Documentation of Ethnoveterinary Knowledge among the Somali Pastoral Community in Eastern Part of Ethiopia: With Special Emphasis on Herbal Medicine for Livestock Health

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Abstract

Ethnoveterinary knowledge, like all other traditional knowledge systems, is handed down orally from generation to generation and it may disappear because of rapid socioeconomic, environmental, technological changes and as a result of the loss of cultural heritage under the guise of civilization. Thus, the aim of the study was to document ethnoveterinary knowledge of pastoralists on use of herbal remedies on livestock health in Somali region in eastern Ethiopia. Semi-structured questionnaire was developed to collect data. Medicinal plants were collected and identified in Haramaya University Herbarium and visually compared with authenticated plant specimens kept at national herbarium. One hundred thirty six (136) plant species under forty three families were recorded with veterinary importance. Majority of plant species used as livestock remedy fall in Burseraceae, Mimosaceae, Aamaranthaceae and Euphorbiaceae plant families among others. Major livestock diseases in the area include skin problems because of tick infestation, lice infestation, mange, ringworm, bite wounds due to predators, sores on work animals and general wounds. Infertility, Joint diseases and “Shimber” were also commonly mentioned by informants. Various plant parts (leaves, fruit, seeds, bark, roots, juice and latex) were used in the preparation of medicines depending on the remedy in question. The medicines were administered orally, topically or in the case of uterine problems, as washes. Certain plants were also used during branding or caunting, notably for joint diseases, and some species were used as amulets or charms. There is no standardized dosing and treatment duration. The major threats of medicinal plants were invasive plants, drought, over grazing, agricultural activity and firewood collection. Endogenous knowledge on ethno-veterinary medicinal plants was accepted orally from healer’s forefathers and transmitted similarly. Relevance and efficacy of ethnoveterinary medicine should be tested and integrated in to livestock extension delivery systems for the need to exploit the possibility of discovering more medicinally viable plants and as immediate solution to the current scenario of development of drug resistance to antimicrobials. There is also a need to conduct trials to check the efficacy and veterinary properties of such plant products and livestock disease treatments.

Keywords: Documentation; Ethnoveterinary; Healers; Oral; Plant species; Threats

Introduction

Ethno-veterinary medicine (EVM) is a system that is based on folk beliefs, traditional knowledge, skills, methods and practices used for curing diseases and maintaining health of animals [1,2]. Traditional veterinary medicine knowledge like all other traditional knowledge systems is handed down orally from generation to generation and it may disappear because of rapid socioeconomic, environmental, technological changes and as a result of the loss of cultural heritage under the guise of civilization [3-5]. Only solution is that it must be documented and conserved through systematic studies before it is lost forever. While Western medicine stray away from herbalism, 75%-90% of the rural population in the rest of the world still relies on herbal medicine as their only health care. The long tradition of herbal medicine continues to the present day in China, India, and many countries in Africa and South America. In many village marketplaces, medicinal herbs are sold alongside vegetables and other wares. Practitioners of herbal medicine often undergo a rigorous and extended training to learn the names, uses, and preparation of native plants [6-8]. While many countries like China melded traditional practices with Western medicine, in Ethiopia traditional systems have remained quite separate from Western medicine [8,9]. The use of EVM may present a cheaper and sustainable alternative to synthetic medicines in the present and future [10]. These herbal preparations, drawing upon centuries of traditional belief and use, are in practice over time by pastoralists and farmers for the treatment of different diseases of livestock [11]. About 65-80% of the

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mainly orally transmitted from generation to generation, consequently, it remains fragile and threatened, and presents an urgent need for being recorded and documented for prospect utilization. Therefore; this study was identified medicinal plants used as ethnoveterinary to treat animal diseases in pastoral community of Somali region.

Materials and Methods

Study area and period

The study was conducted in Somali region, eastern Ethiopia from 2014-2016 for consecutive three years. Somali Region is one of Ethiopia’s largest regions. It borders Djibouti to the north, Somalia to the east and north-east, and Kenya to the south. To the west it borders Oromiya Region, to the north-west Afar Region. There are nine administrative zones comprising about 60% of pastoralists, 25% agro-pastoralists and the remaining 15% comprises sedentary farmers. In Afdem, Harshin, Shinile and Awbere districts a significant number of the population depends on livestock production which is affected by many factors including animal health problems. The representatives of the selected districts to the rest is justified as the existing demographic, socio-economic and ecological variation is negligible or none existent. The capacity of the districts in managing such problems with modern veterinary care services is very limited. This results in considerable mortality and morbidity rates of all livestock species. Traditional animal health care is prevalent in these districts. They also support certain plant species with medicinal values for both animal and human health care.

Data collection method

Survey was conducted to gather information from pastoral communities on traditional usage of plants in livestock health care system using a semi-structured interview, observations and field guided walks with traditional healers to share their indigenous knowledge as works done by Yirga, Zerabruk and Yirga [13,14]. The individual semi-structured interviews included local names of medicinal plants, diseases treated, animal species treated, plant parts used, methods of medicine preparation and preservation, dosage prescriptions, routes of administration, noticeable adverse effects of remedies, use of antidote for adverse effects, source and method of indigenous knowledge transfer, existing threats and traditional conservation practices.

Criteria for the research subject selection in all districts include:
• Willingness to share information,
• Level of dependence on EVM for own animal health care; and
• Ability to practice and transmit ethnoveterinary knowledge and skills to others.

The sample informants were selected purposefully with the help of elders and residents of the area. Interviews were made with each traditional healer about the knowledge and use of medicinal plant species used to treat livestock diseases in the study area. Data on livestock ailments treated, local name of plants used, parts used, methods of preparation, route of administration and application, added values of medicinal plants, existing threats to medicinal species and indigenous knowledge transfer were recorded.

Plant identification: Specimens of plants with leaves and roots, and including floral parts as it was appropriate for taxonomic identification were collected. The specimens were coded by their vernacular names and transported by plastic bag to Haramaya University where it was identified and authenticated by comparison with authentic specimen illustrations and taxonomic keys. Plant-parts and plant-uses were categorized based on recommendation of Kuchar.

Statistical analysis: The collected data were analyzed using statistical package for social sciences (SPSS version 17.00). The variability of documented knowledge of ethno-veterinary medicine and the homogeneity of the information given by the respondents were estimated by informant consensus factor (ICF) [15,16].

ICF=nr-nt/nr-1

Where: nr=Number of usage-reported by informant, nt=Number of plant species used.

Results and Discussion

One hundred thirty six (136) plant species which were classified in to forty three (43) plant family were recorded with veterinary importance in Somali region. The plants were identified by species and local names in Somali language. The recorded plants are listed here below in alphabetical order of the species name. Majority of plant species used as livestock remedy fall in Bursarceae, Mimosaceae, Aamaranthaceae and Euphorbiaceae plant families. Methods of application and animal species to which the remedies are applied were also described (Supplementary Table 1). Various plant parts were used in the preparation of medicines, including leaves, fruit, seeds, bard, roots, juice and latex depending on the remedy in question. The medicinal plants were administered orally, topically or in the case of uterine problems, as washes. Certain plants were also used during branding or cautery, notably for joint disease, and some species were used as amulets or charms.

Regarding the traditional veterinary knowledge of Somali pastoralists, it’s widely recognized that Somalis are skilled herdsmen and can accurately describe the clinical signs and epidemiology of many livestock diseases. Although modern veterinary medicines might be affordable and available in some areas, many herders choose not to use them. Instead, these herders rely on traditional methods for treating disease and are suspicious that their animals will become “addicted” to modern drugs. A survey on acaricide usage in the Ogaden involving 250 elders indicated that people were willing to depend on old livestock practices rather than using acaricide which was often ineffective. In Ethiopia some traditional veterinary practices have been described and research on plant remedies is being conducted in highland areas [17].

Factors affecting plant remedies sustainability

Major factors affecting the wealth of medicinal plants in the study area are indicated in Table 1. The main threats of medicinal plants in the area were reported to include expansion of invasive plants (Prosopis juliflora), agricultural activity, drought, overgrazing, and firewood collection. This finding disagrees with the result of Yibrad who noted that the medicinal plants largely found in the natural habitats faced a major threat to their survival of the mother plants due to the combined effect of factors like cultivation of marginal lands and herbal preparation in the other part of the country [18]. Likewise, Lulekal et al. reported

| Factors                        | Number of informant listed | Proportion (%) |
|--------------------------------|----------------------------|---------------|
| Expansion of Prosopis juliflora| 48                         | 26.7          |
| Agricultural activity          | 39                         | 21.7          |
| Drought                        | 37                         | 20.5          |
| Overgrazing                    | 31                         | 17.2          |
| Collection as fire wood        | 25                         | 13.9          |
| Total                          | 180                        | 100           |

Table 1: List of different factors that affect medicinal plant species in the study area.
that deforestation due to agricultural expansion is the greatest threat to woody plants in southeast part of Ethiopia [19].

Knowledge sharing in EVM

The knowledge of ethnoveterinary and its practices are undertaken in secret way. All participants of this study confirmed that they got the knowledge from their fore parents and still continued in the same way of knowledge transfer as before. The key informants witnessed that forefathers usually tell their son whom they consider the son can keep the secrecy among the family. This result corresponds with studies in other parts of Ethiopia (Giday et al.), Pakistan (Farooq et al.) and Brazil (Barboza et al. and Monteiro et al.) [20-23]. The apparent lack of transfer of ethno-veterinary knowledge from older to younger generations was a cause of concern in all studies including this finding [24,25]. The way ethnoveterinary knowledge is transferred from parents to children was similarly recorded in studies conducted by Yirga, Zerabukr and Yirga [14,26].

Conclusion

One hundred sixty three plant species from forty three plant family were recorded with veterinary importance. The traditional remedy is used to treat variety of livestock health problems majority of which are skin problems due to external parasites, ringworm, sores and animal bite. They also apply to treat almost all systemic diseases including mastitis, infertility, internal parasites and diarrhoea. The most commonly used plant parts were leaves and roots which are used fresh immediately after collection. In some situations, whole plants, barks and juices are used particularly for wound healing. Oral, topical and nasal route were the common mode of administration with no standardized dosing and treatment duration. The major threats to medicinal plants were expansion of invasive plants (Prosopis juliflora), drought, overgrazing, agricultural activity and firewood collection. Endogenous knowledge on ethnoveterinary medicinal plants was passed orally from generation to generation in secret ways. Scientific relevance of ethno-veterinary plants and practices recorded in this study must be assessed based on views and opinions of livestock owners, veterinarians, animal and plant scientists, extension agents, and other experts. The relevant knowledge and practices related to the use of medicinal plants, manipulative and surgical techniques should be systematically selected for further laboratory and clinical analysis as well as biodiversity conservations. There is also a need to conduct trials in order to determine the efficacy of the more popular treatments to advocate the use of certain remedies, particularly if a modern drug is not available for the disease in question.

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References

1. Mathias-Mundy E, McCorkle CM (1989) Ethnoveterinary medicine: an annotated bibliography. Bibliographies in Technology and Social Change, No. 6, p. 199.
2. Tabuji JRS, Dhillon SS, Lyte KA (2003) Ethnoveterinary medicine for cattle (Bos indicus) in Bulamogi county Uganda: plant species and mode of use. J Ethnopharmacol 88: 279-286.
3. Mathias-Mundy E, McCorkle CM (2004) Traditional livestock healers. Rev Sci Tech 23: 277-284.
4. McCorkle CM (1996) Reducing veterinary costs by building on local knowledge: A case with female farmers in Peru. Paper presented to the 18th Annual Agricultural Symposium of the World Bank. 9-10 Jan. Washington DC. McCrindle.
5. Nf AN, Mbuya NY, Ndi C, Kameni A, VaBi M, et al. (2001) Ethno veterinary medicine in the northern provinces of Cameroon. Vet Res Commun 25: 71-76.
6. Bekele E (2007) Study on Actual Situation of Medicinal Plants in Ethiopia. Prepared for Japan Association for International Collaboration of Agriculture and Forestry, Addis Ababa.
7. Yirger E, Kelbessa E, Bekele T, Lulekal E (2007) Ethnoveterinary medicinal plants at Bale Mountains National Park, Ethiopia. J Ethnopharmacol 112: 55-70.
8. Mathias E (2004) Ethno veterinary medicine: Harnessing its potential. Vet Bull 74: 27N-37N.
9. Behailu E (2010) Ethnobotanical Study of Traditional Medicinal Plants of Goma Wereda, Jima Zone of Oromia Region, Ethiopia. MSc Thesis, Addis Ababa University.
10. Raj KV (2001) An ethnobotanical study of plants used for the treatment of livestock diseases in Tikamgarh District of Bundelkhand, Central India. Asian Pac J Trop Biomed 4: 485-9467.
11. Dilshad SMR, Rahman NU, Ahmad N, Iqbal A (2010) Documentation of ethnoveterinary practices for mastitis in dairy animals in Pakistan. Pak Vet J 30: 167-171.
12. Edwards S (2001) The ecology and conservation status of medicinal plants on Ethiopia. Institute of Biodiversity Conservation and Research, Addis Ababa. pp: 46-55.
13. Yirga G (2010) Assessment of indigenous knowledge of medicinal plants in Central Zone of Tigray, Northern Ethiopia. Afr J Plant Sci 4: 6-11.
14. Solomon Z, Gidey Y (2011) Traditional knowledge of medicinal plants in Gindeberet district, Western Ethiopia. South Afr J Bot 76: 165-169.
15. Heinrich M, Ankli A, Frei B, Weimann C, Sticher O (1998) Medicinal plants in Mexico: healers' consensus and cultural importance. Soc Sci Med 47: 1859-1871.
16. Luz R, Saldanhg S, Reinaldo F, Palva D, Ulysses P (2005) Knowledge and use of medicinal plants by local specialists in n region of Atlantic Forest in the state of Pernambuco (Northeastern Brazil). J Ethnobiol Ethnomed 1: 9.
17. Mesfin F, Demissew S, Tekelaymanot T (2009) An Ethnobotanical study of medicinal plants in Wonago Woreda, SNNPR, Ethiopia. J Ethnobiol Ethnomed 5: 28.
18. Tekle Y (2015) Medicinal Plants in the Ethno Veterinary Practices of Bensa Woreda, Southern Ethiopia. Open Access Library J 2: e1258.
19. Lulekal E, Zemed E, Ensermu A, Patrick VD (2014) Ethnoveterinary plants of Ankober District, North Shewa Zone, Amhara Region, Ethiopia. J Ethnobiol Ethnomed 10: 21.
20. Giday M, Asfaw Z, Woldu Z (2009) Medicinal plants of the Meint ethnic group of Ethiopia: An ethnoveterinary study. J Ethnopharmacol 124: 513-521.
21. Farooq Z, Iqbal Z, Mustaq S, Muhammad G, Zafar M, et al. (2008) Ethnoveterinary practices for the treatment of parasitic diseases in livestock in Cholistan desert (Pakistan). J Ethnopharmacol 118: 213-219.
22. Barboza RRD, Souto WMS, Mourão JS (2007) The use of zootherapeutics in folk veterinary medicine in the district of Cubati, Paraíba State, Brazil. J Ethnobiol Ethnomed 3: 32.
23. Monteiro MV, Beviluca CML, Palha MDC, Braga RR, Schwank W, et al. (2011) Ethnoveterinary Knowledge of the Inhabitants of Marajó Island, Eastern Amazonia, Brazil. Acta Amazonica 41: 233-242.
24. Cunningham AB, Zondi AS (1991) Cattle owners and traditional medicines used for livestock. Investigational Report No. 69. Institute of Natural Resources, University of Natal, Pietermaritzburg.
25. Masika PJ, VanAverbeke W, Sonand A (2000) Use of herbal remedies by small-scale farmers to treat livestock diseases in central Eastern Cape Province, South Africa. J South Afr Vet Ass 71: 87-91.
26. Gidey Y (2010) Ethnobotanical Study of Medicinal Plants in and Around Alamata, Southern Tigray, Northern Ethiopia. Curr Res J Biol Sci 2: 338-344.