

CAGE EQUIPMENT FOR THE STUDY OF MOSQUITOES INFECTED WITH PATHOGENIC AGENTS¹

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During the course of studies on the transmission of western equine encephalitis virus and of avian malaria parasites by the mosquito *Culex tarsalis* Coq., two types of mosquito cages were designed. These cages were designed with four characteristics in mind: (1) simplicity and durability of construction, (2) ease in handling and feeding adult mosquitoes, (3) sufficient visibility to permit the detection of even slight blood meals in mosquitoes, and (4) minimal opportunity for the escape of infected mosquitoes. The first of these two types of cages served for the emergence of adults and for infection and transmission work with batches of from 25 to 250 mosquitoes. The second type of cage was intended for transmission work with individual mosquitoes.

The first type, illustrated in Figure 1, was a large cage consisting of a cylinder made from 0.020 inch gauge cellulose acetate sheeting, which was fitted and fixed over a wooden disk bottom. The top was a three-quarter inch wooden rim covered with a netting material or plastic screening. A sleeve, consisting of a suitable length of a woman's cotton stocking, was attached to the margins of a four-inch circular hole in the center of the cage. The seam of the cellulose acetate cylinder was readily sealed by running acetone between the lapped edges of the sheet and applying pressure for a few seconds. Similarly, the sleeve was affixed to the cage

with acetone as a plasticizer and by applying pressure against the cloth. The top and bottom were held in place by thumb tacks and, in some instances, with adhesive tape in addition. Cages were prepared in a variety of diameters, ranging from 7 to 12 inches, and were usually 20 inches high. In feeding mosquitoes by placing cotton soaked in sugar water on top of the cage, it was found that plastic screening was preferable to cloth netting since the latter became moldy.

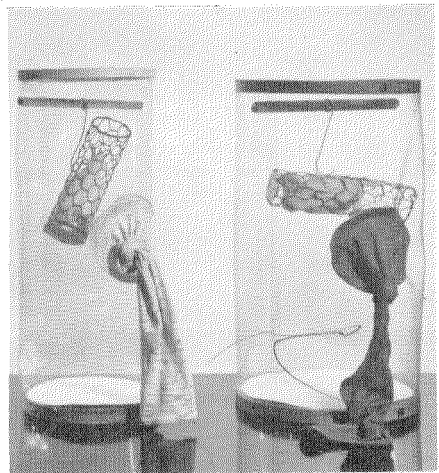


FIG. 1.—Cages for Large Mosquito Lots.

For emergence of adults, pupae were placed in small beakers which were then introduced into the cage through the sleeve. Exposure of birds to mosquitoes in these cages was accomplished by clipping the breast feathers, taping the legs together, and placing the bird in a cylindrical holder made from wide mesh wire cloth. Holders were prepared in a variety

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of sizes to accommodate various sized birds and are illustrated in Figure 1. Small rodents can be exposed to mosquitoes in these cages in a similar manner, providing the holder does not exceed three and one-half inches in diameter. Exposure of larger rodents to mosquitoes requires a larger aperture and sleeve diameter.

A second type of container was designed for work with single mosquitoes and is illustrated in Figure 2. This container

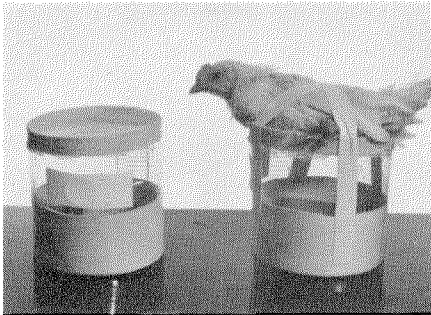


FIG. 2.—Containers for Individual Mosquitoes.

was prepared from a small rectangle of 0.020 inch gauge cellulose acetate through which a three-quarter inch hole had been punched. This sheet was fitted tightly and sealed with acetone over an uncovered half-pint, cylindrical cardboard ice-cream container, forming a cylinder four inches high. The top of the cylinder was reinforced internally with a one-half inch cardboard ring cut from a similar carton. A small paper cup, approximately one and one-half inches in height, was placed in

the ice-cream carton to hold water. The top was then covered with cloth or fiber glass netting which was fixed to the cylinder with acetone. The three-quarter inch hole was covered with a strip of adhesive tape. Mosquitoes were introduced or removed through the hole by use of an aspirator. When cotton soaked with sugar-water was to be placed on top of this container, fiber glass netting was found to be preferable to cotton netting.

Exposure of birds to mosquitoes in these containers was accomplished by clipping the bird on one side, taping the legs together, and taping the bird to the top of the container as shown in Figure 2.

While the first cages of cellulose acetate sheeting were being prepared, it was noted that one lot of 0.030 inch gauge sheeting was toxic to adult mosquitoes. Subsequently, a lot of this heavy gauge sheeting from a second manufacturer was also found to be toxic to mosquitoes. About this time, a paper by Simeone (1953) appeared, indicating that lots of cellulose acetate sheeting which had been treated with diethyl phthalate as a plasticizer in the manufacturing process were toxic to the cigarette beetle, *Lasioderma serricornis*. It was then determined, that the two toxic lots of sheeting had strong and distinctive odors of one of the phthalates. This problem did not manifest itself with sheeting of 0.020 inch thickness or less.

Literature Cited

- SIMEONE, J. B. 1953. The effect of cellulose acetate sheets on *Lasioderma serricornis*. Jour. Econ. Ent. 46(4):709-10.

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