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# A NEW COLLECTING TECHNIQUE FOR THE STUDY OF ADULT MOSQUITOS (WITH A NOTE ON THE TRANSPORTATION OF LARVAE IN THE FIELD)

by

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The need for a technique whereby large numbers of mosquitos could be quickly collected with a minimum of handling and in good condition, was responsible for the development of a method used successfully in Afghanistan. It is believed that this technique will also lend itself to quantitative and qualitative studies of mosquito populations under the conditions herein specified.

This technique applies principally to structures which are tightly made, particularly mud-walled buildings and also to caves. Therefore, its greatest use would seem to be in the Middle East and Africa, where this type of structure is common.

Briefly, the technique depends on smoking the mosquitos out of their resting place.

The structure from which the collection is to be made is darkened by blocking all cracks, windows and doors except for the one where an exit trap is to be placed. It has been found that stuffing these openings with straw or hay is satisfactory. Over the door, inside and outside, several lengths of cloth are hung to block out the light but allow the investigators to enter freely. A trap with a funnel-like opening (slit types were found to allow mosquitos to escape) is mounted outside with the opening facing the structure and either at a window or on a hole in the roof. A square trap with outside dimensions of about 15" has been found to be most satisfactory. A single large nail above the cage and one below

with a string from one to the other behind the trap is sufficient support. The opening between the cage and the outside wall is stuffed with hay or straw and/or one of the cloths. If too much sun is beating on the cage, a light-coloured cloth may be laid on top of it.

Once the cage is in place, the smoke generator which consists of a kerosene tin with a hinged top, compactly stuffed with straw or hay and with half-inch wide slits cut in the sides, is lighted. The tin should be placed at the furthest point from the single source of light, i.e. the window with cage. As the structure fills with smoke, the mosquitos and other insects seek to escape and fly to the only light source. Generally within 15 to 20 minutes, a very high proportion of mosquitos is captured. Before removal of the cage, it should be ascertained whether any adults are resting in the opening leading to the cage. This precaution has not proved as necessary with roof openings as the mosquitos fly easily into the cage with its inverted funnel. A bit of cotton suffices to block the cage opening during removal.

A wooden frame has proved to be satisfactory for a trap of the type used in this study. The covering material should be a wide-meshed net that will not impede the flow of smoke nor the passage of light. The funnel should be eccentric, so that its opening will be near the top of the cage. In the rear and sides of the cage, holes are cut and edged with adhesive tape and blocked with cotton during collecting. These holes are to allow the entrance of a sucking tube to transfer the mosquitos. A sleeve may be made if so desired.

If the investigator wishes, it has proved to be a simple matter to separate the mosquitos by (a) species or (b) on the basis of whether they are engorged, gravid, with a partly digested blood meal, or unfed, or (c) by sex.

The principal uses of this method will be:

1. To collect large numbers of living mosquitos in a short time for use in various tests.

2. To make absolute population studies of structures. This requires further investigation by us as well as by other persons interested in the method.

3. To remove temporarily any part or all of a population of mosquitos in a village, or part of it, and subsequently to determine what the movement of a new population or the captured and released population might be.

In practice, this method has proved invaluable in Afghanistan. Adult A. superpictus showed a survival rate of over 90 per cent. (75 female adults) over a period of nine days; 100 per cent. survival on the second day after being used in a susceptibility test. From this data, it seems that exposure to smoke of the type used (i.e. from hay and straw) has little or no effect on the survival of at least this species. Other species have also been collected in small numbers but these were not kept alive to check longevity.

I would like to express my thanks to Mr Peter F. Beales, Technical Assistant, ATME No. 3, for his help in developing this technique.

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## A NOTE ON THE TRANSPORTATION OF LARVAE FROM THE FIELD

Generally, there has been little success in transporting mosquito larvae great distances for use in susceptibility tests or for rearing for either taxonomic studies or insectary colonization.

A first experience in Nepal has proved the value of the use of pint size thermos bottles for the transportation of larvae over bad roads, in a jeep, from an altitude of over 8000 feet and for a distance of more than 100 miles. Both anopheline larvae of a new species and culicine larvae, also of a new species were subsequently reared to adulthood. Survival of all instars of the larvae and even of pupae was high but no absolute figures are available.

In Afghanistan, the technique was successfully applied to the larvae of A. superpictus, a stream breeder. Larvae were transported from Pulikhumri to Khanabad, a distance of about sixty miles over rough roads in the cab of a pick-up truck. Subsequently, it was found that there was no larval mortality on the trip and even first instar larvae were reared to adulthood from this collection. Later, more larvae of this species were taken in the village of Shorak Ab, some ten to twelve miles from Khanabad, transported over a very rough road and used in a larval

susceptibility test. Thirty of thirty-two larvae in the control survived and most of these were reared through to adults.

The depth of the water in the thermos seems to be important in long distance transportation and limited study indicates that three inches is about the optimum. For shorter distances, more water can be carried. The thermos should be of the narrow type and should be transported in the upright position.[1]

[1] It is possible that the smooth inner surface and the constant temperature of the thermos flask are responsible for the better survival of larvae. On the other hand thermos flasks are more bulky and fragile than the standard 3 x 1 flat bottomed glass tubes in wooden containers or the new polythene models with a plastic hinged cap. /Editor's remark/