OPERATIONAL AND SCIENTIFIC NOTES

A COLLAPSIBLE MODEL OF THE "RED BOX" FOR MEASURING MOSQUITO POPULATION DENSITY [1]

D. J. PLETSCH [2]

Epidemiologic appraisals of malarious areas and evaluations of antimosquito aspects of malaria eradication and control programs benefit greatly from qualitative and quantitative measurement of anophelism. Smith (1939, 1942), working in the Tennessee Valley, found that nail kegs could be effectively used as artificial resting places in measuring adult *Anopheles quadrimaculatus* populations. Goodwin (1942) described a box-type artificial resting place which, as tested in Georgia, proved more attractive to *A. quadrimaculatus* adults than did the other types tested. The device consisted of a 12" wooden, cubical box, open on one side, with all interior surfaces painted red or black. Boxes of this type, constructed of ¼" plywood, show promise for anopheline population measurement in entomologic work carried out in El Salvador by personnel of the Central America Malaria Research Station. However, the space required to transport numbers of these boxes in a truck or station wagon, or by hand, represented a serious disadvantage.

Simple modifications in construction, using essentially the same amount of plywood, have resulted in collapsible boxes which are easily transported and easily assembled for field use. Sixteen or more of the collapsed boxes can be transported or stored in the space required for two conventional boxes (Figs. 1 and 2).

Four sides of the box are ¼" plywood panels, each 12" square. These four panels are joined together by strips of canvas, leather, or plastic-fabric (4" x 12"), stapled or nailed to cover junctions A-A, B-B, C-C, and D-D. The back of the box is a ¼" plywood, 12½" x 13½", joined to the side panels by a canvas "hinge" along the junction C-D. A strip of wood 12" x 1½" x ¾" is fastened transversely to the

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[2] From the Central America Malaria Research Station, San Salvador, El Salvador, Malaria Eradication Program, National Communicable Disease Center, Health Services and Mental Health Administration, Public Health Service, U.S. Department of Health, Education, and Welfare, Atlanta, Georgia 30333. This Program is supported by the Agency for International Development, U.S. Department of State.

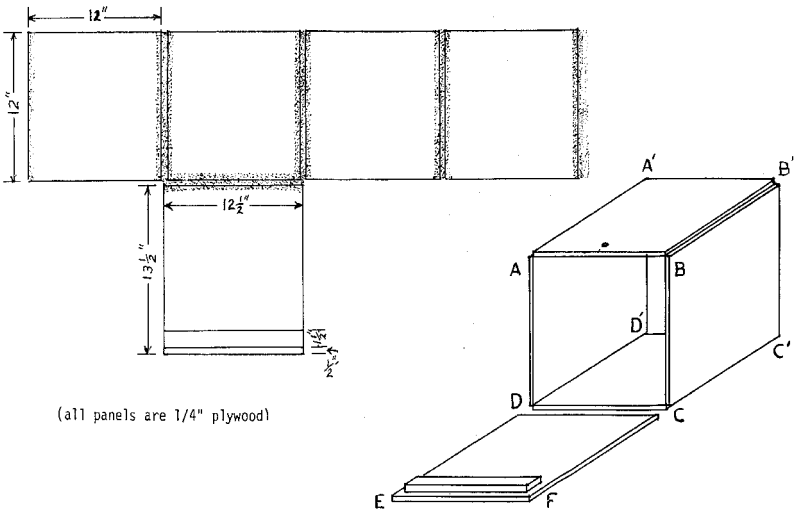

FIG. 1.—Construction details of collapsible "Red Box" for measuring adult mosquito population density.

FIG. 2.—Boxes assembled and collapsed, showing economy of space when collapsed.

inside face of the back panel, at a distance of ½" from the distal border of the panel. This wooden strip (¾" thick) and the ½" lip at the outer end of the back panel offer support and rigidity to the box when the back panel is folded into position for use. The back panel is then held in place with a piece of light cord fastened through a hole in one side panel near margin A-B and wound around a light nail driven into the outer face of the back panel near the margin E-F. Both the inside and the outside surfaces of the assembled box are painted with a dark red, non-glossy paint.

Experience has shown that heavy canvas is the most readily available and economical of the "hinge" materials. It can be stapled to the corresponding panel surfaces for short periods of use, but strips of box-banding metal and light nails provide a more durable assembly.

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GENETIC ANALYSIS OF A RED EYE MUTANT ("OR") OF *Anopheles atroparvus*.

U. LAUDANI, M. PORCU AND A. R. LECIS
Istituto i genetica Università di Cagliari

The isolation of individuals with red eyes ("or") from our laboratory strain, which has been maintained in close inbreeding for many years, has resulted in the formation of a strain, whose individuals transmitted the above-mentioned characteristic, without the appearance of insects with the wild-type phenotype. The eggs, the larvae and the pupae of the "or" strain differed neither in pigmentation nor in other morphological characteristics from those of the laboratory strain. Chromatographic analyses were carried out on normal adult individuals, and on those of the mutant "or." In the former there was found evidence of the presence of Xanthommatin, and of an Ommin (Laudani, Lecis and Bianchi, 1969; Laudani, 1970).

In the "or" strain only Xanthommatin was found to be present. The two populations differed also with regard to their pterinic complement: in the "or" strain there was evidence of the presence of isosepiapterin, which is lacking in insects of normal eye colour (Laudani and Lecis, 1970). Furthermore, $2NH_2$-4OH pteridine was present in the standard strain, but it was not detectable in the mutant. Our working hypothesis presumed that the "or" phenotype was determined by a recessive "or"/"or" mutation and that insects with normal eyes could be +/"or" or +/+.

To confirm this hypothesis and to establish the behavior of the mutant, both mass and pair matings were carried out. The results thus obtained were analysed by the χ^2 method.

In the collective crossing, 10 ♂♂ of the wild type were crossed with the same number of "or" ♀♀; in the F_1, 2537 individuals were obtained (♂♂/♀♀=0.95), all with the normal-eyed phenotype. Five ♂♂ of this F_1 chosen at random were then crossed with the same number of ♀♀ of the same F_1. Thus were obtained 225 ♂♂ and 258 ♀♀ of the wild type (tot.=483), and respectively 78 ♂♂ and 84 ♀♀ of the "or" strain (tot.=162). The ratio 3:1 appears to be well represented ($P<1$).

Twelve individuals obtained from the crossing (♂♂ wild x ♀♀ "or") were back-crossed with the same number of "or," as shown in Table 1.

In both reciprocal back crosses the 1:1 ratio (380 wild: 362 "or," $P<0.7$; 455 wild; 454 "or" $P<.01$) was noted.

F_1 were also obtained from crossings between 10 ♀♀ wild and the same number of ♂♂ "or." The 2202 individuals examined (♂♂/♀♀= 0.96) were all of the wild phenotype. The F_2 obtained from the crossing of 5 pairs chosen at

TABLE 1

Parents	F_1 ♂♂	F_1 ♀♀	F_1 tot.	eye color	P	
♂ wild (♂ wild x ♀ "or")	183	197	380	wild	<0.7	
x ♀ "or"	190	172	362	red		<0.8
♀ wild (♂ wild x ♀ "or")	242	213	455	wild	<1	
x ♂ "or"	211	243	454	red		