

Research Application Summary

**Utilization of African ethnoveterinary information for management of
livestock diseases**

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Abstract

Smallholder farmers in Africa face various challenges in livestock keeping, livestock diseases being one of them. Due to poor infrastructure especially road and communication networks, smallholder farmers in rural areas do not easily access conventional veterinary drugs (CVD) and other veterinary services. Even when CVDs are accessible, they are often unaffordable to most of the smallholder farmers. Plants often provide an alternative to struggling smallholder farmers. The plants in use are traditionally known to have useful roles in the management of vectors transmitting veterinary disease pathogens. This accumulated knowledge on ethnoveterinary among smallholder farmer communities in Africa is largely untapped with respect to the management of livestock diseases. This paper reviews plants of ethnoveterinary significance in Africa.

Key words: East coast fever, ethno veterinary, livestock

Résumé

Les petits exploitants agricoles en Afrique sont confrontés à divers défis dans l'élevage, les maladies du bétail étant l'un d'entre eux. En raison surtout des réseaux routiers et de communication d'infrastructure pauvres, les petits exploitants dans les zones rurales n'ont pas accès facilement aux médicaments classiques vétérinaires (CVD) et à d'autres services vétérinaires. Même lorsque les CVD sont accessibles, ils sont souvent inabordables pour la plupart des petits exploitants agricoles. Les plantes fournissent souvent une alternative à la lutte des petits exploitants agricoles. Les plantes utilisées sont traditionnellement connues pour avoir un rôle utile dans la gestion des vecteurs de transmission des agents pathogènes vétérinaires. Ces connaissances accumulées sur l'ethno-vétérinaire au sein des communautés de petits exploitants agricoles en Afrique sont largement inexploitées par rapport à la gestion des maladies animales. Cet article examine les plantes d'importance ethno-vétérinaire en Afrique.

Mots clés: la fièvre de la côte Est, ethno vétérinaire, bétail

Background

Domestic and grazed livestock have always suffered from a wide range of diseases in Africa (Gilioli *et al.*, 2009). As livestock are concentrated in larger numbers, the problems of major epidemics have become more severe. The transmission of livestock diseases is favored by environmental conditions in the continent (Jabbar *et al.*, 2015). The diseases and complications of livestock include East coast fever, trypanosomosis, babesiosis, anaplasmosis, dermatophilosis, and cowdriosis, retaining placenta, wounds, ectoparasite, diarrhea, fungal and viruses. Diseases affect the livelihood of the small holder farmers as they depend on livestock for income food and social status (Laisser *et al.*, 2016). Livestock disease control at community level particularly among smallholder farmers and pastoral groupings rely on ethnoveterinary information (Grade *et al.*, 2009). Smallholder farmers living in marginal areas which are endemic to pathogens, vectors and diseases are the ones that are more affected. The health of their animals suffers from the diseases as the conventional veterinary services are not available, less effective and unaffordable. Ethnoveterinary information provides a reliable alternative to smallholder farmers in the management of livestock diseases (Kubkomawa *et al.*, 2013).

However, ethnoveterinary information is barely tapped yet it is critical in the remote and rural areas for sustainability of animal health management (Khan, 2009; Marandure, 2016). Ethnoveterinary knowledge in many African societies is undocumented as it is contained and transferred from generation to generation through rituals and rites of passage as well as through observation. It is barely documented; this is threatening its availability in posterity. Therefore this review is aimed to document ethnoveterinary information that is being used by smallholder farming communities in Africa for livestock disease management.

Plants of ethnoveterinary importance

Ethnoveterinary medicine is the totality of knowledge, skills and practices based on the theories, beliefs and experiences of a people used in livestock disease management (Deeba *et al.*, 2009). Different African cultures use ethnoveterinary information in livestock disease management (Damtew, 2012) and several smallholder farmers have incorporated ethnoveterinary information in their production systems (Fajimi and Taiwo, 2005).

Several plants used in the management of endoparasites in cattle, donkey and all small ruminants in Tanzania include: *Tephrosia vogelii*, *Senna didymobotra*, *Azadirachta indica*, *Chassalia subckreata*, *Carica papaya adansonia digitata*, *Arachis hypogea*, *Clausena anisata*, *milletia grandis* and *cyathea dregei*. Meanwhile, plants such as: *Commiphora swynnertonii*, *Taarindus indica*, *Euphobia tirucalli* and *Acacia nilotica* are commonly used for the management of ectoparasites. In poultry production, *Aloe vera*, *Solanum incanum*, *Capsicum frutescens* are used to manage coccidiosis, Newcastle and worms (Masola *et al.*, 2009; Adamu *et al.*, 2012; Adedeji *et al.*, 2013; Mwatawala and Mlinjanga, 2016).

Further, in Kenya, several researchers (Adedeji *et al.*, 2013; Njoroge and Busmann, 2006) have reported the use of *Mucuna spp*, *Aloe secundiflora*, *Agave americana*, *Synadenium compactum*, *Solanecio manni* and *Senna didymobotrya*. Meanwhile the use of *Erythrina abyssinica* and *Capsicum annum* for the management of worms, Newcastle and bacterial infections in poultry (Lagu and Frederick, 2012) and *Balanites aegypticus*, *Carissa spinarum*, *Warburgia salutaris* and *Harrisinia abyssinica* in other livestock species in Uganda has been observed (Gradé *et al.*, 2009).

Like in other dryland ecosystems of eastern Africa, extensive livestock grazing in the rangelands of Somalia and Ethiopia is the norm rather than the exception. In these areas pests such as lice, and ticks are common phenomenon. As a result, herders use a diversity of plants including among others; *Rumez patientia*, *Euphorbia somaliensis*, *Urtica dioica* *Eucalyptus spp*, *Capsicum frutescens* and *Thymus capitatus* (McGaw and Eloff, 2014; Wanzala *et al.*, 2005; Adedeji *et al.*, 2013). Further, in Southern Africa (in parts of Botswana and South Africa); *Terminalia serecea* roots, *Burkea africanum*, *Gunnera perpensa*, *Cissus quadrangularis* and *Jatropha zeyher* are used for the treatment of endometritis, and wounds in livestock (McGaw and Eloff, 2008; McGaw and Eloff, 2014; Moreki *et al.*, 2012). *Adansonia digata*, *Zingiber officinale*, *Parkia filicoides* and *Nicotiana tabacum* are used by Fulani community in Nigeria for the treatment of microbial infections, worms, and skin disorders in livestock (Kubkomawa *et al.*, 2013). The ethnoveterinary knowledge and information is not only limited to plants, but salt water and soap solutions are also used by some African communities to remove retained placenta in cattle (McGaw and Eloff, 2014).

Plant selection for ethnoveterinary use. There are variations in cultural knowledge in the selection of plants for the management of livestock diseases. The number of uses a plant can provide is one of the criteria societies often rely in plant selection. For instance, Maasai use *Commiphora swynnertonii* exudates for the management of ticks, fleas and tsetse flies (Minja, 1999) while the same is used for the management of worm infestation among the Dorobo community (Willbrord *et al.*, 2014). *Acacia drepanolobium* which is known as eluai (Maasai) is used by many communities in Tanzania for removal of retained placenta (Kiringe, 2006). In Tanzania ethnoveterinary information of such plants are fairly documented. The Karamojong of Uganda have similarly used a range of plants to treat multiple livestock diseases, pests and conditions; for example, *Albizia coriaria* is used to treat rinderpest, pneumonia, contagious bovine/caprine Pleuropneumonia, and increase fertility (Grade, 2008; Egeru *et al.*, 2015). Most of the knowledge and information has been preserved generations to generations through a unique adoption procedure. In the recent past, legal practitioners specialized in intellectual property rights, have been trained and have been interested in assisting local communities in developing patents of their local knowledge.

Application of ethnoveterinary knowledge. Ethnoveterinary medicines have been used for more than hundred years ago through trial and error leading to accumulated knowledge of a local people (Grade, 2008). However, few plants have been found to be sufficient to manage various ailments of animals. The traditional knowledge acquired by local people has been transferred through historical times by oral communication through songs, dance and

practice. These patterns are beginning to weaken as cultural practices are similarly weakening. As such the quality and survival of ethnoveterinary knowledge is under immense challenge. Ethnoveterinary knowledge is applied in a range of fields including: plant extraction, concoction mixtures, administration, monitoring and observation of livestock performance and response to drug administration (Grade 2008; Grade *et al.*, 2009).

Conclusion

This review has revealed that there is a wide spread use of plants for ethnoveterinary medicine in the management of livestock disease, pests and allied conditions. As such, ethnoveterinary knowledge is pivotal to the continued effective use and administration of plant materials. It is therefore vital that ethnoveterinary knowledge is documented to allow for a dependable source of information in the rapidly evolving societies and social systems.

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