Brown, R. V., North Texas State University.
Use of Kelthane to control mites in Drosophila.

A recent study (Brown, R. V., 1965, J. of Econ. Entomol. 58:156-157) indicated the value of Kelthane (1, 1-bis (p-chlorophenyl) 2,2,2-tri-chloroethanol) for control of the genetic mite Histiostoma laboratorium (Hughes, R., 1950, J. Wash. Acad. Sci. 40:177-183) formerly called Histiostoma genetica (Stolpe, S. G., 1938, Anat. Rec. 72:133-134). Some additional experience in the use of Kelthane has been acquired in eliminating mites in Drosophila stocks of two other laboratories. The method used was to wash and autoclave bottles to be used for media. Bottle interiors were rinsed in a Kelthane suspension of 400 ppm and allowed to drain and dry (or nearly). A cornmeal-agar media was added. Flies were transferred to these bottles. As soon as the next generation began emerging, they were transferred to similarly treated bottles with fresh media. The third generation flies were examined and were found to be free of mites.

Another procedure was tried and found to be of value. Bottles heavily contaminated with mites were treated as follows: (1) All adult flies were removed and discarded; (2) a 75 ppm solution was poured into the bottles and quickly poured out; (3) bottles were stoppered. Less than one percent of the flies that emerged had mites one week later. This procedure requires quickness in rinsing, and cultures that are vigorous with large numbers of developing flies, as the rinsing removes many of the pupae.

Pre-treatment of bottles before addition of media allowed for drying of bottles. This was more satisfactory than when bottles with media in them were treated and stoppered without drying, as higher concentrations of Kelthane were not so toxic in dry bottles.

One incidental observation that may be of interest to some workers was noted. The toxic concentrations of Kelthane did not appear to be equally toxic for all stocks. Stocks that appeared most susceptible were ec cv v f, f, and v. This is simply an observation and has not been investigated.

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An improved method for determining visual depth preferences in large numbers of D. melanogaster.

Efficient techniques for determining visual preferences of D. melanogaster are often desirable for behavioral studies. Usually flies are allowed to crawl singly through T- or Y-tubes, the arms of which differ on some visual dimension such as brightness or hue. This method is time consuming if large numbers of flies are to be tested. Also the small size of the tubes precludes testing preferences for multi-dimensional visual stimuli such as form or depth.

To overcome the restrictions of the T- or Y-tube a large shaft was used. Fifty flies were released at the bottom and removed at the top. Inside, the shaft was painted flat black and was approximately 14" L x 7" W x 27" H. The final (upper) 8" of the shaft was tapered to 12" L x 6" W. Atop the shaft was a collection box 12" L x 6" W x 3" H inside. This collecting box was divided into two 6" L x 6" W compartments by means of a clear plastic partition 3" high. The top of the collection box was a pane of glass mounted to slide aside for removal of the flies with an aspirator. The visual stimuli were placed above the glass. All light entering the shaft entered through the glass.

When different stimuli are placed over the two 6" x 6" compartments in this two-choice situation flies attracted to the first stimulus collect in one compartment, while flies reacting to the second stimulus gather in the other compartment. Flies are released from the culture bottle by the removal of a small trap door above the bottle. The negative geotropism and positive phototropism of D. melanogaster encourage the flies to fly toward the two visual stimuli. Thirty seconds after the flies are released, the sliding trap doors beneath the two 6" x 6" collecting chambers are closed, effectively isolating the two groups of flies which have chosen between the two different stimuli. (See Fig. 1).

To create a depth stimulus, a 4' x 4' x 2' high inside box was centered above the collecting chambers. A mirror, 4' x 2', was placed in the center of the box in a vertical plane directly above the plastic partition of the collecting box. On either side of the mirror sheets of translucent white plexiglass were suspended. The plexiglass had 3" square pieces of black construction paper glued to the underside in a checkerboard pattern.