	D	Pounded & its powder mixed with honey	1 tea cup 3 times/day for 2 week is taken
GT70	*Millettia ferruginea*	Fabaceae	Sootalloo	S	D	It powder is prepared	Applied to wound till cure
GT71	*Citrus medica*	Rutaceae	Turungoo	F	F&D	Crushed and mixed with honey	1 cup is taken once
GT72	*Linum usitatissimum L.*	Linaceae	Talbaa	S	D	Socked in water	1 cup/day taken for weak
GT73	*Premna schimperi L.*	Lamiaceae	Urgeessaa	Sh	F	-	Chewing by affected teeth during pain
GT74	*Cordia africana*	Cordia africana	Waddeessa	B	D	Pounded & its powder mixed with butter	Creamed affected part until recovery
GT75	*Erythrina brucei*	Fabaceae	Waleensuu	B	D F	Squeezed and drop is prepared	2 to 3 drops is added till cure
GT76	*Securidaca longepedunculata*	polygalaceae	Xabanayi	R B	D	Pounded & its Powdered mixed with water (conc.)	1/2 tea cup is taken 3 times/day till cure
GT77	*Rhus ruspolii*	Anacardaceae	Xaaxessaa	L	F&D	Crashed/Pounded and mixed with butter	Ointment until cure
GT78	*Ehretia cymosa*	Boraginaceae	Ulaagaa	R	D	Pounded & its Powdered mixed with honey	1 cup/day a week
GT79	*Ruta chalepensis L.*	Rutaceae	Xenaddaama	F&L	F	Crashed/Pounded and mixed with water	1 cup 3 times/day for a week
GT80	*Pycnotachys abyssinica F.*	Lamiaceae	Yeriyo	L	F	Crushed and mixed with water	1 cup is taken once
GT81	*Bruceaanti dysentrica*	Simaroubaceae	Qomonyoo	F	F	Crushed and mixed with water	1cup/day for 2 weeks 1 bottle for livestock

Key:Part used; L= Leaf, St= Stem, S=Seed, R= Root, F= Fruit, B= Bark, Sh= Shoot and Ap= Aerial part
Condition in which medicinal plant used F= Fresh, D= Dry, F&D= Fresh and Dry

Appendix 2. List of medicinal plants:rout of administration, growth habit, other use of medicinal plant habitat, status of medicinal plants and disease treated by medicinal plant

Collection number	Scientific Name	Family Name	Local name	Rout	Growth habit	Other use of medicinal plant	Habitat	Status of plant	Disease treated	
									Human	Livestock
GT1	*Carissa sponarum*	Apocynaceae	Agamsa	Or.	Sh	Fen Fw	Wv	Dec	Impotence (loss of sexual feeling)	
GT2	*Maesa lanceolota*	Myrisinaceae	Abbayyii	Ex/D	T	Fw	Wv	Dec	Elephantiasis	Faciolosis
GT3	*Guizotia scabra*	Asteraceae	Adaa	Ex/D	Sh	Fw	Wv	Dec	Wound	
GT4	*Phytoloccad decandra*	Phytolacacace	Andoodee	Na. Or.	Sh	Det	Wv	No ch	Sinus Wound	
GT5	*Albizia schimperiana*	Fabaceae	Ambabessa	Ex/D	T	Fw Fen	Wv	Dec	Kin tarot	
GT6	*Ajugar intogrifolia*	Lamiaceae	Armaguusee	Or.	H	-	Wv	No ch	Epilepsy	
GT7	*Capparis fascicularis*	Capparidaceae	Arangemaa Gurraacha	Or.	Sh	-	Wv	Dec	Snake bite	Snake bite
GT8	*Datur stromonium*	Solanaceae	Asaangira	Ex/D	Sh	-	Wv	No ch	Kin tarot	
GT9	*Euphorbia abyssinica*	Euphorbiaceae	Adamii	Ex/D	T	Fen	Wv	Dec	Wound	
GT10	*Croton macrostachyus*	Euphorbialeae	Bakkannisa	Ex/D	T	Fw Fen Fur	Wv	Dec	Wound Malaria	
GT11	*Kalanchoe laciniata L*	Crassulaceae	Bosoqqee	Or.	H	Fw	Wv	No ch	Ascaris	
GT12	*Dracaena steudneri*	Dracaenaceae	Bubbiftuu	Or.	T	-	Wv	No ch	Rabies	Rabies
GT13	*Coffee arabica*	Rubiaceae	Buna	Ex/D	Sh	Inc St	Wv	Inc	Wound	
GT14	*Cucurbita pepo*	Cucurbitaceae	Buqqee	Or.	H	Fo	Hg	Inc	Gonohorrhea	
GT15	*Cassia arereh*	Fabaceae	Botoroo	Or.	T	Fen Tb.	Wv	Dec.	Snake bite	Snake bite
GT16	*Eucalyptus globulus L*	Myrtaceae	Baargamoo Adii	Ex/D	T	Hc Fw Inc	Hg	Dec	Allergic	
GT17	*Irythrina abyssinica*	Fabaceae	Beroo	Ex/D	T	Fen	Hg	Dec	Wound	

GT18	*Calpurina aurera*	Fabaceae	Ceekaa	Or Ex/D	Sh	Fen Fw Hc	Wv	Dec	Measl	
GT19	*Justicia schimpercna*	Acanthaceae	Dhummugaa	Or.	Sh	Fen	Wv	Dec	Rheumatism.	
GT20	*Ocimum gratissimum*	Lamiaceae	Damakasee	Nas.	Sh	-	Wv	Dec	Allergic	
GT21	*Tapinanthus globifer us*	Loranthaceae	Dheertuu Bakkannisaa	Or.	Ep	-	Wv	Dec	Blood pressure	
GT22	*Tapinanthus globifer us*	Loranthaceae	Dhertuu Bunaa	Or.	Ep.	-	Fl	Inc	-Malaria	
GT23	*Terminalia laxiflora*	Combertaceae	Dabaqqaa	Or.	T	Fen Fw Con	Wv	Dec	Snake bite	Snake bite
GT24	*Rumex abyssinica*	Polygonaceae	Dhangaggoo	Ex/D	Sh	-	Wv	No ch	kuwakucha	
GT25	*Rumex nepajensis sprena.*	Polygonaceae	Dhangaggoo saree	Nas.	Sh	-	Wv	No ch	Epilepsy.	
GT26	*Achyranthes asperal L.*	Amaranthaceae	Darguu	Or.	H	-	Wv	Dec	Abdominal crump.	
GT27	*Acacia etbaica*	Fabaceae	Doddota	Or.	T	Fw Ch	Wv	Dec	Gonorrhea	
GT28	*Olea yeuropae*	Oleaceae	Ejersa	Or.	T	Hc Fw Fen	Wv	Dec	Menstrual pain	
GT29	*Vernonia amygdalina*	Asteraceae	Eebicha	Or.	T	Fw	Wv	Dec	Menstrual pain	
GT30	*Clematis hirusuta*	Ranunculaceae	Fitii	Or.	Cl	-	Wv	Dec		Faciolosis
GT31	*Cucumis fietolius A.*	Cucurbitaceae	Fechwaa	Or.	CL	-	Wv	Dec	Rabies.	Rabies
GT32	*Giardenia ternitolia*	Rubiaceae	Gambeela	Or.	T	Hc Fen Ch	Wv	Dec	Gonohorrea	
GT33	*Withania somnifere L.*	Solanaceae	Gizaawwaa	Or.	H	-	Hg	Inc	Evil eye.	
GT34	*Tragia brevipes*	Euphobiaceae	Gurgubbee	Or.	H	-	Wv	No ch		Blackleg
GT35	*Nicotiam tabacum L.*	Solanaceae	Goofichoo	Nas.	Sh	-	Hg	Inc		For Leach removal.
GT36	*Centella asiatica L.*	Apiaceae	Gurraa	Ex/D	H	Sp	Hg	Inc	Herpessoster	
GT37	*Rhamnus prinoides L*	Rhamnaceae	Geeshoo	Or.	Sh	Ap	Wv Hg	Dec	Tonsilitis	
Gt38	*Colocasia esculenta*	Araceae	Goodarree	Or.	H	Fo	Hg	Inc	Delayed placenta	
GT39	*Urera hypselodendron*	Urticaceae	Hida Antuuta	Or.	Cl	-	Wv	No ch		Faciolosis
GT40	*Solanum giaanum*	Colanaceae	Hiddi Gurracha	Or.	H	-	Wv	Dec	Abdominal crump	
GT41	*Embelia schimperi*	Myrsinaceae	Hanquu	Or.	Sh	Fw	Wv	No ch	Tape worm	
GT42	*Hageria abyssinia*	Rosaceae	Hexoo	Or.	T	Fw	Wv	Dec	Tape worm	
GT43	*Ximenia americana*	Olacaceae	Hundhaa	Or.	T	Fo Fw Fen	Wv	Dec	Abdominal crump	
GT44	*Dodanaea anguestifaia L.*	Sapindaceae	Itacha	Or.	Sh	Fen	Wv	Dec	Menstrual pain	
GT45	*Tynura pseudochina L..*	Compositate	Jiniraas	Or.	Sh	Fw	Hg	Dec	Epilepsy	
GT46	*Zingiber officinale*	Zingebiraceae	Jinjibila	Or.	H	Sp	Hg	Inc	Abdominal crump	
GT47	*Maytenus senegalensis*	Celastraceae	Kombolcha	On eye	T	Fw	Wv	Dec	Eye infection	
GT48	*Helichrysum spp.*	Asteraceae	Loosee	Ex/D	H	-	Wv	No ch.	Scabies	
GT49	*Bersama abyssinia*	Melianthaceae	Lolchiisaa	Ex/D	Sh	Fen	Wv	Dec	Wound.	
GT50	*Citrus limon*	Rutaceae	Lomiio	Or.	Sh	Fo	Hg	Inc	Snake bite	Snake bite
GT51	*Bidens Pilosa L.*	Compositae	Maxxanne gurracha	Or.	H	-	Wv	Dec	Menstrual pain	
GT52	*Clerodondrum myricodes*	Lamiaceae	Marasisaa	On teeth	Sh	-	Wv	Dec	Teeth ache	
GT53	*Shrebera alato*	Oleaceae	Onunu	Or.	T	Fen Fw	Wv	Dec	Ascaris	
GT54	*Carica papaya L.*	Caricaceae	Pappayaya	Ex/D Or.	T	Fo	Hg	Inc	Wound Tape worm Ascaris	
GT55	*Brucea antiducentrica*	Simarubiaceae	Qomonyoo	Ex/D	Sh	Fen	Wv	Dec.	Scabies	
GT56	*Crinum abyssimicam*	Amaryllidaceae	Kulubbii warabessaa	Or.	H	Sp	Wv	No ch	Abdominal crump	
GT57	*Salvia marjame.*	Lamiaceae	Kolankolee	Or.	Cl	-	Wv	No ch	Menstrual pain	
GT58	*Echinops hispidus*	Asteraceae	Keberichoo	Or.	H	Sh	Wv	Dec	Evil eye	

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GT59	*Ricinus communis L.*	Euphorbiaceae	Kobboo	Or.	Sh	-	Hg	Dec	Snake bite	Snake bite
GT60	*Prunus africana*	Rosaceae	Oomii	Or.	T	Fen Fw Hc	Wv	Dec	Pneumonia	
GT61	*Schinus molle L.*	Anacardaceae	Qundobar barree	Or.	T	Sp Fw	Wv	Dec	Abdominal crump	
GT62	*Vernonia myriantha*	Asteraceae	Rejjii	Or.	Sh	-	Wv	Dec	Hepatitis	
GT63	*Kedrostis leloja*	Cucurbitaceae	Saroo bofaa	Ex/D	Cl	-	Wv	No ch	Herpeszoster	
GT64	*Senna schimperi*	Lamiaceae	Senemekii	Or.	Sh	-	Wv	No ch	Diarrhea	
GT65	*Brassica nigra L.*	Cruciferae	Shinfaa	Or.	H	Sp	Fl	Inc	Gastritis	
GT66	*Olea capensis*	Oleaceae	Soole	Ex/D Or.	T	Fen Fw	Wv	Dec	Wound	Black leg
GT67	*Pentas scimperiana*	Rubiaceae	Suruma	Or.	H	-	Wv	Dec	Fracture Gastritis	Fracture
GT68	*Acacia abyssinica*	Fabaceae	Sondii	Or.	T	Fw Ch	Wv	Dec	-	-Babesia
GT69	*Trigonella foenum*	Fabaceae	Sunqoo	Or.	H	Sp	Fl	Inc	Coughing	
GT70	*Millettia ferruginea*	Fabaceae	Sootalloo	Ex/D	T	Fw	Wv	Dec	Wound	
GT71	*Citrus medica*	Rutaceae	Turungoo	Or.	Sh	Fo	Hg	Dec	Ascaris	
GT72	*Linum usitatissimum L.*	Linaceae	Talbaa	Or.	H	Fo	Fl	Inc	Gastritis	
GT73	*Premna schimperi L.*	Lamiaceae	Urgeessaa	On teeth	T	Hc Fen Fw	Wv	Dec	Teeth ache	
GT74	*Cordia africana*	Cordia africana	Waddeessa	Ex/D	T	Fur Fw Fen Con Fo	Wv	Dec	Tumor	
GT75	*Erythrina brucei*	Fabaceae	Waleensuu	On Eye	T		Wv	Inc	Kerato conjunctivitis.	Kerato conjunctivitis.
GT76	*Securidaca longepedunculata*	polygalaceae	Xabanayi	Or.	T	Hc Fw	Wv	Dec	Abdominal crump	
GT77	*Rhus ruspolii*	Anacardaceae	Xaaxessaa	Ex/D	Sh	Fen	Wv	Dec	Herpes zoster	
GT78	*Ehretia cymosa*	Boraginaceae	Ulaagaa	Or.	T	Hc	Wv	Dec	Tap worm	
GT79	*Ruta chalepensis L.*	Rutaceae	Xenaddaama	Or.	H	-	Hg	Inc	Abdominal crump	
GT80	*Pycnotachys abyssinica F.*	Lamiaceae	Yeriyo	Or.	Sh	Fen	Wv	No ch	Ascaris.	
GT81	*Bruceaanti dysentrica*	Simaroubaceae	Qomonyoo	Or.	Sh	Fen	Wv	Dec	Rabies	Rabies

Key: Rout: Or= Oral, Ex/D= External or dermal, Nas= Nasal

Growth habit:T= Tree, Sh=Shrub, H=Herbs, Cl= climber, Ap= Epiphyte

Other use of medicinal plant: Fw= Fire wood, Fen= Fence, Hc= House construction, Sp=Spice, Inc= Income, Fo=Food,

Con= construction, Det=Detergent, St=Stimulant, Fur=Furniture, Tb= Teeth brush, Ch=Charcoal

Habitat:Wv= Wild vegetation, Hg= Home garden. Fl= Farmland

Status ofmedicinal plants: Inc= Increase, Dec= Decrease, No ch= Nochange