

Article 1

Report on the Dissection of *G. morsitans* at
Kariba in August, 1958.

Infection rates in tsetse flies under natural conditions is a subject which has not received attention in S. Rhodesia for a great many years. 500 male *G. morsitans* were dissected at Kariangwe in May and June, 1958, and it was thought that further surveys in other parts of the country and at different times of the year would be of interest.

Area from which flies for dissection were taken.

The area chosen for the present work lies between the new and the old south access roads to Kariba, about 10 miles from the township. This can be seen on the accompanying map, where X marks the site of a temporary camp in which the work was carried out.

Prior to the aerial spraying commenced in May, 1956, *G. morsitans* was heavy in the vicinity of Kariba as shown by figures taken from fly rounds opened at that time.

date	flyround	A.D.	date	flyround	A.D.
29/8/55	Chavaru	204	25/8/55	Kasesse	252
21/9/55	"	168	20/9/55	"	112

In the region under present consideration, that stretching from the edge of the bush clearing northwoods to the Chavaru Fly Round, insecticide was applied only to the riverine vegetation, but block spraying was carried out in an area west of this and south of the access road. The tsetse population was decreased quite considerably as a result of this, but not eliminated, and in the region of the Chavaru fly round under consideration here, the populations at the present time (August, 1958) has probably returned to a size not very much less than it was in 1955.

date	fly round	A.D.
19/9/58	Chavaru	92
20/9/58	"	116

The flies for dissection were caught by fly boys on foot, a certain number being also obtained by catching off the Land Rover.

Game has always been abundant on the upper Chavaru and Nyanyana rivers, and in spite of the greatly increased activity on the new access road and south of this in the region of the bush clearing, it is still prevalent between the access road and the Ruhemahombe Hills. Rhino are resident on the upper Chavaru river. Sable reedbeek, kudu and impala occur, and zebra and warthog are also present.

An indication of the major vegetation types in the region is shown on the map. Scrub mopane is the most widespread and contains a considerable number of species of the thicket forming type.

Temperature and humidity figures recorded outside the Gibb, Coyne and Sogei main offices in Kariba township are roughly applicable to the area from which the flies for dissection were taken.

		August	September.
mean maximum	F	86.9	91.7
mean maximum	F	62.8	65.3
relative humidity	%	37%	38%

Incidence of trypanosomes as revealed by dissection.

A total of 410 teneral male G. morsitans were dissected by the method described in appendix 1. The mean hunger stage of the flies was found to be 2.94. A figure very similar to that obtained from flies dissected at Kariangwe in May and June, 1958.

17.8% of all male flies dissected were found to be infected. 10.2% with the vivax group and 7.5% with the congolense group. The infection rate in the female flies appeared to be very similar, - 17.5% infected of 115 flies examined. 11.4% of these were due to the vivax group and 6.1% to the congolense group. No salivary gland infections or brucei group trypanosomes were recorded at all.

This picture of infection rates in G. morsitans is very similar to that obtained from the data collected at Kariangwe earlier in the year, (Leggate and Lovemore June, 1958.) and which is summed up in appendix 2. The infection rate at Kariba was slightly higher than at Kariangwe, but the proportions in male flies of the vivax to congolense group trypanosomes was about the same. Female flies showed a quite remarkably higher infection rate (17.5% compared with 10.2% at Kariangwe) but as is usually the case with flies of this sex, the small size of the sample precludes the drawing of any definite conclusions.

Further analysis of these Kariba figures yields one other interesting point. If the male flies are divided into two batches, - those caught off the Land Rover, and those by the fly boys on foot- , and compared, the two infection rate pictures are very different as the table below shows. The mean age is calculated from Jackson's figures and tables.

Table 1.

	Flies Caught.	
	off Land Rover.	off fly boys.
no. examined	111	142
no. infected	32	15
%age infected	28.8%	10.5%
mean age	24 days	22 days
mean hunger stage	2.87	2.93

It is a little difficult to explain this. For some reason, flies attracted to the Land Rover are older and less hungry than those attracted to pedestrians. Older flies are, of course, likely to show a higher rate of infection but one still wonders why the older flies are attracted to the Land Rover rather than to the fly boys.

It is hoped that further dissection work will be carried out in the future and that eventually we shall get a good over-all picture of the incidence of trypanosomes in tsetse flies in Southern Rhodesia.

APPENDIX 1.

Technique employed in the dissection of G. morsitans to display the labrum, hypopharynx, salivary glands and gut.

1. Sex, age from wing fray and hunger stage of fly determined and recorded.
2. Legs and wings removed and the tip of the abdomen cut off.
3. The fly is held with the cut end of the abdomen in a drop of sodium citrate or saline solution on a slide. The abdomen is stroked with a needle to expel the contents which are then gently drawn clear of the body into the drop. The fat bodies and gonads adhering to the gut are dissected away and the gut is then placed under a coverslip for examination. In this manner it is quite possible to display the crop and proventriculus as well as the intestine.
4. The abdomen is now cut off at its junction with the thorax.
5. A needle is placed through the thorax to hold the fly ventral side up so that the head is resting in a drop of sodium citrate on a slide. A second needle is then placed on the neck and gentle sawing and pulling movements of this separate the head, to which the salivary glands remain attached, from the thorax.
6. The L.H. needle is placed across the face, slight pressure on which causes the labial palps to swing up and back. The R.H. needle is now laid across the base of the proboscis and similar gentle sawing movements draw this away from the head, together with the salivary glands.
7. The labrum and hypopharynx are dissected away from the labium an attempt being made to keep the salivary glands attached to the former (as shown in the drawing). The head is now removed from the slide and the labrum, hypopharynx and salivary glands are placed under a coverslip for examination.

APPENDIX 2.

species of fly dissected work carried out at time of year	<u>G. morsitans</u>	
	<u>KARIANGWE</u> May/June 1958	<u>KARIBA</u> Aug/Sept. 1958
mean max. temp. F	80.65	89.3
mean min. temp. F	49.7	64.5
relative humidity %	74 %	37.5%
male flies dissected	510	410
number infected	80	73
percentage infected	15.7%	17.8%
" infected with <u>vivax</u>	9.0%	10.2%
" " " <u>congolense</u>	7.25%	7.5%
female flies dissected	78	115
number infected	8	20
percentage infected	10.2%	17.5%
" " with <u>vivax</u>	5.1%	11.4%
" " wit <u>congolense</u>	5.1%	6.1%
M.H.S. of male flies	2.94	2.99