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# Short Communication: Ethnobotanical study of medicinal plants used to treat livestock ailments in Dallo Manna District, Oromia State, Ethiopia

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**Abstract.** *Gobana AH, Telila H, Jilo SA. 2023. Short Communication: Ethnobotanical study of medicinal plants used to treat livestock ailments in Dallo Manna District, Oromia State, Ethiopia. Asian J Ethnobiol 6: 127-136.* Historical information on the use of medicinal plants is in danger of extinction due to changes in different parts of the world, including Ethiopia. This study aimed at the ethnobotanical analysis of medicinal plants used to treat animal diseases. Data were collected through semi-structured interviews with the selected informant sources. Analysis of ethnobotanical data used the Informant Consensus Factor (ICF), preference ranking, ranking matrix, and calculating the degree of fidelity. Dallo Manna Region was reported to have 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.), and Solanaceae (4 spp.). The local people generally used the root, followed by leaves, seeds, and stems, to prepare drugs for treating livestock diseases. All medicine is made and used immediately; some are boiled and dried. In addition, the most common route of administration for treating 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 treating gastrointestinal disorders, followed by species for treating skin diseases and fever. Ten participants compared nine herbs used to treat veterinary diseases to determine their rankings. *Hagenia abyssinica* (Bruce) J.F.Gmel. in the first place, then this was followed by *Zingiber officinale* Roscoe and *Embelia schimperi* Vatke in third place, which achieved the highest value among traditional medicinal plants. The main threats to veterinary medicinal plants are 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

## INTRODUCTION

Ethnoveterinary medicine refers to people's knowledge, skills, methods, practices, and beliefs about animal husbandry (Appelgren 2009). Ethnoveterinary knowledge has been acquired through training and traditionally 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, and many workshops and conferences have been held. Those activities have saved ethnoveterinary knowledge from extinction: most knowledge belongs to the community's elders and is lost after death. Teaching modern culture also causes young people to feel depressed about using their ancestors' beliefs and practices. Although recent efforts have been made to expand the global use of ethnoveterinary knowledge, most information is only recorded in publications and research articles (Toyang et al. 2007). Plant resources have been an essential part of human life throughout history. After meeting their basic needs, such as nutrition and shelter, people began to search for the necessary plant drugs to treat various diseases (WHO 2001). Inadequate animal health services remain the most significant barrier to livestock production in many countries, including Ethiopia. Lack of access to services by farmers also leads to farmers using traditional veterinary medicine and traditional medicine without animal care (Kebede et al. 2014). In sub-Saharan Africa, annual losses due to disease are estimated at US$2 billion, half of which are direct deaths and the other indirect losses from reduced productivity, growth, fertility, and working capacity (De Haan and Bekure 1991). The massive loss of productive land in Africa due to African skin diseases such as trypanosomiasis and dermatophytosis limits 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. Also, 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 essential to livestock development (Cheneau et al. 2004). According to Sofowora (1982), about 60-85% of developing countries' population must rely on traditional medicine. Traditional medicine practices also exist in China, Japan, Thailand, Pakistan, Sri Lanka, India, and Korea (Park et al. 2012). In

Ethiopia, due to its long history, plants have been used as a source of medicine for many diseases since ancient times and have become a part of traditional medicine culture (Pankhurst 1965). Traditional practices and treatments are found in oral traditions, early religious texts, and pharmacopeias that some historians estimate date back to the 15th century AD (WHO 2001). Ethiopia is home to about 6,000 species of vascular plants, probably due to its unique location and climate (IBC 2005). In this country, approximately 80% of the population and 90% of livestock are drug-dependent (IBC 2005). Ethiopian traditional medicine is often used to treat many diseases of humans and animals. Traditional healers, known by different names in different parts of the country, are important people in traditional medicine (Kassaye et al. 2006). Therefore, this research was initiated to gather information on the uses of traditional medicine from plants in local communities in the Dalo Mana District of Ethiopia for treating their livestock. This study aims to fill this gap in the documentation of traditional health practices for livestock disease, even though people living in the 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 must be preserved through appropriate knowledge, identification of herbs used, and preparation of medicinal herbs.

## MATERIALS AND METHODS

### Study area

The Dallo Mana area is located in the Bale region of the Oromia State, Ethiopia 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. The altitude is from 1,314 to 1,508 meters above sea level (masl) (Figure 1).

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 29.5˚C, and the annual average precipitation is 1,006.9 mm, which is recorded in the area (Ethiopian National Meteorology Agency 2020) (Figure 2).

The dominant vegetation in the Dallo Manna region is the African mountainous dry forest type, and the area has an ecotone of sub-African alpine and semi-desert ecosystems. Plants include podocarpus, Guinea dandelion, Thayer acacia, Senegal fruit, African cypress, large-ear croton, honeysuckle, great banyan, southern banyan, African plum, Senegalese custard apple and arabica (Frits et al. 2010)

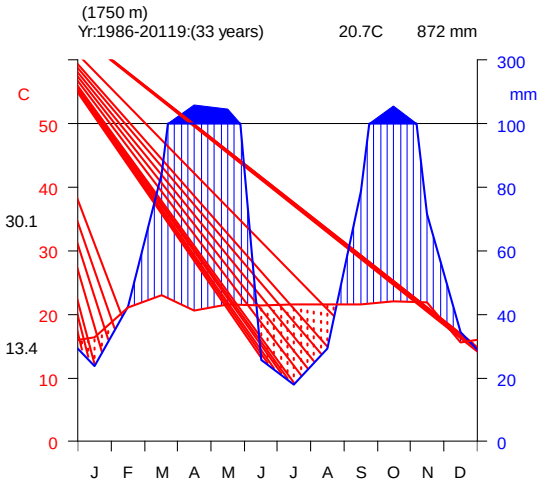


**Figure 1.** Clima diagram of Dallo Mana Districts, Ethiopia (National Meteorogical Agency Robe Branch)

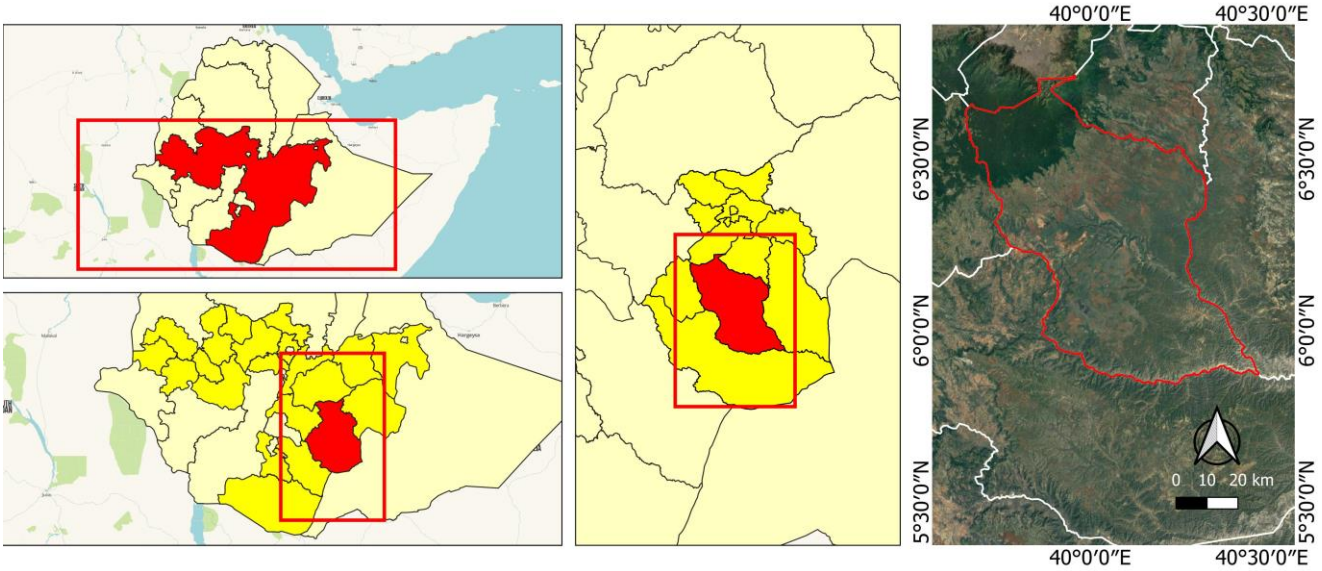


**Figure 1.** Map of the study area Dallo Mana District, Oromia State, Ethiopia

**Sampling design**

The survey was conducted from June 2021 to February 2022. The location selection is based on the recommendations of older people, local authorities, and simple access to the area. Therefore, this study was conducted in eight peasant associations from two agro-climatic zones in Dallo Manna, four of which are semi-pastoral and four dry pastoral. We selected 60 participants (41 men and 19 women) in the representative peasant associations. Following Martin (1995), participant representatives and representatives of medical professionals (main participants) in the Delo Mena Region were selected using random and purposive sampling methods, respectively. 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 narrative quality provided by the interview participants. Local healers are key workers and experts who are the guardians of local knowledge about herbs.

**Ethnobotanical data collection**

The data collection process (Martin 1995) was based on local knowledge of local communities about medicinal plants' health, use, conservation, and threats. 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 were entered into Excel spreadsheets, analyzed using statistical data, such as percentage and frequency, and presented in tables and figures. In addition, decision preferences and comparisons were used to analyze the data (Alexiades 1996). A preference ranking was made for the five main drugs used to treat sick animals. Ten participants selected by each participating administrator 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 choose the best product based on their perspective on wound healing. All possible pairs (Heinrich et al. 1998) were obtained using the n formulas (n-1)/2, where n is the number of herbs compared. 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 choose several other species from all medicinal plants.

## RESULTS AND DISCUSSION

**Composition of plant species used to treat animal diseases**

Moreover, 68 plant species from 35 families were 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.); Three species represent Acanthaceae, Cucurbitaceae, and Rutaceae. The remaining 35 families are represented by only one species (Table 1).

**Habits and habitats of plants**

Shrubs were the most common habits followed by herbs, trees, and climbers. Most plants identified by traditional healers to administer the drug against livestock ailments were recorded in wild habitats, followed by agricultural fields and home gardens (Figure 3).

**Part used, methods of preparation, and route of administration**

Root was the most commonly used plant part to prepare remedies against livestock ailments, followed by leaf, seed, and stem (Figure 4). The medications were prepared and utilized freshly; a few were boiled and dried before use. Moreover, the most common route of administration was oral, followed by topical application and through the nose (Figure 4).

**Informant consensus factor**

The highest number of 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. Most of the species were reported to be used for treating gastrointestinal disorders, followed by those used to treat dermatological and febrile. The least number of species were recorded for the reproductive system and Ophthalmological disease category (Table 2).

**Preference for medicinal plants**

A preference ranking of five medicinal plants reported as effective for treating gastrointestinal ailments 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* (Bruce) J.F.Gmel. scored the highest mark and ranked first, which indicates it was the most effective in treating gastrointestinal disorders, followed by *Zingiber officinale* Roscoe (Table 3).

**Paired comparison**

A paired comparison was made among nine plants used to treat livestock disease using ten participants to know their rank. Subsequently, *H. abyssinica* was first in rank, and then *Z. officinale*, the third in rank, was *Embelia schimperi* Vatke (Table 4).

**Fidelity levels**

Among the claimed traditional medicinal plants, the value of fidelity level of *H. abyssinica* was recorded as the highest, followed by *Nicotiana tabacum* L., *Phyllanthus ovalifolius* Forssk., *Ruta chalepensis* L., and *Santalum album* L. The recorded highest fidelity level value for *H. abyssinica* was found under the gastrointestinal disease category. However, the highest fidelity level value of *N. tabacum* was obtained in the category of wound management. At the same time, the highest fidelity level value of *P. ovalifolius* was for the secondary bacterial infection category (Table 5).

**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, *H. abyssinica* was ranked first, followed by *Ekbergia capensis* Sparrm. And *Olea europaea* subsp. *cuspidata* (Wall. & G.Don) Cif. (Table 6).

**Threat and conservation of medicinal plants**

The primary reported threats to veterinary medicinal plants were overharvesting of available species, agricultural land expansion, and less attention to traditional medicine due to modernization. The primary threat to plants used to treat livestock diseases was mainly related to the parts used in the study area, i.e., the root. Additionally, it has been stated that the necessity for agricultural land has resulted in the loss of plant species' protected habitats. Thus, the threats were classified into direct (killing the species by uprooting through digging) and indirect (clearing significant habitats). On the other hand, some indirect conservation practices were reported in the study areas; these conserved-cultivated veterinary medicinal plants for sale, food, firewood, shade, and fences. In addition, there was a reported seasonal protection of forest patches, which were the primary reported habitats of the species.

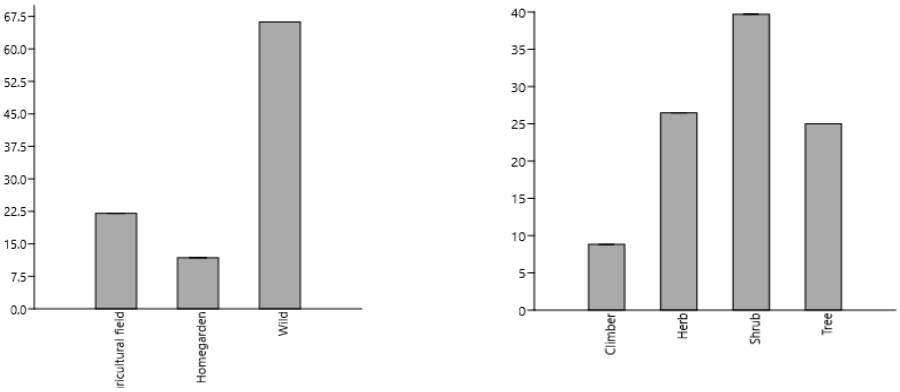


**Figure 3.** Habitats (A) and growth form (B) of medicinal plants

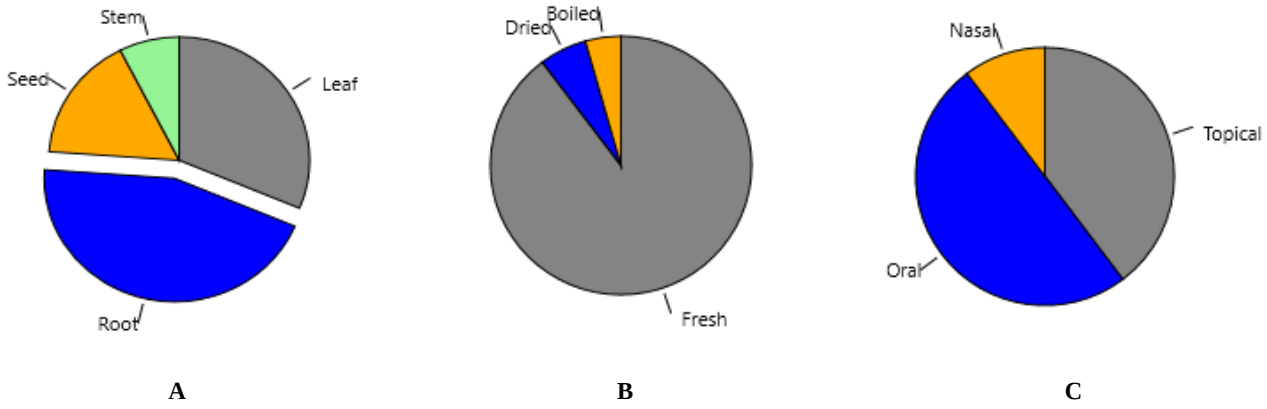


**Figure 4.** Pie chart showing the parts used (A), preparation (B), and routes (C) of administration

**Table 1.** Medicinal plant species and their family, local name, growth form, and ways drug formulation and preparation

| Scientific Name | Local Name | Family | GF | Habitat | Part Used | Dosage | RA | DT | MP | RM |
|---|---|---|---|---|---|---|---|---|---|---|
| *Acacia mellifera* (Vahl) Bosc | Bilaala | Fabaceae | Tree | Wild | Stem | Fresh | Topical | Eye disease | Crushed | Ophthalmological |
| *Albizia ummifera* (J.F.Gmel.) C.A.Sm. | Burii Arbaa | Fabaceae | Shrubs | Wild | Leaf | Dried | Oral | Uterus prolapse | Boiled | Reproductive |
| *Allium cepa* L. | Kulubi | Amaryllidaceae | Herbs | Agriculture field | Leaf | Fresh | Oral | Diarrhea | Dried | Gastrointestinal |
| *Allium sativum* L | Shunkurtii | Amaryllidaceae | Herb | Agriculture field | Seed | Fresh | Nasal | Respiratory manifestations | Fresh | Respiratory |
| *Aloe vera* (L.) Burm.f. . | Hargiisaa | Asphodelaceae | Shrub | Wild | Leaf | Fresh | Oral | Gastrointestinal | Crushed | Gastrointestinal |
| *Balanites **pedicellaris.*** Mildbr. & Schltr | Liqimmee | Zygophyllaceae | Shrub | Wild | Root | Fresh | Nasal | Niagara | Crushed | Respiratory |
| *Barleria acanthoides* Vahl | Shishii | Acanthaceae | Herb | Wild | Root | Fresh | Topical | Dermatitis | Direct | Unclassified |
| *Barleria eranthemoides* R.Br. ex C.B.Clarke. | Shabi | Acanthaceae | Tree | Wild | Root | Fresh | Oral | Gastritis | Crushed | Gastrointestinal |
| *Bidens pilosa* L. | Chogee | Asteraceae | Herbs | Agriculture field | Leaf | Fresh | Topical | Wound management | Crushed | Febrile |
| *Boscia angustifolia* A.Rich. | Qalqalcha Allattii | Capparidaceae | Shrub | Wild | Root | Fresh | Oral | Abortion, retained placenta, muscle pain, pneumonia, joint pain, penis dysfunction | Crushed | Reproductive |
| *Calpurina aurea* (Aiton) Benth. | Cheekataa | Fabaceae | Shrubs | Wild | Leaf | Fresh | Topical | Snakebite | Crushed | Snakebite |
| *Carica papaya* L. | Papaya | Caricaceae | Herbs | Home | Seed | Fresh | Topical | Dermatitis | Crushed | Dermatitis |
| *Cassia angustifol* (Vahl) | Shorbanabii | Fabaceae | Shrubs | Wild | Leaf | Fresh | Oral | Antifever antipain | Crushed | Febrile |
| Catha edulis (Vahl) Forssk. ex Endl. | Chat | Celastraceae | Tree | Agriculture field | Leaf | Fresh | Oral | Pain | Boiled | Febrile |
| *Citrillus colocyntheis* L. | Harree Guugee | Cucurbitaceae | Herbs | Wild | Root | Boiled | Oral | Uterus prolapse | Dried | Reproductive |
| *Citrus aurantifolia* Del. | Loomii | Rutaceae | Tree | Wild and home | Seed | Fresh | Oral | Antihelminth, antidiarrhoeal | Crushed | Gastrointestinal |
| *Citrus aurantium* a Jaub. & Spach | Arboo | Rutaceae | Shrubs | Wild | Seed | Boiled | Topical | Dermatitis | Crushed | Dermatitis |
| *Clematis simensis* Perr. & Guill | Sariitii | Ranunculaceae | Climber | Wild | Root | Fresh | Oral | Retained placenta | Fresh | Reproductive |
| *Clerodendrum myricoides* (Hochst.) R.Br. ex Vatke | Hawaarree | Lamiaceae | Tree | Agriculture field | Root, stem, and leafe | Fresh | Topical | Footrot | Crushed | Febrile |
| *Coffea arabica* L. | Buna | Rubiaceae | Shrubs | Wild | Seed | Fresh | Topical | Wound management(burning) | Direct | Febrile |
| *Cordia africana* Lam., | Wadeessa | Boraginaceae | Shrubs | Wild | Root | Fresh | Topical | Dermatitis | Crushed | Dermatitis |
| *Coronopus didymu* L. | Shuunfaa | Brassicaceae | Shrubs | Agriculture field | Seed | Fresh | Oral | Antihelmintic | Dried | Gastrointestinal |
| *Croton dichogamus* Pax. | Maakaftaa | Euphorbiaceae | Tree | Wild | Root | Fresh | Oral | Reproductive | Crushed | Reproductive |
| *Croton macrostachyus* Hochst. ex Delile | Bakkanniisaa | Euphorbiaceae | Tree | Wild | Root | Fresh | Oral | Reproductive | Crushed | Reproductive |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Cucumis dipsaeus* Ehrenb. ex Spach | Qureerraa | Cucurbitaceae | Climber | Agriculture field | Flower | Fresh | Oral | Bloating, hafraa (secondary bacterial infection), wound management | Crushed | Gastrointestinal |
| *Cucurbita moschata* (Lam.) Pior. | Buqqee | Cucurbitaceae | Climber | Agriculture field | Stem | Dried | Nasal | Respiratory manifestations | Dried | Respiratory |
| *Cymbopogon citratus* | Kormacitaa | Poaceae | Shrubs | Wild | Root | Fresh | Topical | Endoparasite | Crushed | Gastrointestinal |
| *Cyphostemma* sp. L | Laaluu | Vitaceae | Herbs | Agriculture field | Root | Fresh | Topical | Wound | Crushed | Febrile |
| *Datura stramonium* L. | Banjii | Solanaceae | Herb | Wild | Leaf | Dried | Topical | Footrot | Crushed | Nervous system |
| *Dichrostachys cinerea* L | Jirimee | Fabaceae | Herbs | Wild | Root | Fresh | Topical | Bone tb | Dried | Febrile |
| *Ehretia cymosa* Thonn. | Ulaagaa | Boraginaceae | Herbs | Wild | Leaf | Fresh | Topical | Dermatitis | Crushed | Dermititis |
| *Embelia schimperi* Vatke | Hanquu | Myrsinaceae | Herbs | Agriculture field | Seed | Fresh | Oral | Anthelmentic | Crushed | Gastrointestinal |
| *Eucalyptus grandis* W.Hill ex Maiden | Barzafi | Myrtaceae | Shrubs | Home | Root | Dried | Topical | Footrot | Dried | Febrile |
| *Euclea racemosa* L. | Mieessaa | Ebenaceae | Shrub | Wild | Root | Fresh | Topical | Eyedisaese | Mixed with water | Opthalmological |
| *Hagenia abyssinica* (Bruce) J.F.Gmel. | Heexoo | Rosaceae | Shrub | Agriculture field | Seed | Fresh | Oral | Antihelmintic | Crushed | Gastrointestinal |
| *Jatropha curcas* L | Abatalmuluug | Euphorbiaceae | Tree | Agricultural field | Seed | Fresh | Oral | gastro intestinal tract motility | Fresh | Gastrointestinal |
| *Justicia schimperiana* (Hochst. ex Nees) | Dhumuga | Acanthaceae | Tree | Wild | Leaf | Fresh | Topical | Dermatitis | Dissolved with water | Dermititis |
| *Moringa stenopetala* (Baker f.) | Miimmii | Moringaceae | Tree | Home | Leaf | Fresh | Oral | Antiamoebiasis and Giardiasis | Gastro-intestinal | |
| *Moringa stenopetala* (Baker f.) Cufod. | Mooringaa | Moringaceae | Tree | Home | Root | Fresh | Administration | Respiratory manifestations | Crushed | Respiratory |
| *Nicotiana tabacum* L. | Qorondee | Solanaceae | Shrub | Home | Leaf | Fresh | Oral | Antihelminthic wound management | Crushed | Gastrointestinal |
| *Nigella sativa* L | Absuudaa | Ranunculaceae | Herb | Home garden | Seed | Fresh | Nasal | Respiratory manifestations | Crushed | Respiratory |
| *Ocimum lamiifolium* Hochst. ex Benth | Urgoo Harree | Labiatae | Shrubs | Wild | Leaf | Fresh | Topical | Wound management | Crushed | Febrile |
| *Olea capensis* L. | Onoma | Asphodelaceae | Shrubs | Wild | Stem | Fresh | Oral | Intestinal worm | Crushed | Unclassified |
| *Olea europaea* subsp.*cuspidata* L. | Ejersa | Oleaceae | Tree | Wild | Root | Fresh | Topical | Footrot | Through dermally and orally | Nervous system |
| *Persicaria decipiens* (R.Br.) K.L.Wilson | Qorsabuutii | Polygonaceae | Shrubs | Wild | Root | Fresh | Oral | Abdominal swelling | Dried | Gastrointestinal |
| *Phyllanthus ovalifolius* Forssk. | Gurbii | Malvaceae | Shrub | Agriculture field | Root | Fresh | Oral | Anthelmintics (internal parasite), diarhoel disease, waantufaa | Crushed | Gastrointestinal |
| *Plumbago zeylanical.* L. | Dhigaajii | Plumbaginaceae | Tree | Wild | Root | Fresh | Nasal | Respiratory manifestations | Crushed | Respiratory |
| *Polygala sphenoptera* Fresen. | Harmala | Polygalaceae | Shrubs | Wild | Root | Boiled | Topical | Eye disease | Crushed | Ophthalmological |
| *Premna schimperi* Engl. | Urgeessaa | Lamiaceae | Herbs | Wild | Leaf | Fresh | Topical | Burns and wound infection | Crushed | Febrile |
| *Pyrenacantha malvifolia* Engl. | Buurii | Icacinaceae | Herbs | Wild | Stem | Fresh | Oral | Gastrointestinal | Crushed | Gastrointestinal |
| *Rhamnus cathartica* L | Awbariis | Rhamnaceae | Shrubs | Wild | Leaf | Fresh | Topical | eye disease | Crushed | Ophthalmological |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *Rhus vulgaris* Meikle. | Daboobessaa | Anacardiaceae | Shrubs | Wild | Leaf | Fresh | Topical | burns | Crushed | Dermatitis |
| *Rhynchosia malacotricha* Harms | Jiddaa | Fabaceae | Herbs | Wild | Root | Fresh | Oral | Blackleg | Crushed | Febrile |
| *Ricinus communis* L. | Qobboo | Euphorbiaceae | Shrubs | Wild | Leaf | Fresh | Snake and ectoparasite | Crushed | Unclassified | |
| *Ruta chalepensis* L. | Xeenaddaamii | Rutaceae | Herb | Home garden | Leaf | Fresh | Oral | Abdominal pain, skin rash | Decocted | Gastrointestinal |
| *Santalum album* L. | Illamsaa | Santalaceae | Tree | Wild | Root | Fresh | Oral | Bloating, hafraa (secondary bacterial infection), wound management | Dried | Gastrointestinal |
| *Solanecio angulatus* (Vahl) C.Jeffrey | Darris(Jinniraas) | Solanaceae | Herb | Wild | Stem | Fresh | Topical | Eye disease | Crushed | Ophthalmological |
| *Solanum incanum* L. | Hiiddii | Solanaceae | Shrubs | Agriculture field | Root | Fresh | Oral | Blood clotting and internal infection | Crushed | Febrile |
| *Stephania abyssinica* (Quart.-Dill. & A.Rich.) Walp. | Baltokki | Menispermaceae | Shrub | Wild | Root | Fresh | Oral | Retained placenta, loss of milk, | Crushed | Reproductive |
| *Tagetes minuta* L. | Maxannee | Asteraceae | Tree | Agriculture field | Root | Fresh | Snake and Ectoparasite | Crushed | Unclassified | |
| *Tamarindus indica* L. | Roqaa | Fabaceae | Tree | Wild | Seed | Fresh | Oral | Intestinal worm | Crushed | Gastrointestinal |
| *Terminalia polycarpa* Engl. & Diels | Hireerrii | Combretaceae | Climber | Wild | Root | Fresh | Oral | Vaginal bleeding | Crushed | Reproductive |
| *Terminalia spinosa* North. | Hiddagabroo | Combretaceae | Shrubs | Wild | Root | Fresh | Topical | Eye disease | Crushed | Ophthalmological |
| *Tragia cordata* A.Rich. | Laalessaa | Euphorbiaceae | Climber | Wild | Root | Fresh | Oral | Unirary tract infection, external parasite | Crushed | Reproductive |
| *Vernonia amygdalina* (Delile) Sch.Bip. | Ebicha | Asteraceae | Climber | Wild | Leaf | Fresh | Oral | antihelminthic | Crushed | Gastrointestinal |
| *Warburgia ugandensis* Sprague | Beeftii | Canellaceae | Tree | Wild | Leaf | Fresh | Nasal | Respiratory manifestations | Crushed | Respiratory |
| *Xanthium strumarium* L. | Korantakatero | Asteraceae | Shrubs | Wild | Leaf | Fresh | Oral | Antifungal | Crushed | Unclassified |
| *Zingiber officinale* Roscoe | Zanjabiila | Zingiberaceae | Herb | Home garden | Root | Fresh | Oral | Antihelmentical | Dried | Gastrointestinal |

Note**:** GF= growth form, RA= route of administration, DT= disease treated, MP= mechanism of preparation, and RM= medication route**.**

**Table 2.** The result of Informant Consensus Factors (ICF)

| 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 3.** The results of simple preference ranking related to medicinal plants against livestock ailments

| Names of Plants | Informants Labeled A to I | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | I | Total Score | Rank | A |
| *Hagenia abyssinica* | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 50 | 1 | |
| *Zingiber officinale* | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 | 46 | 2 | |
| *Embelia schimperi* | 5 | 5 | 3 | 5 | 3 | 3 | 5 | 5 | 4 | 42 | 3 | |
| *Santalum album* | 3 | 3 | 4 | 3 | 4 | 3 | 5 | 5 | 4 | 35 | 4 | |
| *Coronopus didymu* | 2 | 4 | 3 | 5 | 5 | 3 | 3 | 4 | 2 | 32 | 5 | |

Note: Scores in the table indicate ranks given to medicinal plants based on their efficacy; the highest number (50) was given for the medicinal plant that informants thought most effective in treating diarrhea, and the lowest number (32) was given for the least-effective plant

**Table 4.** Results of paired comparison of medicinal plants used against livestock ailments

| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | *Hagenia abyssinica(HA)* | | | | | | | | |
| 2 | *Zingiber officinale(ZO)* | HA | | | | | | | |
| 3 | *Embelia schimperi(ES)* | HA | ES | | | | | | |
| 4 | *Santalum album(SA)* | HA | ES | ES | | | | | |
| 5 | *Coronopus didymu(CD)* | HA | ES | ES | CD | | | | |
| 6 | *Vernonia amygdalina(VA)* | HA | ES | ES | VA | VO | | | |
| 7 | *Nicotiana tabacum(NT)* | HA | ES | ES | SA | CD | VA | | |
| 8 | *Persicaria decipiens (PD)* | HA | ES | ES | SA | CD | ZO | NT | |
| 9 | *Phyllanthus ovalifolius(PO)* | 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 |

Notes: Paired comparison of medicinal plants to treat livestock; each plant was compared with others

**Table 5.** Fidelity level of five veterinary medicinal plants

| Scientific Name | Therapeutic Categories | Ip | Iu | Fidelity (%) |
|---|---|---|---|---|
| *Hagenia abyssinica* | Anthelmintics (internal parasite), diarhoel disease | 29 | 31 | 93.5% |
| *Nicotiana tabacum* | Anthelmintics, wound management | 53 | 57 | 92.9% |
| *Phyllanthus ovalifolius* | Penile dysfunction, reproductive organ disease | 19 | 21 | 90.5% |
| *Ruta chalepensis* | Abdominal pain, skin rash | 19 | 25 | 76% |
| *Santalum album* | Bloating (secondary bacterial infection), wound management | 12 | 42 | 28.57% |

Notes: "*Ip"* is using a species for the same major purpose, and IU "Iu" is the total number of informants who mentioned the plant for any use.

**Table 6.** Results of direct matrix ranking

| Plant Species | Uses | | | | | | | Total | Rank |
|---|---|---|---|---|---|---|---|---|---|
| | Agricultural Tool | Construction | Firewood | Charcoal | Fodder | Fence | Medicine | | |
| *Hagenia abyssinica* | 5 | 5 | 4 | 4 | 3 | 5 | 4 | 30 | 1 |
| *Ekbergia capensis* | 2 | 4 | 5 | 5 | 3 | 5 | 5 | 29 | 2 |
| *Olea europaea* subsp. *cuspidata* | 5 | 5 | 4 | 2 | 2 | 4 | 5 | 27 | 3 |
| *Terminalia Polycarpa* | 3 | 2 | 4 | 2 | 5 | 2 | 5 | 23 | 5 |
| *Vernonia amygdalina* | 4 | 4 | 4 | 3 | 2 | 4 | 4 | 25 | 4 |
| *Citrus aurantium* | 2 | 4 | 4 | 0 | 5 | 1 | 3 | 19 | 6 |
| *Jatropha curcas* | 2 | 2 | 2 | 0 | 0 | 5 | 5 | 16 | 7 |
| *Moringa stenopetala* | 2 | 2 | 2 | 0 | 1 | 4 | 4 | 15 | 8 |

## Discussion

A study in the Midakegn District of West Shoa Zone, to which Ambo District belongs, revealed 60 medicinal plants to treat various livestock ailments (Kitata et al. 2017). This figure is comparable to the number of medicinal plants (68 species) documented from the Dallo Mana District that were used to manage several livestock ailments. However, the number of medicinal plants identified in the current study is significantly higher than that found in studies carried out in various districts of the three Oromia Region neighboring zones of Horro Gudurru, Jimma, and East Wollega (Tadesse et al. 2014; Yigezu et al. 2014; Birhanu and Abera 2015). There are 28 recognized medicinal plants in the East Wollega Zone (Tadesse et al. 2014); 25 medicinal plants were documented from Horro Gudurru (Birhanu and Abera 2015); and 21, 20, 19, and 14 medicinal plants were recorded from Manna, Dedo, Kersa and Seka Chekorsa districts of the Jimma Zone, respectively (Yigezu et al. 2014).

According to Tamiru et al. (2014), the study district had a greater reported number of medicinal plants than certain nearby districts or zones, which the region's abundant cattle population might explain. Due to their different sizes in terms of each family's species in Ethiopia's ora, Euphorbiaceae and Lamiaceae are thought to have contributed a more significant number of plants to the District under study's medicinal plant flora. With 209 and 184 species, respectively, Euphorbiaceae and Lamiaceae are among the biggest families in the Flora of Ethiopia and Eritrea (Gilbert 1995; Ryding 2006).

The relative abundance of these two medicinal plant families may be attributed to the abundance of certain active components in each family. The fact that herbaceous plants are more frequently used in the research district to cure ailments may be due to their greater abundance compared to other types of life, as was also noted by the study's investigators on their travels to the study area. Further ethnoveterinary investigations conducted in the Midakegn District of the West Shewa Zone (Kitata et al. 2017), as well as various districts of the Horro Gudurru (Birhanu and Abera 2015) and East Wollega (Tadesse et al. 2014) zones, also reported the widespread plants' use; there are a large variety of medicinal herbs used to treat digestive and gastrointestinal. In addition, Bacha and Taboge (2003) state that gastrointestinal ailments are among the study District's most common diseases.

Moreover, in other research done in different regions of the nation (Tadesse et al. 2014; Birhanu and Abera 2015; Kitata et al. 2017;), the leaf was the most employed plant part in the formulation of treatments. Making treatments from such plant parts is significantly simpler and quicker, which may explain why leaves are used more frequently. The majority of remedies in the study district were made by crushing, a practice that is also popular throughout the nation (Belayneh et al. 2012; Yirga et al. 2012; Teklay 2015; Usmane et al. 2016; Bekele et al. 2018).

Crushing is frequently used in creating treatments, which may have something to do with its simplicity. Most remedies in the study district are made from fresh plant materials. Fresh materials were also mentioned in other studies carried out in various regions of Ethiopia (Birhanu and Abera 2015; Lulekal et al. 2013; Usmane et al. 2016; Bekele et al. 2018). The increased usage of fresh ingredients in manufacturing remedies may imply that most necessary plant parts are available nearby throughout the year. Water frequently used as a diluent in the study district may be connected to its ability to dissolve various active chemicals. Furthermore, most remedies that were administered orally could be attributed to the common gastrointestinal tract ailments in the study District. In addition, a study reveals that gastrointestinal ailments are among the top animal health problems in the same study District (Bacha and Taboge 2003).

The main disease categories with high ICF values in the study district were ophthalmological, dermatological, febrile, and gastrointestinal ailments. As a result, medicinal plants used to treat these disease categories could be considered good candidates for further pharmacological evaluation because they are promoted to have higher potency than those used to treat disease categories with low ICF values (Heinrich et al. 1998).

According to reports from previous studies carried out around the nation (Giday et al. 2013; Birhanu and Abera 2015; Usmane et al. 2016; Bekele et al. 2018), the majority of the allegedly medicinal plants in the study district were discovered to be uncultivated plants. Therefore, the country's continuous deforestation and habitat degradation, and most medicinal plants being taken from the wild, implies a severe threat to their existence.

The study district's older and younger people had different levels of knowledge of medicinal plants, which

may indicate a need for more with information transmission between generations. That may be connected to the younger generation's lack of interest in utilizing traditional medicine due to acculturation. Studies conducted in other parts of the country have shown that older people are more informed about medicinal plants than younger people (Gedif and Hahn 2003; Lulekal et al. 2013).

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