

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY
---	-------------------------

1. SUBJECT CLASSIFICATION	A. PRIMARY Agriculture	AL72-0000-0000
	B. SECONDARY Pests of plants	

2. TITLE AND SUBTITLE
Techniques for collecting and handling Glossina morsitans pupae in the field

3. AUTHOR(S)
Nkungu, H.M.S.

4. DOCUMENT DATE 1974	5. NUMBER OF PAGES 3p.	6. ARC NUMBER ARC
---------------------------------	----------------------------------	----------------------

7. REFERENCE ORGANIZATION NAME AND ADDRESS
USDA/ARS

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)

9. ABSTRACT

10. CONTROL NUMBER PN-RAA-569	11. PRICE OF DOCUMENT
12. DESCRIPTORS Larvae Tsetse flies	13. PROJECT NUMBER
	14. CONTRACT NUMBER PASA RA-1-00 Res.
	15. TYPE OF DOCUMENT

TECHNIQUES FOR COLLECTING AND HANDLING *Glossina morsitans*
PUPAE IN THE FIELD

BY H. M. S. NKUNGU

INTRODUCTION: 1974

1. The pupae which we are particularly interested in are those of *Glossina morsitans morsitans*. And it is for this reason that we restrict ourselves only to the areas infested by this particular species. Until now our main collecting station has been Swapilo; an area about 38 kilometres South of Handeni. Mzeri Hill MACO Ranch which has been earmarked as our field release site is another alternative area where crews have been exhausting pupae although not in encouraging numbers. Pupa searches were also conducted around Chanzu, Doma and Dakawa in Morogoro Region but with negative results. These areas have, since, been abandoned.

(A) SEARCHING PROCEDURES:

Searching for pupae usually starts in the morning normally at about 8.00 a.m. when everybody is strong and ends at about 2.00 p.m. At the start of the searching either the crew goes in twos, threes, fours or some go individually depending on how courageous one is to walk alone in the bush. One crew just disperses to any direction where one thinks one is likely to pick many pupae. Fortunately enough the collecting crew has had extensive familiarity with the bush that they know exactly the prospective areas where they trully pick great many pupae.

(B) COLLECTING PROCEDURES:

In the search for pupae two (2) tools are used; a trowel which is used to scratch, dig and scoop the suspected sand or soil and put in the sieve and a sieve which ^{is used} for separating the viable pupae and shells from sand.

On reaching a suspected vicinity, first one removes larger objects obstructing the site such as dead twigs, branches and dead leaves and then inspects the surface for possible pupae and shells. Afterwards the site is scrapped and searched, then dug to a depth of from half an inch to one inch by using a trowel and the loosened earth carefully searched through and finally sieved after which viable pupae and shells are left behind in the sieve whereby live pupae are collected. When finished, the site is restored pretty much to the condition it was in at the start. Search in rot holes in trees entails scooping out the loose material from inside the tree on to the ground searching through it carefully and afterwards replacing it.

It is important to note that pupae are not handled, but are scooped up into a glass tube with the aid of a trowel.

(C) SELECTION OF SITES:

Provided there is sufficient shelter pupae are picked in great numbers under fallen logs in deciduous thickets, under logs in the open, at tree bases, under exposed tree roots, under leaning trees, in rock shelters and very many in warthog hole or hidings.

Greater numbers of pupae are procured during the dry season. During the wet season the pupae of tsetse are scattered so widely through the floor of the general woodland that searches by ordinary means produce but little results.

There are three times during the year which are particularly likely to change the kind of breeding sites chosen by female flies which affects the collection of pupae.

- (i) The break of the "short" rains and the flush of new foliage. During this time larvae are deposited widely through the floor of the general woodland and are difficult to find in large numbers.

- (ii) The change from rainy season to early dry season when conditions are cool and there is progressive leaf fall. Larviposition starts at this time and again large numbers are difficult to find because of wide dispersal of flies.
- (iii) The sudden reduction of shade as a result of grass fires at the end of July at a time when temperatures are rising, conditions become more arid and cool places are very localized. It is during this time that larviposition is very concentrated. Pupae are obtained from warthog holes, under fallen rocks, in rot holes and other areas mentioned previously.

(D) HANDLING OF COLLECTED PUPAE:

When pupae are collected from the field and put in glass tubes, they are taken to the camp at the end of the day's work. Each individual cares for his own collected pupae. After reaching the camp every individual sorts out the likely viable pupae and throws the damaged and those which might have emerged and finally counts them. Numbers of each person are recorded and added to his tally.

Pupae then are put in petri dishes and stored in Paraffin operated Electrolux refrigerators which are always taken with the crews to the field. Temperature in the refrigerator is kept at 25°C; just enough to inactivate the growth of the young fly inside the puparia.

After a week of extensive collection, pupae are ready for being transported to the laboratory. They are put in petri dishes by having a soft piece of paper under and above the pupae covered by the petri dish lid. Then tape is applied around the petri dish. This is to protect the pupae from bouncing on the sides in which case they can get badly damaged. The petri dishes are finally put in boxes made of polyform material which is capable of keeping the temperatures inside it unchanged.

(E) PRECAUTIONS:

- (i) Pupa collection is only done from known areas i.e. areas infested only with Glossina morsitans morsitans. The collected pupae are further checked and any pupa above or below the normal known size is carefully noted, weighed and the offspring studied. If the young fly is of a different species then it is separated. This precaution is taken into consideration because any interference by another fly species is likely to jeopardize our Project.
- (ii) Temperature in the Field Electrolux refrigerators is always controlled to around 25°C; just enough to inactivate the growth of the young fly inside the puparia. Very high temperature speeds emergence of young flies and very low temperature either slows down emergency or kills completely the young fly.

2. (A) RESULTS:

Appended is a graph showing the number of pupae collected since August, 1972. Up to now we've collected a total number of 57,642 pupae from Swagile and Mzeri Camps. The highest figure we've ever collected per month is 11,786. This figure was obtained this September. Ecdysis Percentage is shown in red ink.

From the graph it appears that the best months for conducting pupae searches are August, September, October and November. It is evident that this period actually embraces the dry part of the year. But sometimes January, February and March also produce good results.

3. TRAINING OF FIELD STAFF:

Actually there is no specialized system of training Field Staff except that the new chaps are just instructed practically and learn by experience to search under logs, in rotholes, under leaning trees and branches and in other locations. As long as the new person tries again and again his day to day collection definitely improves. Thus more experience higher production.

SUMMARY:

Based on our experience in attempting year round monthly collections, there are certain times of the year when pupae collection is impractical. Therefore, we feel more can be accomplished by utilizing, trained men and additional personnel during optimum pupae periods in our research area. Therefore, during this month we increased our Field crew size by 10 men and succeeded in obtaining by far the largest number of pupae ever collected an equal period of time.