

Surveillance on Tsetse Presence in Some Selected Communities of Kaduna State, North-Western Nigeria

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Abstract: Tsetse flies are vectors of African trypanosomes which causes Trypanosomiasis, in man and animals. A preliminary survey on the presence of tsetse flies was conducted in 6 selected communities of 5 local government areas (LGA) of Kaduna state. Biconical tsetse traps were deployed in suitable habitats while prevailing temperature, relative humidity and geographical coordinates were recorded using whirling hygrometer and Geographical position system (GPS) monitor. A total of 45 tsetse flies were caught from 2 communities which were morphologically identified as *Glossina palpalis palpalis*. (21(46.7%) and 24(53.3%) males and females respectively), indicating an apparent density of 1.5 T/T/D. This study has confirmed the presence of *G. palpalis palpalis* in Pantaki 40(88.9%) and Maganda 5(11.1%) communities of Kagarko LGA revealing a higher infestation in Pantaki while Madara (Giwa LGA), Kushugi (Kudan LGA), Ruwan sanyi (Kubau LGA), and Bitarana (Lere LGA), had none. The need for extended survey in these areas and the economic implication of the tsetse flies presence are highlighted.

Keywords: Tsetse flies, *Glossina palpalis palpalis*, Kaduna, Trypanosomiasis, Preliminary

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I. Introduction

Tsetse flies are biological vectors of African Trypanosomiasis and are responsible for the transmission of Trypanosomes, the pathogenic agents of Human African Trypanosomiasis (sleeping sickness) and African Animal Trypanosomiasis (1). About 10 million km² area of the 37 sub Saharan African countries are infested with tsetse flies (2).

In tsetse and trypanosomiasis affected countries about 40-50 million animals are at risk of contracting the disease (3, 4,5). Successful control measures against tsetse and trypanosomiasis were taken during colonial administrations. Unfortunately, the success achieved was not sustained largely due to infrastructural collapse, political instability, conflicts, negligence, etc. These reasons and perhaps other factors are partly responsible for the re-appearance of tsetse fly in previously reclaimed areas in many countries, including Nigeria (6)

In Nigeria, tsetse and trypanosomiasis problem is still widely distributed in all the agro-ecological zones (7) and it still infest 80% of the nations land mass as well as the high lands of Jos, Mambilla, and Obudu plateau previously known to be free from tsetse (8). The Nigerian Institute for Trypanosomiasis Research (NITR) received reports of outbreak of animal trypanosomiasis which caused deaths of cattle with consequent animal migration of semi-nomadic Fulani out of Lere local government areas during the rainy seasons. The Lere community used to be a known human African trypanosomiasis (sleeping sickness) endemic focus between 1930 and 1960 (9).

Therefore, this preliminary survey is initiated with the objective of obtaining the baseline information on the current infestation of tsetse flies in the selected communities.

II. Materials And Methods

Study Area

The study was conducted in 6 selected communities in 5 different Local Governments of Kaduna State namely; Madara (Giwa LGA), Kushigi (Kudan LGA), Ruwan sanyi (Kubau LGA), Bitarana (Lere LGA) Pantaki and Maganda (Kagarko LGA)

Tsetse Survey

In each community, 5 to 6 Biconical traps were set along river banks and grazing areas of the animals. The geo-reference of every trap set (using a hand held garmin GPS device), temperature, relative humidity, time, date and river name in each location were recorded. The traps were harvested after 24hrs. Flies caught were identified, sexed, counted, recorded and transported to the institute laboratory for storage and molecular analysis.

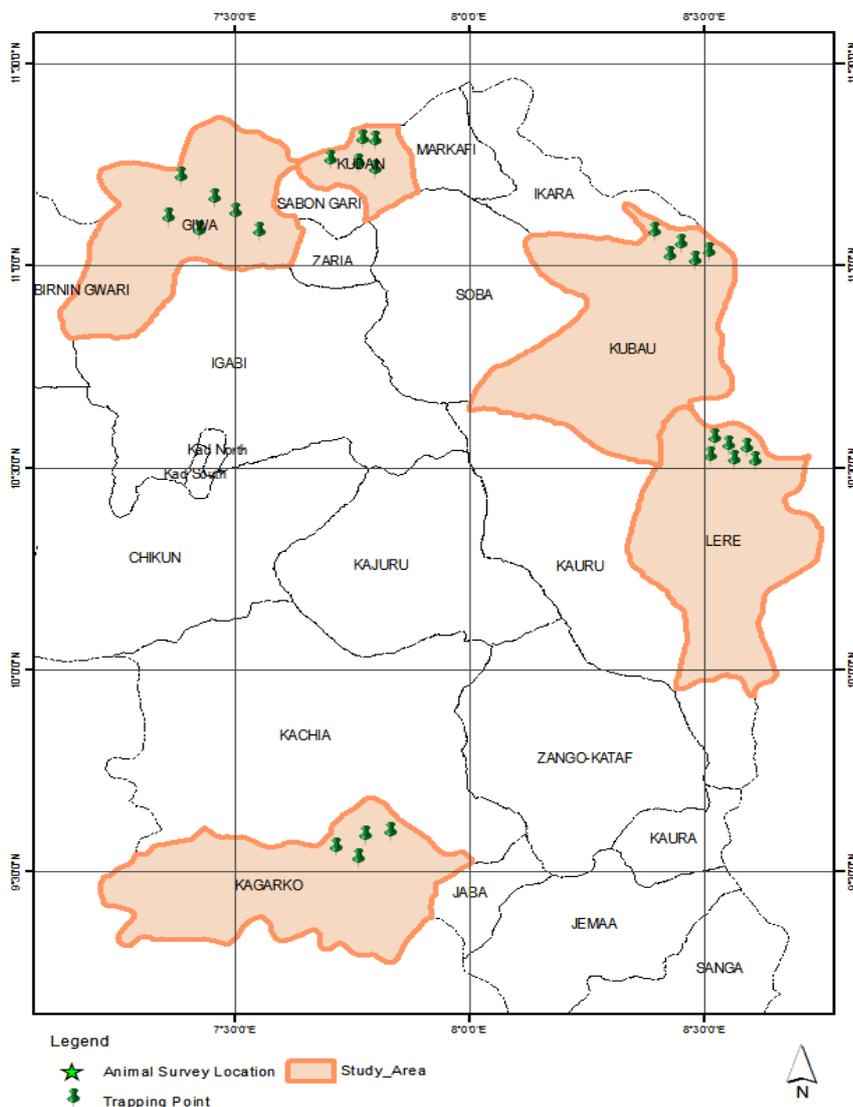


Table 1: Tsetse sampling, location, number of traps, number of flies, sex, and apparent tsetse density

S/N	Community	No. of Traps set	No. of Flies caught		Sex of Flies caught		Apparent Tsetse Density
			M	F	M	F	
1	Madara	6	0	0	0	0	0t/t/d
2	Kushigi	5	0	0	0	0	0t/t/d
3	Ruwan sanyi	5	0	0	0	0	0t/t/d
4	Bitarana	6	0	0	0	0	0t/t/d
5	Pantaki	5	40	18	22	22	8t/t/d
6	Maganda	4	5	2	3	3	1.25t/t/d

Key: m= male, f= female, f= fly, t= trap, d= day

III. Results and Discussion

Of the 6 communities where the preliminary survey was conducted, tsetse flies were caught in two communities (Maganda and Pantaki in Kagarko LGA). Thirty (30) traps were set for the whole survey. A total of forty five (45) flies were caught. Species wise, all the 45 flies caught were *Glossina palpalis palpalis*. There are 21 males and 24 females which represent (43.75%) and (56.25%) respectively. The apparent tsetse density for the whole survey is 1.5t/t/d. Based on local government areas, the apparent tsetse density are given as follows; Giwa LGA 0t/t/d, Kudan LGA 0t/t/d, Anchau LGA 0t/t/d, Lere LGA 0t/t/d and Kagarko LGA 5t/t/d. In this preliminary survey, the result shows that there is low tsetse prevalence in most of the communities visited. It also shows that tsetse flies were caught in only two locations, although some of the communities complained about the presence of the flies in the area especially during the hot and rainy seasons. The Fulani pastoralists of Ruwan sanyi and Bitarana communities complain that during the hot and early rainy season, the population of biting flies which they suspect to be tsetse flies is so high that they are unable to take their bath along the river banks of the communities. Although previous studies had shown that there are about three different species in some parts of the state. For instance, the work of (10) in Kamuku National park Birnin Gwari shows that there are *Glossina palpalis*, *G. tachinoides*, and *G. morsitans submorsitans* in the park with *G. p. palpalis* as the predominant species followed by *G. tachinoides*.

The apparent tsetse density in the four locations; Madara (Giwa), Kushigi (Kudan), Ruwan sanyi (Kubau) and Bitarana (Lere) are 0 t/t/d while in the other two locations, the apparent tsetse density are 5 t/t/d, the apparent tsetse density base on communities shows that Pantaki has the highest number which is 8t/t/d followed by Maganda with 1.25t/t/d, the other four communities had recorded none infestation due to tsetse flies. The prevalence of the *palpalis* group in the communities raises a serious concern because they are one of the vectors that transmit Human African Trypanosomiasis (HAT) (11).

Although the number of tsetse flies caught were low, it is still important considering this is just a preliminary survey and the fact that the study was conducted during the cold dry season which is characterized by low tsetse fly activity. The cold dry season is associated with low humidity and low temperatures, a condition that reduces productiveness and increases mortality in the tsetse species *Glossina tachinoides* and *Glossina palpalis palpalis* (12). It also limits tsetse dispersal within the environment and reduces transmission of AAT. By contrast, climatic conditions in the wet season support increased tsetse populations, greater tsetse dispersal and increased transmission of AAT (13). Another possible reason for low number of tsetse flies caught could be due to the fact that most of the study area is interspersed with crop farms which limit tsetse population (14). Another factor that brought about the low tsetse catches may be due to the limited time the traps were left in the field which is just 24 hours as an alternative of the standard 72 hours. Notably, it was only one (1) species of tsetse fly caught in this study, *G. p. palpalis*, which is a riverine species and member of the palpalis group. The occurrence of one to three different species in a particular area is found in over 86% of the tsetse belt (15) and the study area falls within the *G. p. palpalis* and *G. tachinoides* distribution limits in Nigeria. The presence of this species should necessitate action because of the species adaptability to anthropogenic vegetation changes, (16).

In other to get accurate result on the distribution of tsetse in the study areas, more extensive survey should be carried out and sustained throughout the seasons.

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