

THE MOSQUITO CONCENTRATOR

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In recent years, more and more studies concerning mosquitoes have demanded that new techniques be developed for gathering mosquitoes. A great variety of mosquito traps and sweepers have now been developed, including modified vacuum cleaners mounted on tractors and trucks for collecting resting adults from vegetation (Bidlingmayer, 1966), large funnels with attached bags mounted on motor vehicles for collecting flying adult mosquitoes (Chamberlain and Lawson, 1945; Sommermen and Simmet, 1965; Nelsen, 1966), modified battery-powered clothes brushes to act as small aspirators (Husbands, 1958) or similar devices designed expressly for this same purpose (Nelson and Chamberlain, 1955), and even a 3-volt battery-powered suction apparatus was developed to collect flying mosquitoes found in the foliage near certain tree trunks (DeFreitas, Shope, and

Causey, 1966). Last year Hayes, Kitaguchi and Mann (1967) produced a 6-volt mechanical aspirator for collecting adult mosquitoes at resting sites.

DESCRIPTION OF DUAL PURPOSE CONCENTRATOR. This device seems most fittingly to be described as a mosquito concentrator. It is a lightweight device that can be used interchangeably as a type of light trap for collecting night-flying mosquitoes or as an assist for gathering day-biting or day-resting adult mosquitoes.

The concentrator is constructed of a motor and light unit from a CDC miniature light trap (Sudia and Chamberlain, 1962) mounted in a plastic bottle which acts as the motor and fan housing. A small wooden skeleton provides support for the plastic bottle and the two batteries are carried below as a part of the unit itself. Although only one battery is required for operation of the unit, a second is carried as a spare. One-quart cardboard cylinders are attached to the mouth of the plastic jar by friction. The bottoms of

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these cartons are removed and circular pieces of window screen cut to size are substituted in their place.

Figure 1 shows the plastic jar housing,

carton the collecting net is removed and the carton lid put in place. The carton may then be removed. More specimens may be added to the same carton by

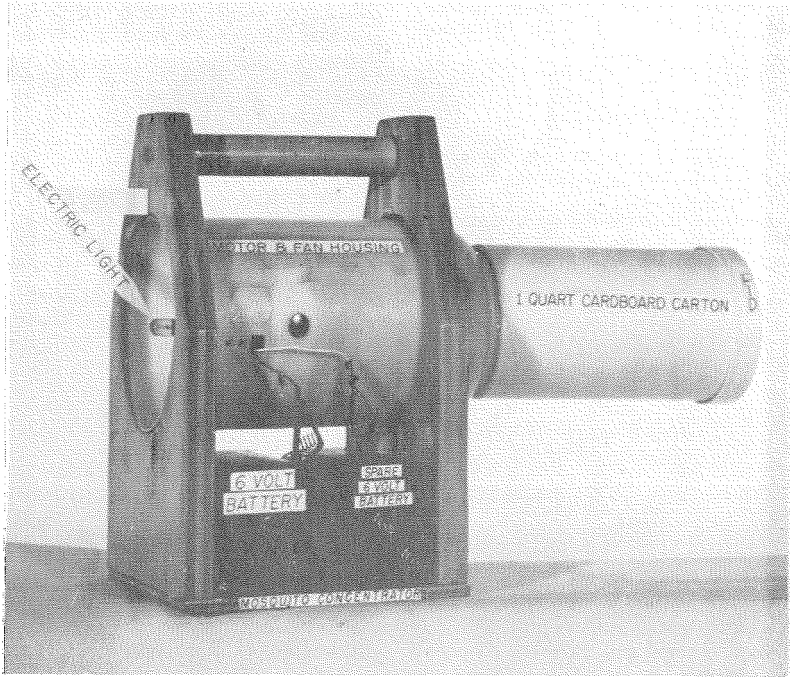


FIGURE 1

the light, batteries and wooden structural skeleton, and carton attached. The fan and light are activated by attaching the "alligator clamps" to the battery terminals. Since the direction of the fan and air flow is controlled by the wires which are attached to the battery terminals, direction of air flow is controlled by attachment of the clamps to appropriate terminals. Typically, the day-resting and day-biting mosquitoes are first caught in an insect collecting net. The motor is then engaged to cause air movement toward the screen bottom of the carton. The net containing the mosquitoes is then slowly passed over the mouth of the carton and the mosquitoes are gently drawn into the carton. When the mosquitoes are all in the

leaving it attached to the concentrator and starting the motor; then very slowly remove the lid and proceed to add mosquitoes as described above.

If the concentrator is to be used as a light trap, the electrical connectors are attached to reverse terminals and air flow moves in the opposite direction. In this case, a carton with the bottom entirely removed is again attached to the mouth of the plastic jar. The solid circular cardboard lid is removed and a circular piece of screen is fitted in the lid to permit free air movement through the container. Flying mosquitoes attracted to the light are drawn past the light and fan into the carton. When collecting is completed, the carton is removed and a cover is put in

place over the bottom of the carton. A different carton may be used for the specimens collected from the various sites. A fine mesh cloth bag may be tied to the mouth of the plastic jar in lieu of the cardboard container.

In instances where the concentrator is to be used as a light trap for several hours of steady running, larger 6-volt batteries may be attached to the apparatus to accommodate the prolonged needs for electric power. Furthermore, this permits conservation of the power from the lightweight batteries to operate the concentrator during daytime collecting.

RESULTS AND DISCUSSION. The mosquito concentrator has been used to assist in collecting resting and flying adult mosquitoes during the last half of 1967 in Oahu, Hawaii; Taiwan; Okinawa; and Japan. It has been successful in helping to recover large numbers of *Aedes albopictus*, *Culex quinquefasciatus*, and *Armigeres subalbatus*. Some *Culex tritaeniorhynchus* specimens were also recovered but in much smaller numbers due to difficulties in finding their resting sites.

The capacity to collect day-resting and day-biting mosquitoes by this device seems to be limited only by the collector himself. Mosquito specimens are massively gathered by sweeping with a net in dwellings, sheds, in vegetation, etc., and the number thus captured depends on the capability of the collector to find mosquito resting sites. Furthermore, significant numbers of *A. albopictus* have been gathered by using individuals under netting as bait, while sweeping with a net is conducted by a second person. Mosquitoes thus captured are then drawn from the sweeping net into the concentrator.

The major advantage of this device is that large numbers of day- or night-biting mosquitoes may be gathered during daylight hours once the resting sites are

located. Also the removable cartons permit rapid, easy separation of specimens collected from location to location.

It is particularly noteworthy that during the daytime collecting, the only time the battery is connected is during actual transfer of specimens from the net to the carton. This contributes considerably to increasing longevity of the batteries used for operating the machine. Also, the collector has only to carry an insect collecting net during the actual collecting procedure thus permitting greater freedom of action. The cartons also serve as cages for transporting the mosquitoes alive to the laboratory for routine processing as required.

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