International Journal of Advanced Scientific Research
ISSN: 2456-0421; Impact Factor: RJIF 5.32
Received: 27-09-2020; Accepted: 13-10-2020; Published: 28-10-2020
www.allscientificjournal.com
Volume 5; Issue 6; 2020; Page No. 01-06

Survey and efficacy of some local plants used against parasitic infections of cattle in Hong LGA, Adamawa State, Nigeria

Bashir RA[1], Umar MR[2]
[1] Department of Plant Biology, Faculty of Life Sciences, Bayero University, Kano PMB, Kano, Nigeria
[2] Department of Forestry and Wildlife Management, School of Agriculture and Agricultural Technology, Modibbo Adama University of Technology, Yola, Nigeria

Abstract
This research was carried out to Survey and Study the Efficacy of some Local Plants used for the treatment and management of parasitic infections of cattle in Hong Local Government Area of Adamawa State. Ethnobotanical information collected from the rural dwellers are documented, thiswas a useful instrument in giving insight on the efficacy of the local plants against parasitic infection on cattle. The survey shows that plants such as A. digitata, V. amygdalina, A. indica, A. nilotica, C. procera, T. indica, P. biglobosa have multiple medicinal uses, also C. aurantiifolio, N. tabacum, K. senegalensis, B. aegyptiaca, H. sabdariffia, A. senegalensis, B. dalziellii were being used to cure two aliment disease, while S. hermontheca, P. guajava, C. papaya, Z. officinale, P. thonningii are use for curing one aliment disease in the study area. Out of the 29 plants species identified during the survey, the family Mimosaceae, Fabaceace, Malvaceace, Alliaceace, Zingibecaceace and Solanaceace are most mentioned frequently for their effectiveness in the community of the study area. Plants such as V. amygdalina, K. senegalensis and T. indica have been demonstrated to be highly effective in the treatment of helminthosis in cattles in the study area which is relatively rich in medicinal plant knowledge and practice.Vernonia amygdalina 15.0% and Khaya senegalensis 18.9% and Calotropi sprocera 9.4% are commonly used local plant in the study sites.Therefore,proper conservation of medicinal plants, documentation as well as promotion of indigenous knowledge by encouraging research activities is highly required in the study area.

Keywords: Efficacy, Parasitism, Helminthosis, Ethnobotanical, Rural dwellers

Introduction
Parasite is an organism that lives on or in host organism and gets its food from or at the expense of its host which have negative impact on health and welfare of animals. Some parasite causes blood loss which is substantial can lead to anaemia and death. Others causes diarrhea which if severe can lead to death of animal and human being (Andrews, 1987) [8]. Parasite affects humans and animal in many forms, including helminths (worms), arthropods (lice, tick, mosquitoes etc) and protozoa (Andrews, 1987) [8]. There are over 1000 species of parasite affecting domesticated animals throughout the world. They can be broadly classified as external or internal depending on where they live on their host (Nighbert, 1927) [23]. External parasite often annoy their host by bitting, embedding or otherwise irritating the skin which can cause serious disease such as mange and scabis that affect health and growth of animals. Internal parasite lives in the blood or tissue inside an animal's body during swallowing of contaminated food or water. Others burrow through the skin, reach the blood stream and settle in preferred location to mature and reproduce. Internal parasite often interferes with digestion and assimilation of food, causing poor growth, temporary or permanent injuries or death. Both external and internal parasite may weaken animal immune system and create conditions favorable to bacterial disease (Nighbert, 1927) [23].

Throughout Southeast Asia, infections caused by gastrointestinal parasites are prevalent in cattle because of the suitable climate for the transmission of infection (Holland, 2000; Tum, 2004; Geurden, 2008) [17, 29, 15] Parasitic nematodes are one of the most important causative agents that bring about considerable losses in most cattle-producing countries of the world. In raising livestock for food production, studies that help in quantifying the economic losses caused by parasitism are important, especially in smallholder farming systems in developing countries (McDermott, 1999) [22]. Parasites may cause clinical and nonclinical diseases leading to economic losses; the goal of veterinarians and producers is to prevent parasitism through management, nutrition, epidemiology, and effective treatment (Kaewthamasorn and Wongsamee, 2006) [21]. Parasitism is well known as a limiting factor responsible for losses in health and productivity. These parasites cause disease leading to enormous economic losses through morbidity and mortality in livestock. These losses include mortality, weight loss, low milk output and reproductive failures. This is highly evident in resource poor livestock farmers in tropical Africa and Southeastern Asia (Alawa, 2002; Alawa, 2010; Bizimenyera, 2008) [4, 5, 9]. Antiparasitic drugs are agents used to expel parasites from the body of animals and man. Resistance of most parasites to these synthetic drugs has become a major threat to livestock production (Danqueh, 2012; Devi, 2010) [11]. It is estimated that 80% of the population of Africa depends on plants that have medicinal attributes for their health requirements (Yedjou, 2008) [30]. The Fulani people, however, consider their cattle as more than simply financial assets but it also serve as index of social prestige (Ikhatua,

2000) [20]. The nomadic Fulanis rely on natural remedies (indigenous methods) that exist within their natural world order for both prophylaxes and cures of their cattle ailments (Ibrahim *et al*., 2015) [19]. These remedies are developed within their community through observation and real life experiences over a period of time, communicated orally from one generation to the other with the ultimate aim of moulding their thought for the sole purpose of ensuring survival and progress (Ibrahim *et al*., 2015) [19]. Adamawa State and indeed national animal protein supply were sustained through this considerable wealth of knowledge that the local people developed (Usman, 2010) [28]. The state is endowed with vast and readily available indigenous materials that have been used by cattle herdsmen. Therefore, ignoring these local knowledge systems by the development workers will constrain the cattle industry and result into waste of huge amount of time and resources. Most livestock diseases present diarrhoea as a symptom with adverse effects reported to include anorexia, weight loss, general malaise and death (Gattuso and Kamm, 1994) [14]. Current management of diarrhoea is achieved using drugs such as antibiotics, atropine sulphate, loperamide, kaolin, anthelminthic, fluid and electrolyte replacement therapy (Sur and Bhattacharya, 2006; Hall, 2011) [27].

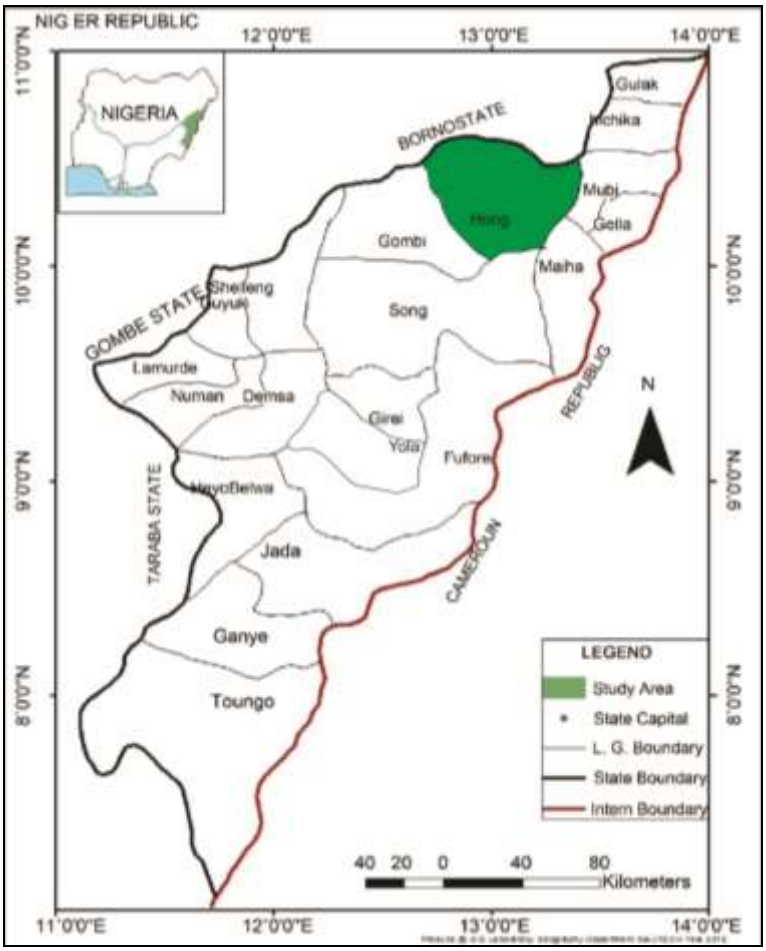
The use of herbal medicines is common among peasant farmers and pastoralist because orthodox medicines have been found to be either not available or too expensive as a result; the Fulanis have resorted to the use of indigenous plants as remedy for animal diseases (Ibrahim, 1984; Abubakar, 2007) [14]. The goal of this research was to survey and study the efficacy of some local plants used against parasitic infections of cattle in Hong L.G.A. of Adamawa state, Nigeria.

Parasitic infection is an important limiting factor that is responsible for deteriorating the health and productivity of livestock. The agro-ecological and geo-climatic conditions of Hong LGA, Adamawa state are highly favorable for the growth and multiplication of parasites. The production performances of these cattle would be low, because of wide spread occurrence of pathogenic parasites. Parasitic infectious diseases are considered important causing enormous economic losses through morbidity and mortality in livestock. Among the parasitic diseases, gastrointestinal nematodes such as *Haemonchus*spp., *Trichostrongylus*spp., *Cooperia*spp., *Oesophagostomum*spp., *Trichuris*spp. and *Strongyloides*spp. are most common (Qadir, 1981; Rahman and Mondal, 1983).

Materials and methods

Study area

Hong LGA is located in Adamawa State, North Eastern Nigeria and lies between latitudes 09º57' and 10º32'N and between longitudes 12º38' and 13º16'E. The relief and landforms of the area is generally hilly withhighlands ranging from about 426 to 1158m above mean sea level (Faniran and Ojo, 1980). The town is dominated by Kilba tribe and has seven districts in the area. The main economic activities are arable farming, rearing of animals and trading. It is about 15 kilometers from Mubi town, Nigeria.



***Source*:** Adebayo and Nwagboso (1999)

Fig 1: Map of Adamawa State showing the Local Government of the Study Area

Ethical approval

The purpose of the study was explained to the respondents (Farmers, Herbalist, Livestock rearers Students, Civil servants and Petty trader) in the Local Government Area and ethical consent was gotten individually from all the respondents by assuring them that their traditional knowledge would be protected and be used for academic purposes only. This was done in order to acknowledge informants' cooperation in preserving the traditional knowledge of the study area and build their confidence for providing reliable information. After explaining the objectives of the research and seeking their consent, the people were individually engaged in semi-structured interviews supplemented with questionnaires.

Sampling Size and Technique

Hong LGA comprises of two political constituencies (Hong and Uba-gaya) further subdivided into six in each of the constituencies and four districts were picked at random by shuffling method. Random sampling technique was adopted in selecting rural dwellers with indigenous knowledge of some local plants used against parasitic infections of cattle within the study area. The cattle were identified within the study area and physical features such as physical fitness and food consumption were observed.

Data Collection

Data were collected through the use of structured questionnaire and oral interview was adopted to obtain relevant information from the rural dwellers using their local language Kilba/Fulfulde. The questionnaire contains information on the plant such as local name of the plant, plant used to treat parasites of cattle, habitat of the plant which could be either wild or cultivated, parts used, mode of preparation and application of the remedies, effect of plant on cattle etc.Sixty (60) people were selected from four communities of the study area comprising of 15 people from each location. Ethno-botanical information on the plants was obtained from 59 respondents out of the totalsample selected. The questionnaire was divided into three sections. Section 1, deals with demographic information of the respondents. Section 2, consist of professional experience on the treatment of diseases and includes question such asplant part(s) frequently used, availability of plants/plant part(s) and knowledge of treatment. In Section 3, plants used in the treatment of common diseases,type of diseases treated, frequency of treatment, herbal preparation, method of preparation, method of administration, accompanied side effects were considered.

Collection and Authentication of Plant Materials: The rural dwellers provided the local names of the plants being used and frequently mentioned plants were selected and collected for authentication. Scientific names were validated from Plant Biology Department of Modibbo Adama University of Technology, Yola (MAUTECH).

Statistical Analysis

Data collected was subjected to simple descriptive statistics such as percentages, tables, charts and graphs where necessary.

Frequency Index

Frequency is expressed as a percentage and sometimes called a frequency index. A frequency (F) of citation of the plants was calculated by using the formula:

$$F = \frac{\text{Number of people who cited the plant}}{\text{Total number of the people interviewed.}} \times 100\%$$

Results and Discussion

Plants have been a major source of medicine for human kind. The demand for traditional herbs is increasing very rapidly, mainly because of the harmful effects of synthetic chemical drugs. The global clamor for more herbal ingredients creates possibilities for the local cultivation of medicinal and aromatic crops as well as for the regulated and sustainable harvest of wild plants (Shosan *et al*., 2014). Such endeavors could help raise rural employment in the developing countries, boost commerce around the world and perhaps contribute to the health of millions (Anita, 2004). Hong LGA has two political constituency (Hong and Uba-gaya) further subdivided into six (6) in each of the constituencies. Two district were selected at random from each ward making a total of four (4) district for the purpose of the study (Banshika, Garaha, Gaya and Hong district) respectively. Overall, twenty nine (29) local plants were reported to be used as medicines in four of the surveyed areas of Hong LGA to treat parasitic infections of cattle. Respondents gave local names of plants used in the treatment of some parasitic diseases. This was in consonance with (Singh, 2008) who reported that plants are generally known by their local names in every part of the world. The local names play a vital role in ethnobotanical study of a specific tribe or region.

Table 1: Demographic table showing frequency of respondents in terms of sex, age, occupation, educational qualification, and parasitic infections in the four villages under study.

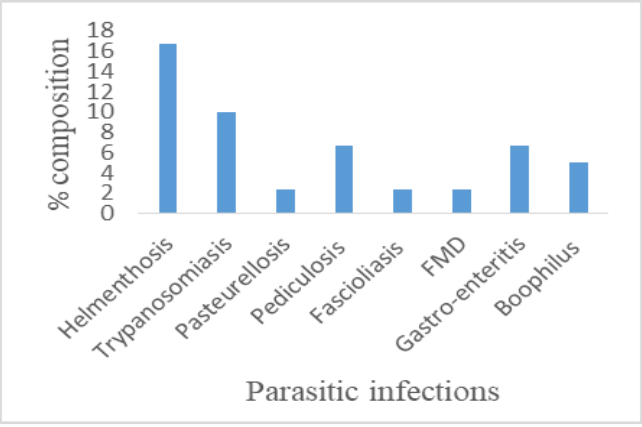
Variables	Frequency	Percentage (%)
Sex		
Female	25	41.7
Male	35	58.3
Age (years)		
15-20	3	5.0
20-30	24	40.0
31-40	10	16.7
41-50	6	10.0
50 above	17	28.3
Occupation		
Farmer	31	51.7
Livestock Rearing	19	31.7
Civil servants	8	13.3
Herbalist	2	3.3
Education		
Secondary	25	41.7
Post-secondary	21	35.0
None	11	18.3
Basic	3	5.0
Parasitic infections		
Helmenthosis	10	16.7
Trypanosomiasis	6	10.0
Pasteurellosis	2	2.3
Pediculosis	4	6.7
Fascioliasis	2	2.3
FMD	2	2.3
Gastro-enteritis	4	6.7
Boophilus	3	5.0

***Source*:** Field Survey, 2019

Table 2: Plants identified and used against parasitic infection of cattle in Hong LGA, Adamawa state.

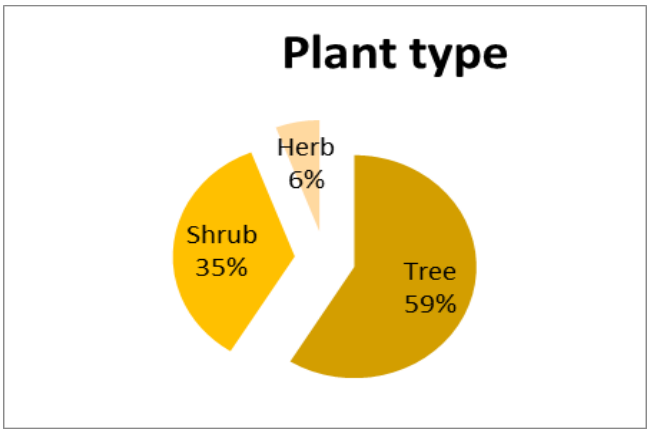
S/n	Scientific names	Family names	Common names	Local names	Parts used	Plant type	Place of collection	Parasitic infection
1	*Vernonia amygdalina*	Asteraceae	Bitter leaf	Shuwaka	Leaf	Shrub	Cultivated	Helminthosis
2	*Carica papaya*	Caricaceae	Pawpaw	Gwanda	Leaf	Shrub	Cultivated	Gastro enteritis
3	*Citrus aurantiifolia*	Rutaceae	Lemon	Lemuntsami	Leaf	Shrub	Wild, cultivated	Boophilus
4	*Adansoniadigitata*	Malvaceae	Baobab	Kuka	Leaf, fruit	Tree	Wild	Trypanosomiasis
5	*Azadirachtaindica*	Meliaceae	Neem	Dogonyaro	Leaf	Tree	Wild, cultivated	Helminthosis
6	*Vitellariaparadoxa*	Sapotaceae	Shea butter	Kadanya	Bark	Tree	Wild	Gastro enteritis
7	*Allium sativum*	Alliaceae	Garlic	Tafarnuwa	Leaf, bulbs	Herb	Wild	Pasteurellosis
8	*Tamarindusindica*	Fabaceae	Tamarind	Tsamiya	Leaf, root	Tree	Wild	Gastro Enteritis
9	*Curcuma longa*	Zingiberaceae	Turmeric	Curcum	Root	Herb	Cultivated	Helminthosis
10	*Zingiberofficinale*	Zingiberaceae	Ginger	Citta	Root	Herb	Cultivated	Helminthosis
11	*Triticumaestivum*	Poaceae	Wheat	Alkama	Chaff	Cereal	Cultivated	Helminthosis
12	*Capsicum annuum*	Solanaceae	Bell pepper	Attarugu	Fruit	Spice	Cultivated	Helminthosis
13	*Nicotianatabacum*	Solanaceae	Tobacco plant	Taba	Leaf	Shrub	Wild	Boophilus, Trypanosomiasis.
14	*Acacia nilotica*	Mimosaceae	Gum arabic	Bagaruwa	Bark, fruits, seeds	Tree	Wild	Foot and mouth infections FMD.
15	*Khayasenegalensis*	Melastomataceae	Mahogany	Madaci	Barks, seed oil	Tree	Wild	Helminthosis, trypanosomiasis
16	*Allium cepa*	Alliaceae	Onion	Albasa	Bulbs	Herb	Wild, Cultivated	Pasteurellosis
17	*Balanitesaegyptiaca*	Balanitaceae	Soap berry tree	Aduwaa	Kernel oil	Tree	Wild	Pediculosis, Helminthosis
18	*Calotropisprocera*	Asclepiadaceae	Sodom apple	Tunfafiya	Root bark	Shrub	Wild	Helminthosis, Boophilus
19	*Hibiscus sabdariffa*	Malvaceae	Jamaican Sorrel	Zoborodo	Leaf	Shrub	Cultivated	Pediculosis, Boophilus
20	*Piliostigmathonningii*	Caesalpiniaceae	camels foot	Kalgo	Root	Tree	Wild	Fascioliasis
21	*Prosopisafricana*	Mimosaceae	Iron wood	Kiriya	Stem bark	Tree	Wild	Trypanosomiasis
22	*Annonasenegalensis*	Annonaceae	Sour sop	Gwandar Daji	Roots	Shrub	Wild, Cultivated	Trypanosomiasis, Pediculosis.
23	*Bosweliadalziellii*	Burseraceae	Frankinsence	Ararrabi	Stem bark	Tree	Wild	Pediculosis, Trypanosomiasis
24	*Dichrostachysglomerata*	Mimosaceae	Cow thorn	Dundu	Root	Tree	Wild	Fascioliasis
25	*Strigahermontheca*	Scrophulareaceae	Witch weed	Makasa, wuta-wuta	Whole plant	Weed	Wild	Helminthosis
26	*Vignaunguiculata*	Fabaceae	Beans	Wake	Whole plant	runner	Cultivated	Foot and mouth infection FMD
27	*Moringaoleifera*	Moringaceae	Drumstick	Zogale	Whole plant	Tree	Cultivated	Gastritis
28	*Parkiabiglobosa*	Mimosaceae	African locust bean	Dorawa	Bark	Tree	Wild	Helminthosis
29	*Psidiumguajava*	Myrtaceae	Guava	Gwaiva	Leaf	Tree	Cultivated	Trypanosomiasis

***Source*:** Field Survey, 2019



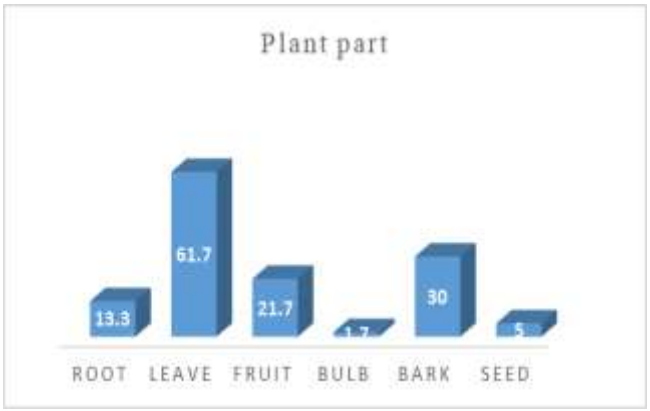
***Source*:** Field survey, 2019

Fig 2: Percentage distribution of parasitic infection in Hong LGA, Adamawa State, Nigeria, 2019



***Source*:** Field survey, 2019

Fig 3: Percentage distribution of plant type within Hong LGA, Adamawa State, Nigeria, 2019.



***Source*:** Field survey, 2019

Fig 4: Percentage distribution of plant parts used against cattle infections, Hong LGA, Adamawa State, Nigeria, 2019.

Table 3: Plants frequency index and number of times mentioned by the respondents.

Scientific names.	Local name	Frequency	Percentage (%)
K. senegalensis	Madachi	10	18.9
V. amygdalina	Shuwaka	9	15.0
C. procera	Tunfafiya	5	9.4
A. leiocarpus	Marke	3	5.7
A. digitata	Kuka	3	5.7
B. aegyptiaca	Aduwa	3	5.7
T. indica	Tsamiya	3	5.7
C. aurantiifolia	Lemon tsami	2	3.8
A. senegalensis	GwandarDaji	2	3.8
M. indica	Mangoro	2	3.8
A. albida	Gawo	1	1.9
Z. mucronata	Magaryarkura	1	1.9
A. cepa	Albasa	1	1.9
M. oleifera	Zogale	1	1.9
B. dalziellii	Ararrabi	1	1.9
G. superba	Baureh	1	1.9
U. chamae	Kaifi	1	1.9
V. unguiculata	Wake	1	1.9
X. americana	Tsada	1	1.9
P. thonningii	Kargo	1	1.9
N. tabacum	Taba	1	1.9
J. carcus	Madobiya	1	1.9
		54	100%

***Source*:** Field Survey, 2019.

Although local names are not recommended directly for scientific accounts as they lack uniformity and consistency, yet they may certainly be considered as a useful tool for search of new useful plants or new uses of known plants (Erinoso and Aworinde, 2012). Demography showing the frequency of respondents in terms of age, sex, occupation, educational qualification and parasitic infections were show in Table 1, whereby 58.3% of the respondents were male while 41.7 were females in terms of sex. Youth 20-30years of age responds the highest representing 40% while 15-20years 5% responds the least from the questionnaire. From the results obtained farmers 51.7% responds higher while the least respondents were herbalist 3.3%. Educational qualification 5% represent Basic which is the least while 41.7% Secondary, this is the show that most of the respondents have Secondary Educational Knowledge. Infections of parasite Helmenthosis 16.7% while Pasteurellosis, Fascioliasis and FMD having 2.3% the least it occurs. Local names render a useful service as a means of reference by local people in a particular area. The scientific names, plants families, common names, vernacular names, parts used, place of collection and parasitic infection used against, are presented in Table 2. The percentage composition also shows in Table 3 reveals that the most commonly used local plants were *Vernonia amygdalina* 15.0% and *Khaya senegalensis* 18.9% and *Calotropis procera 9.4%*in Hong LGA.

The percentage of plant type within the study area where represented in Figure 3, in which 59% of the commonly use plant type are the tree, shrub occupied 35% and Herbs 6% from the results on the site where the study was conducted. Figure 4 of the results reveal that leave 16.7% is the plant part used against cattle infection while the least is 1.7% which is the Bulb used.

The rural dwellers exhibited good knowledge of the pathology of various animal diseases and the corresponding plants used in the treatment. Most of them were able to clearly describe the type of diarrhoea passed by their animals which they called “saaroo or dauda”. Others could identify and name disease conditions responsible for diarrhoea such as: helminthosis (goli), white scour in calves (shanin-koje or gortoyel), fascioliasis (hanta) and rinderpest (bushiya). Their understanding of animal diseases is partly due to experiences gathered during grazing and interaction with butchers when they take sick animals for slaughter (Ibrahim, 1984). Many of the rural people manage and treat their animals without any inputs that cost money, especially if the parasite is common and can be diagnosed easily. This is common with tick infestation, helminthosis, biting flies (Tabanus) among others. With regard to manual ticks’ removal: all the respondents practiced this method in controlling the menace of ticks before leaving the enclosure in the morning, rural people (both adults and children) remove ticks from the cattle and throw it into fire that is burning near them. Different herbs are burnt by the rural people to generate smoke so as to drive away flies in the evening. The respondents use various herbs to control parasites. It involved cutting of leaves, stem or bark, roots, seeds of herbs and boiling them for the animals to drink. In corroborating this finding of Farrah (2009) [13] asserted that pastoralists in India practiced manual tick removal in controlling ticks on their herds. It was sometime dried, grounded and added to fed or dried grounded soaked in drinking water or mixed with oil to rub on skin. Another survey of ethno veterinary practices of agro pastoralist in eleven selected states of Nigeria also reported that *K. senegalensis* and *A. digitata* as the most common plants used as remedies for various livestock diseases (Abdu *et al.*, 2000).

Conclusion

Hong Local Government is relatively rich in medicinal plant knowledge and practice. Therefore, conservation of medicinal plants, documentation and promotion of indigenous knowledge by encouraging research activities is required in the study area. This traditional knowledge faces the risk of disappearing due to increasing livelihood changes and environment degradation, hence the urgent need for both community and concerned authorities to put in place appropriate guidelines in curbing this looming danger.

Acknowledgement
Thanks to the survey team comprising of Parastologist, DVMs (doctors in Vetnary medicine) from ministry of Agriculture, Department of livestock production. Botanist from Department of Plant science, Modibbo Adama University of Technology, Yola for authenticating the plant material. The support and kind cooperation given by the people of Hong is gratefully acknowledged.

References

1. Abdu PA, Jagun AG, Gefu JO, Mohammed AK, Alawa CB, Omokanye AK. A survey of ethnoveterinary practices of agro-pastoralist in Nigeria. In Gefu JO, Abdu PA, Alawa CB (eds) Ethnoveterinary Practices, Research and Development. Proceedings of the International Workshop on ethnoveterinary practices held in Kaduna, Nigeria, 2000, 25-37.
2. Abubakar MS, Musa AM, Ahmed A, Hussaini IM. The perception and practice of traditional medicine in the treatment of cancers and inflammations by the Hausa and Fulani tribes of Northern Nigeria, 2007, 625-629.
3. Adebayo AA, Nwagboso NK. Climate and Agriculturral Planning in Adamawa State, In Adebayo, A.A and Tukur A. L (1999) (Eds).Adamawa State in Maps Paracelete Publishers, Nigeria, 1999, 10-21.
4. Alawa CBI, Gefu JO, Abdu PA, Chiezey NP, Adeyinka IA, Mohammed AK. Incidence of parasites in cattle sold around Zaria, 2002, 195-198.
5. Alawa CBI, Adamu AM, Gefu JO, Ajanusi OJ, Abdu PA, Chiezey NP. Efficacy of Vernoniaamygdalina (compositae) against natural helminth infection in Bunaji (Bosindicus) calves, 2010, 215-218. http://www.pvj.com.pk/pdf-files/30_4/215-218.pdf.
6. Alawa JP, Jokthan GE, Akut K. Ethno veterinary medical practice for ruminants in the subhumid zone of northern Nigeria, 2002, 79-90.
7. Anita M. Medicinal and Aromatic Plants: Monitoring the Effectiveness of Biological Conservation, 2004, http://www.confound.org/global/global.html
8. Andrews JS. Animal Parasitilogy in the United State Department of Agriculture, edited by Vivian D. Wiser, Larry Mark, H. Graham purchase and Associaties of the National Agricultural Libaray, 1987, 113-65.
9. Bizimenyera ES, Meyer S, Naidoo V, Eloff JN, Swan GE. Efficacy of Peltophorum africanum Sond. (Fabaceae) extracts on Haemonchuscontortus and Trichostrongylus colubriformis in sheep, 2008, 364-371.
10. Danquah CA, Koffuor GA, Annan K, Ketor EC. The Anthelmintic Activity of Vernonia Amygdalina (Asteraceae) and Alstonia Boonei De Wild (Apocynaceae), 2012, Pp. 21-27 http://www.ajol.info/index.php/jmbs/article/view/77106.
11. Devi K, Indumathy S, Rathinambal V, Uma S, Kavimani S, Balu V. Anthelmintic Activity of AstaChurna. Int., 2010, 101-103. http://www.ijhr.org/vol2_no1/ijhr_2009_2_1_12.php.
12. Faniran A, Ojo O. Man's Physical Environment. Heinemann, Ibadan, 1980, Pp. 43.
13. Farrah D. Documentation of Ethno-veterinary Practices in Urban and Peri- urban Areas of Faisalabad (Pakistan) PhD Thesis, University of Agriculture, Faisalabad, Pakistan, 2009.
14. Gattuso JM, Kamm MA. Adverse effects of drugs used in the management of constipation and diarrhea, 1994, 47-65.
15. Geurden T, Somers R, Thanh NTG, Vien LV, Nga VT, Giang HH, et al. Parasitic infections in dairy cattle around Hanoi, northern Vietnam, 2008, 384-8.
16. Hall EJ. Antibiotic-responsive-diarrhoea in small animals. Journal of Veterinary Clinic North. Am. Small Anim. Pract. 2011; 41(2):273-286.
17. Holland WG, Luong TT, Nguyen LA, Do TT, Vercruysse J. The epidemiology of nematode and fluke infections in cattle in the Red River delta in Vietnam. 2000; 93:141-7.
18. Ibrahim MA. Veterinary traditional practices in Nigeria. Proceedings of the second ILCA/NAPRI symposium, held in Kaduna State, Nigeria, 1984.
19. Ibrahim SU, Aliyu UM, Ibrahim DM. Indigenous Foot and Mouth Disease Control Methods among Nomadic Cattle Fulanis in Adamawa State, Nigeria. Alexandrian Journal of Veterinary Science. 2015; 45:71-78, ISSN 1110-2047, www.alexjvs.com, DOI: 10.5455/ajvs.177966
20. Ikhatua UJ. The Nigerian Livestock Industry- A Sleeping Giant? 56th University of Benin, Nigeria Inaugural Lectures Series, 2000.
21. Kaewthamasorn M, Wongsamee S. A preliminary survey of gastrointestinal and haemoparasites of beef cattle in the tropical livestock farming system in Nan province, northern 1 Thailand, 2006, 306-8.
22. McDermott JJ, Randolph TF, Staal SJ. The economics of optimal health and productivity in small holder livestock systems in developing countries, 1999, 399-424.
23. Nighbert EM. Swine Sanitation in Colquit Country, George. U.S. National Animal Parasite Collection Records. Box 135, folder 7. Special Collections National Agricultural Library, 1927.
24. Shosan LO, Fawibe OO, Ajiboye AA, Abeegunrin TA, Agboola DA. Ethnobotanical Survey of Medicinal Plants Used in Curing Some Diseases in Infants in Abeokuta South Local Government Area of Ogun State, Nigeria. American Journal of Plant Sciences. 2014; 5:3258-3268, http://dx.doi.org/10.4236/ajps.2014.521340. Published Online October 2014 in Sci. Res.http://www.scirp.org/journal/ajps
25. Singh H. Importance of Local Names of Some Useful Plants in Ethnobotanical Study. Indian Journal of Traditional Knowledge. 2008; **7**:365-370.
26. Suffness M, Douros J. Current status of the NCI plant and animal product program, 1982, Pp. 1-14.
27. Sur D, Bhattacharya SK. Acute diarrhoeal diseases – an approach to management, 2006, Pp. 220-223.
28. Usman AH. Traditional Methods Used to Treat Ruminant Animals Diseases in Nigeria, 2010, 22-23.
29. Tum S, Puotinen ML, Copeman DB. A geographic information systems model for mapping risk of fasciolosisin cattle and buffaloes in Cambodia, 004, 141-9.
30. Yedjou CG, Rogers C, Brown E, Tchounwou PB. Differential effect of ascorbic acid and N-acetyl 1-cysteine on arsenic trioxide mediated oxidative stress in human leukemia (HL-60) cells, 2008, 85-92.