Wright, T. R. F., M. H. Day, and M. D. Morton. University of Virginia, Charlottesville, Va. Drosophila Culture Replicator.

This device expedites the collection of progeny from a large number of matings on more than one type of culture media. For example, progeny may be collected on a deficient medium and then on a complete medium, or progeny may first be collected on media with an inhibitor and then on media without the inhibitor. In addition, this device makes it possible to collect timed embryos from a large number of matings simultaneously. In essence, it is a device which permits the rapid, simultaneous transfer of a large number of matings from one set of vials to another set of vials.

The basic unit of the replicator which contains a single mating is a 16mm O.D. glass tube 4 3/4" long, open at both ends. A 2 inch square of Dacron polyester curtain material (Sears, Roebuck and Co. No. 4164) is held in place over one of the open ends of the tube by a No. 10 rubber band twisted three or four times around the tube. A single mating is placed in such a tube and the flies are restricted to a small space adjacent to the Dacron mesh by pushing a small plug of cotton down into the tube to within 1/4" to 3/8" of the mesh. The size of the mesh is such that flies cannot escape from the tube yet the females can lay eggs through it when the tube is allowed to rest on the surface of the media in a vial. This laying tube need only be moved from one vial to another in order to collect progeny from the same mating in two different vials.

A tube carrier may be built to facilitate the simultaneous transfer of a large number of tubes from one set of vials to the next. First, two or more boxes must be provided in which vials may be firmly packed (preferably hexagonly) in precisely the same positions in the two or more "replica" vial boxes. (Our boxes hold 315 vials in 17 alternate rows of 19 and 18 vials each.) The tube carrier consists of two sheets of 1/8" aluminum with outside dimensions somewhat larger than the vial box. The two sheets of aluminum are temporarily bolted together, and with an 11/16" drill bit holes are simultaneously drilled through the two sheets which precisely match the position of each packed vial in the vial box. (We have drilled as many as six sheets of aluminum simultaneously while making three identical tube carriers.) After drilling, the two sheets are permanently separated from each in precise register by five 3/4" spacers (pieces of 3/4" diameter wood doweling, 3/4" long) placed at each one of the four corners and one in the center where the drilling of the hole for the centermost vial has been purposely omitted. A laying tube passes through both holes in the two aluminum sheets and is suspended from the upper one by means of an "O" ring which easily slides on to the end of the tube. ("O" rings, 5/8" I.D. Kirkhill R-51, Kirkhill Inc., 1202 Woodruff Ave., Downey, Calif. 90241.) Two separated sheets of the carrier are needed in order to prevent excessive lateral wobble of the suspended tubes which could hinder starting the end of each tube into the mouth of each vial. The 11/16" hole also reduces play yet allows each tube to slide up and down independently and find its own level when resting on the surface of the food in the vial. This latter aspect obviates the necessity of pouring media into vials to exactly the same height.

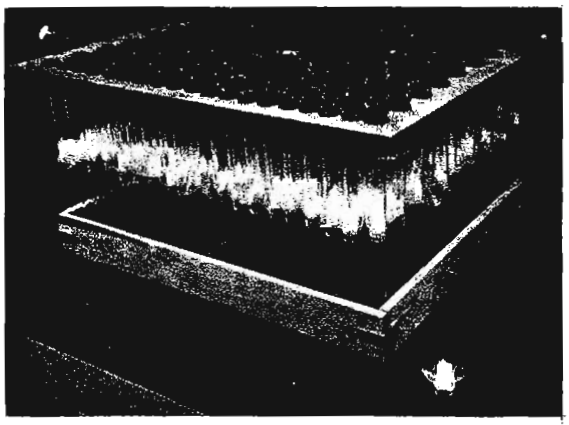

Figure 1. Drosophila Culture Replicator and one laying tube.

We have found the following to be a satisfactory procedure for initiating the use of a Replicator. Complete laying tubes (with "O" rings in place, but without cotton plugs) are

placed in test tube racks (40 tubes/rack) and autoclaved. Rubber bands which have been broken during autoclaving are replaced. With the aid of a small glass funnel, etherized flies are dropped into the tubes while they are still in the test tube rack. Cotton plugs are then pushed down into the tubes with a rod. (Three of us have loaded approximately 1000 tubes with 5 virgins, 1 male, and the cotton plug in less than two hours.) Next, the empty tube carrier is placed in register over a box of unplugged vials containing the appropriate medium. Each loaded tube is then forced through the upper and then the lower hole of the tube carrier and allowed to come to rest on the medium in the vial. To transfer the tube carrier with all its laying tubes from one vial box to another, the tube carrier must first be lifted vertically with some horizontal shaking of the carrier to shake off the few vials that begin to be lifted by the friction of the skirt of Dacron mesh on the end of the laying tube. Holding the carrier over the new box of vials, one lines up the first row of tubes over the first row of vials as accurately as possible and then lowers the carrier very slowly while constantly shaking the carrier horizontally to enable the rest of the tubes to start down into their respective vials. Usually a moderate amount of horizontal shaking is sufficient to get all the laying tubes to drop into their vials but occasionally a third hand is needed to adjust one or two recalcitrant tubes.

One should carefully consider whether or not it would be less effort just to shake individually the parental flies of each mating from one vial to the next, or whether making and operating this Drosophila Culture Replicator will save time and effort in the long run. We, however, have found this device invaluable for the simultaneous collection of timed embryos (4 hour laying periods) from almost 1000 separated matings.

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Lakovaara, S. University of Helsinki, Helsinki, Finland. Malt as a culture medium for Drosophila species.

It is usually rather tedious to rear several Drosophila species simultaneously in laboratory conditions, because they require different culture media. Fungal media are especially laborious to maintain. In order to eliminate these difficulties I have endeavoured to develop a universal culture medium, meeting the requirements of the Drosophila species or other Drosophilids reared in our laboratory to at least a satisfactory extent. The essential ingredient of this medium is malt (rye or barley malt), whose absence generally results in failure of the culture. The medium is composed of the following ingredients:

1 l	water
10 g	agar powder
50 g	semolina (or cornmeal)
100 g	malt
15 g	dried yeast
25 ml	nipagin (500 ml 96% ethanol + 25 g nipagin)

The ingredients are mixed with hot water in the order given. When the medium has been poured into the culture bottles and cooled down, baker's yeast suspended in water is pipeted on the surface in the normal fashion. The medium has given good results in the rearing of the following Drosophilids: D. melanogaster, D. funebris, D. obscura, D. bifasciata, D. subobscura, D. silvestris, D. littoralis, D. phalerata, D. transversa, D. testacea, D. hydei, D. busckii, D. (Hirtodrosophila) n. sp., Chymomyza costata and Scaptomyza pallida.

Several of these species are difficult or impossible to rear on the standard D. melanogaster medium but do well on the malt medium. Some species that also thrive on the standard D. melanogaster medium develop quicker on the malt medium. Among these may be mentioned D. funebris and D. hydei, whose development is speeded up by 4 - 6 days.

The medium can, of course, be modified, e.g. by using syrup and leaving out semolina and dried yeast, but this often results in a culture medium that is too sticky for the flies, especially those of the Quinaria group.

The medium can obviously be improved still further but up to now it has proved the best universal Drosophilid medium.