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RESEARCH ARTICLE

ETHNOVETERINARY PLANTS USED IN KHARTOUM STATE, SUDAN

*Hatil. H. EL-Kamali and Ahmed. A. Elshikh

Department of Botany, Faculty of Science and Technology, Omdurman Islamic University, Sudan

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ABSTRACT

This study covered the animal owners communities in Khartoum State, Central Sudan. It was centered in documenting indigenous knowledge about medicinal plants used for treating animal diseases and other health conditions. The present study revealed that 31 plant species belonging to 19 families were recorded as useful in managing various animal disease ailments by the animal owners/ pastoralists in Khartoum State. Three plant species of families Fabaceae, Mimosaceae and Poaceae and two species of Apiaceae, Asclepiadaceae, Malvaceae, Solanaceae and Cucurbitaceae were largely employed for preparation of herbal remedies for curing animal disease. Among the plant parts used seed was the mostly used plant parts (29%) to treat particular (herb) animal disease followed by fruits (23%), leaves (16%) and aerial parts (13%). Oral administration of herbal preparations was found as mostly used to treat the illness (47%), followed by external applications (37%) and raw feeding (16%). The study showed that a good number of medicinally valuable plants were used for the treatment of various veterinary disease. *Acacia nilotica* ssp. *nilotica* was used for the treatment of most of the disease followed by *Citrullus colocynthis*, *Trigonella foenum-graecum*, *Acacia nubica*, *Camellia sinensis* and *Solenostemma argel*.

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INTRODUCTION

Ethnoveterinary medicine (EVM) deals with people's knowledge, skills, methods, practices and beliefs about the care of their animals. Ethnoveterinary knowledge is acquired through practical experience and has traditionally been passed down orally from generation to generation (Ngeh, *et al.*, 2007). Ethnoveterinary practice to animal health care is as old as the domestication of various animal species (Cassius, 2013). Medicinal herbs as potential sources of therapeutics aids have attained a significant role in health system all over the world for both humans and animals not only in the diseased condition but also as potential material for maintaining proper health. The widespread use of herbal remedies and healthcare preparations, as those described in ancient texts such as the Vedas and the Bible, and obtained from commonly used traditional herbs and medicinal plants, has been traced to the occurrence of natural products with medicinal properties. The indigenous traditional knowledge of medicinal plants of various ethnic communities, where it has been transmitted orally for centuries is fast disappearing from the face of the earth due to the advent of

modern technology and trans-formation of traditional culture (Cassius, 2013). Sudan is considered one of the countries with the largest livestock producers in Africa and its climatic diversity to a diversity in livestock with camels in the Northern belt, cattle in the western and southern belts, while sheep and goats are found all over the country, in addition to a huge resources of fish and have led poultry (Ahmed, 2013).

MATERIALS AND METHODS

Description of the study area

This study was conducted in Khartoum State (Omdurman, Khartoum and Khartoum north). The Khartoum State lies between longitudes 31.5 - 34° E and latitude 15-16° N in an area about 28.165 square kilometers. It is bordered to the north and the east side on the River Nile State, to North Western on the Northern State, and to the east and south-eastern on States of Kassala, Gedaref and Gezira (Khartoum State Office-Information Center, 2011).

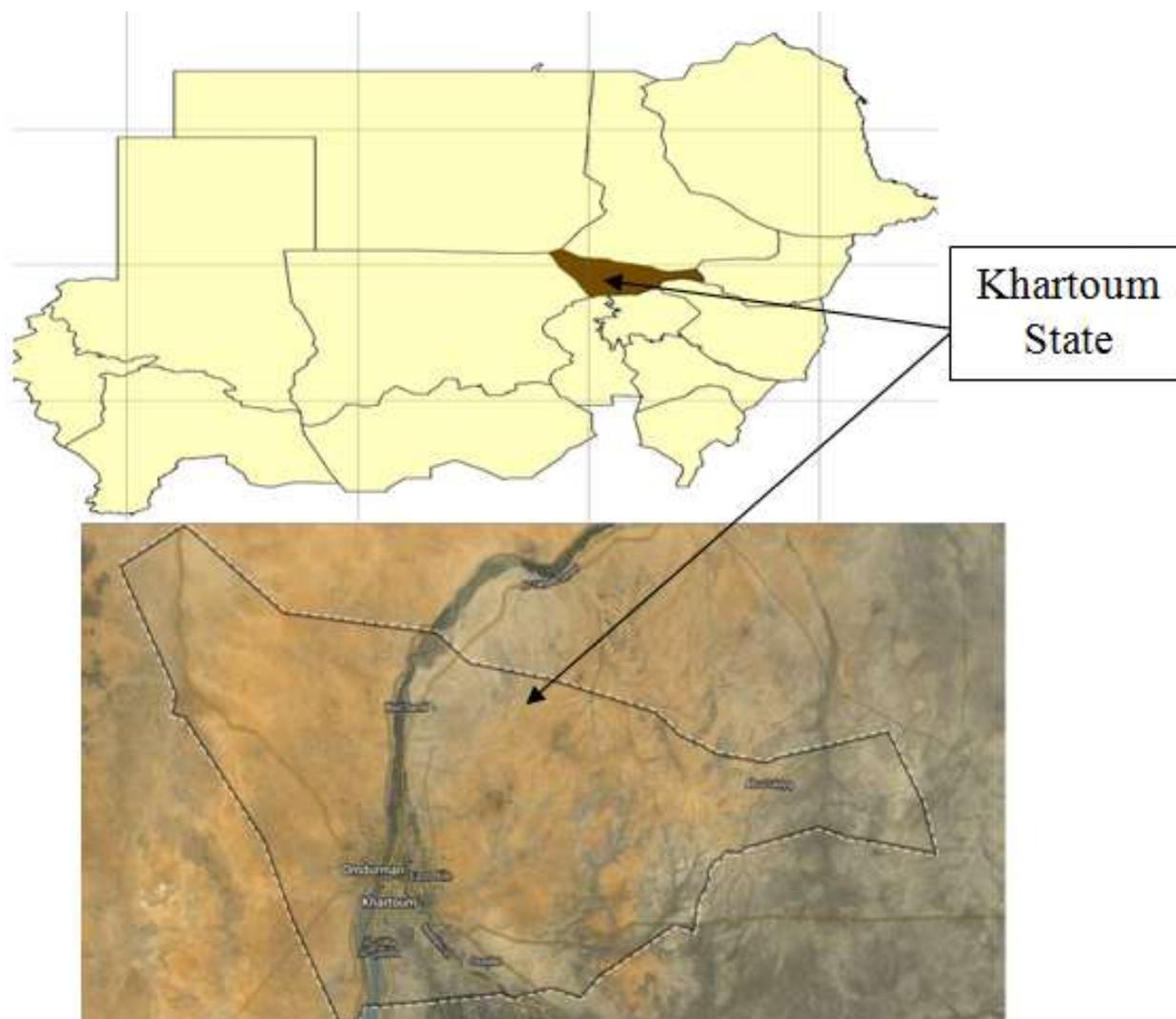
Field survey

Animal owners and other category of informants such as Traditional Health Practitioners (THP) and lay persons knowledgeable on medicinal plants used for treating domestic

*Corresponding author: Hatil. H. EL-Kamali,
Department of Botany, Faculty of Science and Technology,
Omdurman Islamic University, Sudan.

animals diseases were identified. Selection of informants to participate in the study was dependant on their willingness to share information, and their acquaintance with medicinal plants for treating animal diseases. Fifty informants were selected from the pastoral groups and lay persons in Khartoum State. Interviews were conducted with animal owners/ pastaralists to elicit information on medicinal plants used.

Acacia nilotica ssp. *nilotica* was used for the treatment of most of the diseases followed by *Citrullus colocynthis*, *Trigonella foenum-graecum*, *Acacia nubica*, *Camellia sinensis* and *Solennostemma argel*. Among the plant parts used (Figure 1) seed was the mostly used plant part (29%) to treat particular animal disease followed by fruit (23%), leaves (16%), aerial part (13%), stem bark (10%), and grain, bulb and cycles (1%).



RESULTS AND DISCUSSION

The present study revealed that 31 plant species belonging to 19 families were recorded as useful in managing various animal diseases/ailments by the animal owners in Khartoum State (Table 1). The data evidence that three species of Fabaceae, Mimosaceae, and poaceae and two species of Apiaceae, Asclepiadaceae, Malvaceae, Solanaceae and Cucurbitaceae, were largely employed for preparation of herbal remedies for curing animal diseases. Moreover, the observation reveal that seven different species were used for the treatment of wound, eight different plant species for the treatment of inflammation, ten different plant species for the treatment of bloat (flatulence) and four different species were used for the treatment of the diarrhea and worms. The study showed that a good number of medicinally valuable plants were used for the treatment of various veterinary disease.

The mode of treatment was varied with respect to nature of animal disease (Figure 1). It was recoded that oral administration of herbal preparations (infusion, decoction, juice) was found as mostly used to treat the illness (47%), followed by external applications (37%) and raw feeding (16%) (Figure 2)

DISCUSSION

The study covered the animal owners communities in Khartoum State, Central Sudan. It was centered on documenting indigenous knowledge about medicinal plants used for treating animal diseases and other health conditions, field collection and scientific identification of medicinal plant species.

Table 1. Ethnoveterinary medicinal plant species, use and application

Indication	Animals	Plant species	Plant parts	Preparation
Wounds	Cattle	<i>Trigonella foenum – graecum</i>	Seed	Infusion
	Sheep	<i>Coffea arabica</i> L	Seed	Raw
	Goats	<i>Camellia sinensis</i>	Leaves	Infusion and mixed with salt
	Sheep			
	Cows	<i>Acacia nilotica</i>	Fruit	Infusion
	Goats			Raw
	Goats	<i>Maerua crassifolia</i>	Stem bark	Crude or mixed with water
	Sheep			
	Cattle	<i>Ziziphus spina-christi</i>	Leaves	Infusion
	Camel	<i>Citrullus colocynthis</i>	Seed	Tar
Inflammation	Cattle	<i>Trigonella foenum – graecum</i>	Seed	Raw or Infusion
	Sheep	<i>Solennostemma argel</i>	Aerial part	Infusion
	Goats			
	Cattle	<i>Acacia nilotica</i>	Fruit	Infusion
	Cattle	<i>Calotropis procera</i>	Aerial part	Raw
	Goats	<i>Capsicum frutescens</i>	Fruit	Raw
	Cattle	<i>Nigella sativa</i>	Seed	Raw or Infusion
	cows	<i>Allium cepa</i>	Fruit	Raw
	sheep			
	Cattle	<i>Hibiscus sabdariffa</i>	Calyces	Infusion
Bloat	cows	<i>Trigonella foenum – graecum</i>	Seed	Infusion or Raw
	sheep			
	goats	<i>Camellia sinensis</i>	Leaves	Infusion
	sheep			
	Cows	<i>Cymbopogon schoenanthus</i>	Leaves	Infusion
	Goats			
	Goats	<i>Solennostemma argel</i>	Aerial Part	Infusion
	Sheep			
	Goats	<i>Hibiscus sabdariffa</i>	Calyces	Infusion
	Cattle	<i>Abelmoschus esculentus</i>	Fruit	Infusion
Diarrhea	Cattle	<i>Citrus limon</i>	Fruit	Fruit juice
	Cows	<i>Balanites roxburghii</i>	Fruit	Infusion
	Goats			
	Cows	<i>Ricinus communis</i>	Seeds	Seed oil
	Goats	<i>Sesamum indicum</i>	Seeds	Seed oil
	Cows	<i>Trigonella foenum – graecum</i>	Seeds	Infusion
	Goats			
	Goats	<i>Camellia sinensis</i>	Leaves	Infusion
	Sheep			
	Goats	<i>Solennostemma argel</i>	Aerial part	Infusion
Stomatitis	cows	<i>Acacia nilotica</i>	Fruit	Infusion
	cattle			
	Cows	<i>Sorghum bicolor</i>	Seed	Raw or Infusion
Retained placenta	goats	<i>Pennisetum americanum</i>	Grain	Infusion
	sheep			
	Cows	<i>Sorghum bicolor</i>	Seed	Infusion
Nasal discharges – Equine	Horse	<i>Camellia sinensis</i>	Leaves	Infusion
Abdominal gases	Donkeys	<i>Coriandrum sativum</i>	Fruit	Raw
Worms	Donkeys	<i>Foeniculum vulgare</i>	Fruit	Raw
	Cows	<i>Acacia nilotica</i>	Fruits	Infusion
	Cattle	<i>Acacia mellifera</i>	Aerial part	Infusion
	Cattle	<i>Cucurbita pepo</i>	Seed	Raw or
				Mixed with water
Tendinitis	Cows	<i>Cymbopogon schoenanthus</i>	Leaves	Infusion
	Goats			
Enteritis	Cattle	<i>Citrullus colocynthis</i>	Seed	Tar
	Cows	<i>Solennostemma argel</i>	Aerial part	Infusion
	Goats			
Food and mouth disease	Cows	<i>Acacia nilotica</i>	Fruit	Raw or mix with water and Vaseline or Glycerin
Contagious caprine pleura pneumonia	Cows	<i>Acacia nubica</i>	Stem bark	Raw
	Sheep	<i>Acacia nilotica</i>	Fruit	Infusion
	Goats			
Pox	Goats	<i>Acacia nilotica</i>	Fruit	Infusion
				Raw
Gangrene	Goats	<i>Capsicum Frutescens</i>	Fruit	Raw
	Goats	<i>Citrullus colocynthis</i>	Seed	Seed tar
	Cattle	<i>Acacia nilotica</i>	Fruit	Raw
Cough	Sheep	<i>Acacia nilotica</i>	Fruit	Infusion
	Goats			
Dermatitis	Cattle	<i>Acacia nilotica</i>	Fruit	Raw
	Cattle	<i>Citrullus colocynthis</i>	Seed	Seed tar
Tetanus ruminant	Sheep	<i>Acacia nilotica</i>	Fruit	Infusion
	Goat			

Continue.....

Mouth ulceration	Cattle goats	<i>Acacia nilotica</i> <i>Pennisetum americanum</i>	Fruit Grain	Raw Raw
Pneumonia	sheep Goats	<i>Acacia nubica</i>	Stem bark	Raw or Infusion
Snake and Scorpions bites	Cattle Cattle	<i>Acacia nubica</i> <i>Citrus limon</i>	thorns Fruit	Raw Fruit juice
Toxicity	Cattle Cattle	<i>Nicotiana rustica</i> <i>Acacia nubica</i>	Stem bark	Mixed with water Infusion
Mange	Cattle Goats	<i>Citrus limon</i> <i>Calotropis procera</i>	Fruit Aerial part	Fruit juice Raw
Emaciation	Sheep Cows Sheep Cows Cows Cows Goats	<i>Citrullus colocynthis</i> <i>Acacia mellifera</i> <i>Medicago sativa</i> <i>Allium cepa</i> <i>Conocarpus erectus</i>	Seed Stem bark Aerial part Bulb Leaves	Seed tar Infusion Raw Raw
Ophthalmitis	Cattle	<i>Panicum turgidum</i>	Aerial part	Raw
Inappetence	Cattle	<i>Medicago sativa</i>	Aerial part	Raw
No lactating	Goats	<i>Medicago sativa</i>	Aerial part	Raw
Alopecia	Goats	<i>Balanites roxburghii</i>	Fruit	Infusion
Indigestion	Goats	<i>Arachis hypogaea</i>	Seed	Seed oil
Breakage horn	Goats	<i>Arachis hypogaea</i>	Seed	Seed oil
Creaky hoof	Camel	<i>Sesamum indicum</i>	Seed	Seed oil
Gases	Donkey	<i>Sesamum indicum</i>	Seed	Seed oil
Trypanosomiasis	Camel	<i>Citrullus colocynthis</i>	Seed	Seed tar
Contagious ecthyma	Goats	<i>Citrullus colocynthis</i>	Seed	Seed tar
Ticks	goats goats	<i>Citrullus colocynthis</i>	Seed	Seed tar
Candidiosis thrust	goats sheep	<i>Citrullus colocynthis</i>	Seed	Seed tar

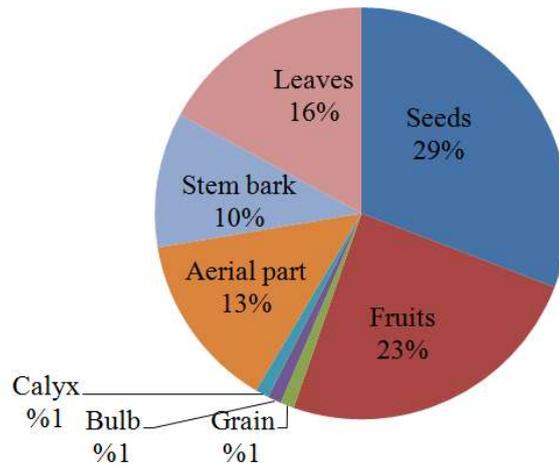


Figure 1. Parts Used

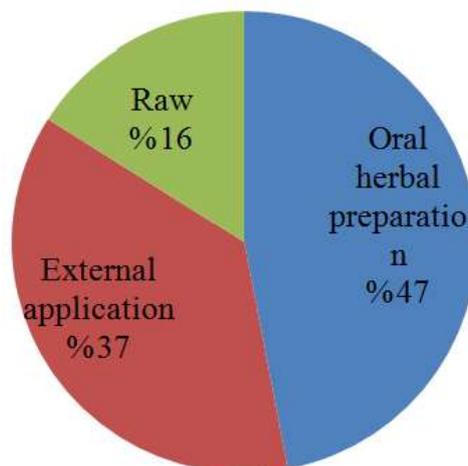


Figure 2. Applications

The knowledge of medicinal plant use among the animal owners is said to have been developed gradually over a period of practical experience. Such knowledge, practices and beliefs is summed as Ethnoveterinary Knowledge (Kamoga, 2010). Plant comprise the largest component of the diverse therapeutic elements of traditional animal health care practices (Etana, 2007). In Brazil, for example, pumpkin seeds (*Cucurbita pepo* L.) are used as vermifuges in veterinary medicine, in a very similar way that they are prepared in human. About 80% of the plants used in traditional veterinary medicine in Mediterranean Greece are used to treat similar condition in human (Alves and Rosa, 2010). The leaves of *Calotropis procera* are ground into paste and applied topically to remedy scorpion stings, and the latex of this plant is applied externally for healing animals wounds, while the roots are kept in nostrils of affected animals for few minutes to cure running nose (Reddy *et al.*, 1998; Eswaran *et al.*, 2013). One of the most used plants in treatment of animal disease is *Citrullus colocynthis*, virtually all parts of the plant are used in medicinal purposes, for example the riped fruit is crushed and boiled in castor oil, given orally as purgative, also it used to cure enteritis. The unripe fruit is heated on fire, mixed with butter and a little salt given orally as vermifuge, while the roots are ground along with turmeric and salt, the paste is given orally to treat fever (Reddy *et al.*, 1998; Eswaran *et al.*, 2013). The fruit of *Citrus limon* is expressed and the juice mixed with chalk dust, rubbed over the breast as a treatment for mastitis, also conphor are ground in the lemon juice, and the paste is used to treat pyrexia (Reddy *et al.*, 1998; Eswaran *et al.*, 2013). The oil from the seeds of *Ricinus communis* cooked castor oil from seeds, dropped into nostrils, applied to head and horns to treat horn cancer, it is also applied externally to cure wounds (Reddy *et al.*, 1998; Eswaran *et al.*, 2013). The seeds of *Nigella sativa* are bounded together with leaves of *Allium sativum* and *Ruta chalepeuris*, mixed with water for drinking to treat black leg whereas *Allium cepa* are ground and given orally for treatment of diarrhea, helminthes and dog bites in sheep, goats and cattle (Yineger *et al.*, 2007; Eswaran *et al.*, 2013). The seed of *Trigonella foenum-graecum* and leaves of *Sida cordifolium* are ground and given orally for curing enteritis in goats. While the oil of *Arachis hypogaea* is applied on the infected spot to treat warts (Eswaran *et al.*, 2013).

REFERENCES

- Ahmed, N. 2013. Livestock Future Perspective in Sudan: Imports threaten national producers and siphon foreign currency, Sudan vision an independent daily, Issue: 3268.
- Alves, R. R. N. and Rosa, I. L. 2010. Animals in traditional folk medicines implications for conservation, Google book.
- Etana, 2007. Ethnobotanical study of traditional medicine plants of Goma Wereda, Jima Zone of Oromia Region, Ethiqia, M.Sc. Thesis, Addis Ababa University.
- Cassius, J. 2013. Documentation of ethnoveterinary practices used in family poultry in Botswana, doi:10.5455/vetworld, 18-21.
- Eswaran, S., Boornibalagan, P. and Rathinarel, S. 2013. Ethnoveterinary medicinal practices of the villagers of Usilampatti Toluk of Madurai District, Indian, *International J. of Botany*, a(1): 37 – 43.
- Kamoga, D. 2010. Some pharmacological activities of selected medicinal plant species used for treating cattle diseases in kabira sub-county, rakai district, BSc (Ethnobotany), A dissertation.
- Khartoum State Office. Information Centre, 2011.
- Ngeh, J., Wanyama, J., Nuwanyakpa, M. and Django, S., 2007. Ethnoveterinary medicine, a practical approach to the treatment of cattle diseases in sub-Saharan Africa, Agromisa Foundation and CTA, Wageningen, ISBN Agromisa: 978-90-8573-080-4, ISBN CTA: 978-92-9081-366-8.
- Reddy, R. V., Lakshmi, N. V. N., Raju, R. R.V., 1998. Folk veterinary medicinal plants in Cudalaph hills of Andhra Pradesh, India, *Fitoterapia*, Vol. LXIX, No. 4 P. 322 – 328.
- Republic of Sudan, Khartoum State, Information Center, (2011) <http://www.krt.gov.sd/khartoumen.php>.
- Yineger, H., Kelbessa, E., Bekele, T and Lulekal, E. 2007. Ethnoveterinary medicinal plants at Bale mountains National park, Ethiqine, *J.Ethnopharmacology*, 112: 55 – 70.
- www.maplandia.com/sudan/khartoum/khartoum/
