

Article
REPORT ON TRYPANOSOME INFECTION RATES AT REKOMITJIE

Dissections of both Glossina morsitans and G. pallidipes were carried out at the research station, Rekomitjie, during the late dry season (October to December) 1959 for the purpose of obtaining new trypanosome strains for Dr. Gordon of the Liverpool School of Tropical Medicine and in order to assess the infection rates in the two species of tsetse fly.

Area from which flies were taken for dissection

The research station, situated in the Zambezi valley at an altitude of 1673 ft. proved an ideal place to carry out investigations on G. morsitans and G. pallidipes since both these species are readily obtainable in the near vicinity.

The vegetation, as listed below, grows on alluvial sandy soils along the banks of the Rekomitjie river. The denser parts are patchy and interspersed with old cultivation sites, which now support Combretum species.

Top storey species
(In leaf during late dry season)

Acacia albida
Acacia nigrescens
Acacia heteracantha
Acacia galpinii
Acacia sieberiana (var. woodii)
Tamarindus indica
Kigelia pinnata
Lonchocarpus capassa
Cordyla africana
Balanites sp.
Albizia sp.
Trichilia emetica
Ficus sp.
Phyllogeiton discolor
Diospyros mespiliformis
Ostryoderris stuhlmannii

Under storey species
(Leafless during late dry season)

Cassia abbreviata
Diospyros sp.
Popowia obovata
Allophyllus sp.
Lecaniodiscus fraxinifolia
Strychnos sp.
Grewia sp.
Capparis sp.
Combretum spp.
Commiphora spp.
Dichrostachys glomerata
Croton megalobotrys
Phyllanthus discoideus
Ziziphus sp.
Ximenia americana
Hyphaene crinita

Climbers included Combretum sp. Strophanthus sp. Hippocratea sp. and Cissus sp.

Game animals seen in the area during the period of investigation were:

Kudu, Duiker, Grysbok and Baboons
and the spoor of Bushbuck and Impala also noted.

Elephants passed regularly through the area on their way to and from water.

Mean maximum and minimum temperatures recorded in a Stevenson screen together with the mean relative humidities were as follows:-

| | October | November |
|-------------------|---------|----------|
| Mean max. °F. | 100.3 | 93.8 |
| Mean min. °F. | 72.9 | 72.0 |
| Relative humidity | 38% | 47% |

Method

The tsetse were caught by fly boys, with the aid of a bait ox in the case of G.pallidipes, stored singly in 3xl" glass tubes and brought to the laboratory for dissection.

In all the morsitans dissections, both the mouth parts and the guts were examined and an estimate of the proportions of the trypanosome species thus obtained.

In the pallidipes dissections, however, due to the necessity for speed, only the mouth parts were examined.

Horse serum, a mixture of 80% alsevers solution, 10% horse serum and 10% glycerine or normal saline containing 10% glycerine, were used as a medium in which the dissections were made.

Results

1. G.morsitans

| | Males | Females | Total Flies |
|---------------|-------|---------|-------------|
| No. dissected | 391 | 114 | 505 |
| No. infected | 50 | 17 | 67 |
| % infected | 12.8 | 14.9 | 13.3 |

The trypanosome species, as identified by the site of infection in the fly (Hoare 1957) were as follows:-

| | Males | | Females | | Total Flies | |
|--------------|---------|--------------|---------|--------------|-------------|--------------|
| | T.vivax | T.congolense | T.vivax | T.congolense | T.vivax | T.congolense |
| No. infected | 22 | 28 | 8 | 9 | 30 | 37 |
| % infected | 5.6 | 7.2 | 7 | 7.9 | 5.9 | 7.3 |

Of the infections assumed to be due to T.congolense the mouth parts of 14 flies were found not to contain trypanosomes on dissection. These infections, then, cannot be said to have been 'mature'.

2. G. pallidipes

| | <u>Males</u> | <u>Females</u> | <u>Total Flies</u> |
|---------------|--------------|----------------|--------------------|
| No. dissected | 444 | 718 | 1162 |
| No. infected | 38 | 81 | 119 |
| % infected | 8.5 | 11.3 | 10.2 |

Discussion

It should be noted that in both species of tsetse the female flies showed a slightly higher infection rate than the male flies (though in G. morsitans the percentage is based on a rather small sample).

In G. morsitans the rate of infection with T. congolense is higher than with T. vivax.

No salivary gland infections and hence no polymorphic trypanosomes (T. brucei and T. rhodesiense) were detected by dissection. This group is obviously present in the area, however, since an infection in one of the dogs belonging to Mr. Simmonds was identified from a blood smear as T. brucei.

APPENDIX I

The method employed in obtaining living trypanosomes which were sent to Dr. Gordon of the Liverpool Tropical School was as follows:-

The mouth parts of the tsetse flies were dissected in the manner described in a previous report. The medium used in the majority of cases was alevers solution 80%, horse serum 10% and glycerine 10%. Those mouth parts found to be positive were transferred to a cavity slide and teased up as finely as possible. The contents of the cavity were then sucked into the end of a very narrow glass tube by means of a rubber teat and the end of the tube sealed in the flame of a gas blow lamp. The tube was then marked with a file well above the column of fluid, the open end sealed, and the now closed capillary stored in alcohol and dry ice at a temperature of -79°C . The dry ice was kept in thermos flasks of 1 gallon capacity in a refrigerator. These flasks contained three metal dioxies with clip on lids sitting one on top of the other. The top and bottom dioxies were filled with dry ice and the centre one with a mixture of dry ice and alcohol, in which the capillary tubes containing trypanosomes were stored.

Trypanosomes can be kept deep frozen in this manner for an indefinite period provided the dry ice is replenished.

APPENDIX II

Summary of data obtained to date from Glossina dissections carried out in Southern Rhodesia.

| Place | <u>G.Morsitans</u> | | | <u>G.pallidipes</u> | |
|-------------------------|--------------------|-----------|------------|---------------------|------------|
| | Kariangwe | Kariba | Rekomitjie | Kariangwe | Rekomitjie |
| Months | May/June | Aug/Sept. | Sept/Dec. | Oct/Nov. | Sept/Dec. |
| Mean max. °F. | 80.65 | 89.3 | 97.0 | 92.4 | 97.0 |
| Mean min. °F. | 49.7 | 64.5 | 72.5 | 67.9 | 72.5 |
| RH % | 74 | 37.5 | 42.5 | 57.5 | 42.5 |
| <u>Infection Rate %</u> | | | | | |
| Total flies | 14.9 | 17.7 | 13.3 | 23.5 | 10.2 |
| Males | 15.7 | 17.8 | 12.8 | 21.0 | 8.5 |
| Females | 10.2 | 17.5 | 14.9 | 27.7 | 11.3 |
| <u>T.vivax</u> | 5.1% | 11.4% | 5.9% | 17.3% | No data |
| <u>T.congolense</u> | 5.1% | 6.1% | 7.3% | 5.1% | No data |
| <u>T. brucei</u> | - | - | - | 1.1% | No data |

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