

# Survey of Veterinary Herbal Folk Medicine and Its Threats in West Arsi Zone, Oromia Regional State, Southern Ethiopia Hirpa Bobaso, Wollega University

## Abstract

*In developing countries, like Ethiopia, livestock production remains crucial and represents a major asset among resource-poor farmers. However, the economic benefit of livestock population is limited due to the prevailing livestock diseases. In Ethiopia, plant remedies are still the most important and sometimes the only sources of therapeutics for human and livestock population. The objective of this study is to document the traditional herbal livestock medicines and knowledge used by elders in the study area. The objective of the study is to identify threats of veterinary Herbal Folk Medicine in West Arsi Zone.*

*A total of fifty four traditional healers were interviewed; and 54 medicinal plant species which are grouped into 31 families were identified in the study area. About 33 livestock ailments were treated and the most common ailments identified in the study area were bacterial and parasitic infestations. The majority of the plants were gathered from the wild and combined with those collected from home garden, based on the knowledge of local elders. The principal route of drug administration was oral followed by topical, nostrils and both oral and topical. Accordingly, medicinal plants play crucial role for the livestock owners. Yet, owners face continues threats from the environment due to timber work, agricultural expansion, overgrazing, deterioration of oral transmission of knowledge and dose related problems. Therefore, the researcher recommends efforts to conserve medicinally important plants, minimize forest clearing and over grazing, and illegal timber works. Plants which have medicinal value should be domesticated from the forests; ethno veterinary knowledge should be documented; budget should be allocated for further scientific investigation; and special attention should be given to indigenous and seasonally available medicinal plants.*

**Key Words:** *Veterinary Herbs, Folk Medicine, Western Arsi Zone, Livestock*

## 1. Introduction

Ethno-veterinary medicine is the studies of traditional knowledge, folk beliefs, skills, methods and practices used for the treatment of livestock ailments. It offers medicines which are cheap and locally available than pharmacotherapy (Tabuti, *et al.*, 2003).

Traditional medicine (also known as indigenous or folk medicine) comprises knowledge systems developed over generations within various societies before the era of modern medicine. WHO, (2014) defines traditional medicine as "the sum total of the knowledge, skills, and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness.

In developing African countries like Ethiopia, livestock production remains crucial and represents a major asset among resource-poor smallholder farmers by providing milk, meat, skin, manure and traction. However, the economic benefits of livestock populations remain marginal due to prevailing livestock diseases (Mesfin and Lemma, 2001).

In Ethiopia, plant remedies are still the most important and sometimes the only sources of therapeutics. Nearly 80% of human and more than 90% of livestock population rely on

medicinal plants. An estimated 6500 to 7000 species of higher plants are of medically important; and out of these medicinal plants 12% are endemic to Ethiopia (Mengistu, 2004).

Even though traditional medical healers are sources of information about herbal medicine, it was found very difficult to obtain their traditional medicinal information as they considered their indigenous knowledge as professional secret, only to be passed orally to their elder sons at their oldest stage (Pankhurst, 2001).

The use of ethno-veterinary practices, to treat and control livestock diseases, is an old practice in a large part of the world, particularly developing countries including Ethiopia where animal health service facilities are still very poor and/or are found scarcely located at urban areas (Kokwaro, 1976). Although Western medicine has become widespread in developing countries, many rural communities are still heavily dependent on plant-based therapies for their primary healthcare (Swanson, 1995; Fratkin, 1996 and Schocke, *et al.*, 2000).

The information collected indicated that dosing of herbal remedies usually involved 750ml in cattle and 375 ml in small stock, irrespective of the concentration of the remedies. As a result, farmers applied herbal remedies in variable concentrations, and this, in turn, might provide variable results. On one hand, there was a possibility that application of a standard dose of very concentrated preparations could actually be toxic to animals. On the other hand, some preparations probably were too dilute to be effective, explaining why some farmers considered herbal remedies to be weak and ineffective (Hedberg, 1993).

Despite their vital role in catering for the health of human and livestock population, large part of the knowledge of ethno medicinal plants is on the verge of irreversible loss, and declining to deterioration due to oral passage (verbally) of herbal heritage from generation to generation rather than in written form (Tadesse, 2007).

Since information on ethno-veterinary medicine haven't been well documented, there is a danger that this knowledge will soon be lost as traditional social patterns are increasingly disturbed by globalization, environmental degradation, agricultural expansion, cultivation of marginal lands and urbanization (Sori, *et al.*, 2004). In line with the above idea, there is no documented survey of herbal remedies in West Arsi zone and medicinal plants are encountering enormous challenges to exist.

Therefore, the objectives of this study were:

- To document the traditional herbal medicines and knowledge used by elders in the study area; and
- To identify threats of veterinary Herbal Folk Medicine in the study area.

## **2. Materials and Methods**

### **2.1 Study Area**

The study was conducted in selected districts of West Arsi Zone (Arsi-Negelle, Kofale and Shashamane) of Oromia Regional State, Southern Ethiopia, from November, 2015 to April, 2016. West Arsi Zone is located at 250 km south of Addis Ababa, and is found in the Rift Valley region. Most parts of the Zone have elevations ranging from 1500 to over 2300 m.a.s.l. Shashamane Town is the administrative center of the Zone.

The mean annual temperature of the Zone is found between 20-25<sup>0</sup>C in the highlands and 10-16<sup>0</sup> C in the lowland areas. However, there is a slight variation of temperature from month to month. October to May is the hottest months, while June to September is the coldest. On average, the Zone gets annual mean rainfall of 1300 mm. Some forests, including Arsi forest, are found in Arsi-Negelle, Shashamane and Kofale districts. The people of the three districts belong to the Oromo ethnic community and others. Afaan Oromo (the Oromo language) is widely spoken in the area (Addisu, 2014; CSA, 2008).

Cattle population of west Arsi zone and types of livestock estimated, respectively, in 2010, 2011, 2012, were: cattle 3,390,756, 3,510,328, 3,629,900; goats 317,272, 312,027, 322,332; sheep 543,802, 639,107, 694,213; horses 185,706, 198,013, 227,784; mules 8,438 8,605, 8,953; donkeys 158,008, 161,524, 165,367, camels 51, 53, 57, poultry 198,020, 245,890 respectively ( Zonal Agricultural and Rural Development Office, 2012).

Arsi-Negelle is one of the districts in West Arsi Zone located between 7<sup>0</sup> 09 up to 7<sup>0</sup>41'N and 38<sup>0</sup>25'-38<sup>0</sup>54'E, in lowland central rift valley region. It is 210 km south of Addis Ababa on the Shashamane-Hawassa road. The overall farming system is strongly oriented towards grain production and dependent on the use of oxen for land preparation. According to the National Metrological Services Agency at Arsi-Negelle station the mean annual temperatures were 6.8<sup>0</sup>c and 27.2<sup>0</sup>c respectively, while rain fall varies between 250-750 mm per annum (NMSA, 2010).

Shashamane is located 250 km south of Addis Ababa, and 25 km north of Awassa. The area lies in the Rift Valley, with altitudes ranging from 1700 to 2600 meters above sea level (m.a.s.l) and located at 7<sup>0</sup> 05'N to 7<sup>0</sup> 19'N, and 38<sup>0</sup> 23'E to 38<sup>0</sup> 41'E. It receives an annual rainfall of 700-950 mm, and has an annual temperature range of 12-27<sup>0</sup>C. Out of the total area of 76,888 hectares; cropland accounts for 48,975 hectares; and the rest are forestland, grazingland and land for other purposes. The urban settlement accounts for 1,733 householders and the cattle population in the districts is 184,549 (Shashamane District Agricultural and Rural Development Office, 2010).

The districts of Kofale is located at 280 km south of Addis Ababa, and is to be found at 7<sup>0</sup> 19'N to 7<sup>0</sup> 40'N and 38<sup>0</sup> 30'E to 38<sup>0</sup> 53'E. (Kofale is a highland, agro-pastoral area with moderate to hot temperature. Rain fall is sufficient. Kofale has erratic type of bimodal rainfall (Kofale District Agricultural and Rural Development Office, 2012). Human population in Kofale districts is estimated around 178,950.

## **2.2. Study Population**

The target populations for this study were traditional household animal healers, specifically knowledgeable elders and a total of 54 individuals were interviewed using semi-structured questionnaire based interview.

## **2.3. Study Design, Sampling Method and Data Collection**

The study sites were purposively selected on the recommendations of local authorities and elders, based on the availability of the practice of traditional medicine, and traditional animal healers, elders, and farming system of the area. Ethno-veterinary botanical survey was conducted to collect data on the traditional usage of plants in livestock health care system using semi-structured questionnaire-based interviews, open-ended interviews, field observations, and field guided walks and guided dialogue techniques with knowledgeable elders who were voluntary to share their indigenous knowledge.

## **2.4 Collection and Identification of Plant Specimens**

Information regarding ethno-veterinary medicinal plants pertaining to livestock ailments in the districts was gathered by interviewing 54 local inhabitants using semi-structured questionnaire-based interviews through the local language (Afaan Oromo). The medicinal plants were collected from the wild and home gardens based on the reports of the informants and preliminary identification was done at the site (in field).

During interview, data regarding the types of livestock ailments treated or prevented; and the types of medicinal plants used including their local names, sources of plants (cultivated, wild or both), types of habitat (trees, shrubs, herbs and climbers), parts of the plants used, mode of preparation, route of administration, availability, public health importance of medicinal plants, socio-economic aspects, collection techniques and other social values of plants were well gathered.

Then, the collected medicinal plant specimens were taken to the Hawassa and Wollega Universities, Faculty of Natural Science National Herbarium Department of Biology. There, they were identified using taxonomic keys and by making a comparison with the already identified specimens that were deposited at National Herbarium of natural science.

## **2.5 Data Analysis**

Finally, all the data collected through questionnaire and survey were entered in to Microsoft Excel Spread sheets. Data analysis was made using Statistical Package for Social Science (SPSS) version 20. Descriptive statistics was used to determine the percentage of herbal medicines and other variables.

## **3. Results**

### **3.1. Medicinal Plants obtained and their Medicinal Uses**

A total of 54 informants were interviewed. The 54 herbal medicines that were categorized into 31 families were found to be used by traditional animal healers in the selected districts of West Arsi Zone (Arsi-Negelle, Shashamane and Kofale). According to this study: Solanaceae 11.1%, Fabaceae 8.1%, Asteraceae 7.4%, Euphorbiaceae 5.6%, and Convolvulaceae 3.7% were the most dominant families of herbal remedies identified in the study area.

This study also revealed that the identified remedies were used to treat bacterial, viral, fungal, protozoal, GIT parasites and ecto parasite diseases, evil eye, repeat breeding, tumor, bloating and snake envenomation, but bacterial and parasitic infestation are the major ailments indicated and most ethno veterinary drugs found are used to treat both animal and human diseases.

### **3.2. Description of Information Obtained from Respondents Based on Different Variables**

Different variables like age, sex, district, Peasant Association (PA) and type of habitat were included in this study to obtain the required information. Among interviewed traditional healers, the most dominant age category was  $\geq 50$  years old; 55.6% which were relatively higher as compared to 40-49 years old; 44.4% and from interviewed respondents, males comprise 90.7% and females are 9.5%.

Number of traditional healers interviewed from each districts were 40.7% from Arsi-Negelle 25.9% from Shashamane and 33.3%, were from Kofale. Interns villages, 9.3%, of these healers were from Alge Dilbato, 13%, from Gubeta, 9.3% from Seyo Meja, 9.3%, Lepis 5.6% from Abaro, 9.3% from Kubi, 5.6% from Chafa Guta, 5.6% from Watara-shagule, 11.1% from Wanpagni Abosa, 5.6% from Sayimena Mudi, 7% from Gurmicho and Wanpagni and 9.3% from Alkaso Peasant Associations. Also the result revealed different types of habitat for these herbal medicines like trees 44.4%, herbs 29.6%, shrubs 16.7% and climbers 9.3% were used.

**Table 1: Age, Sex, District, Peasant Association and Types of Habit versus their Frequency**

Variables	Categories	Frequency	Percentage (%)
Age	Adult (40-49)	24	44.4
	Old ( $\geq 50$ )	30	55.6
	<b>Total</b>	<b>54</b>	<b>100</b>
Sex	Male	49	90.7
	Female	5	9.3
	<b>Total</b>	<b>54</b>	<b>100</b>
Districts	Arsi Negelle	22	40.7
	Shashamane	14	25.9
	Kofale	18	33.3
	<b>Total</b>	<b>54</b>	<b>100</b>
Peasant Associations	Alge Dilbato	5	9.3
	Gubeta	7	13.0
	Seyo Meja	5	9.3
	Lepis	5	9.3
	Abaro	3	5.6
	Kubi	5	9.3
	Chafa Guta	3	5.6
	Watara Shagule	3	5.6
	Wanpagni Abosa	6	11.1
	Sayimanamudi	3	5.6
	Gurmicho	4	7
	Wanpagni Alkeso	5	9.3
	<b>Total</b>	<b>54</b>	<b>100</b>
	Type of habitat	Trees	24
Herbs		16	29.6
Shrubs		9	16.7
Climbers		5	9.3
<b>Total</b>		<b>54</b>	<b>100</b>

**Table 2: Herbal Medicines with their Family, Species and Local name, Part used, Route of Administration and Diseases Treated**

Nº	Local Name	Scientific Name		Parts used	Route of administration	Diseases Treated
		Family Name	Species Name			
1	Ebicha	Asteraceae	Vernonia amygdalina	Leaves	Oral	Para tuberculosis (Johan's disease)
2	Woleenaa	Fabaceae	Erithrina brucei	Buds	Ocular	Conjunctivitis
3	Taruuraa	Lamiifoliaceae	Ocimum lamifolium	Leaves	Oral	Circling disease (coenurus)
4	Heexoo	Rosaceae	Hageria abyssinica	Leaves	Oral	Endo parasites and Tinea saginata in human
5	Doobbii Gurraattii	Convolvulaceae	Ipomea spp	Leaves	Oral	Foot and Mouth disease (FMD) Urethral obstruction in Equine Gastritis in Human
6	Geeshoo	Rhamnaceae	Rhammusprinaideas	Buds and Leaves	Oral	Both types of bloating (frothy and gas bloating) and Salmonellosis
7	Mokkonniisa	Euphorbiaceae	Croton macrostachyus hochst	Buds	Oral and Topical	Both types of bloating and Wound healing
8	Gulbaanaa	NI	NI	Leaves	Oral	For both types of bloating
9	Arbooyee	Convolvulaceae	Ipomea species	Leaves	Oral	For intestinal impaction or removal of undigested non feed materials
10	Buna duudaa	Rubiaceae	Coffee Arabica	Seed	Nostrils	Chocking in calves
11	Hiddii gurraattii	Solanaceae	Schumach	Seed	Nostrils	Chocking
12	Sukkee	Cucurbitaceae	Schumach	Bark	Nostrils	Glanders
13	Abbayyii	Myrsinaceae	Maesallanceolata forssk	Root	Oral	Repeat breeding or ajeessaa in afaan oromo
14	Tambo	Solanaceae	Nocotanata bacum	Leaves	Oral	Pneumonic pasteurellosis in ovine
15	Ceekataa	Ulmaceae	Celtis africana	Leaves	Topical	Ecto parasites
16	Dhittacha	Fabaceae	Acacratortolis	Leaves	Oral	Lung cancer and Ascaris aquarium
17	Hargiisa	Liliaceae	Aloe species	Stem	Oral	For animal and human rabies control
18	Buqqee arbaa	NI	NI	Stem		Malaria in human
19	Banjii	Liliaceae	Datura stramonium	Leaves	Oral	Rabies control in all livestock
20	Sariitii	N	NI	Root		
21	Hadaamii/adaamii	Euphorbiaceae	Euphorbia pliphylla pax	Stem	Topical	Benign tumor or warts
22	Aannannoo	Kleineceae	Euphorbia	Secretion	Topical	Benign tumor
23	Handoodee	Phytolaceae	Phytolaceae dodecandra	Leaves	Oral	GIT parasites and Actinobacillosis or Wooden tongue
24	Ulee foonii	Euphorbiaceae	Clucialanceolata	Root	Oral	Rabies
25	Agamsa	Fabaceae	Carrissaspinarum	Root	Oral	Ring worm, antipyretic and common cold in human
26	Qobboo	Euphorbiaceae	Ricinus communis	Root	Oral	Retained fetal membrane For softening of hide and skin (seed). Other function
27	Baalabofaa (Qoricha)	Zygophyllaceae	Pollieria hygrometra	Leaves	Oral	Snake bite or Envenomation both in
	bofaa)					human and Animal

28	Anfaaree(Anfaara)	Budlejaceae	Budleja polystachya fresen	Leaves	Nostrils	Pneumonic pasteurellosis
29	Warqee	Musaceae	Enset ventricosum	Stem	Oral	Placental retention or removal of retained placenta
30	Surumaa	Urticaceae	Pileabrevistipulaurb	Leaves	Oral	Bone fracture
31	Ciiree(Harkis)	Cactaceae	Opuntieficus indica	Stem	Oral	For placental retention
32	Qullubbii adii	Lidiaceae	Alliumsaturvum L	Bulb	Oral	Michi and stomatitis
33	Qilxuu	Astercaceae	Vernonia hymenolepis, A	Secretion or sap	Oral	Internal parasites
34	Loomii	Rutaceae	Citrus auranti folia	Seed	Oral	Avian Influenza or bird flu
35	Dhummuugaa	Acantaceae	Justicia schimpe riana	Leaf	Oral	Rabies
36	Ejersa	Dacaceae	Oleaeurpea	Leaves	Oral	Arthritis, Paralysis, Back pain Skin diseases
37	Dammakasee	Lamifolium	Ocimum lamifolium	Leaves	Oral	Black leg
38	Maxxanee	Boraginoceae	Cynoglossum lanceolatum forssk	Root	Topical	Mastitis
39	Mukkuree ykn Arriyee	NI	NI	The whole plant	Oral	Ulcerative lymph angitis
40	Jiloo	Asteraceae	Acmella caulirhizadel	Leaves	Oral	Actinobacillosis
41	Annaamuroo	Lamiaceae	Ajuga integrifolia Buch-Hum ex D. Don	Leaves	Oral	Endo parasites
42	Wontefullaasa	Celastraceae	Maytenus obscura	Bark	Oral	Abdominal discomfort or pain or colic
43	Lacee	NI	NI	Leaves and Root	Oral	Repeat breeding
44	Qarcaccee	NI	NI	Bark	Oral	Anthrax
45	Waaccuu	Fabaceae	Acaciaseyal	Leaves	Oral	Lice infestation
46	Qoricha saree maraattee	Papilionioceae	Phaseolus lunatus	Root	Oral	Rabies
47	Gunaa	Fabaceae	Erythrina abyssinica	Leaves	Oral	Cancer and complicated wound
48	Qurquraa adii	Rhamnaceae	Ziziphusmauritiana	Leaves	Oral	GIT parasite infestation and Dermatophytosis (Ring worm)
49	Mi'eessaa	aguifliciae	Ilese mites	Leaves	Oral	Black leg
50	Darguu	Amarantaceae	Achayrentes aspera	Root	Oral	Frothy bloating, michi and colic
51	Ajoo	Fabaceae	Acacia brevispica harms	Bark	Oral	Enteritis
52	Roobaan jireettii (baalbaxxee)	Solanaceae	Solanum anguivicam	Root and leaves	Oral	Envenomation or snake bite and
53	Boraraa	NI	NI	Leaves	Topical	Dermatophytosis (Ring worm)
54	Kurree baarzaafii	NI	Eclophytus tree	seed	Topical	Hemostatic effect, michi and evil eye

**NB:** NI= Not Identified

### 3.3. Parts of Medicinal Plants Used by the Society in the Study Area

The most commonly used parts of herbal medicine were, root 8 (15%), stem 5 (9%), leaves 19 (35%), bark 4 (7%), seed 5 (9%), secretion or sap 3 (6%), buds 2 (4%), bulbs 5 (9%) and more than one part 3 (6%). Leaves and Buds were the higher and the least parts of the plant majorly used by traditional animal healers in the study area respectively.

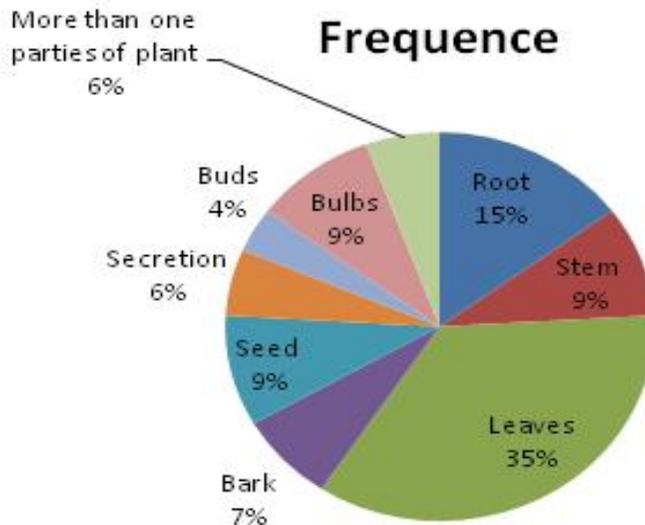


Fig 1: Pictorial Description of Parts of Medicinal Plants used by Society in the Study area

### 3.4 Source, Availability of Plants and Routes of Administration used by Traditional Animal Healers

The common sources of plants were wild, cultivated and both cultivated and wild with 66.7%, 9.3% and 24.1%, respectively. Informants responded that the most popular availability of plants were year round (79.6%) and seasonal (20.4%). The common routes of administration used were oral, nostrils, topical and more than one routes, with 74.1%, 7.4%, 14.8% and 3.7%, respectively (Fig. 2).

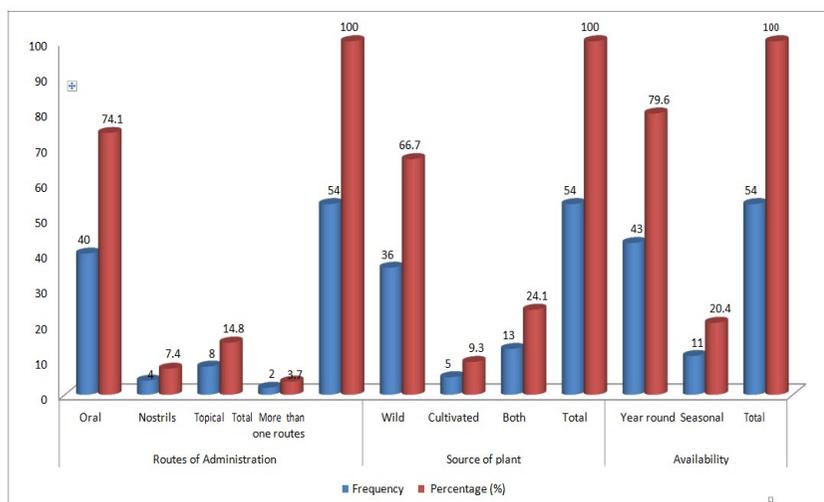


Figure 2: Routes, Source and Availability of the plants versus their frequency

### 3.5. Mode of Traditional Drug Preparation

Crushing (59%), grinding (16.7%), chopping (7.4%), mixed with feed (1.9%), decoction (1.9%), cooking (1.9%), scratching (1.9%) and more than one mode of preparation (9.3%) were modes of herbal medicine preparations in the study area. Crushing is the most dominant mode of veterinary herbal folk medicine preparation, followed by grinding in the study area.

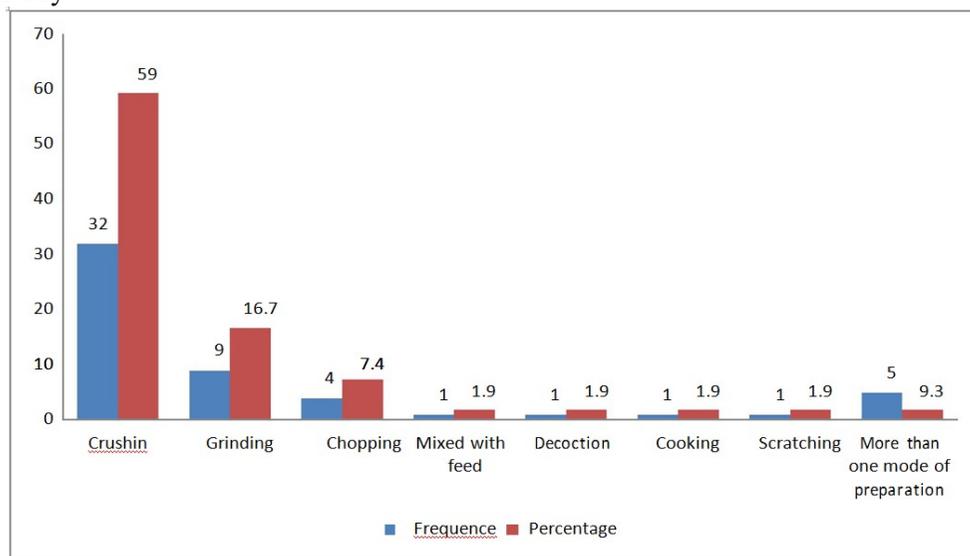


Fig 3: Mode of traditional drug preparation

## 4. Discussion

This study was conducted to identify medicinal plants found in the selected woredas of west Arsi Zone namely, Arsi-Negelle, Shashamane and Kofale. Amentioned in the preceding sections, a total of 54 informants were interviewed about 54 species of veterinary folk herbal

medicines that are categorized into 31 families and used by traditional animal healers to treat 33 various livestock ailments in the study areas. According to this study, Solanaceae (11.1%), Fabaceae (8.1%), Asteraceae (7.4%), Euphorbiaceae (5.6%), and Convolvulaceae (3.7) were the most dominant families of herbal remedies identified in the study area.

This finding is consistent with (Yibrah, 2014) who conducted and reported solanaceae (11.76%), fabaceae (9.80%), asteraceae (9.80%), lobeliaceae (7.84%), lamiaceae (7.84%) and euphorbiaceae (7.84%) on ethno-veterinary botanical survey of medicinal plants in Kochore district of Gedeo Zone, Southern Nations Nationalities and Peoples Regional State (SNNPRs)

This study also revealed that the identified remedies were used to treat bacterial, viral, fungal, protozoal, GIT parasites and ecto parasite diseases, evil eye; repeat breeding, tumor, michi, bloating and snake envenomation. But bacterial and parasitic infestations were the major livestock ailments indicated. These findings are in agreement with those of Tadesse's, (2014) in eastern Wollega. Tadesse reported similar dominant plant families in and around Nekemte; and this compatibility might be due to similar climatic and ecological condition of the two areas.

As this study result reveals, more than half of surveyed plant species (59.26%) are used to treat both livestock and human diseases. This result also indicated that most of traditional herbal medicines were being used to treat animals and human diseases in different Peasant Associations of the study areas even by the single traditional healers or animal health practitioners similar to the rest of Ethiopia. In the contrary, some medicinal plants (40.74%) were exclusively used to treat animal ailments. This finding is consistent with (Praveen *et al.*, 2013) from India where traditional veterinary medicine used by livestock owners of Rajasthan. There is certain overlap between plants used for animal and human medicine though the dose varies greatly.

This study differs with Kelayu *et al.* (2013) from Northern Ethiopia who stated that, major proportions of medicinal plants were used to treat human ailments. This divergence might be due to different study objectives, less consideration for animal health and rare availability of medicinal plants that had veterinary importance.

The present study results indicated that, out of 54 informants, 90.7% and 9.3% were males and females, respectively. Males are the most responsible members of family in learning and passing information related to ethno-veterinary herbal drugs verbally to the next generation as well as treating livestock ailments. In contrast to this, females are almost totally excluded from this practice since knowledge transfer is considered as professional secrete and passed almost entirely to the elder sons and rarely to daughters.

This finding is confirmed what Tadesse *et al.* (2014) from eastern Wollega reported where traditional healers and some local farmers involved in the study were male (88.1%) and female (11.9%); and where most of the respondents were in the older age groups (69.0%). This important consistency between two results reflects presence of constant factors in the study area. This result agrees with the results of Gidey (2014) where males are 100% and females were zero on the practice of using ethnoveterinary medicinal plants used to treat livestock diseases in Seharti-Samre district, Northern Ethiopia. Again, this correspondence may be due to professional secrete and social or culture exclusion of females

From the point of view age, among 54 individuals interviewed, the majority of participants were older age groups (55.6%) while Adults were (44.4%). As Table 1 above shows, this indicates that, the longer they live the more they accumulate knowledge and the more contribution they make towards addressing livestock diseases.

This result corresponds with that of Gidey *et al* (2012) from Mekele, northern Ethiopia, which reported that majority of the respondents were older than 41 years and very few youths were involved in the administration of herbs in the study area and youngsters consider this drugs as back warded or outdated information and neglect them.

An effort has been made to observe the main source of ethno-herbal medicines in the study area. Different sources of plants like wild, cultivated and both cultivated and wild were observed with the percentages of 66.7%, 9.3% and 24.1%, respectively (Table 1).The result indicated that wild type is the most dominant source while those obtained from cultivation and both sources were less common in the study areas.

This is closely related with the findings of Habib *et al* (2014) from Pakistan which documented wild plants (68%), cultivated as well as wild (18%) and cultivated only (14%). Again it also uniform with those of Tadesse and Dereje (2014) who reported wild source dominance 76.5% followed by home gardens 13.7% and both (9.6%) from Horo Guduru Wollega. This uniformity might be due to similar ecological condition of the study areas and very lesser degree of domestication of medicinal plants.

This finding showed that availability of herbal drugs in the study area was 79.6% and 20.4% year-round and seasonal, respectively (Table 1). This result is in concurrence with that of Tadesse *et al* (2014) from East Wollega where the majority of the plants were available every time (92.6%), some are available seasonally (4.90%), and the rest, difficult to get them (2.50%). This Reliability is due to similar climatic conditions between study areas and nature of plants surveyed.

Types of vegetation cover in the study areas were trees (44.4), herbs (29.6%), shrubs (16.7%), climbers (9.3%) and trees constitute the largest percentage while climbers are the least (table 1). The current finding agree with (Yibrah, 2014) from Kochore district of Gedeo Zone, Southern Nations Nationalities and Peoples Regional State who reported, trees, herbaceous and shrubs medicinal plants were the widely used for the treatment of various ailments that constituting the 30, 27.5 and 27.5% respectively, followed by climbers with 1.5 %. This consistency might be because of similar habits of communities to use similar types of plants and treating identical livestock ailments in different areas by traditional healers. The findings also disagree with those of Tessema *et al* (2001) and Teklehymanot and Giday (2010) who documented that herbs were widely used for the treatment of domestic animal diseases. These findings oppose each other may because of different culture of society in using herbal medicine and availability of traditional medicinal plant in the two study areas.

The result of this study showed that the common parts of the plants used for medicinal puposes in the study areas were roots (15%), stems (9%), leaves (35%), barks (7%), seeds (9%), secretion or sap (6%), buds (4%), bulbs (9%) (Fig 1); and more than one parts 3 (6%) in which leaves are frequently used part of the medicinal plant to treat livestock diseases in the study area as compared to the rest parts and this finding is consistent with (Habib *et al.*, 2014). Ethno-veterinary study of medicinal plants in Malak and Valley, from Pakistan, mostly the leaves (28%) of the plant were used by the local inhabitants for curing different ailments of livestock and in line with (Gidey *et al.*, 2012) from Mekele University northern

Ethiopia. The most commonly used plant parts for ethno-veterinary medicine preparations were leaves (68.2%)

According to result of this study, using leaves for drug preparation had positive impacts for continuity of medically important plants when compared to the other parts like roots and barks because unwanted uprooting and complete debarking of plants end up in the destruction of medicinal plants. This result is in agreement with Ugyen *et al* (2011) who documented persistent unscientific harvesting of root of single stemmed; sparsely distributed plant may threaten the survival of important plant species.

According to this study, the common routes of ethno-veterinary drug administration mainly used are oral (74.1%), nostrils (7.4%), topical (14.8%) and more than one route (3.7%) (Table 1). The choice of appropriate route of administration was greatly dependent on the type of livestock ailments to be treated. This result is consistent with (Ngubane, 1977; Liengme, 1981 and Mzamane, 1945). WHO reported that routes and mode of application of herbal remedies varies, depending on the perceived diagnosis.

Topical application of lotions and leaf/root paste was common practice in the treatment of skin conditions, such as wounds, sores, warts and cuts, and also by drenching into prepared medicinal plants. The oral feeding of medicinal herbs followed by topical application was effective for the treatment of livestock ailments. Since, both (oral as well as topical) were applied directly to the affected parts of animals and rapid recovery is maintained.

This finding is in agreement with those of Yibrah (2015) from southern Ethiopia, who reported oral (58.33%) and topical (29.17%) application and oral and topical /both/ 12.5% application and these routes of administrations, both oral and topical routes, they considered rapid physiological reaction with the causative agents and increase the curative power of the medicinal plant remedies.

The present study showed that, the known mode of herbal medicine preparation used by traditional animal healers in the study area were Crushing (59%), Grinding (16.7%), Chopping (7.4%), Mixed with feed (1.9), Decoction(1.9%), Cooking (1.9%), Scratching (1.9%) and more than one mode of preparation (9.3%) (Figure 3) this finding is in agreement with the findings of Abebe and Ayehu (1993) who reported crushing as the dominant mode of drug preparation.

This study is also consistent with those of Alawa *et al* (2003) from ethno-veterinary medical practice for ruminants in the sub humid zone of northern Nigeria. The methods of processing vary from grinding or soaking in water to obtain solutions to inclusion in feed stuff and fed to the animal.

The present finding is concurrent with that of Teshale *et al* (1999) - medicinal plants in the ethno-veterinary practices of Borana pastoralists, Southern Ethiopia, but disagrees with those of Tadesse and Dereje (2014) who reported highest mode of preparation by grinding (49.3%) followed by Crushing (27.7%) and others like chopping, decoction, roasting, consumption of the whole parts and Streaking (23%) from Wollega, selected Horo Guduru Districts. This disparity might be due to various knowledge of traditional healers, practice of herbal medicine and different weather condition between two study areas.

As current study showed, medicinally important folk herbal drugs were encountering many threats in the study areas. Almost all of them are man-made challenges which had paramount negative effect on the perpetuation of medicinal plants as well as to the life of

rural herdsmen especially those located at the periphery of country in which traditional medicine remain the only treatment option.

The principal threats in the study area were agricultural expansion (shifting cultivation and clearing of forest), timber production (one of the worst challenges reported by the local community of study areas), fire wood, construction wood, over exploitation of plants by commercial herbalists. Other challenges which endanger medicinal plants are, oral transfer of knowledge, keeping the information as professional secret and transferring it to the elder or most trusted sons; lack of interest by the new generation considering it as backward knowledge; and dose related problems like toxicity and less effectiveness of the medicinal plants. These results are compatible with those of Assegid and Tesfaye (2014) and Masika *et al* (2000).

## 5. Conclusion and Recommendations

The present study was conducted to document veterinary herbal folk medicine as well as indigenous ethno-veterinary knowledge and practices of communities in West Arsi Zone. A total of 54 traditional healers were interviewed; and 54 medicinal plant species which are grouped in to 31 families used to treat 33 livestock ailments were identified in the study areas. The most common ailments found in the study areas were bacterial and parasitic infestation. The findings indicated that majority of the plants were gathered from wild followed by those collected from home gardens based on the knowledge of local elders and different parts of the plant were involved for various drug formulation mainly through crushing and grinding among which leaves comprises greater proportion. According to this finding, the principal route of drug administration was oral followed by topical, nostrils and both oral and topical. However, medicinal plants are contributing crucial role for the livestock owners, they are facing continues threats from the environment like, timber production, agricultural expansion, overgrazing, oral transmission of knowledge and dose related problems.

Based on the above conclusions the following recommendations are forwarded:

- Government and local community should give more attention to conserve medicinally important plants;
- Forest clearing, over-grazing and illegal timber production should be minimized;
- Plants which have medicinal value should be domesticated from forests;
- Ethn-veterinary knowledge should be documented on regular basis rather than being transmitting through oral tradition;
- Budget should be allocated for further scientific investigation to determine the efficacy and level of toxicity traditional herbal medicines; efforts should also be made to develop safe and convenient dosage formulation; and
- Special attention should be given for indigenous and seasonally available medicinal plants those having crucial societal need.

## References

*Abebe D and Ayehu A (1993): Medicinal plants and Enigmatic Health practice of Northern Ethiopia.*

- Addisu B (2014): *Study on Prevalence of Gastrointestinal Nematodes and Coccidian Parasites Affecting Cattle in West Arsi zone, Oromia Regional State, Ethiopia*; Adigrat University, Department of Animal production and technology, *Journal of Biology, Agriculture and Healthcare* ISSN 2224-3208 (Paper) ISSN 2225-093X (Online) Vol 4.
- Alawaet. G E Jokthan and K Akut (2001): *Ethno veterinary medical practice for ruminants in the sub humid zone of northern Nigeria*, Ahmadu Bello University, Faculty of Agriculture, Department of Animal Science.
- Assegid A and Tesfaye A (2014): *Ethno botanical Study of Wild Medicinal Trees and Shrubs in Benna Tsemay District, Southern Ethiopia*, Southern Agricultural Research Institute (SARI), College of Agriculture, Hawassa University, Ethiopia, *Journal of Science and Development*.
- Biodiversity Conservation*. Cambridge University Press, Cambridge, United Kingdom.
- Birhanu T and Abera D (2014): *Survey of Ethno veterinary Medicinal plants at Selected Districts of Horo Guduru, Western Ethiopia*, Wollega University, College of Medical and Other Health Science, School of Veterinary Medicine, Nekemte.
- Blood D; Radostits O and Henderson J (1983): *Veterinary medicine (6th end)*. Baillière Tindall, London
- Brown D (1969): *A study of the animal and crop production systems and potential of the Bantu Ciskeian territories*. BSc. (Agric) thesis.
- Central Statistics Agency (2008): *Federal Democratic Republic of Ethiopia population census commission: Summary and statistical report of the 2007 population and housing census*.
- European Scientific Cooperative on Phytotherap ESCOP (1999): *Monographs on the Medicinal Uses of Plant Drugs*, Exeter, UK.
- Fratki, Shocke and Swanson (1995, 1996, 2000,): *Editor of Intellectual Property Rights*.
- Gidey Y., Mekonnen T., Gebrerufael G and Samuel Z (2012): *An ethno veterinary survey of medicinal plants used to treat livestock diseases in Seharti-Samre district, Northern Ethiopia*, Department of Biology, Mekele University Mekele, Ethiopia.
- Habib ul Hassan. Waheed Murad., Akash Tariq and Ashfaq Ahmad (2014): *Ethno veterinary study of medicinal plants I Malakand Valley, District Dir (Lower), Khyber Pakhtunkhwa, Pakistan*. *Irish Veterinary Journal*.
- Hedberg I (1993): *Conservation of medicinal plants in the tropics global responsibility. Medicinal and aromatic plants*. *Acta Horticulture*.
- Hutchings A (1989): *A survey and analysis of traditional medicinal plants as used by the Zulu, Xhosa and Sotho*. *Bothalia* .
- Kelayu M., Gebru T and Techlamichael T (2013): *Ethno botanical study of Traditional Medicinal plants used by indigenous people of Gemad district, Northern Ethiopia*.
- Kofale Districts Agriculture and Rural Development Office (KDARDO) (2012): *Annual report*. Kofale, Ethiopia.

- Kokwaro J (1976): *Medicinal Plants of East Africa*. East African Literature Bureau, Nairobi.
- Liengme C (1981): *Plants used by the Tsonga people of Gazankulu*. Bothalia .
- Martin G (1995): *Ethno botany: A method Manual*. Chapman and Hall, London.
- Masika P., Sonandi A and Van Averbeke W (1997): *Perceived causes, diagnosis and treatment of Babesiosis and anaplasmosis in cattle by livestock farmers in communal areas of the central Eastern Cape Province, South Africa*. *Journal of South African Veterinary Association* .
- Masika P., Van Averbeke and Sonandi A (2000): *Use of herbal remedies by small-scale farmers to treat livestock diseases in central Eastern Cape Province, South Africa*. *Journal of the South African Veterinary Association*.
- Mengistu A(2004): *The Effect of Herbal Preparations on Staphylococcus aureus*.
- Mesfin T and Lemma M (2001): *The role of traditional veterinary herbal medicine and its constraints in animal health care system in Ethiopia; In Biodiversity Conservation and Sustainable use of medicinal plants in Ethiopia*.
- Mzamane G (1945): *Some medicinal, magical and edible plants used among some Bantu tribes in South Africa*. Fort Hare Papers.
- National Metrological Service Agency (NMSA, 2010).
- Ngubane H (1977): *Body and mind in Zulu medicine*. Academic Press. London.
- Pankhurst R (2001): *The status and availability of oral and written knowledge on traditional health care, Indian forestry*.
- Praveen G., Anita J and SS Katewa (2013): *Traditional Veterinary Medicine used by livestock owners of Rajasthan*. Laboratory of Ethno botany and Agrostology Department of Botany College of science Mohanlal Sukhandia University Udaipur 313200, Rajasthan India.
- Shashamane Districts Agriculture and Rural Development Office (SDARDO), (2012): *Annual Report, Shashamane, Ethiopia*.
- Streptococcus agalactiae isolated from clinical bovine mastitis (UN published MSC thesis Faculty of veterinary medicine, AAU)*.
- Tabuti J; Dhillion S and Lye K (2003): *Ethno veterinary medicines for cattle (bos indicus) in Bulamogi County. Uganda: plant species and mode of use*. *Journal of Ethno pharmacology*.
- Tadesse (2007): *In-vitro Antimicrobial effects of Combertummolle on Staphylococcus aureus Isolates (Unpublished DVM thesis Faculty of veterinary medicine, AAU)*.
- Tadesse B., Mulugeta G., Fikadu G. and Sultan A. (2014): *Survey on Ethno veterinary Medicinal plants in elected Woredas of east Wollega zone, Western Ethiopia*. *Journal of Biology, Agriculture and Health care*.

- Teklehymanot T and Giday M (2010): Ethno botanical study of wild edible plants Kara and Kewego semi-pastoralists in lower Omo River valley, Debub Omo zone, SNNPR Ethiopia.*
- Teshale Sori., Merga Bekana., Girma Adugna and Ensermu Kelbessa (1999): Medicinal Plants in the Ethno veterinary Practices of Borana Pastoralists, National Veterinary Institute, AAU Faculty of Veterinary Medicine and Faculty of Science Department of Biology Addis Ababa University, Addis Ababa, Ethiopia.*
- Tessema T., Gidey M and Aklilu N (2001): Stacking and information on the medicinal plants of Ethiopia. In National biodiversity Strategy action plan project, Med. Plant team, Addis Ababa: IBDA.*
- Ugyen A., phurpa W and Annette O (2011): Vulnerable Medicinal plants and the risk factors for their sustainable use in Bhutan, journal of medicinal plant studies.*
- World health Organization (WHO), (2014): Traditional medicine as the mainstream practice not involving alternative medicine.*
- Yibrah Tackle (2014): An ethno-veterinary botanical survey of medicinal plants in Kochore district of Gedeo Zone, Southern Nations Nationalities and Peoples Regional State (SNNPRs), Ethiopia. Journal of Scientific and Innovative Research . Available online at: [www.jsirjournal.com](http://www.jsirjournal.com).*
- Yibrah Tackle (2015): Study on ethno veterinary practices in Amado special district southern, Ethiopia animal health researches, southern agricultural research institute (sari), Hawassa, Ethiopia. European Journal of Pharmaceutical and Medical Research. [www.ejpmr.com](http://www.ejpmr.com)*
- Zone Agricultural and Rural Development Office (ZARDO, 2012).*