Ethnoveterinary Medicine Practices in Ethiopia: Review

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Abstract: Ethno veterinary practices involve the traditional beliefs, knowledge, practices and skills pertaining to healthcare and management of livestock. Ethiopia is endowed with a huge potential of medicinal plants and their uses that provide a wide contribution to the treatment of human and livestock ailments. Today, traditional medicine continues to be practiced dominantly in remote areas of the country where conventional animal health care has not reached. Traditional systems of treatment is also still important in Central Ethiopia where modern veterinary services had been first introduced many years ago. Rationalizing and validating the use of each medicinal plant requires thorough research. As a knowledge of ethno medicinal plants is on the verge of irreversible loss, it is important and necessary to collate in a review some of the available information on traditional use of such plants. A review of the literature shows that plants are used in various parts of Ethiopia in the general healthcare of livestock. Several studies have reported such use, although a thorough and complete inventory of plant species used for animal diseases is still unavailable. The present paper deals with the status of herbal remedies for animal diseases in Ethiopia and provides information on the botanical identity, specific preparations and mode of administration of the plant/plant’s part for treatment of various disease and disorder of livestock.

Key words: Ethiopia • Ethnoveterinary • Livestock Diseases • Medicinal Plants • Traditional Knowledge

INTRODUCTION

The application of traditional medicines to veterinary medicine has been termed as Ethno Veterinary Medicine (EVM). EVM has been defined in broad sense as an indigenous animal healthcare system that includes the traditional beliefs, knowledge, skills, methods and practices of a given society [1,2]. The knowledge varies from region to region and from community to community [3]. In general, ethno veterinary practices have been developed by trial and error and by actual experimentation [4]. It comprises of traditional surgical techniques, traditional immunization, magic religious practices and the use of herbal medicines to treat livestock diseases [2,3,5].

Ethiopia is believed to be home for about 6,000 species of higher plants with approximately 10% endemism [6]. Peoples of all cultures depend on plants for their primary requirements and learned diverse applications of plants [7]. Pastoralists, agro-pastoralists and other, small-scale, farmers in the East Africa region have engaged in a long tradition of ethno veterinary practices to care for their animals, involving the use of many plants to prevent and treat different diseases and health conditions [8].

The majority of livestock raisers in Ethiopia are geographically distant from the sites of veterinary stations and those that are closer to the sites may not afford the fees for services. 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 [9]. In fact, these practices are still widely applied, often because of the lack of availability or the prohibitive costs of ‘modern’ veterinary medicines and approaches [10]. Hundreds of plant species have been identified by traditional practitioners for treating a wide range of livestock (and human) ailments [11], although the efficacy of plant treatments has often not been tested through formal trials [12].
Globally, the ethno veterinary medicinal plant knowledge, similar to other several studies have been carried out, many reports written and numerous conferences and workshops held. These activities have saved ethno veterinary knowledge from extinction because most knowledge resided with elderly community members and disappeared as they died [13,14]. However, the effort is still quite insignificant when compared to the undocumented global ethno veterinary plant lore.

In Ethiopian context, the traditional knowledge on ethno veterinary practices by local healers who are knowledgeable and experienced in traditional systems of treatment is important [15], but their knowledge are not documented and is dwindling fast [16]. It is also indicated that the knowledge of ethno medicinal plants is on the verge of irreversible loss and declining to deterioration due to the oral passage of herbal heritage rather than in writings, despite their vital role in catering for the health of human and livestock population [17].

Therefore, the objective of this review paper is:

- To highlight the ethno-veterinary health management practices found amongst livestock producers in Ethiopia.
- To delineate information on ethnoveterinary medicinal plants, their preparation and application methods used by traditional healers in treating different animal ailments.

Components of Ethno Veterinary Practices: Ethno veterinary term does not only comprise of herbal and traditional medicines but it also constitutes information, practices, beliefs, skills, tools and technologies, selection of breeds and human resources/traditional healers. It was observed that almost all parts of the plant are used in the preparation of ethno veterinary medicines. These include bark, leaves, stem, flowers, roots, seeds, fruits [2].

Pros and Cons of Ethno Veterinary Medicine
Pros: Interest in ethnoveterinary practices has grown recently because these practices are much less prone to drug resistance and have fewer damaging side-effects on the environment than conventional medicine. EVM has many advantages; as source of modern medicine (drugs), affordability, locally available and easily accessible, culturally appropriate and understood, effective, comfortably animal metabolize plants and plant extracts and user friendly. For common diseases and more chronic conditions such as colds, skin diseases, worms, wounds, reproductive disorders, nutritional deficiencies and mild diarrhea, EVM has much to offer and can be a cheap and readily available alternative to costly imported drugs [11].

Cons: The fact that some herbs are available only in certain seasons often limits the application of traditional medicine. Moreover, some of the preparations are mixtures of many kinds of plants which may be difficult to find at the same time [18]. There are also other drawbacks such as, risk of incorrect diagnosis, imprecise dosages; low hygiene standards secrecy of some healing practices, absence of written records and some treatments may be ineffective or harmful. EVM are often not as fast-working and potent as allopathic medicines. They may therefore be less suitable to control and treat epidemic and endemic infectious diseases (e.g., foot-and-mouth disease, rinderpest, hemorrhagic septicemia, anthrax, black quarter, rabies) and acute life-threatening bacterial infections (e.g., generalized cases of coli- or pyogenic mastitis). For these problems, modern drugs might be the best choice [19].

Preparations of Ethnoveterinary Medicines (EVM) Leaves: All over the world communities, utilized for the preparation of herbal medicine using leaves [20-22]. The reason why leaves were used mostly is that they are collected very easily than underground parts flowers and fruits etc. [23] and in scientific point of view leaves are active in photosynthesis and production of metabolites [24]. The medicinal use of pounded leaves of Nicotiana tobacum in order to treat tick and leech infestation have been reported in various parts of the country [25-30], snake biting, internal parasite, fever, wound infestation [29]. And also, dried leaves of Nicotiana tobacum are soaked overnight with water, squeezed and given to cure black leg in cattle [26]. It is also used in combination with dried and crushed fresh leave paste of Camellia sinesis is applied topically for external parasite treatment [28].

Croton macrostachys leaves are pounded and squeezed with water to relief bloat [9,26,27,30-32] and black leg [30]. Likewise, leaves are crushed and rubbed on infected lesion [26,27] and applied topically to cure ring worm [27]. In other study, the fresh leaves of Croton macrostachyus together with Trichilia spp. and Rhamnus prinodes crushed and mixed with water and given orally 4 cup/day (morning and evening) for 3-4 days and applied topically for diarrhea (dysentery) [28] and external parasite[27,28].
The crushed fresh leaf of about ¼ kg *Vernonia amygdalina* added to 3 L of water. It is administered orally for GIT problem about 1 L for 3 days, 2 days interval and applied topically for skin problem [28]. Crushed leaves of *Vernonia amygdalina* also used to cure internal parasite, diarrhea, colic [30]. On other hand, its leaves just mixed with salt and given to treat retained placenta in cow [26,27]. Beyond treatment of livestock ailments, fresh leaves of *Vernonia amygdalina* are pounded with salt, then water is added and given to cow for 3 days in the morning to improve milk production in cows [32].

Crushed leaves of *Calpurnia aurea* plant species mixed with water and used to treat mastitis, dermatophillosis and ectoparasites [9,25,26], *Oestrus ovis*, trypanosomiasis [30] and internal parasite [28]. Leaves of *Hagenia abyssinica* chopped, mixed with water and after sieving filter is used to treat internal parasite in livestock [26] and pets [25]. Leaf paste of *Azardrachta indica* applied topically for healing ectoparasite [9,24]. Leaf decoction of *Sesbania sesban* and *Clotalaria natalalata* used to cure sudden illness [9].

The fresh leaves of *Maesa lanceolata* and *Nicotiana tabacum* are pounded together, water added and then 1 cc filtrate is administered through nose for 2 days to cure leech infestation [28]. Crushed leaves of *Maesa lanceolate* mixed with water and then filter used to cure leech infestations [26] and bloat [30].

Chopped leaves of *Solanum incanum* mixed with water and after sieving, filter used for treatment of skin disease [9], eye diseases and problems, general treatment; eye worms (thelaziosis); ticks [26] and wound [25]. Similarly, the leaf of *Oliniaro chetiana* is used as spray in treating eye disease [29]. *Aloe scundiflora* leaf to relief ear pain, ophthalmia, wounds, burns, leaf paste of *Coes edulis* to cure mastitis [9], leaf paste of *Ficus sycomoros* to treat Contagious camel skin necrosis, leaf paste of *Rhus abyssinica* to cure skin and eye problems, *Ricinus communis* used to treat retained fetal membrane [9,27]and rabies[27], infusion made from leaf of *Sphaeranthus steezti* is used to relief bloat [9].

Leaves of *Ageratum conyoides*, *Conyza sp* and *Ehretiacymosa Thonn*, *Acmella caulirhiza*, *Brucea antidysenterica*, *Triumfetta sp*, *Justicia schimperian* and *Asystasia gangetica* crushed singly and after adding water used to cure coccidiosis, internal parasite, New Castle disease, epizootic lymphangitis, trypanosomiasis, circling diseases, pasteurellosis respectively [30]. For treatment of pasteurellosis, leaf of the *Xanthium strumarium* is dried, pounded and then soaked in water for some time is administered orally [25].

Crushed leaves *Plectranthus/Pycnostachyus sp.* mixed with water and used for treatment of mastitis, blackleg and anthrax. Crushed leaves of *Kalanchoe Spp.* mixed with water and used to cure disorder like abscess, low libido and blackleg. Crushed leaves of *Withania somnifera* mixed with water and filter used for blackleg, trypanosomiasis and snake bite. Crushed leaves of *Shrebera alata* and *Sida schimperian* mixed with water and used for treatment of black leg and diarrhea. Crushed leaves of *Artemisia sp.* mixed with water and used for treatment of diarrhea and bottle jaw in cattle [30]. Chopped leaves of *Dodonea angustifolia* mixed with water and filtered for treatment of retained fetal membrane and easing dystocia [26], wound [25] and lice infestation [27]. In treating retained fetal membrane, leaf of *Ensete ventricosum* is also given for cow [30].

Leaf of the *Juniperus procera* [25,29] and *Prunus Africana* [30] are crushed and mixed with water in preparation. Herbalists use this plant to treat trypanosomiosis. *Prunus Africana* is also used for wound infection [27]. The leaves of *Calpurnia aurea*, *Millettia ferruginea* and *Teradenia riparia* chopped and mixed with water for use as tsetse fly repellant [33].

According to Melaku [34], nine potential medicinal plants were identified that could be used to kill or repel ticks in Northern Gondar. Among this, most commonly used plant parts for remedy preparations were leaves of *Calpurnia aurea*, *Millettia ferruginea*, *Grewia ferruginea*, *Phytolacca dodendradora*, *Silene macroserene*, *Cucumis prophetarum*, *Euphorbia abyssinica* to kill or repel ticks. The leaves *Phytolacca dodendradora* plant species is also used to cure gastrointestinal parasite and rabies [27]. Crushed leaves of *pentas sp.* mixed with water and filtrate used for treatment of blackleg, fractured bone, internal parasite and constipation [30].

**Bark:** The bark is most commonly used in the treatment of diarrhoea, dysentery and other gastrointestinal disorders of animals including flatulence, constipation, bloat etc. Bark paste with or without butter or infusion prepared from *Accacia busei* used to treat wounds and burns, mastitis, swollen teats, retained fetal membrane, *Accacia melfera* infusion for diarrhea, *Accacia brevispica* infusion for cowdriasis, 3-day sickness, diarrhea, bark infusion of *Accacia tortilis* for diarrhea, bark decoction of *Albezia anthelminitic* for helminthiasis [9] and infusion as tsetse fly repellant [33,34], bark infusion of *Comphora erythrea* for retained fetal membrane, bark infusion *Grewia bicolar* for retained fetal membrane, bark decoction of *Salvadora persica* for
trypanosomiasis, anthrax., *Sesbania sesban* infusion for mastitis, bark decoction of *Zizyphus Mauritiana* for bloat [9].

The local healer chew fresh bark of the root of the *Albizia anthelmentica* and then spit to the mouth of the animal about 1 teaspoonful, every day for 2 days to treat internal parasite [28]. A Chopped bark of *Croton macrostachyus* is mixed with water and filter then orally drenched for treatment of equine colic, abdominal pain, bloat [26]. Bark of *Albizia anthelmentica* and *Myrica salicifolia* grinded and mixed with water used for tsetse fly repellent and trypanosomiasis treatment respectively [33].

**Flower:** The fresh vegetative part of *Basella alba* and the flower of *Acemia caulirhiza Del.* are pounded, mixed together and squeezed, given 3 times/day until recovering from bloat, eye problem, wound [28]. Crushed flower of *Vernonis sp.* mixed with water is used for treatment of babesiosis in cattle [30].

**Fruit:** Fruit as infusion prepared from *Solanum incanum* fruit is used to treat dermatophilosis in Borana pastoralists, Southern Ethiopia [9]. Fruit of *Citrus aurantifolia* (Christm.) is squeezed and given to hen till recovery from disease [32] and also used to cure tick infestation as well as wound in Western part of Ethiopia [27]. Fruit of *Citrus aurantifolia*, *Piper L.* (Piperaceae), *Lepidium sativum* chopped and mixed with water then used for trypanosomiasis treatment and as tsetse fly repellent [33]. Fruit of *Brueca antidisenterica* used to cure ring worms and rabies [27].

**Roots:** After drying the root of both *Solanum incanum* and *Withania somnifera*, pounded, 1 teaspoonful from each plant mixed together and water added to make solution; 1 teaspoonful of the mixture is given as a drink for 3 days (animal) daily to cure most diseases especially anthrax and three day sickness. The local healer chew the fresh root and spit to the nose of the animal immediately after biting and the dose is probably 1 teaspoon for snake bite [28] and also the root is used to treat pasteurellosis [27]. Root infusion of *Accacia nilotica*, *Coes edulis*, *Cissus rotundifolia* and *Azardrachta indica* are used to cure diarrhea, *cowdriosis*, snake bite and ecto/endo parasites respectively [9].

The bulb (root) of *Allium sativum* pounded, water added and filter then given to cure mastitis, diarrhea, internal parasite and others [28]. Root of *Allium sativum*, *Aeschnomene elaphroxylon* and *Echinops kebericho* grinded separately and mixed with water used for trypanosomiasis treatment & tsetse fly repellent [33]. Root of *Allium spp* and *Milletia ferruginea* were grinded and mixed with water are used to treat trypanosomiasis [30].

The root of the *Rumex nervosus* is dried, chopped and crushed into powder. It is used to treat internal parasite [25]. The root of the *Allium sativum* is chopped and mixed with water used to treat/ control are colds, coughs and pneumonia; lice; stomach and intestinal worms; ringworm [33], Chopped or crushed root of *Cynoglossum lanceolatum* and dried one mixed with butter is used to treat mastitis and black leg [35]. Mostly the root of the *Echinops kebericho* (Asteraceae) is grinded and mixed with water is used to treat trypanosomiasis in Amaro district [33] and skin infection in sheep and cattle in Jimma zone, southwestern part of Ethiopia [32].

Root decoction of *Carissa edulis*, *Clotalaria natalatia* /*Grewia villosa*, *Salvadora persica*, *Solanum incanum* and *Woodfordia uniflora* are used to treat helminthiasis, sudden illness, trypanosomiasis/anthrax, blackleg and 3-day sickness/sudden illness respectively. *Aloe scundiflora* infusion for relief of ear pain, ophthalmia, wounds and burns. Root paste of *Cissus adenocaulis*, *Croton dichogamous*, *Rosa abyssinica* used to treat snake bite paste for poor mothering and skin problems respectively [9].

Root of *Helimus mystacinus* and *Dodonea angustifolia* were grinded separately and mixed with water is used for treatment of black leg, grinded root of *Stephania abyssinica* also mixed with water and used as remedy for blackleg and others like mastitis, trypanosomiasis etc., root of *Tragisa sp.* grinded and mixed with water is used to cure blackleg, anthrax, internal parasite and also bloat relief through use of grinded root of *Acalypha spp.* mixed with water [30].

**Seeds:** Seeds of *Solanum incanum L.* and *Rutaceae* after grinding mixed with water and used for treatment of lice infestations and colic. Grinded seed of *Brueca antidisenterica* left to dry and mixed with water to treat epizootic lymphangitis [30]. Crushed seed of *Vernonia amygdalina Del* mixed with water and filtrate used to treat/control conditions such as bloat (tympany); broken bones (fractures); foot-and-mouth disease; foot rot [35]. Roots of *Zanthoxylum chalybeum* infusion for pneumonia, diarrhea [9].

Crushed seed of *Vernonia amygdalina* mixed with water and filtered for use of filtrate in treatment of equine...
coli, pastuerollosis and abdominal pain [26]. One liter of water is added to the ground fresh seed of Brueca antidysenterica and given orally once per day for 3 days to treat mastitis in cattle [28].

Seeds of Ricinus communis contain around 50% oil, ricin is a very toxic glycoprotein and is used to treat constipation, dermatophilosis (streptothricosis, lumpy wool), lumpy skin disease, retained placenta (retained afterbirth), wounds [36].

**Route of Application of Ethnoveterinary Medicine:**

A single medicinal plant was found to be applied in different routes depending on the preparation and type of the disease needed to be treated. Of these, oral application was the highest and most commonly used route of application followed by topical and nasal application [9,25,27,28,29,31,32]. Oral route is considered to have rapid physiological reaction with the causative agents and increase the curative power of the medicinal plant remedies [30,32].

**CONCLUSIONS**

Medicinal plants have both social and economic values to the community in Ethiopia. Ethnoveterinary practices significantly suggested to play greater roles in livestock health care as an alternative or integral part of modern veterinary practices. The users of medicinal plants gain economic benefits in the form of lower costs and reduced time in looking for treatment. Despite the potential benefits derived from the practice of traditional medicine, limited studies have been conducted in Ethiopia on documenting traditional use of medicinal plants against various livestock diseases. Practitioners of traditional medicine do not have any form of training, registration, designing appropriate skill upgrading training programs and the indigenous knowledge and skill of traditional medicine practitioners did not encourage and protected. This could be the way through which traditional healers could not exercise their knowledge boldly. It also lack scientific proof of its efficacy application rates, forms and side effects of indigenous plants, not validated and are also not clearly stated for safe use; which could result in the decrement of its acceptance. Little or no research is focused on traditional veterinary medicine to understand the underlying science and promote validation procedures and processes.

Therefore, based on the above conclusions the following recommendations are forwarded:

- Use of medicinal plants in the treatment of livestock diseases should be evaluated and scientifically explored.
- Strong policy support is required to promote and integrate research, training and application.
- Basic training should be provided to traditional practitioners with the objective of adding value to their traditional skill.
- The indigenous knowledge on ethnoveterinary medicinal plant among various practitioners should be documented and written.
- Government should create a conducive environment for traditional medicine practitioners and modern medicine so that they will work together hand in hand complementing each other.

**REFERENCES**


