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<b>Autor:</b>	Glasgow, J.P.
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## Miscellanea.

### Seasonal Changes in the Breeding Places of *Glossina morsitans morsitans* Westwood.

By J. P. GLASGOW

East African Trypanosomiasis Research Organization, Tororo, Uganda

At Matari ( $5^{\circ}7'S.$ ,  $34^{\circ}50'E.$ ) near Singida, Tanganyika, this Organization has a station for collecting tsetse puparia. Matari is a small enclave nearly surrounded by *Brachystegia*—*Isoberlinia* woodland inhabited by *G. morsitans morsitans*. Mr. A. M. FUNDISHA, who is in charge of the station, buys the puparia from African juveniles, and posts them once a week to a number of addresses where they are required for investigations. The number of puparia dispatched varies according to demand from 500 to 5000. In September 1956, at the suggestion of Mr. G. R. JEWELL, Mr. FUNDISHA began to keep records of the type of site in which the puparia had been found. Four types of site were recognized: under logs, rot-holes in trees, animal burrows (mainly those of aard-vark, *Orycteropus afer* [Pallas]) and rock-sites, by which are meant shady places beneath rock outcrops.

Matari, at 5000 ft. above sea level, is towards the upper altitude limit of *G. morsitans*. The rainfall is rather less than 750 mm. per year, falling in less than 50 days in the 6 months December—May (ATLAS OF TANGANYIKA, 1957).

During the rains and the early part of the dry season, logs are the only fruitful breeding places. At a time which can be as early as July or as late as September, logs decline in popularity. The available facts are presented in Fig. 1. In 4 years out of the 5 covered by these records, rot-holes became temporarily the most productive type of site, producing for a period 60% or more of all the puparia. Except in 1959, burrows and rock-sites were of little importance. In 1959, however, demand was low. The mean numbers collected per week, during the dry seasons of the 5 years 1956-60, were respectively 2818, 4033, 2064, 752, 1861.

Early in the dry season grass fires swept through the collecting areas. The exact date of the fires varied considerably during the five years considered here, they were earliest in 1956 (on 21st June) and latest in 1958 (on 22nd August). In spite of regrettable gaps in the records, it is clear that this event closely preceded the abandoning of logs as the sole breeding site. The record is complete only in 1958, but in 1957 and 1959 100% logs was recorded the week before the fire and in 1960 100% logs was recorded in the week of the fire. This could, of course, be coincidence: the shift in breeding site could be a response to a general drying up of which the fires are only a symptom. But the grass fires so change the appearance of the country, particularly, we may suppose, as it looks to a larvipositing female, that one is disposed to regard the change as a consequence of the fires. The return to the logs seems to be related to the

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*Fig. 1.* The percentage of the weekly collection of puparia of *G. morsitans* reported from 4 types of site, rot-holes in trees, under logs, animal burrows and rock sites, in 5 dry seasons 1956-60. The downward pointing arrows indicate weeks in which rain fell, the week's total, in millimetres, being entered near the head of the arrow. The upward pointing arrows indicate the first week in which grass-fires were reported in the collecting area.

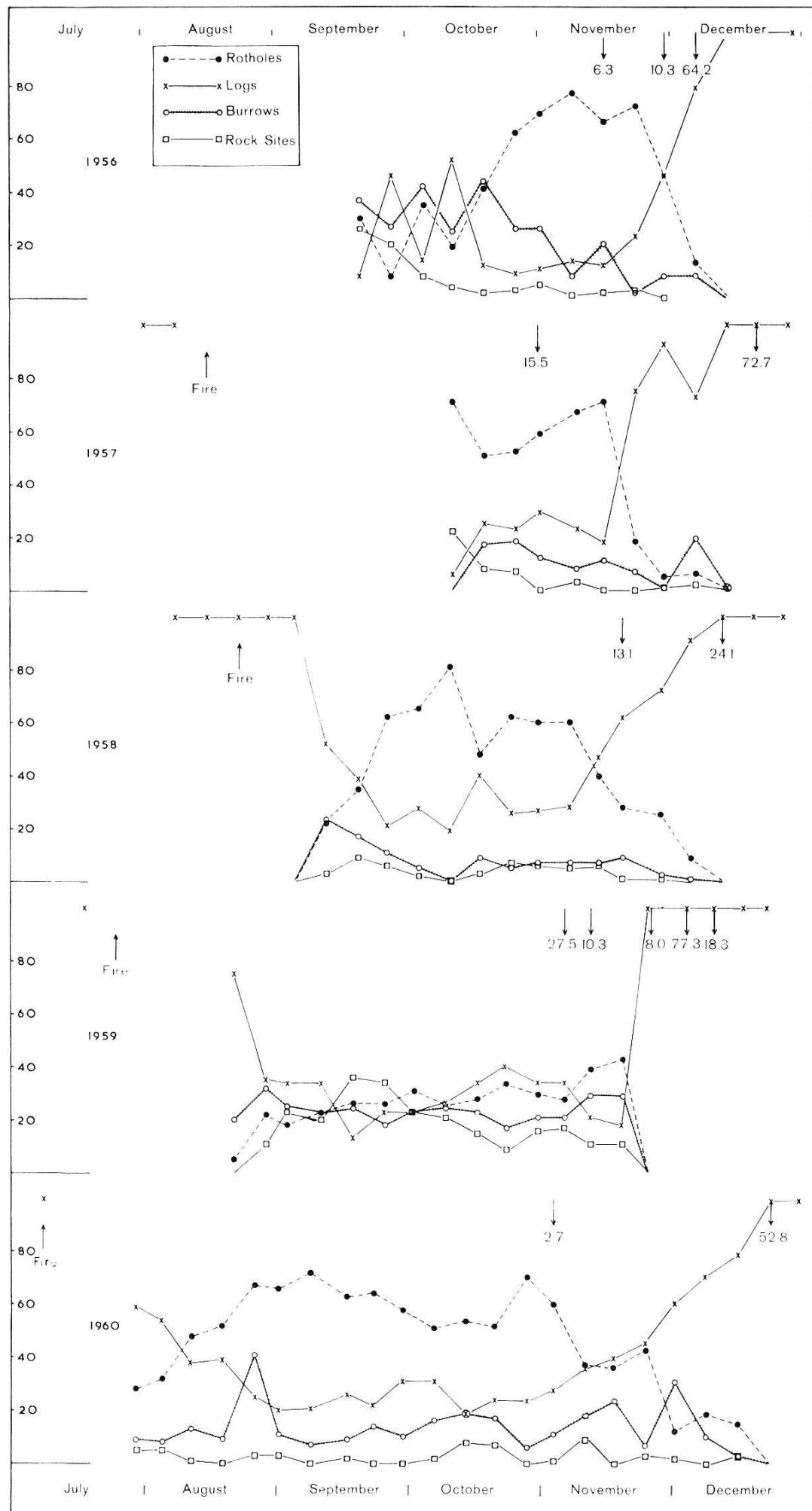


Fig. 1

break of the rains, as it was early in 1959, when the rains were early, and late in 1960 when the rains were late. But it cannot be due to grass growth; in 1960 the return to logs was complete before any grass could have grown.

The reader is to bear in mind that these are records of the places which professional collectors found it most profitable to exploit. The relation between their findings and the true distribution of puparia is unknown. JEWELL (1958) working only a few miles from Matari, found that the same collectors found only a portion, not more than 50% and perhaps as little as 10%, of all the puparia present in an area. It appeared that the yield could be doubled by completely effective searching of the sites which were searched, and it appeared possible that substantial numbers might exist in other, diffuse sites. Nevertheless, when all allowances have been made, it does seem that an important shift in breeding sites does take place in the dry season. The importance assumed by rot-holes recalls the dry-season importance of these sites to *G. swynnertonii* Austen in Shinyanga (BURTT, 1952).

In general the data presented in Fig. 1 confirm the finding of HARLEY (1954) at Mishugaa, only some 10 miles NE of Matari. What is new is the dramatic suddenness with which logs are abandoned and reoccupied.

Records are presented of the places in which professional collectors find puparia of *G. morsitans* near Singida in Tanganyika. For most of the year sites under logs are the only productive ones, but about August (early dry season) other sites, of which rot-holes in trees seem to be most important, become prominent. In November or December (break of the rains) logs regain the monopoly. The movement away from the logs coincides with grass fires, but the return to logs corresponds only in a general way with the onset of the wet season.

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## Sur quelques *Culicoides* (Diptera: Ceratopogonidae) du Haut-Valais.

Par M. KREMER et J. CALLOT

Institut de Parasitologie et de Médecine Tropicale  
Faculté de Médecine de Strasbourg.

La famille des *Ceratopogonidae* (= *Heleidae*) comprend de nombreuses espèces vulnérantes dont certaines appartenant au genre *Culicoides* Latreille, sont vectrices de filaires de l'homme dans les régions tropicales ou de filaires des animaux domestiques dans nos pays. C'est ainsi que MOIGNOUX a étudié ici même (1952) le vecteur des Onchocerques du cheval du Midi de la France.