

## Ethnobotanical Study of Medicinal Plants Used To Treat Livestock Ailments, In Dallol Manna District, Bale Zone, Oromia Regional State, South East Ethiopia

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### Abstract

Historical information on the use of medicinal plants is in danger of extinction due to different changes in different parts of the world, including Ethiopia. This study, carried out in the DallomAna, Oromia regions of Ethiopia, aims at the ethnobotanical analysis of medicinal plants used in the treatment of animal diseases. Data were collected through semi-structured interviews with the information sources selected. Analysis of ethnobotanical data using tools such as the Consensus Consent Factor (ICF) preference ranking, ranking matrix, and calculating the degree of fidelity. In Dallomanna Region reported all 68 medicinal plant species used to treat veterinary diseases. The most common family is Fabaceae (7 spp.), followed by Euphorbiaceae (5 spp.), Asteraceae (5 spp.) Solanaceae (4 spp.). For the preparation of drugs for the treatment of livestock diseases, plants are generally used as the root, followed by leaves, seeds and stems. All of the medicine is made and used immediately, and some of it is boiled and dried for use. In addition, the most common way of route of administration for treatment animal diseases in the study area is oral, followed by topical application and nasal. The highest consensus criteria (ICF) values were recorded in ophthalmology, followed by dermatology. Most species have been reported for the treatment of gastrointestinal disorders, followed by species for the treatment of skin diseases and fever. Ten participants compared nine herbs used to treat veterinary diseases to see how they ranked. This was followed by *Hagenia Abyssinia* in first place, then *Zingier ofcinale* and *Embelia schimperii* in third place. *Nicotiana tabacum*, *Phyllanthus ovalifolius*, *Ruta chalepensis* *Santalum album* followed *Hagenia abyssinica*, which achieved the highest value among traditional oyster medicinal plants. The main threats to veterinary medicinal plants were overharvesting of available species, agricultural land expansion, and less attention to traditional medicine due to modernization.

**Keywords:** Dallo Manna, Ethnobotany, Livestock Ailments, Oral Administration, Roots

### 1. Introduction

Ethnoveterinary medicine refers to people's knowledge, skills, methods, practices and beliefs about animal husbandry [1]. Ethnoveterinary knowledge has been acquired through practice and has traditionally been transmitted orally from generation to generation. In the early 1980s there was an interest in writing and validating ethnoveterinary practice. Since then, a lot of work has been done, many documents have been collected, many conferences and workshops have been held. These activities have saved ethnoveterinary knowledge from extinction: most of the knowledge belongs to the elders of the community and is lost after their death. Teaching modern culture also causes young people to feel depressed and use their ancestors' beliefs and practices. Although recent efforts have been made to expand the worldwide

use of ethnoveterinary knowledge, most of the information is only recorded in publications and research articles [2]. Plant resources have been an important part of human life throughout history. After meeting their basic needs such as nutrition and shelter, people began to search for the necessary drugs in plants to treat various diseases [3]. Inadequate animal health services remain the biggest barrier to livestock production in many countries, including Ethiopia. Inadequate animal health services remain the biggest barrier to livestock production in many countries. Lack of access to services by farmers also leads to farmers using traditional veterinary medicine and traditional medicine without animal care [4]. In sub-Saharan Africa, annual losses due to disease are estimated at US\$2 billion, half of which are direct deaths and the other half-indirect losses from reduced productivity, growth, fertility and working

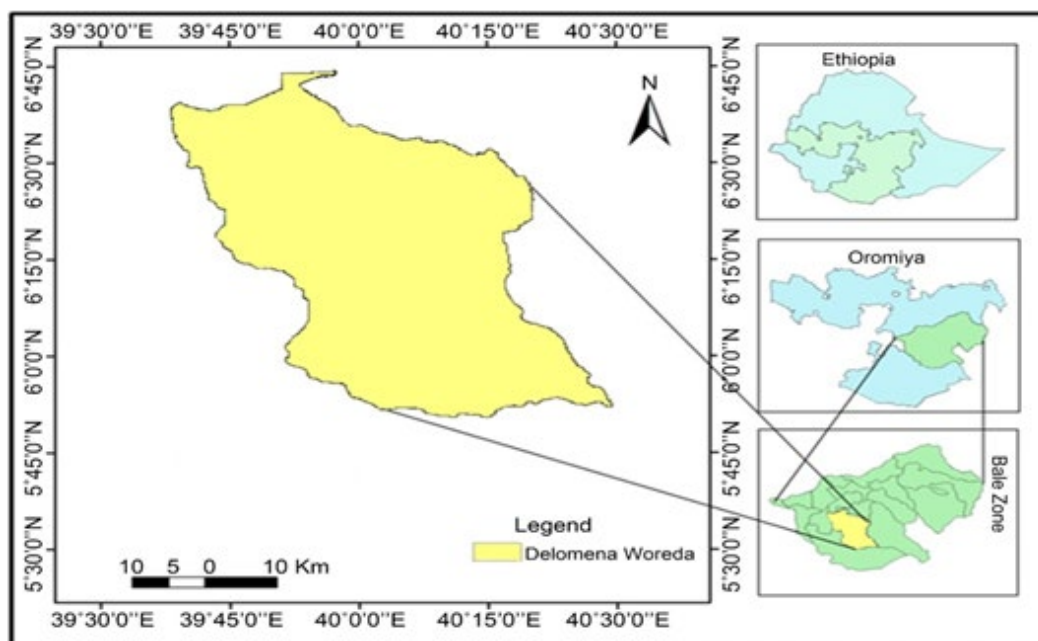
capacity [5]. Loss from animal diseases, not limited to reduction; additionally, viruses can protect human and animals from certain sources (eg. The massive loss of productive land in Africa due to African skin diseases such as trypanosomiasis and dermatophytosis is limiting the use of more productive animals, including hybrid cattle, improved pigs and chickens. Trade embargoes are imposed by importing countries because highly contagious diseases create a significant economic burden, reducing trade and foreign exchange. In addition, some animal diseases are zoonotic, which means that animal disease control is not only an economic but also a social and political priority. Therefore, disease control programs will continue to be an important part of the development of livestock [6]. According to Software, about 60-85% of the population in all developing countries have to rely on traditional medicine [7]. Traditional medicine practices exist in China, India, Japan, Pakistan, Sri Lanka, Thailand and Korea [8]. For example, traditional medicine in China accounts for approximately 40% of all medical treatments and is used to treat approximately 200 million patients per year [3]. Due to its long history in Ethiopia, plants have been used as a source of medicine for different diseases since ancient times and have become a part of traditional medicine culture [9]. Traditional practices and treatments are found in oral traditions and early religious texts and pharmacopoeias that some historians estimate date back to the 15th century AD [3]. Ethiopia is home to about 6,000 species of vascular plants, probably due to its unique location and climate [10]. In this country, approximately

80% of the population and 90% of livestock are drug dependent [10]. Ethiopian medicine is often used to treat many diseases of humans and animals. Traditional healers, who are known by different names in different parts of the country, are important people in traditional medicine [11]. Therefore, this research was initiated to gather information on traditional agriculture from local communities in the Dallo Mana region. With regard to organic meat, it can be used by small farmers due to the importance of herbal products in livestock and their cost compared to today's medicines. This study aims to fill this gap. People living in study area are familiar with medicinal plants to treat various animal diseases; however, the spread of agriculture and the dissatisfaction of the youth threaten medicinal plants. Therefore, indigenous knowledge of traditional medicine needs to be preserved through appropriate knowledge, identification of herbs used and preparation of medicinal herbs. To prevent further loss of medicinal plants, it is recommended that you join the community in cultivating the most widely used medicinal plants.

## 2. Methodology

### 2.1. Study Area

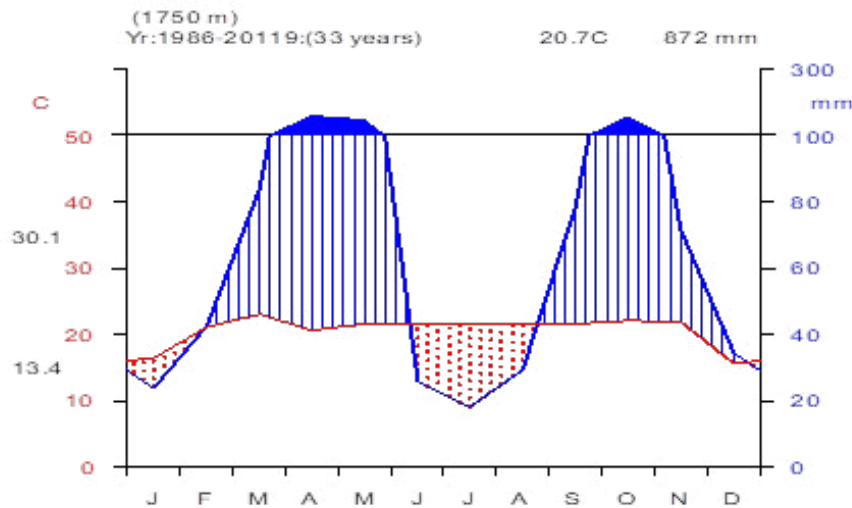
Description the Dallo Mana area is located in the Bale region of the Oromia Territorial State and covers an area of approximately 461,665 hectares. It lies between latitudes 5°51'N and 6°45'N and east longitudes 39°35'E and 40°30'E. Altitude 1314 to 1508 m.a.s.l (Figure 1).



**Figure 1:** ARABIC 1 Map of the Study Area

The precipitation pattern in this area is bimodal, i.e. from mid-March to May (main rainy season) and September to October (short rainy season). The annual average temperature is 29 degrees.

5°C and annual average temperature 15°C, maximum temperature 29.9°C and annual average precipitation 1006.9 mm (Figure 2) [12].



**Figure 2:** Clima\_Diagram of Dallo Mana Districts (NMA Robe Branch)

The dominant vegetation in the Dallo Manna region is the African mountainous dry forest type and the region has an ecotone of sub-African alpine and semi-desert ecosystems [12]. Plants include podocarps, Guinea dandelion, Thayer acacia, Senegal fruit, African cypress, large-ear croton, honeysuckle, great banyan, southern banyan, African plum, Senegalese custard apple and arabica [13].

## 2.2. Sampling Design

The survey was conducted from June 2021 - February 2022. The choice of place of work is based on the recommendations of the elderly, local authorities and high places. Therefore, this study was conducted in eight OA from two agro-climatic zones. There are 18 PAs selected in Dallo Manna, four of which are Bada dare or semi-pastoral and four of which are dry pastoral. A total of 60 participants (41 men and 19 women) were selected by the representative kebeles. Following the Martin method, participant representatives and representatives of medical professionals (main participants) in the Delo Mena region were selected using random and purposive sampling methods, respectively [14]. Twenty key people were deliberately selected based on the advice of knowledgeable elders, city leaders and development representatives. The selection of key participants also depends on the quality of the narratives provided by the participants in the interviews. Local healers are key workers and experts who are the guardians of local knowledge about herbs.

## 2.3. Ethnobotanical Data Collection

The data collection process was based on local knowledge of local communities about the health, use, conservation and threats of medicinal plants [14]. The methods used in data collection are semi-structured interviews, group discussions, job training and participant observation. Semi-structured interviews were based on a list of questions prepared in English and then translated into the language of the study area, Afaan Oromo. Interviews were

conducted to cover the main points of the checklist. Meeting places and times are determined according to the interests of the participants. With the help of local guides, the morphological features and habitats of all medicinal plants in the field were determined in situ. Data Analysis Ethnobotanical data collected by was entered into Excel spreadsheets and analyzed using statistical data such as frequency and percentage and presented in tables and figures. In addition, decision preferences and comparisons are given below [15]. Ranking of preference was made for the five main drugs used to treat sick animals. Ten participants selected by each of the participating administrators participated in this exercise to determine the best herbs for veterinary use. In a joint comparison, ten participants were selected and each partner was asked to select the best product based on their own perspective on wound healing. All possible pairs were obtained using the formula  $n(n-1)/2$ ; where  $n$  is the number of herbs compared [16]. Adding the number of times each item was selected gives the overall grade for comparison. The most selected items get the highest scores. Direct matrix sorting was used to compare the use of different medicinal plant species based on data collected by the participants, to select the number of different species from all medicinal plants

## 3. Results

### 3.1. Composition of Plant Species Used to Treat Animal Diseases

A total of 68 plant species from 35 families were used recorded in the area of Dallo Manna, which treated animals. The most common family is Fabaceae (7 spp.), followed by Euphorbiaceae (5 spp.), Asteraceae (5 spp.) Solanaceae (4 spp.), Acanthaceae, Cucurbitaceae and Rutaceae are represented by 3 species. Everything; Amaryllidaceae, Heliconiaceae, Boraginaceae, Compositae, Lamiaceae, Moringaceae, Polygalaceae, Ranunculaceae 2 species each. The remaining 22 families are represented by only 1 species (Table 1).

Scientific Name	Local name	Family	GF	Habitat	Part used	Dosage	RA	DT	MP	DC
<i>Acacia Mellifera</i>	Bilaala	Fabaceae	Tree	Wild	Stem	Fresh	Topical	Eye disease	Crushed	Ophthalmological
<i>Albizia Gummifera</i>	Burii Araba	Fabaceae	Shrubs	Wild	Leaf	Dried	Oral	Uterus prolapse	Boiled	Reproductive
<i>Allium Copa</i>	Kulubi	Amaryllidaceous	Herbs	Agriculture Field	Leaf	Fresh	Oral	Diarrhea	Dried	Gastrointestinal
<i>Allium sativum</i>	Shunkurtii	Amaryllidaceous	Herb	Agriculture Field	Seed	Fresh	Nasal	Respiratory manifestations	Fresh	Respiratory
<i>Aloesp.</i>	Hargiisaa	Asphodelaceae	Shrub	wild	Leaf	Fresh	Oral	gastrointestinal	Crushed	Gastrointestinal
<i>Balanitis pedis</i>	Laimbeer	Zygophyllaceous	Shrub	Wild	Root	Fresh	Nasal	Niagara	Crushed	Repiratory
<i>Barleria acanthoides</i>	Shishii	Acanthaceae	Herb	Wild	Root	Fresh	Topical	dermatitis	Direct	Unclassified
<i>Barleria Eranthemoide</i>	Shabi	Acanthaceae	Tree	Wild	Root	Fresh	Oral	Gastritis	Crushed	Gastrointestinal
<i>Bidens Pilosa</i>	Cho gee	Asteraceae	Herbs	Agriculture Field	Leaf	Fresh	Topical	Wound Management	Crushed	Febrile
<i>Boscia angustifolia</i>	Qalqalcha Allattii	Capparidaceae	Shrub	wild	Root	Fresh	Oral	Abortion, Retained Placenta, Muscle Pain, Pneumonia, Joint Pain, Penis Dysfunction	Crushed	Reproductive
<i>Calpurnia Aurea</i>	Chemeketa	Fabaceae	Shrubs	Wild	Leaf	Fresh	Topical	Snakebite	Crushed	Snake bite
<i>Carice Papaya</i>	Papaya	Caricaceae	Herbs	Home	Seed	Fresh	Topical	Dermatitis	Crushed	Dermatitis
<i>Cassia Angustifolia</i>	Shorbanabii	Fabaceae	Shrubs	Wild	Leaf	Fresh	Oral	Antifever Antipain	Crushed	Febrile
<i>Catha edulis</i>	Chat	Celastraceous	Tree	Agriculture field	Leaf	Fresh	Oral	Pain	Boiled	Febrile
<i>Citrillus colocynthis</i>	Harree Guugee	Cucurbitaceae	Herbs	Wild	Root	Boiled	Oral	Uterus prolapse	Dried	Reproductive
<i>Citrus Aurantifolia</i>	Loomis	Rutaceae	Tree	Wild and home	Seed	Fresh	Oral	Anthelmintic, Antidiarrhoea	Crushed	Gastrointestinal
<i>Citrus aurantium</i>	Arboo	Rutaceae	Shrubs	Wild	Seed	Boiled	Topical	Dermatitis	Crushed	Dermatitis
<i>Clematis Simensis</i>	Sariitii	Ranunculaceae	Climber	Wild	Root	Fresh	Oral	retained placenta	Fresh	Reproductive
<i>Clerodendrum Myricoides</i>	Hawaarree	Lamiaceae	Tree	Agriculture Field	Root, Stem and Leaf	Fresh	Topical	Foot rot	Crushed	Febrile
<i>Coffea arabica</i>	Buna	Rubiaceae	Shrubs	Wild	Seed	Fresh	Topical	Wound Management(Burning)	Direct	
<i>Cordia Africana</i>	Wadeessa	Boraginaceae	Shrubs	Wild	Root	Fresh	Topical	Dermatitis	Crushed	Dermatitis
<i>Coronopus Didymu</i>	Shuunfaa	Brassicaceae	Shrubs	Agriculture field	Seed	Fresh	Oral	anthelmintic	Dried	Gastrointestinal
<i>Croton Dichogamies</i>	Maakaftaa	Euphorbiaceous	Tree	wild	Root	Fresh	Oral	reproductive	Crushed	Reproductive
<i>Croton Macrostachyus</i>	Bakkanniisaa	Euphorbiaceous	tree	Wild	Root	Fresh	Oral	reproductive	Crushed	Reproductive
<i>Cucumis Dipsaeus</i>	Qureerraa	Cucurbitaceae	Climber	Agriculture Field	Flower	Fresh	Oral	Bloating, Hafraa (Secondary Bacterial Infection), Wound Management	Crushed	Gastrointestinal
<i>Cucurbita Moschata (Lam.) Pior.</i>	Buqqee	Cucurbitaceae	climber	Agriculture Field	Stem	Dried	Nasal	Respiratory manifestations	Dried	Respiratory
<i>Cymbopogon Citratus</i>	Kormacitaa	Poaceae	Shrubs	Wild	Root	Fresh	Topical	endoparasite	Crushed	Gastrointestinal
<i>Cyphostemma sp.</i>	Laaluu	Vitaceae	Herbs	Agriculture Field	Root	Fresh	Topical	Wound	Crushed	Febrile
<i>Datura stramonium</i>	Banjii	Solanaceae	Herb	Wild	Leaf	Dried	Topical	Footrot	Crushed	Nervous system
<i>Dichrostachys Cinerea</i>	Jirimee	Fabaceae	Herbs	Wild	Root	Fresh	Topical	Bone Tb	Dried	Febrile
<i>Ehretia Cymosa Thonn.</i>	Ulaagaa	Boraginaceae	Herbs	Wild	Leaf	Fresh	Topical	Dermatitis	Crushed	Dermatitis

<i>Embelia Schimperi</i>	Hanquu	Myrsinaceae	Herbs	Agriculture Field	Seed	Fresh	Oral	Anthelmintic	Crushed	Gastrointestinal
<i>Eucalyptus Grandis</i>	Barzafi	Myrtaceae	Shrubs	Home	Root	Dried	Topical	Footrot	Dried	Febrile
<i>Euclea Racemosa</i>	Mieessaa	Ebenaceae	Shrub	Wild	Root	Fresh	Topical	Eyedisaease	Mixed With Water	Ophthalmological
<i>Hagenia Abyssinica</i>	Heexoo	Rosaceae	Shrub	Agriculture Field	Seed	Fresh	Oral	Anthelmintic	Crushed	Gastrointestinal
<i>Jatropha curcas</i>	Abatalmuluug	Euphorbiaceae	Tree	Agricultural field	Seed	Fresh	Oral	Gastro intestinal tact Motility	Fresh	Gastrointestinal
<i>Justicia schimperiana</i>	Dhumuga	Acanthaceae	Tree	Wild	Leaf	Fresh	Topical	Dermatitis	Dissolved With Water	Dermatitis
<i>Moringa stenopetala</i>	Miimmii	Moringaceae	tree	home	Leaf	Fresh	Oral	Antiamoebiasis and Giardiasis	Gastrointestinal	
<i>Moringa Stenopetala</i>	Mooringaa	Moringaceae	Tree	home	Root	Fresh	Adminstration	Respiratory manifestations	Crushed	Respiratory
<i>Nicotiana Tabacum</i>	Qorondee	Solanaceae	Shrub	Home	Leaf	Fresh	Oral	Anthelmintic, Wound Management	Crushed	Gastrointestinal
<i>Nigella Sativa</i>	Absuudaa	Ranunculaceae	Herb	Home garden	Seed	Fresh	Nasal	Respiratory manifestations	Crushed	Respiratory
<i>Ocimum Lamiifolium</i>	Urgoo Harree	Labiatae	Shrubs	Wild	Leaf	Fresh	Topical	Wound Management	Crushed	Febrile
<i>Olea Capensis</i>	Onoma	Asphodelaceae	Shrubs	Wild	Stem	Fresh	Oral	Intestinal Worm	Crushed	Unclassified
<i>Olea europaea subsp.cuspidata</i>	Ejersa	Oleaceae	Tree	wild	Root	Fresh	Topical	Footrot	Through Dermally And Orally	Nervous system
<i>Persicaria Decipiens</i>	Qorsabuutii	Polygonaceae	Shrubs	Wild	Root	Fresh	Oral	Abdominal Swelling	Dried	Gastrointestinal
<i>Phyllanthus Ovalifolius</i>	Gurbii	Malvaceae	Shrub	Agriculture Field	Root	Fresh	Oral	Anthelmintics(Inernal Parasite), Diarhoel Disease, Waantufaa	Crushed	Gastrointestinal
<i>Plumbago Zeylanical.</i>	Dhigaajii	Plumbaginaceae	Tree	Wild	Root	Fresh	Nasal	Respiratory manifestations	Crushed	Repiratory
<i>Polygala sphenoptera</i>	Harmala	Polygalaceae	Shrubs	Wild	Root	Boiled	Topical	Eyedisaease	Crushed	Ophthalmological
<i>Premna Schimperi</i>	Urgeessaa	Lamiaceae	Herbs	Wild	Leaf	Fresh	Topical	Burns And Wound Infection	Crushed	Febrile
<i>Pyrenacantha malvifolia</i>	Buurii	Icacinaceae	Herbs	Wild	Stem	Fresh	Oral	Gastrointestinal	Crushed	Gastrointestinal
<i>Rhamnus cathartica</i>	Awbariis	Rhamnaceae	Shrubs	Wild	Leaf	Fresh	Topical	Eye disease	Crushed	Ophthalmological
<i>Rhus vulgaris</i>	Daboobessaa	Anacardiaceae	Shrubs	Wild	Leaf	Fresh	Topical	Burns	Crushed	Dermatitis
<i>Rhynchosia malacotricha</i>	Jiddaa	Fabaceae	Herbs	Wild	Root	Fresh	Oral	Black leg	Crushed	Febrile
<i>Ricinus communis</i>	Qobboo	Euphorbiaceae	Shrubs	Wild	Leaf	Fresh	snake and ectparasite	Crushed	Unclassified	
<i>Ruta Chalepensis</i>	Xeenaddaamii	Rutaceae	Herb	Home garden	Leaf	Fresh	Oral	Abdominal Pain, Skin Rash	Decocted	Gastrointestinal
<i>Santalum Album</i>	Illamsaa	Santalaceae	Tree	Wild	Root	Fresh	Oral	Bloating, Hafraa (Secondary Bacterial Infection), Wound Management	Dried	Gastrointestinal
<i>Solanecio Angulatus</i>	Darris(Jinniraas)	Solanaceae	herb	Wild	Stem	Fresh	Topical	Eyedisaease	Crushed	Ophthalmological
<i>Solanum Incanum</i>	Hiiddii	Solanaceae	Shrubs	Agriculture Field	Root	Fresh	Oral	Blood Clotting And Internal Infection	Crushed	Febrile
<i>Stephania abyssinica</i>	Baltokki	Menispermaceae	Shrub	Wild	Root	Fresh	Oral	, Retained Placenta, Loss Of Milk,	Crushed	Reproductive
<i>Tagetes Minuta</i>	Maxannee	Asteraceae	Tree	Agriculture Field	Root	Fresh	snake and ectparasite	Crushed	Unclassified	
<i>Tamarindus Indica</i>	Roqaa	Fabaceae	Tree	Wild	Seed	Fresh	Oral	Intestinal Worm	Crushed	Gastrointestinal
<i>Terminalia Polycarpa</i>	Hireerrii	Combretaceae	Climber	Wild	Root	Fresh	Oral	Vaginal Bleeding	Crushed	Reproductive
<i>Terminalia spinosa</i>	Hiddagbroo	Combretaceae	Shrubs	Wild	Root	Fresh	Topical	Eyedisaease	Crushed	Ophthalmological
<i>Tragia Cordata</i>	Laalessaa	Euphorbiaceae	Climber	wild	Root	Fresh	Oral	Unirary tract infection, External Parasite	Crushed	Reproductive

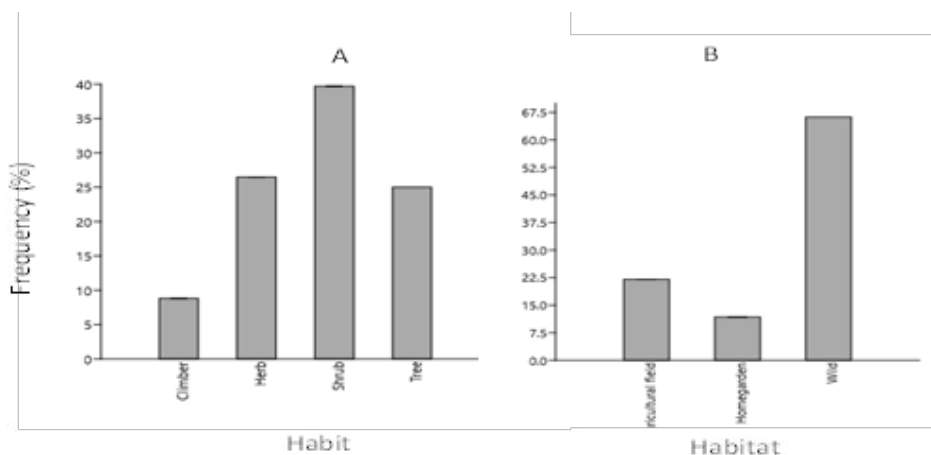
<i>Vernonia amygdalina</i>	Ebicha	Asteraceae	Climber	Wild	Leaf	Fresh	Oral	Antihelminthic	Crushed	Gastrointestinal
<i>Warburgia Ugandensis</i>	Beeftii	Canellaceae	Tree	Wild	Leaf	Fresh	Nasal	Respiratory manifestations	Crushed	Respiratory
<i>Xanthium Strumarium</i>	Korantakatero	Asteraceae	Shrubs	Wild	Leaf	Fresh	Oral	Antifungal	Crushed	Unclassified
<i>Zingiber ofcinale</i>	Zanjabiila	Zingiberaceae	Herb	Home garden	Root	Fresh	Oral	Antihelmentical	Dried	Gastrointestinal

**Table 1: Medicinal plant its Species, Family, Local Name, Growth Form and Ways Drug Formulation and Preparation in Study Area**

### 3.2. Habits and Habitats of Plants

Shrubs were the most common habits followed by herbs, trees and Climbers. Majority of the plants identified by traditional healers

to administered the drug against livestock ailments were recorded in Wild habitat followed by agricultural fields and homegardens (Figure 3)

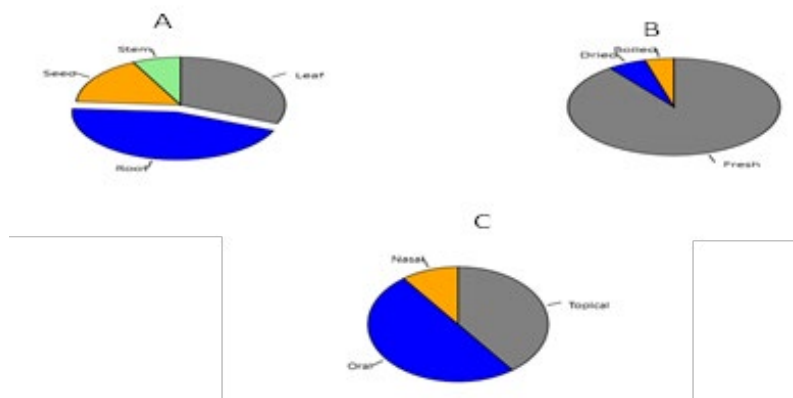


**Figure 3**

### 3.3. Part Used, Methods of Preparation and Route of Administration

Root was the most commonly used plant part in the preparation of remedies against livestock ailments followed by leaf, seed, and stem (Figure 3). The remedies were prepared and used freshly

and a few was boiled and dries before use . Moreover, the most common route of administration for remedies against livestock ailments in the study area was Oral followed by topical application and through nose (Figure 4).



**Figure 4: Pie Chart Showing the parts Used, Preparation and Routes of Administration in Dallo Mana District, Bale Zone**

### 3.4. Informant Consensus Factor

The highest informants' consensus factor (ICF) values were recorded for Ophthalmological followed by dermatological. The lower informant consensus was recorded for reproductive and unclassified ones. The highest plant use citation was recorded for gastrointestinal diseases followed by dermatological (Table

3). Majority of the species were reported to be used for the treatment of gastrointestinal diseases followed by those used to treat dermatological and febrile. The least number of species were recorded for Reproductive system and Ophthalmological disease category (Table 2).

Category of the disease	Number of plant species	Number of informant citations	ICF
Ophthalmological	6	18	0.82
Dermatological	9	43	0.79
Febrile	10	40	0.77
Gastro-intestinal	19	58	0.77
Snake and spider poisoning	3	12	0.73
Nervous system	5	18	0.71
Respiratory system	7	12	0.64
Reproductive system	9	5	0.5

Table 2: The result of Informant Consensus factors

### 3.5. Preference of Medicinal Plants

Preference ranking of 5 medicinal plants that were reported as effective for treating gastrointestinal ailment was conducted after selecting ten key participants. The participants were asked to compare the given medicinal plants based on their efficacy. The

results showed that *Hagenia abyssinica* scored the highest mark and ranked first indicating that it was the most effective in treating gastrointestinal disorder and followed by *Zingiber ofcinale* (Table 3).

	A	B	C	D	E	F	G	H	I	J		Rank
<i>Hagenia abyssinica</i>		5	5	5	5	5	5	5	5	5	50	1
<i>Zingiber ofcinale</i>		5	4	4	4	5	4	5	5	5	46	2
<i>Embelia schimperi</i>		5	5	3	5	3	3	5	5	4	42	3
<i>Santalum album</i>		3	3	4	3	4	3	5	5	4	35	4
<i>Coronus didymu</i>		2	4	3	5	5	3	3	4	2	32	5

Table 3: The results simple preference ranking related to medicinal plants against livestock ailments in Dallo Mana District, Bale Zone

### 3.6. Paired Comparison

A paired comparison was made among nine of plants used to treat livestock disease using ten participants to know their rank. Subsequently *Hagenia abyssinica* was first in rank, and then *Zingiber ofcinale*, the 3<sup>rd</sup> in rank was *Embelia schimperi* (Table 4).

	<i>Hagenia abyssinica</i>	<i>Zingiber ofcinale</i>	<i>Embelia schimperi</i>	<i>Santalum album</i>	<i>Coronus didymu</i>	<i>Vernonia amygdalina</i>	<i>Nicotiana tabacum</i>	<i>Persicaria deceptions</i>
<i>Hagenia abyssinica</i>								
<i>Zingiber ofcinale</i>	HA							
<i>Embelia schimperi</i>	HA	ES						
<i>Santalum album</i>	HA	ES	ES					

<i>Coronus didymu</i>	HA	ES	ES	CD				
<i>Vernonia amygdalina</i>	HA	ES	ES	VA	VO			
<i>Nicotiana tabacum</i>	HA	ES	ES	SA	CD	VA		
<i>Persicaria deceptions</i>	HA	ES	ES	SA	CD	ZO	NT	
<i>Phyllanthus ovalifolius</i>	HA	ES	ES	SA	CG	PO	PO	PO
Frequency	8	7	6	3	2	1	1	1
Rank	1	2	3	4	5	6	7	8

**Table 4: Results of Paired Comparison of Medicinal Plants used Against Livestock Ailments in the Study Area**

### 3.7. Fidelity Levels

Among the claimed traditional medicinal plants, the fidelity level value of *Hagenia abyssinica* was recorded as a highest followed by *Nicotiana tabacum*, *Phyllanthus ovalifolius*, *Ruta chalepensis* *Santalum album*. The recorded highest fidelity level values for

*Hagenia abyssinica* was found under the gastrointestinal disease category. However, the highest fidelity level values of *Nicotiana tabacum* was obtained in the category of wound management. Whereas, the highest fidelity level values of *Phyllanthus ovalifolius* was for the secondary bacterial infection category (Table 5).

No	Scientific name	Therapeutic categories	Ip	Iu	Fidelity (%)
1	<i>Hagenia abyssinica</i>	Therapeutic categories	29	31	93.5%
2	<i>Nicotiana tabacum</i>	Anthelmintics (Internal Parasite), Diarrhoeal Disease	53	57	92.9%
3	<i>Phyllanthus ovalifolius</i>	Penile Dysfunction, Reproductive Organ Disease(Looo)	19	21	90.5%
4	<i>Ruta chalepensis</i>	Abdominal Pain, Skin Rash	19	25	76%
5	<i>Santalum album</i>	Bloating, (Secondary Bacterial Infection), Wound Management	12	42	42.8%

**Table 5: Fidelity Level of 5 Veterinary Medicinal Plants**

Direct matrix ranking on multipurpose medicinal plants Nine commonly reported multipurpose medicinal plant species were considered in the direct matrix ranking (DMR) exercise to

assess their degree of threat based on their multiple use reports. Subsequently, *Hagenia abyssinica* was ranked first followed by *Ekberg. capensis* and *Olea European subsp.cuspidata* (Table 6)

Use Diversity	Agri. Tool	Construction	Firewood	Charcoal	Fodder	Fence	Medicine	Total	rank
<i>Hagenia Abyssinia</i>	5	5	4	4	3	5	4	30	1
<i>Ekberg caponises</i>	2	4	5	5	3	5	5	29	2
<i>Olea europaea</i>									
Subsp. cuspidataid	5	5	4	2	2	4	5	27	3
<i>Terminalia Polycarpa</i>	3	2	4	2	5	2	5	23	5
<i>Vernonia amygdalina</i>	4	4	4	3	2	4	4	25	4
<i>Citrus aurantium</i>	2	4	4	0	5	1	3	19	6
<i>Jatropha curcas</i>	2	2	2	0	0	5	5	16	7
<i>Moringa Stenopetala</i>	2	2	2	0	1	4	4	15	8

**Table 6: Results of Direct Matrix Ranking**



### 3.8. Threat and Conservation of Medicinal Plants of Study Area

The major reported threats of veterinary medicinal plants were overharvesting of available species, agricultural land expansion, and less attention to traditional medicine due to modernization. The major threat to plants used for the treatment of livestock diseases was related to mainly the parts used in the study area i.e. the root. The habitats where the species were reserved were also reported to be lost in need of extra agricultural land. Thus, the threats were both direct (killing the species by uprooting through digging) and indirect (clearing their major habits). On the other hand, some indirect conservation practices were reported in the study areas. These were cultivating veterinary medicinal plants for sale, food, firewood, shade, and fences as well as there was a reported seasonal protection of forest patches, which were the major reported habitats of the species.

### 4. Discussion

The number of medicinal plants (55 species) recorded in the Dallo Mana region for the treatment of various animal diseases was compared with the number reported in the study conducted in the Midakegn region of the West Shoa region, including the Ambo region. showed that 60 medicinal plants were used to treat different animal diseases [17]. On the other hand, the number of medicinal plants reported in the current study is the Oromia region i.e. Horro Gudurru, Jimma and East Wollega region [18-20]. East Warregha District collected 28 types of herbs, Horro Gudurru collected 25 types of herbs, Manna, Dedo, Kelsa and Seka Chekosa counties collected 21, 20, 19 and 14 herbs from Quartermain lands, respectively [18-20]. The fact that more medicinal plants were reported in the study area than in some neighboring regions or areas can be attributed to the animals in the area, as explained [21]. Euphorbiaceae and Lamiaceae added many medicinal plants to the study area, which may be related to the species scale in Ethiopia. Euphorbiaceae and Lamiaceae are the largest families in the flora of Ethiopia and Eritrea, with 209 and 184 species respectively (22 and 23 species) [22,23]. The relative richness of the two medicinal plant families is also related to the richness of some active substances. The widespread use of plants in medicine in the research area can be attributed to their greater wealth compared to other life forms that the researchers observed during their visit to the study area. Other Ethnoveterinary studies conducted in the Midakegn area of the West Shewa Zone and parts of the Horro Gudurru and East Wollega areas have also reported green medicine use. The use of many medicinal plants for gastrointestinal diseases may indicate the prevalence of these diseases in the study area. According to Bacha and Taboge, intestinal diseases are common diseases in the study area [24]. According to studies conducted in other parts of the country, the leaves are the most commonly used plants to make medicine [17,19,20]. The widespread use of leaves can be attributed to the fact that it is easier and faster to prepare medicine from this plant. Most of the drugs in the study area were prepared by pulverization, a method frequently used in other parts of the country [25-29]. The wider use of new products

in medicine will show that most of the herbs needed are almost available at all times of the year. In the study area, the use of water as a diluent in the pharmaceutical industry will affect its ability to make various compounds. Oral ingestion of most treatments can be attributed to the prevalence of gastrointestinal disorders in the study area. In a study, it was determined that one of the health problems of animals in the study area was intestinal diseases [24]. Ophthalmology, dermatology, fever and gastrointestinal diseases are the main diseases with high ICF values in the study area, and the herbs used to treat these diseases can be considered ordinary people. be exposed to. It is more effective than drugs used to treat diseases with low ICF values [16]. Most of the medicinal plants found in the study area were not cultivated, similar to other studies reported elsewhere in the country [19,26,29,30]. The fact that most of the medicinal plants are collected from nature shows that the medicinal plants are under serious threat due to the constant invasion and destruction of the country. The fact that the older people in the region know more about medicinal plants than the younger ones may indicate that there is a problem in the transfer of information about medicinal plants, which may affect the lack of interest in medicinal plants among the young for cultural reasons. factors. to practice medicine. Other studies conducted elsewhere in the country have also shown that older people know more about herbs than younger people [31,32]. The reason why men know more about herbs than women is because traditional medicine in Ethiopia is dominated by men, and men are denied this when choosing wise men to pass on their knowledge [33]. A study conducted in the Ankober district of the Ethiopian Am Khara region also found no difference in knowledge of medicinal plants between illiterate and illiterate people [32]. The results show that farmland expansion is a major threat to the flora of the region as it has been reported as a major threat in other parts of Ethiopia [32,34]. Species [19]. The results also show that local people in these areas do little for conservation. Consistent with other work carried out in other parts of Ethiopia, conservation activities have also been indirect, not their main role (protection of medicinal plants [35,36].

### References

1. Appelgren, L. E. (2009, August). Veterinary drugs: yesterday, today and tomorrow. In *Journal of Veterinary Pharmacology and Therapeutics* (Vol. 32, pp. 7-10). COMMERCE PLACE, 350 MAIN ST, MALDEN 02148, MA USA: WILEY-BLACKWELL PUBLISHING, INC.
2. Ngeh, J., Nuwanyakpa, M., & Djang, S. (2007). Ethno veterinary medicine, a practical approach to the treatment of cattle diseases in sub-Saharan Africa, Agromisa Foundation and CTA, Wageningen. Nigeria. *Research Journal of Agricultural and Environmental Management*, 1, 25-33.
3. World Health Organization. (2001). Legal status of traditional medicine and complementary/alternative medicine. In *Legal status of traditional medicine and complementary/alternative medicine* (pp. 189-189).
4. Kebede, H., Melaku, A., & Kebede, E. (2014). Constraints in

- animal health service delivery and sustainable improvement alternatives in North Gondar, Ethiopia. *Onderstepoort Journal of Veterinary Research*, 81(1), 1-10.
5. De Haan, C. & Bekure S., 1991, Animal health services in sub-Saharan Africa: experiences with new approaches, ALPAN network paper 29, International Livestock Centre for Africa, Addis Ababa. <https://agris.fao.org/agris-search/search.do?recordID=QM9300053>
  6. Cheneau, Y., El Idrissi, A. H., & Ward, D. (2004). An assessment of the strengths and weaknesses of current veterinary systems in the developing world. *Revue scientifique et technique-Office international des épizooties*, 23(1), 351-360.
  7. Sofowora, A. (1996). Research on medicinal plants and traditional medicine in Africa. *The Journal of Alternative and Complementary Medicine*, 2(3), 365-372.
  8. Park, H. L., Lee, H. S., Shin, B. C., Liu, J. P., Shang, Q., Yamashita, H., & Lim, B. (2012). Traditional medicine in China, Korea, and Japan: a brief introduction and comparison. *Evidence-based complementary and alternative medicine*, 2012.
  9. Pankhurst, R. (1965). An historical examination of traditional Ethiopian medicine and surgery. *Ethiop Med J*, 3, 157-172.
  10. IBC (2005). National Biodiversity Strategy and Action plan. Addis Ababa Ethiopia, Pp.115. IBC, "Ethiopian third national report," Tech. Rep., IBC, Addis Ababa, Ethiopia, 2012, <http://www.fao.org/pgrfa-gpa-archive/eth/Reports/ThirdReport.pdf>.
  11. Kassaye, K. D., Amberbir, A., Getachew, B., & Mussema, Y. (2006). A historical overview of traditional medicine practices and policy in Ethiopia. *Ethiopian Journal of Health Development*, 20(2), 127-134.
  12. Bang, C. H., & Leem, C. S. (2020). A new perspective on the supply and demand of weather services. *Sustainability*, 12(21), 9049.
  13. Friis, I., Demissew, S., & Breugel, P. V. (2010). Atlas of the potential vegetation of Ethiopia. (No Title).
  14. G. J. Martin, *Ethnobotany: A Method Manual*. A "People and Plants" Conservation annual, Chapman and Hall, London, UK, 1995.
  15. Alexiades, M. N. (1996). Collecting ethnobotanical data: an introduction to basic concepts and techniques. *Advances in economic botany*, 10, 53-94.
  16. Heinrich, M., Ankli, A., Frei, B., Weimann, C., & Sticher, O. (1998). Medicinal plants in Mexico: Healers' consensus and cultural importance. *Social science & medicine*, 47(11), 1859-1871.
  17. Kitata, G., Abdeta, D., & Amante, M. (2017). Ethnobotanical study of plants used in veterinary practices in Midakegn district, west showa of Oromia region, Ethiopia. *Journal of Medicinal Plants Studies*, 5(5), 282-288.
  18. Yigezu, Y., Haile, D. B., & Ayen, W. Y. (2014). Ethnoveterinary medicines in four districts of Jimma zone, Ethiopia: cross sectional survey for plant species and mode of use. *BMC veterinary research*, 10(1), 1-12.
  19. Birhanu, T., & Abera, D. (2015). Survey of ethno-veterinary medicinal plants at selected Horro Gudurru Districts, Western Ethiopia. *African Journal of Plant Science*, 9(3), 185-192.
  20. Tadesse, B., Mulugeta, G., Fikadu, G., Sultan, A., & Nekemte, E. (2014). Survey on ethno-veterinary medicinal plants in selected Woredas of east Wollega zone, western Ethiopia. *Journal of Biology, Agriculture and Healthcare*, 4(17), 97-105.
  21. Tamiru, F., Dagmawit, A., Askale, G., Solomon, S., Morka, D., & Waktole, T. (2014). Prevalence of ectoparasite infestation in chicken in and around Ambo Town, Ethiopia. *J Vet Sci Technol*, 5(189), 10-4172.
  22. Gilbert MG. Euphorbiaceae. In: Edwards S, Tadesse M, Hedberg I. editors. *Flora of Ethiopia and Eritrea*. Volume 2, Part 2: Canellaceae to Euphorbiaceae. Addis Ababa: The National Herbarium; 1995. p 265–380.
  23. Ryding, O. (2006). *Flora of Ethiopia and Eritrea*. Volume 5: Gentianaceae to Cyclocheilaceae.
  24. Taboge, E., & Bacha, D. (2003). *Enset Production in West Shewa Zone*. Ethiopian Agricultural Research Organization.
  25. Belayneh, A., Asfaw, Z., Demissew, S., & Bussa, N. F. (2012). Medicinal plants potential and use by pastoral and agro-pastoral communities in Erer Valley of Babile Wereda, Eastern Ethiopia. *Journal of ethnobiology and ethnomedicine*, 8(1), 1-11.
  26. Hordofa, F. B. D. L., & Abebe, D. G. N. R. A. Survey of Ethno-Veterinary Medicinal Plants at Dale Sadi Districts of Oromia Regional State, Western Ethiopia.
  27. Yirga, G., Teferi, M., Brhane, G., & Amare, S. (2012). Plants used in ethnoveterinary practices in Medebay-Zana district, northern Ethiopia. *J Med Plants Res*, 6(3), 433-438.
  28. Teklay, A. (2015). Traditional medicinal plants for ethnoveterinary medicine used in Kilte Awulaelo district, Tigray region, Northern Ethiopia. *Adv Med Plant Res*, 3(4), 137-150.
  29. Usmane, A., Birhanu, T., Redwan, M., Sado, E., & Abera, D. (2016). Survey of ethno-veterinary medicinal plants at selected districts of Harari Regional State, Eastern Ethiopia. *Ethiopian Veterinary Journal*, 20(1), 1-22.
  30. Giday, M., & Teklehaymanot, T. (2013). Ethnobotanical study of plants used in management of livestock health problems by Afar people of Ada'ar District, Afar Regional State, Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 9, 1-10.
  31. Gedif, T., & Hahn, H. J. (2003). The use of medicinal plants in self-care in rural central Ethiopia. *Journal of ethnopharmacology*, 87(2-3), 155-161.
  32. Lulekal, E., Asfaw, Z., Kelbessa, E., & Van Damme, P. (2013). Ethnomedicinal study of plants used for human ailments in Ankober District, North Shewa Zone, Amhara region, Ethiopia. *Journal of ethnobiology and ethnomedicine*, 9, 1-13.
  33. Teklehaymanot, T. (2009). Ethnobotanical study of knowledge and medicinal plants use by the people in Dek Island in Ethiopia. *Journal of Ethnopharmacology*, 124(1), 69-78.
  34. Tadesse, M., & Demissew, S. (2000). Medicinal Ethiopian plants: inventory, identification and classification. *Plants used*

- 
- on African traditional medicine as practiced in Ethiopia and Uganda, East Africa. Botany 2000: NAPRECA, Monograph Series, 5.
35. Ramos, M. A., de Medeiros, P. M., de Almeida, A. L. S., Feliciano, A. L. P., & de Albuquerque, U. P. (2008). Use and knowledge of fuelwood in an area of Caatinga vegetation in NE Brazil. Biomass and bioenergy, 32(6), 510-517.
36. Alemayehu, G., Asfaw, Z., & Kelbessa, E. (2015). Ethnobotanical study of medicinal plants used by local communities of Minjar-Shenkora District, North Shewa Zone of Amhara Region, Ethiopia. Journal of Medicinal Plants Studies, 3(6), 1-11.

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