

Research Article

Identification of Ethno-Veterinary Practices for Animal Diseases in Assosa Zone

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Abstract

Ethno-veterinary medicine is the application of traditional knowledge, theory, and practice to mitigate livestock diseases. The study conducted to document veterinary use of medicinal herbs of local users in Assosa Zone, Ethiopia from September 2022 to July 2023. Data collected between individual based field's interviews using semi-structured questionnaire. Most of the respondents were males and with age group of 40 to 60 years old. Most of the respondents were illiterate by educational status and Muslims by religion. Around 68.6% of respondents acquire their traditional knowledge from family and most traditional healers prepared remedies from plants 73 (71.6%). In our investigation, 71 plant species from five districts identified. Those plants used against 68 types of livestock diseases and to increase livestock outputs. Those plants botanically distributed across 43 families. Data from our study suggested that the highest number of plant species was found in Solanaceae and Fabaceae family with (13.95%) followed by Combretaceae and Asteraceae (9.30%). Majority of the medicinal plants reported were found from forest (42.25%) followed by both possible to cultivated or found in forest (35.21%), and Backyard (21.13%). Majorities of medicinal plant preparations was from root parts (25.35%), followed by leaf, seed (22.54%), and bark (8.45%). The current study has revealed that the natives in the districts have been heavily dependent on traditional veterinary medicine for the treatment of variety of livestock diseases. Thus, it should recommend that conservational activities of medicinal plants and governmental encouragements of traditional healers should be addressed.

Keywords

Ethnoveterinary, Plant, Respondent, Medicinal Plant

1. Introduction

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 bottlenecks of livestock performance [11]. The majority of livestock raisers in Ethiopia are geographically far away from clinic stations; and some may not afford the fees for veterinary services [7]. Therefore, traditional ways of treatment appear

to be a viable alternative to tackle the problems, due to the inadequate animal health services in the different areas of country, and drug resistance development [6, 8]. Due to the longer period of practice, traditional medicine using plant-and animal-based remedies deeply integrated into the culture of Ethiopians. However, this medicinal practice poorly documented, resulting in the loss and underestimation of its value by the younger generation [1].

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Ethno-veterinary medicine is the application of traditional knowledge, theory, and practice to treat illnesses in livestock [15]. In addition, it comprises belief, and skills pertaining to healthcare and management of livestock [5, 10]. It estimated that the traditional remedies are sometimes the only source of therapeutics for nearly 80% of human population and 90% of livestock of which 95% are plant origin in pastoral area of Ethiopia. Ethno veterinary practice to animal health care is as old as the domestication of various livestock species. The ethno veterinary systems are an ecological unit and ethnic community-specific and therefore, the characteristics, sophistication, and intensity of these practices differ greatly among individuals, societies, and regions. However, they are facing the threat of rapid erosion because of rapid socio-economic, environmental, and technological changes [3].

World Health Organization (WHO) estimates that the majorities of the world's population rely mainly ethno botany and zoo therapy based medicine. Reports indicated that traditional medicine accounts for around 40% of all health care medicines in China while 65% of Indian population living in rural areas uses traditional medicines to meet their primary health care needs [2, 10]. Traditional medicine used in the diagnosis, prevention and elimination of physicals, mental or social imbalances, which passes from generation to generation, whether verbally or in writing [9].

Medicinal plants serve as potential sources of therapeutics for both humans and animals. But the major factor hindering the development of medicinal plant based industries in developing countries has been the lack of information on social and economic benefits which can be derived from the industrial utilization of those plants. As a result, the governments and entrepreneurs have not exploited their real potential [12].

The inadequate funding at the national level for the prevention and control of animal diseases adds to the burden, especially among pastoralists who live in the remote arid and semi-arid lowland parts of the country. Therefore, a reasonable solution would be to complement modern veterinary health care with traditional care. Ethno veterinary medicine often provides cheaper options than comparable western drugs, and the products are locally available and more easily accessible. In the face of these and other factors, there is increasing interest in the field of ethno veterinary research and development [14].

A large number of farmers rely on a range of ethno veterinary knowledge to keep their livestock healthy and have used for preventing and treating livestock ailments for several generations in Ethiopia [15]. Agriculture is the mainstay of Benishangul-Gumuz regional State but, livestock production is constrained by many factors and the return obtained from the sector is very low mainly due to killer diseases (animal Trypanosomosis) affecting all types of livestock especially cattle. Those knowledge systems mostly handed down orally from generation to generation and it may disappear because of rapid socioeconomic, environmental and technological changes. The collection of information about natural flora,

classification, management and use of plants by the people is very important since it is economical, culturally acceptable and ecologically sounds [7]. Therefore, documenting traditional medical knowledge is important to facilitate discovery of alternative medicine and new pharmaceuticals. Because ethno veterinary systems are ecological units and ethnic community-specific, the characteristics, sophistication, and intensity of these practices vary greatly across individuals, societies, and regions. Therefore, the objectives of the study were to document ethno veterinary medicinal plants and to identify different indigenous knowledge of local users in Assosa Zone.

2. Materials and Methods

2.1. Description of the Study Area

The study conducted from September 2022 to July 2023 in selected districts of Assosa zone of Benishangul Gumuz region. Assosa is the capital city of the region. Benishangul Gumuz Regional state is located in the northwestern part of Ethiopia, which suited between 090 17'-12.06" N latitude and 340 10'-37.4" E longitude. It shares common borders with the State of Amhara in the east, the Sudan in the northeast, and the State of Oromia in the south. The average annual temperature is 16-39 0C; its annual rainfall is 650-1,900 mm. The region covers a total area of 5,033, 592 hectare /50,380 Km² or 4.4 % total of the country, with altitude ranges from 580 – 3300 m.a.s.l with 75% low land/kola/ (below 1,500 m.a.s.l) [13]. The districts were purposively selected based on large number of livestock population and people way of life. The Kebele were also purposively selected because of high number of traditional plants knowledgeable indigenous people. Each participant was selected with a history of traditional medicinal practitioners.

2.2. Selection of Informants and Interviewing Process

Participants were traditional healers who volunteered and varied in age, gender, occupation, and educational level. One hundred and two informants (91 males) and 11 females purposefully selected from study districts with the support of Benishangul Gumuz Administration Office and respected Kebele level elders. Before the start of the interviews, informed consent was obtained from each informant who participated in this study after explaining the objective of the study and assuring them of the most responsible judicial use of the resulting information.

2.3. Data Collection

Individual interviews conducted with informants using semi-structured questionnaires written in English and translated into the local Rutanegna and Amharic languages. Each

informant's age, gender, level of education, occupation, and religion were gathered. The Ethnoveterinary medicinal plants' local/vernacular names, methods of preparation, diseases treated with traditional plants, route of administration, doses, location of plant found, type of plants, and parts of the medicinal plants recorded. Major animal diseases occur in the area, the symptom and clinical presentation of animal disease present and/ or the type of the disease recorded.

2.4. Plant Specimen Collection and Identification

Field trips conducted with local informants to collect and record reported medicinal plants specimens from wild and home gardens following standard procedures. Plant specimens collected by including vegetative parts, leaves, and/or seed parts that were suitable for taxonomic identification. The collected plant specimens were dried and pressed onto herbarium sheets made of cardboard or newspaper. The scientific name collected plant species identified by botanist.

2.5. Statistical Analysis

The data entered into SPSS version 20 and, summarized using descriptive statistical methods (frequency and percentage).

3. Result and Discussion

3.1. Socio-Demographic Profiles of Informants

One hundred two (102) respondents were participated in the study, with interview in five districts and 14 peasant associations. From (102) respondents participated in the study, 91(89.2%) were male (Table 1). Similar to this [4] from the interviewed males 90(93.8%) accounted the majority. The most traditional healers are males comparing to females. Concerning Age groups, 47(46.1%) of them were found at the age group level of 40 to 60 and most respondents 82(80.4%) were Muslim. Majority of the ethno veterinary practitioners respondents in Assosa zone were rural residents. Ethno-veterinary knowledge of the traditional healers mostly obtained from family members but some from religious institutions, which passed through generation with word of mouth. The majority of respondents used multiple plants to treat animal diseases. Educational status analysis showed that, 46(45.1%) of the respondents were illiterates, 15(14.7%) of them were able to write and read, while the remaining 25(24.5%), 7(6.9%) and 9(8.8%) were in elementary, high school, and degree or diploma respectively. In other study [15], educational status showed that, 47 (55.95%) of the respondents were illiterates, 17 (20.24%) of them were able to write and read. This minimum difference may be due to time variation, which is the number of intellectuality increase with

time.

Table 1. Demography of participants.

Demographic factor	Categories	Number of respondents	Percentage
Sex	Male	91	89.2
	Female	11	10.8
Age	Below 20	1	1.0
	20 to 40	29	28.4
	40 to 60	47	46.1
	Above 60	25	24.5
Religion	Orthodox	20	19.6
	Muslim	82	80.4
	Illiterate	46	45.1
Educational status	Read and write	15	14.7
	Elementary	25	24.5
	High school	7	6.9
	Degree and Diploma	9	8.8
Animal health worker	Yes	8	7.8
	No	94	92.2
	Yes	93	91.2
Source of knowledge	No	9	8.8
	Family	70	68.6
	Religion	9	8.8
	Learn from others	5	4.9
	written material	13	12.7
	Others (trial and error)	5	4.9
Source of ethno veterinary	Plant	73	71.6
	Non plant	9	8.8
	Both plant and non-plant	6	5.9
	Others (physical activity on animals body)	3	2.9
	Not give response	11	10.8

3.2. Plants Identified

In our investigation, 71 plant species from five districts identified. Those plants used against 68 types of livestock diseases and to increase livestock outputs. Those plants bo-

tanically distributed across 43 families. Data from our study suggested that the highest number of plant species was found

in Solanaceae and Fabaceae family with (13.95%) followed by Combretaceae and Asteraceae (9.30%).

Table 2. Table medicinal plants species, families, parts used, habit and indication.

Plant local name	Language	Family name	Plant Scientific name	Plant location	Part of plant used	Indication / disease
Awiet	Amharic	Solanaceae	<i>Solanum nigrum</i>	Backyard	Root	Newcastle
Agara	Rutanegna	Combretaceae	<i>Combretum Molle.</i> R.Br.ex G.Don	Forest	Root	Trypanosomiasis
Bebi	Amharic / Rutanegna	Olacaceae	<i>Zimonia americana</i>	Forest	Leaf	Trypanosomiasis
Mengug	Rutanegna	Vitaceae	<i>Ampelocissus schim-</i> <i>periana</i>	Forest	Root	Pneumonia
Qombo	Rutanegna	Sterculiaceae	<i>Sterculia Africana</i>	Forest	Root	Trypanosomiasis / Pneumonia / wound
Zinigeble	Amharic	Zingiberaceae	<i>Zingiber officinale</i>	Backyard	Root	Newcastle / Pnumenia
Yejib shinkurt	Amharic	Amaryllidaceae	<i>Crinum bambusetum</i>	Backyard	Stem and un- derground stem	Diaharrea / Trypanoso- miasis
Qebricho	Amharic	Asteraceae	<i>Eknops kebericho</i>	Forest	Root	Diaharrea / Black leg / Canavolism / trypano- somiasis
Mimi	Amharic	Meliaceae	<i>Azadirachta indica</i>	Forest	leaf	trypanosomiasis / Dia- harrea / Poultry disease
Aquden	Rutanegna	Rubiaceae	<i>Sarcocephalus latifo-</i> <i>lius</i>	Everywhere	Root / leaf	Canavolism / Black leg / Poultry disease / trypano- somiasis /bcolic in cattle / Gogobesa, Ra- bies / GIT diseases
Qundo ber- eberie	Amharic	Anacardiaceae	<i>Schinus molle* L.</i>	Backyard	Berry	Diaharrea
Sheqete	Rutanegna	Polygalaceae	<i>Scuridaca</i> <i>longepedunculata</i>	Forest	Root	Shoat diseases, New- castle
Mesel	Rutanegna	Fabaceae	<i>Accacia species</i>	Forest	Berry and bark	Brucelosis
Tseta	Rutanegna	Dioscoreaceae	<i>Dioscoria prehenselis</i>	Forest	Leaf	retained placenta
Nichi shinkurte	Amharic	Alliaceae	<i>Allium sativum L.</i>	Everywhere	Underground stem	Trypanosomiasis, Pnu- menia
Tsira	Rutanegna	Moraceae	<i>Ficus thonningii</i>	Forest	Root	Rabies
Tikure Azi- mude	Amharic	Ranunculaceae	<i>Nigella sativa L.</i>	Backyard	Seed and berry	Trypanosomiasis, Poul- try disease, Diaharrea, food appe- tite,
Abeshi	Amharic	Fabaceae	<i>Trigonellum foe-</i> <i>num-graecum</i>	Backyard	Seed and berry	Trypanosomiasis, Cattle diseases
Qey shinkurte	Amharic	Alliaceae	<i>Allium cepa L</i>	Everywhere	Berry	Poultry disease
Tsetse furi	Rutanegna	Euphorbiaceae	<i>Sapium elipti-</i> <i>cum(Krauss)Pax</i>	Not give response	Root	Equine disease

Plant local name	Language	Family name	Plant Scientific name	Plant location	Part of plant used	Indication / disease
Tsetse mali	Rutanegna	Asteraceae	Guizotia abyssinica (L.f) Cass	Forest	Root	Rabies
Aqanda	Rutanegna	Rubiaceae	Gardenia Ternifolia schum. & Thonn.	Forest	Leaf	Cattle diseases, Pnumenia
Muze	Amharic	Musaceae	Musa acuminata	Backyard	Seed and berry	Cattle diseases
Kerkedie	Amharic	Malvaceae	Hibiscus Corymbosus A.Rich	Forest	Root	Cattle diseases
Gulo / shumeshugi	Amharic / rutanegna	Euphorbiaceae	Ricinus Comminus L.	Everywhere	Seed and berry	Bloat
Agongilo	Rutanegna	Burseraceae	Boswellia Papyrifera (Del.) Haast	Forest	Root and berry	Bloat
Mitimita	Amharic	Solanaceae	<i>Capsicum frutescens</i>	Backyard	Berry and seed	Poultry disease, Shout disease, couging, FMD, ORF
Feto	Amharic	Brassicaceae	Lepidium sativum L.	Backyard	Berry or seed	Pnumenia, diaharrea, Equine disease, Cattle diseases, Pasturolosis, Blackleg, couging, unknown diseases, Gogobesa, constipation
Demakasio	Amharic	Lamiaceae	<i>Ocimum lamiifolium</i>	Everywhere	Leaf	Trypanosomiasis
Lomi	Amharic	Rutaceae	<i>Citrus limon</i>	Everywhere	Berry	unknown diseases
Aregeisa	Oromogna	Aloaceae	Aloe pubescens (Reynolds)	Everywhere	Leaf	Lung disease
Birbera	Amharic	Fabaceae	<i>Millettia ferruginea</i> (Hochst.) Baker	Everywhere	all part	Abriqe (equine diseases), poultry diseases
Habhabe	Amharic	Cucurbitaceae	<i>Citrullus lanatus</i>	Everywhere	Leaf	Pnumenia
Dinbilale	Amharic	Apiaceae	<i>Coriandrum sativum</i>	Everywhere	Berry and seed	Trypanosmiasis, Lung disease, equine (Manzer), GIT diseases couging, unknown diseases
Agam	Amharic	Apocynaceae	<i>Carissa spinarum L.</i>	Everywhere	Bark	constipation
Tena adam	Amharic	Rutaceae	<i>Ruta chalepensis</i>	Backyard	Leaf	Newcastle, Brucellosis, Black leg, skin diseases Emaciation, skin diseases, gansh teeth
Beqolo	Amharic	Poaceae	<i>Zea mays</i>	Everywhere	Berry and seed	Pnumenia, diaharrea
Teliba	Amharic	Linaceae	<i>Linum usitatissimum*</i> L	Everywhere	Berry and seed	retained placenta
Lenquata	Amharic	Malvaceae	<i>Grewia mollis</i>	Forest	Bark	retained placenta
Nichi bahirzafe	Amharic	Myrtaceae	<i>Eucalyptus globulus</i> Labill	Everywhere	Leaf	Black leg
Embuaye	Amharic	Solanaceae	<i>Solanum incanum</i>	Forest	Berry and seed	Poultry disease, Trypanosmiasis, diaharrea, hornwound, couging, unknown diseases, Al-

Plant local name	Language	Family name	Plant Scientific name	Plant location	Part of plant used	Indication / disease
						opacia, food appetite
Buna	Amharic	Rubiaceae	<i>Coffea arabica</i>	Forest	Berry and seed	Trypanosmiasis, Wound, FMD
Telenji	Amharic	Amaranthaceae	<i>Achyranthes aspera</i> L.	Forest	Leaf	Bleeding
Yequra arg	Amharic	Cucurbitaceae	<i>Momordica foetida</i> Schumach.	Forest	Root	Trypanosmiasis
Moro	Rutanegna	Asparagaceae	<i>Asparagus Flagellaris</i> (kunth) Baker	Backyard	Root	Newcastle
Yeselite zyeit	Amharic	Pedaliaceae	<i>Sesamum indicum</i>	Everywhere	Beery and Seed	Bloat
Mengu	Rutanegna		<i>Ampelocissus Schimperiana</i> (hochst.x.A.rich planchl.exA.Vitaceae)	Everywhere	Bark	Trypanosmiasis
Qulqual	Amharic	Euphorbiaceae	<i>Euphorbia ampliphyl-la*</i> Pax	Forest	Stem and underground stem	Trypanosmiasis
Sorghohum	Rutanegna	Poaceae	<i>Sorghum Sorghum bicolor</i>	Forest	Berry and seed	diaharrea
Qeye	Rutanegna	Combretaceae	<i>Anogeissus leiocarpa</i> (A.DC)Guill.Bperr	Backyard	Berry and Bark	diaharrea, GIT diseases, Goat disease, Equine disease, Colic, respiratory diseaes
Hornotse	Rutanegna	Tiliaceae	<i>Grewia velutina</i>	Everywhere	Bark	Trypanosmiasis
Weyira	Amharic	Oleaceae	<i>Olea capensis</i> L.Subsp. <i>macrocarpa</i> (C.H. Wright) I.Verd. (Oleaceae)	Forest	Root	Emaciation, all disease
Qutse	Rutanegna	Asteraceae	<i>Saussuria lappa</i>	Forest	Root and berry	Rabies, couging
Moringa	Amharic	Moringaceae	<i>Moringa stenopetala</i>	Backyard	Leaf	all disease
Gumero	Amharic	Capparaceae	<i>Capparis tomentosa</i>	Forest	Root	gansh teeth
Washenit	Amharic	Asteraceae	<i>Solanecio</i> sp.	Backyard	Bark	gansh teeth
Gezaiwa	Amharic	Solanaceae	<i>Withania somnifera</i> (L.) Dunal (Solanaceae)	Backyard	Root	wound, gansh teeth
Qulqualcho	Amharic	Cactaceae	<i>Opuntia ficus-indica</i> (L.) Mille	Backyard	Leaf	Warts
Ye Habesha gomene	Amharic	Brassicaceae	<i>Brassica carinata</i> (A.) Braun	Everywhere	Berry and seed	FMD
Sinapheche	Amharic	Brassicaceae	<i>Brassica carinata</i> A.Br	Everywhere	Berry and seed	Equine disease, couging
Ashure	Rutanegna	Combretaceae	<i>Terminalia laxiflora</i> Engl.B.Diales	Everywhere	Root	Trypanosmiasis
Lebiremegu	Rutanegna	Fabaceae	<i>Vigna membranacea</i> . A. Rich	Everywhere	Root	Lung disease
Tsaba	Rutanegna	Fabaceae	<i>Dalbergia boehmii</i> (L.Del)	Forest	Bark	couging, poultry disease
Bambee	Amharic	Convolvulaceae	<i>Ipomoea batatas</i> L.	Everywhere	all part	wound

Plant local name	Language	Family name	Plant Scientific name	Plant location	Part of plant used	Indication / disease
Agaro	Rutanegna	Celastraceae	Maytenus senegalensis (Lam.).Exell	Forest	Root and Leaf / Bark	Trypanosmiasis, Bloat and Goat diseases
Enquaye	Amharic	Solanaceae	Solanum marginatum L.F.	Everywhere	Berry and seed	Newcastle, photphobia, Canavolism, Dafent (eye diseases),
Qeha	Rutanegna	Balanitaceae	Balanites Aegyptiaca (L.Del)	Everywhere	Leaf	couging
Gushel	Rutanegna	Combretaceae	Combretum collinum fresen	Forest	Leaf	Trypanosmiasis
Giendher	Rutanegna	Fabaceae	Albizia mamacophylla (A.Rich).walp	Forest	all part	increase milk
Aqulqa	Rutanegna	Bignoniaceae	<i>Stereospermum kunthianum</i>	Forest	Leaf	Trypanosmiasis, diarrhea, Reih or dyspnea, Goat diseases, Equine disease,
Tinbaho	Amharic	Solanaceae	Nicotiana tabacum	Everywhere	Leaf	myasis, Ectoparasite, wound

3.3. Parts Used and Source of Medicinal Plants

Part of the plant used for medicinal value varies according to the type of plant they used. Most of the plant administer to diseased animal orally but use of nose, smocking, ointment, pour on, drop and spray also used according to type of diseases and nature of plant material. Even though different parts of plants reported to use for remedy preparation by the respondents, a majority of remedy preparations of traditional medicine found to from root parts (25.35%), followed by leaf, seed (22.54%), and bark (8.45%). But the rest parts of the plants like Stem and underground stem, Berry, root and leaf, berry and bark, all part of the plant, root and berry, leaf and berry, root and bark, have been accounted the rest. Similar to this study [11], root is the most frequent part of plants used by the respondent's.

Table 3. Frequency of Part of the plant use for treatment.

Part of the plant	Percentage	Percent
Root	18	25.35%
Leaf	16	22.54%
Stem and underground stem	2	2.82%
Bark	6	8.45%

Part of the plant	Percentage	Percent
Root and Leaf	2	2.82%
Berry and Bark	2	2.82%
All part of the plant	3	4.22%
Root and Berry	2	2.82%
Seed	16	22.54%
Berry	3	4.22%
Underground stem	1	1.41%
Total	71	100%

Traditional veterinary use medicines were reported to be administered through oral, nasal, topical, smoking, with ear, inhalation, pour on, surgical, drop and spray, however among those routes oral application was the best represented routes of administration as (78.6%) of respondents revealed, followed by pour on (22.9%), respectively. Similar to this study, [4] oral rout is the most frequently root of administration followed by pour on methods.

3.4. Plant Location

Majority of the medicinal plants reported found from forest source (42.25%) and others were either cultivated or found in forest (35.21%), or obtained from Backyard (21.13%).

Table 4. Plant location.

Location	Percentage of plants	Percent (%)
Backyard	15	21.13%
Both backyard and forest	25	35.21%
Forest	30	42.25%
Not give response	1	1.41%
Total	71	100%

4. Conclusion and Recommendation

The current study has revealed that the people of the Assosa zone have sound traditional veterinary medicines knowledge and practices for preventing, controlling, and the treatment of variety of livestock diseases. The traditional knowledge always provides a baseline for further phytochemical and pharmacological investigation. Conservational activities of medicinal plants and governmental encouragements of traditional healers should conduct.

Abbreviations

m.a.s.l	Mean Above Sea Level
SPSS	Statistical Package for Social Science
WHO	World Health Organization

Author Contributions

Betelihem Yirdaw is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The author declares no conflicts of interest.

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