

Ethnobotanical Study of Medicinal Plant and Indigenous Knowledge in Harar Town

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Abstract

As a study, medicinal plants are dominantly used in the healthcare system around the world and an easily accessible source of treatment. A purposive sampling technique was used to select a total of 120 knowledgeable respondents from different age groups. Data were analyzed using descriptive statistical methods. 55 medicinal plant species and 32 families were identified and documented. Among the 55 plant species (52.74%) of the plant species used to treat human health problems, (10.90%), plant species used to treat livestock health problems and (36.36%) plant species were used to treat both human and livestock health problems. The most dominant families were Solanaceae (6), followed by Fabaceae. Home garden (49.10%) is the principal method of cultivation of medicinal plants whereas road side is the least method of cultivation. Herbs (43.63%) were the most growth habits of medicinal plants. Leaf (36.26%) was the most common plant part used followed by root (17.58%). The causes to threaten medicinal plants and associated knowledge are natural and human factors. Most commonly, causes of threatening with medicinal plants and associated knowledge were urbanization, agricultural expansion, lack of awareness to the community, charcoal production, firewood, construction, modern health expansion, drought, and overgrazing.

Keywords: Medicinal plant; Use; Ailment; Conservation; Harar

Introduction

Plants have been used in traditional medicine to treat various ailments and to produce drugs as well as inducing the development of modern medicine throughout the world, which is called medicinal plants. As the World Health Organization (WHO) reported, 80% of the world population depends on traditional medicine to satisfy their wellbeing by using animal products and plants. Medicinal plant is a plant used as medicines which have its own organs used for therapeutic purposes and synthesis of drugs to treat livestock and human ailments. These medicinal plants are principally utilized in the healthcare system and an easily accessible source of treatment for different ailments [1]. Medicinal plants also play an important role for the development of pharmacopoeial and non-pharmacopoeial drugs, which provide a vital involvement of traditional and modern health care systems [2]. However, medicinal plants have various organs to produce and prepare effective drugs which are used for healing and managing complicated diseases. Thus, important organs were leaves, stems, flowers, seeds, fruits, shoots, latex, barks, and roots.

In Ethiopia, peoples have a long history using traditional medicinal plants for their primary health care. Actually, medicinal plants of Ethiopia have shown very effective medicinal value for many human and animal ailments particularly where modern public health services are limited. From the beginning of humanity, people have developed their own local specific traditional knowledge on medicinal plant use, management ailments, and conservation of plants [3].

Generally, local communities have indigenous knowledge and widely practiced traditional medicine in health care systems by using medicinal plant in the study areas, but this medicinal plants and knowledge are threatened due to environmental degradation, cultural and socio-economic changes, death of elders and urbanization as well as lack of systematic conservation, influence of modern health expansion and lack of written document [4]. However, there is no comprehensive systematic study on the use and conservation practices of medicinal plants in the current study districts. Therefore, the present study was to fill up the problem through documenting indigenous knowledge, plant use, methods of preparation, routes of administration, and conservation

of medicinal plants in the study areas.

Materials and Methods

Study site

The study was conducted in 2022-2023 in four Purposive selected Woredas around Harar town. Those selected Woredas were Erer Woreda, Sofi Woreda, Shankor Woreda and Abadir Woreda. The study woreda were selected based on the presence of medicinal plants and traditional medicinal practices of the community. Purposive sampling techniques were used to select the study Woreda based on the availability of the practice of traditional medicine, recommendation of local elders, local authorities, and religious leaders, presence of traditional healers, and knowledgeable persons as well as vegetation cover.

Sampling size and techniques

Purposive sampling technique was used to select 120 respondents from different age groups and 24 key informants (16 men and 8 women) were selected from community leaders, elderly people, and herbalist commitment. Samples of medicinal plant species were collected and recorded in their local names and later converted into the scientific name based on the researcher own experience, referring to 'Useful Trees and Shrubs of Eritrea' and useful trees and shrubs for Ethiopia and Flora of Ethiopia [5,6].

Data collection methods

Ethnobotanical data was collected using semistructured

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questionnaires, interviews, and field observations on the use and conservation of medicinal plants and indigenous knowledge by people from each selected woreda [7]. The key informants share their knowledge on the method of preparation, plant parts used, and route of administration, remedy, and preparation methods. Semi-structured questionnaires were conducted with respondents to collect ethnobotanical data of plants; methods of preparation, remedies, route of administration, conservation, and factors of threaten medicinal plants. Interviews were also carried out with key informants in order to validate the data and to avoid confusion of plant species uniqueness via repeated examination. These activities were done twice with the same and different respondents to confirm the validity and reliability of the data.

Specimen identification and collection

Medicinal plants were collected from home gardens, live fences, agroforestry, and cultivated areas. The local names, habits, methods of cultivation, mode of preparation, and disease threatening to plants were collected and conserved in Harar biodiversity center. The identification of plant species and specimens were done from January to March by using taxonomic keys and flora of Ethiopia and Eritrea.

Data analysis

The collected data of plant species diversity, growth habit, parts, route of administration, remedies, methods of preparation, conservation practices, and factors of medicinal plants threatening were analyzed by using statistical methods following [8,9].

Results and Discussion

Demographic characteristics of respondents

(63.33%) Male and (36.67%) female respondents were involved in the study. From the total respondents (55.83%) were found between the age (36-65), followed by (26.67%) respondents between (20-35)age, while the remaining, above 66 years were (17.5%), which was the least compared to the other age groups presented (Table 1). The educational status of (53.33%) respondents were having formal education followed by Illiterates (29.17%), whereas (13.33%) of them had Religious education. Therefore, most of the respondents had formal education

Table 1: Sociodemographic characteristics of the respondent.

Criteria	Characteristics	Frequency	Percentage
Age	20-35	21	26.67
	36-65	32	17.5
	Above 66	67	55.83
Gender	Male	76	63.33
	Female	44	36.67
Years of experience	None	10	8.33
	0-5	11	9.17
	06-Oct	46	38.33
Treatment incidence	Above 11	53	44.17
	No response	14	11.67
	Irregular	36	30
Source of knowledge	Regular	70	58.33
	Friends	14	11.67
	exercise	11	9.17
Educational status	family	67	55.83
	family and exercise	28	23.33
	Illiterates	35	29.17
	Religious education	16	13.33
	Modern education	64	53.33

and were the least illiterate. Majority of (58.33%) respondents have used medicinal plants for regular treatment and the most common source of knowledge of medicinal plants is family constitute (55.83%) followed by family and exercise (23.33%).

Medicinal plant diversity

A total of 55 medicinal plant species belonging to 32 families were identified and documented in the study area presented (Appendix 1). In the study, the most dominant families were Solanaceae (6) and Fabaceae (4), followed by Alliaceae (3), Lamiaceae (3), and Asteraceae (3). These plant species were used to treat major health problems. Among the 55 medicinal plant species (52.74%) of them used to treat human health problems, (10.90%) of them were used to treat livestock health problems and (36.36%) of them were used to treat both human and livestock health problems . This result is in line with the reported that Solanaceae (28.57%) species were the most frequently used species in Fadis District, Eastern Ethiopia (Figure 1) [10].

Cultivation of medicinal plants

The study indicated that the methods of cultivating medicinal plants were home gardens, live fences, agro-forestry, and agricultural fields mixed with other crops and road side. Home garden (49.10%) is the principal method of cultivation of medicinal plants followed by agroforestry (25.45%), whereas road side is the least method of cultivation and resulted threatened of medicinal plant species (Figure 2).

Growth habit of medicinal plant

The grow thing habits of medicinal plant species in the study were categorized as trees, herbs, and shrubs. As the study indicated that herbs

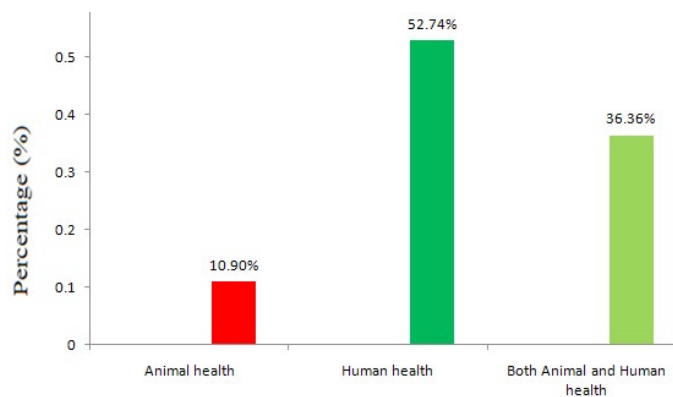


Figure 1: Medicinal plant species used to treat Health problems.

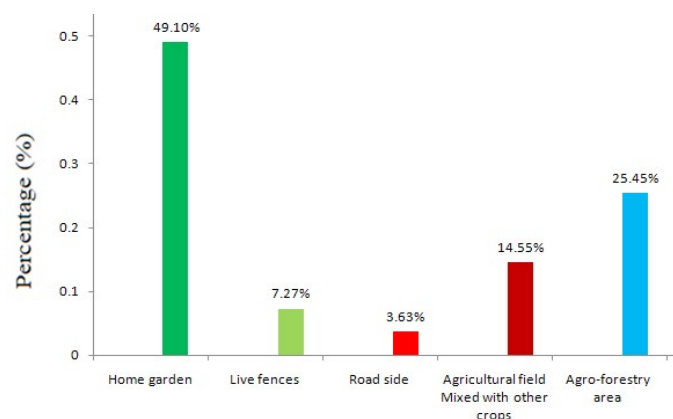


Figure 2: Methods of cultivation of medicinal plants in the study area.

(43.63%) were the most growth habits of medicinal plants followed by shrubs (32.73%), whereas (21.82%) trees and climbers (1.82%) were presented. This is similar to the report indicating that 39.9%-56.6% of medicinal plant habits were constituted of herbs (Figure 3) [11,12].

Medicinal plant parts used to treat ailments

As the result of the study on medicinal plant parts used to produce remedies to treat various human and livestock health problems were leaf (36.26%), root (17.58%), shoot (1.1%), bark (5.49%), whole plant (1.1%), fruit (9.9%), latex (2.2%), stem (6.59%), seed (16.48%), flower (1.1%), and rhizome (1.1%), Bulb (2.2%) presented in. Leaf (36.267%) was the most commonly used plant parts followed by root (17.58%) parts. This result is similar to the research conducted that leaves are the most widely used medicinal plant parts (Figure 4) [13].

Methods of preparation and route of administration of plant remedy

Preparations of plant remedies were used using various methods of preparation depending on the types of ailments. The common methods of plant remedy preparation were pounded (32.67%), boiled (8.91%), crushed (13.86%), squeezed (7.92%), cooked (1.98%), powdered (10.89%), grounded (5.94%), chewed (6.93%), chopped (2.97%),

smoking (1.98%), unprocessed (3.96%) and fumigate (2.97%). Pounded (32.67%) is the principal method of preparation remedy followed by crushing (13.86%) and powdered (10.89%) in the study area. This finding is agreed with a report conducted by pounding is the most method of preparation plant remedy followed by crushing in Fadis District, Eastern Ethiopia (Figure 5).

There are various routes of administration of medicinal plants remedies in the study areas. The results showed that the route of administration of medicinal plant remedy are oral (49.28%), dermal (36.23%), nasal (10.14%), and eye (4.35%). oral (49.28%) were the dominant route of administration plant remedies followed by dermal (36.23%). This result is similar to various reports conducted that the major way of medicinal plants administration was the oral administration methods in Ethiopia and other countries (Figure 6) [14].

Threat and conservation of medicinal plants in the study area

Factors of medicinal plants threatened: Factors that cause to threats, to medicinal plants, and associated knowledge can be natural and human factors. As the study conducted and analysis, the most common factors to threaten medicinal plants were urbanization, agricultural expansion, lack of awareness to the community, Charcoal production, firewood, construction, modern health expansion, drought,

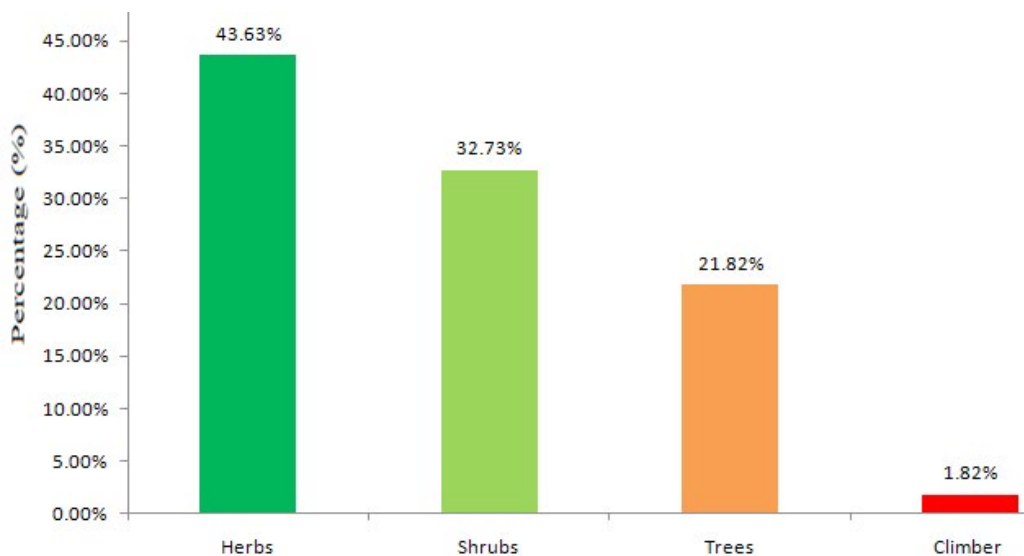


Figure 3: Growth habits of medicinal plant species in the study.

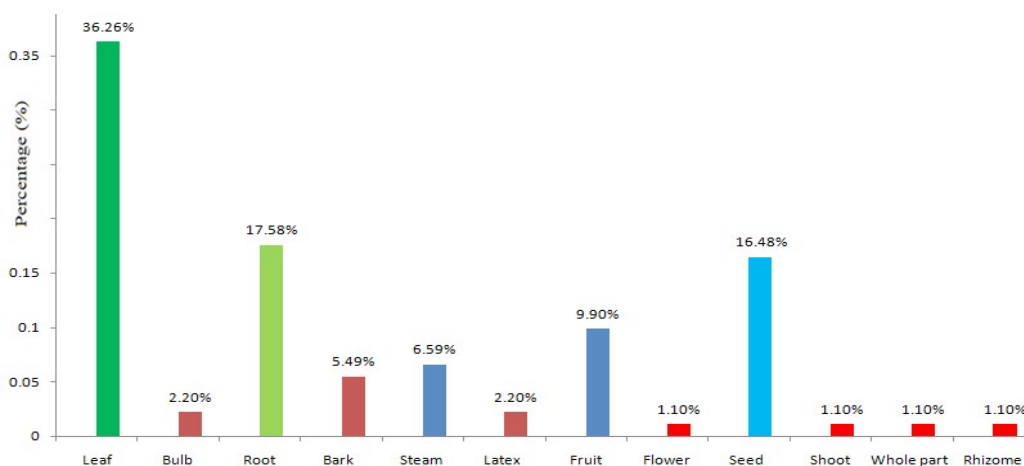


Figure 4: Parts of the plant used to prepare of the remedy.

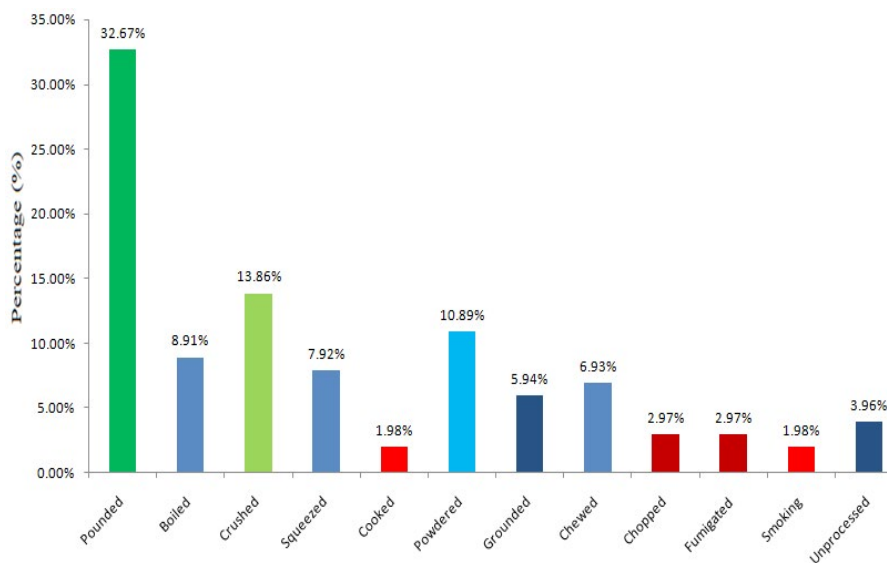


Figure 5: Methods of preparation medicinal plant remedy.

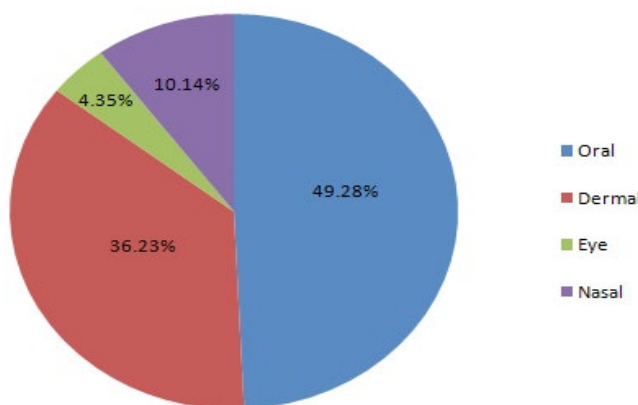


Figure 6: Rout of Administration medicinal plant Remedy.

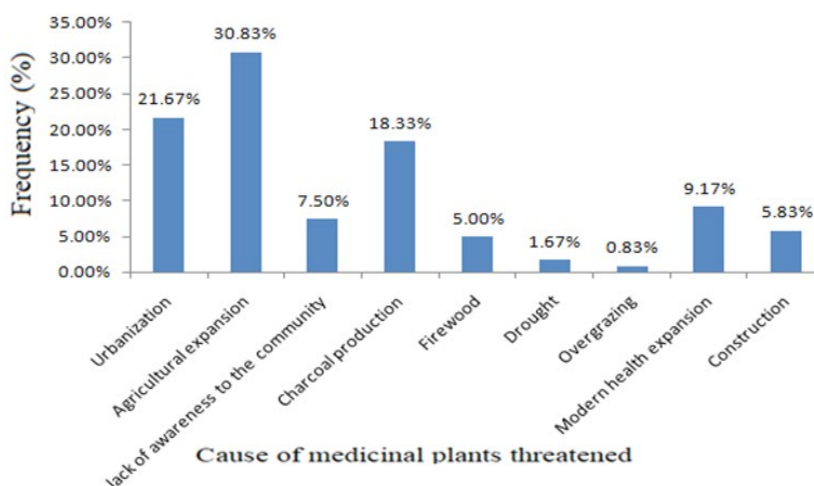


Figure 7: Factors of medicinal plants threatened.

and overgrazing. This is similar to the report conducted that medicinal plants have been threatened by agricultural expansion, deforestation, fire, overgrazing, and charcoal. Agricultural expansion (30.83%) was the major factor for medicinal plants threatened followed by urbanization (21.67%) and charcoal production (18.33%) presented in Figure 6. This

finding is agreed with the report conducted that agricultural expansions (34%–55%) are the main factor for the disappeared of medicinal plants in different parts of the country [15]. Moreover, informants have been recommended that the young generation refused with knowledge of traditional medicine and practitioners die without sharing their

knowledge with others are other critical factors of lost traditional medicinal plants and associated knowledge's (Figure 7).

Conservation of medicinal plants: This study showed that (61%) of the respondents clarify that no attempt for conservation of medicinal plants, whereas (38%) of respondents have a conservation attempts on medicinal plants. But all respondents agreed that there is no particular attention given to medicinal plant conservation. In the

study district, respondents were conserving medicinal plants in the home garden, farmland, agroforestry systems, cultivating in fences, road sides, mosques, and churches. It is essential to raise awareness of the local community and Community-based conservation practices of traditional medicine plants. Home garden is a strategic conservation of medicinal plant diversity and traditional knowledge. Medicinal plants can be conserved by ex situ and in-situ conservation methods.

Scientific Name (Family)	Local name	CT	GH	Pu	MP	DT	RA
Allium sativum L. (Alliaceae)	Nech shinkurt	HG	H	Bu	Bulb mixed with fruit of Capsicum annum are boiled with butter then drunk	Stomach complaints*	O
				Bu	Blub is crushed together with rhizome of <i>Zingiber officinale</i> , <i>Lepidium sativum</i> adding with honey and taken 2 teaspoon	Evil eye*	O
				Bu	Blub is pounded and mixed with the crushed fresh leaves of <i>Ruta chalepensis</i> and <i>Solanum nigrum</i> then applied externally.	Malaria*	D
				Bu	The dried bulb is pounded mixed with seed of <i>Lepidium sativum</i> and <i>Ricinus communis</i> and tied on the wound every two days for one week.	Wound*	D
Carica papaya L. (Carricaceae)	Papaya	HG	T	Se	Dried seeds are pounded and drunk two coffee cups every morning for three days.	Jaundice*	O
Croton macrostachyus author (Euphorbiaceae)	Bisana	AGF	T	Ba	Fresh bark together with bulb of <i>Allium sativum</i> , is pounded, mixed with butter and then eaten.	Stomachache*	O
				L	Fresh shoot tips is cut, cooked and two spoonful of the solution is drunk per a day for five consecutive days.	Gonorrhea*	O
				L	Fresh leaf cooked, pasted with honey and then eaten.	Jaundice*	O
				Ba	The fresh bark is grounded, mixed with water and given to the animal by drinking material.	Bloat**	O
				La	Sap juicy is produced and applied on the skin	Ringworm*	D
				L	Boil fresh leaf in water, filter and drink with milk or tea.	Malaria*	O
				L/Ba	Fresh leaf or bark is pounded and boiled adding with butter after solidifies given to the patient.	Ascaris*	O
Datura stramonium L. (Solanaceae)	Astenagir	RS	H	Fl	Flower is Pounded and the dried powder is given with honey to the women after 10 days of menstruation.	infertility in women *	O
				L	Seeds are boiled in water and inhaled the vapour.	toothache*	O
				L	The fresh leaf is squeezed and the juice is applied to the eye	Eye disease*	E
				L	Crushed and homogenized leaves drunk with water	Rabies*	O
				L	Fresh leaf with <i>Withania somnifera</i> and <i>Laggera tomentosa</i> are pounded, half spoon is added to a cup of coffee and then drunk every morning until recovery.	Cough*	O
Aloe macrocarpa Tod. (Alliaceae)	Ret	HG	H	La	The latex of the species is squeezed and then taken once.	Stomachache*	O
				L	Fresh leaves are crushed and tie on.	Nose bleeding*	N
				L	Fresh leaf is pounded with <i>Ruta chalepensis</i> , <i>Allium sativum</i> and <i>Foeniculum vulgare</i> mixed with water and given to cattle.	Bloat**	O
				L	Fresh leaves are pounded and mixed with butter then applied on the skin.	Leprosy*	D
				L	Fresh leaves chewed and swallow the juice	Intestinal parasite***	O
Calpurnia aurea. (Fabaceae)	Digita	HG	S	L/ Se	Fresh leaf or seed are pounded together with leaf of Nicotiana tobaccos are taken through the nostrils.	Leech**	N
				L	Fresh leaves is chewed and swallow for humans and leaf is pounded, mixed with water and given to animal until the diarrhea stops	Diarrhea***	O
				Se	Seeds are crushed, mixed with honey and one teaspoon is eaten for five consecutive days.	Syphilis*	O
				L	Fresh leaves are pounded, mixed with water and wash the boy of the animal every morning until the parasites are eradicated.	Lice**	D
				L,Se& Fr	Fresh leaf, fruit and seeds are crushed, mixed with food and given to dogs	Rabies**	O
Carissa spinarum L. (Apocynaceae)	Agamsa	AF	S	R	Fresh root is crushed and boiled then adding with cow milk and drunk it.	Gonorrhea*	O
				R	Fresh root is pounded and adding with water then keep and wait for a day and drunk it.	Malaria*	O
				R	Fresh root is pounded then mixed with tella and drinking it.	Sexual impotency*	O
Citrullus lanatus (Cucurbitaceae)	Habhab	HG	H	Fr	Squeezing and eating	Hypertension*	O

Cordia africana Lam. (Boraginaceae)	Wanza	LF	T	L	Leaf is pounded mixed with butter and applied on the affected part	Wound*	D
				Ba	Fresh bark is pounded then mixed with water and drunk with one coffee cup for three to four consecutive days.	Continuous flow of menstruation*	O
				L	Fresh leaves boiled in water after mixing it with Sorghum bicolor, chewing.	Jaundice*	O
Coriandrum sativum (Apiaceae)	Dimbelal	HG	H	L	Fresh leaf is pound with leaf of <i>Croton macrostachyus</i> and creamed on pain area for 2-3 days.	Diffuse cutaneous leshmaniasis*	D
Cucurbita pepo L. (Cucurbitaceae)	Duba	HG	CI	Fr	Fresh fruit is cook and cool then eat before meal in the morning	Gastritis	O
				Se	Fresh seeds are chewed and soaked in water then drinking overnight.	Hookworm*	O
				R	Fresh root is pounded with <i>Vernonia amygdalina</i> and mixed with local areke or katukala then given orally it.	Bloat*	O
Ehretiacymosa Thonn .(Boraginaceae)	Ulaagaa	AF	T	L/R	Fresh leaf/ root is pounded with root of <i>Zehneria scabra</i> and <i>Zaleyia pentandra</i> then add with katicala and given to cattle.	Stomach ache***	O
				L	Fresh leaf is crushed with leaf of <i>Cissus</i> species and drunk.	Mich*	O
				Se	Fresh dried seeds are grounded and mixed with water then drunk it.	Taeniasis *	O
Eucalyptus globulus Labill. (Myrtaceae)	Nech bahir zaf	AGF	T	L	Fresh young leaves are boiled in water the fumigated the vapour under sealed clothes at morning time.	Asthma*	D
				Sh	Washing the sol with young shoot or putting under the sock.	Athlete's foot*	D
				L	Fresh young leaves are boiled in water and fumigate the vapour under sealed clothes at bed time.	Cough*	D
Hordeum vulgare L. (Poaceae)	Gebis	AGF	H	Se	The roasted seed powder is boiled in water and drunk until relief.	Gastritis*	O
				Se	Fresh dried seed with dry leaf of <i>Melia azedarack</i> is crushed and sprinkled on the feed.	Bloat**	O
Justicia schimperiana (Acanthaceae)	Smiza	LF	S	L	Dried leaf is decoctions mixed with <i>Calpurina aurea</i> and wash the body.	Lice***	D
				L	Dried leaf powder with the powder of leaf of <i>Croton macrosrachyus</i> are pasted with butter and apply once a day for five.	Eczema*	D
				L	Newly growing fresh leaves milled on palms and the squeezed liquid added to a coffee cup 4. Drink the liquid every night time for a week.	Jaundice***	O
				R&L	Roots and leaves are pounded together then mixed with water and given orally for human and animals in the morning before food.	Rabies***	O
Lagenaria siceraria (Cucurbitaceae)	Buqqee	HG	S	Se	Fresh seeds are grounded and add to fire then smoke or drink it with honey.	Evil eye*	O
				L	Fresh leaves are pounded and drunk with small amount of water.	Snake bite*	O
Linum usitatissimum L. (Linaceae)	Telba	AGF	H	Se	Powdered seeds immersed in water and drunk one glass continuously.	Gastritis*	O
				Se	The dried seeds are soaked in water and the water solution is drunk.	Constipation***	O
				R	Dried seed is boiled and adding salt then to give the animal a day.	Retention Of placenta***	O
				Se	Powdered seed is adding with water and drunk in an empty stomach.	Amoebiasis*	O
Lepidium sativum L. (Brassicaceae)	Feto	HG	H	Se	Seeds ground into paste-like food and mixed with butter and water then drunk.	Diarrhea*	O
				Se	The seeds are inserted in to fire and smoking to the patient.	Mich*	D
				Se	Fresh seed is pounded and mixed with water the drunk.	Stomach complaints*	O
Lycopersicon esculentum L. (Solanaceae)	Timat ime	AGF	H	Fr	Fresh fruit put in fire and eaten it in order to get relief from common cold.	Common cold*	o
Maytenus senegalensis Lam. (Celastraceae)	Komb olcha	AF	S	L	Dried leaf is pounded with stem of <i>olea europea</i> and mixed with butter then paste is applied on it.	Hemmoroids*	D
				Ba	Fresh bark is pounded with flower of <i>Hagenia abyssinica</i> and mixed with water and local beer then given to animal.	Diarrhea**	O
				L	The fresh leaf is collected and pounded add with water then applied on animal skin.	Lice**	D
Milletia ferruginea author (Fabaceae)	Birbira	AF	T	Fr	Dry fruit is powder and mixed with butter and salt then after applied to the infected skin.	Skin infection*	D
				Fr	Crushed fruits are spread on the water surface.	Fish poison**	O
				Fr	Fruits are pounded and mixed with butter then applied to the affected area.	Scabies*	D
				Fr	Fresh fruit is Chewing.	Goiter*	O
Nigella sativa L. (Ranunculaceae)	Tiqur-azmud	HG	H	Se	Fresh seed is ground into powder and inhaled three to four times per day.	Common cold*	N
				Se	The fresh seeds are boiling into the water then steam is inhaled.	Asthma*	N
				Se	Seed is pounding and mixing with <i>A. sativum</i> , <i>Ruta chalepensis</i> , and <i>A. cepa</i> then drinking adding with lemon juice	Stomach complaints *	O
Ocimum lamiifolium (Lamiaceae)	Damakese	RS	H	L	Fresh leaves are cutting from three places and crushed then squeezed the body.	Sun-strike*	O
				L	Fresh leaf together with leaf of <i>Eucalyptus globulus Labill</i> , <i>Silene macroselen</i> is pounded, mixed with water and drunk.	Mich*	O
Olea europaea L. (Oleaceae)	Woirra	HG	T	L	Fresh leaf is boiled in water and steam the vapour.	Itchy* skin*	D
				St	Dried stem is inserting into fire and the oily liquid produced is applied on the wound.	Wound***	D
				St	Dried steam is pounding and produced oily liquid then drunk after meal for four consecutive days.	Gastritis*	O

Phytolacca dodecandra L'Herit. (Phytolaccaceae)	Endod	LF	S	L	Fresh leaf is crushed and mixed with water then after filtered and drunk.	Abortion*	O
				R	Fresh root is pounded with <i>Artemesia abyssinica</i> and <i>Justicia schimperiana</i> mixed with water then a glass of solution is given for 7-10 day for humans and 15-20 days for animals.	Rabies***	O
				R	Fresh root is grounded and mixed with water then drunk in the morning for five consecutive days.	Malaria*	O
Rhamnus prinoides L.(Rhamnaceae)	Geeshoo	HG	S	L	Fresh leaf is pounded with <i>Nicotiana tabacum</i> and mixed with water and goat butte then applied through the nose.	Leech**	N
				L	Fresh leaf is chewed and swallow twice a day for four days.	Tonsillitis*	O
Ricinus communis L.(Euphorbiaceae)	Qobbo o	HG	S	L	The fresh leaf is warmed and rubbed on the swelling.	Tuberculosis sis***	D
				Se	The dried seeds are pounded and mixed with latex of <i>Aloe spp.</i> and drunk two coffee cups before bed time for two days.	Impotency*	O
Ruta chalepensis L. (Rutaceae)	Tila-adam	HG	H	St/L	Fresh stem or leaf are boiled into coffee or tea then drunk.	Common cold*	O
				R	Fresh root chewed and swallowed the juice.	Abdominal pain*	O
				L	Fresh leaf pounded with garlic and mixed with a glass of milk and drunk.	Stomachache***	O
				L	Fresh leaf with leaf of <i>Datura stramonium</i> is wash on the body of the patient.	Evil eye*	D
				L	Fresh leaf is pounded with <i>Zingiber officinale</i> and adding with coffee and drunk	Headache*	O
				L	Fresh leaf is pounded with <i>Zingiber officinale</i> and added to coffee then a cup of coffee is drunk every morning for three consecutive days.	Fever*	O
Verbena officinalis L. (Verbenaceae)	Darguu	AF	H	R	Dried root with root of <i>Carissa spinarum</i> and fumigated to the patient.	Mich*	O
				R	Fresh root is fumigated to the patient.	Tonsillitis*	O
Vernonia amygdalina author(Asteraceae)	Girawa	HG	S	L	Fresh leaf is mixed with water, crushed, and squeezed then drunk.	Stomachache*	O
				L	Fresh leaves chopped and produced Juice then mixed with locally beer and salt then given to the animal.	Intestinal parasite**	O
				L	Fresh leaf is pounded and mixed with water after filter drunk it.	Jaundice*	O
				L	Leaf is pounded and mixed with coffee seeds and mixed with butter and eaten	Diarrhea*	O
				L	Fresh leaf Pounded and mixed with water and given orally	Bloat**	O
Withaniasomnifera L. Dunal (Solanaceae)	Gizewa	HG	S	L	Fresh leaf is crushed and with <i>Allium sativum</i> then rubbed the whole body.	Fibril illness*	D
				R	Root is pounded with <i>Phytolacca dodecandra</i> and bark of <i>Croton macrostachyus</i> mixed with water then given to animal.	Anthrax**	O
				L	Fresh leaf is chewed and swallowed.	Mich*	O
Zingiber officinale (Zingibraceae)	Zingible	HG	H	Rh	Fresh Rh is Chewing and eating.	Stomachache***	O
				Rh	Fresh Rh is chopped and pounded then adding in the boiling water with honey or sugar and drinking	Cold*	O
Catha edulis author (Celastraceae)	Catii	AGF	S	L	The leaf is chopped and mixed with water then drink.	Cough, chest disease *	O
				L	Fresh leaf is pounded and mixed with <i>Ruta chalepensis</i> and <i>Foeniculum vulgare</i> adding with water and local kaskala then drinking.	Urine retention**	O
Moringa stenopetala auth (Moringaceae)	Sheferaw	AF	T	L	Fresh drying leaf is pounding and mixed with water after filtering drinking it.	Hypertension*	O
Echinops kebericho (Asteraceae)	Kebericho	AF	H	R	The root is powdered and applied on the affected area during the bed time.	Scabies*	D
				R	Dried root is adding with <i>Silene macroselen</i> root then smoked to the patient.	Evil eye*	D
Ocimum basilicum (Lamiaceae)	Besobila	HG	H	L	Fresh leaves pounded with <i>Aloe macrocarpa</i> and water then drink it.	Flu*	O
Mentha spicata (Lamiaceae)	Nana	HG	H	L/St	Leaf /stem are pounding and mixing with <i>Nigella sativa</i> and <i>A. sativum</i> then drunk.	Diarrhea*	O
Lantana camara L. (Verbenaceae)	Bekerkitie	LF	S	L	Fresh leaf is pounded with leaf of <i>Ocimum lamiifolium</i> and the squeezed out liquid drink with tea.	Fungi /Mich*	O
Phoenix reclinata (Arecaceae)	Meexx	AF	T	L/St	Fresh leaf and stem of <i>Phoenix reclinata</i> are chewed together then spitted on cattle eye.	Eye disease**	D
Solanum incanum L.(Solanaceae)	Hiddii	HG	S	R	Fresh root is powder and drunk with coffee.	Snake bite*	O
				R	Fresh root is chewed and hold between the teeth.	Toothache*	O
Solanum marginatum L.f. (Solanaceae)	Embuay	AF	S	Fr	Root is pounded and mixed with water and drunk.	Placenta retention**	O
				Fr	Fruit is pounded and tie on the bleeding part.	Bleeding*	D
				St	Fresh stem is warm on the fire and placed it on the wound again and again.	Wound*	D
				R	Fresh root is fumigated	Evil eye*	D
				L	The leaf is chopped and the juice is placed in the nostrils.	Nose bleeding*	O
				Fr	Fruit is squeezed and the juice is mixed with milk and applies through the nostrils.	Leech*	N
				R	Fresh root is crush then boiling the part then the steam is inhale or smoke.	Rabies	O
Psidium guajava L. (Myrtaceae)	Roqaa	AF	S	Ba	Fresh bark is pounded and mixed with butter paint on the wound.	Wound**	D

Trigonella foenum graecum L. (Fabaceae)	Abish	AGF	H	L	Fresh leaf is crushing and adding on fire then Fumigation	Evil eye*	N
				Se	Fresh seed is pounding and boiling with water applied on the broken bone	Broken leg*	D
				L	Leaves are pounded with toasted seeds of <i>Coffea arabica</i> and mixed with butter then rub the external eye.	Eye disease**	E
Brucea antidysenterica autho (Simaroubaceae)	Avalo	AF	T	R /L	Dry root is crushed and dissolved in water and half of coffee cup is drunk.	Bloody diarrhea*	O
				Fr	Dried fruit is crushed and applied on wounds.	Wound***	D
				L	Fresh leaf is placed in the nostrils.	Evileyes*	N
				Se	Dried seed crushed and added with wheat flour then applied on wounds	Leishmaniasis*	D
				Fr, R&L	Squeezed with teff flour, <i>Croton macrostachyus</i> and <i>Rumex nervosus</i> then given for 3 days	Rabies* *	O
Capsicum annum L. (Solanaceae)	Barberee	HG	H	Fr	Fresh fruits is powdered with <i>Allium sativum</i> , <i>Zingiber officinale</i> and <i>Nigella sativum</i> are immersed with water and drunk for 2-3 days continuously	Dysentery & vomiting*	O
				Fr	Dried fruit pounded and mixed with water then given to orally	Bloat**	O
Coffea arabica L. (Rubiaceae)	Bunna	HG	S	Se	Fresh seeds are roasted and powdered then put on the part of the wound.	Wound*	D
Acacia abyssinica Hochst (Fabaceae)	Grar	AF	T	L	Fresh leaf is pounding and then squeezing	Allergy*	D
				L	Fresh leaves are pounded and squeezed then the juice is added to the eye.	Eye disease**	E
				R /Ba	Fresh root and bark grounded together with water then wash the animal.	Horse scabies**	D
Allium cepa L. (Alliaceae)	Key shinkur	HG	H	Bu	Fresh bulb is pounding with <i>A. sativum</i> and <i>Ruta chalepensis</i> then adding honey and drunk	Stomach Complaints*	O
				R	Dried root is powder with the leaf concoction of <i>Vernonia amygdalina</i> and <i>Premna schimperi</i> then Tie up.	Poisoning*	D
Artemisia absinthium L. (Asteraceae)	Natra	HG	H	Wh	Squeezing and producing juice then drunk	Uvula infection*	O
				L	Smoking	Evil eye*	N
Brassica nigra L. (Brassicaceae)	Senafich	HG	H	Se	Dying, then grinding after mixing it with <i>A. sativum</i> and <i>Vicia faba</i>	Stomach complaints*	O
				Se	Seeds were processed into a paste and used as a poultice to treat swelling of lymph nodes	swelling of lymph nodes*	D
				Se	Mustard seeds were dry and decocted in water poultice then applied on the affected part.	cracked skin and acne*	D
Beta vulgaris L. (Chenopodiaceae)	Kosta	HG	H	R	Fresh root is collected and pounded then eaten it.	Abdominal pain*	O
Citrus limon L. (Rutaceae)	Lomi	HG	S	Fr	Fresh fruit and bulb of <i>Allium sativum</i> are pounded together and mixed with honey and eaten with wheat bread.	Stomach ache*	O
				Fr	Fruit juice mixed with fine powder, root of <i>Acokanthera schimperi</i> , and applied to the affected part and sit under the sun for about half an hour	Scabies*	D
Rumexnervosus Vahl (Polygonaceae)	Embacho	AF	S	L	Grounding the fresh leaf and drinking one cup of the solution.	Retained placenta**	O
				St	The powder of stem is mixed with butter and applied on the skin.	Burn	D
				R	The root is pounded and mixed with <i>Phytolacca dodecandra</i> , <i>Brucea antidysenterica</i> , <i>Croton macrostachyus</i> then one tea spoon is drunk with coffee	Rabies*	O
				R	Crushed root together with butter is placed on the wound	Wound***	D
Plantago lanceolata L. (Plantaginaceae)	Gorteb	AGF	H	L	Crush and apply it on the cut part.	Cut*	D
				L	Fresh leaves are squeezed and rub the body.	Mitch*	D
Ziziphus spina-christi L. (Rhamnaceae)	Kurkura	AF	T	L	The fresh leaf is pounding then squeezing	Devil's illness*	O

Key: -Animal disease** Human disease* Animal and human disease***.

Conclusion

To summarize, a medicinal plant is a plant used as medicine to treat livestock and human ailments. These medicinal plants also play an important role for the development of pharmacopoeial and non-pharmacopoeial drugs. Local communities have indigenous knowledge and practiced traditional medicine in health care systems using medicinal plants in the study areas. In the studied area, most of the respondents had formal education. (58.33%) of the respondents have used medicinal plants for regular treatment. 55 medicinal plant species and 32 families were identified and documented in the study area. Solanaceae (6) and Fabaceae (4) are the most dominant families. (52.74%) plant species were used to treat human health problems (10.90%) plant species used to treat livestock health problems and (36.36%) plant species used to treat both human and livestock health

problems. Home garden (49.10%) is the principal method of cultivation of medicinal plants. The study indicated that herbs (45.24%) were the most growth habits of medicinal plants followed by shrubs (30.95%). Leaf (36.26%) was the most commonly used plant parts to prepare remedies followed by root (17.58%). Pounded (32.65%) is the principal method of preparation remedy followed by crushing (13.86%). Oral (49.28%) is the dominant route of administration plant remedies followed by dermal (36.23%). Factors that cause threats to medicinal plants and associated knowledge were natural and human factors. Agricultural expansion (30.83%) was the major factor for medicinal plants threatened, followed by urbanization (21.67%) and charcoal production (18.33%). (61%) of the respondents were clarified that no attempt for conservation of medicinal plants, whereas (38%) of them have made conservation attempts on medicinal plants. But

all respondents agreed that there is no particular attention given to medicinal plant conservation.

Recommendations

Based on the results of the study, the following recommendations were forwarded;

Encourage the local communities to cultivate medicinal plants in their home gardens, on farm land and in the form of live fences.

We should support and encourage local communities during giving awareness, education, and understanding on the sustainable utilization and conservation of medicinal plant species with its indigenous knowledge.

Encourage traditional medicine practitioners to improve the use of traditional medicinal plants through licensing and incentive approaches.

Appendix 1

List of medicinal plants used for treating human ailments in the study area with scientific name, family, local name, shrub (S), growth habit (GH), cultivation (CT), tree (T), herb (H), Disease treated (DT)), seed (Se), fruit (Fr), flower (Fl), shoot (Sh), parts used (PU), root (R), leaf (L), latex (La), stem (St), bulb (Bu), bark (Ba), rhizome (Rh), methods of preparation (MP), home gardens (HG), route of administration (RA), oral (O), dermal (D), nasal (N), eye (E), road side (RS), live fence (LF), agricultural field (AGF) and agroforestry (AF).

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