

PREVALENCE OF TSETSE FLY AND BOVINE TRYPANOSOMOSIS IN THE BIOLOGICAL CONTROL OF TSETSE FLY PROJECT (BICOT) WITHIN LAFIA LOCAL GOVERNMENT AREA OF NASARAWA STATE, NIGERIA

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ABSTRACT

*The prevalence of tsetse fly and bovine trypanosomosis was studied in the biological control of tsetse fly project (BICOT) area within Lafia Local Government Area of Nasarawa state, Nigeria between May and November 2000. The project area, covering approximately 1500 km² was virtually freed of *Glossina palpalis palpalis* and to some extent *G tachinoides* by Dec. 1984. By 1987, however, sterile male releases were suspended and remained so till the time of this study due to lack of funding. Ten biconical traps were set at an interval of 25 meters along each river/stream in the study area. In all, 466 flies were caught out of which 454 were *G.p palpalis* while the remaining 12 were *G.tachinoides*. The result of the dissection of the insects showed that 9 (1.9%) of tsetse flies caught were positive for *Trypanosoma vivax*. All infected flies were *G.p palpalis*. Also blood samples were collected from 200 cattle in the abattoir and 200 in the sedentary cattle in the area. The blood samples were examined using standard parasitological techniques. The result showed that, in sedentary cattle, 18(9%) were positive for trypanosomes while in the abattoir 21(10.5%) were positive for trypanosomes. There was however no significant difference ($p > 0.05$) between the numbers of cases defected in sedentary cattle and abattoir cattle. Most of the infections in sedentary cattle (67%) and abattoir cattle (81%) were due to *T. congolense*.*

Key words; Tsetse fly ,bovine trypanosomosis, biological control, Lafia

INTRODUCTION

Trypanosomosis is a serious, frequently fatal disease caused by single-celled parasites of the genus *Trypanosoma*. The trypanosome is transmitted by the bite of a tsetse fly to people and to wild and domestic animals (Anon, 1991). The most important are those that affect cattle in Africa; they are *Trypanosoma vivax*, *T. congolense* and *T. brucei*. The tsetse fly (genus: *glossina*) the vector of trypanosomosis occurs only in sub-Saharan Africa. In other parts of the world, the transmission of trypanosomes pathogenic to animals is believed to be non-cyclical or mechanical and is effected mainly by blood sucking arthropods (Anon, 1991). The essential difference between cyclical and non-cyclical transmission is that in the former case, tsetse flies form a reservoir of infection, a factor that complicates the epidemiology and control of the African animal trypanosomosis (connor, 1989).

Tsetse transmitted trypanosomosis is classified as severe in the majority of the 37 sub-Saharan countries affected, where is figures among the first three priority veterinary diseases (FAO, 1992). Tsetse flies invest about 10 million km² of fertile land spread across 37 countries on the African continent from Senega in the North to South Africa in the South (PAAT,2001). Their economic and social impact is considerable, constraining livestock production and also arable farming where animals are not available for draught power. It has been found over the years that in a large number of African countries, agricultural development as a whole has fallen behind overall economic growth and the shortfall are particularly serious in the livestock sub-sector (Sabine, 1993).

A few breeds of livestock that are indigenous to Africa, such as the N'dama cattle of West Africa are able to tolerate trypanosomes, hence they are considered to be trypanotolerant (Murray et al,1982). However trypanotolerant N'Dama cattle can nevertheless suffer from trypanosomosis when subjected to high level of tsetse challenge (Mattoili *et al* 1998). The Zebu breeds, which are

trypanosusceptible, can permanently inhabit the tsetse-infected zone only when supported by chemical prophylaxis or vector control (Anon, 1991). Tsetse and trypanosomosis situation in many parts of Nigeria has been severally reported by Kalu (1996,1997) Ilemobade *et al* (1991), Ilemobade, (1994) and Kalu and Lawani (1996) to mention but a few.

In contribution to these efforts, the present study was carried out to determine the present state of tsetse fly and bovine trypanosomosis in the Biological Control of Tsetse fly Project (BICOT) area in Lafia Local Government area of Nasarawa State. By the end of Dec. 1984, most of the target area had been virtually freed of *G.p. palpalis* and about 90% of *G. tachinoides*, but the sterile male releases in the field were suspended in November 1987 due to lack of funding (Anon 1988) despite the recommendation for the commencement of the second phase as contained in the report of Ilemobade *et al*, 1985.

MATERIALS AND METHODS

The study was carried out in the field unit of the biological control of tsetse fly project area, within Lafia Local government area of Nasarawa state Nigeria. Covering approximately 1500km², the area is one of the most productive agricultural zone of Nigeria. Nasarawa state was originally part of plateau state and is located next to the Federal Capital Territory of Abuja and in the central area of Middle Belt region along latitude 7o N and longitude 10oE. It is within the Guinea savanna vegetation Zone of Nigeria. The annual rainfall varies between 131.75cm in some places to 145cm in other places (Anon,1999).

Data for this study were obtained from the survey of tsetse fly and bovine trypanosomosis in the study area. The surveys for the prevalence of tsetse flies involve the use of 10 biconical traps, which were employed to cover each of the river/stream within the area on a 24-hour basis. The traps were set at designated sites along the river course. On the other hand, the survey for the prevalence of trypanosome infection in cattle was carried out through tsetse fly dissection and parasitological examination of blood samples collected from 200 sedentary cattle and another 200 from those slaughtered at the abattoirs and slaughter slabs in the study area. Tsetse flies caught were dissected daily during the study period to examine for the presence of trypanosomes in their system (mainly the proboscis, salivary gland and the mid-gut of the flies). Blood samples collected from both sedentary and slaughter cattle were also examined for the presence of trypanosomes using standard parasitological techniques.

RESULTS AND DISCUSSION

The total number of tsetse flies caught was 466 out of which 454 were *Glossina palpalis palpalis* while the remaining 12 were *G. tachinoides*. The results of the dissection showed that 9 (1.9%) of the 466 flies were infected with trypanosomes, all being *Trypanosoma vivax* and from *G.p. palpalis*. The small number of *G. tachinoides* caught during the study period may be responsible for the absence of infection in this specie. The results of parasitological examination of blood samples on the other hand showed that, out of the 200 samples collected from sedentary cattle, and another 200 samples from slaughter cattle, 18(9%) and 21 (10.5%) were positive for various trypanosomes species respectively. All the three pathogenic trypanosomes were encountered in the study area during the study period. The breakdown showed that from sedentary cattle, 12 (6.7%), 4 (22.2%) and 2 (11.1%), and from slaughtered cattle, 17 (81%), 3 (14.3) and 1 (4.8%) were positive for *Trypanosoma congolense*, *T. vivax* and *T. brucei* respectively (Tables I and II).

Table1. trypanosome infection in slaughtered cattle from abattoir and slaughter slabs in the study area.

S/no	Town/village	Number sampled	Number positive	T. congolense	T. vivax	T. brucei	mixed
1	Lafia	50	6	4	2	0	0
2	Adogi	25	2	2	0	0	0
3	Assakio	20	3	3	0	0	0
4	Maiakuya	20	1	1	0	0	0
5	Akura	35	4	2	1	1	0
6	Bakin-rigia	20	2	2	0	0	0
7	Agyaragu	20	3	3	0	0	0
	Total	200	21(10.5%)	17(81%)	3(14.3%)	1(4.8%)	

Table 2: Trypanosome infection in sedentary cattle in the study area.

S/no	Town/village	Number sampled	Number positive	T. congolense	T. vivax	T. brucei	mixed
1	Adogi/kirayi/tsakwa	30	2	2	0	0	0
2	Wakwa/Bakin-rigia	20	1	1	0	0	0
3	Akura/Feferuwa	30	4	3	1	0	0
4	Ganye/Chiba	25	2	1	1	0	0
5	Assakio/Maiakuya	25	2	1	0	1	0
6	Shabu/Awuma	20	2	1	2	0	0
7	Bukankwato	20	1	1	0	0	0
8	Lafia	30	3	2	0	1	0
	Total	200	18(9%)	12 (66.7%)	4 (22.2%)	2 (11.1%)	0

The present study indicates that tsetse and trypanosomosis are still of much concern and represents a major obstacle to livestock production and development of allied industries. The study further revealed that *G.p. palpalis* that was eradicated from the study area about two decades ago (Anon. 1985) have again become established in the area. This clearly showed that in spite of the efforts made and the financial commitments to the fight against tsetse and trypanosomosis in the study area, the disease is still prevalent. Unless a genuine policy and realistic measures as regards tsetse and trypanosomosis control are accorded due priority, the situation will persist or probably increase in the nearest future.

The presence of infected *Glossina* in the area indicates that the transmission cycle has not been broken. This situation will continuously create a trypanosomosis problem in the area. That the infection in tsetse flies caught during the study period is low, is in agreement with leak (1999) which says that tsetse species differ in their capacity to acquire and transmit trypanosomes, with *palpalis* group species being poor vectors of most trypanosome species. However, despite the low vectorial capacity of this species of *Glossina*, their economic important role in maintaining the transmission cycle cannot be over emphasized. All the three pathogenic trypanosome species found in cattle were encountered during this study, with *Trypanosoma congolense* being the most prevalent followed by *T. vivax* and *T. brucei*. This is in agreement with the findings of other researchers (Ilemobade, 1994, Onyiah, 1997 and Ajayi et al, 1997).

Earlier reports from the study area from 1982 to 1985 stated that the overall prevalence of bovine trypanosomosis in sedentary herd was 11.8% (Anon, 1985). In comparison with the findings of this study, there appears to be no significant difference because the present study revealed an overall prevalence of 9%. A number of factors however is responsible for this unhealthy situation,

prominent among which is the lack of consolidation of the achievement recorded in the first phase of the BICOT project.

CONCLUSION

The rate of tsetse reinvasion as revealed by the present study shows that unless there is deliberate intervention, there will be a continuous build up of tsetse population. The threat of trypanosomosis can be removed once and for all by the eradication of the vector. This has been achieved in the past especially in the study area using sterile insect technique (SIT). Concerted effort is therefore needed generally in the country towards the control of tsetse flies and trypanosomosis.

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