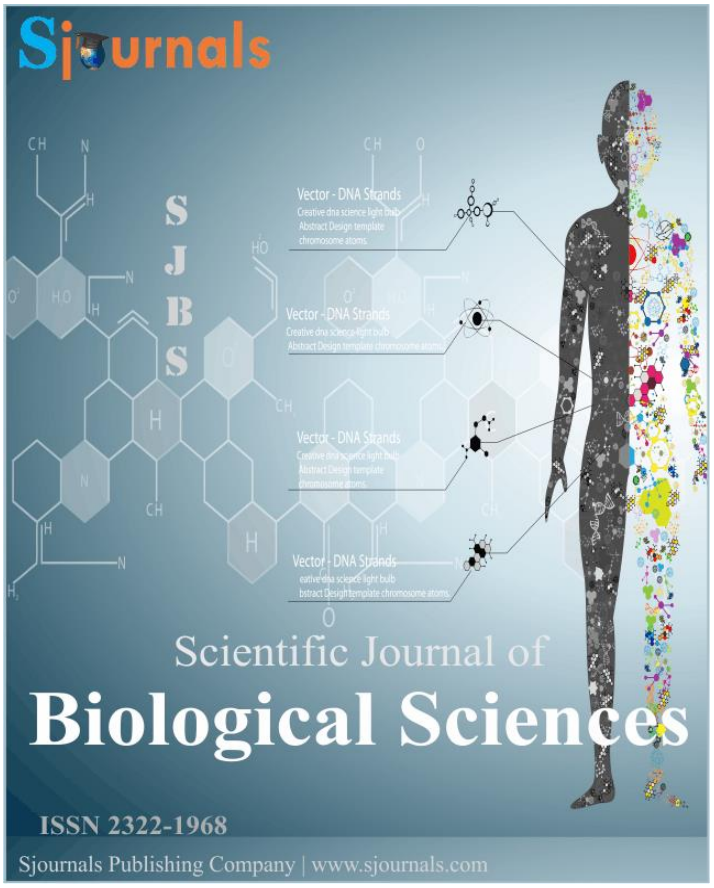

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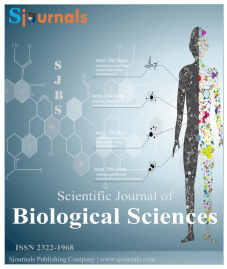

Original article

Ethnobotanical study of medicinal plants used by local people in treatments of human and livestock ailments in Gasera Woreda, Bale zone, Oromia regional state, Ethiopia

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ABSTRACT

An ethnobotanical study of indigenous knowledge on the uses of medicinal plant species was conducted from December 2017 to March 2018 in Gasera district of Bale Zone, Oromia Regional State. The objective of the study was to document indigenous knowledge of medicinal plants used to treat human and livestock ailments, threats and conservation status of medicinal plants before it is lost. Different ethnobotanical techniques such as semi-structured interviews, group discussion, field observations and guided field walk were used for gathering data and a total of 97 informants from 6 kebeles were involved in the study. A total of 121 medicinal plant species belonging to 113 genera and 60 families were documented. Among plant families, Lamiaceae was the most dominant plant family represented by 10 species, followed by Solanaceae represented by 8 species and Asteraceae represented by 7 species. Most of the species (78 species) were collected from the wild while (43 species) were collected from home-gardens. A total of 59 (48.76%) species were used for the treatment of human ailments, 34 species (28.1%) were used to treat both human and livestock ailments and 28 species (23.14%) were used to treat livestock ailments only. Herbs were the most used plants, accounting for 52.89% followed by shrubs (23.14%), trees

(19.01%), climbers (3.31%) and epiphytes (1.65%). Human interference through habitat destruction for agricultural expansion, construction, firewood and other purposes were the major threats to medicinal plants in the study area. Awareness raising and community based participatory forest management program should be encouraged.

1. Introduction

Since time immemorial, people in developing countries relied on medicinal plants for treatment of diseases and restoration of physical and mental wellbeing (Abebe, 2001). Traditional medicine still remained to be the most important source of treatment in the primary healthcare systems of the majority rural poor of developing countries. Like other developing countries, in Ethiopia, the use of traditional medicinal plants has been practiced for thousands of years. This long history of medicinal plant use practice of the country is evidenced in various religious manuscripts that have been written several centuries ago (Abebe and Ayehu, 1993). The practice has been persisted to date and plays a major role in health care system of the country. According to Bekele (2007) about 80% human and 90% livestock in Ethiopia rely on traditional medicinal plants for their basic health. Having considered the affordability and accessibility of traditional medicine the government of Ethiopia has also promoted the use of medicinal plants that are of proven safety and efficacy (Abebe, 2001).

However, despite the interest and recognition, there has not been much progress in research and documentation of medicinal plant resources in the country. Ethiopia is a country of diverse flora and people of several languages, cultures, and traditional knowledge and beliefs. Although the knowledge and use of plants is an integral part of diverse ethnic groups in the country, the extent of which has not yet been studied in depth (Abebe, 2001). This study therefore, was carried out in Gasera district of Bale zone to document the medicinal plant species used to treat human and livestock diseases and associated traditional knowledge of local peoples on medicinal plants.

2. Materials and methods

2.1. Description of the study area

Gassera district is located in Oromia Regional State (Figure 1), the district is located at a distance of 58km far from zonal capital, Robe and at a distance of 488Km southeast of Addis Ababa. Geographically the district is situated 70 11'39'' to 70 34' 19''N latitude and 390 51' 15'' to 04023'02''E longitude (Fig 1). The district covers an area of 1, 114 km2 and has an altitude range 1100-2600 masl. It is bounded Agarfa in the East, Sinana in the north, and Ginir in the southwest, Gololcha in the east and Arsi district in the south. Gasera town is the center of the district's administration. Totally, this district comprises 21 kebeles. Gassera district has three agro climatic zones traditionally categorized as Dega (82 %), Weina dega (15%) and Kolla (3%). Based on the meteorological information, the district has bimodal rainfall having two rain seasons per year, locally called Belg and Meher or Kirement season. The Belg season sets in March and extended to May and Meher rain starts from July and extends to November. Belg rainfall accounts for about 38% while that of Meher for about 62% total rainfall of the area. The mean annual rainfall is 819.25mm whereas the lowest and highest rainfall is 735.9mm and 912.5mm respectively (GDANRO, 2017). Moreover, the district is characterized by a great diversity of temperature due to its wide range of altitudinal variation Lowland area along Wabe River the area experience moderately warm temperature. The mean annual temperature of the district is 20oc.The lowest temperature is 15^{o}c and highest is 25oc respectively (GDANRO, 2017).

The common plant species in Gasera district include *Croton macrostachyus, Acacia abyssinica, Cordia africana*, *Eucalyptus globules Junipers procera, Ficus spp. Olea europea*, Podocarpus *falcatus, Carissa spinarum*, *Calpurnia aurea, Vernonia* spp and others. The vegetation of plants areas are highly degraded due to agricultural

expansion, overgrazing, high demand of wood for constructions, firewood and charcoal. Especially, *Junipers procera* and *Cordia Africana* are highly used for construction and other purposes.

According to ECSA (2006), Gassera district has a population of 78, 639 of which the number of males and females are 40298 and 38341, respectively. The Oromo ethnic group is the largest ethnic group and "Afan Oromo" language is the most widely used language in the area. About 93.9% of human populations were rural population whereas about 6.1% of populations are urban populations.

The human health resource improvement through public action of health, nutrition and education is a precondition for accelerating of growth. According to (GDANRO, 2017), the reported that the first ten major diseases found such as pneumonia, diarrhea, skin disease, rheumatism, internal parasite, eye disease, gastritis, tonsillitis, STDs and anemia. These diseases mostly affect people living in the rural areas where the health services are in shortage, they are unable to afford the high cost of modern drugs and because far from the health center.

2.2. Selection of study sites and informants

Ethnobotanical data were collected between December 2017 and March 2018 from six sampled kebeles that were purposively selected with the help of elders and local authorities of the District based on better availability of traditional healers and knowledgeable people. The kebeles were *Nake negawo, Ballo amigna* and Watechemo from highland (2000-2600masl), *Acheche birbirsa* and *Banaba guranda* from semi highland (1800-2000masl) and *Ballo habebe* from lowland (1600-1800masl). For the interview, 97 healers and knowledgeable informants were selected using purposive sampling method, of which 84 were males and 13 were females. The ages of the informants ranged between 20 and 82 years. From 97 informants 22 key informants were selected for ranking exercise with the help of elders and local administrators. The sample size for quantitative data was determined using Yamane (1967) formula as follows:

$$n=N/1+N(e)^2$$

n= Sample size for the research conduct household, N= total number of households in all selected kebeles, e = maximum variability or margin of error 10 %(0.1), 1= the probability of event occurring.

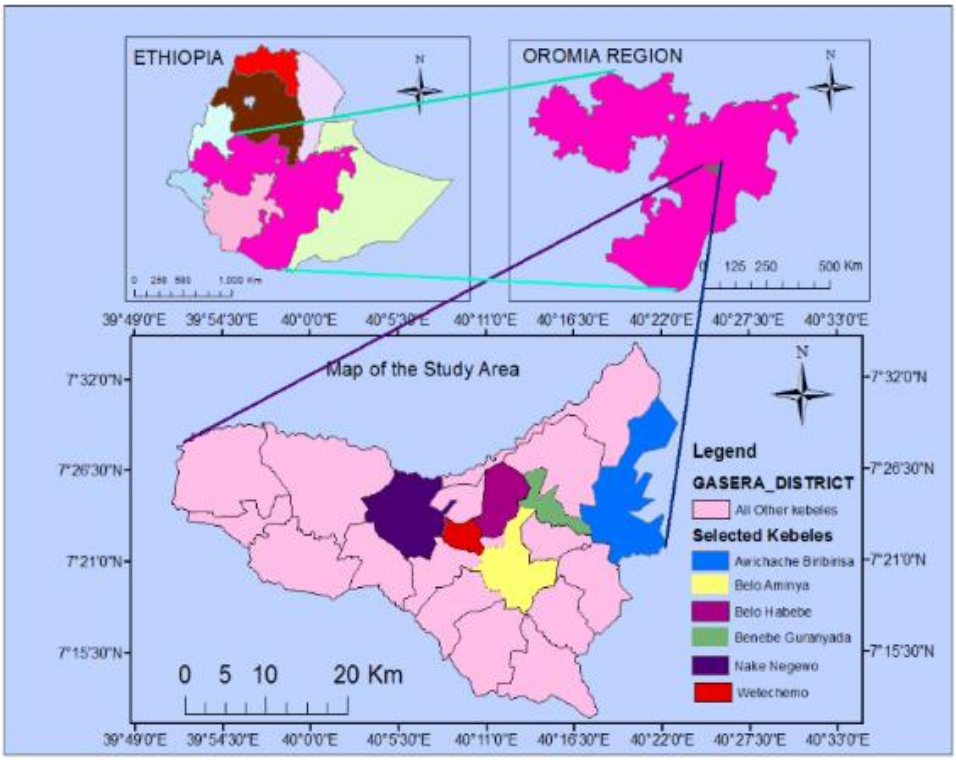

Fig. 1. Map of Gassera district showing the study Kebeles.

2.3. Ethnobotanical data collection

Ethnobotanical data was collected using semi-structured interviews, group discussions and guided field walks with key informants. During interview information regarding local names of plants used, their threats and management, part(s) used, preparation methods, routes of remedy administration, diseases treated and side effects of remedies was gathered. Field observation was used to record the habit and habitat and conservation status of medicinal plants were recorded. All of the interviews were held based on the checklist of questions prepared in English language and translated into *Afan Oromo*, the language of the inhabitants. Finally, for each reported species specimens were collected pressed and dried and identified using flora books and assistance of expertise.

2.4. Data analysis

The collected ethnobotanical data using Microsoft Excel 2007 and result summarized using descriptive statistics such as frequency and percentage. A preference ranking was conducted using six informants and seven medicinal plants following (Martin, 1995) to select best preferred medicinal plants species for treatment of febrillness, the disease to which highest number of medicinal plants were subscribed by informants. Accordingly, the informants were asked to arrange the plants based on their personal level of efficacy. Medicinal plant that was believed to be the most effective was given the highest value, i.e. 7, and the one with the least effectiveness a value of 1 and rank was determined based on the total score of each species.

The paired comparison was also used to evaluate the degree of preference or level of importance of certain selected plants according to (Martin, 1995). A list of the pairs of selected items with all possible combination was presented to selected informant and their responses were recorded and total value was summarized. In this study, six key informants were selected to indicate the efficacy and popularity of seven medicinal plants species used to treat the most frequent disease in the study area and rank was made based on the report of the informants. The numbers of pairs are calculated by the formula, n (n-1)/2, where n is the number of items. An item with highest frequency of choices has the highest score.

Direct matrix ranking exercise was done following (Martin, 1995) in order to compare multipurpose use of a given species and to relate this to the extent of its utilization versus its dominance. Based on information collected from informants, eight multipurpose medicinal plant species were selected out of the total medicinal plants and seven use diversities of these plants were listed for 6 selected key informants to assign use values to each species (Table 6). The seven use values include furniture, fence, charcoal, construction, medicinal, food and firewood.

3. Results

3.1. Medicinal plants recorded

In the study, a total of 121 medicinal plant species belonging to 113 genera and 60 families were documented (Tables 1, 2 and 3). Of these, family *Lamiaceae* was the most commonly reported medicinal plant family which represented 10(8.26%) species, followed by *Solanaceae* 8(6.61%) and *Asteraceae* 7(5.79%). Most of the species (78) were collected from the wild while (43) were collected from home gardens. Of the total medicinal plants, herbs were the most used plants, accounting for 64 species (52.89%) followed by shrubs 28(23.14%) species, trees 23(19.01%) species, climbers 4(3.31%)and epiphytes 2(1.65).

3.2. Disease treated

Among 121 plant species recorded in the study, 59 medicinal plant species (48.76%) were reported to be used for human ailments only (Table 2) while 28 medicinal plant species (23.14%) were used to treat only livestock ailments (Table 3) and the remaining 34 medicinal plant species (28.1%) were used to treat both human and livestock ailments (Table 1).

3.3. Plant part used

The most widely used plant part for the preparation of remedy were leaves 29 species (40.85%) followed by roots 15 species, (21.13%), seeds 5 species (7.04%), whole part 5 species (7.04%), fruit 5 species (7.04%), bark 4

species (5.63%) and others (Table 3). The majority of plant part were prepared from fresh materials 104 species (66.24%) followed by 32 dry species (20.38%) and fresh/dry 21 species (13.38%). Regarding to method of preparation herbal remedies the most frequently herbal remedies used for human ailments were accounted by crushed 34 species (45.95%), were followed chewing 21 species (28.38%), smoking 10 species (13.51%), powdering 3 species (4.05%) brushing 3 species (4.05%) and Dropping 3 species (4.05%). According to the informants of the study area herbal remedies preparation based on the actual site of ailments and also the result of the study area revealed that relatively relied on type of diseases area study.

3.4. Routes of administration, dosage and side effects

Route of administration traditional medicinal plants for human ailments were accounted by oral 53.73% were followed by dermal 26.87%, nasal 13.43% and Optical 5.97%. Oral administration the most commonly route over the others used by local people in the study area. Application of herbal remedies were accounted by drinking for the largest number 23 (31.94%), followed 15(20.83%) eating, sniffing 10 (13.89%) and others (Figures10). Preparation of herbal remedies commonly treated internal diseases through applied drinking patient. Skin infections such as ringworm were treated by painting herbal preparations on an infected skin.

About 94.1% of informant reported that the amount of dosage given to children and weak individuals are less than that of strong adults. However, measurements used to determine the dosages are not standardized. The amount of medicinal plant dosage prescribed by healers differs from place to place or from healers to healers and there is no standard dose as that of modern medicine (Dawit Abebe and Ahadu Ayehu, 1993). Despite that 5.9% of informants revealed that the amount of dosage given to children and weak individual no such difference with strong adults. The reason that the type of diseases and actual site of ailments determined the amount of dosage prescribed for patient. According to the informants, traditional herbal remedies prepared and prescribed for patient can cause different side effects such as vomiting, severe headache, diarrhea, gastric, burning wound skin, removal of mineral, and loss of weight. But 68.7% of informants informed that frequently using medicinal plant used to treat diseases like hepatitis, gonorrhea, tape worm and rabies no clear showed side effect on patients. Despite, 31.3% of informants reported that traditional herbal remedies prescribed for patients showed side effect like unconsciousness, lack of appetite. Other side effect also reported by informants such as hemorrhoids and skin infection temporary irritation occurs.

3.5. Preference ranking

Results of preference ranking made to determine the most preferred plant species against febrillness using six key informants showed that *Ocimum lamiifolium is* the most preferred medicinal plant followed by *Lepidium sativum* and *Allium sativum* (Table 4). While *Leonatis raineriana* least preferred species and less effective for treating febrillness in the study area.

Table 4
Preference ranking of seven selected medicinal plants used to treat febrillness.

	Key informants							
Plant species	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**Total**	**Rank**
Allium sativum	6	5	6	5	6	6	34	3
Eucalyptus globulus	3	4	1	2	4	4	18	4
Leonatis raineriana	1	1	2	4	3	1	12	7
Lepidium sativum	5	7	4	7	7	5	35	2
Ocimum lamiifolium	7	6	7	6	5	7	38	1
Ruta chalepensis	4	3	5	1	2	2	17	5
Withania somnifera	2	2	3	3	1	3	14	6

3.6. Direct matrix ranking

Results of direct matrix ranking exercise conducted on seven multipurpose medicinal plant species using six informants showed that *Eucalyptus globulus* is the most preferred multipurpose species followed by *Croton*

macrostachyus, Zyzyphus spina-christi and Olea europea L. subsp cuspidata. While *Platostoma* rotundifolium the least preferred multipurpose species in the study area (Table 5).

Table 5
Direct matrix ranking for eight multipurpose area in the study area.

	Use category								
Plant species	**Furniture**	**Fence**	**Charcoal**	**Fuel wood**	**Constr**	**Food**	**Medicine**	**Total**	**Rank**
Eucalyptus globulus	5	4	4	4	5	0	3	26	1
Platostoma rotundifolium	0	3	0	3	2	0	4	12	8
Olea europea	3	4	2	4	4	0	4	21	4
Vernonia amygdalina	0	4	1	4	4	0	5	18	5
Calpurnia aurea	0	3	0	3	3	0	4	13	7
Croton macrostachyus	4	4	3	4	5	0	4	24	2
Carissa spinarum	0	3	0	4	3	3	3	16	6
Zyzyphus spina	2	4	3	2	4	4	4	23	3
Total	14	30	13	28	30	7	31	153	

3.7. Major threats of medicinal plant

According to FGD and local informant individual interviewed result in the study area nowadays quite large number of medicinal plants under significant stress by manmade and natural factors. Some of the threats of medicinal plants were performed during interviewed made individual informant were responded to list. FGD result showed that the major factor threats of medicinal plants included Agricultural expansion, fire wood, fence, construction, medicine and charcoal, agrochemical application. But as informants reported that Agricultural expansion 26.25% the leading of extensively wheat and barley cultivation followed fire wood 21.45%, fence 18.35%, and construction 16.35%, medicine 8.1% and charcoal 5% in the study area. Agro-chemical application the new emerging agriculture input also affected herbaceous plants and particularly medicinal plant threats in the study area. Deforestation and drought also threats of medicinal plants species in the study area. According to key informants discussed that construction was the most found to be threats of medicinal plants were followed agriculture expansion, deforestation and drought in the study area. Medicine was the least threats of medicinal plants in the study area (Table 6). As result, currently searching of medicinal plants finding moving long distance remote even going to *Gammoojj*i (*Berha*) district like Sewena and lega hida district to collect medicinal plants such as *Commiphora myrrha and Silene macrosolen.*

Table 6
Priority ranking for threats of medicinal plants.

	Key informants (coded R1-R6)						Total	
Threats	**R1**	**R2**	**R3**	**R4**	**R5**	**R6**	**score**	**Rank**
Agrochemicals	3	3	6	3	1	3	19	7
Agricultural expansion	5	5	7	8	8	7	40	2
Construction	8	7	8	7	5	8	43	1
Deforestation	4	8	5	4	6	5	32	3
Drought	1	6	2	6	7	6	28	4
Fence	7	2	4	2	2	4	21	6
Firewood	6	4	3	5	4	2	24	5
Harvest for medicine	2	1	1	1	3	1	9	8

Regarding effort to conserve of medicinal plant species, 36.4% of informants practice conservation by planting and cultivating some medicinal plants in their home garden in the study area. The most common medicinal species found under cultivation and plantation includes *Platostoma rotundifolium*, *Vernonia amygdalina, Eucalyptus globulus, Ocimum lamiifolium, Allium sativum, and Lepidium sativum.* Some of these species are usually planted for other purposes. For example, *Platostoma rotundifolium* widely grown for fencing as same time could be used for treatment of both human and livestock ailments. On the other hand, some plants species are deliberately cultivated at home garden for medicinal purpose only. For instance: *Ocimum lamiifolium, Allium sativum* and *Lepidium sativum.*

Table 1
Medicinal plants used to treat human and livestock diseases.

Scientific name	Family name	Local name	Habit	Part used	Disease treated	Preparation
Achyranthes aspera L.	Amaranthaceae	Xaalanjii	Herb	Root	Eye disease	Chew and spit the liquid into the affected eye
					Cough	Chew the root with salt
					Snake bite	Chew and spit the liquid in affected part
Allium sativum L	Alliaceae	Qullubbii adi	Herb	Bulb	Blotting	Bulb of *Allium sativum is* crushed with roots of *Cucumis ficifolius,* and *Vernonia amygdalina leaves* mixed water and given to cattle
					Sudden disease	Bulb of *Allium sativum is* crushed with *Ruta chalepensis leaves salt* mixed water and drunk
					Blackleg	Bulb of *Allium sativum is* crushed with roots of *Cucumis ficifolius, Vernonia amygdalina* and *Ruta chalepensis* mixed water
					Stomachache	Bulb of *Allium sativum is* crushed with *Ruta chalepensis leaves salt* mixed water and drunk
					Toothache	Fresh of bulb put on tooth for few time and chewing with salt
					Diarrhea	Bulb of *Allium sativum is* crushed with *Ruta chalepensis leaves salt* mixed water and drunk
					snake bite	Bulb *is* crushed with *Ruta chalepensis leaves salt* mixed water and drunk
					Febrillness	Bulb *is* crushed with *Ruta chalepensis leaves salt* mixed water and drunk
					Common cold	Bulb *is* chewed with *salt* and drunk
Aloe pubescens Reynolds	Aloaceae	Hargisa	Herb	Whole part	Snake bite	Crushed fresh leaf with salt and drunk a cup of tea
				Whole part	Blackleg	Whole part of *Aloe pubescens* above the root used to treatment blackleg by crushing with salt added a little water a drunk cattle
				Leaf	Stomachache	Crushed fresh leaf with salt and drunk a cup of tea

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

Brassica nigra (L.).Koch	***Brassicaceae***	**Saanaficha**	**Herb**	**Seed**	**Stomachache**	**Dried powder of *Brassica nigra* mixed with *Allium sativum* of bulb one or two chewed**
Calpurnia aurea (Aiti) Benth.	*Fabaceae*		Shrub		Blotting	Dried powder of Brassica nigra crushed with Nigella sativum and *Ruta chalepensis* added water making solution to drink cattle
				Leaf	Skin infection	Fresh leaf crushed and painted an infected skin

				Leaf	Ecto-parasite	Fresh leaf crushed with salt and painting on the body of surface cattle
				Root	Rabies	Fresh root of Calpurnia aurea crushed with leaf of Phytolacca dodecandra drunk cattle
				Root	Snake bite	Fresh root of Calpurnia aurea crushed with Allium sativum drunk cattle
				Leaf	Diarrhea	The leaf of *Calpurnia aurea* is crushed and then drunk before meal
Capparis fascicularis DC	*Capparidaceae*	Gora	shrub	root	urinating problem	Fresh root crushed with salt and to drink human very small amount of liquid
					Wound	Fresh root crushed with salt and painted on the wounded skin of livestock
				Seed	Diarrhea	Dried powdered crushed with Allium sativum added salt drunk as solution
					Internal parasite	Dried powdered crushed with *lepidium sativum* added salt drunk as solution
					Anti-inflammatory	Dried powdered crushed with *lepidium sativum* added salt drunk as solution
Carrissa spinarum .L	Apocynaceae	Agamsa	Shrub	Leaf	Urinary problem	Fresh leaf crushed with Allium sativum salt added and making as solution drunk cattle
				Root	Diarrhea	Dried root crushed with dried powder of Brassica nigra and mixed with salt
					Internal parasite	Dried root crushed with salt added and making as solution drunk cattle
					Rabies	Dried root crushed with added salt and making as solution drunk cattle
					Snake bite	Fresh root crushed with fresh bulb of *Allium sativum* added salt and making as solution drunk cattle

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

Cucumis ficifolius A. Rich	***Cucurbitaceae***	**Hooloto**	**Herb**	**Root**	**Snake bite**	**Fresh of root crushed with *Verbascum sinaiticum* and drunk livestock**
					Headache	Fresh of root chewed with salt relief from diseases
					Liver ache	Fresh of root chewed with salt relief from diseases
					Gonorrhea	Fresh of root chewed with salt relief from diseases
					Rabies	Fresh of root crushed with *Verbascum sinaiticum* and drunk livestock and human
					Stomachache	Fresh of root chewed with

						salt relief of disease
					Blackleg	Fresh root crushed with *Verbascum sinaiticum* and drunk livestock
					Dearrhea	Fresh root crushed with *Verbascum sinaiticum* and drunk livestock
					Rabies	Fresh root crushed with *Verbascum sinaiticum* and drunk livestock
					Suddenly disease	Fresh root crushed with *Verbascum sinaiticum* and drunk livestock
					Febrillness	boiling fresh leaf with salt and washed body
Cymbopogon citratus (DC.) Stapf	*Pocaeae*	Teji sar	Herb	Leaf	Suddenly disease	Fresh root crushed with *Allium sativum* added salt making solution to drink cattle
					Blotting	Fresh root crushed with *Allium sativum* added salt making solution drunk cattle
					Tonsillitis	Fresh root chewed with salt to get relief from stomach ache
					Evil eye	Dried root smoking covered with clothes or closed room applied fumigated
					Febrillness	Dried leaf smoking covered with clothes or closed room fumigated
					Stomachache	Fresh root chewed with salt to get relief from stomach ache
Datura stramonium. L	*Solanaceae*	Baanjii	Herb		Snake breath	Fresh leaf of *Datura stramonium* crushed with salt and extracted solution and very small amount drink human
					Snake bite	Fresh leaf of *Datura stramonium* crushed with salt and extracted solution rubbed affected areas of snake bite body and very small amount drink human
					Blotting	Fresh leaf of *is crushed with salt and extracted solution drink half of litter livestock*
Cissus quadrangularis. L	Vitaceae	Gaalee	climber	Root and leaf	Anthrax	Fresh root and leaf is crushed with salt and drink cattle
					leeches	Dried root crushed and dropping to nose and drink some amount of solution
					Sudden disease	Dried root fumigated through nose

					Febrillness	Dried root with water boiling fumigated through nostrils
Citrus aurantifolia Burn. f	Rutaceae	Loomi	Shrub	Fruit	Bleeding feces	During bleeding feces for livestock mixed with other croton macrostachyus
					Cough	Fresh of fruit juice sniffing and rubbed around nostril for human

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

Euclea divinorum Hier	***Ebenaceae***	**Miessa**	**Tree**	**Leaf**	**Toothache Eye disease**	**Chewing fresh leaves with salt Chewing fresh leaves and spit to liquid eye of livestock**
Eucalyptus globulus Labill	*Myrtaceae*	Bargamo adii	Tree		Febrillness	The leaf of *Eucalyptus globulus* is crushed and boil with water and inhale repeatedly the vapour, while boiling wash face
					Toothache	Chewing latex of leaf with salt
					Cough	Fresh leaf of is crushed with *Allium sativum* one or two bulb and chewing
					Amoeba	The leaf is crushed with *Allium sativum* and Zinger officinale one or two bulb making as solution drunk
					Suddenly	The leaf of *Eucalyptus globulus* is crushed with *Allium sativum* and Zinger officinale one or two bulb making as solution drunk
					Diarrhea	The leaf of *Eucalyptus globulus* is crushed with *Allium sativum* and Zinger officinale one or two bulb making as solution drunk
					Diarrhea	The leaf of *Eucalyptus globulus* is crushed Vernonia amygdalina making as solution drunk cattle
					Blotting	Crushing fresh leaf Eucalyptus globulus with *Allium sativum* bulb and *Platostoma rotundifolium* leaf added salt and making as solution drink cattle
					Urinatory problem	Crushing fresh leaf *Eucalyptus globulus* with *Allium sativum* bulb and leaf added salt and making as solution drink cattle
Grewia tenax (Forssk) Fiori	*Tiliaceae*	Hurgessaa	Tree	Leaf Leaf	Eye disease	Fresh leaves chewing and dropping to eye disease of cattle
					Neqarsa	Fresh leaf crushed with salt and applied to affected area of body cattle or human
Kanahia laniflora	*Asclepiadaceae*	Jidaa ananii	Herb	Leaf	Hepatitis	Leaf is *crushed with Allium sativum added salt* and making as solution drunk
					Snake bite	Crushed leaf of *Kalanchoe laniflora* with leaf of *Phytolacca dodecandra* and given for cattle drunk
					Hemorrhoid	Fresh leaf of *Kalanchoe laniflora crushed with* leaves of *Croton macrostachyus rubbing on affected area*
Croton	*Euphorbiaceae*	Bakkannisa	Tree	Leaf	Blotting	Leaf crushing with salt added water and

macrostachyus Hochst						drunk cattle
					Stomachache	Chewing leaf and feeling ache
					Diarrhea	Leaf crushing with salt added water and drunk cattle
					Febrillness	Leaf is crushing with salt and boiling and fumigate vapour droplet water inhaled
					evil eye	Dried leaf crushing and smoking inhaled
					Ring worm	The leaf sap painted the affected body part
					rash skin	Fresh bark is crushed and applied to affected area

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

Lepidium sativum L.	**Brassicaceae**	**Feexoo**	**Herb**	**Seed**	**Blotting**	**Dried seed of *Lepidium sativum* and bulb of *Capsicum frutescens* are crushed together and given to cattle**
				Seed	internal parasite	Dried seed of *Lepidium sativum* and bulb of *Capsicum frutescens* are crushed together and given to cattle
				Seed	Dearrhea	Seed of *Lepidium sativum* is powdered and mixed with bulb *Allium sativum drink cattle*
				Seed	Blackleg	Seed of *Lepidium sativum* is powdered and mixed with bulb *Allium sativum drink cattle*
				Seed	Febrillness	Chewing the seeds with salt
				Seed	Dearrhea	Dried seed of *Lepidium sativum* are crushed together with *Allium sativum* given to human
Leonotis ocymifolia (Burm.f.) Iwarsson	Lamiaceae	Bokoluu	Herb	Leaf	Febrillness headache	Leaf will be crushed mixed with water and drunk and wash body
Nicotiana tabaccum L	Solanaceae				Blotting	Leaf of *Nicotiana tabacum* is dried, powdered, mixed with salt and water given to cattle.
				Leaf	Blackleg	Leaf *Nicotiana tabacum* of Crushed together with *Allium sativum* given to livestock
					Stomachache	Dried powder of leaf mixed with salt added with water given to cattle
					Leech	Crushed and backed leaf of *Nicotiana tabacum* is dried, powdered and mixed with water. Half of glass given to cattle
Nigella sativa L	Ranunculaceae	Absuudaa	Herb	Seed	Stomachache	Dried powder of Nigella sativum mixed with Rhizome of zinger taken
					Dearrhea	Dried powder of Nigella sativum mixed with Rhizome of zinger taken
					Blotting	Dried powder of *Nigella sativum* crushed with fresh leaf of *Ruta chalepensis* and *Brassica nigra* drunk cattle
					Blackleg	Dried powder of *Nigella sativum* crushed with powder *Brassica nigra* drunk cattle

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

***Ocimum lamiifolium* Hochst. ex Benth**	**Lamiaceae**	**Damakase**	**Herb**	**Leaf**	**Febrillness**	**Fresh of leaf *Ocimum lamiifolium* crushed and the solution applied through inhaled nose**
				Seed	Evil eye	Dried seed of *Ocimum lamiifolium* fumigating/smoking to patient closed room
				Leaf	Stomachache	Fresh of leaf *Ocimum lamiifolium* chewed during ache feeling as
					Headache	Fresh leaf are crushed mixed with water and drunk
					Cough	Fresh of Leaf crushed mixed with water and drunk
					Swelling	Fresh leaf rubbed on swelling body of affected area
					Blotting	Dried powder of *l*eaf crushed with *Linum usitatissimum and added salt with water solution given to drink cattle*
Phytolacca dodecandra L.	Phytolaccaceae	Handoodee	Shrub	Leaf	Eye disease	Leaf will be chewing and apply to drop eye
				Root	Gonorrhea	Root will be crushed with bulb of *Allium sativum* water and given to human
				Leaf	Rabies	Leaf will be crushed with water and to drink livestock
Platostoma rotundifolium (Briq.) A. J.	Lamiaceae	Totona	shrub	Leaf Seed	Febrillness,	Fresh leaf of *Platostoma rotundifolium* is crushed with *Allium sativum* rubbed body
					stomach ache	Fresh leaf *Platostoma rotundifolium* is chewed with *Allium sativum* or *Zinger officinale*
					Amoeba	Fresh leaf Platostoma rotundifolium is crushed with *Allium sativum* of bulb, *Zinger r officinale* drink
					Rheumatism	Fresh leaf *Platostoma rotundifolium* is chewed with Allium sativum or *Zinger officinale*
					Blotting	Fresh leaf *Platostoma rotundifolium* is crushed with *Allium sativum* and *Ruta chalepensis* and added salt drunk cattle
					Blackleg	Fresh leaf *Platostoma rotundifolium* is crushed with *Allium sativum* salt and drunk cattle
					Hepatitis(*Dhibe allati)*	Fresh leaf of *Platostoma rotundifolium* is crushed with *Allium sativum* and added salt drunk cattle
Rumex nepalensis Spreng	Polygonaceae	Shulti	Herb	Leaf	Wound	Crushing fresh leaf put on affected wounded area
				Root	Stomachache	Fresh root crushed and drunk with coffee
					Tinea corporis	Fresh root crushed and with painting/rubbed on affected area
				Leaf	Urinatory problem	Fresh leaf of *Rumex nepalensis* crushed with fresh fruit of *Ricinus communis* making as solution drunk livestock

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

Ruta chalepensis L.	**Rutaceae**	**Xeena addamii**	**Herb**	**Leaf**	**Blackleg blotting**	**Fresh leaf together with added salt water crushed and drunk cattle**
					Stomachache	Fresh leaf together with garlic and *Zingiber officinale chewed*
					Febrillness	Fresh leaf together with garlic and *Zingiber officinale chewed*
					Headache	Fresh leaf together with *Zingiber officinale* is chewed and drunk
					Tonsillitis	Fresh leaf together with *Zingiber officinale* is chewed
					Evil eye	Fresh leaf with crushed and boiling drink
					Diarrhea	Fresh leaf together with salt*& Zingiber officinale* is chewed
					Suddenly disease	Fresh leaf with salt*& Zingiber officinale* is chewed
Silene macrosolen A. Rich	Caryophyllaceae	Wagarti	epiphytes	Root	Evil eye	Dried root crushed with *and Carisa spinarum* is fumigated in closed room human
				Whole	Evil eye	Dried whole part crushed with *Ruta chalepensis and* is fumigated in closed room
				Whole	Evil eye	Dried whole part crushed with *and Carisa spinarum* is fumigated to cattle
					Internal parasite	Fresh whole part crushed with *salt and* drunk cattle
					Rabies	Fresh whole part crushed with *salt and* drunk cattle
					Synerosis celebralis	Dried whole part crushed with *and Carisa spinarum* is fumigated to cattle
					Skin infection	Whole part of fresh *Silene macrosolen* crushed with salt boiling and washing part of infected skin
					Febrillness	Whole part of fresh *Silene macrosolen* crushed with salt boiling and washing part of infected
Solanum incanum L	Solanaceae	Hiddi	Herb	Root	Toothache	Root tip crushed and put on surface of teeth ache
					Headache	Root tip will be crushing and chewing
					Stomachache	The root will be chewed during ache feeling

Table 1
Medicinal plants used to treat both human and livestock diseases (continued).

***Verbascum sinaiticum* Benth**	**Scrophulariaceae**	**Harboqanna**	**Herb**	**Root**	**Urinary problem**	**Fresh root crushed with fresh root of *Cucumis ficifolius* and drunk cattle**
					Blackleg	Fresh root crushed with fresh root of *Cucumis ficifolius* and drunk cattle
					Blotting	Fresh root crushed with fresh root of *Capsicum frutescens* and drunk cattle
Vernonia amygdalina D	Asteraceae	Ebicha	Shrub	Leaf	Stomachache	Fresh leaf chewed with salt
					Blotting	Fresh leaf of Vernonia crushed with salt making solution drunk cattle

					Diarrhea	Fresh leaf of crushed with leaf of *Eucalyptus globulus* making solution drunk cattle
					Internal parasite	Fresh leaf of crushed with leaf of *Eucalyptus globulus* making solution drunk cattle
					Urinatory problems	Fresh leaf of crushed with leaf of *Eucalyptus globulus* making solution drunk cattle
Terminalia brownii Fresen	Combretaceae	Bir'eessaa	Tree	Bark	Urinating blood	Fresh leaf is crushed with fruit of *citrus aurantifolia* drink cattle
				Bark	Blotting	Fresh bark and leaf is crushed with salt drunk cattle
				Bark	Bleeding mixed urinating	Fresh bark is crushed with Allium sativum added salt drunk cattle
				Bark	Dearrhea	Fresh bark is crushed with salt drunk cattle
Ranunculus multifidus Forssk	Ranunculaceae	Qarxassaa	shrub	Root	Diarrhea	Fresh of root crushed with salt added few water as solution making drunk livestock
				Root	Hepatitis	Fresh of root crushed with salt added few water as solution making drunk human
				Root	Evil eye	Dried root smoking covered with cloth or room
					Rabies	Fresh of root crushed with salt few water as solution making drunk livestock
					Neqarsa	Fresh leaf crushed put on affected area
					Rabies	Fresh of root crushed with salt added few water as solution making drunk human
Rumex abyssinicus Jacq	Polygonaceae	Dubara	Herb	Root	Evil eye	Dried root is fumigated in closed room
					Diarrhea and stomachache	Dried root crushed with salt drink cattle

Table 2
Medicinal plants used to treat human diseases only

Scientific name	Family name	Local name	Habit	Part used	Disease treated	Preparation
Acalypha frutiocosa Forssk	Euphorbiaceae	Baal-tokkee	Herb	Root	Hepatitis	Crushed fresh root with *Allium sativum* and eat with enjera
					Diarrhea	Crushed fresh root with Zinger officinale and salt eat with enjera
Acokanthera schimperi (DC) Oln	Apocynaceae	Qararuu	Tree	Leaf & bark	Evil eye	Fresh of leaves and bark crushed and given to drink human and also dried bark smoking to patient closed room
Alchemilla abyssinica Fresen.	Rosaceae	Hindriif	Herb	Leaf	Febrillness	Fresh of leaves crushed with salt boiling while wash face and some amount of solution
Anethum foeniculum L	Apiaceae	Kumauni	Herb	Root	Evil eye	Crushed fresh root part and drink small amount of liquid and also fumigated

Annona muricata L	Annonaceae	Gishixa	Tree	Fruit	Gastric	Fresh fruit peeled and pounded as juice drunk or eat
Artemisia absinthium L	Asteraceae	Inaarii	Herb	Leaf	Skin infection	Fresh of leaf dressing/painting on infected skin area
Artemisia afra Jacq. ex Willd	Asteraceae	Chukune	Herb	Leaf	Cough	Fresh leaf crushed and sniffing through nostrils
Asparagus africanus	Asparagaceae	Sariti	Herb	Leaf	Febrillness	leaf will be boiled and fumigated
Buddleja polystachya Fresen.	Loganiceae	Anxarafee	shrub	Bark	Ring worm	Fresh bark is crushed and dropped to liquid on the affected area by rubbed area
Cadaba farinosa Forssk	Capparidaceae	Barjeen	shrub	Root and leaf	Diarrhea	Fresh part used root and leaves crushed with *Zinger officinale* and salt added as drink small amount of solution
Capparis tomentosa Lam	Capparidiaceae	Harangama gurracha	shrub	Leaf	Evil eye	Fresh leaf of *Capparis tomentosa are crushed with water used* as a drink
				Leaf	Diarrhea	*Dried root powdered mixed with Ruta chalepensis*
				Root	Suddenly disease	Root of *Capparis tomentosa is* dried powdered mixed with salt water given to human
				Root	Stomachache	Dried root powdered chewing with salt
Caralluma priogonium L.	Asclepiadaceae	Haadha abdullahii	Herb	Whole part	Stomachache	Fresh of whole part chewed alone during ache feeling
Carica papaya L	Caricaceae	Paappaayya	Tree	Fruit	Gastric	Fresh fruit part eat or drink before meal morning or at any feeling gastric

Table 2
Medicinal plants used to treat human diseases only (continued).

***Catha edulis (*Vahl) Forssk. ex Endl**	**Celastraceae**	**Jimaa**	**Shrub**	**Leaf**	**Blood pressure**	**Fresh leaf chewed**
Chenopodium murale L.	Chenopodiaceae	Amedamado	Herb	Leaf	Skin rash	Fresh leaf sap rubbed on the surface of affected area
Commiphora myrrha (Nees) Engel	Burseraceae	Qumbi	Tree	Bark	Evil eye	Dried bark prepared by smoking through inhaled nasal closed room
				Seed	Breath snake	Fresh bark prepared by crushing and making solution of drink
					Snake bite	Dried seed prepared by crushing and making solution of drink
					Stomachache	Dried seed prepared by crushing and making solution of drink
					Diarrhea	Dried seed prepared by crushing and making solution of drink
Cucurbita pepo L.	Cucurbitaceae	Dabaqulaa	Herb	Seed	Tape worm	The dried of Cucurbita seed roasted and order eaten
Daucus carota L	Apiaceae	Kaarootii	Herb	Root	Eye problem	Eating fresh root without cooking
Discopodium eremanthum Chiov	Solanaceae	*Mararo*	shrub	Leaf	Wound	Fresh leaf is crushed with salt and mixed with water extracted liquid and applied on wounded area
*Dovyalis caffra (*Hook. f.&Harv.) Hook. F	Flacourtaceae	kooshimmii	Tree	Fruit	Stomachache	Fresh fruit peeled covered and extracted juice used

Echinops kerebicho Mesfin	Asteraceae	kebericho	Herb	Root	Febrillness	The dried root of *Echinops kerebicho* is smoking to nostril
Ehretia cymosa Thonn	Boraginaceae	Hulagaa	Tree	Leaf	Febrillness	Fresh leaf together with *Zinger officinal* is crushed and drunk
Eleusine floccifolia (Forssk.) Spreng	Pocaeae	Coqoorsa	Herb	Leaf	Snake bite	Fresh leaf will be crushed with mixed water extracted liquid to drink human
				Whole part	skin rash	Fresh whole part leaf will be crushed with salt and painting on the surface of skin
					snake breath	Fresh leaf will be crushed with mixed water extracted liquid to drink human

Table 2
Medicinal plants used to treat human diseases only (continued).

***Embelia schimperi* Vatke**	**Myrsinaceae**	**Hanqata**	**Shrub**	**Root and leaf**	**Diarrhea**	**Fresh root and leaf will be crushed with *Zinger officinale* and salt that extracted liquid drink a cup of tea**
Eragrostis tef	Pocaeae	Xaaffii	Herb	Seed	Diarrhea and stomach-ache	Dried powdered making porridge of red teff to eat
Euphorbia tirucalii L.	Euphorbiaceae	Annanoo	shrub	Milk sap	Hemorrhoid	The milky sap dropped on affected area
Galinsoga parviflora Cav. I	Apiaceae	Abadadaboo	Herb	Leaf	Febrillness	Fresh leaf crushed with salt and boiling wash face or body
Garcinia Livingstonei T. Anders	Clusiaceae	Habuqurtoo	shrub	Leaf	Snake bite	Fresh leaf crushed with salt and also rubbed area of affected or bite
Gladiolus dalenii Van Geel	Iridaceae	Kaladee	Herb	Root	Febrillness	Fresh root crushed with salt as well as boiling and vapour of water washing body
Glinus lotoides L.	Muluginaceae	Mata-harree	Herb	Whole part	Tape worm	Whole part of fresh crushed and drink very small amount
Hagenia Abyssinica	Rosaceae	Heexoo	Tree	Flower	Tenia sagianata	Dried fruit crushed and mixed in water making solution drink morning before break fast
Heliotropium cinerascens Steud. ex. DC.	Boraginaceae	Baala cabbicha	Herb	Leaf and root	Febrillness	Fresh leaf and root crushed with salt and boiling washing vapour water body or face and also drink small amount
Hordeum vulgare L	*Pocaeae*	Garbuu	Herb	Seed	Gastric	powdering of *Hordeum vulgare L* preparing *besso* and drinking during feeling gastric
Leonotis ocymifolia (Burm.f.) Iwarsson	Lamiaceae	Bokoluu	Herb	Leaf	Febrillness and headache	Leaf will be crushed mixed with water and drunk and wash body
				Root	Snake bite	Crushed fresh root part with salt and drink small amount of liquid by a cup of tea

Table 2
Medicinal plants used to treat human diseases only (continued).

Lippia adoensis Hochst. ex Walp	**Verbenaceae**	**Kusaayee**	**Herb**	**Leaf**	**Diarrhea,**	**Fresh of leaf is crushed added with water and salt solution drink**
					Stomachache	Leaf is directly chewed during feeling ache
Maesa lanceolata Forssk.	Myrsinaceae	kelew	shrub	Leaf	Toothache	Fresh leaf chewed with *Zinger officinale* and salt put on surface of teeth ache for few minute
Mangifera indica L.	Anacardaceae	Mangoo	Tree	Fruit	Gastric	drunk fresh fruit juice of mango
Maytenus gracilipes (Welw. ex Oliv.) Exell	Celastraceae	Kombolcha	shrub	Leaf	Evil eye	Fresh leaves of *Maytenus gracilipes crushed with Allium sativum making as solution to drink patient while residue put on fire fumigate*
Mimusops kummel	Sapotaceae	Qolatii	Tree	Stem	Common cold	Fresh stem crushed and boiling with *Zinger officinale* drink
Ocimum urticifolium Roth	Lamiaceae	Kasee	Herb	Leaf	Febrillness	Crushed leaves drinking small amount and rubbing residual the body
					Stomachache	Crushed leaves drinking small amount making solution
Olanecio angulatus (Vahl) C. Jeffrey*	Asteraceae	Rafuu osolee	Herb	Whole part	Evil eye	Whole part of fresh *crushed with Ruta chalepensis to drink human*
Olea europea L.subsp cuspidata (Wall. ex G. Don) Cif.	Oleaceae	Ejersaa	Tree	Stem	Evil eye	A fresh stem crushed produced oil liquid and small amount is drunk
					Snake breath	A fresh stem crushed produced oil liquid then small amount is drunk
					Stomachache	A very small amount of the oily liquid produced from the stem is drunk after meal during feeling ache
					Cough	A very small amount of the oily liquid produced from the stem is drunk for relief from the cough consecutive 2 or 3 days
				Leaf	Skin rash	Fresh leaf crushed with dried leaf of *croton macrostachyus* is boiled in water and steam the vapour while wash the affect area of skin

Table 2
Medicinal plants used to treat human diseases only (continued).

Otostegia integrifolia **Benth**	**Lamiaceae**	**Tunjiiti**	**Herb**	**Leaf**	**Stomachache**	**Fresh leaf chewed with salt when feeling ache**
					Febrillness	Fresh leaf crushed and boiling while wash body and small amount drunk
Periploca linearifolia Quart.Dill	Asclepiadaceae	Gaalee gurraacha	climber	Leaf	Neqarsa	Leaves crushed with salt and *Zinger officinale* rubbed on affected area
Persea americana Mill.	Lauraceae	Avookadoo	Tree	Fruit	Constipation	Fruit of peeled avocado juice drunk and eaten human
Pisum sativum L	Fabaceae	Atara	Herb	Seed	Skin rash	Dried powdered crushed with *Allium sativum* rubbing on the affected parts

Plumbago zeylanica. L	Plumbaginaceae	Marxasaa	shrub	Root	Skin infection	Dried root powder of the mixed with a little water is applied to infected skin
Rhamnus prinoides L Herit	*Rhamnaceae*	Gee shoo	shrub	Leaf	Tonsillitis	Chewed fresh leaf with *Zinger officinale* and salt
				Seed Leaf	Tinea corporis	Fresh leaf is crushed with salt and painting on affected area of skin
					Stomachache	dried root and *Allium sativum* are crushed and drunk
Salix subserrata Willd	Salicaceae	Alaltuu	shrub	Leaf	Toothache	Fresh leaf put on tooth surface for a few minute
				Bark	evil eye	Fresh bark is crushed with bulb of *Allium sativum* and drunk
Schinus molle L	Anacardaceae	Qundoo barbaree	Tree	Leaf	Febrillness	Fresh leaf boiling with salt and wash face and small amount drink
Schrebera alata (Hochst.) welw	Oleaceae	Dhamee	Shrub	Leaf	Febrillness	Crushed fresh leaves with salt and making solution rubbing residual on the body
Sida schimperiana Hochst. ex A. Rich	Malvaceae	Hanqanuri	Herb	Root	Evil eye	Fumigated/smoking dried root to patient in closed room
Solanum nigrum L	Solanaceae	Hiddi gurraacha	Herb	Root	Stomachache	Fresh root crushed with salt and drunk
					Febrillness	Fresh root crushed with salt boiling and small amount drunk while wash face residual
					Diarrhea	Fresh root crushed with *Zinger officinale* and salt making as solution form and drunk or chewed
					Amoeba	Fresh root crushed with *Zinger officinale* and *Ruta chalepensis* salt making as solution form and drunk

Table 2
Medicinal plants used to treat human diseases only (continued).

***Solenostemon latifolius* (Hochst.Ex.Benth.)J.K**	**Lamiaceae**	**Dachiti**	**Herb**	**Root**	**Skin infections**	**Fresh root crushed with croton macrostachyus and rubbed on the affected area of skin**
Thymus schimperi Ronniger	Lamiaceae	Xoosinyii	Herb	Leaf	Blood pressure	Dried leaf powdered used in tea drunk one cup of tea
Triticum aestivum L.	Pocaeae	Ayisaa	Herb	Seed	Gastric	Dried powdered Ayisa making soup of besso relief from gastric feeling
Vernonia hymenolepis A. Rich.	Asteraceae	Wayena Gift	shrub	Leaf	Eye disease	Fresh leaf crushed/ chewed dropped to eye disease closed room
Withania somnifera (L) Dunal	Solanaceae	Hunzoo	Herb	Root	Evil eye	Root will be crushed and smoke inhaled
					Febrillness	Dried root will be crushed and smoke/boiling vapour water inhaled through nostrils
Zingiber officinale Roscoe	Zingiberaceae	Gaajibila	Herb	Rhizome	Febrillness	Fresh rhizome crushed and chewed
					Stomachache	Fresh or dry rhizome crushed and drunk as *qisher* and chewing with salt
					Cough	Fresh or dry rhizome crushed

						drunk as *qisher* and chewing with salt
					Headache	Fresh or dry rhizome crushed drunk as *qisher* and chewing with salt

Table 3
Medicinal plants used to treat livestock diseases only.

Scientific name	Family name	Local name	Habit	Part used	Disease treated	Preparation
Acacia brevispica Harms	Fabaceae	Qonxoorree	shrub	Root	Eye disease	Chewing fresh root and droplet liquid to cattle eye
*Caucanthus auriculatus (*Radlk) Nied	Malphigiaceae	Gadila	climber	Root	Blackleg	Crushed fresh part of root with fresh leaves of *Foeniculum vulgare* and drink cattle
Celeosia argentea. L	Amaranthaceae	Balbaxoo	Herb	Leaf	Lumpy skin	Fresh part of plant used leaves crushed with salt and painting on affected skin of cattle
				Root	Urinatory problem	Fresh part of plant used root is crushed with leaves and salt to drink cattle
Clerodendrum myricoides (Hochst.) Vatke	Lamiaceae	marasisaa	Herb	Root	Anthrax	Fresh root crushed with salt and drink cattle
					Pastureolosis	Fresh root crushed with salt and drink cattle
Coriander sativum L	Apiaceae	Dimbilaala	Herb	Seed	Blotting	Dried powder of Coriander sativum is crushed with *Allium sativum* added salt and drunk cattle
Deinbollia kilimand scharica	Sapindaceae	*Shunshuna*	Shrub	Leaf	Urinatory problem	*Fresh leaf crushed and mixed with water and drink to cattle*
Englerina woodfordiodes (Schweinf.) M. Gilbert	Loranthaceae	Digaluu ejersa	Epiphytes	Root Whole part	Diarrhea	Fresh Whole part and roots crushed with salt and making solutions drink to cattle
Erythrina brucei Schweinf	Fabaceae	Waaleen	Tree	Leaf	Eye disease	Fresh of Leaf *Erythrina brucei* chewing or crushing and applied by dropping of the liquid extract is dropped to livestock eye
				Leaf	Cater eye	Fresh of leaf chewing or crushing and dropping extracted liquid to eye
Eucalyptus camaldulensis Dehnh	Myrtaceae	Bargamo dima	Tree	Leaf	Cough	Crushing fresh leaves with Allium sativum and added salt making solution drink cattle
Euphorbia candelabrum L.	Euphorbiaceae	Adami	Tree	Root	Cough	Crushed fresh root with *Allium sativum* added salt making as solution form drunk cattle

Table 3
Medicinal plants used to treat livestock diseases only (continued).

***Foeniculum vulgare* L**	**Apiaceae**	**Insilaalee**	**Herb**	**Leaf**	**Blotting**	**Crushed fresh root and making solution to drink cattle**
					Blackleg	Crushing the fresh root drink one bottle of glass for livestock

					Stomachache	Crushing the fresh root given solution one bottle of glass for livestock
					Urinary problem	Fresh leaves of *Foeniculum vulgare and Cucumis ficifolius* is boiled in water together and drunk to cattle
Helixanthera thomsoni Sprague	Loranthaceae	Dheertoo	shrub	Whole part	Hepatitis	Fresh whole part of *Helixanthera thomsoni* crushed with *Allium sativum* and salt drink cattle
Juniperus procera L	Cupressaceae	Hindheessaa	Tree	Leaf	Stomachache	Fresh leaf crushed with salt and water extracted liquid given to drink cattle
Justicia schimperiana (Hochst ex. Nees)T.Anders	Acanthaceae	Dhumugaa	Shrub	Leaf Root	Urinatory problem	Leaf of *Justicia schimperiana* is crushed with added salt water given to livestock.
					Blotting	Leaf and root of *Justicia schimperiana* is crushed with dried leaf of *Nicotiana tabaccum* to drink cattle
Kalanchoe laciniata (L). DC	Crussulaceae	Bossoqqee	Herb	Whole part & root	Blackleg	Whole part and root of *Kalanchoe laciniata* and leaves of *Croton macrostachyus are crushed* together and drink cattle
Linum usitatissimum L	Linaceae	Talbaa	Herb	Seed	Urinary problem	dried powdered and half of Jog of the powder is dissolved in water and given to livestock
Lycopersicon esculentum Mill	Solanaceae	Timatima	Herb	Leaf	Urinary problem	Fresh of *Lycopersicon esculentum* crushed and drunk cattle
Papea capensis Eckl. & Zeyh	Sapindaceae	Biiqqaa	Tree	Bark	Urinary problems	Fresh bark of *Papea capensis crushed capsicum florens and drink cattle*
Podocarpus falcatus (Thunb.) R.B. ex. Mirb	Podocarpaceae	Birbirsa	Tree	Bark	Hepatitis(*dhibee allattii)*	Fresh of bark is crushed with making solution drunk cattle
Premna schimperi Engl	Lamiaceae	Coocoo	Herb	Leaf	Eye disease	Chewing the leaves and dropping to eye disease of cattle
Pyrenacantha malvifolia	Icaciaceaae	Buri	Herb	Root	Diarrhea	Dried root crushed with salt drink one glass of bottle cattle for two or three days
					Urinary problem	Fresh root crushed with salt drink one glass of bottle cattle for two or three days
					Hepatitis	Fresh root crushed with salt drink one glass of bottle cattle for two or three days

Table 3
Medicinal plants used to treat livestock diseases only (continued).

Rhus natalensis Krauss	**Anacardiaceae**	**Daboobessa**	**Herb**	**Leaf**	**Blotting**	**Fresh leaf is crushed with *Capsicum frutescen* added salt water and drunk cattle**
Ricinus communis L	Euphorbiaceae	Qobboo	Herb	Leaf	Blackleg	Fresh leaf of *Ricinus communis* crushed with Allium sativum making as solution forms drunk cattle
Rubia cordfolia L.	*Rubiaceae*	*Maxxanne Gaalee*	climber	leaf	Eye disease	Fresh leaf and root is crushed with a few water and the dropped in the eye cattle
Tagetes minuta L.	Asteraceae	Ajawa	Herb	Leaf	Blotting	Fresh leaf crushed with *Platostoma rotundifolium* added salt and drunk cattle
Terminalia brownii Fresen.	Combretaceae	Bir'eessaa	Tree	Bark	Urinary	Fresh leaf is crushed with fruit of *citrus aurantifolia* drink cattle
					Blotting	Fresh bark and leaf is crushed with salt drunk cattle
					Bleeding	Fresh bark is crushed with Allium sativum added salt drunk cattle
				Leaf	Cough	Fresh leaf is chewed with salt
Zanthoxylum chalybeum Engl.	Rutaceae	Geda	Shrub	Bark	Wound	Fresh bark of *crushed and painting on the surface of affected areas of skin*
Zyzyphus spina-christi	Rhamnaceae	Qurqura	Tree	Leaf	Diarrhea	Fresh leaf pounded with salt added water as solution drunk

4. Discussion

4.1. Diversity of medicinal plants

In the present study, a total of 121 medicinal plant species were recorded indicating the wide use of herbal medicine and wealth of indigenous knowledge in the area. The number of species documented in this study is higher than similar studies undertaken in different parts of the country such as Kilte Awlaelo (Teklay et al., 2013) and Ofla districts Abdurhaman (2010) of Tigray Ethiopia who reported 114 and 113 medicinal plant species respectively and also that of (Ashagre, 2013), who reported 106 species of medicinal plants from Bule Hora district of Oromia regional State. Compared to livestock, relatively higher number of plant species was reported to be used for treatment of human diseases probably due to either less prevalence of livestock diseases in this particular study area. The result of family Lamiaceae as higher contributor medicinal plants is in agreement with findings of (Teklay et al., 2013; Wassihun Asfaw and Demissew, 2003; Tolasa, 2007; Lulekal et al., 2008). But differ from that of (Itana, 2010; Hailemariam et al., 2008; Yineger and Yehuawalaw, 2007) who reported higher number of species from family Fabaceae.

With regard to plant habitat, the majority species (64.46%) were collected from the wild indicating that the little practices of cultivating medicinal plants in home gardens. This is in agreement with similar studies undertaken in different parts of the country (Itana, 2010; Hunde et al., 2004; Awas and Asfaw, 1999). Research reports on plant diversity of Ethiopian homegardens by (Wondimu et al., 2007; Asfaw and Nigatu, 1995) medicinal plants constituted only 8% of the species recorded. This shows that the natural habitat still remains to be the major source of traditional medicine all over the country.

The present study also showed that herbs comprises of the major proportion of medicinal plant species followed by shrubs and trees. The occurrence of greater proportion of medicinal plants as herbs might attribute to the fact that herbs can grow easily everywhere in roadside, homegardens, farmland, grazing land and other habitats as long as sufficient moisture present. Our finding in agreement with that of (Giday and Ameni, 2003; Giday, 2001; Teklehaymanot and Giday, 2007) who reported herbs constitute the highest category medicinal plants and differ from finding (Awas and Asfaw, 1999) who reported trees provide the highest services.

4.2. Plant parts used

The findings of the study showed the leaves are the most commonly used plant part to prepare traditional medicine in the study area. Previous studies conducted in various parts of the country also reported the leaves being the most frequently used part for both human and livestock medication (Itana, 2010; Giday and Amenu, 2003; Megersa et al., 2013). Other studies have also reported roots as major part used to prepare herbal medicine (Giday, 2001; Balemie et al., 2008). Nevertheless, utilization of leaves as a source of drug believed to reduce the rate of threat on plant species compared to root harvesting since removal of an appreciable amount of leaf is tolerated by the plant (Itana, 2010). Utilization of root as a source of drug may risk the survival of the whole plant (Asfaw and Nigatu, 1995).

4.3. Methods of preparation, route of administration and dosage

In the study, the local people employed different methods for preparations of remedies. The methods of preparation vary depending on the type of diseases treated and the actual site of the ailments. The most frequently applied methods of medicine a preparation is crushing followed by chewing and smoking. This finding agrees with the finding of (Hailemariam et al., 2009; Balemie et al., 2008; Mesfine et al., 2009).

Different routes are followed to apply the various traditional medicinal plants in study area. The medication for internal problems involves oral administration while those prescribed for the purpose of curing skin diseases applied externally. This is in agreement with similar studies conducted in other parts of the country (Getaneh, 2009; Yineger et al., 2008).

With regard to dosage, there is no single standard dosage. The local people mostly use material units such as cup, spoon and other local materials for measurement a drug of solution form. Quantity prescribed depends on age sex, and physical strength of the individual and vary from place to place. The variation in units of measurement and dosage has been reported as one of the drawbacks of traditional medicine (Balemie et al., 2004; Birhanu and Haji, 2017; Sofowora, 1982; Abebe and Ayehu, 1993).

4.4. Threats and conservation status of medicinal plants

Most of the medicinal plants in the study area are found in natural habitat where the risk of destruction is very high. Analysis of result obtained from focus group discussion indicated that agricultural expansion, fire wood, fence, construction, medicine and charcoal, agrochemical application are some of the threats for medicinal plants. According to the informants, destruction of habitat for construction and agricultural expansion take the major share relatives to others as reported by other researchers (Awas and Asfaw, 1999; Wondimu and Asfaw, 1995; Asfaw and Nigatu, 1995).

Though minimal, there is some practice of cultivating medicinal plants in the study area. Some of the medicinal plant species found under cultivation includes *Platostoma rotundifolium, Vernonia amygdalina, Eucalyptus globulus, Ocimum lamiifolium, Allium sativum*, and *lepidium sativum.* Some of these species are deliberately cultivated for medicinal purpose while others for other uses too. For instance, *Platostoma rotundifolium* commonly used for fencing and at same time could also be used for treatment of both human and livestock ailments. On the other hand, *Ocimum lamiifolium*, Allium sativum and Lepidium sativum are plants species that are deliberately cultivated for medicinal purpose only.

5. Conclusion

In the present study, 121 medicinal plants used to treat human and livestock ailments were documented. The majority of medicinal plants was herbs and obtained from wild habitats. The leaves were also the major part used for medicine, which may not be detrimental for the plant relative to those medicinal plants in which roots are the major part. However, at present the habitat of medicinal plants threatened by various anthropologic factors such as degradation and deforestation. So, there is an urgent need towards sustainable utilization and conservation of those highly threatened medicinal plants before them being completely lost.

Competing interest

The authors declare that they have no competing interest.

Author's contribution

All three authors had significant intellectual contribution towards design of the study, data collection, analysis and interpretation of data, write of the manuscript for publication.

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