The Incidence of Trypanosome Infections in *Glossina pallidipes* (Aust.)

Dec. 1958

B. Leggate.

Recent survey work by D.F. Lovemore in the northern tsetse belt of this country has shown *G. pallidipes* Aust. to be of more widespread occurrence than was previously thought. (Lovemore D.F. 1957) He has demonstrated that this species, although not readily attracted to man, can be caught in considerable numbers under suitable conditions. He found that in areas where *pallidipes* had been recorded in small numbers and at irregular intervals, it could be taken with surprising frequency by using bait animals and carrying out the catches at dawn and at dusk. The occurrence of this cryptic population of *G. pallidipes* convinced him that the economic importance of the species in this country had been generally underestimated.

In order to assess the role of a tsetse species in the epizoology of trypanosomiasis, a knowledge of the incidence of trypanosome infections in the fly is essential. In view of this, dissection of some 400 flies was carried out at the research station at Kariangwe in the Binga district of S. Rhodesia.

Area from which flies for dissection were taken

Lovemore states that, "thicket or the edge of thicket would appear to be essential for breeding, resting and as a dry season refuge for *G. pallidipes*" (Lovemore 1958) A portion of the fringe vegetation of the Gwabuba and Mbelele rivers, situated some eight miles east of the research station satisfied these requirements and was therefore chosen as the source of flies for dissection.

The main species which constitute this type of vegetation are:- *Albizzia spp.*, *Acacia sieberiana*, *Mimusops zocheri*, together with thicket species such as *combretum mossambicensis*, *Feretia aeruginescens*, *Grewia* spp. and *Popowia obovata*.

Game animals most commonly seen in the area are:- duiker, bushbuck, impala, kudu, waterbuck, warthog and occasionally elephant.

The average temperature and relative humidity as recorded by a whirling hygrometer at the start and finish of each catch are as follows:-

	Start(5.30p.m.)	finish (6.30 p.m.)
Temp	81.6 °F	75°F
rel. humidity	50%	75 %

Temperatures recorded in the stevenson screen at the research station and mean relative humidities at 7.0 a.m. may also be quoted.

	October	November
mean max.	91.3 °F	93.5°F
mean min.	66.6 °F	69.2°F
Re. humidity	50%	65%

/Incidence of .....

Incidence of trypanosomes.

The method used for the dissection of tsetse flies has been described in a previous report (Leggate and Lovemore 1958) and will not be repeated here. As no standards are available for G. pallidipes, it was not possible to assess the age and hunger stage of the flies, but the mouth parts, salivary glands and gut of each were examined for the presence of trypanosomes.

Of 370 G. pallidipes examined 23.5% were found to be infected Of these infections a very large proportion (17.3% of all flies) appeared to be due to the vivax group, only 5.1% being attributed to the congolense group. Four salivary gland infections were detected (1.1%) these trypanosomes being assigned to the brucei group.

The infection rate in 137 female flies was found to be higher (27.7%) than in 233 male flies (21%), but it is possible that these are not sufficiently large samples to give an accurate picture. Vanderplank (1947) in Tanganyika, found the infection rate to be higher among male flies, and Pires et al (1950) found the infection rates in male and female pallidipes to be the same.

Discussion

While it is possible that not all infections recorded were 'mature', 23.5% would seem to be a high rate especially compared with the results of other workers. Whitnall (1934) working in the Umfolosi Game Reserve in Zululand, found a general infection rate in G. pallidipes of 4.13%. While in the Sitatonga district of P.E.A. Pires et al (1950) found only 3.6 % of flies to be infected. In both instances the vivax group predominated, but not to the extent that was found at Kariangwe during the work under discussion.

The brucei group, indicated by the presence of infected salivary glands, is generally of low occurrence in wild tsetse populations, but again, 1.1 % is higher than recorded elsewhere. During the dissection of some 3,359 pallidipes by Pires in the work quoted above, no salivary gland infections were recorded, and Whitnall (1932) found only four brucei group infections in 1606 flies taken from various localities in the Umfolosi Game Reserve, Zululand.

A comparison of infection rates in G.pallidipes and those in G. morsitans in the northern tsetse belt of S. Rhodesia is also of interest. A batch of 500 male G. morsitans from Kariangwe and one of 400 from Kariba gave infection rates of 15.7% and 17.5% respectively. No salivary gland infections were recorded from these flies, yet the dissection of only 370 G. pallidipes yielded four such infections. This would suggest that the role of pallidipes in the transmission of brucei group trypanosomes viz. T. brucei and T. rhodesiense in this country, and hence in the epidemiology of human sleeping sickness, is of importance and warrants further investigation.

Recent work by Robertson and Baker (1958) on human trypanosomiasis in S.E. Uganda has indicated that G. pallidipes in playing a major part in transmission in this area. Here game is not thought to be the main reservoir of the trypanosomes and amongst the fishing population man-fly-man passage is probably continuous. If it is assumed that T.rhodesiense occurs in game animals in S. Rhodesia, the very restricted contact between G. pallidipes and man in this country might, in part, explain the low incidence of human trypanosomiasis here.

It would be of interest, it is felt, if some attempt were made to isolate T. rhodesiense from tsetse flies, especially in an area from which human trypanosomiasis has not been recorded for a number of years. One of the few recorded cases of recovery of undoubted

T. rhodesiense from a wild Glossina is that of Jackson (quoted by Mackichan 1944) who fed batches of pallidipes from E. Uganda on rats. Five strains of brucei sub group were recovered and tested on human volunteers, one of whom showed trypanosomes in the blood and exhibited signs of human trypanosomiasis.

References.

Buxton P.A. The Natural History of Tsetse Flies.

Mackichan I.W. (1944) Rhodesian sleeping in east Uganda. Trans. Roy. Soc. Trop. Med. & Myg. 38.

Pires et al. (1950) Posicao actual da tse-tse na area da Sitatonga circunscricao do Mossurise. Estudo comparativo da infestacao por trypanosomas patogenicos nas G. morsitans, G. pallidipes, G. brevipalpis & G. austeni.

'Mocambique' 62.

Robertson D.H.H. & Baker J.R. (1958) Human trypanosomiasis in S.E. Ug Uganda. Trans. Roy. Soc. Trop. Med. & Hyg. 52. 4

Whitnall A.B.M. (1932) The trypanosome infections of G. pallidipes in the Umfolosi Game Reserve, Zululand. 18th Rep. of Dir. of Vet. Serv. and Anim. Ind. S.A. Aug. 1932.

Whitnall A.B.M. (1934) ditto

Onderspoort J. Vet. Sci. & Anim. Ind. 2 1. Jan.