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Review on the role of ethno veterinary practice for animal health

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Abstract
Ethnoveterinary practices are important because they are easily available, inexpensive and effective, especially in rural areas where veterinary services are absent or irregular and expensive. At this level, indigenous animal health systems are used for emergency purposes. Despite recent efforts to promote the use of ethno veterinary knowledge worldwide, much information is only documented in field reports and scientific publications. Few practical researches have been done to help animal healthcare workers, farmer leaders and farmers to actively train others in the use of effective and validated ethno veterinary practices. The overall objective of the paper is to highlight to importance of traditional medicinal practices used to treat livestock diseases. Local people in the study area possess traditional knowledge of medicinal plants to treat various animal ailments; however, agricultural expansion and disinterest of young generation became the major threat to medicinal plants. It is, therefore, necessary to preserve this indigenous knowledge on traditional medicines by proper documentation, identification of plant species used, and herbal preparation. To save medicinal plants from further loss, involving local communities in cultivation of the most utilized medicinal plants is recommended.

Keywords: Animal, ethnoveterinary health, importance

Introduction

Ethnoveterinary medicine deals with people's knowledge, skills, methods, practices and beliefs about the care of their animals (Appelgren 2009) [5]. Ethnoveterinary knowledge is acquired through practical experience and has traditionally been passed down orally from generation to generation. Widespread interest in documenting and validating ethnoveterinary practices arose in the early 1980s. Since then, several studies have been carried out, many reports written and numerous conferences and workshops held. These activities have saved ethnoveterinary knowledge from extinction: most knowledge resided with elderly community members and disappeared as they died. The introduction of modern practices also made it difficult for the younger generations to appreciate and use the beliefs and practices of their forefathers. Despite recent efforts to promote the use of ethnoveterinary knowledge worldwide, much information is only documented in field reports and scientific publications (Ngeh *et al*., 2007) [40]. Plant resources have remained an integral part of human society throughout history. After fulfilling the primary needs like food and shelter, man has sought for a suitable remedy among plants for curing various diseases (WHO, 2002) [52].

Traditional medicine is defined as indigenous medicine that is used to maintain health and to prevent, diagnose, and treat physical and mental illnesses differently from allopathic medicine based on theories, beliefs, and experiences (WHO, 2012) [54]. Traditional medicine has been used for thousands of years with great contributions made by practitioners to human health, particularly as primary health care providers at the community level and has maintained its popularity worldwide (WHO, 2012) [54]. According to Sofowora (Sofowora, 2001) [1] about 60-85% of the population in every country of the developing world has to rely on traditional medicine. The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka, Thailand, and Korea (Park, *et al*., 2012) [26]. In China, traditional medicine accounts for around 40% of all health care delivered and is used to treat roughly 200 million patients annually (WHO, 1999) [55].

In Ethiopia, plants have been used as a source of medicine from time immemorial to treat different ailments due to its long history, and traditional medicine has in fact become an integral part of culture (R. Pankhurst, ", 1965) [44].

These traditional medical practices and remedies are recorded in oral tradition and in early medico- religious manuscripts and traditional pharmacopoeias, which, according to the estimates of some historians, date back to the 15th century AD (WHO, 2001) [56].

Add one paragraph about the status of ethnoveternary medicine in Ethiopia by comparing with use of chemicals to control vectors and phrmaceuitical for the treatment of livestock diseases.

Ethiopia possesses about 6,000 species of vascular plants which could be due to its different topography and climatic conditions (IBC, 2012) [28]. About 80% of human population and 90% of livestock rely on traditional medicine in this country (PGRC 10). Traditional medicine of Ethiopia is commonly used to treat various human and livestock ailments. Traditional healers known by different names in different parts of the country are the primary players in the curative aspect of traditional medicine practice (Kassaye 2006) [33]. Thus, this study will be initiated to document the traditional medicinal plants knowledge accumulated by local communities of Delomena district.

The importance of botanical products to treat livestock in relation to organic meat comparing to modern chemicals and accessible to small scale farmers because of its cost.

Historical background and development of veterinary drug

From Materia Medica to Veterinary Pharmacology and Therapeutics The origins of veterinary pharmac ology and therapeutics are the same as those of the equivalent human disciplines, lying in the administration of and responses to plants and extracts of plants containing pharmacologically active compounds. The history of Materia Medica, and then the emergence of pharmacology and therapeutics in humans have been extensively described. Appelgren (2009) [5] has provided a

recent summary of both the human and parallel veterinary developments. He describes the early records contained: (a) in Egyptian papyri (1800–1200 BC), the contents of which became known only from 1822 when the Rosetta stone was translated and; (b) in the writings of the Greeks (notably Hippocrates, 430 BC) and later Galen (94 AD). Hippocrates' and Galen's prescriptions dominated European medicine for many centuries, through the medieval periods, until superseded in the Age of Enlightenment. As Appelgren points out, we can certainly conclude that the same "drugs" were used in animal s and man up to and beyond the Age of Enlightenment. There was, however, at this time an expression of concern relating to the use of drugs therapeutically in animals on the basis of human experience. As voiced by the Swedish botanist and doctor Carolus Linneaus, "human medicines are used for animal s without know ledge if they work, which is devastating barbarism". At that time much of the progress in veterinary medicine was made in France, and Linneaus sent Peter Hernquist to France to learn the scientific principles under lying veterinary medicine. In 1791, Charles Vial de St. Bel left the Ly on school to found the first veterinary teaching establishment in the English speaking world, the Royal Veterinary College in London, later to become a constituent College of the University of London. A key development in the emergence of the science of pharmacology, from the older discipline of Materia Medica, was the progress in organic analytical and synthetic chemistry in the early to mid-nine tenth century. One example will suffice to illustrate this historical development, through to the twenty-first century. The therapeutic properties of the leaves and bark of the willow tree had been described in the first century AD by Diosco rides in his pharmacopoeia. Several centuries prior to the birth of Christ, Aristotle had similarly used extracts of the willow to ease the pain of childbirth in humans. The benefit s of the willow might have remained as a small historical footnote had the Reverend Ed ward Stone of Chipping Norton, UK not revived interest in his Philosophical Transact ions to the Royal Society. In the first half of the nineteenth century, chemists isolated from the willow a glycoside, saligenin, one component of which was shown in 1830 to be salicyl alcohol. Recognising this as the active principle of saligenin, chemists converted this to salicylic acid and then to its sodium salt. Finlay Dun (1895) described the therapeutic value of sodium salicylate in the horse and dog, for its analgesic action in joint diseases. We now know that the pathology of degenerative joint disease in these species shares many common features with that occurring in the ageing human population and that the natural wear and tear process is accelerated by extreme activity or sub-optimal conformation (Appelgren, 2009) [5]

Constraints in animal health service delivery in Ethiopia

Poor livestock health services remain one of the main constraints to livestock production in many developing countries, including Ethiopia. Poor livestock health services remain one of the main constraints to the development of livestock production in many developing countries. Deficiencies in access to services by farmers have also led farmers to use modern veterinary drugs as well as traditional remedies without veterinary supervision (Kebede *et al*., 2014) [25]. In sub-Saharan Africa, losses resulting from disease are estimated at $2 billion per year, of which half is attributable to direct losses from mortality and the other half to indirect losses as a consequence of reduced growth, fertility and ability to work (De Haan & Bekure 1991) [16]. These losses caused by animal disease are not simply restricted to lower outputs; in addition, disease prevents the introduction of livestock into certain areas (e.g. in Africa large tracts of land with high yielding potential are lost because of African trypanosomosis) and skin diseases, such as dermatophilosis, preclude the use of more productive animals, including crossbred dairy cattle, improved pigs and poultry breeds. Trade embargos are enforced by importing countries as a result of the presence of highly contagious diseases, creating another important bottleneck for the sector, reducing trade and the inflow of foreign currency. Furthermore, certain livestock diseases are zoonotic, which means that the control of animal disease is not only of economic importance, but also of social and political significance. Consequently, disease control services will continue to be an important factor in the development of the livestock sector (Cheneau, El Idrissi & Ward 2004; Chilonda & Van Huylenbroeck 2001) [9, 10]

Traditional Medicinal Plants in Ethiopia

The various climatic and topographic conditions of the country contributed to a rich biological diversity. Ethiopia is believed to be home for about 6,000 species of higher plants with approximately 10% endemism (Vivero *et al*., 2006) [50]. Similarly, as it was reported by IBC (2005) [28], the flora of Ethiopia consists of an estimated number of 6000 species of higher plants with 10-12% endemism. Medicinal plants species are also part of those many plant species of the country. Like all other parts of the world, plants are used as a source of medicine in Ethiopia.

According to Dawit (1986) [12], 95% of traditional medicinal preparations are of plant origin. Ethiopia is also a country with many languages, beliefs and highly diversified culture. This diversification contributes to the people of the different localities of the country to develop their own specific knowledge of plant resource uses, management and conservation (Pankhurst, 1990) [44]. Ethiopia has a long history of using traditional medicines from plants and has developed ways to combat diseases through it (Asfaw *et al.,* 1999) [4]. Although a significant number of people in Ethiopian societies use traditional medicinal plants for their primary health care. Much of the earliest knowledge was not written down due to the secrete kept by priest and other knowledgeable persons, as a source of power since ancient times (Mirutse *et al*., 2003) [39]. It is not easy to get traditional medicinal knowledge of the healers because they claim that the knowledge is their own and wanted to transfer their knowledge only to a person they want to pass, mostly to the eldest son. This becomes practical when they approach death (Jansen, 1981) [29].

Integration of Traditional Medicines with Modern Medicines

In Ethiopia health care coverage, management of disease and disorders is believed to be improved by the integration of modern and traditional medicines. According to Kebu *et al.* (2004) [32], the adaptability base for the development of modern drugs is facilitated by keeping the efficacy, and quality of traditional medicines. This promotes its integration to the modern health system of the country. Integration in this case is an increase of health coverage through collaboration, communication, harmonization of the modern system with that of the traditional one while ensuring intellectual property, right and protection of traditional medicinal knowledge. Integration of the two systems is believed to be crucial due to the fact that people with different cultures, beliefs and locality have their own unique knowledge of traditional medicines and this helps for the development of modern health system (Bekele, 2004) [7].

Status of Medicinal Plants in Ethiopia

About eighty percent of Ethiopia depends on medicinal plants for primary health care. Although the contribution of medicinal plant species to modern health system and the poor society who live mainly in the rural area is very high, lack of detailed descriptions of the medicinal plants has made it difficult for the researchers to decide the identity of these plants universally with the only reference being the local names of the plants and there is very little attention in modern research and development and the effort made to upgrade is not satisfactory. One of the reasons is that the traditional medicinal plant species are not well described (Mesfin and Sebsebe, 1992) [19]. According to Sebsebe and Ermias (2001) [45], when research is conducted on the medicinal plant species, it must target on the fact that the providers of the indigenous knowledge should get a fair share on the benefits of the development of medicines. According to Tesfaye Awas (2007) [48], detailed information on medicinal plants of Ethiopia could only be obtained when studies are under taken in various parts of the country where little or no botanical and ethnobotanical studies have been conducted. Scientific research on medicinal plants provides additional evidence to the present knowledge of medicinal plants which has been handed down from generation to generation (WHO 1998) [51]. As it has already been stated by Cunningham (1993) and Alexiades (1996) [35], it is better to involve traditionally medical practitioners in pharmaceutical companies. The modern health professionals and some of the consumers ask for scientific based evidence. This encourages for better and more research work. According to Kannon (2004) [31], research on medicinal plants should direct for quality control and the research should examine active herbal constitute for efficacy and toxicity of the herbs.

The Role of Medicinal Plants and Practitioners

According to the World Health Organization, at least 80% of people in developing countries depend largely on indigenous practices for the control and treatment of various diseases affecting both human beings and their animals. Ethnoveterinary remedies are accessible, easy to prepare and administer, at little or no cost at all to the farmer. These age-old practice cover every area of veterinary specialization and all livestock species. The ethnoveterinary techniques include treatment and prevention of disease, extensive materia-medica preparation, ecto- and endo-parasite control, fertility enhancement, bone setting and poor mothering management. The materia-medica consists mainly of plants in addition to other components such as earth and minerals, and animal parts. The potential contributions of a well-developed ethnoveterinary scheme as illustrated by the practices above cannot be overemphasized. Suggestions are provided on how to document, assess and promote effective ethnoveterinary practices (Ngeh *et al*., 2007) [40]

Medicinal plants and Animal health care

Millions of people around the world have an intimate relationship with their livestock. Many people depend on their livestock: animals provide them with food, clothing, labour, fertilizers and cash, and act as a store of wealth and a medium of exchange. Animals are a vital part of culture and in many societies are regarded as equal to humans. To keep animals healthy, traditional healing practices have been applied for centuries and have been passed down orally from generation to generation. Before the introduction of western medicine, all livestock keepers relied on these traditional practices. According to the World Health Organization, at the moment, at least 80% of people in developing countries depend largely on these practices for the control and treatment of various diseases that affect both animals and humans. These traditional healing practices are called 'ethnoveterinary medicine (Ngeh *et al*., 2007) [40]'

Transfer of Knowledge of Traditional Health Practitioners

In many counties one of which is Ethiopia, the use of traditional healing systems has evolved over a long period of time and the knowledge of selection of plant species for their medicinal value is not obtained overnight but after many practices that is after a long trial and error, people distinguish plant species which have medical value. Even though people have almost equal access to those plants, a few people are lucky in having the remedial knowledge. Such persons include priests, witch doctors, expert herbalists, and the like. Those knowledgeable people don't easily transfer their knowledge to community where they live. Instead, they want their knowledge to be secreted and the knowledge of plant remedies remained in their hands (Mirutse *et al*., 2003) [39].

Poor people living in urban centers and others who have interest in using plant remedies also use them for their primarily health care. Abbink (1995) [2] noted that 80% of people in Africa depend on traditional medicine for their health care practices. The dependence of majority of Africans including Ethiopia on traditional medicine will continue side by side with that of modern medicine due to cultural and economic factors (WHO, 1998) [51]. Similarly Dawit (2001) [13] indicated that 80% of the population in Ethiopia use traditional medicines as their major health care system due to their accessibility, affordability and acceptability.

According to Fassil (2001) [22]; Mirtuse *et al*. (2003) [39]; Pankhurst, (2001) [44] much of the earliest knowledge of plant remedies was not written down which makes the knowledge difficult to obtain easily. People who have knowledge of plant remedies pass their knowledge to the person to whom they trust. The person who has knowledge on the identities and use of medicinal plant species transmits his expertise mostly to first born son in an incomplete way. Some of the knowledgeable people take their sons to the field and show the plants with medical value, tell the time when and the place where they are collected and the son is told not to share the skills of healing to anybody. These persons pass their knowledge when they approach death and is transferred by oral communication.

When the knowledge of healing by traditional medicinal plants is passed from generation to generation, the original and valuable information passed in an incomplete fashion or even the medical healer may die without passing his knowledge of healing. In this way the traditional healing knowledge using plant, animal or mineral materials or spiritual system passes from one generation to the next. This and other facts of the nature of traditional medicines, traditional healers and the associated knowledge were also studied by different researchers including (Fikadu, 2001; Pankhurst, 1990) [44].

Uses of Medicinal Plants Other Than Their Medicinal Values

As it has already reported, medicinal plants are used for different purposes namely, as food, charcoal, fire wood, construction, fodder, forage, ornamental, spices, etc. many medicinal plants are used as a food. For instance plants like *Allium sativum* (Alliaceae), *Capsicum annum* (Solanaceae), *Carissa spinarum* (Apocynaceae), *Citrus limon* (Rutaceae), *Coffea arabica* (Rubiaceae), *Cordia africana* (Boraginaceae),

Dovyalis abyssinica (Flacourtiaceae), *Embelia schimperi* (Myrsinaceae), *Ensete ventricosum* (Musaceae), *Ficus sur* (Moraceae), *linum usitatissimum* (linaceae), *Trigonella foenumgraecum* (Fabaceae), *Urtica simensis* (Urticaceae), *Ximenia americana* (Olacaceae) (Tigist *et al*., 2006) [49].

The pharmacologically active constituents in plants used as food would likely have a great impact on medicinal plant species than those in plants used as medicine which are taken only in small amounts (Etkin, 1988) [21]. Other medicinal plants like *Eucalyptus globulus, Prunus africana, Hagenia abyssinica, Acacia abyssinica, Allophyllus abyssinicus, Cordia africana, Juniperus procera, Millettia ferruginea, Olea europaea* subsp.*cuspidata* and *Vernonia amygdalina* are used as a fire wood, constructing and charcoal.

Others like *Zingiber officinale* and *Coriandrum sativum* are used as a spice (Amare, 1976) [3]. Adding to this WHO (1998) [51] and *traditional* medicinal plants are also used as raw materials for the manufacture of modern drugs.

Sources of Medicinal Plants

According to Frankel *et al*. (1995) medicinal plants species are grown in the natural ecosystem. Similarly, the work of Tesfaye and Sebsebe (2009) indicatedthat most of the medicinal plants in Ethiopia are collected from the wild, some are cultivated and some others are grown in home gardens either purposely for medicinal use or non-medicinal purpose. According to Zemede (1997) [57], plant species cultivated in Ethiopian home gardens for the purpose of medicine is about 6%. This figure indicates that a large number of medicinal plant species that are used by the herbalists are collected from the natural vegetation. Local forests are sources of plant processes into therapies used in traditional medical system (Balick and Cox, 1996) [6]. The natural ecosystems of the forests, grass lands, wood lands, wet lands, field margins, contain a significant number of medicinal plants species. These are places where traditional healers and other members of the community collect medicinal plant species and use it.

Plant Diversity and Distribution in Ethiopia

Ethiopia is a country with a great range of ecological edaphic and climatic conditions (Dawit and Ahadu, 1993; Dawit *et al*., 2003) [15]. The number of plant species in each corner of the country and the vegetation type is also varied ranging from arid low land to Afroalpine vegetation (Abebe, 2001) [13]. Similarly, it was reported that the variation in vegetation type of the country is due to the country's significant geographical diversity.

As it was reported by Edwards (2001) [17], the wood lands, montane vegetation including grassland, forests and the evergreen scrubs and rocky areas contain more medicinal plants which indicated that traditional medicinal plant species are not equally distributed throughout the country similar to the distribution of the total plant species. According to this report the vegetation types found in the wood lands contain more medicinal plant species while the Afroalpine vegetation consists of the least medicinal plants of all the vegetation types (Edwards, 2001) [17].

Threats and Conservation of Medicinal Plant Species

Threats to medicinal plant species

As medicinal plants are part of the total plant of the different ecosystems of the earth, they are affected by anthropogenic and natural forces. Apart from other species of plants, medicinal plant species can also be exploited for their medicinal value and leads to a serious threat to the biodiversity in the area, as a result, several plant species have been exploited to such an extent that they are seldom found in unprotected areas (Cunningham, 1991; Williams, 2004). People who have some traditional knowledge of healing in general and those professional healers in particular harvest medicinal plant mainly from the wild habitat (Tesfaye and Sebsebe, 2009).

According to Cunningham (1996); Abebe (2001) [13] and Kebu *et al*. (2004) [32], vegetation types where traditional medicinal plant species are collected are declined from time to time. Similar to other countries of Africa, medical plant species of Ethiopia is vulnerable to problems of continuity and sustainability primary due to loss of taxa of medicinal plants and loss of habitats (*et al.*, 1992) [19]. The threatened factors can be elaborated as lose of cultural diversity including traditional knowledge due to, uncontrolled grazing, drought, agricultural expansion, fire wood, charcoal, urbanization and construction (Mirutse *et al.*, 2003) [39] It has also been reported that medicinal plant species are affected by unsustainable harvesting for export and extraction of pharmaceuticals (Farnsworth, 1985; WHO, 1998) [51]. Beside to these known factors which treat medicinal plant species, other condition like the types of the medicinal plant and the part used also affect the medicinal plant.

For example harvesting the roots and barks of medicinal plant possess more of a threat than collecting leaves for medicinal value (Edwards 2001; Haile, 2005) [17, 27]. Besides to other factor, the younger generation under estimate the traditional system of healing (Sofowara, 1982) [1] and this is bad fortune for the advancement and the conservation of medicinal plants and associated knowledge.

Conservation of Medical Plants

Conservation should be aimed at conserving maximum diversity within each species to ensure that its genetic potential will be available in the future Abebe (2001) [13]. Sustainable management of traditional medicinal plant resources is important not only because of their value as a potential source of new drugs built also due to reliance on traditional medicine for health. As it was reported by different researchers plant species with medicinal value that are harvested from the wild, especially those which are highly used either for local use or trade are not found in a nearby places rather the professional traditional healers move along distance to harvest. In contrast to this problem of scarcity, the demand and recognition for traditional medicine is increased and this is a good opportunity to the medicinal plants to conserve (Zemede, 2001). The wise use of medicinal plants species needs the involvement of different sectors and greater public support and for this, awareness creation is recommended. As it was reported, home gardens have a great contribution to conservation of biodiversity in general and at the same time medicinal plants species can also be conserved, thus homegardens are strategies and ideal farming systems for the conservation, production, and enhancement of medicinal plants (Zemede A, 2001). Some traditional medicinal plants are collected on selective days and seasons. An account that have been made by Cunningham (1993) indicated that plant species whether medicinal or non-medicinal plants grown in religious sites like churches, mosques and the like are forbidden to be cut. Moreover, the author reported, harvesting of medicinal plants using pointed wooden digging stick than using metal axes are some of the cultural methods of medicinal plant collection and this has contribution to the conservation strategy. In the field, medicinal plants conservation goes side by side with conservation of ethnobotanical and ethnopharmacological information. The conservation of medicinal plants is achieved through in-situ and

ex-situ conservation Methods. In-situ is a type of conservation where species are conserved in their natural habitats which include the national park and reservoirs. This method is especially preferable for those species where domestication and management is difficult out of their natural and normal habitats and ecosystem (Zemede A, 2001). Ex-situ conservation is another method of conservation where endangered species are protected by removing part of them from a threatened habitat and place them in a new location which may be a wild area or within the care of humans which includes seed gene banks, field gene banks, arboreta, botanic gardens. In situ and ex-situ should be complementarily implanted in Ethiopia to conserve valuable plant species which are threatened due to natural or manmade factors (Abebe, 2001) [13].

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