INVESTIGATION ON ETHNOVETERINARY MEDICINAL PLANTS AND NON PLANT REMEDIES USED FOR TREATMENT OF LIVESTOCK AILMENTS IN YEM SPECIAL DISTRICT, SNNPRS, ETHIOPIA

M.Sc. THESIS

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WOLKITE, ETHIOPIA

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THESIS SUBMITED TO WOLKITE UNIVERSITY COLLEGE OF AGRICULTURE AND NATURAL RESOURCES DEPARTMENT OF ANIMAL SCIENCE

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SCHOOL OF GRADUATE STUDIES

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ADVISORS' APPROVAL SHEET

This is to certify that the thesis entitled "**Investigation On Ethnoveterinary Medicinal Plant, Non Plant Remedies Used For Treatment Of Livestock Ailments In Yem Special District, SNNPRS Ethiopia**" submitted in partial fulfillment of the requirements for the degree of **Masters** with specialization in animal science, the graduate program of the Department of Animal Sciene, and has been carried out by Abiyot Sisay Nano ID N^{O} AGGR/001/13 under our supervision. We recommend that it be submitted as fulfilling thesis requirment.

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We, the undersigned, members of the Board of Examiners of the final open defense by **Abiyot Sisay** have read and evaluated his thesis entitled "**Investigation On Ethnoveterinary Medicinal Plant, Non Plant Remedies Used For Treatment Of Livestock Ailments In Yem Special District, SNNPRS, Ethiopia"** and examined the candidate. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree of Master of Science in Animal science.

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STATEMENT OF THE AUTHER

I declare that this thesis is my original work and that all sources of materials used for this thesis have been deeply acknowledged. This thesis has been submitted in partial fulfilment of the requirements for a Master of Science (MSc) at Wolkite University, and it is deposited at the university library to be made available for users under the rules of the library. I intensely declare that this thesis is not submitted to any other institution anywhere for the award of any academic degree, diploma, or certificate.

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BIOGRAPHY

The author, Mr. Abiyot Sisay, was born on October 2, 1980, at Kesheli Kebele Yem Special Woreda, SNNPRS, Ethiopia, from his father, Ato Sisay Nano, and mother Woizero Arigtu Kiya. He attended his primary education at Kesheli primary school, his secondary education at Fofa secondary and preparatory school.

Then he joined Jimma University College of Agriculture and Veterinary Medicine (JUCAVM) in the department of animal science in 2000 and obtained his BSc degree in animal science in June, 2002. He was employed in the Yem Special Woreda Agricultural Offices served for more than 9 years.

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LIST OF ACRONYMS AND ABBREVIATIONS

CSA	Central Statistical Agency
EVM	Ethnoveterinary Medicine
EVMP	Ethnoveterinary Medicinal Plant
FL	Fidelity Level
FMD	Foot and Mouth Disease
GI	Gastrointestin
HM	Herbal Medicine
ICF	Informant Consensus Factor
IK	Indigenous Knowledge
JCS	Jaccards Coefficient of Similarity
MPs	Medicinal Plants
RFC	Relative Frequency of Citation
RI	Relative Importance
SNNPR	Southern Nation Nationality People Region
TK	Traditional Knowledge
TM	Traditional Medicine
UV	Use Value
YSDAFPD	Yem Special District Animal and Fishery Production Development
YSDANRD	Yem Special District Agriculture and Natural Resource Development
YSDFED	Yem Special District Finance and Economy Development

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ABSTRACT

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By Abiyot Sisay, MSc Thesis

Major advisor: Dr Yeshihareg Afera, Co-advisor Behailu Bizuhayehu (Asst. Prof)
Wolkite University,2023

Most Ethiopian farmers rely on locally available plants to treat diseases of their domestic animals. Such knowledge needs to be recorded and transferred to generations before it is eroded. The aim of this study was to investigate the ethnoveterinary medicinal plant and non-plant remedies used for treatment of livestock ailments in Yem Special District, Southern Ethiopia. Sixty-seven informants were purposively selected from seven study kebeles. Semi-structured interviews, field observations and focus group discussions were used to collect ethnoveterinary information. The data were analyzed using quantitative approaches. A total of 151 plant species and 25 non plant remedies were used in the treatment of 49 livestock ailments based on 26 signs and symptoms. Plant family lamiaceae and non-plant remedies meat of porcupines were frequently used. The most frequently harvested plant parts were leaves (66.2%). Pounding (87.3) was the most commonly used method of remedy preparation whereas the most widely used method of administration is oral (67.5). The majority of medicinal plants (82.2%) were harvested from the wild. Herbs (35.1%) were the dominant growth form. In this study, the highest relative importance, relative ferequence of citation values and most preferred medicinal plant species for the most frequenlyt cited disease was Olinia rochetiana A. Juss. Ensete ventricosum was used for various purposes by the local people. The highest informant consensus factor values were gastrointestinal and endoparasites (0.71) disease categories. Calpurnia aurea. (Ait.) Benth showed the highest fidelity level value (95%) in dermatological and ectoparasites and from non plant remedies, faeces of aardvark (100%) in reproductive and bile of animals (100%) in gastrointestinal and endoparasite disease categories. The Plant species with the highest use value was; Cordia africana Lam (6). The current study shows that medicinal plants and non-plant remedies are still the major animal health care system in Yem Distrct. Hence, Conducting phytochemical screening and clinical trials of the MPs with high informant consensus and FL, and plant species and animal identified as sources of traditional medicine in the area should be conserved.

Keywords:-Ethnoveterinary, Indigenous knowledge, medicinal plant, Non-plant remedies.

1. INTRODUCTION

Ethnoveterinary is the traditional knowledge of people's belief, skills, methods, practices and faith regarding use of plants and plant products for treatment of animals diseses (Sushmita *et al*., 2017). It is the community-based local or indigenous knowledge and methods of caring for healing and managing livestock ailments (Moabiemang *et al*., 2013). Ethnobotany is defined as the study of local people's interaction with the natural environment: how they classify, manage and use plants available around them(Limenih *et al*., 2015). Over the centuries, indigenous people have developed their locality specific knowledge on medicinal plant use, management, and conservation (Yigezu *et al*., 2014).

Plants have been used for centuries in traditional healing systems and many indigenous communities around the globe manipulated them as ethnoveterinary medicines (Adnan *et al*., 2014). Medicinal plants have made a significant contribution to the primary healthcare of human and livestock around the world. Population increases, inadequate supplies of drugs, the prohibitive cost of treatments, side effects of several synthetic drugs, and the development of drug resistance to infectious diseases have led to the increasing use of plant materials as a source of medicine for a wide variety of animal ailments (Mesfin *et al*., 2013).

In most African countries, traditional medicine has been bonded to people and animal health planning for centuries, and it has undergone a major revival for generations (Caudall *et al*., 2017). Ethiopia is among the countries in Africa with the highest livestock population, livestock production remains crucial and represents a major asset among resource-poor smallholder farmers. However, the economic benefits of livestock populations remain marginal due to prevailing livestock diseases which are among the principal bottle necks of livestock performance and cause of high economic losses of the resource poor farmers (Mesfine and Lemma, 2001). In Ethiopia, about 90% of the livestock population rely on traditional medicines due to difficulties in accessing modern health facilities, the cultural acceptability of healers, and low cost of traditional medicine (Nguta *et al*., 2010). The majority of livestock keepers in Ethiopia are far away from animal clinic stations (Belayneh *et al*., 2012).. The traditional medicines sometimes the only sources of therapeotics for livestock in Ethiopia of which 95% are plant origin (Giday, 2007).

On the other hand, some of the non-plant materials which include product of animals or by-product, minerals, insects and sharp hot iron or knife (Dilbato *et al*., 2021); wood ash, honey,

oils, kerosene, kaolin, potassium, local soap, and spent engine oil are used as sources of ethnoveterinary medicinal agents (Alhaji and Babalobi, 2015). Ethiopians widely practiced the use of traditional medicine, so as Ethiopia is the land of vegetation as well as livestock. There are over 6600 higher plant species in Ethiopia, which makes the country as one of the most diverse floristic regions in the world (Bekele, 2007). Nearly 645 medicinal plant species are frequently mentioned in many sources; *croton macrostachyus* and *solanum incanum* are frequently used plant species to treat livestock ailments of the country (Tilahun *et al*., 2019).

The greater concentration of medicinal plants is found in the south and southwestern parts of the country in keeping with the concentration of biological, cultural diversity and numerous ethnicities (Nguta *et al*., 2010). The traditional knowledge on ethnoveterinary practices by local healers who are knowledgeable and experienced in traditional systems of treatment is important (Phondani *et al*., 2010), but their knowledge is not documented and is dwindling fast (Dulo and Mekonnen, 2017; Tadesse *et al*., 2018; Berhanu *et al*., 2020). Ethiopians have used traditional medicines at least as early as the 17th century; however, very little is documented (Solomon, 2012).

1. Statement of problem

Yem special district has relatively diverse nature particularly endowed with plants having remedial properties in which indigenous people have utilized and benefited from it for centuries. Yem peoples have deep-rooted and ancient traditional knowledge managing livestock ailments and health conditions using plant biodiversity and non-plant remedies. Even though the conventional medicinal services system showed better coverage than before, Yem people still use plants and non-plant remedies and consult local herbal experts for a number of livestock ailments and health condition due to their accessibility, efficacy of traditional medicines that led to cultural trust in them (Woldemariam, 2020).

Although there is high traditional medicinal plant knowledge and strong beliefs, ethnoveterinary medicinal knowledge is simply transferred orally from generation to generation and most of ethnoveterinary medicinal plants kept as a secret thus there is a danger of extinction as old people die and the younger generation is not interested in living with the traditional way of life. Particularly, comprehensive and systematic study was conducted on the use of ethnobotanical plant diversity (Woldemariam, 2020). EVMPs and non plant remedies in livestock health management was not studied in-depth in the yem special district. In addition, indigenous knowledge is disappearing due to a lack of written

documents about ethnoveterinary medicinal plant species and non plant remedies, the deaths of tribal elders without transfer of traditional skills to other members of family, the migration of people due to social problem, urbanization and modernization and climatic factors. Therefore, this study was conducted to identify and document ethnoveterinary medicinal plants, non plant remedies and ethnoveterinary knowledge of the yem special district, southern Ethiopia.

1.1. Objectives

1.1.1. General objective

- To investigate ethnoveterinary medicinal plant and non-plant remedies used for treatment of livestock ailments in Yem special district, Southern Ethiopia

1.1.2. Specific objectives

- To identify common livestock diseases in the study area.
- To identify and document medicinal plant species and non plants used for treatment of livestock diseases in the study areas.
- To investigate indigenous knowledge on treatment of livestock ailments

1.2. Research questions

- ✓ What are most common livestock health problems in study area?
- ✓ What are the most important plants species and non plant remedies to treat livestock ailments?
- ✓ How do utilize the traditional medicine to treat livestock ailments?

1.3. Significance of the study

The output of the study of the value of ethnoveterinary medicinal plants and non plant diversity in the study area was essential for,

- ✓ To fill the research gap,
- ✓ To investigate and understand indigenous knowledge of community on livestock health management,
- ✓ To document ethnoveterinary medicinal plants and non plant remedies which preserve indigenous knowledge on livestock health management of the communitye and
- ✓ To provide baseline data for future pharmacological & phytochemical studies.

2. LITERATURE REVIEW

2.1. Importance of indigenous knowledge

Indigenous knowledge (IK) is a complex body of knowledge, skills and technology, which belongs to a particular geographical community that enable the community to achieve stable livelihoods in their environment (Matsika, 2012). It has significances role in designing sustainable farming systems, by improving traditional method of livestock management and ability of the stockowners to deal with different challenge of selection, disease tolerance, feeding management, product handling and maintains genetic resources (both plant and animal) which are essential for the wellbeing, sustenance and development of the environment and livelihood of a community (Banerjee *et al*., 2014).

Indigenous knowledge can be seen as local or traditional knowledge that is unique to every culture or society. The knowledge influences planning as well as decision-making in local areas. IK is regarded as a problem solving mechanism to rural communities. It is recognized as having relevance to the daily life of most individuals, economic development, culture preservation and political transformation (Msuya, 2007).

Indigenous knowledge as a community based functional knowledge system, developed, preserved and refined by generations of people through continuous interaction, observation and experimentation with their surrounding environment (Risiro, 2013). It is characteristics as: a home grown form of knowledge, which is derived from the solution of everyday life problems and It is part and parcel of a community's cultural practices and ways of life and regularly it is not documented but has passed from one generation to another through oral history (Matsika, 2012).

The livelihood of rural population mainly depends on indigenous knowledge, which is essential for their survival (Mahalik and Mahapatra, 2010). Ik is generated by a particular society within a geographical area and it is respected for its ability to solve prevailing problems (Risiro, 2013). Furthermore, IK has been recognized as a valuable input into modern industries such as pharmaceuticals, botanical medicines, cosmetics and toiletries, agriculture and biological pesticides. Most industries look for the time-tested traditional knowledge information for developing novel products having commercial acceptability (Kumar and Bijoylaxmi, 2011).

The introduction of western education and missionary activities in Africa watered down the value and respect given to indigenous knowledge and cultural beliefs. This indigenous knowledge had ensured forests, water resources and animals protected from destruction and extinction (Risiro, 2013). Indigenous knowledge plays a substantive part in poverty eradication among communities in different parts of Africa. The knowledge is implicit and thus difficult to systemize it. It is embedded in community practices, institutions, relationships and rituals (Msuya, 2007).

2.2. Ethnoveterinary medicine (EVM)

Ethnoveterinary medicine is the scientific study of relationships between livestock and plants (Teklay, 2015). It is holistic interdisciplinary study of the local knowledge, sociocultural structures and environment associated with animal health care and husbandry (Romha *et al*., 2015). It comprises of traditional surgical techniques, traditional immunization, magic religious practices and the use of herbal medicines to treat livestock diseases (Dulo and Mekonnin, 2017; Oyda, 2017).

The study of ethnoveterinary medicinal plants is a growing area of interdisciplinary research having enormous potential to understand various nuances of folk knowledge on domesticated animals. Traditional medicine is an integral part of the culture, belief, structure and lifestyle of Ethiopian people's (Oyda, 2017).

Ethnoveterinary medicine is sustainable and ecologically sound because plant products with recognized medicinal properties are far more accessible to the villagers than Western medicine and it is a cheaper and more easily accessible alternative to expensive pharmaceuticals (Kubkomawa et al., 2013).

Ethnoveterinary medicine has many advantages; as source of modern medicine (drugs), affordability, locally available and easily accessible, culturally appropriate and understood, effective, comfortably animal metabolize plants and plant extracts and user friendly. For common diseases and more chronic conditions such as colds, skin diseases, worms, wounds, reproductive disorders, nutritional deficiencies and mild diarrhea, EVM has much to offer and can be a cheap and readily available alternative to costly imported drugs (Oyda, 2017). Some of the disadvantages of EVM are; often not as fast working and potent as allopathic medicines, time consuming and inconveniences involved in their preparations and use (Solomon, 2012).

2.3. Ethnoveterinary medicinal practices in Ethiopia

Ethiopian farmers and pastoralists rely on traditional knowledge, practices and locally available materials, plants in particular, to control and manage domestic animal diseases (Oyda, 2017).

Traditional (Indigenous) means something which is communicated from ancestors to descending; only by oral means. Thus, the knowledge of traditional medicine both for man and animal is handed down from one generation to another through practical demonstrations or through oral communications. Ever since the life started on the earth, diseases and death coexisted with him and with their animals. Therefore, efforts have been made to get relief out of it by using herbs in various forms as medicine from the very beginning of human civilization (Jarsso, 2016).

Livestock production affected by different type of disease and indigenous people used different prevention and control measures to treat their sick animals while the reasons for using traditional treatment were lack of adequate veterinary services, long distance to animal clinics, lack of transport facilities and they believed that the animal can recover with traditional ethnoveterinary practices (Duguma *et al*.,2013). Tick and tick born diseases (TBD) are widely distributed parasite disease throughout the world particularly in tropical and subtropical countries, which cause bacterial diseases and great economic losses in livestock industries (Zenebe, 2001). However, the stockowners use herbals with combination of other modern medicine to control tick invasion in their stock. Ethiopian Stockowners use potential medicinal herbs to control tick invasion (Melaku, 2013).

Promoting the conservation and use of ethnoveterinary medicine does not mean downgrading or ignoring the value of modern medicine and attempting to replace one with the other. However, it does mean recognizing that both types have their strengths and limitations. In some instances, they complement each other in others, local practices will be the better choice, and again in others modern practices should be recommended (Sri and Vikrama, 2010).

Modern livestock health care in pastoral community of Ethiopia is still at its lowest stage due to limited veterinary services and supply of drugs. Besides, most modern drugs are expensive and, as a result, not affordable by the majority of Ethiopian farmers and pastoralists. As a result, pastoral and agropastoral communities heavily rely on their TK and

practices on locally available materials mainly plants in the management of animal diseases (Serda, 2017).

2.4. Medicinal plants used for livestock treatment in Ethiopia

Nature has been the sources of therapeutic agents for treating human and livestock diseases since the dawn of civilization (Yadav *et al*., 2014). A great variety of traditional remedies are used to treat and prevent livestock health problems; medicinal plants which have been used both for prevention and cure of various diseases of human and livestock from time immemorial occupy the largest portion (Gebrezgabiher, 2013). Nature is provided with a lot of herbal medicinal plants which play a major part in the treatment of diseases. Plants are considered as the significant and elemental sources of medicinal traits. Medicinal plants form the richest entity in medicines, food supplements, nutraceutical, pharmaceutical and chemical industries for manufacturing drugs (Banumathi and Vaseeharan, 2015). Ethiopia is a country characterized by a wide range of climate and ecological conditions, possessed enormous diversity of fauna and flora (Yetechalew *et al*., 2018). The country possesses a wide range of potentially useful medicinal plants, more extensive indeed that available in many other parts of the world (Yirga and Zerabruk, 2011).

Ethiopian farmers and pastoralists rely on traditional knowledge, practices and locally available materials, plants in particular, to control and manage domestic animal diseases (Giday and Ameni, 2003). The majority of livestock raisers in Ethiopia are geographically removed from the sites of veterinary stations, and those that are closer to the sites may not afford the fees for services. The inadequate funding at the national level for the prevention and control of animal diseases adds to the burden, especially among pastoralists who live in the remote arid and semi-arid lowland parts of the country. Therefore, a reasonable solution would be to complement modern veterinary health care with traditional care (Teshale *et al*.,2004). It is estimated that about 90% of the livestock population are treated with traditional medicines. In some parts of the country, livestock diseases such as Anthrax (Quruba), Black leg (Aba gurba), Anaplasmosis (Afrera), Ascariasis (Aosfat), Abscess (Ebach), Leeches (Alqt), Trypanosomiais, Lymphangitis (Gub gub), Stomatitis (Yaf qusil), and Coccidosis have been treated using various natural plant product combinations (Fullas, 2010). The confident use of safe and effective traditional medicines may improve livestock health and productivity that will ultimately improve income and quality of life of poor households owning livestock. The most frequently utilized medicinal plants were from the

Fabaceae families in pastoral and solanaceae families in integrated livestock production system (Tilahun *et al*., 2019).

Among the ethnoveterinary medicinal plant families, Solanaceae and Fabaceae are the major ethnoveterinary medicinal plant families in the country. *Croton macrostchyus* (bisana) and *solanum incanum* (embuay) are the frequently utilized ethnoveterinary medicinal plant species in integrated and pastoral livestock production system of Ethiopia. Agroecological factors can determine the type and abundance of ethnoveterinary medicinal plants that grown in an area (Bekele, 2007). Moreover, the utilization frequency of those effective ethnoveterinary medicinal plants species might coincide with the presence of bioactive ingredients against livestock ailments.

2.5. Non-plant remedies used in animal disease treatment in Ethiopia

Non plant remedies are remedies other products than plants that used by the people in animal health management such as body parts or by-products of animal, minirals and hot iron (Dilbato *et al*., 2021). Traditional knowledge on the use of animals in traditional medicine (ethnomedicine or folk veterinary medicine) needs to be approached as an integrated and holistic structure by various branches of science in order to achieve a truly interdisciplinary understanding of the phenomenon of traditional medicine (Padmanabhan and Sujana, 2008). Animals, their parts and their products have constituted a particular sector of medicinal substances in several cultures and such practices continue to play an essential role in world health care (Jaroli *et al*.,2010).

Non-plant remedies are used as source of veterinary therapeutic agents for livestock ailments include hyena faece, wood ash, honeydew, oils, kerosene, local soap, salt, porcupine meat, dear faece, sharp hot iron or knife, milk, Porcupine meat and honey dew (aphids by product) are by far the main source of ethnoveterinary remedies (Alhaji and Babalobi, 2015; Dilbato *et al*., 2021). The knowledge of non-medicinal plant practices found that sharp hot iron or branding for treatment of blackleg and inflammation due to trauma, salt are used to treat nutritional deficiencies, appetite promotion, cow butter for wound healing, cattle fats for burns and vegetable oil for managing bloat and dermatomycosis (Alhaji and Babalobi, 2015). Livestock ailments majorly diarrhea, bloat, bad mouth smell and skin diseases are treated by the mineral called Bole soil (Tilahun and Mengistu, 2019).

2.6. Routes of administration and methods of remedy preparation

Ethnoveterinary medicines (EVMs) can be administered in many different ways, including drenching, bathing, fumigation, spraying, injecting and topical application, on surface wounds, making incisions into the skin, and burying the medicine under the skin or muscle. Another method of traditional treatment includes different surgical techniques and branding. These techniques assist in the healing processes of bone fractures and chronic ailments, particularly swellings on the skin (Oyda S, 2017). EVM is mainly administered to livestock orally as decoctions (liquid in that the plants have been steeped) vaccinations, suppositories, smoke, vapors, massage, intranasal or applied topically on the skin or as a bath in skin problems (Yirga *et al*., 2012). Common methods for administering EVM are drenching (oral), adding medicine to feed and water, fumigation, nasal, and eye, skin, anal and viginal application (Mequanent *et al*., 2017).

Traditiona remedies are prepared in various forms including liquids, ointments, powders and pills. Remedies are also prescribed in a non-formulated form and additives are usually incorporated and more than one remedies are used in a single dosage form (Oyda, 2017). Common remedy preparations are decoction, infusion, pounding, crushing, chopping and powdering (Dulo and Mekonnen, 2017).

2.7. Indigenous Knowledge Practices for livestock Diseases Diagnosis

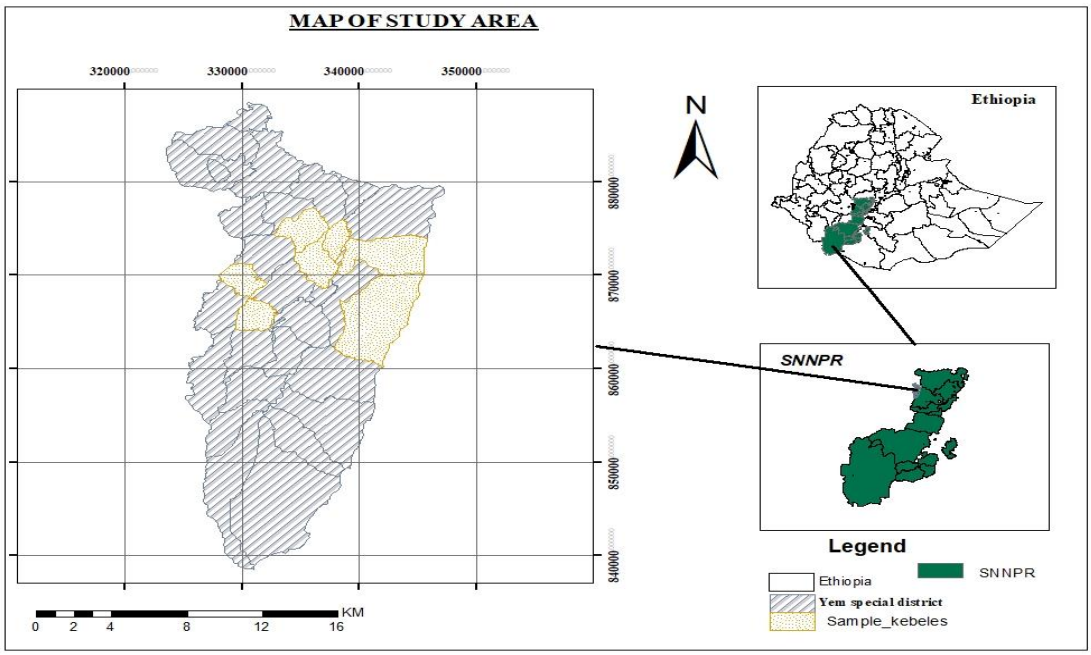
In developing countries, people depend largely on indigenous knowledge for the control and treatment of various diseases affecting animals. There are a lot of livestock diseases known to the indigenous people. However, as the number of livestock diseases are there, also they know different methods and mechanism to prevent and treat them based on the symptoms of their animals (Elmalik *et al*.,2012).

Identification of specific livestock ailment types was found to be made based on age-old cultural knowledge on symptoms and corresponding livestock illnesses held in the memories of indigenous people (Lulekal *et al*., 2014). The majority of livestock owners have a good idea of the diagnosis and treatment of livestock diseases, which are mainly diagnosed symptomatically. The diagnosis depends on close observation and the experience of animal attendants; older people are more skillful in this respect (Elmalik *et al*., 2012).

3. MATERIALS AND METHODS

3.1. Description of the study area

The study was conducted in Yem District found in South Western part of Ethiopia at a distance of 243 Km far from Addis Abeba and 555 Km from Hawassa. It occupies a surface area of 724.5 km2 (Bizayehu *et al*., 2012). The district consists of 34 rural and 4 urban kebeles. Its administrative center is Saja Twon (YSDANRD, 2019).



Source: Yem special district Administration, 2022

Figure 1. map of the study area

The Special district is situated in Dega (18.4%), Weyna-Dega (57.6%) and Qolla (24%) agro-ecological zones (Negash, 2005). The elevation of the study area ranges between 920-2939 meter above sea level and the annual mean temperature varies from12 to 30-degree centigrade above sea level (Yem Special District Finance & Economic Development Department (YSDFED). , 2016). The mean annual rainfall ranges 900-2200mm. The land feature of the district is rugged and undulating. The livestock population in the special district was 78228 heads of cattle, 17284 sheep, 43414 goats, 372 horses, 5357 donkeys, and 82069 poultry (CSA, 2019).

3.2. Reconnaissance survey

A reconnaissance survey of the study area was conducted with administrative centres of each kebeles to select study informants or traditional medicinal practitioners. local guides were chosen by recommendation of kebeles administration.

3.3. Study design

Community based cross sectional study was conducted from November 2021-December 2022 to assess and document the current status of the indigenous knowledge of community about medicinal plants. Relevant data was collected from the community by using semi-structured questionnaires, interview with the herbalists, traditional practitioner and field observations were conducted by using ethnobotanical data collection techniques manual (Martin, 1995). Specimen vouchers have given on the spot for each plant species and later identify using taxonomic keys in the relevant volumes of the flora of Ethiopia.

3.4. Sampling technique

The ethnoveterinary data were collected from seven kebeles of the study area: namely *Ediya*, *Meleka*, *Herto*, *Wengacho*, *Nuba*, *Kerwa* and *Layignaw kesheli*. These were selected using purposive sampling method with the help of elders and local authorities based on better availability of traditional healers and knowledgeable elders, the potentiality of medicinal plants and agro-ecology (midland and highland around Bori Mountain). For this study, a total of 67 informants of age 20 and 98 were included and interviewed, accordingly, *Ediya* 12, *Meleka* 7, *Herto* 8, *Wengacho* 13, *Nuba* 9, *Kerwa* 6, and *Layignaw kesheli* 12 informants were selected based on numbers of traditional herbalists. The selection of informants was performed according to (Martin, 1995) who stated that when recording indigenous knowledge controlled by ethnobotanical healers or by certain social groups, the choice of key informant is vital. The selections of the key informants were carried out with the collaboration of local governmental bodies and community elders based on their rich indigenous knowledge and long-term experience on medicinal plants for animal disease management. So, from total informants 10 key informants were selected purposively based on above criteria.

3.5. Data collection techniques

Before collecting the data, official permission was secured from culture and tourism office of the Yem special district and administrator of kebeles of the district. Ethnoveterinary investigations were carried out to collect data on medicinal plants and non plant remedies

used to treat livestock ailments. The data collection techniques were used semi-structured questionnaires, field observations, focus group discussion and guided field walk with herbalists; (Martin, 1995; Alexiades, 1996). Interviews and group discussions were held in '*yemigna*' local language of the study area.

3.6. Semi-structure questionnaire

Semi structures interviews were undertaken based on checklist of questions prepared in English and translated to '*yemigna'* by researcher (appedex 4). It addressed questions regarding on informants' background. The individual semi-structured questionnaire was asked about livestock ailment treatment, diagnosis, local name of medicinal plants used, non plant remedies, growth form, plant part used, route of administration, condition used, dosage used, ingredients added, methods of preparation and application of medicinal plants were collected (Martin, 1995; Cotton, 1996). In order to evaluate the reliability of information recorded during the interview, informants were contacted at least 2 times for the same ideas, and the validity of the information was confirmed and recorded.

Figure 2. Interviews underway with informants

3.7. Field observation

Field observation was conducted to record the habit and habitat of each medicinal plant with the assistance of informants who participated in the interviews.

Figure 3. Field observation in the study area

3.8. Focus group discussion

Focus Group discussions were conducted to assess indigenous knowledge of medicinal plant and non plant remedies used to treat livestock ailments in the community. Two focus group discussions 6 participants or informants in each group were selected (Martin, 1995) purposively based on their rich indigenous knowledge and long-term experience with medicinal plants for animal disease management. From the total informants selected for ethnoveterinary data collection to gain further information on medicinal plants at the community level. The information collected by group discussions was important to triangulate information collected through semi-structured interviews.

3.9. Guided field walk

The semi-structured interviews were followed by guided field walks with herbalist in the home garden and natural habitat, which allowed for more discussion with individual informants and the practical identification and collection of medicinal plants in their home garden and natural habitat. The guided field walk was a combination of observation and interview methods. In this method, the researcher has guided some interview to the most knowledgeable once who was suggested by respective kebele elders and administrators through areas where the plants of interest was expected to be found. Specimen collection

and recording were done at spot while the interview is undergoing. It was give time to observe and discuss parts of plant harvesting or patterns of plant distribution.

Figure 4. Guided field walk in kesheli kebele

3.10. Plant specimen collection and identification

The reported medicinal plants were collected from their home garden and natural habitat during the field walks and habits, habitat of the plants, local name, date of collection were record. Preliminary identification was done in the field. In addition, specimen identification and confirmation were done by taxonomic key; various volumes of the flora of Ethiopia (Edwards *et al*., 1995; Edwards *et al*., 1997) and by comparison with authenticated herbarium specimen and vouchers were deposited at Wolkite university college of Agriculture and Natural Resources Department of Animal Science for the further investgation.

3.11. Data analysis

The collected ethnoveterinary data were analysed by using Statistical Package for Social Sciences Software (SPSS) versions 20. The collected data were entered into excel spreadsheet and summarized using descriptive statistical methods such as frequency, percentages and tables. preference ranking, Informant consensus, direct matrix ranking, fidelity level, use value, relative frequency of citation, relative importance and Jaccard's Coefficient of Similarity (JCS) were carried out to analyze data.

3.11.1. Preferences ranking

Preferences ranking of ethnoveterinary plant species used to treat the commonly reported livestock ailments in the study area were ranked by adding the values/scores of preferences given by respective informants to identify the most-preferred medicinal plant species to treat the most frequently reported disease type in the area following the relevant standard methods (Martin, 1995).

3.11.2. Direct Matrix Ranking

The exercise of Direct Matrix Ranking (DMR) of multipurpose medicinal plants (MPs) used for livestock ailments was performed separately with purposively selected 10 key informants in each kebeles. Direct Matrix Ranking (DMR) was conducted to find out the local people′s preference over the use of multipurpose medicinal plants which are threatened in the course of their daily uses by the people and suggest protection and conservation of those high-ranked ones following (Martin, 1995).

3..3. Informant Consensus Factor

Informant Consensus Factor (ICF) values (Trotter and Logan, 1986; Tariq A *et al*.,2014.), were calculated to determine the most important livestock ailment categories in the district and identify potentially effective medicinal plant species in respective disease categories. Accordingly, reported traditional remedies and corresponding livestock ailments occurring in the district were categorized and the Informant Consensus Factor values were obtained by;

$$\mathrm{ICF} = \frac{\mathrm{Nur} - \mathbf{Nt}}{\mathbf{Nur} - \mathbf{1}}$$

Where, ICF= Informant Consensus Factor

Nur =the number of use reports from informants for a particular plant-use category;

Nt = number of taxa or species that are used for that plant use category for all informants.

3.11.4. Fidelity level

The fidelity level analytical approach was used in evaluating the plants and non-plants remedies in the study area. The fidelity level is mathematically expressed as

$$\mathrm{FL} = \frac{\mathrm{IP}}{\mathrm{IU}} \mathrm{X}\ 100$$

Where: FL is the fidelity level of each plant or non-plant material, Ip is the number of informants who mentioned that a plant or non-plant material has specific ethnoveterinary uses against a particular disease condition, and Iu is the total number of informants who independently suggested that the same plant or non-plant material has any therapeutic uses (Alhaji and Babalobi, 2015).

3.11.5. Use value index

Informants of each kebele free listed the number of added values of each of the MPs during the individual semi-structured questionnaire. The added values of MPs in each kebele were organized and grouped into use categories. Then, the local importance of each medicinal plant species cited in the study area was calculated using the formula proposed by Phillip and Gentry (1993a) that was modified by (Rossato,1999). The UV index shows the relative importance of each species locally known by the informants. The plants with the highest UV index indicate species that are most important to local people. It has also been associated with issues of conservation, based on the idea that the most important species suffer the greatest harvesting pressure (Albuquerqe, 2006).

The formula of use value is given as; $$\mathrm{UV} = \frac{\Sigma \mathrm{U}}{\mathbf{n}}$$

Where:

UV is use value, ƩU = the sum of number of uses mentioned by each informant per species, and n = the total number of informants that mentioned any use for that species.

3.11.6. Relative frequency of citation(RFC)

Relative frequency of citation was obtained by dividing frequency citation (FC) by the total numuber of informants in the survey (N). The value of RFC for species of medicinal plants is based on the citing percentage of informants for every species. RFC was calculated by using the following formula (Tardío and Pardo, 2008) with (0 < RFC < 1).

$$\mathrm{RFC} = \frac{\mathrm{FC}}{\mathrm{N}}$$

3.11.7. Relative importance

RI was calculated using the following formula (Bennett and Prance, 2000).

RI= (PP+AC)×100/2

Where;

PP stands for pharmacological properties, which indicate relative use reports, were calculated by dividing the number of use reports (UR) attributed to a species by the maximum number of use reports attributed to the most important species (the species with the highest number of use reports), and AC stands for ailments treated, which indicates the relative body systems treated. AC was calculated by dividing the number of body systems treated by a given species, by the maximum number of ailment categories treated by the species that are used most widely

3.11.8. Jaccard's Coefficient of Similarity (JCS)

The similarity of medicinal plant species used by the Yem special district was compared with ethnoveterinary investigations in other ethnic groups in Ethiopia using JCS following (Kent and Cocker, 1992). $\mathrm{JCS} = \frac{c}{a+b+c}$ where a = no. of species in site A only, b = no. of species in Site B only, and c = no. of species in both sites.

4. RESULTS

4.1. Demographic characteristics of the informants

The current result of the study revealed that the majority of the respondents were males 59(88%) and 8(12%) were females. From these results, there was more chance of males than females being interviewed to obtain relevant information. Age-wise, the majority of informants were falling between 20-98 years old. Besides, the educational status of informants showed that 52% of the respondents were illiterates while the remaining 31% of them were between grades 1-6th, according to this result educational levels of respondents were very low. In this study, the highest proportion of the respondents were married (94%) and the lowest singles (4.5%) (Table 1).

Table 1: backgruound of informants

Variables		Ferequency	percentage
Male		59	88
Female		8	12
Age	Young(20-29)	6	9
	Elder(30-98)	61	91
Educational level	illiterate	35	52
	1-6	21	31
	7-8	7	11
	9-12	4	6
Marital status	married	63	94
	single	3	4.5
	widowed	1	1.5

4.2. Common livestock ailments in the study area

In this study, a total of 49 veterinary ailments were identified in the study area for which informants reported using one or more plant species to treat specific livestock ailments

which were categorized into gastrointestinal disease and endo- parasites, dermatological cases and ectoparasites, musculoskeletal diseases, diseases of the respiratory system, disease of the reproductive system, sensorial diseases (Bluetongue(BT), Strangle, conjunctivitis, Thelizia, FMD, Orf, Actinobacillosis), poisoning (Tetanus, Snake bites). moreover, they also use for the purpose of increasing milk quantity and quality, fatting, treating evil eyes, poor appetites, sudden pain, milk fever, poor mothring, and foreign body). The three top cited livestock ailments in the district were; GI diseases 47 (70%), Blackleg 37 (56.7%), and Mastitis 24 (35.8%) (Appendix 1)

4.3. Medicinal plants species and non-plants remedies used to treat livestock diseases

4.3.1. Medicinal plants species used to treat livestock diseases

The current study documented 151 medicinal plant species that were distributed across 68 families used to manage several livestock ailments. The higher numbers of medicinal plants belonged to the families Lamiaceae contributed 14 medicinal plants species followed by Asteraceae contributed 12 medicinal plants species, Euphorbiaceae contributed 8 medicinal plants species, Solanaceae contributed 7 medicinal plants species, Fabaceae and cucurbitaceae contributed 6 medicinal plants species each, Malvaceae contributed 5 medicinal plants species, Celastraceae, Rosaceae and Poaceae contributed 4 medicinal plants species, Rubiaceae, Brassicaceae, Acanthaceae, Oleaceae, Rutaceae, Myrtaceae, Rununculaceae and Myrsinaceae contributed 3 medicinal plants each and Hypericaceae, Boraginaceae, Apiaceae, Podocarpaceae, Rhamnaceae, Ericaceae and Araceae contributed two medicinal plants each. The rest of the families contributed one medicinal plant in aspecies(Appendix 3).

4.3.2. Nonplants remedies used to treat livestock diseases

The current study documented 25 non-plant remedies that were used in Yem Special District to manage 23 livestock ailments (Appendix 4). From these non-plant remedies, 14 are animal species, and 11 are non-animal remedies. 25 non-plant remedies were used as sources of veterinary therapeutic agents, including hyena faeces, wood ash, honeydew, oils, kerosene, soap, mud, porcupine meat, a sharp hot iron or knife, butter, and the end product of Ensete ventricosum fluid, traditionally called "Hirka".

4.4. Part used, condition of remedy preparation and aditives

In ethnoveterinary remedy preparations, leaves (66.2%) were the most frequently sought plant parts, followed by roots (11.90%), barks (6.6%), seeds (6%), and whole plants (2%) (Figure 5).

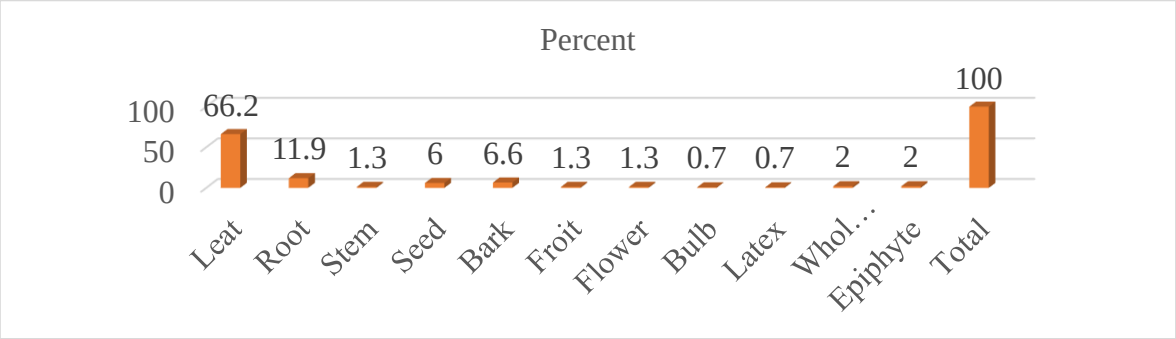


Figure 5. Plant part used

Most of the plant remedies were prepared from fresh plant materials (73.5%). In addition, 12.6% of the remedies were prepared from dry plant materials, and the remaining 13.9% were prepared from either dry or fresh plant materials (Figure 6). Different additives such as water, butter, salt, and milk were frequently used in the preparation of plant remedies so as to improve the flavor, decrease the toxic side effects of remedies, prepare suitable formulations, and for ease of remedy administrations.

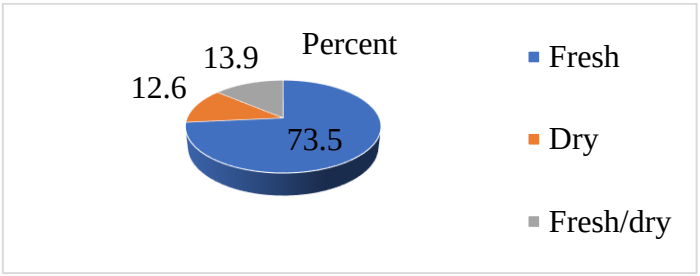
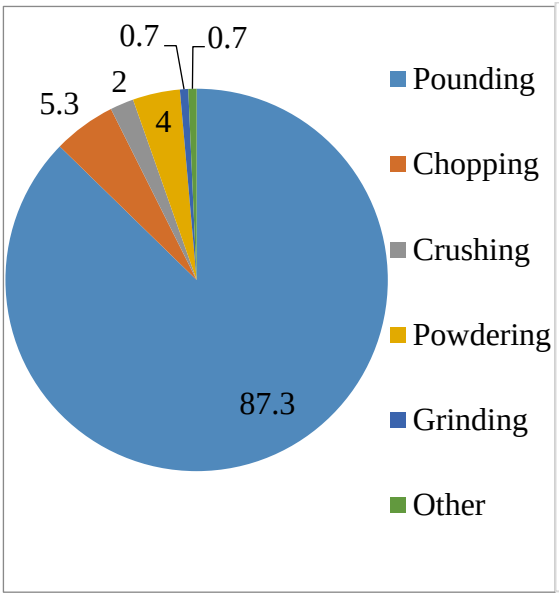


Figure 6. Plant condition used

4.5. Methods of remedy preparation and Routes of administration

In the study District, the most commonly used methods of medicinal plants remedy preparation were pounding (87.3%), followed by chopping (5.3%) and powdering (4%) (Fig. 7) and the most commonly used methods of non plants remedy preparation were cooking (32.3%) followed by direct application (22.9%), homogenization(22.6%), putting on fire(9.6%) and boiling (6.5%). Medicinal plants were given via different routes of administration, such as oral, dermal, ocular, ear, external, and nasal. The principal route of remedy administration was oral (67.5%) followed by external (9.3%), feeding (7.9%) and

nasal (7.3%). Other routes such as anal and ocular were also used when considered appropriate (Figure 8).



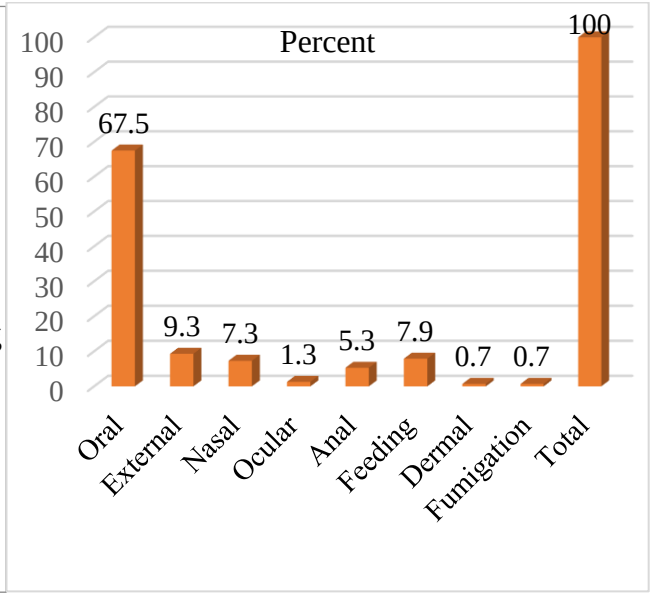


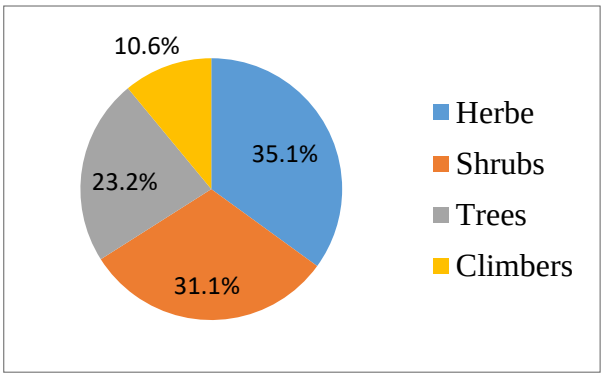
Figure 7. Methods of preparation

Figure 8. Routes of remedy administration

4.6. Habits and habitats of medicinal plants

The growth habits of medicinal plant species showed that herbs constitute the highest number of species (53 species, 35.1%) followed by shrubs (47 species, 31.1%); tree (35 species, 23.2%); and climbers (16 species, 10.6%) (Figure 9).

The majority 126(82.8%) of the claimed medicinal plants in the study district were found to be uncultivated mainly harvested from edges of forests and bushlands, roadsides, riverbanks, and grasslands. A few of the uncultivated ones were weeds growing in cultivated fields and home gardens. Some 25(17.2%) of the reported medicinal plants were cultivated in home gardens but primarily for other purposes (Figure 10).



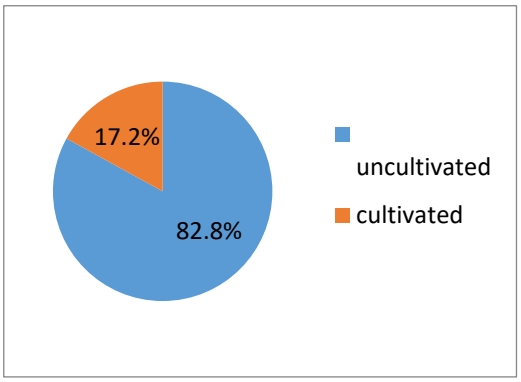


Figure 9. Habits of medicinal plants

Figure 10. Habitats of medicinalplants

4.7. Indigenous knowledge on treatment of livestock ailments

4.7.1. Transfer of knowledge in the study area

According to this study, the highest number of transfer of knowledge of traditional medicine is to trusted eldest son that accounted for 25(37%) followed by trusted sons 22(33%), and others are trusted doughter 8(12), all members of the family 9(13%) and kept secret 3(5%) by word of mouth.

4.7.2. Dosage of EVM in the study area

The local herbal practitioners in the study area indicated that they use some measurement objects to regulate dosage of livestock phytoremedies (Table 2). In the study area, the highest cited local measurements of remedies were meka/‟honkola‟ 133 (59%) followed by handful 31 (14%), estimation 29 (13%), kubaya 16(7%), coffee cup 13(6% and drop 2(1%). The frequency application of EVM preparations varied from 1 to 5 days and rarely until the case improves for those remedies thought to be safe for the animal. It was observed that the dose of plant remedies differed among traditional healers (even in treating the same health problems) in study District.

4.7.3. Diagnosis of livestock ailments in the study area

About 26 signs and symptoms of livestock ailments were listed during interviews (Appendix 2). In the study area, the highest cited sign and symptoms were failure to eat 51(10%) followed by cough 44 (9%) and shivering 39(8%).

4.8. Preference ranking

Preference ranking exercise with 10 purposively selected key informants for medicinal plants that were reported to be used against GI parasite, the most frequently reported livestock disease under the gastrointestinal disease category, showed that *Olinia rochetiana* A. Juss. and *Inula confertiflora* A.Rich. A. Rich. were the most preferred species to treat the reported disease (Table 2).

Table 2: preference ranking (T =total, Ra=rank)

Medicinal plants	Respondants										T	R
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10		
Olinia rochetiana A.	10	7	7	10	10	10	8	9	7	10	88	1
Premna schimperi Engl.	9	9	8	8	6	6	9	8	8	8	79	3
Lobelia giberroa	1	8	5	7	9	8	7	6	9	6	66	5
Inula confertiflora	8	10	10	6	5	7	10	10	10	9	85	2
Clematis longicauda.	7	6	6	9	8	9	3	7	6	7	68	4
Carissa spinarum L.	6	4	3	3	4	5	6	4	3	5	43	7
Myrsine africana L.	2	1	9	4	3	3	4	3	4	3	36	8
Dodonaea angustifolia.	5	5	4	5	7	4	5	5	5	4	49	6
Euphorbia abyssinica	4	3	1	1	1	1	1	2	1	2	17	10
Hypericum quartinianum	3	2	2	2	2	2	2	1	2	1	19	9

NB-Scores in the table indicate ranks given to medicinal plants based on their efficacy. Highest number (10) for the medicinal plant which informants thought was most effective in treating GI parasite and the lowest number (1) for the least-effective plant.

4.9. Direct Matrix Ranking

Key informants evaluated the functionality of multifunctional medicinal plants to the local people and indicated their scores for each medicinal plant (on a scale of 1 to 5). Eight medicinal plants were selected to be evaluated in seven usage categories. The output of the direct matrix analysis found Ensete ventricosum to be the preferred medicinal plant used for various purposes by the local people, followed by Syzygium guineese (Willd.) DC. subsp. guineense and Juniperus procera Hochst. ex Endl. (Table 3).

Table 3: Direct matrix ranking

Name of medicinal plants	Used categories						To	R
	A	B	C	D	E	F		
Ensete venteicosum (Welw.)	5	3	2	4	3	4	21	1
Hagenia abyssinica (Bruce) J. F. Gmel.	0	4	4	0	4	1	13	6
Erythrina brucei Schweinf.	0	2	4	4	4	2	16	4
Cordia africana Lam.	0	4	4	2	4	2	16	4
Syzygium guineese (Willd.)DC.subsp.*guineense*	3	3	5	1	4	2	18	2
Juniperus procera Hochst. ex Endl.	2	3	4	2	5	1	17	3
Prunus africana (Hook. f.) Kalkm	0	3	5	0	2	1	11	7
Maesa lanceolata Forssk.	0	0	5	1	1	1	8	8
Croton macrostachyus Del.	0	1	4	0	1	1	7	9
Podocarpus falcatus (Thaub.) R.B. ex Mirb.	0	4	5	0	4	2	15	5
Total	10	27	42	14	32	17		
Rank	6	3	1	5	2	4		

NB give 5=best, 4 very good, 3 good, 2 less used 1 least used and 0 not used. A = food, B = Furniture, farming & house hold tools , C = fuel wood, D = fodder, E = construction, F =Cultural value, To=total, R=rank

4.10. Informant consensus factor

The diseases in the study area were grouped into 8 disease categories based on the usage reports by the informants and the resemblance to the disease category. A total of 49 diseases treated by 151 plant species were documented in the study area. Among the disease categories, the categories with the highest informant consensus factor (ICF) values were gastrointestinal and endo parasites (0.71), followed by Musculoskeletal (0.64) and Dermatological and ect-parasites (0.62) (Table 4). The medicinal plants that had higher ICF values were presumed to be more common and effective when used to treat a certain disease. However, the Sensorial diseases category had a lower ICF value (0.39). Lower ICF values indicated that the informants disagreed on the mps to be used as a treatment within the disease category. In addition, the highest plant use citation (31.60%) was recorded for GIT and endo parasites diseases categories.

Table 4: Informant consensus factor

Diseases category	Nt	Nur	ICF
GIT and endo parasites	89	304	0.71
Musculoskeletal	89	243	0.64
Dermatological and ecto-parasites	43	110	0.62
Reproductive	48	96	0.51
Respiratory	30	64	0.54
Sensorial	20	32	0.39
Poisoning	12	20	0.42
Other diseases	53	93	0.43

4.11. Fidelity level(FL%)

Calpurnia aurea (Ait.) Benth. showed highest fidelity level value (95%) in dermatological and ecto-parasites followed by *Tragia plukenetii Radcl.-Sm*. (91.7%) in the reproductive disease category and also *Cissus populnea* Guill. & Perr. (87.5) showed relatively high healing potential record under the musculoskeletal disease category (Table 5).

Table 5: Fidelity level of highest cited

Medicinal plant species	Diseases category	IP	IU	FL(%)
Crinum abyssinicum Hochst.	Musculoskeletal	10	15	66.7
Olinia rochetiana A. Juss.	GIT and endo parasites	33	53	62
Ensete venteicosum (Welw.)	Reproductive	13	24	54
Tragia plukenetii Radcl.-Sm.	Reproductive	11	12	91.7
Calpurnia aurea (Ait.) Benth.	Dermatological and ecto-parasites	19	20	95
Maesa lanceolata Forssk.	Musculoskeletal	10	15	67
Coriandrum sativum L.	GIT and endo parasites	5	6	83
Eucalyptus globulus Labill	Respiratory	7	11	77
Cissus populnea Guill. & Perr.	Musculoskeletal	7	8	87.5
Linum usitatissimum L.	Dermatological and ecto-parasites	5	7	71
Hypericum revolutum Vahl	Other disease categories	12	15	80

4.12. Use values

Use value index (UV) were calculated based on 8 main use categories for the whole medicinal taxa out of which only 10 species with highest UV are presented in (Table 6). Accordingly, three species with the top use values (UV) in study area was; *Cordia africana* Lam. (6) followed by *Juniperus procera* Hochst. ex Endl. (5.1) and *Ensete venteicosum* (Welw.) (4.6).

Table 6: Use values of medicinal plants

Plant species	Local name	∑U	N	UV
Ensete venteicosum (Welw.)	*Hewa*	110	24	4.6
Erythrina brucei Schweinf.	*Kocho*	48	11	4.4
Hagenia abyssinica (Bruce) J. F. Gmel.	*Hofa*	57	18	3.2
Juniperus procera Hochst. ex Endl.	*Arkewa*	96	19	5.1
Maesa lanceolata Forssk.	*Tegewa*	46	15	3.1
Croton macrostachyus Del.	*Washkala*	81	29	2.8
Podocarpus falcatus (Thaub.) R.B. ex Mirb.	*Gedewa*	15	7	2.1
Syzygium guineese (Willd.) DC. subsp. *guineense*	*Shawu*	17	5	3.4
Cordia africana Lam.	*Waza*	18	3	6
Ekebergia capensis Sparrm.	*Horoma*	15	6	2.5

4.13. Relative frequencies citation

Relative frequencies of citation (RFC) were calculated based on each medicinal plan species out of which only 10 species with highest RFC are presented in (Tables 7). Based on the analysis of RFC, three MPs with the highest RFC values in study area was; *Olinia rochetiana* A. Juss. (0.79) followed by *Inula confertiflora* A.Rich. A. Rich. (0.55) and *Premna schimperi* Engl. (0.49).

Table 7: Relative frequencies of citation

Medicinal plant species	Local name	FC	N	RFC
Olinia rochetiana A. Juss.	*Fegegu*	53	67	0.79
Inula confertiflora A.Rich. A. Rich.	*Hoyazu*	37	67	0.55
Premna schimperi Engl.	*Wagnara*	33	67	0.49
Clematis longicauda Steud. ex A. Rich.	*Sagu*	28	67	0.42
Lobelia giberroa Hemsl.	*humuri*	26	67	0.39
Ensete venteicosum (Welw.)	*Hewa*	24	67	0.36
Croton macrostachyus Del.	*Washkala*	29	67	0.43
Calpurnia aurea (Ait.) Benth.	*Zimsa*	20	67	0.30
Embelia schimpei Vatke	*Fofa*	31	67	0.46
Nicotiana tabacum L.	*Tumako*	26	67	0.39

4.14. Relative Importance

Relative Importance (RI) were calculated based on 8 main use categories for the whole medicinal taxa out of which only 10species with highest RI are presented in (Table 8). Based on the analysis of RI, five MPs with the top RI values in study area was *Olinia rochetiana* A. Juss. (100%) followed by *Inula confertiflora* A.Rich. A. Rich.(78%), *Embelia schimpei Vatke*(65%), *Croton macrostachyus* Del.(63%) and *Lobelia giberroa* Hemsl. (60%).

Table 8: Relative importance of EVMPs

Plant species	Local name	PP	AC	RI(%)
Olinia rochetiana A. Juss.	*Fegegu*	1	1	100
Inula confertiflora A.Rich. A. Rich.	*Hoyazu*	0.70	0.86	78
Embelia schimpei Vatke	*Fofa*	0.59	0.71	65
Croton macrostachyus Del.	*Washkala*	0.55	0.71	63
Lobelia giberroa Hemsl.	*Humuri*	0.49	0.71	60
Nicotiana tabacum L.	*Tumako*	0.49	0.57	58
Premna schimperi Engl.	*Wagnara*	0.62	0.43	52.5
Phytolacca dodecandra L.'Hérit	*Andode*	0.25	0.71	48
Clematis longicauda Steud. ex A. Rich.	*Sagu*	0.53	0.43	48
Acmella caulirhiza Del	*Shishmo*	0.21	0.71	46

4.15. Jaccard`s Coefficient of Similarity (JCS)

Jaccard`s Coefficient of Similarity (JCS) revealed that the study area has the highest similarity in medicinal plant diversity, 48 common species (23%) with the study conducted around Dawuro Zone, followed by 33 common species (19%) similarity with Ambo District. The least similarity 6 (2%) was linked with the study conducted on Somali pastoral community (Table 9).

Table 9: Jaccard`s Coefficient of Similarity

Sample area	Nº of SPP.	a	b	c	JCS %	sources
Dawuro zone	103	103	55	48	23	Dilbati *et al.*, 2021
Ankober District	51	125	25	26	14.8	Lulkal *et al*., 2014
Enarj Enawga district	36	138	23	13	7.5	Birhan *et al*., 2018
Dale sadi District	47	122	18	29	17.2	Bayecha *et al*.,2018
Kersa District	33	133	15	18	10.8	Gemechu, 2021
Ambo District	55	118	22	33	19	Berhanu *et al*., 2020
Bahir Dar District	69	119	37	32	17	Tadesse *et al*., 2018
Chencha & Boreda District	27	133	9	18	11.3	Seifu & Bala, 2018
Hareri Regional State	46	127	22	24	13.9	Usmane *et al*.,2016
Somali pastoral community	136	145	130	6	2	Serda, 2017

5. DISCUSSIONS

5.1. Demographic characteristics of the informants

In this study, a total 67 traditional healers of which 88% (59) were male and 12% (8) were female respondents were involved. The current study was indicated that the majorty of informants were elder age groups (91%). As observed, much of knowledge of traditional medicine obtained from elder peoples and informants reported that young people have no interests to use traditional medicine and to acquire knowledge from the elder peoples. Young peoples were unable to mention much number of medicinal plants compared with the elders. Similarly, other studies reported in Ethiopia (Birhan *et al*., 2018). The decline in the use of medicinal plants by younger generation may gradually lead to disappearance of the indigenous knowledge associated with the plant species and non plants. Regarding the educational status, the majority of the informants were not educated 52% but only 42% have education below grade 9. This shows that even though most of the traditional healers are not educated, they know more about medicinal plants than educated ones as indigenous knowledge on medicinal plants transferred orally and secretly from generation to generation. The present finding is in agreement with report of (Gemechu, 2021).

5.2. Common livestock ailments in the study area

Indigenous people in the study district are dependent on livestock for supporting their livelihood. Animal diseases are a major constraint to income generation and asset acquisition by the poor. Identification of specific livestock ailment in the area was found to be made based on symptoms and corresponding livestock illnesses held in the memories of local people.

In this study, a total of 49 veterinary ailments were identified in the study area for which informants reported to use one or more plant species to treat specific livestock ailments which were categorized into gastrointestinal disease and endo-parasites, dermatology and ecto-parasites, musculo-skeletal diseases, diseases of respiratory system, diseases of reproductive system, sensorial diseases (Blue toung,strangle, keratoconjanctivies, thelizia, FMD, orf, actino basillosis), poisoning (tetanus, snake bites) and other ailments (increasing milk quantity and quality, fatting, evil eye, poor appetites, sudden pain, milk fever, hate the calf, foreign body) (Lulekal *et al*.,2014). The three top cited livestock ailments in district were; Gastrointestinal diseases 47 (70%), blackleg 38 (56.7%) and mastitis 24 (35.8%). Similarly, various studies

reported in Ethiopia gastrointestinal diseases was top cited (Lulekal *et al*., 2014; Berhanu *et al*., 2020).

5.3. Medicinal plants and non-plants remedies used to treat livestock diseases

5.3.1. Ethnoveterinary medicinal plant species

In the current study, a total of (151) medicinal plant species belongs to 68 families were identified and documented with deatiles in there local names, habitatis, habitis, preparation mothed and mode of application. Identified ethnoveterinary medicinal flora of Yem showed that the District is rich in its ethnoveterinary medicinal plant diversity and indigenous knowledge associated with each traditionally used species.

From the 68 plant families, Lamiaceae contributed 14 medicinal plants species, Asteraceae 12 medicinal plants species, Euphorbiaceae 8 medicinal plants species and Solanaceae 6 medicinal plants species. Similarly, various studies in Ethiopia have reported Lamiaceae as the most dominant medicinal plant family (Bassa,2017; Berhanu *et al*.,2020). In contrast, other studies found that Asteraceae (Lulekal *et al*.,2014) was dominant over others. The fact that Lamiaceae contributed a higher number of plants to the medicinal plants flora of the study district may be related to their respective sizes in terms of the number of species comprises in the flora of Ethiopia. Lamiaceae is among the largest families in the Flora of Ethiopia and Eritrea containing 184 species (Rydind, 2006). The relative richness of the this family in medicinal plants may also be related to their richness in some active principles.

5.3.2. Non-plants remedies used to treat livestock diseases

Different non plant remedies were identified and documented as the sources of traditional animal health care practices in the study district. The current study documented 25 non-plants remedies that were used to manage 23 livestock ailments. Some of the identified traditional medicinal animals include porcupine, hyena, bush pig, squirrel, monkey, apis, bear, cattle and aardvark. In no case was the whole animals used, but rather body parts or by-products such as, meat, blood, bones, feaces, butter and honey were used by the community in ethnoveterinary practices. Similarly, hyena faece, honeydew, porcupine meat, dear faece, milk of animals were used to treat different diseases (Dilbato *et al*., 2021). Some of non-animals remedies were used as source of veterinary therapeutic agents include wood ash, oils, kerosene, soap, mud, sharp hot iron or knife, butter, and the end product of Ensete. Nearly similar study conducted in Etiopia (Alhaji and Babalobi, 2015; Dilbato *et al*., 2021).

5.4. Part used and condition of remedy preparation

Accoriding to the present study leaf was the most commonly used plant part in the preparation of remedies, making a contribution to the conservation of plants rather than harvesting the root part and/or whole plant. Similarly, various studies in Ethiopia (Dilbato *et al*., 2021; Jima and Megersa, 2018) have reported leaves as the most dominant medicinal plant part used. In contrast, the most frequently used plant parts were roots. However, harvesting roots for remedy preparation is always accompanied with complete removal of the respective medicinal plant from the natural environment has been observed in many cases posing challenges by affecting eventual survival of the individual and ultimately the species (Lulekal *et al*., 2014). In the study area, there was no such fear due to the major part of plant used by healer to treat remedies were leaves and their harvesting could be regarded as sustainable since some leaves are left on the parent of plant to carry on its life activities.

In study area, remedies are mostly prepared from newly harvested plant parts, which is in agreement with studies conducted in other parts of the country (Bekele *et al*., 2018; Birhanu and Abera, 2015). The traditional healers in the study area harvested fresh plant part could indicate the availability of copious plant materials in the vicinity to be picked at any time and traditional belief of attaining high efficacy from fresh remedies.

5.5. Methods of remedy preparation and Routes of administration

In the study area, various methods of remedy preparations were reported to be used in the districts based on the type and severity of livestock diseases. Pounding(87.3%) the part in wooden made mortar and pestle, and homogenizing it with water is found to be the major method of preparation. This is in agreement with studies conducted in other parts of country (Lulekal *et al*., 2014; Romha *et al*., 2015). Traditional plant remedies are reported to be administered through oral, topical, nasal, fumes/smoking or auricular routes of the diseased animal. Oral application is reported to be the best-represented route of administration in the study area. Similarly, various studies in Ethiopia (Berhanu *et al*., 2020; Tadesse *et al*., 2018; Romha *et al*., 2015) have reported Oral application as the best routes of administrtion. The fact that most remedies were administered orally could be attributed to the common occurrence of gastrointestinal tract ailments in the study district.

5.6. Habits and habitats of medicinal plants

The growth forms of medicinal plant species showed that herbs(35.1%) constitute the highest number of medicinal plants species used for treating livestock ailments in the study area. The common use of herbaceous plants in the study district in the preparation of remedies could be

attributed to the better abundance of the same as compared to other life forms as was also observed by the investigators of the study during their visits to the study area. Similarly, various studies in Ethiopia (Gebrezgabiher, 2013, Berhanu *et al*., 2020) have reported herbs constitute highest numbers of medicinal plant species used for treating livestick ailments. Majority of the claimed medicinal plants in the study district were found to be uncultivated ones. The fact that the majority of medicinal plants were harvested from the wild indicates a serious threat to the same amid ongoing deforestation and habitat destruction that are taking place in the country, which is in agreement with reports of other studies conducted elsewhere in the country (Dilbato *et al*., 2021; Birhanu and Abera,2015).

5.7. Indigenous knowledge on treatment of livestock ailments

5.7.1. Transfer of knowledge in the study area

Almost all the ethnoveterinary practitioners in the study area acquired their knowledge (regarding the method of diagnosis, type of medicinal plants used for specific ailment and remedy preparations) through oral tales from their father or grandfather with high level of secrecy. The practitioners didn't disclose information concerning medicinal plants even to all family members. Because they afraid of losing the pharmacological effectiveness of the medicinal plant remedy. This respected from their belief ''plants that are kept secret will have a pronounced efficacy''. In addition to secrecy of knowledge, younger generation is not interest in living with traditional way of life due to urbanization and modernization. The way of indigenous knowledge transfer on types of medicinal plants, non plant remedies, traditional concepts of illness and method of diagnosis among the ethnoveterinary practitioners of in the study area was by word of mouth to a family member (to an elder son or trusted son or trusted doughter). According to this study, the highest number of transfer of knowledge of traditional medicine is to trusted eldest son oral way(37%), which is in agreement with reports of other studies conducted elsewhere in Ethiopia (Bekele *et al*., 2018; Jima and Megersa, 2018).

5.7.2. Dosage of EVM in the study area

The local herbal practitioners in the study area indicated that they use some measurement objects to regulate dosage of livestock phytoremedies based on severity and duration of ailments, body size/condition/ and age of the livestock. Most of the time, doses in the study area were determined by using different house hold utensils like water glasses, coffee cups, plastic containers, handful and estimation. The frequency application of EVM preparations varied from 1 to 5 days and rarely until the case improves for those remedies thought to be safe for the animal. It was observed that the dose of plant remedies differed among traditional

healers (even in treating the same health problems) in study District. On the other hand, lack of precision and standardization has been reported as a drawback of remedy preparation from medicinal plants. Similar findings were reported in Ethiopia and elsewhere in the world (Lulekal *et al*., 2014; Romha *et al*., 2015).

5.7.3. Diagnose of livestock ailments in the study area

Traditional medicine practitioners diagnose livestock ailments based on observation and/or information obtained by interviewing the livestock owner about major symptoms shown by the diseased animal. Ethnoveterinary herbal remedies are commonly prescribed only after the diseased animal is visually examined by a traditional healer for any symptom on its mouth and foot parts, throat, eyes, nose, ear and/or skin as well as through presence and status of sores/wounds or any form of infection. Participants reported signs and symptoms of cattle diseases/conditions, which they use for diagnosis. In this study 26 different clinical signs and symptoms of disease were reported by participants. The most common ones were fail to eat, cough, poor appetite, shivering, and blood in the mouth and nose. Similar findings were reported in Ethiopia and elsewhere in the world (Elmalik *et al*.,2012; Lulekal *et al*., 2014).

5.8. Preference ranking

The preference ranking exercise indicated that *Olinia rochetiana* A. Juss. and *Inula confertiflora* A.Rich. are the most-preferred ethnoveterinary medicinal plants used to treat gastrointestinal and endo parasites disease category, the most commonly reported disease in the study area (Martin,1995). This may be attributed to the presence of bioactive compounds against causative agents of gastrointestinal and endo parasites in these species. Hence, both species should be further subjected to antimicrobial activities investigation to prove their medicinal preferances. It is therefore worth engaging in the conservation of these plants which in turn calls for conserving their habitats. This action would save many more plants as well as medicinal plants for humans. Validating bioactivity of ethnoveterinary medicinal plants that are most agreed for their curative role by the community is highly recommended to come up with further scientific evidence which can be used to support the livestock healthcare system in the country and globally in the years ahead(Lulekal *et al*., 2014; Birhan *et al*., 2018).

5.9. Direct matrix ranking

The output of the direct matrix analysis found *Ensete ventricosum* (Welw) to be the preferred medicinal plant used for various purposes by the local people, followed by *Syzygium guineese* (Willd.) DC. subsp. *guineense* and *Juniperus procera* Hochst. ex Endl. The multipurpose MPs serve enormous economic and sociocultural values and reinforce the major ecosystem services.

However, they are threatened by different livelihood activities such as construction goods, extraction of fuel wood and charcoal, food, furniture, farming and house hold tools and forage/fodder/ which violate their sustainable use. Therefore, it is important to display the impacts of such utility services, educate local communities on sustainable harvesting practices and cultivation of such species are some of the conservation measures suggested. Other studies also reported similar threats of multipurpose medicinal species(Woldemariam *et al*.,2021).

5.10. Informant consensus factor

The diseases in the study area were grouped into 8 disease categories based on the usage reports by the informants and the resemblance to the disease category. Among the disease categories, the categories with the highest informant consensus factor (ICF) values were gastrointestinal and endo parasites (0.71), which is in agreement with studies conducted in other parts of the country and elswere (Lulekal *et al*., 2014). These indicated popularity of curative plants against diseases in the gastrointestinal and endo parasites disease category. The medicinal plants that had higher ICF values were presumed to be more common and effective when used to treat a certain disease.

The recorded high plant use citation (31.6%) for treating ailments in the gastrointestinal and endo parasites disease category may also indicate the relatively high incidence of such diseases and ease of identifying ailments and corresponding curative plants occurring in the District, which is in agreement with studies conducted in elswere (Birhanu *et al*., 2020). These high ICF values clearly indicate the incidence of livestock diseases in the study area and the efficacy of the medicinal plants for the disease categories as a whole. Moreover, these medicinal plant species are thought to be potential sources for chemotherapeutic agents and hence important assets in search for bioactive compounds (Trotter and Loga, 1986).

5.11. Fidelity level

The didelity level (FL) is useful for recognizing the most preferred plants used for curing certain ailments by the respondents. In study area, highest fidelity level values were obtained for *Calpurnia aurea* (Ait.) Benth in Dermatological and ecto-parasites therapeutic category and these indicates relatively high healing potential of the species for treating ailments under the respective ailment categories (Alhaji and Babalobi, 2015). The highest FL might be related to which the cited plant species has more healing power contributed to the presence of bioactive compounds for the respective ailments (Tariq *et al*.,2014). Thus, these results would call for pharmacological investigations on these plants since high percentage of informants agreed on their curative values. Hence, plants with high fidelity level value obtained in this investigation

should be further subjected to phytochemical and pharmacological investigation to prove their medicinal efficacy.

5.12. Use values

Use value is an important index to identify the plant species which are extensively used among indigenous communities. The highest use values (UV) of ethnoveterinary medicinal plant species in study area was; *Cordia africana* Lam followed by *Juniperus procera* Hochst. ex Endl and *Ensete venteicosum*. The high use values of species in the present study indicate that they are most important, best known and most utilized by the local people. A high UV of plants also indicates their abundance in a specific study area and their consistent use for the treatment of various ailments and high usage reported by the number of informants shows that the plant is well recognized by the local inhabitants and is well utilized in ethnomedicinal purposes (Phillips and Gentry, 1993a). More importantly, the taxa that are used over and over again are more likely to be biologically active (Trotter and Logan, 1986). The plants with the highest UV index been associated with issues of conservation, based on the idea that the most important species is suffer the greatest harvesting pressure (Albuquerqe, 2006).

5.13. Relative frequency of citations

Relative frequency of citation highlights the importance of individual species among local communities based on the number of uses (Vitalini., 2013). It is calculated from the citation frequency of informants claiming the use of a plant species divided by the total number of informants who participated in the survey to share their indigenous knowledge (Tardio and Pardo, 2008). The highest RFC values in study area was; *Olinia rochetiana* A. Juss. followed by *Inula confertiflora* A.Rich. A. Rich. and *Premna schimperi* Engl. These results revealed that plants with high RFC values illustrate their dominancy in the study area and indigenous people are more familiar with them or specific species that are widely distributed and easily accessible and plant species about which the communities have widespread knowledge. They prefer these plants over others because of their availability and positive role in ethnoveterinary medicine. These results are in line with that local people have greater knowledge of ethnomedicinal use on plants which are more common in an area (Tariq *et al*.,2014). Additionally, common plants would allow local people to gain more experience of their properties and consequently would have a greater probability of being introduced into the local culture (Zia-ud-Din *et al*., 2010).

It has been suggested that plants with high RFC values should be involved in biological, phytochemical and pharmacological studies for further investigation of drug development (Zia-

ud-Din *et al*., 2010). Furthermore, such plants must be conserved on priority basis due to the threat of over exploitation and extensive use by the community (Albuquerqe, 2006). It is well known that species with low RFC values are not necessarily less important (Leonti,2022). Their low values may represent the low knowledge of the local people especially the younger ones, who are not aware of the uses of these species.

5.14. Relative Importance

The local importance of each species cited in the study area was also calculated using Relative Importance (RI) which also shows the relative importance of each species locally known by the informants (Bennett & Prance, 2000). In these study, relative importance (RI) were calculated based on 8 main use categories for the whole medicinal taxa. Based on the analysis of RI, the MPs with the highest RI values in study area was; *Olinia rochetiana* A. Juss. followed by *Inula confertiflora* A.Rich. A. Rich, *Embelia schimpei* Vatke, *Croton macrostachyus* Del and *Lobelia giberroa* Hemsl. The highest scors of RI indicate high availability and affordability of medicinal plants in possession of pharmacological properties (Bennett and Prance, 2000, Yirga and Zerabruk, 2011).

5.15. Jaccard`s Coefficient of Similarity (JCS)

The Jaccard`**s** coefficient of similarity was performed in order to develop a relationship between this study and previously reported studies, one from other regions (with in region) of Ethiopia. Jaccard`s Coefficient of Similarity (JCS) revealed that the study area has the highest similarity in medicinal plant diversity with the study conducted around Dawuro Zone, followed by Ambo District. The least similarity was linked with the study conducted on Somali pastoral community. Calculated values of Jaccard`s Coefficient of Similarity displayed that medicinal plant species were not evenly distributed when compared with other places. This was also true, even by itself in the study area medicinal plants were not equally distributed. The highest similarity in distribution between the study area and Dawuro Zone (Dilbato *et al*., 2021) may be due to they share some similar geographic environments, socioeconomic relationships as well as cultural similarity using medicinal plants. On the other hand, the least similarity of the EVMPs with north Ethiopia (Birhan, 2018) and with Eastern part of Ethiopia (Serda, 2017) might be the distance between the sites, cultural variation, difference in EVMK, morbidity of ailments, agroecology and floristic composition.

6. CONCLUSIONS

The results of this investigation revealed that the study area has plenty of MPs, non-plant remedies and IK. A total of 151 EVMP species were utilized for the treatment of 49 types of livestock health problems. Among these lamiaceae, asteraceae, euphobiaceae and solanaceae families are mostly used and a total of 25 non plant remedies were utilized for the treatment of 23 types of livestock health problems. Among non plant remedies meat and feaces of porcupine, hyena and aardvark are mostly used in the study area. It was found out that the highest number of medicinal plants was used to manage GI complains, an indication of a high prevalence of this ailment category in the area. Most remedies in the study district were prepared by pounding fresh leaves which were most frequently harvested plant part and applied oraly. The majority of the claimed MPs were found to be harvested from the wild and herbs were highly utilized for medicinal purpose.

The most preferred MP species for most frequent cited disease was *Olinia rochetiana A. Juss* and the values of ICF, FL(%), UV, RFC and RI in the present study could reveal a number of culturally important and popular MPs that are locally employed in traditional health care with suggestion of further pharmacological studies for development of therapeutic products.The JCS displayed that medicinal plant species were not evenly distributed when compared with other places. The findings of UV, RFC and DMR indicated that such use pressure on MPs and IK that originate from secrecy, oral based knowledge transfer and unwillingness of young generation to gain the knowledge might lead to threat of sustainability of the existing EVMPs and IK. Hence, this investigation emphasizes the need for urgent implementation of awareness creation to improve local community's knowledge on importance and management of medicinal plants and non plant remedies and awareness raising should be made among the healers so as to avoid erosion of the indigenous knowledge and to ensure its sustainable use.

7. RECOMMENDATIONS

Based on findings of current investigation, the following points are recommended

- ✓ Conducting phytochemical screening and clinical trials of the MPs with high informant consensus and FL (%) such as *Calpurnia aurea, Tragia plukenetii, Cissus populnea, Eucalyptus globulus, Hypericum revolutum, Coriandrum sativum, Linum usitatissimum, Maesa lanceolata, Crinum abyssinicum, Olinia rochetiana* and *Ensete venteicosum* for evaluating their efficacy and safety for further uses.
- ✓ The contribution of TMPs to the health care of the livestock should be acknowledged and supported by collaborative researches with ethnobotanists, pharmacists and chemists to evaluate and validate the usage of traditional medicinal plants with the modern scientific methods and innovative techniques for the development of health sector
- ✓ All concerned parties such as the Government and higher leaning institutions and NGOs need to work in the agenda of conservation of the indigenous knowledge and MPs in the health development strategy to secure the wealth of MP in hand in the study area.
- ✓ young generation should be mobilized to take interest in ethnoveterinary practies in order to conserve this knowledge.
- ✓ The Special Distric Administration and other concerned body have to encourage the local herbal medicinal practitioners to enhance the use of traditional medicine through licencing and other incentives.

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Appendix 1. Livestock diseases

No	Livestock disease	Local name	Citation	percentage
1	Colic	*Kuta*	5	7.5
2	Gastrointestinal parasite	*kemar*	47	70
3	Blackleg	*Sinch/helifaza/*	38	56.7
4	Mastitis	*Bahu*	24	35.8
5	Fasciola	*Tisha*	13	19
6	Brucellosis	*Chopitu*	3	4.5
7	Hemoglobinuria	*Amshisho*	10	14.9
8	Babesiosis	*Nohu*	7	10.5
9	Dermatophilosis	*Washikala*	20	29.9
10	Anthrax	*Kejahaho*	2	3
11	Foot rot	*Bujale/noka*	2	3
12	Actinomycosis	*Agugitu*	11	16
13	Trypanosomiasis	*Sute/shulula*	11	16
14	Amoeba	*ameobia*	2	3
15	Pneumonia	*Mich*	17	25
16	Pastueriollosis	*Shusho*	11	16
17	Bluetongue	*Ago*	6	9
18	Dermatophytosis	*Gontagiza*	1	1.5
19	Splenomegaly	*Tamani mero*	2	3
20	Conjunctivitis /pink eye/	*Mora*	3	4.5
21	Thelazia	*Zawa*	2	3
22	Ecto-parasites	*Gerinitigegna*	19	28
23	Plant toxin	*Sisa/anbeta*	3	4.5
24	CBPP	*Dofu*	2	3
25	Foot and mouth diseases (FMD)	*Masa*	6	9
26	Strangle	*Kafira*	8	11.9
27	Actinobacillosis	*Zaha*	1	1.5
28	Epizootic lymphanngitis	*Biche*	3	4.5
29	Contagese oedema	*Amizu*	4	6

30	Rederpest	*Minikita*	2	3
31	Rabies	*Nifaso*	6	9
32	Foreign body	*Konaza*	1	1.5
33	Milk fever (hypocalcaemia)	*Hubama*	2	3
34	Poor mothering	*Nawibahomito*	1	1.5
35	Tetanus	*Teanesi*	2	3
36	Leach	*Karkada*	21	31
37	Cough	*Hocha*	3	4.5
38	Swelling	*Wolisu*	1	1.5
39	Evel eye	*Asuniafa*	9	13
40	Retained placenta	*Kini kerobeya*	25	37
41	Milk production problem	*Shabomasu*	24	35.8
42	Constipation	*Shupomiya*	3	4.5
43	Fatting	*Fatu*	3	4.5
44	Bloat	*Katinikita*	24	35.8
45	Newcastle diseases	*Akonitururu*	1	1.5
46	Sudden pain	*Dingetegna*	1	1.5
47	Calf scour/calf diarrhea/	*Ankalani dohito ,*	1	1.5
48	diarrhoea	*Dohito*	11	16
49	Sneak bits	*Zawinidupa*	1	1.5

Appendix 2: Signs and symptoms of livestock disease

Signs and symptoms	Citation	percentage
Frequent urine	19	3.8
Sore milk	21	4.3
Abortion	5	1
Rough skin	20	4.1
Abdominal bloat	32	6.5
Bleeding nose and mouth	37	7.5
Bloody urine	33	7
Sweeling	18	3.5
bitting other animals	6	1
Dry faeces	23	5
Salvation	11	2.2
Eating soil	9	1.8
Worm in faeces	2	0.4

Unable to move	15	3
Sneezing	3	0.6
Shivering	39	8
Poor appetite	32	6.5
Limping	3	0.6
Flow of tear	7	1.4
Isolate and stand alone	12	2.4
Sore mouth	17	3.5
Fail to eat	51	10
Fail to regurgitate cud	9	1.8
Erection of hair	17	3.5
Cough	44	9
Eating their teeth	8	1.6

Appendix 3: List of ethno veterinary medicinal plants, diseases and diseases conditions treated and local, scientific and family name of the medicinal plants. (Pu=part used,Ha=habit, Ra=routs of administration, C=condition used, Lt=livestock treated)

Scientific name	Family name	Local name of MPs	Pu	Ha	Local name of diseases	Disease treated	Methods of remedy preparation and application	Ra	C	Lt
Acacia negrii Pic. Serm.	Fabaceae	Hezu	Ba	T	Bahu	Mastits	Pounded along with roots of *Euphorbia* sp1, *Securidaca longepedunculata* Fresen, barks of *Vernonia amygdalina* Del & *Maesa lanceolata* Forssk. Forssk mix with water and drenching	O	S	Cattle
Acanthus eminens C.B. Clarke	Acanthaceae	Zarqua	R	S	Biche	Epziotic lyphanjits	Pounded along with leaves of *Caylucea abyssinica* (Fresen.) Fisch *Stephania abyssinica* (Dillon & A. Rich.) Walp &. mix with water and drenching and painting skins of equines.	External , O	F	Horse
Acmella caulirhiza Del	Asteraceae	Shishimo	F,L	H	Kemar	GI parasite	Pounded along with leaves of Leucas martinicensis (Jacq.) R. Br & *Clematis longicauda* Steud. Ex A. Rich mix with water and drenching	O	F/S	Cattle Goat
					Kodn mero	Skin disease	Pounded along with seeds of *Embelia schimpei* Vatke & mix with water and rubbing	External	F	Cattle, Goat, sheep

					Sute	Trypanosomiasis	Pounded along with leaves of *Vernonia hochstetteri* Sch. Bip. ex Walp & *Microglossa pyrifolia* (Lam.) Kuntze, roots of *Allium sativum* L then cutting skin of animal with blade and inserting medicine in it	Dermal	F	Cattle, Goat, sheep
			L		Sesa shabo	Watery milk	Pounded along with roots of *Euphorbia* sp1, *Haplocarpha rueppellii* (Sch. Bip.) Beauv, leaves of *Hypericum revolutum* Vahl, *Acmella caulirhiza* Del & *Myrsine africana* L &adding salt and feeding.	Feeding	F	Cattle
Agarista salicifolia (Comm. ex Lam) Hook.f	Ericaceae	Totu	L	T	Kemar	GI parasite	Pounded along with leaves of *Carissa spinarum* L, *Carissa spinarum* L & *Juniperus procera* Hochst. Ex Endl; mix with water and drenching	O	F	Cattle, sheep
Ajuga integrifolia Buch. -Hem. ex D. Don	Lamiaceae	Tanachu	L	H	Ago	Blue toung	Pounded along with fruits of *Solanum incanum* L& mix with water and drenching	O	F	Cattle
Albizia schimperiana Oliv.	Fabaceae	Siso	Ep	T	Himata kesanak	Butter production	The leaves are pounded; mix with water and drenching	O	F	Cattle
					Kemar	GI parasite	The leaves are pounded; mix with water and drenching	O	F G	Cattle
Allium sativum L.	Alliaceae	Sunto	Bl	H	Karkada	leach	The bulbs are pounded and inserting orally	O	F/S	Cattle

					Sute	Trypanosomiasis	Pounded along with leaves of *Vernonia hochstetteri* Sch. Bip. ex Walp & *Microglossa pyrifolia* (Lam.) Kuntze, *Acmella caulirhiza* Del, then cutting skin of animal with blade and inserting medicine in it	Dermal	F	Cattle, Goat, sheep
Arisaema enneaphyllum Hochst.exA. Rich.	Araceae	kichuwa	R	H	Sinch	Blackleg	Pounding along with leaves of *Lobelia giberroa* Hemal seed of *Embelia schimpei* Vatke & dissolved with water and drenching.	O	F	Cattle
Arisaema schimperanum Schott	Araceae	Zawuni hewa	R	H	Bahu	Mastitis	The roots are pounded mix with water and drenching, rubbing the udder and teats.	O, External	F	Cattle
Asparagus setaceus (Kunth) Jessop	Asparagaceae	kashalezuna	R	C	Ankalan dohito	Calf scour	The roots are pounded mix with water and drenching	O	F/S	Cattle
Bersama abyssinica Fresen.	Melianthaceae	Boha	L	T	Kemar	GI parasite	The leaves are pounding mix with water and drenching	O	F	Cattle
Brassica carinata A. Br.	Brassicaceae	gesha	L	H	Kina keronak	Delayed placenta	Pounded along with leaves of *Malva parviflora* Höjer mix with water & drenching	O	F	Cattle, sheep
Brassica nigra L	Brassicaceae	Sanabi	Seed	H	Tisha	Fasciola	The seeds are powdering mix with water and drenching	O	S	Cattle, sheep

Brucea antidysentrica J.F. Mill.	Simaroubaceae	Tolo	L	S	Sinch	Black leg	The leaves are pounded mix with water and drenching	O		Cattle
					Michi	Pneumonia	Pounded along with leaves of *Cynoglossum lanceolata* Forssk & *Clutia abyssinica* Jaub. & Spach mix with water and given nasally.	N	F	Horse, Donkey Cattle
					Kemar	GI parasite	The leaves are pounded mix with water and drenching	O	F	Cattle Sheep
Buddleja polystachya Fresen.	Buddlejaceae	Fastu	L	T	Go?sigiza		The leaves are pounded mix with water and drenching	O	F	Cattle, Goat, Sheep
					Kuta	Colic	The leaves are pounded mix with water and drenching	O	F	Horse Cattle
					Sinch	Blackleg	The leaves are pounded mix with water and drenching, giving anally.	O, An	F	Cattle
					Bahu	Mastits	The leaves are pounded, add salt and feeding.	O, Feeding	F	Cattle
Calpurnia aurea. (Ait.) Benth.	Fabaceae	Zimisa	L	T	Kemar	GI parasite	The leaves are pounded mix with water and drenching.	O		Cattle , Sheep
					Kuta	Colic	The leaves are pounded mix with water and drenching.	O	F	Horse , Cattle

					Geron tigegna	External parasite	Pounded along with seeds of *Hibiscus berberidifolius* A. Rich, epp of *Croton macrostachyus*. Del & *Prunus persica* (L.) Batsch & Paint with better	Exter nal	F	All
Canarina eminii Schweinf.	Canarinaceae	Agino/K orfo/	L	H	Sinch	Blackleg	The leaves are pounded mix with water and drenching.	O	F	Cattle
Capsicum frutescens L.	Quad	Ziga	Fr	H	Karkada	Leach	Pounded fruit is wrapped with cloth & Putting in water	O	S	Cattle
					Nuhu	Babesiosis	Pounded along with bark of *Erythrina brucei Schweinf & Catha edulis (Vahl) Forssk. Ex Endl* drenching.	O	F/ S	Cattle
					Katin kita	Bloat	Pounded along with *Nicotiana tabacum L* drenching.	O		Cattle
Carduus schimperi Sch. Bip.	Asteraceae	Asewa	R	H	Kemar	GI parasite	Pounded along with *Inula confertiflora* A.Rich. *& Olinia rochetiana A. Juss &* drenching.	O	F	Cattle
Carissa spinarum L.	Apocynaceae	Alalu	L	S	Kemar	GI parasite	Pounded along with Olinia rochetiana A. Juss, Inula confertiflora A.Rich. A. Rich	O,N, An	F	Cattle
					shabonm ahisu	Milk quality	Pounded along with leaves of *Hypericum revolutum* Vahl *& ep of Syzygium guineese (*Willd.*)* DC. *subsp. Guineense* & mix with salt allow to feed	Feedi ng	F/ S	Cattle

			Ep		sute	Trypanosomiasis	Pounded & squeezed nasally	N	S	Cattle, Goat
Catha edulis (Vahl) Forssk. ex Endl.	Celastraceae	Chati/jima	L	S	Nohu	Babesiosis	Pounded along with *Capsicum frutescens L & Caylucea abyssinica (Fresen.)Fisch. & Mey* dissolve with water drenching.	O	F	Cattle
Caylucea abyssinica (Fresen.) Fisch. & Mey	Resedaceae	Helako	L	H	Sinch	Blackleg	Pounded along with *Allium sativum* L & leaves of *Acmella caulirhiza* Del dissolve with water &drenching	O	F	Cattle
					Biche	Epizootic lymphanngitis	Pounded along with roots of *Acanthus eminens C.B. Clarke & stephania abyssinica (Dillon & A. Rich) Walp* dissolve with water & drenching & paint body of equines.	External	F	Horse
Ceiba pentandra L. Gaertn.	Malvaceae	Tiro	Seed	H	Shusho	Pastreallosis	Powdered along with seed of *Maesa lanceolata* Forssk. Forssk. Dissolve with water & drenching by tee cup.	O	S	Cattle, Sheep
Centella asiatica (L.) Urban	Apiaceae	Hodo	L	H	Amishisho	Babesiosis	Pounded along with *stephania abyssinica* (Dillon & A. Rich) Walp dissolved with water & drenching & given anally with strow.	O,An	F/S	Cattle, Sheep
Chinopodium ambrosioides L.	Chinopodiaceae	Beketa	L	H	Katn kita	Bloat	Pounded along with *Nicotiana tabacum L* & drenching.	O	F	Cattle
Cissus populnea Guill. & Perr.	Vitaceae	Yesha	L	C	Agugitu	Actinomycosis	The leaves are crushed then cut the skin of animal with blade & insert medicine in it.	dermal	F	Cattle

					Shabon masu	Milk quality	Pounded along with *Hypericum revolutum Vah*l & ep of *Syzygium guineese (Willd.) DC. subsp. Guineense* & Feeding with salt	Feeding	F	Cattle
Clausena anisata (Willd.) Benth.	Rutaceae	Kameksa /hulimaye/	L	S	Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora A.Rich. A. Rich& Olinia rochetiana A. Juss* & dissolved with water & drenching.	O	F	Cattle Sheep
					Shusho	Pastreallosis	Pounded of *Inula confertiflora A.Rich. A. Rich* is dissolved in water & drenching.	O	F	Cattle, Sheep
					Katn kita	Bloat	Pounded along with *Nicotiana tabacum L* & drenching.	O	F/S	Cattle
Clematis longicauda Steud. Ex A. Rich.	Ranunculaceae	Sagu	L	C	Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke leaves of Lobelia giberroa Hemal, *Hagenia abyssinica* (Bruce) J. F. Gmel & *Lagenaria abyssinica* (Hook.f.) C. Jeffrey &dissolved with ensete by product & drenching.	O	F	Cattle
					Tetanesi	Tetanus	Pounded along with leaves of *Jasminum abyssinicum* Hochst. Ex DC & dissolve with water &drenching &tieing on the wound.	O	F	Horse, Cattle
					Kemar	GI parasite	Pounded along with leaves *of Inula confertiflora A.Rich. A. Rich & Olinia rochetiana A. Juss, Lobelia giberroa Hemal & premna schimperi Engl* dissolve with water & drenching.	O	F/S	Cattle, Sheep

			Fl		Nifaso	Rabis	Pounded along with flowers of *Erythrina brucei Schweinf & Stephania abyssinica* (Dillon & A. Rich.) Walp & dissolved with water & drenching.	O	F	All
Clerodendrum myricoides (Hochst.) Vatke	Lamiaceae	Mignimignu	R	S	hishma	Constipation	The roots are pounded and boiling with water &drenching	O	F	All
					Dofu	CBPP	The roots are pounded and boiling with water &drenching	O		Cattle
Clutia abyssinica Jaub. & Spach.	Euphorbiaceae	Nagina	L	S	Michi	Pneumonia	Pounded along with *Leonotis ocymifolia (Burm. f.) Iwarsson* & dissolve with water & drenching & squeezing nasally.	O,N	F	All
					Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich *& Olinia rochetiana* A. Juss, *Lobelia giberroa Hemal & premna schimperi* Engl dissolve with water & drenching.	O,N	F	Cattle, Sheep
Commelinia imberbis Ehrenb. ex Hassk.	Commeliniacea e	Naraha	L	H	Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke, leaves of *Lobelia giberroa* Hemal, *Hagenia abyssinica* (Bruce) J. F. Gmel *& Lagenaria abyssinica* (Hook.f.) C. Jeffrey &dissolved with ensete by product & drenching.	O	F	Cattle

Cordia africana Lam.	Boraginaceae	Karewaza	L	T	Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich & *Olinia rochetiana* A. Juss, *Lobelia giberroa* Hemal & *premna schimperi* Engl dissolve with water & drenching.	O	F	Cattle, Sheep
Coriandrum sativum .L.	Apiaceae	Demisa	Seed	H	Shusho	Pasturolosis	Pounded along with seed of *Maesa lanceolata* Forssk. Forssk, *Lepidium sativa* L & *Allium sativum* L & dissolve with water and drenching	O	S	Cattle, Sheep
					Tisha	Fasciola	Powdered along with seed of *lepidium sativa* L, *Brassica nigra* L, *Ruta chalepensis* L, leaves of *solanum nigrum* L &*Allium sativum* L & dissolve with water & drenching.	O	F/S	Cattle
Crinum abyssinicum Hochst. Ex A. Rich.	Amaryllidaceae	Kahonisunto	R	H	Sinch	Blackleg	Pounded along with leaves of *Embelia schimpei* Vatke and boilling with enset by product & drenching.	O	F/S	Cattle
					Kejahaho	Antherax	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich & dissolved with water & drenching.	O	F/S	Cattle
					Dinigetigna	Sudenpain	The roots are pounded & dissolve with water & drenching	O	F/S	All
Crotalaria incana L.	Fabaceae	Saksaku	L	S	Dohito	Diarrha	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich & *Olinia rochetiana* A. Juss,	O		All

							Lobelia giberroa Hemal & *premna schimperi* Engl dissolve with water & drenching			
			L		Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke, leaves of *Lobelia giberroa* Hemal, *Hagenia abyssinica* (Bruce) J. F. Gmel & *Lagenaria abyssinica* (Hook.f.) C. Jeffrey &dissolved with ensete by product & drenching.	O	F	Cattle
Croton macrostachyus Del.	Euphorbiaceae	Washikala	EP	T	Geron tigegna	Ecto-parasite	Pounded along with leaves of *Calpurnia aurea*. (Ait.) Benth & rubbing.	External	Fresh	All
					Kaga shabo	Milk quality	Pounded along with leaves of *Hypericum revolutum* Vahl & ep of *Syzygium guineese* (Willd.) DC. subsp. *Guineense* & Feeding with salt	Feeding	F/S	Cattle
			Ba/ep		Kodini mero	Skin disease	Pounded along with bark of *Erythrina brucei* Schweinf & *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & boiled with water &drenching & painting the skin	O, External	Fresh	Equin, Bovin, Ovin
			L		Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke, leaves of *Lobelia giberroa* Hemal, *Hagenia abyssinica* (Bruce) J. F. Gmel &	O,N	Fresh	Cattle

							Lagenaria abyssinica (Hook.f.) C. Jeffrey &dissolved with ensete by product & drenching.			
					Zawa	Thelasia	Pounded along with leaves of *Ocimum sanctum* & squeezed & drop in eye.	Ocular	F	Cattle
					Katn kita	Bloat	Crushed along with leaves of *Nicotiana tabacum* L & opining the mouth of animals & insert by hand.	O	Fresh	Cattle
			Fl		Sute	Trypanosomiasis	Pounded along with flower of *Erythrina brucei* Schweinf & *Maesa lanceolata* Forssk. Forssk dissolve with water & drenching	O	F	Cattle, Goat, sheep
			B		Nohu	Babesiosis	Pounded along with bark of *Olinia rochetiana* A. Juss, *Erythrina brucei* Schweinf & *Maesa lanceolata* Forssk. Forssk dissolved with water & drenching	O	S	Cattle
Cucumis ficifolius A.Rich.	Cucurbitaceae	Sikiya	R	C	Sinch	Blackleg	Pounded along with *Allium sativum* L, leaves of *Embelia schimpei* Vatke & *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching	O	Fresh/ stored	Cattle
Cucurbita pepo L.	Cucurbitaceae	Dabu	Fr	C	Masa	FMD	Chopped and cooked & painted on foot and mouth	External	F/S	Cattle

Cyathula cylinderica Moq	Amaranthaceae	Humo	L	H	Kuta	Colic	Pounded along with *Galium simense* Fresen, leaves of *Hypericum quartinianum* A. Rich & Buddleja polystachya Fresen dissolved with water & drenching.	O	F	Cattle Horse
					Amishisho	Basilery heamoglobin urine	Pounded along with *stephania abyssinica* (Dillon & A. Rich) Walp, leaves of *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & *Phytolacca dodecandra* L.'Hérit dissolved with water & drenching	O	F	Cattle Sheep
Cynoglossum lanceolata Forssk.	Boraginaceae	Forozano	L	H	Michi	Pneumonia	Pounded along with leaves of *Dicliptera laxata* C.B. Clarke & squeezed nasally.	N	F	Equin Ovin
Dicliptera laxata C.B. Clarke	Acanthaceae	Focho	L	H	Michi	Pneuminia	Pounded along with leaves of *Croton macrostachyus* Del, *Eucalyptus globulus* Labill, *Leonotis ocymifolia* (Burm. f.) *Iwarsson* dissolved with water &drenched & squeezed nasally.	O,N	F	Bovin
Discopodium penninervium Hochst.	Solanaceae	Fururu	L	S	Michi	Pneumonia	Pounded along with leaves of *Croton macrostachyus* Del, *Eucalyptus globulus* Labill, *Leonotis ocymifolia* (Burm. f.) Iwarsson & *Dicliptera laxata* C.B. Clarke dissolved with water &drenched & squeezed nasally.	O,N	F	
Dodonaea angustifolia L.f.	Sapindaceae	Titra	L	S	Sinch	Black leg	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich & *Lobelia giberroa* Hemsl	O,An	F	Cattle

							dissolved with enset by product &drenched & given anally.			
					Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich, *Maytenus addat* (Loes.) Sebsebe, *Lobelia giberroa* Hemsl & *Olinia rochetiana* A. Juss & dissolved with water & drenching .	O,An	F/S	Cattle Sheep Horse
Dombeya torrida (J. F. Gmel.) P. Bamps	Steculiaceae	Borabosha	Br	T	Nohu	Babesia	Pounded along with bark of Dracaena steudneri Engler, *Prunus africana* (Hook. f.) Kalkm & *Maesa lanceolata* Forssk. Forssk & mix with water & drenching.	O	F/S	Cattle
Dracaena steudneri Engler	Dracaenaceae	Toso	Ba	T	Bahu	Mastitis	Chopped and boiled along with *Ensete venteicosum* (Welw.) & feeding.	O	F	Cattle
					Ameba	Amoebae	Pounded along with barks of *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & *Erythrina brucei* Schweinf dissolved with water & drenched	O	F	Horse Cattle
					Washikala	Skin disease	Pounded along with bark of *Erythrina brucei* Schweinf, *Croton macrostachyus* Del. & *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & boiled with water &drenching & painting the skin	External	F	Cattle, Horse

Drymaria cordata (L.) Schultes	Caryophyllaceae	Moha	L	H	Go?sigiza	Dermatophatosis	Ponded along with leaves of *Buddleja polystachya* Fresen & drencing	O	F	Cattle
Echinops kebericho Mesfin	Compositeae	Kabarcho	R	H	Sinch	blackleg	Cutting and putting on fire and fumigation	Fumigation	F/S	Cattle
Ekebergia capensis Sparrm.	Meliaceae	Horoma	L	T	Sinch	blackleg	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich, *Dodonaea angustifolia* L.f. & *Lobelia giberroa* Hemsl dissolved with enset by product &drenched & given anally.	O,AN	F	Cattle
Embelia schimpei Vatke	Myrsinaceae	Fofa/Tomoko/	L/SEED	S	Sinch	Blackleg	Pounded along with leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, *Juniperus procera* Hochst. ex Endl, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & *Haplocarpha rueppellii* (Sch. Bip.) Beauv & dissolved with water & drenching.	O	F/S	Cattle
					Kemar	GI	Pounded along with leaves of *Oreosyce africana* Hook.f, *Olinia rochetiana* A. Juss, Leucas calostachys Oliv & *Inula confertiflora* A.Rich. A. Rich & dissolved with water & drenching.	O	F/S	Cattle
					Kodinomero	Skin disease	Pounded along with leaves of *Acmella caulirhiza* Del & *Ruta chalepensis* L & painted	External	F	Horse, Cattle

					Asuniafa	Evil eye	Pounded along with leaves of *Bersama abyssinica* Fresen & drenching and paint body of animals.	O, External		All
					Bahitana	Pneumonia	Pounded along with leaves of *Croton macrostachyus*. Del, *Eucalyptus globulus* Labill, *Leonotis ocymifolia* (Burm. f.) Iwarsson & *Dicliptera laxata* C.B. Clarke dissolved with water &drenching.	O	F	All
Ensete venteicosum (Welw.)	Musaceae	Hewa(kinkisir)	All part	H	Kina kesu	Delayed placenta	Chopped& boiled along with leaves of Urera hypselodendron (A. Rich.) Wedd & *Tragia plukenetii* Radcl.-Sm & feed	Feeding	F	Cattle, Goat, sheep
		Hewa(Anchro)	All part		Bahu	Mastitis	Chopped and boiled & feed	Feeding	F	Cattle Goat
		(Asu)	All part		Hate the calf		Chopped and boiled & feed	Feeding	F	Cattle
Erica arborea L.	Ericaceae	Ayahu	L	S	Kemar	GI parasite	Pounded along with leaves of *Myrsine africana* L, *Juniperus procera* Hochst. ex Endl, *Olea europaea* L. subsp. Cusidata (Wall ex G. Don) Cif & *Premna schimperi* Engl dissolved with water & drenching.	O,An		Cattle , Horse Sheep

Erirgrustis tef	Poaceae	She mejo	See d	H	Nifaso	Rabies	Grinded seed are mixed with pounded leaves of *Dodonaea angustifolia*. L.f, roots of *Cucumis ficifolius* A.Rich. A. Rich & cooked & given to Dogs to eat.	Feedi ng	S	All
Erythrina brucei Schweinf.	Fabaceae	Foro kocho	Ba	T	Bahu	Mastitis	chopped and boiled along with barks of *Dracaena steudneri* Engler mix with water & drenching	O	F	Cattle, Goat, sheep
					Ameba	amoebae	Pounded along with barks of *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & *Dracaena steudneri* Engler & dissolved with water & drenched	O	F	Horse Cattle
						Skin disease	Pounded along with bark of *Dracaena steudneri* Engler, *Croton macrostachyus* Del. & *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & boiled with water &drenching & painting the skin	O, An	F	Cattle, Goat, Sheep Horse
		s	Fl		sute/Gen di/	Trypanoso miasis	Pounded along with flowers of *Dracaena steudneri* Engler & *Croton macrostachyus* Del & boiled with water &drenching .	O	F	Cattle, Goat, sheep
Eucalyptus camalduiensis Dehnh	Myrtaceae	Sheha barzafi	L	T	Michi	Pneumoni a	Pounded along with leaves of *Croton macrostachyus* Del, *Eucalyptus globulus* Labill, *Leonotis ocymifolia* (Burm. f.) Iwarsson &	O,N		Bovin Equin Ovin

							Dicliptera laxata C.B. Clarke dissolved with water &drenched & squeezed nasally.			
Eucalyptus globulus Labill	Myrtaceae	Foro Barzafi	L	T	Michi	Pneumonia	Pounded along with leaves of *Croton macrostachyus* Del, *Leonotis ocymifolia* (Burm. f.) Iwarsson & *Dicliptera laxata* C.B. Clarke & dissolved with water &drenched & squeezed nasally.	O,N	F	
Euphorbia abyssinica Gmel	Euphorbiaceae	Akma	L	T	Keja haho	Anthrax	Pounded along with leaves of *Kalanchoe* petitiana A. Rich, *Clematis longicauda* Steud. ex A. Rich, *Rhamnus prinoides* L'Hérit & *Dodonaea angustifolia* L.f & mix with water & drenching.	O		Cattle
					Sinch	Black leg	Pounded along with leaves of *Brucea antidysentrica* J.F. Mill, *Caylucea abyssinica* (Fresen.) Fisch. & Mey & *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching.	O,N		Cattle
			BL		Washikala	Skin disease	Pounded and painted or rubbing on the skins of animals.	External	F	Cattle, Goat

Euphorbia schimperiana Scheele	Euphorbiacea e	Binabish a	L	S	Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich, *Maytenus addat* (Loes.) Sebsebe, *Lobelia giberroa* Hemsl & *Olinia rochetiana* A. Juss & dissolved with water & drenching	O	F	Cattle, Goat, Sheep horse
Euphorbia sp1.	Euphorbiacea e	Gognoni heta	R	H	Sinch	blackleg	Pounded along with roots of *Haplocarpha rueppellii* (Sch. Bip.) Beauv, seeds of Embelia schimpei Vatke & leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel & drenched.	O	S	Cattle
					Shabon masu	Milk quality	Pounded along with roots of *Haplocarpha rueppellii* (Sch. Bip.) Beauv, leaves of *Hypericum revolutum* Vahl, *Acmella caulirhiza* Del & *Myrsine africana* L &adding salt and feeding.	Feedi ng	F	Cattle
					Katni kita	Bloat	Pounded along with fruits of *Solanum incanum* L & mix with water & drenching.	O		Cattle
					Sute	Trypanoso miasis	Pounded and add water drenching	O	F/ S	Cattle, Goat
Ficus vasta Forssk.	Moraceae	kasha	Ba	T	Kodni mero	Skin disease	Pounded along with bark of *Erythrina brucei* Schweinf, *Croton macrostachyus* Del, *Dracaena steudneri* Engler & *Schefflera abyssinica*	O, Exter nal	F	Cattle, Goat, Sheep

							(Hochst. ex A. Rich.) Harms & boiled with water &drenching & painting the skin			
Flacourtia indica (Burm.f.) Merr.	Flacourtiacea e	Chika	B	S	Konun rako	Stress during birth	The bark is pounded & drenching	O	F	Cattle, Goat, sheep
Galium simense Fresen	Rubiaceae	Achicha		H	Aka shabo	Watery milk	Pounded & boiled along with roots of *Haplocarpha rueppellii* (Sch. Bip.) Beauv, leaves of *Hypericum revolutum* Vahl, Euphorbia sp1, *Acmella caulirhiza* Del & *Myrsine africana* L & adding salt and feeding.	Feedi ng	F	Cattle
Gnidia glauca (Fresen.) Gilg	Thymelaeace ae	Awilo	B	S	Amizu	Horfis	The barks are pounded painted on the mouth	Exter nal	F	Ovin
*Hagenia abyssinica (*Bruce) J. F. Gmel.	Rosaceae	Hofa	F	T	Sinch	blackleg	Pounded along with roots of *Cissus populnea* Guill, *Arisaema schimperanum* Schott & seeds of *Embelia schimpei* Vatke dissolved with ensete by product & drenching.	O	F	Cattle
			L,F l		Kemar	GI parasite	Pounded along with leaves of *Myrsine africana* L, Olea europaea L. subsp. Cusidata (Wall ex G. Don) Cif, *Premna schimperi* Engl, *Carissa spinarum* L & *Erica arborea* L & dissolved with water & drenching.	O,An	F/ S	Cattle, Goat, sheep

			Ba		Nohu	Babesiosis	Pounded along with leaves of *Olinia rochetiana* A. Juss & dissolved with water & drenching.	O	F	Cattle
					Sute	Trypanosomiasis	Pounded along with leaves of *Dodonaea angustifolia*. L.f & *Embelia schimpei* Vatke & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
*Haplocarpha rueppellii (*Sch. Bip.) Beauv.	Asteraceae	Taseta	R	H	Tamanimero	Splenomegaly	The roots are pounded & boiled with water & drenching.	O	F/S	Cattle
					Sinch	Blackleg	Pounded along with *Thymus schimperi* Ronninger, leaves of *Inula confertiflora* A.Rich. A. Rich, *Lobelia giberroa* Hemsl & *Olinia rochetiana* A. Juss & dissolved ensete by product & drenching.	O	F/S	Cattle
					Kaga shabo	Sure milk	Pounded along with roots of Euphorbia sp1, leaves of Hypericum revolutum Vahl, Acmella caulirhiza Del & Myrsine africana L &adding salt and feeding.	Feeding	F/S	Cattle
*Helichrysum schimperi (*Sch. Bip. ex A. Rich.) Moeser	Asteraceae	apso	L	H	Kaga shabo	Sure milk	Pounded along with roots of *Euphorbia* sp1, leaves of *Hypericum revolutum* Vahl, *Acmella caulirhiza* Del & *Myrsine africana* L &adding salt and feeding.	O	F	Cattle

Hibiscus berberidifolius A. Rich.	Malvaceae	kasa	L	S	Washikala	skin disease	Pounded along with seeds of *Calpurnia aurea* (Ait.) Benth, epp of *Croton macrostachyus* Del & *Prunus persica* (L.) Batsch & Paint with better	External	F	Cattle, Goat, sheep
			R		Hubama	Hapocalicia	Pounded along with roots of *Tragia plukenetii* Radcl.-Sm & dissolved with water & drenching	O	F	Cattle
Hypericum quartinianum A. Rich.	Hypericaceae	Arnsheshо	L	T	Kemar	GI parasite	Pounded along with *Olinia rochetiana* A. Juss, *Solanum anguivi* Lam, *Agarista salicifolia* (Comm. ex Lam) Hook.f & *Microglossa pyrifolia* (Lam.) Kuntze &dissolved with water & drenching & anal application with strow.	O, An		Cattle, Goat, sheep
					Mich	Pneumonia	Pounded along with *Stephania abyssinica* (Dillon & A. Rich) Walp & *Leonotis ocymifolia* (Burm. f.) Iwarsson & dissolved with water & drenching & squeezed anally.	O,N		Cattle, Goat, Sheep Horse
					Kuta	Colic	Pounded along with roots of *Stephania abyssinica* (Dillon & A. Rich) Walp, leaves of *Cyathula cylinderica* Moq, *Buddleja polystachya* Fresen & *Galium simense* Fresen & dissolved with water & drenching.	O	F	Horse Cattle
			Fl		Shusho	Pasturolosis	Pounded along with seeds of *Maesa lanceolata* Forssk. Forssk & *Brassica carinata* A. Br & dissolved with water & drenching.	O	F	Cattle, Goat, sheep

Hypericum revolutum Vahl	Hypericaceae	Faya	L	S	Zeya shabo	Milk bad oder	Pounded along with leaves of *Osyris quadripartita* Decn, *Cissus populnea* Guill. & Perr, *Periploca linearifolia* Quart. -Dill. & A. Rich & epiphaits of *Syzygium guineese* (Willd.) DC. subsp. *Guineense* & adding salt & feed.	Feeding	F	Cattle
Ilex mitis (L.) Raldk.	Aquifoliaceae	Botewa	L	T	Sinch	Blackleg	Pounded along with leaves of *Microglossa pyrifolia* (Lam.) Kuntze, *Haplocarpha rueppellii* (Sch. Bip.) Beauv & *Dodonaea angustifolia* L.f & dissolved with water & drenching.	O	F	Cattle
Indigofera spicata Forssk.	Fabaceae	Faztupo	L	S	Masa	Foot and mouth disease	Pounded & dissolved with water and drenching	O		Cattle
Inula confertiflora A.Rich.	Asteraceae	Hoyazu	L	S	Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke, leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Juniperus procera* Hochst. ex Endl & *Lobelia giberroa* Hemsl & dissolved with ensete by product & drenching & given anally.	O,An	F	Cattle
					Himata keronak	Butter production	Pounded & boiled along with leaves of *Hypericum revolutum* Vahl & ep of *Syzygium guineese* (Willd.) DC. subsp. *Guineense* & mix with salt allow to feed	Feeding	F	Cattle

					Shusho	Pastreallosis	Pounded along with seed of *Maesa lanceolata* Forssk. Forssk & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
					Kejahaho	Anthex	Pounded along with roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching.	O	F	Cattle
					Chopitu	Brusela abortus	Pounded along with roots of *Stephania abyssinica* (Dillon & A. Rich) Walp, *Osyris quadripartita* Decn, leaves of *Ekebergia capensis* Sparrm & *Clematis longicauda* Steud. ex A. Rich & dissolved with water & drenching.	O	F	Cattle, Goat, Sheep Pig
					Mora/Heberiku/	Pin eye	Pounded along with leaves of *Olinia rochetiana* A. Juss & *Dracaena steudneri* Engler & filtrate and drop in eye.	Ocular	F	Sheep Goat
					Hocha	cough	Pounded along with leaves of *Clematis longicauda* Steud. ex A. Rich, *Maytenus addat* (Loes.) Sebsebe, *Lobelia giberroa* Hemsl & *Olinia rochetiana* A. Juss & dissolved with water & drenching	O	F	
					Kemar	GI parasite		O,An	F	Cattle, Goat, sheep
Jasminum abyssinicum Hochst. ex DC.	Oleaceae	Foro gamidu	L	C	Tetanesi	Tetanus	Pounded along with leaves or roots of *Clematis longicauda* Steud. ex A. Rich & dissolved with water & drenching & paint on wound.	O, External	S	All

Juniperus procera Hochst. Ex Endl.	Cupressaceae	Arkewa	L	T	Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, Lagenaria abyssinica (Hook.f.) C. Jeffrey, *Canarina eminii* Schweinf & *Lobelia giberroa* Hemsl & dissolved with ensete by product & drenching & given anally	O		Cattle
					Kemar	GI parasite	Pounded along with leaves of *Myrsine africana* L, *Olea europaea* L. subsp. *Cusidata* (Wall ex G. Don) Cif, *Premna schimperi* Engl, *Carissa spinarum* L & *Erica arborea* L & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
					hocha	cough				
Justicia schimperiana (Hochst ex Nees) T. Anders	Acanthaceae	Atabiyo	L,EP	S	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, Bersama abyssinica Fresen & *Thelypteris confluens* (Thunb.) C.V.Morton mix with water & drenching.	O,An	F/S	Cattle, Goat, sheep
Kalanchoe petitiana A. Rich	Crassulaceae	Mucha	L	H	Kejahaho	Antherax	Pounded along with leaves of *Euphorbia abyssinica* Gmel, *Clematis longicauda* Steud. Ex A. Rich, *Rhamnus prinoides* L'Hérit & *Dodonaea angustifolia*. L.f & mix with water & drenching	O	F	Cattle

Lagenaria abyssinica (Hook.f.) C. *Jeffrey*	Cucurbitacea e	Ganigana	Fr	C	Karkada	leach	Chopped & putted in water		F	Cattle
					Amishish o	Basilery heamoglo bin urine	Chopped & pounded along with leaves of *Phytolacca dodecandra* L.'Hérit, *Prunus persica* (L.) Batsch, *Discopodium penninervium* Hochst & *Lobelia giberroa* Hemsl & dissolved with water & drenched	O	F	Cattle Sheep
					Bahu	Mastits	Pounded along with leaves of *Laggera crispata* (Vahl) Hepper & Wood, *Periploca linearifolia* Quart. -Dill. & A. Rich, *Salvia tiliifolia* vahl & *Salvia nilotica* Jacq & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
Lagenaria siceraria (Molina) Standl.	Cucurbitacea e	Bocha	L	C	maza	Wound	The leaves are pounded and painted on wound	Exter nal		All
Laggera crispata (Vahl) Hepper & Wood	Asteraceae	Gofufa	L	H	Bahu	Mastits	Pounded along with leaves of *Laggera crispata* (Vahl) Hepper & Wood, *Salvia nilotica* Jacq & *Periploca linearifolia* Quart. -Dill. & A. Rich & dissolved with water & drenching	O	F	Cattle, Goat, sheep
Leonotis ocymifolia (Burm. f.) Iwarsson	Lamiaceae	Mika	L	S	Michi	Pneumoni a	Pounded along with Stephania abyssinica (Dillon & A. Rich) Walp & *Hypericum quartinianum* A.	N,O	F	Cattle Horse Donkey

							Rich & dissolved with water & drenching & squeezed anally			Sheep
Lepidium sativa L.	Brassicaceae	Shima	Seed	H	Karkada	leach	Powdered with seeds of *Linum usitatissimum* L & roots of *Allium sativum* L &adding water & drenching & given nasally.	N,O		Cattle
Leucas calostachys Oliv.	Lamiaceae	Dabase	L	H	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Acmella caulirhiza* Del & *Clematis longicauda* Steud. Ex A. Rich & dissolved with water and drenching	O	F	Cattle, Goat, sheep
Leucas martinicensis (Jacq.) R. Br.	Lamiaceae	Mari	L/St	H	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, Acmella caulirhiza Del & *Clematis longicauda* Steud. Ex A. Rich & dissolved with water and drenching.	O	F	Cattle, Goat, sheep
Linum usitatissimum L.	Linaceae	Mororo	Seed	H	Karkada	leach	Powdered along with seed of *Nigella sativa* L & pounded *Allium sativum* L mixed with honey & drenching.	O	S	Cattle
Lippia adoensis Hochst. ex.Walp. var. *adoensis*	Verbenaceae	Shasha	L	S	Shabon masu	Milk quality	Pounded along with leaves of *Acmella caulirhiza* Del, *Thymus schimperi* Ronninger & *Juniperus procera* Hochst. ex Endl & feeding	Feeding	F	Cattle
Lobelia giberroa Hemsl.	Campanulaceae	Humiru	L	S	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, Solanum anguivi Lam, *Euphorbia schimperiana*, *Premna schimperi* Engl&	O	F/S	Cattle, Goat, sheep

							Juniperus procera Hochst. ex Endl & dissolved with water & drenching			
					Sinch	Blackleg	Pounded along with seed of *Embelia schimpei* Vatke & dissolved with water & drenching	O,An	F	Cattle
					Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Phytolacca dodecandra* L.'Hérit, *Stephania abyssinica* (Dillon & A. Rich.) Walp, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & *Discopodium penninervium* Hochst & dissolved with water & drenching.	O	F	Cattle Sheep
					hocha	cough	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Solanum anguivi* Lam, *Euphorbia schimperiana*, *Premna schimperi* Engl& *Juniperus procera* Hochst. ex Endl & dissolved with water & drenching			All
Maesa lanceolata Forssk.	Myrsinaceae	Tegewa	Seed	T	shusho	Pastreallosis	Pounded along with seed of *Lepidium sativa* L, roots of *Allium sativum* L & leaves of *Clerodendrum myricoides* (Hochst.) Vatke & dissolved with water & drenching.	O	F/S	Cattle, sheep
					Tisha	Fasciola	Pounded along with seeds of *Coriandrum sativum* .L & *Thymus schimperi* Ronninger &dissolved with water &drenching.	O	F/S	Cattle

Malva parviflora Höjer	Malvaceae	Nosma	L	S	Kina kesu	Delayed placenta	Pounded along with leaves of *Brassica carinata* A. Br. & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
*Maytenus addat (*Loes.) Sebsebe	Celastraceae	Mara	L	S	Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich., *Olinia rochetiana* A. Juss, *Dodonaea angustifolia*. L.f, *Clematis longicauda* Steud. ex A. Rich & *Myrsine africana* L & dissolved with water &drenching.	O	F/S	Cattle, Goat, sheep
Maytenus gracilipes (Welw. ex Oliv.) Exell	Celastraceae	Tuluma	L	S	Mora	Pin eye	Pounded, squeezed & drop in eye.	Ocular		Sheep Goat
Maytenus senegalensis (Lam.) Exell	Celastraceae	Boni sona	L	S	Sinch	Blackleg	Pounded along with seed of *Embelia* schimpei Vatke, leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Canarina eminii* Schweinf & *Lobelia giberroa* Hemsl & dissolved with ensete by product & drenching.	O	F/S	Cattle
Microglossa pyrifolia (Lam.) Kuntze	Asteraceae	Hetini sukaru	L	S	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Premna schimperi* Engl, *Cordia africana* Lam & roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching.	O		Cattle, sheep

					Sute	Trypanosomiasis	Pounded along with leaves of *Acmella caulirhiza* Del, *Vernonia hochstetteri* Sch. Bip. ex Walp & roots of *Allium sativum* L & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
					Sinch	Blackleg	Pounded along with leaves of *Inula confertiflora* A.Rich., *Lobelia giberroa* Hemsl, *Buddleja polystachya* Fresen & *Clematis longicauda* Steud. Ex A. Rich & dissolved with water &drenching	O	F	Cattle
					Kodinomero	Skin disease	Pounded along with bark of *Pennisetum cladestinum* choiv & drenching.	O	F	Horse
					Hocha	Cough	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Premna schimperi* Engl, Cordia africana Lam & roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching.	O	F	All
Momordica foetida Schumach	Cucurbitaceae	Wojimiya	L	C	Nifaso	Rabis	Pounded &drenching	O	F	All
Myrsine africana L.	Myrsinaceae	Futwaya	L	S	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Dodonaea angustifolia*. L.f, Erica arborea L & *Inula confertiflora* A.Rich. A. Rich & dissolved with water & drenching.	O	F/S	Cattle, sheep

					Sesa shabo	Watery milk	Pounded & boiled along with leaves of *Osyris quadripartita* Decn, *Cissus populnea* Guill. & Perr, *Periploca linearifolia* Quart. -Dill. & A. Rich & epiphaits of *Syzygium guineese* (Willd.) DC. subsp. *Guineense* & adding salt & feed.	Feeding	F/S	Cattle
Nicotiana tabacum L.	Solanaceae	Tumako	L	H	Karkada	leach	Pounded along with fruits of *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & mix with water & drenching & given anally.	O,N	F/S	Cattle
					Hocha	Cough	Pounded along with leaves *Olinia rochetiana* A. Juss & *Inula confertiflora* A.Rich. A. Rich & dissolved with water & drenching.	O	F/S	All
					Katinikita	Bloat	Pounded along with leaves of *Croton macrostachyus* Del & opping animal's mouth & inserting by hand.	O	F/S	Cattle
					Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Phytolacca dodecandr*a L.'Hérit, *Stephania abyssinica* (Dillon & A. Rich.) Walp, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & *Discopodium penninervium* Hochst & dissolved with water & drenching	O	F/S	Cattle Sheep

Nigella sativa L	Ranunculaceae	Kara azimacha		H	Karkada	leach	Powdered along with seed *Linum usitatissimum* L & pounded *Allium sativum* L mixed with honey & drenching	O,N		Cattle
Ocimum sanctum.	Lamiaceae	Himateto	L	H	Zawa	Thelazia	Pounded along with leaves of Croton macrostachyus. Del & squeezing & drop in eye.	Ocular	F	Cattle
Ocimum lamiifolium Hochst. Ex Benth.	Lamiaceae	damakase	L	H	Michi	Pneumonia	Pounded along with leaves of *Croton macrostachyus* Del, *Brucea antidysentrica* J.F. Mill & *Stephania abyssinica* (Dillon & A. Rich.) Walp & squeezing nasally.			Horse Cattle Sheep Goat
Olea europaea L. subsp. *Cusidata* (Wall ex G. Don) Cif.	Oleaceae	Buna	L	T	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Premna schimperi* Engl & *Juniperus procera* Hochst. ex Endl & dissolved with water & drenching.	O	F	Cattle, Goat, Sheep Horse
Olinia rochetiana A. Juss.	Oliniaceae	Fegegu	L	T	Kemar	GI parasite	Pounded along with leaves of *Lobelia giberroa* Hemsl, *Premna schimperi* Engl, *Cordia africana* Lam & roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching		F/S	Cattle, Goat, Sheep Horse
					Sesa shabo	Watery milk	Pounded along with leaves of *Osyris quadripartita* Decn & *Hypericum revolutum* Vahl & feeding	feeding	F/S	Cattle
					Sinch	Blackleg	Pounded along with leaves of *Inula confertiflora* A.Rich. A. Rich, *Lobelia giberroa* Hemsl,	O	F	Cattle

							Buddleja polystachya Fresen & *Clematis longicauda* Steud. Ex A. Rich & dissolved with water &drenching			
					hocha	cough	Pounded along with leaves of *Lobelia giberroa* Hemsl, *Premna schimperi* Engl, *Cordia africana* Lam & roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching	O		All
					Mora/Heberku/	Pin eye	Pounded along with leaves of *Dracaena steudneri* Engler & *Inula confertiflora* A.Rich. & squeezed & droped in eye	Ocular	F	Sheep Goat
					Bahu	Mastitis	Pounded along with leaves of *Buddleja polystachya* Fresen & *Leucas martinicensis* (Jacq.) R. Br & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
					Kodin mero	Skin disease	Pounded along epiphate of *Croton macrostachyus* Del, *Prunus persica* (L.) Batsch, seeds of *Podocarpus graciliar* & *Calpurnia aurea*. (Ait.) Benth & enclosed with fiber & rubbing.	External	F	Cattle, Goat, sheep
Oreosyce africana Hook.f.	Cucurbitaceae	Sikilu/kahoniaju/	L	C	Kemar	GI parasite	Pounded along with leaves of *Inula confertiflora* A.Rich., *Olinia rochetiana* A. Juss & *Leucas*	O,An	F	Cattle, Goat, sheep

							calostachys Oliv & dissolved with water & drenching & given anally.			
					Fatu	Fatting	pounding and boilling	Feeding	F	Cattle,
					sirktigegna	Internal parasate	Pounded and boiled along with leaves of *Vernonia hochstetteri* Sch. Bip. Ex Walp, *Premna schimperi* Engl, *Olinia rochetiana* A. Juss & *Juniperus procera* Hochst. Ex Endl & feeding with salt	Feeding	F	Cattle, Goat, sheep
					Katinikita	Bloat	Pounded along with leaves of *Croton macrostachyus*. Del, *Nicotiana tabacum* L & *Juniperus procera* Hochst. Ex Endl mix with water & drencing	O	F	Cattle
			R		Bahu	Mastitis	Pounded along with leaves of *Oreosyce africana* Hook.f, *Ricinus communis*, and Croton macrostachyus. Del, *Phytolacca dodecandra* L.'Hérit & *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & feeding	O	F	Cattle, Goat, sheep
					Nifaso	Rabies	The roots are pounded dissolved with water & drenching.	O	F	All
Osyris quadripartita Decn	Santalaceae	Makakuma	L	S	Shabonmasu	Milk quality	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Hypericum revolutum* Vahl & *Syzygium*	Feeding	F	Cattle

							guineese (Willd.) DC. subsp. *Guineense* & adding salt & feedinh.			
Oxyanthus speciosus DC.	Rubiaceae	Wetekibo	L	S	Asuni afa	Evil eye	Pounded & dissolved with water then drenching & paint on body of animals.	External	F	All
Pavonia urens Cav.	Malvaceae	Nosa	R	S	Kina keronak	Delayed placenta	Pounded along with leaves of *Urera hypselodendron* (A. Rich.) Wedd& dissolved with water & drenching	O	F	Cattle, Goat, sheep
Pennisetum cladestinum choiv.	Poaceae	Gada	whole	H	Zawa	Thelazia	The whole part is pounded mix with ensete by product & drenching	O	F	Cattle
Pennisetum sphacelatum Th. Dur. & Schinz	Poaceae	Fasha	R	H	Amishisho	Basilery heamoglobin urine	Pounded along with roots of *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & dissolved with water & drenching	O	F	Cattle Sheep
Periploca linearifolia Quart. - Dill. & A. Rich.	Asclepiadaceae	Tubu	L	C	Bahu	Mastitis	Pounded along with leaves of *Laggera crispata* (Vahl) Hepper & Wood, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Salvia tiliifolia* vahl & *Salvia nilotica* Jacq & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
Phoenix reclinata Jacq.	Arecaceae	Deya	R	T	Agugitu	Actinomicosis	Pounded along with roots of *Asparagus setaceus* (Kunth) Jessop leaves of Inula confertiflora A.Rich. A. Rich & *Acmella caulirhiza* Del & dissolved with water & drenching.	O	F	Cattle

Phytolacca dodecandra L.'Hérit	Phytolaccaceae	Andode	L	S	Kemar hocha	GI parasite cough	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Premna schimperi* Engl & *Juniperus procera* Hochst. ex Endl & dissolved with water & drenching.	N		Cattle, Goat, sheep
					Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Stephania abyssinica* (Dillon & A. Rich.) Walp & *Lobelia giberroa* Hemsl & dissolved with water & drenching	O	F	Cattle Sheep
					Bahu	Mastits	Pounded along with leaves of *Oreosyce africana* Hook.f, *Ricinus communis*, Croton macrostachyus. Del & *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & feeding	O	F	Cattle, Goat, sheep
			R		Kodin mero	Skin disease	Pounded along with barks of *Podocarpus falcatus* (Thaub.) R.B. ex Mirb, *Schefflera abyssinica* (Hochst. ex A, *Croton macrostachyus.* Del & *Erythrina brucei* Schweinf & dissolved with water & drenching & paint on skin.	O, external	F/S	Cattle Horse Sheep Goat
Pittosporium viridiflorum Sims	Pittosporaceae	Toshu	L	T	Sinch	Black leg	Pounded with along roots of *Stephania abyssinica* (Dillon & A. Rich.) Walp & dissolved withwater and drenching.	O	F	Cattle

Plantago lanceolata L.	Plantaginaceae	Buriyo	L	H	Karkada	leach	The leaves are pouned and boiled then drenching.	O		Cattle
Podocarpus falcatus (Thaub.) R.B. ex Mirb.	Podocarpaceae	Gedewa	Ba	T	Kodin mero	Skin disease	Pounded along with barks of *Schefflera abyssinica* (Hochst. ex A, Croton macrostachyus. Del, *Erythrina brucei* Schweinf & roots of *Phytolacca dodecandra* L.'Hérit & dissolved with water, drenching & paint on skin.	O, external	F	Cattle, Goat, Sheep Horse
			L		Sinch	Blackleg	Pouned along with leaves of *Crotalaria incana* L dissolved with water & *Juniperus procera* Hochst. Ex Endl & mix with water & drenching	O	F	Cattle
					kemar	GI parasite	Pounded along with leaves of *Croton macrostachyus*. Del &	O		Cattle, sheep
			La		Nohu	Babesia	Pounded along with fruits of *Phytolacca dodecandra* L.'Hérit & mix with water & drenching.	O	F	Cattle
					Nifaso	Rabis	Pounded along with roots of *Clematis longicauda* Steud. Ex A. Rich, leaves of *Urera hypselodendron* (A. Rich.) Wedd & seeds of *Eucalyptus globulus* Labill & dissolved with water & drenching.			All

Podocarpus graciliar	Podocarpaceae	Zagu	Seed	T	Washikala	Skin disease	Pounded along with seeds of *Calpurnia aurea* (Ait.) Benth, epp of *Croton macrostachyus* Del & *Prunus persica* (L.) Batsch & Paint with better	External	S	Cattle, Goat, Sheep Horse
Premna schimperi Engl.	Lamiaceae	Wagnara	L	S	sinch	Blackleg	Pouned along with leaves of *Crotalaria incana* L dissolved with water & *Juniperus procera* Hochst. Ex Endl & mix with water & drenching	O	Fresh	Cattle
					Sirki tigegna	Internal parasate	Pounded and boiled along with leaves of *Vernonia hochstetteri* Sch. Bip. Ex Walp, *Olinia rochetiana* A. Juss & *Juniperus procera* Hochst. Ex Endl & feeding with salt.	Feeding	Fresh	Cattle, sheep
					Katn kita	Bloat	Pounded along with leaves *Myrsine africana* L& *Nicotiana tabacum* L.& dissolved with water &drenching	O	Fresh	Cattle
					hocha	Cough	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Lobelia giberroa* Hemsl, *Premna schimperi* Engl, *Cordia africana* Lam & roots of *Crinum abyssinicum* Hochst. Ex A. Rich & dissolved with water & drenching	O	Fresh	Cattle, Goat, sheep
					Kemar	Rectal parasite				
Prunus africana. (Hook. f.) Kalkm	Rosaceae	Hona	L	T	Sesa shabo	Watery milk	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & *Syzygium guineese* (Willd.) DC.	O	F	Cattle

							subsp. *Guineense* & dissolved with water & drenching.			
			Br		Nohu	Babesiosis	Pounded along with barks of *Dracaena steudneri* Engler, *Dombeya torrida* (J. F. Gmel.) P. Bamps & *Maesa lanceolata* Forssk. Forssk & dissolved with water &drenching	O	F/S	Cattle
Prunus persica (L.) Batsch	Rosaceae	Kuko	L	T	Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Phytolacca dodecandr*a L.'Hérit, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Stephania abyssinica* (Dillon & A. Rich.) Walp & *Lobelia giberroa* Hemsl & dissolved with water & drenching.	O	F	Cattle Sheep
			Ep		Washikala	Skin disease	Pounded along with epiphait of *Croton macrostachyus.* Del, seeds of *Podocarpus graciliar, Calpurnia aurea*. (Ait.) Benth & *Olinia rochetiana* A. Juss & mix with better & paint.	External	F	Cattle
Pycnostachys abyssinica Fresen.	Lamiaceae	Zero	L	S	Hishma	Concepation	Pounded along with leaves of *Clerodendrum myricoides* (Hochst.) Vatke & dissolved with water & drenching.	O		All
Rhamnus prinoides L'Hérit.	Rhamnaceae	Geshe	L	S	Kejahahor	Antherax	Pounded along with leaves of *Clematis longicauda* Steud. Ex A. Rich, *Dodonaea angustifolia*. L.f, *Euphorbia abyssinica* Gmel &	O	F	Cattle

							Kalanchoe petitiana A. Rich &dissolved with water & drenching.			
					Akonimero	Newcastle disease	The leaves are pounded & mix with water and oral administration	O	F	Hens
Rhamnus staddo A. Rich.	Rhamnaceae	Wacha	L	T	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Microglossa pyrifolia* (Lam.) Kuntze, *Premna schimperi* Engl& *Euphorbia abyssinica* Gmel & mix with water & drenching.	O	F	Cattle, Goat, sheep
Rhus natalensis Krauss	Anacardiaceae	Kamo	L	S	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Microglossa pyrifolia* (Lam.) Kuntze, *Premna schimperi* Engl& *Euphorbia abyssinica* Gmel & mix with water & drenching	O	F	Cattle, Goat, sheep
Ricinus communis	Euphoriaceae	Kobo	L	S	Bahu	Mastits	Pounded along with leaves of Oreosyce africana Hook.f. *Croton macrostachyus*. Del, *Phytolacca dodecandra* L.'Hérit & *Lagenaria abyssinica* (Hook.f.) C. Jeffrey & feeding	Feeding	F	Cattle, Goat, sheep
					Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Brucea antidysentrica* J.F. Mill & *Centella asiatica* (L.) Urban mix with water & drenching.	O	F	Cattle sheep
Rosa abyssinica Lindley	Rosaceae	Garona	L	C	Kemar	GI parasite	Pounded along with leaves of *Erica arborea* L, *Thelypteris confluens* (Thunb.) C.V.Morton,	O	F	Cattle, Goat, sheep

							Solanecio gigas (Vatke) C. Jeffrey & *Premna schimperi* Engl & mix with water & drenching			
Rubia cordifolia L.	Rubiaceae	Sabini achicha	L	C	Sute	Trypanosomiasis	Pounded along with leaves of *Acmella caulirhiz*a Del, *Vernonia hochstetteri* Sch. Bip. ex Walp & roots of *Allium sativum* L & dissolved with water & drenching.	O	F	Cattle, Goat, sheep
Ruta chalepensis L	Rutaceae	Chirata	St	H	Bahu	Mastits	Cutting stems and thoroughly inserting in opining of teats.		F	Cattle, Goat, sheep
Salvia nilotica Jacq.	Lamiaceae	Hokita	L	H	Bahu	Mastits	Pounded along with leaves of *Laggera crispata* (Vahl) Hepper & Wood, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, Salvia tiliifolia vahl & *Periploca linearifolia* Quart. -Dill. & A. Rich & dissolved with water & drenching	O	F	Cattle, Goat, sheep
Salvia rosmarinus		Tibis kitel	L	H	Katn kita	Bloat	Pounded along with fruits of *Capsicum frutescens* L & opping mouth of animals & inserting by hand.	O	F	Cattle
Salvia tiliifolia Vahl.	Lamiaceae	Shushima	L	H	Bahu	Mastits	Pounded along with leaves of *Laggera crispata* (Vahl) Hepper & Wood, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Salvia nilotica* Jacq & *Periploca linearifolia* Quart. -Dill. & A. Rich & dissolved with water & drenching	O	F	Cattle, Goat, sheep

Satureja paradoxa (Vatke) Engl. ex Seybold	Lamiaceae	kambewa /Afgeta	L	H	Mora	Pin eye	Crushed & squeezed then drop in eye	Ocular	F	Sheep Goat
Schrebera alata (Hochst.) Welw.	Oleaceae	Horewa	L	T	Sisa	Plant toxin	Pounded mix with butter and given nasally	N	F	All
Securidaca longepedunculata Fresen.	Polygalaceae	Amali	R	S	Bahu	Mastits	Pounded along with roots of *Euphorbia* sp1, barks of Acacia negrii Pic. Serm, *Vernonia amygdalina* Del & *Maesa lanceolata* Forssk. Forssk & mix with water & drenching	O	S	Cattle, Goat, sheep
Schefflera abyssinica (Hochst. ex A. Rich.) Harms	Araliaceae	Daga	B	T	amishisho	babesia	Pounded along roots of *Pennisetum sphacelatum* Th. Dur. & Schinz & dissolved with water & drenching.	O	F	Cattle
			B		Kodnmero	Skin disease	Pounded along with barks of *Podocarpus falcatu*s (Thaub.) R.B. ex Mirb, *Croton macrostachyus* Del, *Erythrina brucei* Schweinf & roots of *Phytolacca dodecandra* L.'Hérit & dissolved with water ,drenching & paint on skin.	O, External	F	Cattle, Goat, Sheep Horse
					Ameba	Amoebae	Pounded along with barks of *Erythrina brucei* Schweinf & *Dracaena steudneri* Engler dissolved with water & drenching.	O	F	Cattle Horse

			Ep		shabo	Milk quality	Pounded along epiphate of *Prunus persica* (L.) Batsch & chopping whole part of *Ensete venteicosum* (Welw.) & feeding together.			Cattle
Sida schimperiana Hochst. ex A. Rich.	Malvaceae	Keja	R	S	Sinch	Blackleg	Pounded along with roots of *Oreosyce africana* Hook.f & dissolved with water & drenching.	O,An	F	Cattle
Smilax aspera L.	Smilacaceae	Koha	L	C	Kemar	GI parasite	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Premna schimperi* Engl & Juniperus procera Hochst. ex Endl & dissolved with water & drenching.	O	F/S	Cattle, Goat, sheep
Solanecio gigas (Vatke) C. Jeffrey	Asteraceae	Domoris a	L	S	Kemar	GI parasite	Pounded along with leaves of *Erica arborea* L, *Thelypteris confluens* (Thunb.) C.V.Morton, *Rosa abyssinica* Lindley & *Premna schimperi* Engl. & dissolved with water & drenching	O	F	Cattle, Goat, sheep
Solanum anguivi Lam.	Solanaceae	Gameke wa	L	S	Sisa/bilig na	Plant toxin	Pounded aling with leaves of *Solanum nigrum* L, *Myrsine africana* L & *Agarista salicifolia* (Comm. ex Lam) Hook.f then filtrate & dissolve dwith butter & given nasally.	N	F	cattle
Solanum incanum L.	Solanaceae	Amamu	frui t	S	Ago	Blue toung	Pounded along with leaves of *Clematis longicauda* Steud. Ex A. Rich, *Nicotiana tabacum* L, *Ajuga integrifolia* Buch. -Hem. ex D. Don & *Croton macrostachyus*. Del & dissolved with water & drenching.	O		Cattle

Solanum nigrum L.	Solanaceae	Hereto	L	S	karkada	Leach	Chopped along with leaves of *Nicotiana tabacum* L & wrapped with ensete leav & putting in fire then feeding.	Feeding	F	Cattle
*Stephania abyssinica (*Dillon & A. Rich.) Walp.	Menispermaceae	Tamitako	Whole	C	Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Phytolacca dodecandra* L.'Hérit, *Lagenaria abyssinica* (Hook.f.) C. Jeffrey, *Prunus persica* (L.) Batsch & *Lobelia giberroa* Hemsl & dissolved with water & drenching	O	F	Cattle Sheep
					Biche	Epziotic lyphanjits	Pounded along with roots of *Acanthus eminens* C.B. Clarke & leaves of *Caylucea abyssinica* (Fresen.) Fisch. & Mey mix with water & drenching & paint.	External , O	F	Horse
					Nifaso & zawinidupa.	Rabis & snake bite	Pounded along with roots of *Cucumis ficifolius* A.Rich. A. Rich, *Justicia schimperiana* (Hochst ex Nees) T. Anders & *Dodonaea angustifolia*. L.f & mix with powder of Erirgrustis tef & cooking brade & feeding	Feeding		All
					Kita	Render pest	Pounded along with fruits of *Capsicum frutescens* L mix with better & paint.	O, external		Cattle

Syzygium guineese (Willd.) DC. subsp. *guineense*	Myrtaceae	Shawu	L/ep	T	Sesa shabo	Watery milk	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Hypericum revolutum* Vahl & *Syzygium guineese* (Willd.) DC. subsp. *Guineense* & adding salt & feedinh	O	F	Cattle
Teclea nobilis Del. Del.	Rutaceae	Meku	R	S	Shabon masu	Milk/butter quality	The roots are pounded and boiled and drenching.	O,N	F	Cattle
Thalictrum rhynchocarpum Dill. & Rich.	Ranunculaceae	Showotasa	R	H	Amishisho	Basilery heamoglobin urine	Pounded along whole parts of *Stephania* abyssinica (Dillon & A. Rich.) Walp mix with water & drenching	O	S	Cattle sheep
*Thelypteris confluens (*Thunb.) C.V.Morton	Siphonopteridaceae	Biska	L	H	Kemar	GI parasite	Pounded along with leaves of *Erica arborea* L, *Solanecio gigas* (Vatke) C. Jeffrey, Rosa abyssinica Lindley & *Premna schimperi* Engl & mix with water & drenching.	O,An	F	Cattle, Goat, sheep
Thymus schimperi Ronninger	Lamiaceae	Zifiya	L/St	H	Sinch	Blackleg	Pounded along with leaves of *Olinia rochetiana* A. Juss, *Lobelia giberroa* Hemsl, Crotalaria incana L & *Haplocarpha rueppellii* (Sch. Bip.) Beauv & dissolved with water & drenching.	O	F/S	Cattle
					Tisha	Fasciola	Pounded along with seeds of *Maesa lanceolata* Forssk. Forssk & Coriandrum sativum .L & dissolved with water & drenching.	O	F/S	Cattle
Tragia brevipes Pax	Euphorbiaceae	Guho/Geldu	L	C	Hishma	Concepation	The leaves are pounded & drenching.	O	F	All

Tragia plukenetii Radcl.-Sm.	Euphorbiaceae	Huga	R	H	Kina kesu	Delayed placenta	Pounded along with bark of *Dracaena steudneri* Engler & powder of *Linum usitatissimum* L & dissolved with water & drenching.	O	S	Cattle, Goat, sheep
					Hubama	Hypocalicia	Pounded along with roots of *Hibiscus berberidifolius* A. Rich & dissolvded with water & drenching.	O	S	Cattle
					Kuta	Colic	Pounded along with leaves of *Urera hypselodendron* (A. Rich.) Wedd & dissolved with water & drenching.	O	S	Horse Cattle
Triticum dicoccon (Schrank) Schübl.	Poaceae	Hombori	Seed	H	Hocha	Cough	Feeding for equeins	Feeding	S	All
Urera hypselodendron (A. Rich.) Wedd.	Urticaceae	Alu	L	C	Sinch	Black leg	Pounded along with leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, *Phytolacca dodecandra* L.'Hérit, Myrsine africana L & *Pycnostachys abyssinica* Fresen & dissolved with water & drenching.	O	F	Cattle
					Konaza	Foreign body	Pounded along with leaves of Solanecio gigas (Vatke) C. Jeffrey mix with water & drenching.	O	F	All
			L		Kina	Delayed placenta	Pounded along with *Tragia plukenetii* Radcl.-Sm mix with water & drenching.	O	F	Cattle, sheep

					Amishisho	Basilery heamoglobin urine	Pounded along with leaves of *Canarina eminii* Schweinf, *Thelypteris confluens* (Thunb.) C.V.Morton, *Hypericum quartinianum* A. Rich & *Microglossa pyrifolia* (Lam.) Kuntze & dissolved with water & drenching.		F	Cattle Sheep
Vernonia amygdalina Del.	Asteraceae	Sukaru	L	T	Bahu	Mastitis	Pounded along with roots of *Tragia plukenetii* Radcl.-Sm, *Thalictrum rhynchocarpum* Dill. & Rich & bark of *Schefflera abyssinica* (Hochst. ex A. Rich.) Harms & feeding with salt.	Feeding	F	Cattle, Goat, sheep
					Sesa shabo	Watery milk	Pounded and boiled along with leaves of *Pycnostachys abyssinica* Fresen & *Haplocarpha rueppellii* (Sch. Bip.) Beauv & feeding with salt.	Feeding	F	Cattle
Vernonia hochstetteri Sch. Bip. Ex Walp.	Asteraceae	Hotomiya	L	S	sinch	Blackleg	Pounded along with leaves of *Vernonia myriantha* Hook.f, *Premna schimperi* Engl, *Olinia rochetiana* A. Juss & *Hagenia abyssinica* (Bruce) J. F. Gmel & mix with water & drenching.	O	F	Cattle
Vernonia myriantha Hook.f.	Asteraceae	Buzo	L	S	Kemar	GI parasite	Pounded along with leaves of A*cmella caulirhiza* Del, *Carissa spinarum* L., *Agarista salicifolia* (Comm. ex Lam) Hook.f, and *Clematis longicauda* Steud. Ex A. Rich & *Olinia*	O,N, An	F	Cattle, Goat, sheep

							rochetiana A. Juss. & dissolved with water and drenching & given anally.			
Withania somnifera (L.) Dunal	Solanaceae	Zaboni herto		S	Sinch	Blackleg	Pounded along with leaves of *Hagenia abyssinica* (Bruce) J. F. Gmel, *Phytolacca dodecandra* L.'Hérit, *Myrsine africana* L & *Pycnostachys abyssinica* Fresen & dissolved with water & drenching.	O	F	Cattle
Zehneria scabra (Linn.f.) Sond.	Asteraceae	Sakaku	R	C	Dohito	Diarrah	pounded and mix with water & drenching.	O	F	

Appendix 4: List of non plant remedies

Local name	non-plant remedies	part used /product/	methods of preparation & applications	route of administration	disease treated	livestock
kuruma	Porcupine	Meat	Fresh/dry meats is cooked & drenching	O	Skin disease, Evil eye, mastitis	Bovine, Ovine and Equine
Darbo	Dragon	Meat	A fresh/dry meat is cooked & drenching by cannula.	O	Evil eye, Skin disease, GI, Constipation	Bovine, Ovine and Equine
Huko	Squirrel	Meat/ blood/	Fresh/dry meat or blood is cooked & drenching	O	Evil eye, cough, Skin disease	Bovine, Ovine and Equine

Maja	Hyena	Meat	Fresh/dry meats is cooked & drenching	O, fumigation	Evil eye	Bovine, Ovine and Equine
		Bone	Putting the bone on fire & fumigation	Fumigation	Mastitis	Bovine
		Feaces	The feaces are dissolved with water & cooked or without cooked then filtrate with fibers of ensete & drenching	O	Hate the calf/evil eye, Constipation	Bovine, Ovine and Equine
siko	knife		putting in the fire and branding	Topical	Foot rot, Strangle, Trypanosomiasis	Ovine Bovine & Equine
Boto	Apis	honey	Painting foot and mouth.	Topical	Foot and mouth disease	Bovine
			Mix with little water & drenching.	O	Leach	Bovine
		honey comp	Boiled with little water & paint	Topical	Foot and mouth disease	Bovine
Miya	cattle	Butter	Opining the mouth of animals & inserting by hand	O	Bloat, mastitis, Babisia	Bovine
Zeyit	oils	oils	Drenching	O	Foreign body	bovine
Bakuma	Aardvard	Feacea	Putting on fire and fumigation	fumigation	mastitis	cow

Zawa/aka	water	Salty water	Drenching or let to be drunk	O	GI parasite, Constipation	Bovine
Ako	Hens	Eggs	Breaking the eggs and giving orally	O	Fassiola, Pastuellosis	Bovine
Bedina/sir	Wood ash	Ash	The internal part of ash is mix with water & drenching	O	Fassiola	Bovine
hedo/shea woha	Red soil	Soil	The red soil is mix with water & drenching.	O	CBPP/TB	
samuna	Soap	Soap	Paint on maize by product & rubbing	Topical	Actinobasilosis	Bovine
Muko	Bush pig	Meat /Intestine/	Dry intestine is cooked &drenching.	O	skin diseases, Evil eye	Bovine, ovine& equine
Zagno	Monkey	meat	Dry meats is cooked & drenching	O	Constipation, Evil eye, Trypanosomiasi	Bovine
Kaho	Apes	Meat	Fresh/dry meat is cooked & drenching	O	Diarrhea	Whole
Dema	Honeydew	Honey	drenching	O	Fassiola, Trypanosomiasis	Bovine and Ovine
Miya	Cattle	Bile	mix with water	O	Fassiola	
Maro			Feeding mix with other feeds.	feeding	typanosomiasis	

chama	Mud	Mud	Mix soil & water & standing on mud	Topical	FMD	
Erka	Enset by product	Enset by product	Boiled & paint	Topical	FMD, Horfs	Bovine
Kerah	Enset by pruduct	Enset by product	Mix with water and drenching	O	Delayed placenta	
Hirma	Bear	Meat	Dry meat is cooked & drenching	O	Fasciola	
Arake	Alcohol	Alcohol	Drenching	O	bloat	
Benizin	Kerosene	Kerosene	Drenching	O	Blackleg	cattle

Appendix 5. Semi-structured questionnairs used for ethnoveterinary data collection of medicinal plant and non plant remedies in the study area

Informants' consent for the participation in the study:

I_____ (name of informant) hereby give my full consent and conscious to participate in this study and declare that to the best of my knowledge the information that I have provided are true, accurate and complete.

Date: _____ (Signature/Thumb impression of Informant) _____

1. Demographic characteristics of the informants

Name of the respondent----------sex---- age---------district----------Kebele-------

Community/village---------- occupation---------- Ethnicity----------

Educational level**:** illiterate ☐ Elementary (1-6) ☐ Junior secondary school (7-8) ☐

High School (9-12) ☐ Diploma ☐ Degree ☐ other information----------

Marital status: Married ☐ Single ☐ Widowed ☐ Divorce ☐

Religion: Orthodox ☐ Muslim ☐ protestant ☐ other----------

2. Data on values of ethnoveterinary medicinal plants and non plant remedies

2.1 Mention the local names of livestock health problems or diseases occur in your locality?-

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2.2 Mention the local names of traditional medicinal plants and non plant remedies you know in your locality----------

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2.2.1. What are the main medicinal plant used to treat livestock health problems?

Mention types of medicinal plants used for treatment of livestock disease local names, parts used(Pu), Habitat(Ha), Habit(H), preparation method(Pm), local name of diseases treated, administration route, Condition used, Ingredients added, dosage and side effect of the plant?

No	Scientific name	Family name	local names (yemigna)	Part used	Habit	Habitat	Local name of diseases	Disease treated	Preparation method	Route of administration	Condition used	Ingredients added	dose	Side effects	Other value

2.2.2. What are the non plant remedies used to treat livestock ailments? Mention

No	Name of non plant remedies(Yemigna)	Name of non plant remedies(Engilsh)	Methods of preparation	Route of administration	Diseases treated (yemigna)	Diseases treated (Engilsh)	Livestock

2.2.3. Does the traditional healer use only a single traditional medicinal plant to prepare the remedies or by mixing with others? ----------

2.2.4. Any antidotes or side effects?----------

3. How do utilize indigenous knowledge?----------

3.1.What are the ways of transferring of indigenous knowledge of the healers to the next generation?----------
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3.2. How do diagnose and treat the livestock diseases, at what time?----------
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3.3. Are the medicinal plants easily accessible? If not why? List the factors----------
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3.4. What are the additional value of medicinal plants rather than medicinal value?----------
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3.5. Any information and suggestions on medicinal plants and non plant remedies ----------
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Date/Month/Year---------/------/----------

Time: From----------

--------Thank you---------