Journal of the American Mosquito Control Association, 20(3):321–322, 2004

SCIENTIFIC NOTE

A READILY CONSTRUCTED LARD-CAN TRAP FOR SAMPLING HOST-SEEKING MOSQUITOES

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ABSTRACT: Although lard-can traps have been used for sampling host-seeking mosquitoes for at least a half-century, the materials from which they originally were constructed no longer are available. We therefore devised a method for constructing such devices from parts available in the ventilation industry. These traps, baited with birds and mounted near the tops of trees, were employed to monitor the host-seeking activity of *Culex* spp. mosquitoes. Lard-can traps, constructed in this manner, are economical and sturdy and effectively sample the *Culex* mosquitoes that appear to perpetuate West Nile virus in North America.

KEY WORDS Lard-can trap, West Nile virus, *Culex* sp., mosquito trap, mosquito surveillance

The recent introduction of West Nile virus into North America has emphasized the need for specialized devices that effectively sample host-seeking adult mosquitoes using live animals as bait. Lard-can traps have been used for this purpose for more than half a century (Bellamy and Reeves 1952). The original devices were constructed from the containers used to transport animal fat, but these contained have come into disuse. Later versions were fashioned from custom-formed sheet metal (reviewed by Service 1993). Here we describe a method for constructing such a trap using materials that are readily available from suppliers to the ventilation industry.

The body of the trap (A) is a 24-in[4]. section of cylindrical galvanized ducting 16 in. in diameter (Figure 1)[4]. Collecting chambers (B) that slide into each end of this body are not identical; one fits over the crimped end of the trap body, while the other is crimped to fit within the noncrimped end of the trap.[5] The body of both chambers is a 6-in. length of 10-in.-diameter ducting (F). They are designed to slide over the crimped end of a 10-in. end cap (E) and are attached to the inner face of a 16-in. end cap (H) by a 10-in.-diameter crimped collar (G). The bait is held in a cage (L) that fits between the chambers. Mosquitoes attracted by the bait can enter either chamber through a screen funnel (I) with a screen funnel (I) with a 1-in. aperture. A screen window (D) spaced 1 in. from this aperture prevents access to the bait. The 9 components (C–J) of the collecting chambers are held together by 0.25 self-tapping screws (K). The windows and funnels are cut from 16-mesh aluminum window screening. The funnels are secured by flat rings (C: outer diameter, 9.5 in.; inner diameter, 8.5 in.) and (J: outer diameter, 11.5 in.; inner diameter, 9.75 in.), both cut from sheet metal. These rings are screwed to the area around circular holes cut into the flat ends of standard duct end caps (E: 10 in. diameter, 9-in.-diameter hole), and (H: 16-in.-diameter hole). Note that, in one of the collection chambers, it is part H that must be crimped to fit the noncrimped end of A. In the field, both end caps are secured to the body of the trap with duct tape. The entire trap weighs 15 lbs.[6] The various parts of this trap cost less than $80 (in the United States in 2002) and can be assembled in a matter of hours.

To harvest mosquitoes, each collecting chamber is removed from the body of the trap and placed with its larger end over an inflatable cushion (a child's swim ring) taped to a board. A plastic shower cap, perforated by a 1-cm opening, is slipped over the opposite, smaller end of the chamber. A tube, threaded through a hole in the board, directs carbon dioxide into the chamber from a commercial pressure cylinder. The contained mosquitoes become anesthetized in about a minute. The end cap can then be removed and the mosquitoes harvested by means of a portable aspirator.

We evaluated these traps during 2 seasons along a 0.8-km transect in Cambridge, MA, using rock doves (*Columba livia*) or European starlings (*Sturnus vulgaris*) as bait. The mosquitoes collected were mainly female *Culex pipiens* and *Cx. restuans.* Although some traps caught no mosquitoes, many caught as many as 100 mosquitoes per night (6,623 total). Nearly 5 times as many mosquitoes were collected in the canopy of tall trees (ca. 15 m) than close to the ground (ca. 1.5 m), reflecting previous observations (Main et al. 1966). Lard-can traps,

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[4] 1 in. = 2.54 cm.

[5] All crimped parts are available commercially as standard items.

[6] 1 lb = 0.45 kg.

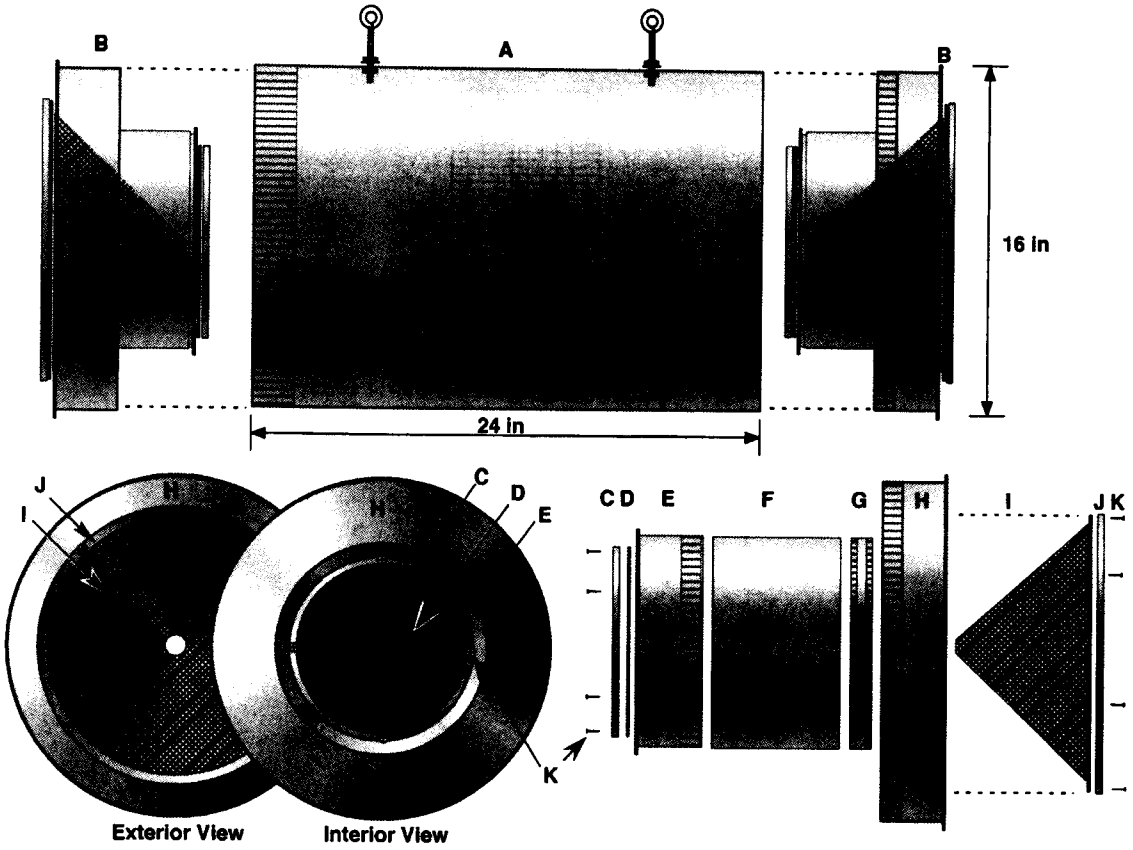

Fig. 1. Design and components of modified lard-can trap. A. Trap body, comprised of a length of galvanized duct (24-in. long × 16-in. diameter) and with 2 eyebolts inserted for mounting. B. Mosquito-collecting chambers, assembled from 9 parts (C–J) and fastened by screws (K). C. Ring, galvanized sheet metal (9.5-in. outer diameter × 8.5-in. inner diameter). D. Panel, 16-mesh aluminum screen (11 in.). E. End cap, galvanized duct (10-in. diameter with a 9-in. diameter opening cut in its center). F. Duct, galvanized (6-in. length × 10-in. diameter). G. Collar, galvanized (10-in. inner diameter). H. End cap, galvanized duct (16-in. diameter with a 10-in. hole cut in its center). I. Funnel, 16-mesh aluminum screen (12-in. diameter with 1-in. diameter hole at its apex). J. Ring, galvanized sheet metal (9.5-in. outer diameter × 8.5-in. inner diameter). K. Sheet metal screws (0.25 in.). L. Animal cage.

constructed in this manner, are economical and sturdy and effectively sample the *Culex* mosquitoes that appear to perpetuate West Nile virus in North America.

This work was supported in part by funds provided by the Centers for Disease Control and Prevention and grant AI 44064 from the National Institutes of Health.

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