

Parasitic prevalence and indigenous medicinal plants used in traditionally managed cattle in Odeda local government area, Ogun state, Nigeria

Fasae O.A and Showale, A.G.

*Department of Animal Production and Health, Federal University of Agriculture,
P.M.B 2240, Abeokuta, Nigeria.*

ABSTRACT

An investigation was carried out on the parasitic prevalence and indigenous medicinal plants that are used in the traditionally managed cattle rearing in Odeda local government area, Ogun state, Nigeria. Faecal egg count analysis and microscopic identification were used to assess the gastro intestinal and external parasites, respectively, and a structured questionnaire used to collect data on medicinal plant parts and their usage. The overall prevalence of parasitic infection was high across the study area with *Strongyles* and *Eimeria* identified as main gastrointestinal parasites while ticks, mites and lice were identified as the major ecto-parasites. Ten indigenous plants were identified and evaluated for the treatment of parasites in cattle with the leaves been widely utilized compared to the other plant parts. Some of these plants provide multipurpose remedies, preventing or curing several kinds of ailments and the mode of preparation and application of these plants parts require different methods. Respondents preferred these plants because of easy accessibility (89.5%), while 81.25% and 51.33% of the respondents prefer it because it is economical and traditional in nature respectively. About 77.5% of the respondents claimed its simplicity and effectiveness in healing without visible adverse effects. It was therefore concluded that the study areas are rich source of medicinal plants for disease management in the traditional cattle production system. However, there is need to scientifically ascertain the authenticity of the use of these medicinal plants

Keywords: Cattle management, parasites, indigenous, medicinal plants.

Corresponding address: animalex@yahoo.co.uk

INTRODUCTION

The traditionally managed cattle are an integral part of Nigerian agriculture as they play an important role in the economy as suppliers of milk, meat and draft power. However, parasitic infestations are a major cause of mortality and sub-optimal productivity in grazing cattle in Nigerian pastoral systems (Kudi and Kalla, 2001, Biu and Adindu, 2004) and most of these parasitic diseases are significantly important in the aspect of economic as well as public health. As a consequence, the control methods mainly rely on the use of curative or preventive treatment with anthelmintics which has led to an ever increasing anthelmintic resistance problem.

The search for new and more effective remedies for controlling parasitic diseases of livestock has given rise to the study of plant based remedies. Plants not only grant food and shelter to human beings but have served, through centuries, as a constant source of medication for the treatment of a variety of diseases (Shen *et al.*, 2010). The use of medicinal plants in the treatment of diseases in livestock otherwise called ethno-veterinary medicine is a community-based indigenous knowledge and methods of caring for, healing and managing livestock. It consists of local peoples' knowledge dealing with folk beliefs, skills, methods and practices pertaining to animal health care and production (Misral and Kumar, 2004) which has been part of human culture since ancient times. Using medicinal plants for the prevention and treatment of livestock diseases can be promoted as an alternative or complementary to allopathic drugs and it will help in poverty alleviation by empowering the people to use their own resources. The objectives of the present study were therefore, to investigate into the parasitic prevalence and indigenous medicinal plants used in traditionally managed cattle, thereby facilitating the development and implementation of natural control strategies relevant to cattle production systems.

MATERIALS AND METHODS

The study was carried out in five different locations, namely: Ojojo, Alabata, Odeda, Isolu and Apakila in Odeda local government area of Ogun State, South-West Nigeria, which is located on Latitude 7° 23' N and

Longitude 3^o 411E. It occupies an area of 1,658km² with an estimated population of 864,322 according to the 2006 Nigerian census. The area has a tropical climate with distinct dry and wet seasons characterized by the prevalence of the moist south westerly monsoon winds that results in heavy rainfall spread between March and October (Amori *et al.* 2012). The studied villages were selected because of the dominance of the nomadic cattle rearers in the areas. Cattle rearers were selected at random in each community and their cattle were physically examined for parasitic infestation and level of infestation. Parasites were collected from each cattle by forceful detachment and put into different labeled experimental bottles and transported immediately to the laboratory and identified with the aid of a compound microscope.

About 2 to 4 grams of faecal samples were obtained directly from the rectum of the animal with the use of rubber gloves and kept chilled prior to analysis. The faecal egg count analysis was carried out using McMaster techniques. All the specimens were identified and specific species present were determined.

The data on various common disease incidences among their animals, plants or plant parts used in ethno-veterinary practices as well as the mode of preparation and administration of the plants parts were collected using a well-structured questionnaire. Plants were identified through their local names and samples/ pictures collected for identification and confirmation (Odugbemi and Akinsulire, 2006). Descriptive statistics was used to analyze the data. Simple percentage and tables were used to describe the results.

RESULTS

The present study revealed an overall high prevalence of endo-parasites in the five locations (Figure 1) with the most prevalent being Strongyles and *Eimeria* oocyst. The strongyle has the highest infestation percentage compared to *Eimeria* across locations.

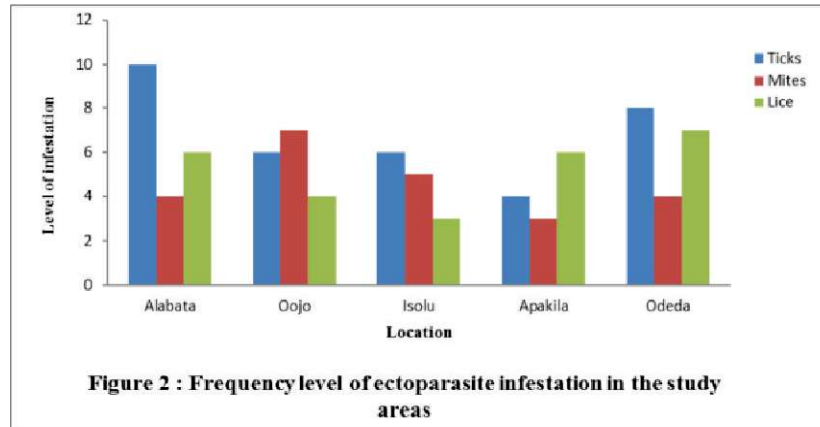


Table 1 presents the list of plant species and other traditional methods used in the treatment and management of parasitic diseases of cattle in the study areas. Ten (10) plants were identified by respondents for the treatment of parasitic diseases in cattle as depicted in Figure 3. It was evident that various plants were extensively used through different herbal preparations administered to the animals. It was also observed that various plant parts namely the leaves, bark, roots, leaves, twigs, seeds and sometimes the fruits were used as remedies for a variety of parasitic conditions in the traditional cattle production system, with the leaves been widely used. However, the mode of preparation and application of these plants parts in the treatment of parasitic infestation in traditionally managed cattle in the study areas require different methods.

Table 1: Medicinal plants used for the treatment of parasitic infestation in traditionally managed cattle in the study area.

Scientific name	Common name	Local Name*	Part used	Diseases cured	Application
<i>ziz exasperate</i>	Sand paper	Opoto	Leaves	Ectoparasites	Mash leaves and apply liquid to the affected part.
<i>adirachtaindica</i>	Neem	Dongoyaro	Bark/leaves	Worms/parasites	Soak leaves or bark in water and give orally or drench the animal.
<i>urtiabioglobosa</i>	Locust bean	Inu	Seeds	Foot pain/Diarrhoea	Use grinded seeds to rub affected part till symptoms disappear.
<i>ondiasmombin</i>	Hog plum	Iyeye	Leaves	Ectoparasites	Dry the seeds and mix with water, then administer orally.
<i>lanumaculestrum</i>	Love apple	Odu	Fruits	Streptothricosis	Roast fruits, slice into halves. Scrub the affected area for 1-3 days.
<i>trus aurantifolia</i>	Lime	Osanwewe	Leaves	Diarrhoea	Give the liquid extract to animal orally until symptoms disappear
<i>wbouldialaevis</i>	Boundary plant	Akoko	Leaves	Anthelmintic/Constipation	Leaves are squeezed and given to animals.
<i>coitanatabacum</i>	Tobacco	Taba	Leaves	Cold/Mange	Mash leaves and rub the affected part.
<i>tiostigmahonningii</i>	Monkey bread	Abefe	Leaves/Twig	Skin diseases	Apply liquid from mashed leaves and twig to the affected parts.
<i>phrosiavogelii</i>	Fish bean	Orobeja	Leaves	Tick	Pound leaves, soak with wood ash in water, stir, filter and add animal urine. Bathe animal with solution.

*Local names are either in Hausa or Yoruba languages

In terms of the reasons associated with the preference for the use of medicinal plants among the cattle rearers, Figure 4 shows that majority of the respondents preferred these plants because of easy accessibility (89.5%), while 81.25% and 51.33% of the respondents prefer it because it is economical and traditional in nature, respectively. However, 77.5% of the respondents claimed its simplicity and effectiveness in healing without visible adverse effects.



Azadiracta indica



Spondia mombin



Parkia biglobosa



Citrus aurantifolia



Solanum aculestrum



Ficus exasperate



Newbouldia laevis



Nicotiana tabacum

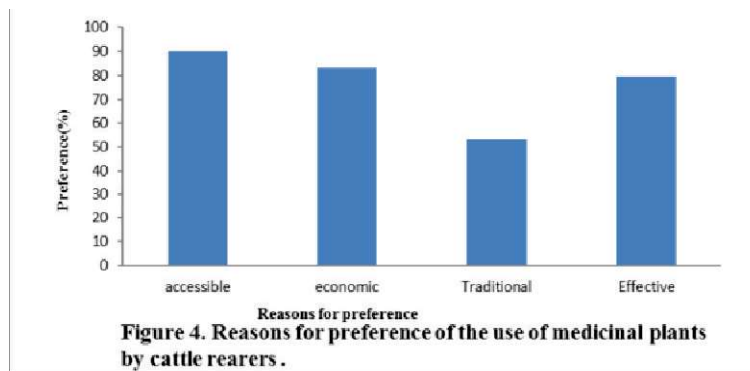


Piliostigma thonningii



Tephrosia vogelii

Figure 3: Pictures of medicinal plants used for the treatment of parasitic infestation in traditionally managed cattle in the study areas.



DISCUSSION

The high infection level of endo parasites as shown in the results of this study could be as a result of high levels of parasitic contamination in the pastoral environment. This corroborates earlier findings in different ruminant species grazing natural pastures in the tropical environment (Mulugeta *et al.*, 2010; Edosomwan and Shoyemi, 2012; Pam *et al.*, 2013). In addition, the period of study being in the early rainy season could have contributed to the relatively high parasitic infections. The high moisture content during the period of study could however, have favoured the growth and development of the young stage of these parasites on pasture resulting to increased contact between the host and parasites. Agyei (1997) observed that, the number of infective larvae on pasture was directly related to the pattern of rainfall and influenced by the number of rain days in the period. Moreover, the observed high prevalence of strongyle in this study

supports earlier reports of Regassa *et al.*, (2006) and Squire *et al.*, (2013) of high prevalence of strongyle in cattle in sub Saharan Africa.

High humidity has been attributed to favour the development of eggs into infective larvae (Hansen and Perry, 1994) and the particular climate of an area has also been found to influence the grazing management of ruminants because egg hatching and larval development both depend on prevailing climatic conditions (Rahmann and Seip, 2007). Moreover, the poor farm management techniques such as poor hygienic conditions, housing, feeding, grazing methods and watering systems could also be contributing towards the high prevalence of parasites within the herd, as disease may be as a result of poor environment and husbandry. Manuel and Galdones (1982) stated that the level of nutrition, kind of management and amount of rainfall influence the severity of parasitism. The severity of endoparasite infection in this study could also have been influenced by the movement of animals from one place to another which is a common feature of the Fulani cattle rearers.

The higher tick prevalence compared to lice and mites, across locations is in consonance with the reports (Leeflang and Ilemobade, 1977; James-Rugu and Iwuala, 2002) that ubiquitous tick species are major parasites infesting a wide range of domestic and wild animals in most parts Africa countries while serving as vector of *Cowdria ruminantium*, the causative agent of heart water disease of ruminants in Nigeria. Skin diseases caused by lice, ticks and mange mites are among the major diseases of cattle causing serious economic loss to the farmer. It has been observed that ectoparasites do not only have direct effects on their host, they may also transmit pathogens, thereby acting as vectors of diseases (Parola *et al.*, 2001). The infestation by ticks is capable of causing bacterial and fungal infestation and other forms of parasitism due to wounds emanating from tick bites in the animal skin, thereby causing a decrease in production and reproduction, and downgrading and rejection of skins (Bekele, 2002; Gumel, *et al.*, 2015).

The high tick infestation observed in this present study compared to other ectoparasites could be attributed to long period of humid climatic condition in the study area. Humidity and prolonged sunlight has been found to favour the survival and reproduction of ticks (Sajid *et al.*, 2008).

Other possible factors that could have warranted the prevalence of high ectoparasite infestation in the study area may include environmental conditions under which the animals are kept (Soulsby, 1978). For example, most of the animals observed in this study are kept in extremely dirty environment with organic wastes and under direct sunlight, which are favourable for the transmission of ectoparasites. Also, the process of movement of cattle from one community to another is a possible risk factor which could facilitate transmission of parasites by direct contact. This scenario could enhance direct, prolonged and sustained bodily contact between the cattle consistently, thereby enhancing ectoparasites spread amongst the animals (Mulugeta *et al.*, 2010).

The preference for the use of plant leaves been widely used in this study confirms reports that indicated preference for the use of plant leaves because it is more convenient to collect leaves than root parts, flowers and fruits (Giday *et al.*, 2009). Plant leaves have also been known to be actively involved in photosynthesis and the production of metabolites (Ghorbani, 2005). Thus, the numerous constituents found in leaves could explain their efficacy in the treatment of various ailments in cattle. This therefore suggests that the basic active ingredients used for treating various ailments are accumulated in the different parts of plants being used, showing that most of these plants contain some physiologically active compounds, which are known to be potent medicines (Iwu, 1993).

Some of the medicinal plants recorded in this study have been found by earlier researches to contain antimicrobial activities, with most of them observed to provide multipurpose remedies, preventing or curing several kinds of ailments. *Piliostigma thonningii* have been reported to be used by Fulani herdsmen in the management of animal diarrhoea in Plateau State, Nigeria (Offiah *et al.*, 2012). The potential of *Azadirachta indica* as trypanocidal and anthelmintic has been reported (Nok *et al.*, 1993, Jabbar, 2006). The root and twig of *Piliostigma thonningii* has also been used for the treatment of dysentery, fever, snake bites, hookworm and skin disease as well as laxative, anthelmintic and anti-inflammatory agents (Fakae *et al.*, 2000; Igoli *et al.*, 2005). *Spondias mombin* have however been found to be used for treating retained placenta and mastitis in ruminants (Olanipekun *et al.*, 2013; Adeola *et al.*, 2014).

CONCLUSION

It was concluded from the results of this investigations that the study areas were infested with relatively high parasitic burdens with the possession of rich source of medicinal plants which if adequately harnessed could be a natural option in the treatment and control of parasites in cattle. Consequently, cattle farmers should be encouraged through proper awareness and sensitization programme on the various precautionary measures to prevent parasitic infestation as well as the potential of the available natural medicinal plants in the treatment of parasites in cattle. Also, more detailed studies on indigenous medicines to know their active ingredients and properties are also recommended.

REFERENCES

- Adeola A.O., Adewole, S.O. and Olofintoye L.K. (2014) Studies on Ethnoveterinary Practice in Ruminants in Ekiti State, Nigeria. *Research Journal of Agriculture and Environmental Management*, 3(12): 632-645.
- Agyei A.D. (1997). Seasonal changes in the level of infective strongylate larvae on pasture in the coastal savanna regions of Ghana, *Veterinary Parasitology*, 70: 175-182.
- Amori A. A., Oduntan, O.O., Okeyode I.C. and Ojo S.O. (2013). Heavy metal concentration of groundwater deposits in Odeda region, Ogun state, Nigeria, *Journal of Environmental Research and Management*, 4(5): 253-259
- Bekele T. (2002). Studies on seasonal dynamics of ticks of Ogaden cattle and individual variation in resistance to ticks in Eastern Ethiopia. *J. Vet. Med.* 49: 285-288.
- Biu, A.A. and Adindu, J.U. (2004). The prevalence of bovine hydatidosis in Maiduguri, Nigeria. *Journal of Life and Environmental Science*, 6(2): 360-362.
- Edosomwan E. U. and Shoyemi O.O. (2012). Prevalence of gastrointestinal helminth parasites of cattle and goats slaughtered at abattoirs in Benin City, Nigeria, *African Scientist*, 13, (2):109-114.
- Fakae B.B, Cambell A.M, Barrett J., Scott I.M, Teesdale-Spittle P.H., Liebau E., Brophy .PM. (2000). Inhibition of glutathione S-transferase(Gsts) from parasitic nematodes by extracts from traditional Nigerian medicinal plants. *Phytother Res.*, 14: 630-634.
- Ghorbani, A. (2005) Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, north of Iran (Part1): General results, *J. Ethnopharmacol.*, 102:

58-68.

- Giday M., Asfaw Z., Woldu Z. and Teklehaymanot T. (2009). Medicinal plant knowledge of the Bench ethnic group of Ethiopia: an ethnobotanical Inventory. *J. Ethnobiol. Ethnomed.* 5:34.
- Gumel M.A., Inuwa, S., Qadeer, M.A. and Abdurrahman, S.L. (2015). Dry season survey on abundance and distribution of Ixodid ticks in cattle in Auyo local government area of Jigawa state, Nigeria. *Proceedings of the 40th Annual Conference of the Nigerian Society of Animal Production*, held in NAPRI, Ahmadu Bello University, Zaria, pp. 178-180.
- Hansen J. and Perry B. (1994). *The Epidemiology, Diagnosis, and Control of Helminth Parasites of Ruminants*. FAO. Rome, Italy, Pp. 317.
- Igoli J.O, Ogaji, O.G, Tor-Anyin, T.A, Igoli, N.P. (2005). Traditional medicine practice amongst the Igede people of Nigeria part II. *Afr. J. Trad. Cam.*, 2: 134-152.
- Ismail, (2004). *Nomadic education and education for nomadic Fulanis*. Washington DC, USA.
- Iwu, M. M., (1993). *Handbook of African Medicinal Plants*. C.R.C. Press Boca Taton, Annbor Tokyo London.
- Jabbar, A., Raza M.A., Iqbal Z., and Khan M.N. (2006). An inventory of the ethnobotanicals used as anthelmintics in the southern Punjab (Pakistan). *Journal of Ethnopharmacology*, 108: 152-154.
- James-Rugu, N. N. and Iwuala, M. O. E. (2002). Ectoparasites of some domestic animals in Jos Plateau. *Nigerian Science Forum*, 5 (1): 149-156.
- Kudi A.C., and Kalla D.J.U. (2001). Prevalence and effect of parasitic infections on cycling in traditionally managed cattle herds in Bauchi, Nigeria. *Pertanika J. Trop. Agric. Sci.* 24(2): 87-93.
- Leeflang, P., and Ilemobade, A.A. (1977). Tick-borne diseases of domestic animals in Northern Nigeria II: Research Summary 1966 to 1976. *Tropical Animal Health and Production*, 9: 211-218.
- Manuel M.F. and Galdones A.C. (1982). Prevalence of gastrointestinal helminths of cattle and Carabao calves in central Luzon, Phil. *The Phil. J Vet. Med.*, p.60.
- Misral K.K., Kumar A.K. (2004). Ethno-veterinary Practices among the KondaReddi of East Godavari District of Andhra Pradesh. *J. Tribes Tribals* 2(1):37-44.
- Mulugeta Y., Yacob H.T., Ashenafi H. (2010). Ectoparasites of small ruminants in three selected agro-ecological sites of Tigray Region, Ethiopia. *Tropical Animal Health and Production*, 42(6): 1219-1224.

- Nok, A.J., Esievo, K.A.N., Longdet, I., Arowosafe, S., Onyenekwe, P., Gimba, C.E. and Kagbu, J.A. (1993). Trypanocidal potentials of *Azadirachta indica*: *In vivo* activity of leaf extract against *Trypanosoma brucei*. *Journal of Clinical Biochemistry and Nutrition*, 15:113-118.
- Odugbemi T. and Akinsulire O. (2006). 'Medicinal plants by species names' in: Odugbemi T, editor: 'Outlines and pictures of medicinal plants from Nigeria', University of Lagos Press, pp. 95-156.
- Offiah N.V., Dawurung C.J., Oladipo O.O., Makoshi M.S., Makama S., Elisha I.L., Gotep J.G., Samuel A.L. and Shamaki D. (2012). Survey of herbal remedies used by Fulani herdsman in the management of animal diarrhoea in Plateau State, Nigeria., *Journal of Medicinal Plants Research*, 6 (312): 4625-4632
- Olanipekun M. K and Dr. Tedela P. O (2013). Ethno-Medicinal Importance of Some Selected Plants Used For the Treatment of Ruminant Animal Diseases in Ekiti State, Nigeria. *IOSR Journal of Agriculture and Veterinary Science*, 5(6): 16-22.
- Pam V. A., Ogbu K. I., Igeh C. P., Bot C. J. and Vincent G. (2013). The occurrence of gastrointestinal and Haemo parasites of cattle in Jos of Plateau State, Nigeria, *J. Anim. Sci. Adv.*, 3(2): 97-102.
- Parola, P., Inukoma, H., Camicas, J. L., Bronqui, P., Raoult, D. (2001). Detection and identification of spotted fever group Rickettiae and Ehrlichiae in Africa ticks. *Emerging Infectious Diseases*, 7(6):10114-7.
- Rahmann G. and Seip H. (2007). Alternative management strategies to prevent and control endo-parasite diseases in sheep and goat farming systems - a review of the recent scientific knowledge, *Landbauforschung Völkenrode* 2, 57:75-88.
- Regassa F, Sori T, Dhuguma R and Kiros Y. (2006). Epidemiology of gastrointestinal parasites of ruminants in Western Oromia, Ethiopia, *International Journal of Applied Research in Veterinary Medicine* 4: 51-56
- Sajid S.M., Iqbal Z., Khan N.M., Muhammad G., (2008). Point prevalence of hard ticks (Ixodids) infesting domestic ruminants of lower Punjab, Pakistan. *Int. J. Agri. Biol.* 10: 349-51.
- Shen S., Qian J., and Ren J. (2010). Ethnoveterinary plant remedies used by Nu people in NW Yunnan of China, *J. Ethnobiol. Ethnomed.*, 6: 24.
- Squire S.A., Amafu-Dey H. and Beyuo J. (2013). Epidemiology of gastrointestinal parasites of cattle from selected locations in Southern Ghana, *Livestock Research for Rural Development* 25 (7)
- Soulsby, E.J.I. (1978). Helminthes, Arthropods, and Protozoa of Domesticated Animals 7th ed. Bailliere, Jindall and Casse Ltd, London, pp. 450.