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Full Length Research Paper

Ethnoveterinary practices against animal trypanosomosis in Amaro district, Southern Ethiopia

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Traditional medicine practitioners in the Amaro district of southern Ethiopia have been using various ethnoveterinary practices to control animal trypanosomosis. Thus the aim of the present study was to document these practices in the two Amaro kebeles (wards) of southern Ethiopia, Kellie and Gamule. Data was collected using semi-structured interviews, field observations, preference and direct matrix ranking. A total of 18 species of medicinal plants were collected and submitted to Ethiopian National Herbarium for botanical classification. From all the plant species 7 (38.9 %) were indicated for the treatment of animal trypanosomosis, 4(22.2%) for tsetse fly repellant and 7(38.9%) for both treatments of the disease and tsetse fly repellant. The five most common plant species indicated for treatment of animal trypanosomosis were Lepidium sativum, Echinops Kebericho, Allium sativum, Withania somnifera (L.) Dunal in DC and Myrica salicifolia Hochst ex A. Rich, where as Allium sativum, Aloe vera, Lepidium sativum L., Nicotiana tabacum L., Teradenia riparia, Loblia giberroa and Trifolium burchellianum were the five most common plant species indicated for tsetse fly repellant respectively. The indigenous knowledge on medicinal applications of the medicinal plants documented in this survey could be useful for future phytochemical and pharmacological studies.

Key words: Animal trypanosomosis; ethnoveterinary; Ethiopia; medicinal plants; traditional medicinal practitioners

INTRODUCTION

Animal diseases in general and infectious ones in particular are the major constrains to crop and livestock production in the humid and sub humid parts of the African continent (Palling and Dwinger, 1993). Parasitic diseases especially animal trypanosomosis is the most important factor contributing to the sub potential performance of livestock; 10-14 million heads of cattle and equivalent numbers of small ruminants together with significant equine and camel population are at risk of contracting the disease any time (Tikubet, 2000).The disease is a serious often fatal disease of mainly domestic animals that occur in large areas of Africa, Latin America, the Middle East and Asia. It is caused by species of flagellate protozoa belonging to the genus Trypanosoma of the family Trypanosomatidae that multiply and inhabit in the blood stream, lymphatic vessels and tissue including the cardiac muscle, and central nervous system (CNS) of host, and are transmitted by vectors which are generally haematophagus arthropods (Fischer and Say, 1989). Most cases of animal trypanosomosis (Nagana) are transmitted cyclically by tsetse flies of genus Glossina (Hendrix, 1998). In Ethiopia, a substantial amount of the national resource is spent annually for control of trypanosomosis through purchase of trypanocidal drugs. An annual loss attributed to the disease exceeds US $236 million, while loses from reduced milk and meat production and from animal draught power and manure are unquantifiable (Tikubet, 2000). Recent findings and field observations have indicated that the common trypanosomosis control tools; i.e., trypanocurative and trypanoprophylactic drugs have become ineffective in many areas due to development of drug resistance by the parasite (FAO, 1993). Moreover, toxicity of the drugs and exhibition of antigenic variation which hampers vaccine production (Kuzoe, 1993) are the limitations facing the modern veterinary medicine. However, people have been tackling tsetse and trypas-

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Table 1. Ethnomedicinal plants and other materials indicated by the traditional medicine practitioners of Kellie and Gamule kebeles (wards) of Amaro district in southern Ethiopia, with their local name, parts used, mode of preparation and ethno medicinal uses against animal trypanosomiasis.

Local Name	Scientific Name (Family Name)	Parts used	Preparation	Route of administration	Ethnomedicinal uses	Use Report (%) Trypanosomosis Rx	Tsetse repellant
Sibaka	*Lepidium sativum L* (Brassicacea)	F	chopping + water	oral , topical	trypanosomosis Rx , tsetse fly repellant	80.7% (21/26)	21.4% (3/14)
Tuma	*Allium sativum* (Alwaceae)	R	chopping + water	oral , topical	trypanosomosis Rx , tsetse fly repellant	61.5% (16/26)	35.7% (5/14)
Cholie	*Aloe vera* (Aloaceae)	L	using the gel	oral , topical	trypanosomosis Rx , tsetse fly repellant	3.8% (1/26)	50% (7/14)
Kenkelcha	*Aeschnomene elaphroxylon Guill* (Fabaceae)	R	chopping + water	oral	trypanosomosis Rx , tsetse fly repellant	3.8% (1/26)	7.1% (1/14)
Ganta	*Loblia giberroa Hemsl* . (Lobeliceae)	L	chopping + water	oral, topical	trypanosomosis Rx , tsetse fly repellant	3.8% (1/26)	14.3% (2/14)
Bundo	*Myrica salicifolia Hochst ex A. Rich* (Myricaceae)	B	grinding + water	oral	trypanosomosis Rx	19.2% (5/26)	__
Tiro	*Withania somnifera (L.) Dunal in DC.* (Solanaceae)	R, L, S	chopping + water	oral	trypanosomosis Rx	53.8 % (14/26)	__
Gizawa	*Vernonia amygdalina Del*. (Asteraceae)	L	chopping + water	oral	trypanosomosis Rx	7.7% (2/26)	__
Tumbo	*Nicotiana tabacum* (Solanaceae)	L	chopping + water	oral	trypanosomosis Rx , tsetse fly repellant	3.8% (1/26)	35.7% (5/14)
Olma	*Trifolium burchellianum* (Fabaceae)	L, R, S	chopping + water	oral	trypanosomosis Rx , tsetse fly repellant	3.8% (1/26)	14.3% (2/14)
Tid	*Thuja orientalis* (Cupressaceae)	L	chopping + water	oral	trypanosomosis Rx	3.8% (1/26)	__
Mitmita	*Piper.L* (Piperaceae)	F	chopping + water	oral	trypanosomosis Rx	3.8% (1/26)	__
Lomi	*Citrus aurantifolia.* (Rutaceae)	F	juicing + water	oral	trypanosomosis Rx	3.8% (1/26)	__
Boruse	*Echinops kebericho* (Asteraceae)	R	grinding + water	oral mix with food	trypanosomosis Rx	73% (19/26)	__
Bana	*Teradenia riparia (Hochest)* (Lamiaceae)	L	chopping + water	topical	tsetse fly repellant	__	14.3% (2/14)
Bisana	*Albizia anthelmentica* (Fabaceae)	B	grinding + water	topical	tsetse fly repellant	__	7.1% (1/14)
Birbira	*Millettia ferruginea (Hochest) Bak.* (Fabaceae)	L	chopping + water	topical	tsetse fly repellant	__	7.1% (1/14)
Cheketa	*Calpurnia aurea* (Fabaceae)	L	chopping + water	topical	tsetse fly repellant	__	7.1% (1/14)
Mekado		Type of soil	grinding + food	oral mix with feed	trypanosomosis Rx		__

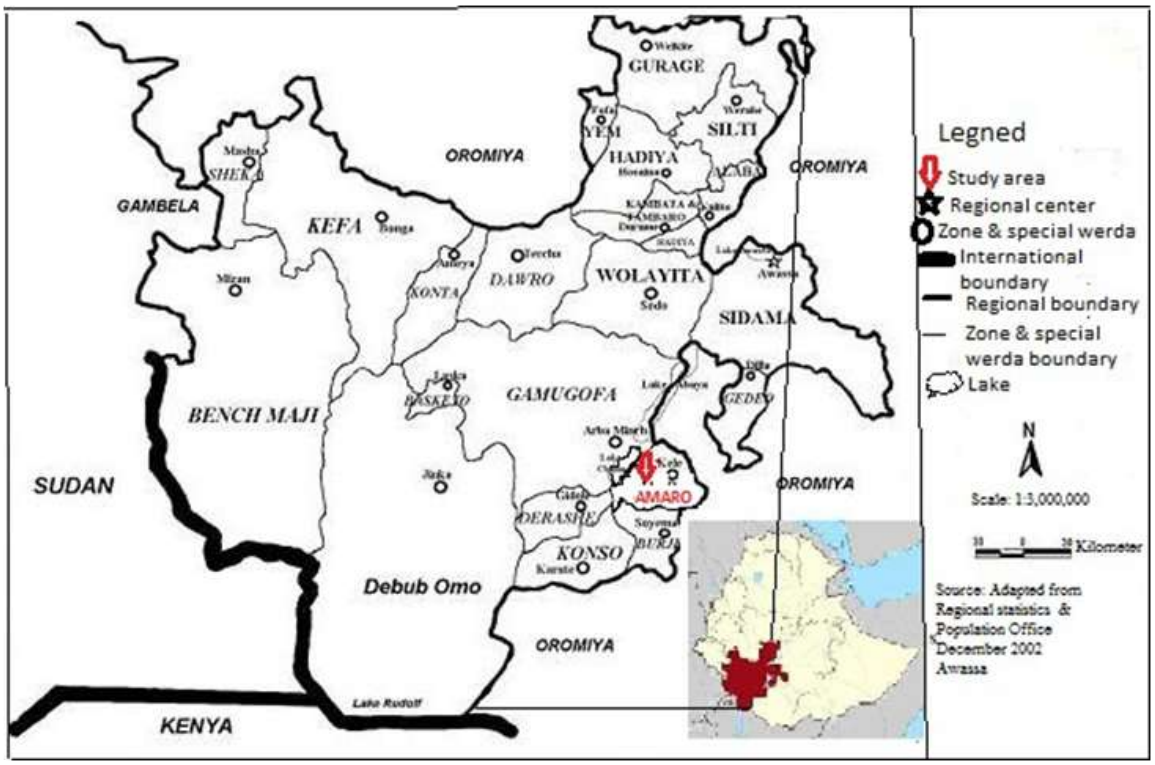

Figure 1. Location map of Amaro District, Kele and Gamule in Southern Ethiopia.

omosis by using their own indigenous knowledge and local resources. Animal producers in the Amaro district of southern Ethiopia have been using various ethnoveterinary knowledge and practices to control tsetse and trypanosomes. These knowledge and practices could be a useful input to the control and treatment of the disease.

Thus this study was designed to document ethnoveterinary practices which are used by traditional medicine practitioners in the two Amaro kebeles (wards) of southern Ethiopia, Kellie and Gamule for the treatment of animal trypanosomosis and tsetse fly repellant.

MATERIALS AND METHODS

Study area

Amaro special wereda (district) is located between 37°.54 and 37°.59 E longitude and 0.5°.42 and 0.5°.58 N latitude in the Southern Nations, Nationalities and People's Regional (SNNPR) State of Ethiopia. It is bounded on the north and east by Oromia and the south by Burgi special wereda (district) and to the west Semen Omo zone (Chamo and Abaya lakes) (Fig.1). The capital Kelle town is located 478 km. south of Addis Ababa. The wereda (district) is characterized by plain, mountainous and undulated terrain. The altitude ranges from 1200 to 3600 m a.s.l. The Amaro mountain chain, Dello Mountain being the highest peak, drops south east and gently North West till it reaches the lowest elevation at Gelana River and Chamo Lake respectively. The extreme of elevation characterizes the diversity of agro-climate and vegetation cover of the area. (Agri-Service Ethiopia, 2000).

STUDY METHODOLOGY

Ethnobotanical data collection

Information was collected from November 2007 to February 2008 through semi-structured interviews as described by Cotton (1996), field observations, preference and direct matrix ranking according to Alexiades (1996) with 26 traditional medicine practitioners. The semi structured interview was used to collect information on the local names of the plants, parts of the plants used, their use (treatment of animal trypanosomosis, tsetse fly repellant or plants for both treatments of the disease and tsetse fly repellant) and methods of preparing the herbal remedies.

Taxonomic identification

The medicinal plants reported by the informants were collected and species identification was performed at the Ethiopian National herbarium, using taxonomic keys and floras and by comparison with already identified herbarium specimens. The identified specimens were deposited at the National Herbarium.

Data management and analysis

Data were entered into Microsoft Excel spreadsheet and summarized using descriptive statistics.

RESULTS AND DISCUSSION

A total of 26 traditional medicine practitioners were participated to make this study in Kellie and Gamule kebeles (wards) of Amaro district in southern Ethiopia. The number of traditional medicine practitioners which responded about the most noticeable symptoms of the disease was 84.6% (22/26). All the traditional medicine practitioners have been practicing the traditional treatment of animal trypanosomosis and only 53.8% (14/26) of them have been using the traditional tsetse fly repellant. A total of 18 types of medicinal plants and a Mekado soil were indicated for ethnoveterinary practices against animal trypanosomosis. 7 (38.9 %) medicinal plants were indicated for animal trypanosomosis treatment, 4 (22.2%) as a tsetse fly repellant and 7 (38.9 %) for both animal trypanosomosis treatment and tsetse fly repellant (Table 1).Lepidium sativum L. (Sibaka), Echinops Kebericho (Boruse), Allium sativum (Tuma), Withania somnifera (L.) Dunal in DC (Tiro), Myrica salicifolia Hochst ex A. Rich (Bundo) are the five most common plant species for the treatment of animal trypanosomosis respectively as indicated by the respondents. Antitrypanosomal and antileishmanial activity of Allium sativum L (Garlic) were recorded in previous studies (Sharma, 2009; Salem, 2006). Withania somnifera (Sharma, 2009), Aloe vera (Sharma, 2009; Dutta, 2007) and Nicotiana tabacum L (Rocha, 2005) were reported for their antileishmanial effect. Several bioactive compounds isolated from piper species have been reported to display antileishmanial (Bodiwala et al., 2007; Hermoso et al., 2003) and trypanocidal activities (Batista et al., 2011). Leishmanicidal activity of the Piperaceae family Piper malacophyllum is related with its alkenylphenol gibbilimbol B compound to cause plasma membrane disruption (Oliveira et al., 2012).

The five most common plant species indicated for tsetse fly repellant by the respondents were Allium sativum (Tuma), Aloe vera (Chole), Lepidium sativum L. (Sibaka), Nicotiana tabacum L. (Tumbo), Teradenia riparia (Hochest) (Bana), Loblia giberroa Hemsl.(Ganta) and Trifolium burchellianum (Alma/Olma) respectively. In Ghana, Cobbinah (1998) recorded the use of the leaves of Nicotiana tabacum with insect repellent activities to preserve food crops in the various farming communities of the Ashanti region and in Uganda in pastoral Karamoja it is used for mosquito and flea control (Gradéa et al., 2009). Previous studies reported the biological activities of Teradenia riparia (Hochest) (Bana) as larvicide (Weaver et al., 1992); insecticide (Weaver et al., 1994); antimalarial (Campbell et.al., 1997) and its repellent effects on the mosquito species Anopheles gambiae sensu strict (Maikai et al., 2010). Lobelia gibora is reported to be anti leshimanial (Gradéa et. al., 2009). Moreover, essential oils of L. sativum moderate larvicidal activity against mosquito larvae of Culex pipiens is reported (Kimbaris et al., 2012).

The parts of the plants used for treatment were leaf 44.4% (8/18) followed by root and fruit 16.6% (3/18) each, bark 11.1% (2/18) and combination of one plant with another part of plant is 11.1% (2/18). The parts of the plants were prepared by chopping, grinding, juicing or by extracting gel mixed with water and drenched, or mixed with the feed, or making a paste of the plant part and applied topically. The use of leaves as the major plant part of remedy and oral as the major rout of application against treatment of trypanosomosis in this study is consistent with the study in Nigeria (Maikai et al., 2010). The practice of exploiting perennial plant parts, such as roots of relatively slow growing woody species, can result in a decline in both, the size and distributions of populations of the exploited species (Kimbaris et al., 2012) unless proper conservation and sustainable measures are considered.

Other than the use of plant parts, Mekado soil mixed with feed in combination with herbal treatments is also indicated for treatment of animal tryanosomosis. This soil is found in Borana Zone of Oromia regional state and traditional medicine practitioners get it from the market. It is also known that this soil is commonly used for fattening purpose for animals in the area. Other studies in Ethiopia also reported the use of soil for fattening purpose (Mesfin and Obsa, 1994). It is tempting to suggest that the livestock owners may feed their animals the Mekado soil as supplementary treatment to tackle the progressive weight loss caused by the disease.

CONCLUSION

Most of the medicinal plants documented in this survey have not been scientifically validated for their claimed antitrypanosomal or tsetse fly repellent activity. Hence, their documentation will be useful as a baseline data for future phytochemical and pharmacological studies.

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