

Study on Ethno Veterinary Practices in Amaro Special District Southern Ethiopia

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Abstract

Background: Ethno veterinary knowledge covers up people's knowledge, skills, methods, practices and beliefs about the care of their animals and themselves, and has been used over many centuries.

Aim: To documented traditional medicinal plants that used to prevent and control ailments in Amaro Special District, Southern Ethiopia.

Method: A purposive sampling technique study was carried out using a semi-structured questionnaire, field observational and survey to document indigenous knowledge. Descriptive statistics were used to analyze and summarize the ethno-botanical data. A total of 24 herbalists aged between 35-69 years old, 71% were over 46 years old (elders) and 29% were between 35 and 45 years old (younger). The majority informants were males, 87.5% and the experiences year from 29-32 years were 58.33% and the remaining 41.67% were from 5-20 years.

Result: Twenty four medicinal plants against a total of 29 animal and human ailments were reported and botanically identified as belonging to 24 plant families. Most frequently used plants were from Solanaceae (16.67%), Lamiaceae (12.5%), Fabaceae (8.33%), Cucurbitaceae (8.33%) and Asteraceae (8.33%). The medicinal plant parts that were more commonly utilized for the preparation of ethno veterinary medicines were leaves (41.67%), roots (25%) and bark (12.5%). The findings showed that herbaceous accounted for 41.67%, followed by trees (29.17%), climbers (16.67%) and shrubs (12.5%). 83.33% of medicinal plants reported were collected from wild habitats and 16.67% from home garden. The preparations were applied through oral administration accounted for (58.3%), followed by topical application (29.17%). The identified and documented medicinal plants predominantly used to animal ailments treatment (65%) and followed by human and animal ailments (both) treatment (25%).

Conclusion: The people of the district have sound ethno veterinary knowledge and practices for preventing and controlling their animal and themselves from ailments, but this facing the risk of disappearing due to combined effect factors. So, training on the awareness creation and rising and documentation are highly recommended. Scientific investigations should be carried out to ascertain their effectiveness of the identified medicinal plants used in animal and human health management.

Keywords: Ethno veterinary practice; Herbalist; Animal ailments; Indigenous knowledge; Southern Ethiopia

Introduction

Ethiopia has the huge livestock population in Africa and owns about 41.5 million heads of cattle, 28.2 million sheep and goats, 5.8 million equine, 1 million camels and over 42 million poultry [1]. The livestock production is a major asset among resource-poor smallholder farmers by providing milk, meat, skin, manure and traction. However, their economic benefits remain low due to prevailing diseases which are among the principal bottle necks of livestock performance and cause of high economic losses of the resource poor farmers [2,3]. The majority of livestock raisers in Ethiopia are far away from the sites of animal clinic stations. 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 [4]. Modern veterinary medicines are not well developed in the country, and the modern drugs availability is not adequately to fight animal diseases. It is estimated that the traditional remedies are sometimes the only source of therapeutics for nearly 90% of livestock in Ethiopia of which 95% are plant origin [5,6]. Ethiopian farmers and pastoralists rely on traditional knowledge, practices and plants, to control livestock diseases [6-9] and Ethiopians have used traditional medicines for many centuries, due to cultural acceptability, efficacy against certain diseases and economic affordability [10,11]. The indigenous people of different localities in the country have developed

their own specific knowledge of plant resource uses, management and conservation [12,13].

The application of traditional medicines to veterinary medicine has been termed as ethno veterinary medicine. Ethno veterinary medicine has been defined as an indigenous animal healthcare system that includes the traditional beliefs, knowledge, skills, methods and practices of a given society, [14,15]. The knowledge varies from region to region and from community to community [16]. In general, ethno veterinary practices have been developed by trial and error and by actual experimentation [17]. Ethno veterinary medicine comprises of traditional surgical techniques, traditional immunization, magico-religious practices, and the use of herbal medicines to treat livestock diseases [6,11].

The ethno veterinary medicinal plant knowledge, similar to other

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forms of traditional knowledge, is not compiled in Ethiopia, [16,18] and also passed verbally from generation to generation, [19] this kind of knowledge transmission also has been reported in other regions of Brazil [20] as well as Nigeria [21], Pakistan [22] and Ethiopia [23]. As a result, they need to perform ethno veterinary practice researches and to document the medicinal plants and the associated indigenous knowledge must be an urgent task [24,25]. The studies conducted on the traditional remedies used in animal healthcare in Ethiopia are inadequate when compared with the multi-ethnic cultural diversity and the diverse flora of Ethiopia, about 6500 species of higher plants, with approximately 12% of these endemic [26]. The greater concentrations of medicinal plants are found in the south and south-western parts of the country following the concentration of biological and cultural diversity [27]. Therefore, this study, it was necessary and important, was initiated to collect and document the traditional use of medicinal plants in veterinary medicine available in Amaro special district, Southern part of Ethiopia, which suppose that the data could be used as a source for further studies on medicinal plants in Amaro special district and for further pharmacological and phytochemical studies. Therefore, to document the traditional medicinal plants that used to prevent and control ailments in Amaro Special District, Southern Ethiopia.

Materials and Methods

Study area

The study was conducted in Amaro special district, Southern Nations Nationalities and Peoples Regional State (SNNPR), Southern Ethiopia. The district has 1534 km² area and 91 people per km² population density. It has 32 kebeles and a mountain that elevated about 3240 m.a.s.l, and bordered on the North and East by the Oromia Region, on the South by Burji Special district and on the East by GamoGofa and Lake Chamo. And the largest West part of Amaro is bordered by Nechisar National Park, found in the Gomo Gofa Zones. Amaro has a total of 139,727 population (Men=70,018; Women=69,709); the urban inhabitants are about 4% of its population [28]. And the majority of the district's people spoke the korete language because the largest ethnic group living there are korre.

Amaro is located 478 km from Addis Ababa, Ethiopia. Mixed crop and livestock farming system are the mode of agriculture in the study area, and the livestock available this study area are cattle, sheep, poultry, horses, goat, donkey and mule as the major livestock kept which are highly important for the livelihood of the local population in district. Cattle, goat and sheep production particularly plays a vital role in the farming system. And also the main crop dominants are tef, maize, wheat, barley, and, from root crops: sweet potato, potato, and carrot.

Field survey

The survey was conducted to collect information on the ethno veterinary practices in animal health management system using a semi-structured interview and observation [29] with the traditional healers who were willing to share to their indigenous knowledge. A prior communication was done with the regional, Zonal and District livestock coordinators and veterinarian, kebele administrative and elders, animal health assistances and healers up on the objective of study. Finally, we were mostly arrived to the agreement by avoiding the fear to feed us the genuine information, but no further attempt was made to influence those healers who completely refused to provide information.

Sample size and sampling techniques

For this study two kebeles were selected from the study area using purposive sampling techniques. This is because of these areas are typically possess an intellectual healers and covered by different plant species that used for traditional medicinal to treat different animal and human ailments. Totally 24 healers were selected using purposive sampling technique study to gather the all relevant data.

Data collection

Specimens of plants that were used by the healers for their animal ailments treatment were collected using the standard botanical methods together with the healers, that including the vegetative part, leaves, and floral, fruiting and/or seed parts as it was appropriate for taxonomic identification. The information gathered included local name of the traditional medicinal plant, general description of the plant, habitat data, use, plant parts used, method of preparation, route of administration, ingredients added, other uses of the plant and existing threats to medicinal species. The collected specimens of medicinal plants were coded, pressed, and dried then taken to botanical identification, by botany specialists, Science Faculty of Addis Ababa University, National Herbarium.

Data analysis

The collected data analyzed using descriptive statistics and the Proportions (percentiles), figures and tables were used to summarize the collected ethno-veterinary medicinal data.

Results and Discussion

A total of 24 ethno-veterinary medicinal plant species belonging to 24 families were documented with in details on their traditional preparation, plant parts used, habit, family name, scientific name, local name, mode of application, use, importance, ingredient added and code (Table 1). The most frequently used and reported plant families for ethno-veterinary practices were Solanaceae (16.67%), Lamiaceae (12.5%), Fabaceae (8.33%), Cucurbitaceae (8.33%) and Asteraceae (8.33%) (Figure 1). This observation coincided with the findings registered in the four districts of Jimma zone, Ethiopia: Asteraceae, Cucurbitaceae and Solanaceae [30] and in Marajó Island, Eastern Amazonia, Brazil: Lamiaceae and Asteraceae plant families [31]. Many plants were commonly mentioned against particular diseases, and one medicinal plant species to single disease was also observed. The study indicated that the foremost of the informants in the study district dependent up on traditional veterinary knowledge practices and locally available materials, primarily medicinal plants, that used to prevent and cure animal ailments such as Trypanosomosis, Sheep and goat pox, Blackleg, Babesiosis, Eye disease, Rabies, Tick infestation, Leech infestation, Fever, Calf diarrhea, Internal parasite, External parasite, Wound, Abdominal pain, Snake bite, Pneumonia, Retained placenta, Anthrax and Fashiolosis, And also used to cure the human ailments like Gonorrhoea, Snake biting, Abdominal pain, Skin disease, Headache, Chest pain, Common cold, Diarrhea, Joint pain, and Amoebae.

This study showed that the herbaceous, trees, climbers and shrubs of the medicinal plants were the widely used for the treatment of various animal and human diseases that constituting the 41.67%, 29.17%, 16.67% and 12.5% respectively (Figure 2). The herbalists of the district used different plant parts, like root, leaves, bark, fruit, tuber and whole herb, for the purposes of ethno veterinary medicinal practices, mainly leaves, roots and bark, 41.67%, 25%, and 12.5% respectively, and followed by fruit (8.33%), tuber (8.33%) and whole herb (4.17%)

No.	Code	Local name	Botanical/scientific name	Family	Habit	Plant parts	Preparation	Use	Mode of application	Importance
1	42.1	Bundo	<i>Myrica salicifolia</i> A. Rich.	Myricaceae	Tree	Bark	Chopping +water	Trypanosomosis, Babesiosis, Amoebae,* joint pain*, abdominal pain*	Oral, Topical	Veterinary Human
2	44.1	Bana	<i>Tetradenia riparia</i> (Hochst. in C. Krauss) Codd	Lamiaceae	Herb	Leaf	Chopping+ water	Sheep and Goat Disease	Oral	Veterinary
3	44.2	Soga	<i>Clematis simensis</i> Fresen.	Ranunculaceae	Climber	Leaf	Chopping+ water	Sheep and Goat Disease	Topical	Veterinary
4	45.1	Belelie	<i>Rumex abyssinicus</i> Jacq.	Polygonaceae	Herb	Tuber	Grinding +water	Internal parasite, headache*	Topical	Veterinary
5	46.1	Drgayle	<i>Lannea schimperi</i> (A. Rich) Engl.	Anacardiaceae	Tree	Bark	Chopping+ water	Blackleg	Oral	Veterinary
6	47.1	Kuro	<i>Cucumis dipsaceus</i> Ehrenb. ex Spach	Cucurbitaceae	Climber	Leaf	Chopping + water	Pneumonia, Abdominal pain	Oral, Topical	Veterinary
7	47.2	Begegechoo	<i>Achyranthes aspera</i> L.	Amaranthaceae	Climber	Fruit	Chopping + water or boiling the bark	Chronic trypanosomosis, Headache*, babesiosis, gonorrhoea*, wound	Oral	Veterinary Human
8	48.1	Tiro	<i>Withania somnifera</i> (L.) Dunal in Dc.	Solanaceae	Shrub	Root	Chopping +water plus held up by teeth the root	Fashiolosis, diarrhea*, joint pain*, chest pain* anthrax, headache*	Oral	Veterinary Human
9	49.1	Tsetala	<i>Ruta chalepensis</i> L.	Rutaceae	Herb	Leaf	Chopping +water	Retained placenta, abdominal pain*, snack biting	Oral	Veterinary Human
10	49.2	Godzie	<i>Lagenaria siceraria</i> (Molina) Standl.	Cucurbitaceae	Climber	Leaf	Chopping +water	Retained placenta, Abdominal pain*	Oral	Veterinary Human
11	50.1	Gizawa	<i>Vernonia amygdalina</i> Del.	Asteraceae	Tree	Root	Chopping +water	Trypanosomosis, cough, wound, skin disease	Oral	Veterinary
12	51.1	Akorarach	<i>Ajuga integrifolia</i> Buch.-Ham. ex D. Don	Lamiaceae	Herb	Leaf	Chopping + water	Calf diarrhea	Oral	Veterinary
13	53.1	Uebena	<i>Dracaena steudneri</i> Engler	Dracaenaceae	Tree	Tuber	Chopping and filtered	Wound, Rabies	Oral	Veterinary
14	53.1	Borsie	<i>Echinops hoehnelii</i> Schweinf	Asteraceae	Herb	Root	Chopping +salt	Internal parasite, amoebae* common cold*,	Topical	Veterinary Human
15	54.1	Ele	<i>Phoenix reclinata</i> Jacq.	Arecaceae	Tree	Leaf	Chewing + spray	Eye disease	Oral	Veterinary
16	54.2	Qaga	<i>Oliniario chetiana</i> A. Juss.	Oliniaceae	Tree	Leaf	Chewing + spray	Eye disease	Topical	Veterinary
17	57.1	moroalie	<i>Fuerstia africana</i> TCE. Fr.	Lamiaceae	Herb	Bark	Chopping +water	External parasite, skin disorder*	Topical	Veterinary Human
18	59.1	Mitmita	<i>Capsicum frutescens</i> L.	Solanaceae	Herb	Fruit	Chopping +water	Trypanosomosis	Oral	Veterinary
19	65.1	Hidie	<i>Solanum lanzae</i> J-P. Lebrun & Stork	Solanaceae	Herb	Whole herb	Chopping +water	Blackleg	Oral	Veterinary
20	67.1	Gulo	<i>Ricinus communis</i> L.	Euphorbiaceae	Shrub	Root	Chopping + water	Blackleg, retained fetal membrane, skin disease	Topical	Veterinary
21	72.1	Shoshidhale	<i>Indigofera spicata</i> Forssk.	Fabaceae	Herb	Root	Chewing the root part half of this swallowing and the remained spray by mouth to the bitted area	Snack biting** abdominal pain*	Oral	Veterinary Human
22	72.2	Kenkelcha	<i>Aeschnomene elaphroxylon</i> Guill	Fabaceae	Shrub	Root	Chopping +water	Trypanosomosis	Oral, Topical	Veterinary
23	72.3	Tumbo	<i>Nicotiana tobacum</i> L. (DB.9)	Solanaceae	Herb	Leaf	Pounded leaves applied topically	Tick and leech infestation, snack biting, internal parasite, fever, wound infestation	Oral	Veterinary
24	72.4	Tid	<i>Juniperu sprocera</i> Hochst. exEndl.	Cuperssaceae	Tree	Leaf	Chopping water	Trypanosomosis	Topical	veterinary

**Both animal and human ailments, *Only for human ailments

Table 1: Shows plants of ethno veterinary and human importance in Amaro special district, Southern Ethiopia.

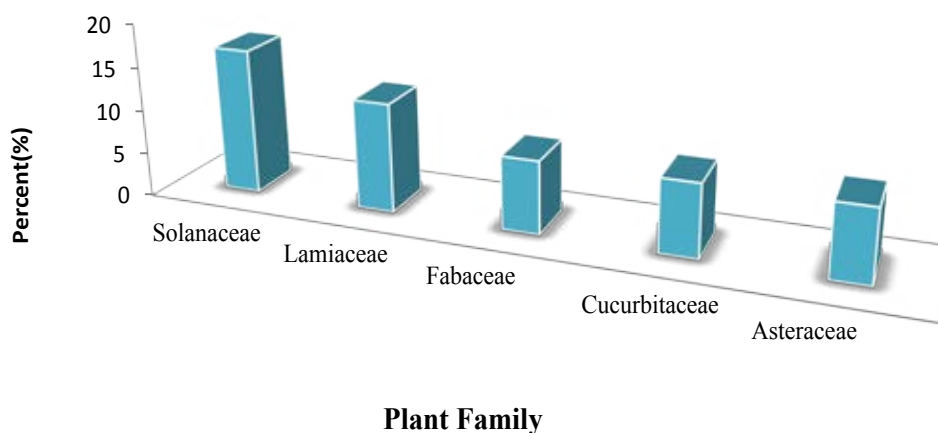


Figure 1: The most frequently used and reported plant families for ethno veterinary practices in Amaro special district, Southern Ethiopia.

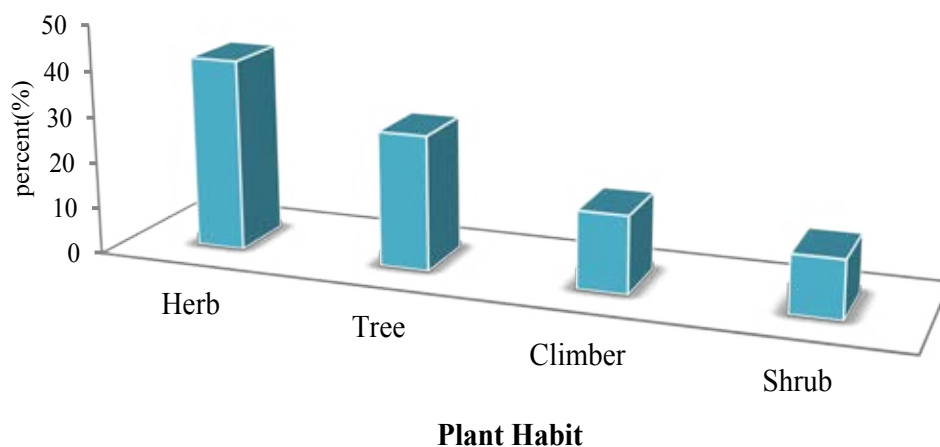


Figure 2: The proportion of growth form of medicinal plants identified for the treatment of different livestock and human disorders in the Amaro special district, southern Ethiopia.

(Figure 3). Such a wide, totally 50%, harvesting of root (25%), tuber (8.33%), bark (12.5%) and whole herb (4.17%) in the district is a great risk for the continuity and survival of these ethno veterinary medicinal plants. That observation was in agreement with the findings study in Bale Mountains National Park [32] and Jimma zone, [30] Ethiopia. Hence, in this study area the combine factors like the root, tuber, bark and whole herb harvested to ethno-veterinary practice by the herbalists and the inhabitants used the medicinal plants for different purposes like agricultural and urban expansions, construction and firewood have the harmful impact on the sustainability of the medicinal plants and also climate change. In Leaves, 41.67% have been used as a remedy more than other medicinal plants parts used because this medicinal plant part may be richer in active chemicals. By leaf part, the plant species used to different animal and human ailments prevention and controlling were such as *Juniperus Procera Hochst. ex Endl.*, *Nicotiana tobacum L. (DB.9)*, *Oliniarochetiana A. Juss.*, *Phoenix reclinata Jacq.*, *Ajugaintegrifolia Buch.-Ham. ex D. Don*, *Lagenaria siceraria (Molina) Standl.*, *Ruta chalepensis L.*, *Cucumis dipsaceus Ehrenb. ex Spach*, *Clematis simensis Fresen.* And *Tetra deniariparia (Hochst. in C. Krauss) Codd.*

The herbalists first prepared the remedies by chopped/grinded

the medicinal plant parts, then squeezed and sieved to collect gel/plant juice form for drenching orally (58.33%) and topical (29.17%) application, followed by oral and topical /both/ 12.5% application (Figure 4). These routes of administration, both oral and topical routes, they considered rapid physiological reaction with the causative agents and increase the curative power of the medicinal plant remedies. This observation was coincided with the findings of study in Nu villages of China, [33] Jimma zone [30] and Gimbi district, West Wellega, [34] Ethiopia. In addition to this, the herbalists applied the remedies sediments on the external body of the sick animal. While the plant parts processed most of them mixed with ingredients like coffee (8.33%), salt (4.17%) or water (66.67%), they considered to adjust flavor of medicinal plants in order to intake adequate dosage of medication, which was also documented in similar study in different areas of Ethiopia, [30,34-37] but some of the plant parts were processed without any ingredients (20.83%), even water no added. Therefore, in ways of remedies formulation majority of the herbalists used water as a vehicle system, which might be due to its universal solvent and easy availability. The quantity of medicinal plant parts were measured by number of fruit, leaves, tubers, whole herbs and length of root and bark, and also the dosage were determined by the locally available materials such as highland plastic, beer bottle, coffee cup, teaspoon and/or number of

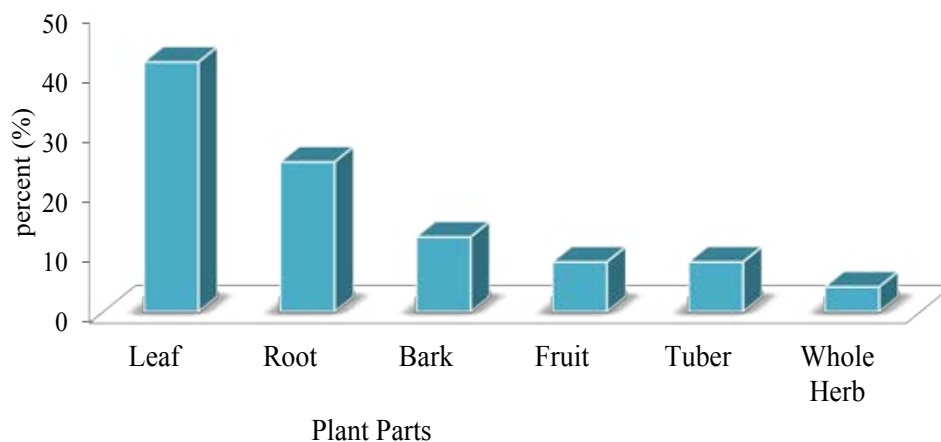


Figure 3: The proportion of growth form of medicinal plants identified for the treatment of different livestock and human disorders in the Amaro special district, southern Ethiopia.

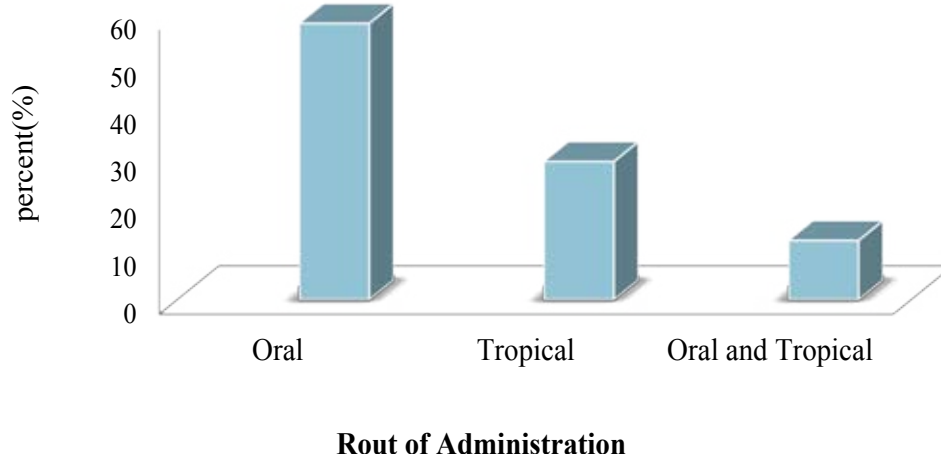


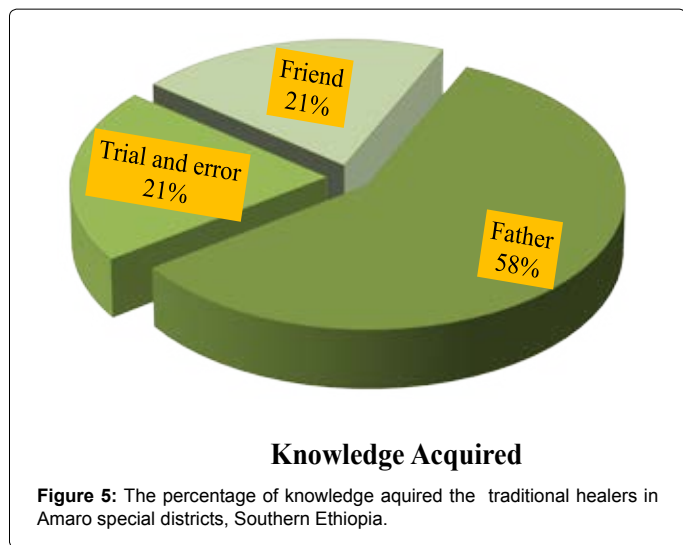
Figure 4: The percentage of route of administration medicinal plants prepared for different livestock diseases in Amaro special district, Southern Ethiopia.

drops. Thus, these ways of quantity measurement units and dosage determination were the problems of the herbalists in the district.

In the district the knowledge or information on the medicinal plants, was found in unwritten form; no one had a written document out of the total herbalists [24] participated in this study. All informants asserted that they usually used medicinal plants to treat their own diseases and those of their animals. According to the questionnaires, knowledge of medicinal plant usage in the studied area was transmitted from one generation to another through oral communication. The medicinal plant practitioners were acquired the ethno veterinary medicinal knowledge orally from their friends (21%) and fathers (58%), who were the first-born/elders from their families, and also by trial and error approaches discovered 21% (out of 5; females=2 and men=3) (Figure 5). Moreover, it was an income generation tasks for the herbalists, and this is analogous with the studies done in other part of Ethiopia [18,30]. Most of the medicinal plant species were collected from wild habitats, 83.3%, and few of them collected from home garden, 16.7%. The medicinal plants largely found in natural habitats due to the combined factors [38] like mass destruction in their habitants, [18] agricultural and urbanization expansion, [39,40] herbal preparation involves roots

and bark, grazing, soil erosion, orally transfer of indigenous knowledge from generation to generation, [41] draught and urbanization are the major threaten to their survival of the mother plants. Consequence, the stock resources of the ethno-veterinary medicinal plants are coming diminished in their population [39].

Some of the surveyed traditional medicine plant species practiced by herbalists were recorded in other parts of the country and coincided with them like: *Vernonia amygdalina Del.* in Kofle, Bale, and Debark rural communities of Ethiopia, [42] in Ankober, Amhara Region, [43] in South East Ethiopia, [44] in and around Alamata, Southern Tigray, [45] in in rural areas of Akaki District, Eastern Shewa, Ethiopia, [46] and in sub humid zone of northern Nigeria, [21] *Nicotiana tabacum* in Borana Pastoralists, Southern Ethiopia, [47] in and around Alamata, Southern Tigray [45] and in Botswana, [48] *Myrica salicifolia A. Rich.* In Gilgel Ghibe area, South Western Ethiopia, [49] *Echinops hoehnelii Schweinf.* in Tigray region, Northern Ethiopia, [50] and *Withania somnifera (L.) Dun.* in Ankober, Amhara Region, [43] in and around Alamata, Southern Tigray, [45] in Gemad district, Northern Ethiopia, [51] in Kafficho people, south western Ethiopia, [52] in South Omo, Southern Ethiopia, [53] and *Achyranthes aspera L.* in Ankober,



Amhara Region, [43] in Borana Pastoralists, Southern Ethiopia, [47] in and around Alamata, Southern Tigray, [45] *Ruta chalepensis* L., in rural areas of Akaki District, Eastern Shewa, Ethiopia, [54] *Dracaena steudneri* Engl. and *Ricinus communis* L. in Borana Pastoralists, Southern Ethiopia, [47] in and around Alamata, Southern Tigray, [45] in rural areas of Akaki District, Eastern Shewa, Ethiopia [54] *Rumexabyssinicus* Jacq. in South East Ethiopia, [44] in Gemad district, Northern Ethiopia, [51] *Ruta chalepensis* L. in and around Alamata, Southern Tigray, [45] *Ajugaintergri folia* in South East Ethiopia, [44] *Cucumis dipsaceus* in and around Alamata, Southern Tigray, [45] *Rumex abyssinicus* Jacq. In Gemaddistrict, Northern Ethiopia, [51] in Boana Pastoralists, Southern Ethiopia, [47] *Ruta chalepensis* L., in rural areas of Akaki District, Eastern Shewa, Ethiopia [46].

Some of the medicinal plants documented were used to cure against different animal and human ailments and this agreed with others studies result recorded like: antiprotozoan properties by *Vernonia amygdalina* Del., [55-57] rabies by *Dracaena steudneri* Engl., [52] Retained placenta membrane by *Ricinus communis* L., [47] Snack bite by *Nicotiana tabacum* [52] and *Ruta chalepensis* L., [45,58] Internal parasite by *Nicotiana tabacum* [53] chest pain by *Withania somnifera* (L.) Dun., [58] coughing by *Vernonia amygdalina* Del. [46] headache by *Rumex abyssinicus* Jacq., [52] *Withania somnifera* (L.) Dun, [52] and *Achyranthes aspera* L. [52] and wound by *Achyranthes aspera* L., [46,58] *Nicotiana tabacum*, [52] and *Vernoniaamygdalina* Del., [58] tick infestation by *Nicotiana tabacum* and leech infestation by *Achyranthes aspera* L [46].

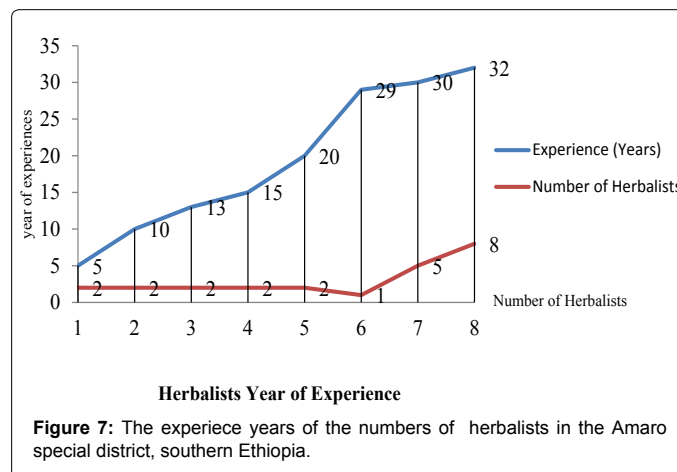
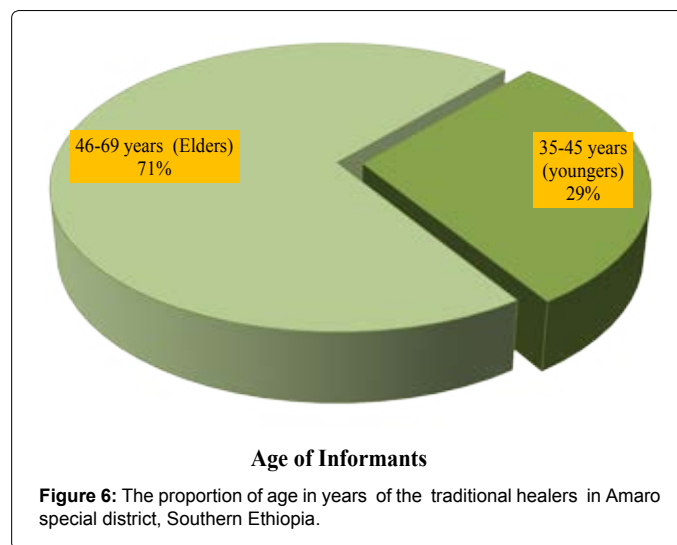
The study observed that out of the 24 herbalists interviewed, the majority were from 46-69 years of age. Further analysis showed that 71% were over 46 years old, and 29% between 35 and 45 years old (Figure 6). Generally, the age of herbalists who participated in this study totally it was over 34 years of age, and among the informants 71% ethno veterinary practitioners were elders. Majority of informants accounting for 87.5% were males, and the remaining 13.5% were females. This study was observed that the men of the community had more knowledge about the ethno veterinary medicine practices because they are naturally selected during childhood to be apprentices of ethno veterinary practices [23]. In addition, in some regions, labour division makes women responsible for housekeeping only, while men take care of the animals [22]. The informant's year of experiences distribution on traditional medicine practices in the study area 58.33% from 20-

32 years of experiences and 41.67% from 5-20 years of experiences (Figure 7). Out of the total 24 ethno-veterinary medicinal plant species were identified and documented in the study area 65% predominantly used to animal diseases treatment followed by 35% for animal and human (both) diseases treatment (Figure 8). This study suggested that traditional uses of plants for the treatment of human diseases are frequently also used in veterinary treatments [21,23].

This study contributed that an inventory of ethno veterinary plants to the district, which could be the basis for future scientific validation studies. Scientific evidence of pharmacological properties of these plants supports the development of new and low-cost drugs that are harmless to the environment and effective and safe for the treatment of animals and humans.

Conclusion

This study suggested that the people of the district have sound traditional veterinary medicines knowledge and practices for preventing and controlling their animal and human diseases. The region has a huge potential in medicinal plants than the other parts of the country, but the mother medicinal plants, stock sources, faced a major threat due to the combine effect factors such as the herbalists harvested the whole herb, tuber, bark and root plant parts and the inhabitants also influenced them by agriculture and urban expansion, used for firewood



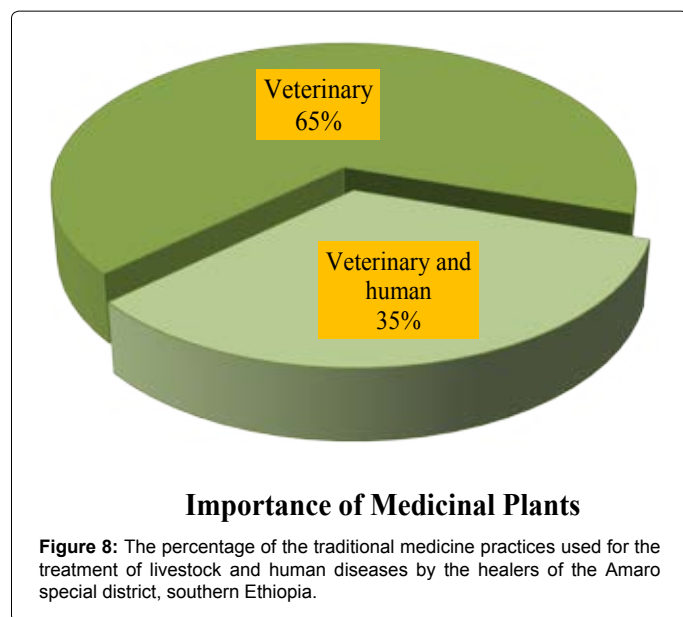


Figure 8: The percentage of the traditional medicine practices used for the treatment of livestock and human diseases by the healers of the Amaro special district, southern Ethiopia.

and construction. This study indicated that the dose determination was lacked of precision because the units of measurements and the quantity of plant parts used were varied. Therefore, research is needed on dosage determination and the preparations concentrations for sake of identifying the remedies side effects, and also study requires on the effectiveness of preparations, techniques and practices the medicinal plants. Further investigations on the medicinal plant parts effectiveness, either harvesting tuber, root, whole herb and bark or harvesting of flowers, fruits, and leaves, may relief the problem faced on the stock source medicinal plants by combine effect factors such as herbalist harvesting ways and inhabitants used medicinal plants for firewood and construction. This traditional knowledge also faces the risk of disappearing due to livelihood changes and environment degradation, so documentation medicinal plant is highly recommended and training on awareness creation and rising should be given to herbalists and the local community respecting to the management of medicinal plants, to encourage their cultivation systematic way.

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