

## **Preliminary Survey of Medicinal Plants Used in Treatment of Animal Trypanosomosis in Kaduna State, Nigeria**

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### **Abstract**

A preliminary survey of medicinal plants used in the treatment of animal trypanosomiasis in Kaduna State, Nigeria, was carried out. Three hundred questionnaires were distributed and interviews were conducted with livestock owners, livestock traders, herb sellers, herdsman and agricultural extension workers in six local government areas namely, Birnin Gwari, Kachia, Kafanchan, Makarfi, Saminaka and Soba - Zaria. Plants commonly used included *Khaya senegalensis* 23.3% (70), *Terminalia avicennioides* 16.3% (49), *Ximenia americana* 12.7% (38), *Anona senegalensis* 10.7% (32) and *Azadirachta indica* 9.3% (28). The parts of the plants used included leaves, fresh bark, and roots prepared by either soaking or boiling in water. The investigation provides a baseline data for future research into these plants.

**Key words:** Trypanosomiasis, *Khaya senegalensis*, *Terminalia avicenioides*, *Ximenia americana*.

### **Introduction**

The African trypanosome is a group of diseases caused by a protozoan of the genus *Trypanosoma*. It is an acute, sub acute and chronic disease affecting both animals and humans of tropical and subtropical countries only. The disease is characterized by intermittent fever, anemia, odema (Anosa, 1988), and known as jola or sammore in fulfulde (Fulani). In Nigeria it is further characterized by teeth grinding and abnormal eating of sand. In humans it causes sleeping sickness (Gallat, 1991; Kuzoe, 1993). Sleeping sickness currently affects about half a million people in sub-Saharan Africa and an estimated 60 million people are at risk of contracting this disease which is fatal if untreated (WHO, 1998). The most important species responsible for the disease complex, commonly known as Nagana, surra and souma in livestock include *Trypanosoma brucei*, *T. congolense*, *T. evansi* and *T. vivax* while *T. gambiense*, *T. rhodesiense* and *T. cruzi* are important human pathogens responsible for sleeping sickness (Gallat, 1991; Kuzoe, 1993). *Trypanosoma* is known to render approximately a quarter of African arable land mass unsuitable for profitable livestock farming (Molyneux, 1997). It is estimated that 65% of the world's livestock resources exist in Africa, yet Africa accounts for only 30% of world's meat output (Mortelmans, 1986; Donald, 1994) as a result of this disease. It causes the death of well over 3 million cattle annually with an estimated

lost potential of \$ 6-12 billion US dollars (Mortelmans, 1986; ILRAD, 1994).

Chemotherapy and chemoprophylaxis by trypanocides however, form the most important aspect of control and eradication of trypanosomes. Unfortunately the use of these trypanocides is beset by numerous limitations, including toxicity of the drugs, development of resistance by the parasites and exhibition of antigenic variation which hampers vaccine production (Kuzoe, 1993; Doua and Yapo, 1993). These factors emphasize the need for research into a more comprehensive, formidable and cheaper sources of trypanocide. About 60-80% of third world countries rely wholly or partially on traditional / herbal medicines (Sofowora, 1993) which are mainly plants. Plants have been traditionally used for centuries and are still widely used to treat illness and other parasitic diseases. Several well known drugs such as quinine and artemisinin are used as antiprotozoal agents have their origins in nature (Tagboto and Townson, 2001).

Plants have provided the basis for traditional treatment for different types of diseases and still offer an enormous potential source of new chemotherapeutic agents. Plants present a spectrum of biological compounds with activities against virus, cancer and parasites. These plants contain compounds mainly secondary metabolites such as alkaloids, glycosides, flavonoids, terpenes and coumarins (Rates, 2001). They have been reported to provide better and cheaper alternatives (Nwude and Ibrahim, 1980; Secoy and Smith, 1983; Phillipson and Wright, 1991; Freiburghans *et. al.*, 1996; ITDG and IIRR 1996, Nok *et. al.*, 1996, Adewummi *et. al.*, 2001, Nok, 2005).

The present investigation therefore was undertaken to survey the most used plants in treating animal trypanosomosis in Kaduna state of Nigeria.

## **Materials and Methods**

### **Study area**

Kaduna State is located in northern Nigeria. Rainfall lasts from 4 to 6 months on average (between April to November) with a mean of 700 mm. Harmattan a period (between November to March) of cold dry and windy weather normally proceeds a fairly hot dry season. Mean annual temperature is about 35°C with highest temperature occurring in April (38-40°C) and lowest in January (23°C). The study areas, Kachia, Kafanchan and Saminaka, are located in the southern parts of the state with a dense forest like vegetation favourable for tsetse fly habitation. Rainfall could last 6 to 7 months with a mean of 700mm. The northern areas (Birnin Gwari, Markafi and Soba) have rainfall lasting 5 months with a mean of 550 mm. The vegetation is not dense, but tsetse flies are still found along the river areas where vegetation could be dense.

### **Survey**

The survey was carried out in six areas namely, Birnin Gwari, Kachia, Kafanchan, Makarfi, Saminaka and Soba – Zaria all in Kaduna State (11° 10' N, 7° 38' E) Nigeria through the administration of 300 questionnaires to literate and interviews with non –literate respondents. The respondents included livestock farmers, livestock traders, herb sellers in various markets located in the areas, traditional medicine practitioners,

representatives of Miyeti Allah Association, herdsmen and agricultural extension workers in the local government areas. The questionnaires were designed in such a way that the respondents could respond by providing, name of the disease in a local language, symptoms, diagnosis, type of plant use and mode of preparation and administration.

### **Statistical analysis**

A simple descriptive statistical method of analysis was used for analyzing the data.

### **Results and Discussion**

The result of the preliminary survey on plants used in treating animal trypanosomosis is summarized in Table 1. The result showed that *Khaya senegalensis* (23.3%) had the highest usage followed by *Terminalia avicennioides* (16.3%), *Ximenia americana* (12.7%), *Anona senegalensis* (10.7%) and *Azadirachta indica* (9.3%). Others had lower percentage of usage. In all the six areas surveyed, the plants were noted to grow widely in the environment; the easy accessibility to these plants could be a reason for usage. ITDG and IIRR (1996), Adewunmi, *et al.*, (2001), Arbonnier (2004) reported that *Terminalia brownii*, *Acacia reficiens*, *Clarodendrum spp.*, *Azalia africana*, *Cordia myxa*, *Eugenia uniflora*, *Acacia artaxacantha*, *Terminalia uorensis* and *Strophanthus sarmentosus* were used in Kenya, Nigeria and other countries by herdsmen to locally treat their animals. The respondents especially the livestock owners, herdsmen, and some herbal and medical traditional practitioners were able to give the most noticeable symptoms of the disease which include, lack of appetite, dull lusterless hair, ocular discharges, foul smell and progressive weight loss.

The leaves bark and roots were mainly the parts of the plant used. The parts of the plants were prepared by soaking or boiling in water and drenched, or pounded and mixed with the feed of the sick animal, or the parts of the plant was smoked in a room and the animal allowed to inhale the smoke. Others include making a paste of the plant part and rubbing the animal with the paste or putting the paste in a cloth and tying the cloth to the leg of the sick animal. Some modes of preparation include addition of red potash or salt to the part of plant before soaking in water. The dosage of the part of the plant varies from 2 to 3 times a week until the animal recovers, which they noted by resumption in eating and passing out of bloody gelatinous stools. Since this work is a preliminary survey, there is a need to further validate the claims of the respondents to determine the efficacy and safety of the plants.

In conclusion, the preliminary survey of the plants showed that *Khaya senegalensis* and *Terminalia avicennioides* were widely used in treatment of trypanosomosis in animals in Kaduna state. Though, this work was a survey, it is recommended that a need exist to validate their efficacy. Hence work is already in progress investigating the efficacy of one of the plants.

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## References

- Adewummi, C.O., Agbedahunsi, J.M., Adebajo, A.C., Aladesanmi, A.J., Murphy, N., and Wando, J. (2001). Ethno-veterinary medicine: Screening of Nigerian medicinal plants for trypanocidal properties. *J. Ethnopharmacology* 77: 19-24.
- Anosa, V.O. (1988). Haematological and biochemical changes in human and animal trypanosomiasis. *I. Revue. Elev. Med. Vet. Pays Trop.* 41 (1): 65 -78.
- Arbonnier, M. (2004). *Trees, shrubs and lianas of West African dry zones*. Margraf Publishers-CIRAD-GMBH, MNHN.
- Donald, A. D. (1994). Parasite, animal production and sustainable development. *Vet. Parasitol.* 54, 7-47.
- Doua, F. and Yapo, F. B. (1993). Human Trypanosomiasis in the Ivory Coast: Therapy and Problems. *Acta Tropica* 54, 163 – 168.
- Freiburghaus, F., Kaminsky, R., Mayunga, H. H. N and Brun, R. (1996). Evaluation of African medicinal plants for their in vitro trypanocidal activity. *Journal of Ethnopharm.* 55: 1-11.
- Galat, V. F. (1991). *Tropical veterinary parasitology*. UAA Publishing House, Kiev. Pp. 301-333
- ITDG and IIRR (1996). *Ethnoveterinary medicine in Kenya: A field manual of traditional animal health care practices*. Intermediate Technology Development Group and International Institute of Rural Reconstruction, Nairobi, Kenya. 102pp.
- ILRAD (1994). *Trypanosomiasis*. International Laboratory for Research on Animal Diseases Reports, Nairobi. Pp. 21 – 29.
- Kuzoe, F. (1993). Current Situation of African Trypanosomiasis. *Acta Tropica* 54, 153 162.
- Nok, A.J., Williams, S. and Onyenekwe, P.C. (1996). *Allium sativum* – induced death of African trypanosomes. *Parasitol. Res.* 82, 634-637.
- Nok, A. J. (2005). Effective measures for controlling trypanosomiasis. Expert opinion. *Pharmacother.* 6 (10), 1-8.
- Nwude, N. and Ibrahim, M.A. (1980). Plants used in traditional veterinary medical practice in Nigeria. *J. Vet. Pharm. Therap.* 3, 261- 273.
- Molyneux, D. H. (1997). Current public status of the trypanosomiasis and leishmaniasis. In: Hide, G., Mottram, J. C., Coombs, G. H., Holmes, P. H. (Eds.). *Trypanosomiasis and Leishmaniasis: Biology and control*. CAB International, Wallingford, UK, 39 –50.
- Mortelmans, J. (1986). Some economic aspects related to veterinary parasitology. *Tropiculture* 4 (3), 112 - 116.
- Phillipson, J. D. and Wright, C. W. (1991). Medicinal plants in tropical medicine. *Trans. of the Royal Soc. of Trop. Medicine and Hyg.* 85, 18-21.
- Secoy, D. M., and Smith, A. E. (1983). Use of plants in control of agricultural and domestic pests. *Economic Botany* 37(1), 28-57.
- Sofowora, A. (1993). *Medicinal plants and traditional medicine in Africa*. Spectrum Books Limited, Ibadan, Nigeria. Pp. 1-10.
- Tagboto, S. and Townson, S. (2001). Antiparasitic properties of medicinal plants and other naturally occurring products. *Advances in Parasitology* 50, 199-295.

Rates, S. M. K. (2001). Plants as source of drugs. *Toxicon*. 39, 603- 613. WHO (1998). Control and surveillance of African Trypanosomiasis. Report of a WHO Expert Committee. World Health Organization Technical Report Series 881, I –VI, 1-114.

**Table 1. Plants used in the treatment of trypanosomosis in six areas of Kaduna State.**

Plant name	Common name	Hausa	Part of plant used	No. and % of Respondents	
				No.	%
<i>Azadirachta indica</i>	Neem	Dogonyaro	Bark	28	9.3
<i>Terminalia avicennioides</i>	-	Baushe	Bark	49	16.3
<i>Khaya senegalensis</i>	Mahagony	Madachi	Bark/root	70	23.3
<i>Prosopis africana</i>	Iron wood	Kirya	Bark/root	26	8.7
<i>Anonaceae senegalensis</i>	Wild custard apple	Gwandandaji	Bark/root	32	10.7
<i>Ximenia americana</i>	Wild olive	Tsada	Bark/root	38	12.7
<i>Tamarind indica</i>	Tamarind	Tsamiya	leaves	22	7.3
<i>Guiera senegalensis</i>	-	Sabara	leaves	18	6.0
<i>Lannea verdingii</i>	-	Faru	root	17	5.7