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ESCAPE-PROOF COLONY CAGE (*AEDES AEGYPTI*)

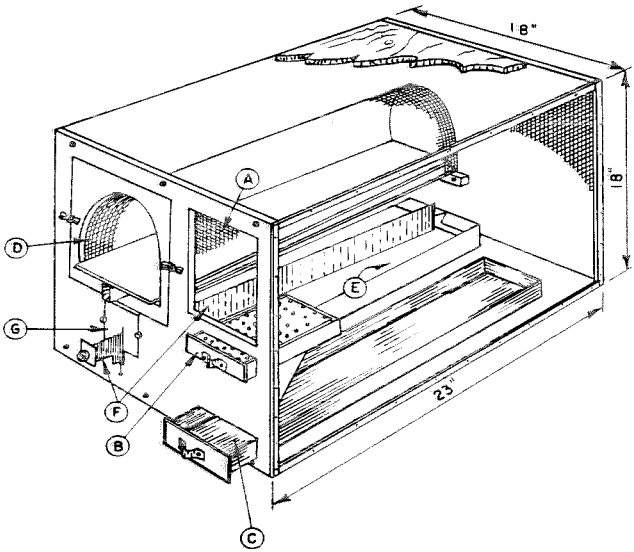
ELMO M. McCRAY, JR.[1]

In laboratory studies on insecticide resistance in mosquitoes, it is frequently necessary to maintain colonies of many strains of the same species in the same room. As each strain represents a potentially different gene pool, a major concern is the possibility that escapees during insertion and removal of food pad, oviposition bowls, and emergence containers may cause a cross-contamination of the different strains. Such escapees cause annoyance to the workers, which is a particular problem during mass rearing for sterile-male-release studies, when numerous colonies must be maintained for egg production (Morlan *et al.*, 1962; Fay *et al.*, 1963). In addition, it is important to avoid the release of laboratory strains in uninfested areas. To minimize these problems, the existing cages (Morlan *et al.*, 1963), which had a port in front closed by a cloth sleeve through which all containers were inserted and removed, were modified.

The modified colony cage (Fig. 1) is 23″ long x 18″ wide x 18″ high, and the top, bottom, front, and back are made of ½″ plywood. The two sides are closed with 20-mesh galvanized screening on a ½″ plywood frame. The sides and the top and bottom are nailed together, and the back and front panels are fastened in place with screws. Openings in the front panel (see figure) accommodate (A) a screened observation port 5″ wide x 8″ high; (B) a stainless steel tray 6″ long x 3½″ wide x ¾″ high, supported inside the cage by a wooden cleat and containing a cellulose sponge to retain liquid food; (C) a stainless steel tray 22½″ long x ¾″ high, for holding pupae; (D) a removable 8½″ wide x 9″ high panel of ½″ plywood which forms a frame attached to the front of a tunnel for the blood-host; (E) a galvanized tray, 21″ long x 4″ wide x 1½″ high, for an oviposition tray; (F) a 22-gauge stainless steel oviposition strip, 22″ long x 3″ high, which is inserted through a ½″ wide x 4″

[1] From the Biology/Chemistry Section, Technology Branch, Communicable Disease Center, Public Health Service, U. S. Department of Health, Education, and Welfare, Savannah, Georgia.

MOSQUITO COLONY CAGE



PARTS LIST

- (A) OBSERVATION PORT
- (B) FOOD TRAY
- (C) TRAY FOR PUPAE
- (D) BLOOD-HOST TUNNEL
- (E) OVIPOSITION TRAY
- (F) OVIPOSITION STRIP
- (G) SLIDING DOOR

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FIG. 1.—Escape-proof mosquito colony cage.

high slot lined vertically with thin latex flaps[2] and held vertically by a notched partial cover of the oviposition tray and by (G), a sliding metal door mounted on the front panel of the cage.

In the initial preparation of a colony, the frame of the host tunnel is removed temporarily to permit placing an empty oviposition tray in the cage. Approximately 10,000 pupae are introduced initially and supplemented at periodic intervals. The tray of pupae is left in place for 3 to 4 days, then removed, drained, and replaced empty. To furnish a blood meal source for the adult mosquitoes, every second day a rabbit is held for 3 hours in the screened tunnel, which, with the exception of being removable, is closely patterned after one previously described (Morlan *et al.*, 1963). The tunnel has a wooden floor and 20-mesh galvanized screen on top and sides. The rear end is closed by a wooden panel and the open end attached to the plywood front panel of the cage. The rear end of the tunnel rests upon a wooden cleat attached to the back of the cage. The rabbit, in a metal tray, is placed on a hinged platform which forms a secondary floor to the tunnel. In use, the platform is wedged upward to force the clipped back of the rabbit against the wire screen through which the adult mosquitoes feed readily.

As a supplemental source of food, the sponge in the food tray is saturated with a 1:1 mixture of honey and water. The

[2] Medium thickness "Dental Dam." Use of trade names is for identification purposes only and does not constitute endorsement by the Public Health Service.

sponge is replaced weekly, and any mold growth on the used sponge is easily removed by a brief soaking in a mild bleach solution before re-use.

To obtain eggs, the oviposition tray is filled with water to a depth of 1¼ inches. Loss by evaporation is replenished through the slot in the front panel. The steel oviposition strip forms a support for wet paper toweling, a single layer of which is pressed on each side of the steel strip to cover it from the top to within ½ inch of the bottom. The paper-covered metal strip is then slid into the oviposition tray.

Observations have shown that over 90 percent of the eggs are deposited on the toweling within ½ inch above the water. Each strip, containing eggs less than 24 hours old, is removed daily by raising the metal door (G) and sliding the metal strip (F) out of the cage. The thin vertical latex flaps which cover the slot effectively prevent any adults from escaping but do not damage the eggs. The egg strip, still adhering to the stainless steel oviposition strip, is then gently rinsed with a 1:1,000 solution of zephiran chloride to inhibit mold growth. Upon removal, the strip is drained of excess water with blotting paper but is kept moist in a closed plastic container for an additional 48 hours to insure completion of embryonic development. The strip is then air dried at 80° F. and 80 percent RH for 4 to 12 hours, after which it is stored loosely at 80–90 percent RH in plastic containers. Eggs on strips thus obtained were found to have 80 percent viability after 2 months storage (Fay *et al.*, 1963).

The use of this cage has prevented the escape of adults without increasing the amount of time necessary for proper maintenance. It has been used with effectiveness in the mass production of sterile *A. aegypti* (Morlan *et al.*, 1962; Fay *et al.*, 1963).

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