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Ethnobotanical study of ethnoveterinary plants in Kelem Wollega Zone, Oromia Region, Ethiopia

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Questionnaire based cross sectional study design was conducted from November 2015 to April 2016 in Dale Sadi district area, Kellem Wollega Zone of Oromia regional state of Ethiopia, to identify potential medicinal plants used for treatment of the livestock ailments. In this study 50 species of medicinal plant species were identified which were categorized under 32 different families. Among the medicinal plants 45(90%) were used for curative purpose, 2(4%) for only prophylactic purpose and 3(6%) for both curative and prophylactic activities. Shrubs 29(58%), herbs 10(20%) and tree 8(16%) were the main habitat of the herbal plants. The main routes of administration were oral and topical, 30(60%) and 9(18%) respectively. Leaves 18(36%) and roots 7(14%) were the main parts of the plant used as medicinal values. The results of this study play a significant role in encouraging further investigations by extracting and identifying bioactive constituents of those herbal medicines for the antimicrobial effect. It is recommended that further detailed examination should be conducted to investigate the medical principles and pharmaceutical activity found in these plants.

Key words: Livestock, traditional healers, medicinal plants.

INTRODUCTION

Medicinal plants have served through ages as a constant source of medicament for treatment of a variety of diseases (Okoli et al., 2007). The history of herbal medicine is almost as old as human civilization (Choudhary et al., 2015). In ancient cultures people developed their own herbal pharmacopoeias based on information gained through experience and in our today's scientific pharmacopoeia much of the information on scientific medicine is derived from those herbal

pharmacopoeias (Kim, 2005). Medicinal plants play a key role in the development and advancement of modern studies by serving as a starting point for the development of novelties in drug (Wright, 2005). Tropical plants have been used for medicinal purposes since the evolution of man. This knowledge is still alive and several hundred species are used in herbal remedies in indigenous system of medicines, where the whole plant or plant part or its extraction is used (Alawa et al., 2002; Okoli et al.,

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2002; Ogbuewu et al., 2015). Medicinal plants are the “backbone” of traditional medicine, which means more than 3.3 billion people in the less developed countries utilize medicinal plants on a regular basis (Davidson-Hunt, 2000). Primitive people learned by trial and error to distinguish useful plants with beneficial effects from those that were toxic or non-active and also which combinations or processing methods had to be used to gain consistent and optimal results (Jagessar et al., 2008).

In comparison with modern medicine, herbal medicines cost less, are more often used to treat chronic diseases and the occurrence of undesirable side effects seems to be less frequent (Jagessar et al., 2007). Natural products have long been regarded as excellent sources for drug discovery, given their structural diversity and a wide variety of biological activities (Fu et al., 2008). Due to easy availability and low cost of ethno veterinary medicinal plants, the livestock owners of the remote areas use them as a first aid for their animals (Jabbar et al., 2006).

Ethno veterinary knowledge is acquired by communities over many years and passed between generations through oral tradition. Today, with rapid cultural changes, this knowledge is being lost, necessitating its scientific documentation (Mathias, 2001). Thus, saving the species, documenting and preserving indigenous knowledge is essential (Alam and Ali, 2010). There is a lack of ethno botanical survey carried out in most parts of the country. In view of these, documentation of the traditional use of medicinal plants is important to preserve the knowledge regarding the traditional plants. Once these local ethno medical preparations are scientifically evaluated and disseminated properly, people will be better informed regarding efficacious drug treatment and improved health status. Therefore, this study was attempted with objectives:

1. To identify and document potential medicinal plants for the livestock ailment treatments at the study area.
2. To investigate the scientific name of those medicinal plants used by the local traditional healers.

MATERIALS AND METHODS

Study area and study population

The study was conducted from November 2015 to April 2016 on some traditional medicinal plants found in Dale Sadi district. Dale Sadi is one of the districts in Kellelem Wollega zone of Oromia Regional state. It is 510 km far from Addis Ababa capital city of Ethiopia. The area lies at average altitude of 1150 m above sea level. The area has temperature range of 33 to 35°C with more agricultural crops. The climatic condition alternates with long summer May to August and short rainy seasons from March to April. The winter dry seasons (November to February) with mean annual rain fall of 1200 mm (DDBOA, 2013). The target populations for this study were voluntary livestock's owners such as farmers,

traditional healers and veterinarian.

Study design and sampling methods

Cross sectional study design was conducted to identify traditional plants used in animals disease healing. Primary data were collected by questionnaire survey from purposively selected elders, especially traditional healer's livelihoods which depend predominantly on traditional plants for curing their livestock and their own health. At the same time voluntary animal owners, animal health practitioners were interviewed using focus group discussions and field observation. Non-probability sampling method was carried out to collect information related to medicinal plants for livestock in the study area. All volunteer traditional healers selected based on recommendation from elders of the study area.

Study methodology

The structured questionnaire was used to collect information related to medicinal plants used to treat livestock and Information regarding local name of the plant, its habit, part(s) of plants used, route of administration, methods of preparation, local name of the animal diseases treated, dosage used and species of animals treated was recorded at spot. Based on ethno botanical information acquired from informants, the plants were collected from the surrounding forests and other parts of the study areas with the people who know the local name of the plants. Pictures (Figure 1) of voucher specimens were captured and their leaves were collected, pressed and dried to identify the scientific names of the collected medicinal plants at the National Herbarium of Biology Department of Natural Science Faculty, Wollega University, Ethiopia.

Data analysis and management

The information that was gathered through questionnaire survey was coded and entered in to Microsoft Excel spreadsheet. Descriptive statics and chi-square were employed by SPSS version 20 software for analyzing of ethno botanical data.

RESULTS

The total numbers of species of plants collected during the study period were fifty (50). These were categorized under 32 different types of families. From the total 32 families of the plant-samples, 6(12%) plant species belong to family Asteraceae and 4(8%) plant species belong to family Solanaceae. Those family including Zygophyllaceae Fabaceae, Rosaceae, Musaceae, Euphorbiaceae, Moraceae, Rutaceae, Malvaceae, Brassicaceae and Cucurbitaceae each contains 2(4%) species of plants. Each of the remaining twenty (20) families was represented by single species of plants (Table 1).

The identified traditional medicinal plants were used traditionally to cure livestock ailments by local communities. It was found that the medicinal plants were used as anti-bacterial, anti-parasitic, anti-viral. At the same time those medicinal plants could be used for haemostatic, retention of fetal membrane, suturing the



Figure 1. Some of the identified medicinal plants in the study area. (A). *L. actucain ermis*; (B) *Bersama abyssinica*; (C). *Datura arborea*; (D). *Justiciasc himperiana*

physically damaged part, snake bites, fracture, snake allergy, poison consumed, free gas bloat, tympanic bloat, and others (Tables 2 to 6).

Routes and dosage of the administered medicinal plants

Numerous techniques of administrations routes were employed during administering the remedies. The highest numbers of medicinal plants were given orally 30(60%), followed by topical application 9(18%) (Table 7). According to study area much of recorded medicinal plants were found not to be toxic to animals even given at higher doses, except some plants like *Euphorbia Ampliphylla*, *Zehneriascabra*, *Capparistomentosa*, *Capsicum annum* and *Eulophia* that were reported to be toxic at higher concentration (Table 7).

Parts of plant used as medicinal values and their growth form

The plants part used to treat animal disease varied from species to species and from diseases to diseases. Leaf,

seed, bark, root, sap and latex were widely used for treating animal disease. Leaf 18(36%) were the most frequently used plant parts followed by root 7(14%) and seed 4(8%) and the minimum used part was pod (2%) (Table 8).

The investigated plants were fall under 5 groups. Shrubs are highest 29(58%), followed by herbs 10(20%), tree 8(16%) and epiphyte is the least 1(2%) (Table 9).

DISCUSSION

Medicinal plants play a key role in the development and advancement of modern studies by serving as a starting point for the development of novelties in drug. Herbal medicine has been widely formulated and used as an integral part of primary health care in Nigeria, China, Ethiopia and Argentina (Ogbuewu et al., 2015).

Among the plant families, Asteraceae was the dominant medicinal plant (12%) followed by family Solanaceae (8%). This finding was in line with Getaneh et al. (2014), in which Asteraceae was found to be the most dominant (11.2%) and Solanaceae was the second dominant (7.4%). This result is different with the finding of Zewdu et al. (2015), in which Euphorbiaceae was

Table 1. Lists of plant's family frequently used by traditional healers in the study area.

Family name	No. of species of plants under the family	Percentage (%)
Asteraceae	6	12.0
Zygophyllaceae	2	4.0
Apocynaceae	1	2.0
Scrophulariaceae	1	2.0
Fabaceae	2	4.0
Urticaceae	1	2.0
Combretaceae	1	2.0
Solanaceae	4	8.0
Cactaceae	1	2.0
Simaroubiaceae	1	2.0
Scrophulariaceae	1	2.0
Unknown	1	2.0
Rosaceae	2	4.0
Musaceae	2	4.0
Capparaceae	1	2.0
Loranthaceae	1	2.0
Agavaceae	1	2.0
Liliaceae	1	2.0
Euphorbiaceae	2	4.0
Moraceae	2	4.0
Rutaceae	2	4.0
Phytolaccaceae	1	2.0
Malvaceae	2	4.0
unknown	1	2.0
mucronata	1	2.0
Brassicaceae	2	4.0
Curbitaceae	2	4.0
unknown	1	2.0
Amaryllidaceae	1	2.0
Francoaceae	1	2.0
Acanthaceae	1	2.0
Zingiberaceae	1	2.0

reported to have the highest number of species employed in the treatment of diseases followed by Cucurbitaceae, Lamiaceae, Solanaceae and Verbenaceae underscoring the significance of these species in the ethnomedicine of Gondar town.

Citrus aurantifolia is a traditional medicinal plants also identified in this study which have insecticidal property against lice infestation. Similar result was reported by Parle and Chaturvedi (2012), who indicated that orange peel oil produces lethal effect on fleas, fire ants, and houseflies due to its 90 to 95% limonene. Other than using as insecticides, it was reported that the juice of *C. aurantifolia* is considered as tonic for libido and as antidote for poison and the diluted form of the *C. aurantifolia* fruit juice is used for mouth wash to treat sore mouth, sore throat and useful to treat irritation, diarrhea and swelling due to mosquito bites (Aibinu et al., 2007;

Khare., 2007; Akhtar., 2013). Similar to the reports of Firaol et al. (2013), *Euphorbia ampliphylla* plant was found to have the ability to cure the wart by topical application.

At the study area, *Phytolacca dodecandra* have medicinal values for internal parasites, abdominal aches and washing of the wound. However, the study results of Abebe et al. (2003) indicated that *P. dodecandra* used as taenicial and molluscicidal activity and other study conducted in Hadya Zone, Ethiopia also revealed that this plant's root was useful for treating Anthrax and itchiness (Habtamu et al., 2014).

In this study finding the *Gossypium herbaceum* plant have medicinal values for treating of ocular problem. In contrast to this Dhamija et al. (2011) reported that aqueous extract of *G. herbaceum* showed significant anti-depressant like effect due to activation of adenylyl cyclase

Table 2. Summary of general characteristics of the identified medicinal plants under family Asteraceae's family.

Plant local name	Scientific name	Plant type	Part used	Adm. Route	Method of preparation	Indication	Animal's species
Lomi simbira	<i>Crassocephalum sarcobasis</i>	H	Leaf	Oral, auricular and nasally	Its leaves are chopped and given with feed. It is also squeezed and the drop applied in both eyes and noses	For dulled and emaciated animals	Bovine
Kabaricho	<i>Echinops</i>	S	Root	Oral and nasal	The roots finely chopped and given with feed. Its root is also chopped and added to burning fire and the vapor of the smoke is inhaled	For abdominal aches, circling disease and dry coughing	All mammals
Ebicha	<i>Vernonia amygdalina</i>	S	Leaf	Oral and topical	Some of the leaves added to their feed with salt and wash the wound locally	For washing and healing the wound	All mammals
Ada	<i>Guizotiascabra</i>	S	Root	Topical	Its root are inserted into the needle for suturing of the wounded part	Suturing the wounded body	All domestic animals
Kasi	<i>Ageratum conyzoides</i>	S	Leaf	Topical	leaves are squeezed and dropped to the bleeding area	For haemostasis	All domestic Animals
Koricha ramo	<i>Lactucainermis</i>	S	Whole	Oral	After rooted off, whole parts are chopped together and given with their feed	For killing maggots found in open wound.	All domestic animals

S, Shrub; H, herb.

Table 3. Summary of general characteristics of the identified medicinal plants under family Solanaceae.

Plant local name	Scientific name	plant types	Part used	Adm. Route	Method of preparation	Indication	Animal's species
Mimita	<i>Capsicum annum</i>	H	Pod	Oral & Topical	2-3 pods are grinded with the bulb of <i>Allium sativum</i> then drenched. It also applied topically for leech treatment	For abdominal aches and removal of Leech from gum	All mammals
Asangira gibe	<i>Datura arborea</i>	H	Leaf	Oral	Leaves are given orally with the bulb of <i>Zingiber officinal</i> for ruminants. But for equines it should be chopped and drench by bottle	For Black leg, dullness, ocular and nasal discharges	All mammals
Hidi warabesa	<i>Solanum marginatum</i>	S	Root	Oral	Some of its roots are chopped and added to their feed	Black leg	Ruminants
Tambo	<i>Nicotiana tobacum</i>	S	Leaf	Oral	The leaves are squeezed into throats of sheep and cattle	For coughing & killing of Internal parasites	Ovine and bovine

cAMP pathway in signal transduction system and hence protecting the neurons from the lesion and Narasimha et al. (2008) also emphasized that *G. herbaceum* seeds to have antioxidant activity, anti-diarrheic, wound healing, anti-migraine, and

diuretic activity. In addition, the *Allium cepa* is another type of traditional medicinal plants useful for treating Foot and mouth viral diseases. This result is different from the finding of Yusha'u et al. (2008), in which *A. cepa* is used in treatment of

common ailments like cold, allergies, toothaches, laryngitis and cough.

In this study, the whole parts of *Bersama abyssinica* were identified having the ability to treat internal parasites. This is in agreement with

Table 4. Summary of general characteristics of the identified medicinal plants under families of Zygophyllaceae, Fabaceae, Rosaceae, Musaceae, Euphorbiaceae

Plant local name	Scientific name	Family name	Plant types	Part used	Adm. route	Method of preparation	Indication	Animal's species
Koso	<i>Hagenia abyssinica</i>	Rosaceae	S	Seed	Oral	A cup of seed is grinded then the powder mixed with chopped form of <i>A. sativum</i> and given for taeniasis infected animals. It also grinded with ant's clustered on a tree then drench for donkey	For taeniasis, treat and prevention and from any kind of infections in donkey.	All mammals
Facah	NI	Zygophyllaceae	S	Root	Oral	Root are chopped and given with feed	For emaciation, coughing, black leg, trypanosomiasis	Ruminants
Ambalta	<i>Entada abyssinica</i>	Fabaceae	T	Barks and leaves	Topical	Leaves and bark are chopped together and applied topically to wound containing maggot's larvae	To kill maggot larvae found in the wound	All domestic animals
Bakanisa	<i>Croton macrostachyus</i>	Euphorbiaceae	T	Latex	Oral and topical	The immature parts of leaves are given with its fruits for bloated animal. Its latex is also directly painted on the affected area	For bloats, dandruff	All mammals
Kacho	<i>Ensete ventricosum</i>	Musaceae	H	Stem	Oral	Its sap was collected to clean container and a few drops are drenched orally	For diarrhea and cough	Poultry
Adami	<i>Euphorbia ampliphylla</i>	Euphorbiaceae	S	Latex	Oral and topical	The sap is collected and given with their feed and it is also applied to the local warts.	For any internal parasites, Lameness, wart.	All domestic animals
Warke	<i>Musa sapientum</i>	Musaceae	H	Stem	Topical	Its sap is collected to clean container and washing an animal body with a medicinal infusion	Mange mites, ticks and lice	All domestic animals
Tumjo	NI	Rosaceae	C	Leaf and stem	Oral	All stem and leaves are chopped together and given with their feed for 2 times per year	For prolonged emaciated animal, lameness, Anthrax, coughing, Black leg	All ruminants
Ceka	<i>Calpurnia aurea</i>	Fabaceae	S	Leaves	Topical	Some of the leaves juice are squeezed to their body and washed thoroughly	For all ecto-parasites, and alopecia	All domestic animals
Koricha bofa	<i>Portieria hygrometra</i>	Zygophaceae	S	Leaves	Oral	The leaves is chopped added to their feed	For snake bite	All domestic animal

S, Shrub; H, herb; T, tree; C, climber; NI, not identified.

report of Mathewos et al. (2015) and Zewdu et al. (2015), that the extracts of *B. abyssinica* which could be administered orally for treating dysentery, stomach disorders such as abdominal pain, colic, diarrhoea, intestinal worms, amoebiasis. *Justicia schimperiana* have medicinal values for prevention rabies. The result was in line with other finding of Abiyu et al. (2014) that was

conducted on Ethnobotanical study of traditional medicinal plants in and around Fiche District, Ethiopia. Anthelmintics use of *H. abyssinica* in ruminants has been in agreement with the finding of Abebe et al. (2000). However it was reported that *H. abyssinica* also used against tapeworms in humans in Ethiopia (Giday et al., 2003, Yayesh et al., 2015). According to local herbalists *Zingiber*

officinale have medicinal values for treating any internal parasites. This is similar with the finding of Iqbal et al. (2006), who investigated the anthelmintic activity of crude powder and crude aqueous extract of dried Zinger (1 to 3 g/kg) in sheep naturally infected with mixed species of gastrointestinal nematodes. Contrary to this finding specific aspects of Zinger's actions has

Table 5. Summary of general characteristics of the identified medicinal plants under families of Moraceae, Rutaceae, Malvaceae, Brassicaceae, Cucurbitaceae.

Plant name	local	Scientific name	Family name	Plant types	Part used	Adm. route	Method of preparation	Indication	Animal's species
Hida refa		<i>Zehneriascabra</i>	Cucurbitaceae	C	Whole parts	Oral	The whole plant is chopped and the powdered form is dissolved in water and drenched by bottle.	For dry cough, emaciated, lameness, alopecia, colic	Equine
Kiltu		<i>Ficusvasta</i>	Moraceae	T	Sap	Oral	Decocted leaf is collected and drunk by cup	For GIT parasites	All mammals
Lomi		<i>Citrus aurantifolia</i>	Rutaceae	S	Fruit	Oral	A few drops of fresh juice are squeezed orally to throat	Coughing and lice infestation	Poultry
Ciladami		<i>Ruta chalepensis</i>	Rutaceae	H	Leaves	Oral	The leaf are chopped are squeezed to the bottle and drunk the poisoned animals	For poisoned animals	All domestic animal
Karabi		<i>Sidarhombifolia</i>	Malvaceae	S	Leaves	Topical	The leaves are pinched and squeezed and dropped to wound topically.	Wound	All domestic animal
Sanaficha		<i>Brassica nigra</i>	Brassicaceae	H	Seed	Oral	A cup of its Seed are grinded and mixed with water and drunk by bottle	For frothy and free gas bloat	All mammal
Buke		<i>Cucurbita Pepe</i>	Cucurbitaceae	H	Leaves and fruit	Oral and topical	Some of its upper part are chopped and mixed with water then drench the neonates half of a bottle. Its fruit is roasted and applied topically to infection found on the nose	Prevention of disease from neonates like Orf	Ruminants
Jirbi		<i>Gossypiumherbaceum</i>	Malvaceae	S	Seeds	Ocular	Some of its seed are grinded and the dust particles are applied to the infected eye only once	For ocular diseases	All animal
Shinfa		<i>Lepidium sativum</i>	Brassicaceae	S	Seed	Oral	A cup of its seed juices is mixed with water and drunk only once	For both productive & dry coughing	All mammals
Odaa		<i>Ficussycomorus</i>	Moraceae	T	Sap	Topical	A few drops of its latex are pasted with ash of the burned <i>Aspiliamossambicensis (Oliv.)</i> and applied to the wound until it dry	For wound healing	All domestic animal

S, Shrub; H, herb; T, tree; C, climber; NI, not identified.

been practiced for centuries in Chinese, Ayurvedic and Tibb-Unani fields of study as herbal medicines for the treatment of catarrh, rheumatism, nervous diseases, gingivitis, tooth ache, asthma, stroke, constipation and diabetes (Wang and Wang, 2005; Tapsell et al., 2006). On the other hand (Grzanna et al., 2005) indicated the anti-inflammatory action of ginger, while Shukla and Singh (2007) dealt with the cancer prevention properties of the Zinger crude drug.

Echinops is a well-known medicinal plant which is used for treating abdominal ache, dry cough and circling diseases. Similarly Hymete et al. (2007) reported that the root of *Echinops* is chewed and used to alleviate stomach ache. The anti-microbial activities of medicinal plants are varying; this is in agreement with (Yusha'u et al., 2008) who reported that antibacterial activity may vary from one plant to another. Generally herbal medicines collected during the study were found to have

medicinal values in health care of livestock for treatment of multiple ailments. This was also reported in different countries (Deeba et al., 2009; Shinwari, 2010).

Conclusion

The results of the present study show presence of wide range of herbal medicine used for treating

Table 6. Summary of general characteristics of the remaining identified medicinal plants.

Plant name	local	Scientific name	Family name	Plant types	Part used	Adm. route	Method of preparation	Indication	Animal's species
Kulubi warabesa		<i>Allium cepa</i>	Amaryllidaceae	S	Bulb	Oral	Roots are chopped and given with salt for 2 days	Foot and mouth disease	Ruminants
Jijimbila		<i>Zingiber officinale</i>	Zingiberaceae	S	Roots	Oral	Two bulbs are chopped with salt and given orally for 2 days	Ascariosis, stomach disorder	All domestic animal
Dumuga		<i>Justicia schimperiana</i>	Acanthaceae	S	Leaves	Oral	The juice of 2-5 leaves are squeezed to their feed and given for 3 days	Rabies	All mammals
Lolchisa		<i>Bersama abyssinica</i>	Francoaceae	T	Whole	Oral	All of its parts are grinded together and mixed with water and drench a bottle of the mixture	Black legs, chronically diseased, paralyzed animal that unable to stand	Ruminants
Asangira guracha		<i>Eulophia</i> spp.	Orchidaceae	S	Leaves and seed	Oral	The odd's number of its seed (either 3, 5 or 7) are given orally and some of its leaves are chopped then given with their feed	Snake bite, for retained fetal membrane, abdominal aches	All domestic animal
Aleltu		<i>mucronata</i>	mucronata	T	Leaves	Oral	Some of its leaves are chopped and grinded together with <i>Justicia schimperiana</i> 's leaves and drench a bottle of the filtrate	Rabies prevention	All mammals
Tabanae		<i>Acokanthera schimperi</i>	Apocynaceae	T	Bark	Oral	Its bark grinded with leaf of <i>Vernonia amygdalina</i> and added to its feed	For healing of swelling	All mammals
Arangama		<i>Capparistomentosa</i>	Capparaceae	S	Root	Topical	Root is covered by clean cloth and applied locally to swelled area	For treat local swelling	All mammals
Dertu		<i>Phragmantheramacrosolen</i>	Loranthaceae	E	Leaves	Oral	The leaves are chopped and given with their feed	Clinical mastitis, prolonged emaciated animals	Ruminants
Kicu warabesa		<i>Agave americana</i>	Agavaceae	H	Bulb	Oral	The bulbs are chopped and given with salt	For Black leg	Ruminants
Basango		<i>Canna indica</i>	Cannaceae	S	Root	Oral	The roots are given with the leaves of <i>Datura arborea</i> .	Black leg	Ruminants
Kulubi adi		<i>Allium sativum</i>	Liliaceae	H	Bulb	Oral	The bulb is chopped with salt and drenched orally	Abdominal aches and bloat	All domestic animal

Table 6 cont'd

Komogno	<i>Brucea antidysenterica</i>	Simaroubaceae	S	Leaves	Ocular and auricular	Some of its leaves are chopped and squeezed. Then its drops applied at the side of infected eye	For blinded and eye discharged animals	All domestic animal
Gura harre	<i>Verbascumsinaiticum</i> Benth.	Scrophulariaceae	S	Leaves	Oral	Its leaves are chopped with the bulb of <i>Allium sativum</i> and drenched orally	For coughing	All mammals
Harkis	<i>Opuntia ficus-indica</i>	Cactaceae	S	Steam	Oral	Some of steam parts are chopped and given with salt	For retention of fetal membrane, and against bloat	All mammals

Table 7. Lists of administration route(s) for medicinal plant(s) in study area.

Routes of administration of medicinal plant (s)	Number of responders	Percentage
Oral	30	60.0
Topical	9	18.0
Ocular	1	2.0
Oral and nasal	1	2.0
Oral and topical	6	12.0
Oral, auricular and nasal	1	2.0
Ocular and auricular	1	2.0
Nasal and ocular	1	2.0

Table 8. Summary of plant part(s) used as medicinal values.

Parts of medicinal value(s)	Number of species	Percentage (%)
Leaf	18	36.0
Root	7	14.0
Bark	2	4.0
Stem	3	6.0
Leaf and stem	1	2.0
Bulb	3	6.0
Latex	2	4.0
Sap	2	4.0
Fruit	1	2.0
Bark and leaf	1	2.0

Table 8. Cont'd

Seed	4	8.0
Pod	1	2.0
Leaf and seed	1	2.0
Leaf and fruit	1	2.0
Whole parts	3	6.0

Table 9. Distribution of the medicinal plants by their growth forms.

Habit of the plants	Frequency	Percentage (%)
Herb	10	20.0
Shrubs	29	58.0
Tree	8	16.0
Climber	2	4.0
Epiphyte	1	2.0
Total	50	100.0

various animal ailments. The study area was endowed with plenty of medicinal plants fairly distributed throughout the region. The identified plants had broad spectrum of activities, the findings indicated that they are used for treatment of multiple ailments and have medical value against many diseases. The ethnomedical use of the plants is mainly for curative and prophylactic purposes. Oral and topical routes of administration are the main administration route for traditional herbal medicine. It is recommended that further investigations should be conducted to establish the medical principles and pharmaceutical activity found in these plants.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

Abbreviations

AD, Anno Domini; **CAMP**, cyclic adenosine mono phosphate; **DDBOA**, Dale District Bureau of Agriculture; **EVM**, ethno veterinary medicine; **HSV**, Herpes Simplex Virus; **MDs**, medicinal plants; **TM**, traditional medicine.

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