



Identification of ethnoveterinary medicinal plants used for the treatment of livestock ailments in Seharti-Samre district, northern Ethiopia

Tamanda Nelson and Shapronima chimango

Mzuzu University, Malawi

Abstract

Ethnoveterinary medicine is frequently used for treating livestock diseases by many different ethnic groups in Ethiopia. Nearly 90% of livestock population in Ethiopia use plant based traditional medicines as their major health care system. This study was conducted to identify ethnoveterinary medicinal plants used for the treatment of livestock ailments in Seharti-Samre district, northern Ethiopia. Ethnoveterinary data were collected from 36 informants using semi-structured interviews. Twenty two species of ethnoveterinary medicinal plants were collected and identified for treating 18 different livestock ailments. Most of the ethnoveterinary medicinal plants were collected from the wild stands and leaves were most commonly used plant parts for ethnoveterinary medicine preparations. The ethnoveterinary medicinal plant preparations were applied through different routes of administration like dermal, oral, nasal, ocular and anal routes. Evaluation of the ethnoveterinary medicinal plants for their efficacy and possible toxicity would be very important.

Keywords: Ethiopia, ethnoveterinary, livestock, medicinal plants.

INTRODUCTION

Livestock in sub Sahara Africa is a fundamental resource in enhancing development as it provides 20 to 30% of the gross domestic products (GDP) and as much as 70% of the cash income at the farm level (Ndikimara et al., 2000). It plays a substantial role in the macro and micro economy of Ethiopia such as production of food, industrial raw materials, inputs for crop production and export earnings (Gizachew, 2007).

Ethiopia is leading in livestock population in Africa, with an estimated population of 43 million cattle, 23.6 million sheep, 18.6 million goats, 1.7 million horses, 4.5 million donkeys, 0.36 million mules, 0.6 million camels, and 34.2 million poultry (CSA, 2006/7). However, livestock productivity is relatively poor owing to inadequate availability of feed, wide spread disease, poor health care services and insufficient knowledge on the dynamics of the different farming systems existing in the country (Yirga and Hassen, 2000).

Ethnoveterinary medicine is frequently used for treating

of livestock diseases by many different ethnic groups in Ethiopia. Nearly 90% of livestock population in the country use plant based traditional medicines as their major health care system (Endashaw, 2007). Ethnoveterinary medicine plays an important role in animal production and livelihood development. It provides valuable alternatives to and complements western-style veterinary medicine (Shen et al., 2010) and is accessible and easy to prepare and administer, at little or no cost to the farmer (Jabbarm et al., 2005).

Because of the higher price of modern medicines and lack of accessibility to a modern veterinarian in the rural areas, farmers rely on traditional veterinary medicinal healers for treatment of livestock ailments (Harun-or-Rashid et al., 2010). In addition they believe that the medicinal plants are more efficacious for treating of livestock ailments than modern medicine (Harun-or-Rashid et al., 2010).

Various researchers in Ethiopia have reported the loss

Table 1. Livestock and dog population of Seharti-Samre district in 2011.

Species	Stock
Cattle	99,151
Sheep and goats	194,601
Cats	11,399
Poultry	101,491
Donkeys, horses and camels	15,652
Dogs	13,297
Total	435,591

Source: Seharti-Samre district agricultural and rural development office, 2011.

Table 2. Common livestock ailments and number of livestock animals treated over the last five years in Seharti-Samre district veterinary clinic.

Livestock ailments	Animals treated	Rank
Sheep and goat pox	193,000	1
Peste des petits ruminants (PPR)	183,330	2
Ovine pasteurellosis	146,950	3
Anthrax	48,418	4
Bovine pasteurellosis	30,250	5
Blackleg	29,800	6
Lumpy skin disease (LSD)	17,700	7
African horse sickness (AHS)	5,800	8
Fowl pox (FP)	3,340	9

Source: Seharti-Samre district veterinary clinic, 2011.

of valuable medical plants due to population pressure, agricultural expansion and deforestation (Abebe, 2001; Getachew and Shiferaw, 2002, Yirga, 2010b). Moreover, documenting traditional medical knowledge is important to assist discovery of new sources of drugs (Teferi et al., 2009). This study, therefore, attempts to identify ethnoveterinary medicinal plants used for the treatment of livestock ailments in Seharti-Samre district, northern Ethiopia.

Study area

The study was conducted in Seharti-Samre district located 60 km south of Mekelle, capital city of Tigray regional state of Ethiopia. The district lies between 12° 30' and 13° 02' north and 38° 59' and 39° 26' east with a total area of approximately 171,650 ha at a range of 1470 to 2370 m.a.s.l. (Seharti-Samre district rural and agricultural development office, 2011). The mean minimum and maximum annual rainfall is 350 and 700 mm, respectively. The temperature ranges between 15 to 30°C The district has two urban centers: Samre and Gijet. Mixed crop and livestock farming system is the mode of agriculture in the district (Seharti-Samre district rural and agricultural development office, 2011).

The total livestock population of the district is about 871,182 (Table 1) and the most common livestock disease in the area includes sheep and goat pox, Peste des Petits Ruminants (PPR), anthrax, Pasteurellosis and Fowl pox (FP) (Table 2). The total human population of the district is about 136, 873. Our research focused on Adi Kaala sub district.

METHODS

Ethnoveterinary data were collected from 36 informants using semi-structured interviews. First a sample informant was selected based on recommendation from elders and local authorities of the Adi Kaala sub district. Then after snow ball sampling technique was employed to select potential informants. The interview was based on the checklist of questions prepared before in English and translated to the local language 'Tigrina'. Information regarding local name of ethnoveterinary medicinal plants, disease treated, route of administration, ingredients added, source of the medicinal plants, parts used and other uses of the medicinal plants was recorded. Identification of the medicinal plants was done in Mekelle University using Flora of Ethiopia and Eritrea, by comparison with authentic specimens, illustrations and taxonomic keys.

RESULTS

Majority of the respondents were illiterate and all were

Table 3. Background characteristic of sampled respondents.

Items	Alternative	Count	Percentage
Sex	Male	36	100
	Female	0	0
Age	30 to 40	6	16.7
	41 to 50	17	47.2
	51 to 60	10	27.8
	>60	3	8.3
Family size	1 to 5	10	27.8
	6 to 10	23	63.88
	> 10	3	8.33
Educational status	Illiterate	24	66.7
	Able to read and write	3	8.3
	Elementary (1 to 4)	5	13.9
	Junior (5 to 8)	2	5.6
	Secondary (9 to 10)	2	5.6
Marital status	Married	26	72.2
	Divorced	4	11.1
	Widow	6	16.7

males (Table 3). Twenty two species of ethnoveterinary medicinal plants were collected and identified for treating 18 different livestock ailments (Table 4). Most (72%) of the ethnoveterinary medicinal plants were collected from the wild stands (Figure 1). The ethnoveterinary medicinal plant preparations were applied through different routes of administration like dermal, oral, nasal, ocular and anal routes. However, dermal application (7 preparations, 31.8%) was the highest and most commonly used route of application followed by oral application (6 preparations, 27.3%) (Figure 2). The most commonly used plant parts for ethnoveterinary medicine preparations were leaves (68.2%) (Figure 3). The ethnoveterinary medicinal plants have various methods of preparation for different types of ailments like crushing, squeezing, grinding, direct use and homogenizing in water.

In the study area the inhabitants rely on medicinal plants for various purposes such as medicine, firewood, spice, construction and food. It was found that 40.9% of medicinal plants have values other than their medicinal role (Table 4). To assess the relative importance and to check the major impact on such plants priority ranking of factors perceived as threat to ethnoveterinary medicinal plants based on the level of destructive effects was performed. The result indicated that agricultural expansion was ranked first followed by soil erosion and deforestation (Table 5).

DISCUSSION

Plants are by far the most important for human well being in providing a significant number of traditional and

modern remedies required in healthcare. In this study, majority of the respondents were older than 41 years. Very few youths were involved in the administration of herbs in the study area. As the knowledge of traditional medicine is held as professional secret, the healers should be encouraged to transfer their knowledge to interested persons in their communities.

Farmers in various under-developed regions of the world use medicinal plants for treating livestock diseases due to lack of access to modern veterinarians and price of modern medicines (Harun-or-Rashid et al., 2010). They believe that ethnoveterinary traditional medicinal plants are more efficacious for treatment of livestock ailments than modern medicines (Harun-or-Rashid et al., 2010). In addition ethnoveterinary medicines are easy to prepare and with very little or no cost to farmers (Jabber et al., 2005). Veterinary services are unable to provide good quality animal health services because of poorly developed necessary infrastructures and deweeding financial resources (McCorkle and Green, 1998; Matekaire and Bwakura, 2004; Fajimi and Taiwo, 2005). In the present study different preparation methods of ethnoveterinary medicine were used such as grinding, crushing and squeezing, drying and immediate use of the ethnoveterinary traditional medicinal plants. According to Deeba (2009) grinding or crushing in wooden or stone-made mortar and pestle, and soaking or boiling different parts of plants are common methods for drug extraction. Depending on the active ingredient to be extracted, application routes, and the medical objective preparation methods of ethnoveterinary medicine differs (McCorkle and Mathias-Mundy, 1992).

Table 4. List of ethnoveterinary medicinal plants, disease treated, ingredients added, preparation methods and other uses of the medicinal plants.

Local name	Scientific name	Disease treated	Ingredients added	Preparation methods	Other uses
Mesaguh	<i>Meriandra dianthera</i>	Diarrhea	Water and soup of <i>Eragrostis tef</i>	Crushing and squeezing	Firewood
Tfarya	<i>Sida schimperiana</i>	Joint dislocation	None	Direct use	None
Trnakia	<i>Verbascum sinaiticum</i>	Uroliths	Omo (detergent)	Crushing and squeezing	None
Amam Gemel	<i>Piliostigma thonningii</i>	Conjunctivitis	None	Crushing and squeezing	None
Gindae	<i>Calotropis procera</i>	Actinobacillosis	Butter	Crushing and squeezing	None
Hsaws	<i>Calpurnia aurea</i>	Wound	Salt	Crushing and squeezing	None
Limo	<i>Melia azedarach</i>	Mange mites	None	Crushing and squeezing	Construction
Kolqwal	<i>Euphorbia abyssinia</i>	Swelling	None	Crushing and squeezing	Binding
Dandaer	<i>Cirsium straminispinum</i>	Lungworm	None	Crushing and squeezing	None
Mesehayit	<i>Tragia cinera</i>	Grain overload	None	Crushing and squeezing	None
Tsilal no Mariam	<i>Alternanthera nodiflora</i>	Leech	None	Crushing and squeezing	None
Giesho	<i>Rhamnus prinoides</i>	Bloat	Oli and powder of <i>Hordeum vulgare</i>	Grinding	For local beverage
Ere	<i>Aloe barbadensis</i>	Joint dislocation	None	Direct use	None
Newribarya	<i>Cucumis metuliferus</i>	Oestrus ovis	<i>Allium sativum</i>	Crushing and squeezing	None
Engule	<i>Citrullus colocynthis</i>	Colic	None	Grinding and drying	Tanning
Shanfae	<i>Rute chalepesis</i>	Blackleg	Water	Homogenizing in water	None
Guli	<i>Ricinus communis</i>	Bottle Jaw	None	Grinding and drying	None
Duba	<i>Cucurbita pepo</i>	Ovine pasteurellosis	soup of <i>Eragrostis tef</i>	Crushing	Human food
Jinjible	<i>Zingiber officinale</i>	Conjunctivitis	Saliva	Crushing	Spice
Tmbaho	<i>Crotom macrostachyus</i>	Leech	Urine	Crushing and squeezing	Fire wood
Mechelo	<i>Achyrrathes aspera</i>	Rectal prolapse	Butter	Grinding and drying	None
Qebqeb	<i>Maytens senegalnsis</i>	Conjunctivitis	None	Crushing and squeezing	Fire wood

Ethnoveterinary medicine is mainly administered to livestock orally as decoctions, liquid in that the plants have been steeped, vaccination, suppositories, through smoke, vapours, massage, intranasal or applied topically on the skin or as a bathe in skin problems (McCorkle and Mathias-Mundy, 1992; Lans et al., 2000; Tabuti et al., 2003; Muhammad et al., 2005; Dilshad et al., 2008).

To maintain a community-based sustainable livestock production system, it is crucial to learn, evaluate, promote and integrate the beneficial

facets of traditional animal health care practices into current primary livestock health care delivery services (Wanzala et al., 2005). In the present study 22 species of plants have been identified for treating 18 livestock ailments. Many professionals from different fields have over the past decades recognized, valued and documented the potential effectiveness of the traditional animal health care practices (Wanzala et al., 2005).

The ethnoveterinary medicinal plants were mainly collected from the wild stands for their stands for their leaves, the healers in consultation

with government officials should take care not to eradicate the medicinal plant species altogether. Awareness creation among the traditional healers and community at large is important in order to preserve the indigenous medicinal plant species (Yirga, 2010a).

Agricultural expansion has been found to be the first main threat for the medicinal plants in the study area. Agricultural expansion, deforestation for fuel wood and drought has been reported by various researchers in Ethiopia as main factors for environmental degradation (Zerhiun and Mesfin,

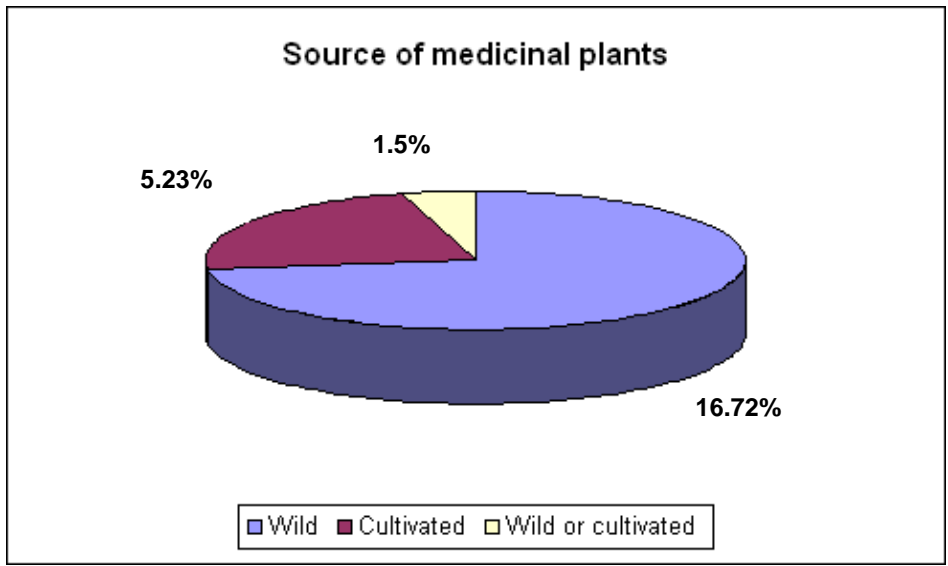


Figure 1. Source of medicinal plants used in the treatment of livestock ailments.

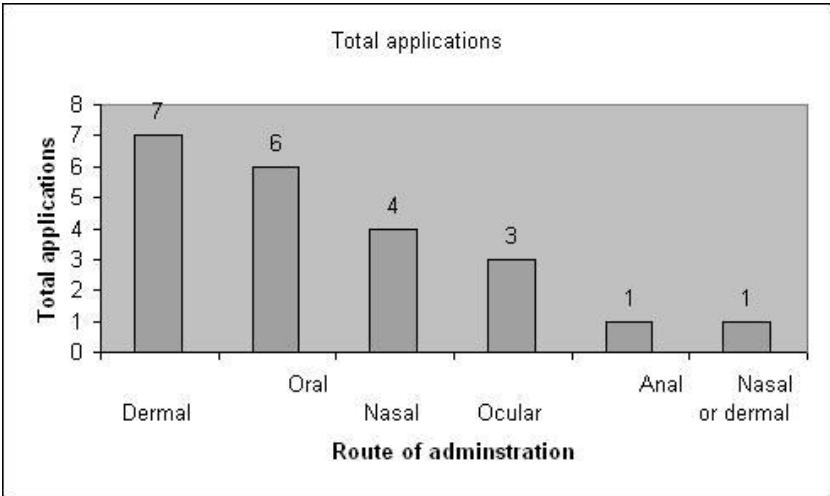


Figure 2. Route of application of remedies used for livestock disease treatment.

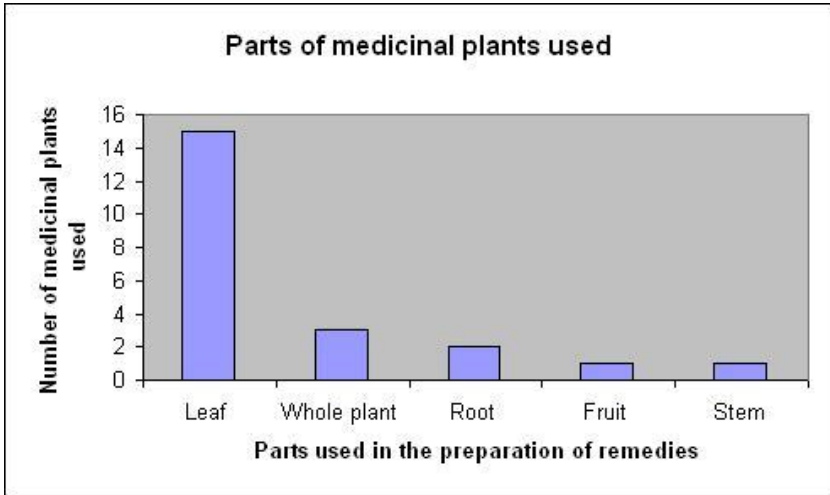


Figure 3. Parts of medicinal plants used in the preparation of remedies.

Table 5. Priority ranking of factors perceived as threat to medicinal plants based on the level of destructive effects in Seharti-Samre, based on interviews (n=36).

Factors	Frequency	Percentage	Rank
Agricultural expansion	22	22.9	1
Soil erosion	20	20.8	2
Deforestation	16	16.7	3
Low cultivation	14	14.6	4
Overgrazing	12	12.5	5
Drought	12	12.5	5
Total	96	100	

1990; Ensermu et al., 1992; Kebu et al., 2004; Yirga, 2010b). Moreover, the increase in human population growth would result in various ecological impacts such as intensification of agriculture in marginal areas, deforestation and environmental degradation which have a major impact on the medicinal plants.

Leaves were frequently used as part of the ethnoveterinary medicinal plants in the district. Herbal preparation that involves roots, rhizomes, bulbs, barks, stems or whole parts have effects on the survival of the mother plants (Dawit and Ahadu, 1993). Harvesting of leaves compared to harvesting of roots has a less negative influence on the survival and continuity of useful medicinal plants and hence does not affect sustainable utilization of the plants.

Evaluation of the ethnoveterinary medicinal plants for their efficacy and possible toxicity would be very important. Attention should be given to ensure the sustainability utilization of the medicinal plants and not to eradicate altogether though deforestation.

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