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Research Article

Ethno Medicinal Plants Used in the Management of Cattle Helminths in Kyanamukaaka Sub County, Uganda

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Abstract: An ethnobotanical survey in Kyanamukaaka Sub-county, Masaka District was carried out to document medicinal plants used to cure helminths and other different ailments of cattle. Information on local plants used for curing helminths and other cattle diseases was obtained purposively using structured questionnaires, personal observations, interviews of herdsmen, herbalists, and farmers. Twenty-four (24) medicinal plant species used to treat helminthosis belonging to 13 families were mentioned. Euphorbiaceae being the most used (21%) family, and Fabaceae (17%) followed by Solanaceae (13%), Verbenaceae, Caparicacea, Gramineae, Phytolacaceae, Moringaceae, Lamiaceae were among the least used medicinal plants families with (4%) each. Leaves were the most used anthelmintic medicinal plant parts (46%). Ethnoveterinary medicine practices involved the use of plants as remedies collected specifically from the bush (34.9%), majority of which were herbs (33%) prepared mainly by maceration (59%) and the oral route accounted for (92%) then topical/ocular route 8% as means of administration of the anthelmintic remedies. Dosage administration varied among different remedy users. For the other ailments twenty-five (25) medicinal plants were reported, East Coast fever, trypanosomiasis, and fever were among mentioned other diseases. The research study contributes to the native knowledge of medicinal plants practiced among different communities, hence assisting in knowledge and practice preservation, which remain mostly with elderly traditional practitioners. However, there is a need for conservation, standardization of dosages, determination of the chemical composition, to be potential candidates for the development of commercial drugs.

Keywords: Helminth, Ethnoveterinary, Dosage, Anthelmintic.

INTRODUCTION

The livestock sector is highly dynamic, according to Reid *et al.,* (2008), livestock is a significant global asset estimated at a value of least $1.4 trillion and occupy 45% of the global surface area. At least 1.3 billion people are employed globally under the livestock industry and support about 600 million livelihoods of poor smallholder farmers in low developed countries (Herrero *et al.,* 2009, Thornton *et al.,* 2006). Countries especially in the drier and poorer parts of Sub Saharan Africa, livestock accounts for a large share of total agricultural Gross Domestic Product (AGDP). For example, it contributes to one-third of agricultural GDP in Ethiopia, half in Kenya, two thirds in Sudan, and 80-90% in Djibouti and Somalia (Haggblade *et al.,* 2007).

Lapenga and Rubaire, (2009), reported at least 80% of Uganda's rural population are relying on Agriculture with a varied focus on livestock and crop production. In the year 2009 livestock contributed 1.7% to the national Gross Domestic Product (GDP) in Uganda, revised estimates in 2012 placed this contribution at about 3.2% of the national total. The contribution is larger than GDP derived from other cash crops or fishing (UBOS, *2009*; Behnke and Nakirya, 2012). Most rural households who keep livestock benefit a lot from them. They act as social security, mobile banks, providing social esteem, not forgetting the basic importance of providing food (Herrero *et al.,* 2012).

Despite its significance diseases greatly affects animal health, welfare, and productivity leading to high treatment costs and great losses (Nabukenya *et al.,* 2014). According to Kamoga, (2010), diseases are a major constraint to cattle productivity and production. Helminthosis and bacterial related infections expose

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cattle to mortality risks thereby causing greater loss to farmers. Hoareau and DaSilva, (1999), due to the increasing cost of modern drugs to manage these diseases this have resulted in interest in medicinal plants which are cheaper.

Ethnomedicinal plants form the backbone of the traditional medicine system in the whole world (Bukuluki *et al.,* 2014). The use of medicinal plants globally has supported public health care and existing plant ranges from 250 to 500 thousand species and around 1-10% are used as food for human and animals (Silva and Fernandes, 2010). World Health Organization estimates that 80% of the population in developing countries use traditional medicine for their primary health care needs though the percentage differs from country to country for example 90% in Ethiopia, 70% in Rwanda and 60% in Uganda (Tabuti *et al.,* 2012) and ethnomedicine present a lower degree of side effects and risks and a wide range of therapeutic uses than synthetic or chemical drugs (Okigbo and Mmeka, 2006).

There are limited studies on specific ethnopharmacological plants, however, people in rural and some urban areas in Uganda rely on mostly plant-derived preparations for primary health care needs and treatment of their domesticated animals (Kamoga, 2010). Ethnobotanical medicine can be used in the treatment of many livestock diseases in the face of modern drug resistance in the socio-cultural context of resource-poor farmers that for a large part of Uganda's agriculture for sustainable livestock production (Nalule *et al.,* 2011).

Helminthosis is among the most livestock conditions, costing farmers millions of Ugandan shillings ((Lapenga and Rubaire, 2009; Bizimenyera *et al.,* 2000). Since some farmers cannot afford to buy modern drugs, which are also accompanied now with increasing resistance to antihelminthic (Nabukenya *et al.,* 2014). Medicinal plants would be good substitutes, sparing farmers from economic losses (Bukenya and Kamoga, 2007). However, there is limited well-documented information concerning the medicinal plants that are used as anthelmintic, parts used, dosage, major threats and routes of administration majorly in veterinary practices, yet livestock owners who live in rural areas are surrounded by these plants and have an excellent knowledge of these ethnomedicinal plants (Matekaire and Bwakura, (2004),. These elders who pass the information orally to the young generation may die minus passing it hence disappearing from the society (Getahun, 1976), The overall objective of this research was to document medicinal plants used in the management of cattle helminths in Kyanamukaaka Sub County, Masaka District Uganda also other plants used for managing other ailments were documented. Then the specific objectives were the preparation methods, habitats, dosage forms, and the different routes of administration of these medicinal plants.

Description of The Study Area

The research area was Kyanamukaaka Sub-county and the study was conducted in 2016. Kyanamukaaka Sub-county in Masaka district is located in the South-Western region of Uganda in the East side of Lake Victoria and situated about 62Kms away from the Equator towards the South and lies between Longitudies 30^{o} – 32^{o}E and latitude 0^{o} – 1^{o} South. Kyanamukaaka comprises the following parishes; Kamuzinda, Kyantale, Buyinja, Zzimwe, and Buyaga. There is a fair distribution of rainfall throughout the year, which is bimodal with two peak periods and having annual average rainfall between 10mm and 120mm with 100-110 rainy days. The average maximum temperature does not exceed 30^{o}c and minimum below 10^{o}c (Kyanamukaaka Sub County Local Government 3year Development plant 2007/2008 – 2009/2010 unpublished).

MATERIALS AND METHODS

A structured questionnaire was used during data collection noting the local plants' names, uses, parts used, and modes of preparation and administration. The study involved personal observations, interviews of herdsmen, herbalists, and farmers. Seventy-five (75) respondents were sampled from the five parishes whereby in each parish 3 villages were selected according to the cattle population and the number of farmers and in each village 5 specific respondents were sampled and also other 7 key informants were interviewed about their knowledge on medicinal plants used in the management of livestock diseases.

The specimens collected from the field excursions reported to be medicinal plants were mounted on manila labeling them with the local name, specifying the area or environment where it was got from, those that bear seeds, sample seeds were also collected (Tabuti *et al.*,2012) in addition to this photograph of some specimens were taken. Following general documentation of plant species used, voucher specimens were taken for correct botanical identification at Makerere University Herbarium and also using the existing authentic literature, verifying using the International Plant Names Index (IPNI), www.ipni.org. Data were summarized into major themes by content analysis such as percentages, rate, and frequencies computed using Microsoft Excel (2007) package.

Figure 1: During the field surveys

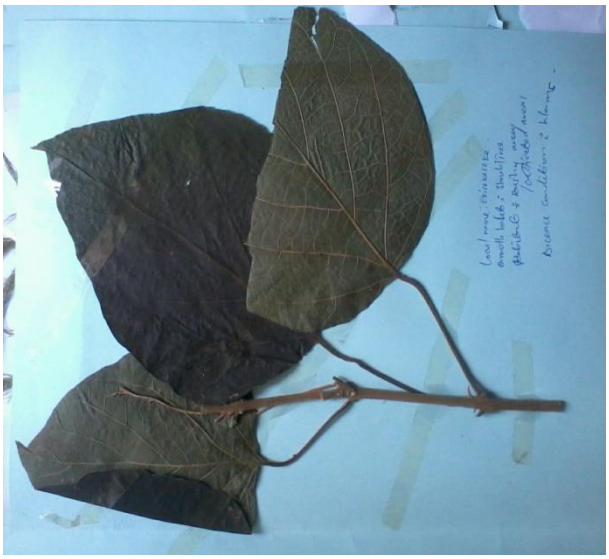

Figure 2: *Clerodendrum rotundifolium.Oliv.* Mounted on a white sheet after pressing.

RESULTS AND DISCUSSIONS

The medicinal plant used by the farmers in the management of helminthes.

Twenty-four (24) medicinal plant species belonging to thirteen (13) families were reported as used to treat helminths of cattle and were documented according to Table 1. Species from Euphorbiaceae being the most used (21%), and Fabaceae 17%) followed by Solanaceae (13%), Vibrionaceae, Caparicacea, Gramineae, Phytolacaceae, Moringaceae, Lamiaceae were the least used plants families with (4%) each. For the plants reported to be most used in the area for management helminths were *Vernonia amygdalina.Del.* (22%), *Abrus precatorius.L.* (16%), then *Ricinus communis L*. (6%) with *Clerodendrum rotundifolium.Oliv*.(6%).

The discovery of the utilization of such a big number of ethnomedicinal plants for the treatment of helminths condition by the people of the study area indicates clearly how native people depend on medicinal plants for the treatment of livestock diseases. This shows that the areas consisted of a notably large variety of plant species. The widely spread means can be easily accessed accounting for the most frequent use of plant families. Species from *Euphorbiaceae* have been also reported in other parts of the country, Nalule *et al.*, (*2011*), reported *Euphorbiaceae* species as being mostly used by drylands communities of Uganda in the management of livestock helminths and similar to a report by Nabukenya *et al.*, (2014). However these findings are not in line with other studies from other countries showed Solanaceae and Liliaceae species being richer in Ethnomedicine (Mussarat *et al.*, 2014) in Pakistan, (Benítez *et al.*, 2012) in Spain. The discrepancy in the domination of species used of medicinal plants could be linked to the special native knowledge of the different geographical communities in addition to the different ecological diversity. Some of the plants used by the people in Kyanamukaaka have also been reportedly used in other Ugandan communities(Peter and Deogracious, 2006). Kamoga, (2010), documented 43 plants of which 11 plants are used for helminths control, *Abrus precatorius*, *Cannabis sativa.L.*, *Senna occidentalis* are some of the species reported of which are also documented in this report.

Table 1: Medicinal plants used to treat cattle helminthosis, local name plant parts used, preparation, dosage, and administration

Scientific name (taxon)	Family	Local name	PPU	MOP	Preparation	Dosage and administration
Euphorbia heterophylla Linn.	*Euphorbiaceae*	Akasandasanda	L	M	Pound about 0.5kg of leaves add 1L of water and sieve.	Drench 1L to adult and 300ml to calves.
Tragia brevipes		Kamyu	L	M	A handful of leaves (0.3kg) are crushed and mixed with 2L of water and filter.	Administer 0.5L – 1L to young and adult cattle respectively.
Achornea cordifolia Muell.Arg.		Oluzibaziba	S, L	M, D	Pound 2kg of leaves plus seeds and add 1L of water, or boil.	Drench 1/2 L to adult cattle.
Ricinus communis L.		Ensogasoga	S	P	Pound seeds.	4 seeds to calves and 10 seeds to mature cattle and put into the mouth.
Jatropha curcas L.		Kiroowa	S	P	Get dried seeds are either pounded	Give 2seeds to calves or 5-6

					or not.	seeds to adult animals.
Senna occidentalis L.		Mutanjoka	L	M, D	Pound a handful of roots (300g), add 1L of water, stir and sieve or boil and sieve later.	Drench about 0.5L to calves and 2L to the adult ones.
Abrus precatorius.L.		Olusiiti	L, S	M, D, P	Pound seeds, or grind a handful (0.4kg) of leaves mix with 2L of water, or boil.	2 seeds for calves mature 4-5 for adult animals or drench; 200 -300ml to adults and 50-70 to calves.
Erythrina abyssinica. Lam ex D.C	*Fabaceae*	Ejilikiti	F	M	Pound about a handful (200g) of the flowers.	Squeeze 4-5drops into the eye.
Pseudarthria hookeri Wight & Arn.		Omukakala	L	M	About 2 handfuls of leaves are pounded and add 2L of water and sieve.	Drench 600ml to calves and half a litre to adult ones.
Cannabis sativa.L.	*Cannabiaceae*	Enjaga	S, L	M, D	About a handful (300g) of leaves plus seeds pounded, add 1L of water and sieve or boil 0.5kg of leaves/seeds in 2litres of water.	Drench 300ml to adult animals, and about 50 -70ml to calves.
Vernonia amygdalina.Del.	*Compositae*	Omululuza	L, B/R	M, D	About 2 kg of mature leaves pounded, add 5L of cold water and sieve, or boil 3kg of roots/bark in 2L of water.	Drench 3 – 5litres to adult cattle or 300ml to young ones
Clerodendrum rotundifolium.Oliv.	*Verbenaceae*	Kisekeseke	L	M, D	Pound 1/2 kg of leaves add 1liter of water, stir and sieve or boil and sieve later.	Drench 800ml to adult cattle about and 300ml to calves.
Senna didymotrya Fresen	*Caesalpinioideae*	Omucuura	L, R	M, D	Pound a handful (0.3kg) of roots/ leaves add 1/2litre, or boil in 1 liter of water to reduce to half liter extract.	Drench 1/2litre to adult animals and 250ml to calves.
Carica papaya L.	*Caparicacea*	Epapali	F, S	P	Chop 2kg young fruits or about 100g of seeds are grinded.	Mix with feed or put in the mouth of the animal.
Moringa oleifera Lam	*Moringaceae*	Moringa	L, S		Leaves mixed with fodder.	Administer as feeds.
Digitaria abyssinica	*Gramineae*	Olumbugu	L		Animals are made to graze on the grass or the grass is cut and given to the animals	Administer as feeds
Phytolacca dodecandra. L.Herit	*Phytolacaceae*	Oluwoko	L	M, D	About 0.5kg of leaves are crushed and mixed with 1litre of water then sieve, or 0.5 kg of mature leaves boiled in 3L of water to remain with 1.5L.	Drench 1.5L to adult cattle, 750ml to calves.
Fuerstia africana Th.C.E.Fries	*Lamiaceae*	Segamwenge	L, S, R	M, D	Pound about 3 handfuls of leaves (900g) and mix in 1 liter of water, or boil the leaves plus roots.	Drench 300ml to calves and 1litre to adult animals.
Memordica foetida Schumach		Ebombo	L	M	Pound 1/2 kg of fresh leaves add 3L water and filter.	Drench 1.5L to adult cattle and 300ml to calves.
Citrullus colocynthis	*Cucurbitaceae*	Akatanga	L	M	Grind about 1kg of leaves and mix with 2L of water.	Drench about 0.5L to calves and 1L to the adult ones.
Nicotiana tobaccum. L.		Taaba	L	M	Pound a leaf to make a paste.	Squeeze 4-5drops into the eye.
Physalis peruviana L		Entuntunu	L	M	Pound 2 handful (300g) add 1.5 L of water.	Drench 1 L to adult animals and 1/2 L to young animals.
Solanum incanum. L.	*Solanaceae*	Ntengotengo	R	M	About 1/2 kg of roots are chopped, add 2L of water and boil to reduce to about half of the extract.	Drench 300ml to calves and 600 - 750 ml to adult animals.
Aspilia africana. (P.Beauv.) C.D Adams	*Asteraceae*	Makayi	WP	M	Pound about 1/2 kg add 1L of water and sieve	Drench 0.5L to adult animals and 300ml to calves

PPU - Plant part used, **MOP –** method of preparation, **WP** - whole plant, **R** – roots, **L** – leaves, **S –** Stem, **F –** flowers/fruits, **P –** powdered extract, **M** – maceration, **D –** decoction.

The majority of medicinal plants recorded were herbs (33%), followed by shrubs (25%), trees (25%) and climbers (17%) were less used as medicinal plants for managing helminths. This was in agreement with the observations made earlier about the growth forms mostly used in the management of livestock diseases such as (Ssegawa and Kasenene, 2007) in the Sango bay area, Southern Uganda, and other countries like in Ethiopia (Teklay et al., 2013) herbaceous plants having a high dominancy. Pastoral farmers are fond of interacting with herbs and shrubs, hence discoveries regarding their medicinal applications were much more, compared to other existing life forms. Meaning the local communities' knowledge seems to be generally influenced by the nature of flora in their surrounding environment. The over-dependence on herbs as a major supply of medicinal plants poses risks of unsustainability because they cannot survive during the dry seasons. Hence to ensure sustainability for future use, proper strategies for conservation should be put in

place.

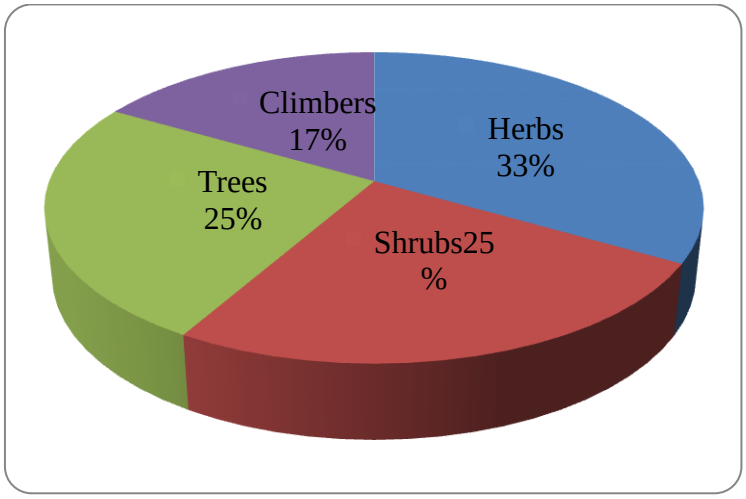

Figure 3: Growth habits of medicinal plants used as anthelmintic**.**

Plants were majorly harvested from the wild since these are rural areas surrounded by bushes and used when fresh. Plants collected from bushlands accounted for (34.9%), followed by rangelands (30.2%) cultivated lands (16.3%), and swamp (13.95%). Plants harvested from the wild are known to be more potent plus high efficacy (Luseba and Van Der Merwe, 2006). (Luseba and Van Der Merwe, 2006), showed that dried medicinal plants harvested from the wild had better antibacterial activities than fresh and cultivated grown plant materials.

The routes of administration of anthelmintic medicinal plants after preparation as practiced by the community included oral 92% and topical/ocular 8% as incase of Thelazia infestation. Nalule *et al.*, (*2011*), Nabukenya *et al.*, (*2014*) and (Kuma *et al.*, 2015), reported the same methods in this report. The most used route is the oral because it requires fewer skills in that uneducated farmers can do it easily, also because most of the worms are found in the digestive system. It was noted that utensils like cups, saucepans, jars, bottles, basins are used for oral doses since they are available in homes and easy to get. Since most of these utensils are not calibrated, lack of dose and dosage standardization was noted in the study area and its in agreement with other studies by (Katunguka-Rwakishaya *et al.*, 2004), (Kuma *et al.*, 2015).

Leaves were found to be frequently used plant parts accounting for 46%, as shown in table 2. The results are in line with the previous studies in other parts of the country which indicated that leaves are preferably used for the treatment of various health problems (Tabuti *et al.*, 2012) and (Offiah *et al.*, 2011). This is contrary to other studies, (Tolossa *et al.*, 2013); (Lulekal *et al.*, 2008); (Gradé et al., 2009) reported that roots taking the highest proportion in the preparation of medicinal plants. (Mussarat *et al.*, 2014), the reason for the frequent use of leaves and seeds in livestock ailments treatment could be a result of the highest bioactivity due to the availability of different secondary metabolites they contain. On the other hand-harvesting roots, will affect the survival of the useful medicinal plants. However, the use of leaves for the preparation of most plant remedies possibly will reduce the possibility of the loss of medicinal plants from the source since most plants have the ability for re-growth.

Table 2: Summary of plant parts used by farmers in the management of helminths

Parts of the plants	**Number**	**%age number of plants**
Leaves	11	46
Roots	1	4
Seeds	2	8
Whole plant	1	4
Leaves/roots/seeds	6	29
Flowers/fruits	2	8
Total	**24**	**100**

The methods of preparation were maceration (59%), decoctions (22%), and powdered extracts (19%), and maceration were the frequently used methods. Iwu, (1993), reported that the methods of preparation are dictated by the nature of the illness and the plant part used. Maceration compared to other methods of preparation of remedies is easier and faster. But this is contrary to findings by, Ssegawa and Kasenene, (2007), who ranked decoction as the most used method in preparing medicinal plant remedies. However decoction

is known for the complete extraction of therapeutic active compounds (Mussarat *et al.*, 2014).

Of the 75 respondents, the majority of the respondents were males (53%) and the least number were females with 47%, this is in agreement with other research made in the different parts of the country (Bizimenyera *et al., 2000,*) and other countries like Kenya (Nanyingi *et al., 2008).* However not in line with the study by Nabukenya *et al.*, (*2014*), where they showed that more females participated in the research more than men. In this research males had more ethnopharmacological information because they fond of taking care of livestock and it's their role in community settings in Uganda.

Forty-six percent (46%) participants were older than 50 years; thirty-nine percent (39%) were between 36 – 50 years; while fifteen percent (15%) participants were between 19 – 35 years of age. Though traditional medicine is still treasured by the majority (46%) of the aged (>50 years old), very few of the young generations, know and use traditional treatments. This is probably due to being influenced by western technology and/or the aged people may have informed them less about the use of traditional medicine as they consider it confidential. This may be particularly true, as it is a source of income for some people. Most youths know little about traditional knowledge of livestock disease management and most of them call it outdated. Forty percent (40 %) of the respondents had acquired the knowledge from their grandparents, while 25% had acquired it from their parents, friends 19% and from School/workshop was 16 percent. Masimba *et al.*, (2011), pointed out that ethnoveterinary knowledge was specifically in the custody of older men and women who passed it orally to younger generations by word of mouth which was also observed here in this study.

The literature reviewed indicated that almost medicinal plants reported in this study for the treatment of other ailments have been reported previously as having a medicinal value in other places. Twenty-five (25) other medicinal plants for treating other diseases were documented as shown in Table 3. Katunguka-Rwakishaya *et al.*, (2004), documented *Phytolacca dodecandra*, *Leonotis nepetifolia*, *Cannabis sativa* leaves which are used against East coast fever, still, these plants have been recorded in this study. A lot of medicinal plants used in the treatment of East Coast Fever have been recorded and this may suggest the high importance or prevalence of the disease in the Sub County.

Table 3: ***Showing other common cattle diseases and corresponding medicinal plants used in treatment.***

Scientific name	Family name	PPU	Habitat	Growth habit	Preparation	Condition treated	ROA
Vernonia amygdalina Del.		L, R	Bushland	Tree	Maceration/ Decoction	Foot and Mouth Disease (FMD), Fever, Diarrhea	Oral
Vernonia grantii Oliv	Compositae	L, R	Rangeland	Shrub	Maceration	East Coast fever (ECF)	oral
Phytolacca dodecandra. L.Herit	*Phytolacaceae*	L, R	Rangeland	shrub	Maceration/cold extract mixed with fresh cow dung.	Retained placenta, constipation, ECF	oral
Carica papaya L	*Caparicacea*	F, S	Cultivated land	Tree	Maceration/cold extract	Retained placenta	oral
Priva adhaerens (Forssk.) Chiov.	*Verbanaceae*	WP	Cultivated land	Herb	Cold extract + Clay	Diarrhea, Worms	Oral
Sapium ellipticum (Hochst)		L	Bushland	Tree	Given as fodder	Agalactia	Oral
Euphorbia heterophylla Linn.	*Eurphorbiaceae*	WP	Cultivated land	Herb	Mixed with feeds	Anaplasmosis	Oral
Euphorbia tirucalli		L	Bushland	Shrub	Maceration	ECF	Topical
Cannabis sativa.L.	*Cannabiaceae*	L, S	Swamp	Herb	Maceration/ decoction	FMD, fever, cough	Oral
Leonitis nepetifolia (L.)R.Br.		L	Bushland	Herb	Maceration	Ectoparasite	Topical
Fuerstia africana Th.C.E.Fries	*Lamiaceae*	L	Rangeland	Herb	Decoction mixed	Fever, ECF, trypanosomiasis	oral
Ocimum suave. Willd	*Abiatae*	L	Cultivated land	Shrub	Maceration	Wounds	Topical
Tetradenia riparia	*Solanaceae*	L	Cultivated land	Shrub	Maceration /decoction	ECF	Oral
Solanum incanum. L.	*Malvaceae*	L	Bushland	Herb	Decoction mixed with phytolacca	ECF	Oral
Sida cuneifolia Roxb.		L	Rangeland	Herb	Maceration	Fractured bones	Topical
Asparagus flagellaris (Kunth) Bak.	*Asparagaceae*	L	Forest	shrub	Decoction	3day sickness, Snake poison	Oral
Aloe sp	*Asphodelaceae*	L	Cultivated land	Shrub	Maceration	Fever, ECF	Oral
Artocarpus heterophyllus	*Moraceae*	F	Cultivated land/bush land	Tree	Chop and give the animal.	Agalactia	Oral

Erythrina abyssinica. Lam ex D.C	*Fabaceae*	FL	Rangeland	Tree	Maceration	Conjunctivitis	Topical
Azadirachta indica	*Meliaceae*	L	Cultivated land	Tree	Maceration	fever	Oral
Coffea	*Rubiaceae*	L	Cultivated land	Tree	Maceration	Diarrhea	Oral
Cucurbita sphaerica. (Sond.) Naudin.	*Cucurbitaceae*	L	Bushland	Climber	Decoction	Agalactia	Oral
Ipomea batatas	*Convolvulaceae*	R	Cultivated land	Herb	Burn it into ashes	FMD	Topical
Zingiber officinale	*Zingiberaceae*	R	Cultivated land	Herb	Maceration	FMD	Oral
Tephrosia vogelii Hook.f.	*Fabaceae*	L	Bushland	Tree	Maceration	Mange/Ecto parasites	Topical

L – Leaves, **FL** – Flower, **F** - Fruit, **WP** – whole plant, **S**- seeds, **R –** root, **ROA –** Route of administration

CONCLUSIONS

In Kyanamukaaka Sub County, farmers used a variety of 24 plants to treat helminths belonging to 13 families and 25 other medicinal plants to treat other common cattle diseases like East coast fever, retained placenta, conjunctivitis, and Ephemeral fever among others. The main routes of administration of medicinal plants were found to be oral drench, herbs were mostly used. Maceration appeared to be the most popular preparation form in the current study. Leaves were the most plant parts used. There was no standard dosage used. Many plants were harvested from the wild(bush). This study contributes to the indigenous knowledge on ethnomedicinal plants used in the management of cattle diseases, However, there is a need for conservation like the establishment of botanical gardens to avoid extinction of some beneficial plants, determination of the chemical composition of these plants which can help in the development of commercial drugs.

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