

A PORTABLE SUCTION APPARATUS FOR COLLECTING MOSQUITOES

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Most of the mechanical devices used at present to collect mosquitoes employ an electric-powered fan to provide suction. In many of these (*e.g.*, the New Jersey light trap) the insects must pass through the fan blades into a holding cage; in this process specimens are frequently damaged or destroyed. In the apparatus described here, which was designed to collect resting mosquitoes, this has been avoided by placing the holding cage in front of the fan. It was built in northern Thailand, from locally procured materials, and is powered by a 6-volt motorcycle-type storage battery.

DESCRIPTION. The suction apparatus consists of 4 main parts—(1) the pickup tube, (2) cage housing, (3) cage, and (4) blower unit.

(1) The pickup tube is simply a piece of thin wall plastic water pipe, $3\frac{1}{2}$ inches in diameter by 36 inches long. The mouth of this tube can be covered with $\frac{1}{2}$ inch mesh wire cloth to keep out leaves and large insects (Fig. 1, A).

(2) The cage housing is a cylindrical canister, 8 inches in diameter and 8 inches long, constructed from 16-gauge aluminum (Fig. 1, B). These dimensions were dictated by the size of the

cage we used (see below), but they can be varied according to need. The front end of the housing is closed by a hinged lid with a $3\frac{1}{2}$ inch diameter, sleeved opening into which the pickup tube fits snugly. The rear end has a $3\frac{1}{2}$ inch opening over which the blower is attached. A handle for holding the suction apparatus while in operation is fashioned from heavy gauge aluminum and riveted to the side of the canister.

(3) The cage can be made from a cylindrical, 1 gallon, paper ice cream container (Fig. 1, C), or a more durable container can be constructed of sheet aluminum. The bottom of the container is covered with a nylon netting. The top is fitted with an 18-inch sleeve of 6-inch wide surgical stockinette. Both nylon netting and stockinette can be attached to the container with masking tape. The cage is placed inside the housing with the netting against the opening to the blower (Fig. 2). The pickup tube is fitted into the sleeved opening of the hinged lid until about 4 inches protrude through the back side of the lid. The stockinette sleeve of the cage is slipped over this extension of the pickup tube before the hinged lid is closed and fastened shut by means of a hasp attached to the cage housing. Several cages can be used during a single collection period, for the break-open design of this apparatus permits rapid changing of cages. The stockinette sleeve on the cages is knotted to prevent escape of mosquitoes from the cage following its removal from the housing. These cages can be stored in refrigerators or deep-freeze units until the mosquitoes can be conveniently examined.

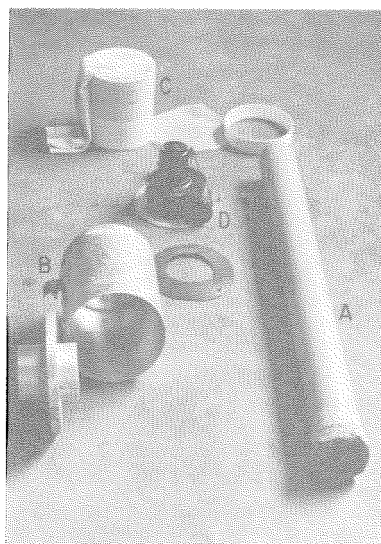


FIG. 1. Component parts of suction apparatus described in text.



FIG. 2. Placing cage in suction apparatus.

(4) Suction for this apparatus is provided by a 6 volt "squirrel cage" blower from a Volkswagen heating unit¹ which is bolted through a gasket, cut from an automobile tire inner tube, over the opening in the rear end of the canister (Fig. 1, D). The motor cycle storage battery providing power for blower can be carried on the waist of the operator in a web belt. Because of the small diameter of the pickup tube, this small motor draws a fairly high velocity current of air into the mouth of the tube. The larger dimensions of the holding cage provide a zone of more static air, which reduces the speed of impact of the mosquitoes against the nylon netting. After being sucked into the cage, mosquitoes tend to move to the sides of the cage where there is little air movement.



FIG. 3. Suction apparatus being used to collect mosquitoes from vegetation.

OPERATION. This apparatus was first used in 1970 to collect resting mosquitoes from a variety of habitats during a study of Japanese encephalitis in Chiangmai valley, Thailand (Gould *et al.*, 1973). Figure 3 shows the apparatus being used outdoors to collect mosquitoes from vegetation. This apparatus can be conveniently used for surveys of the mosquito fauna of an area; it is less selective than other collection devices, such as bait traps, for male as well as female mosquitoes are collected. As an example, tables 1 and 2 summarize the numbers and species of mosquitoes

Table 1.—Numbers of mosquitoes collected with suction apparatus in a village orchard.*

Species	Males	Females
<i>Culex tritaeniorhynchus</i>	..	40
<i>Culex fuscocephala</i>	57	31
<i>Culex gelidus</i>	2	2
<i>Culex whitmorei</i>	..	1
<i>Culex bitaeniorhynchus</i>	1	..
<i>Culex vishnui</i> subgroup	42	2
<i>Aedes lineatopennis</i>	1	1
<i>Aedes vexans</i>	..	2
<i>Anopheles sinensis</i>	2	..
<i>Mansonia uniformis</i>	1	..
Total	106	79

* Saraphi district, Chiangmai, 1400–1405 hours, 15 June 1970.

Table 2.—Numbers of mosquitoes collected with suction apparatus in forest.*

Species	Males	Females
<i>Aedes albopictus</i>	..	2
<i>Aedes mediolineatus</i>	..	2
<i>Aedes (Finlaya) sp.</i>	..	12
<i>Culex gelidus</i>	..	1
<i>Culex tritaeniorhynchus</i>	9	1
<i>Culex whitmorei</i>	1	1
<i>Culex (Culex) sp.</i>	..	1
<i>Culex (Culicomyia) sp.</i>	..	1
<i>Culex (Lophoceraomyia) sp. 1</i>	..	3
<i>Culex (Lophoceraomyia) sp. 2</i>	..	2
<i>Culex (Lophoceraomyia) sp. 3</i>	4	..
<i>Culex (Mochthogenes) sp.</i>	..	1
<i>Heizmannia sp.</i>	..	2
<i>Hodgesia sp.</i>	..	1
<i>Uranotaenia sp. 1</i>	1	4
<i>Uranotaenia sp. 2</i>	..	2
<i>Uranotaenia sp. 3</i>	2	2
Total	17	38

* 57 Km south of Chiang Dao, Thailand, 1300–1320 hours, 17 July 1970.

collected on two occasions in Chiangmai province, Thailand in 1970. While designed primarily to collect mosquitoes, many other kinds of small arthropods are also pulled in by this portable suction apparatus.

Reference

Gould, D. J., Grossman, R. A., Edelman, R. A., Sullivan, M. J. and Muangman, D. 1973. Study of Japanese encephalitis virus in Chiangmai Valley, Thailand, IV. Vector studies. *Am. J. Epidemiology* (In press).

¹ Available from automobile part suppliers or wreckers.