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Culture media for Drosophila.

With the development of the Drosophila technique, not only a certain amount of sterilization of the culture medium during its preparation became necessary, but also an adaptation of it to different requirements. Productivity and duration of the media are the two main factors to be considered for our purpose, and they are to a certain degree in inverse relationship. By productivity we mean the quantity of flies produced in a given time. By means of overcrowding a certain food can yield a higher number of flies which are small in size, but this higher yield will usually be cancelled by a serious loss in the speed of development (in strongly overcrowded bottles in fact the cycle has proved to be as much as twice the usual length). Three functional types of media may be distinguished: 1) for the maintenance of parent flies, 2) for the maintenance of lines of stock cultures, 3) for the attainment of high productivity. 1) this type has proven to be extremely useful for the current work where we have to keep alive the flies from the moment we obtain them until the moment of their use. In this case offspring are not desired. Flies have been kept on such a medium for over a month (some over two months) at room temperature, without a transfer. The same vial or bottle can be used over again until the surface dries out, and etherized flies will not stick to its surface. - Water 90 cc., agar 2 gr., syrup 7 gr., Nipagin .15 gr. 2) Suitable media serving this purpose, such as the banana agar and the cornmeal syrup media, are already in use in all Drosophila laboratories and will not be described here. 3) The main characteristics of this type are: production of large quantity of flies, short cycle of development, and low selective level (preservation of individuals of low viability).

The addition of killed yeast in large quantities to the ordinary food formulae was introduced a few years ago by Muller (in 1928), giving surprisingly good results. These media had, however, the inconvenience or requiring a constant supply of fresh ingredients. Dry yeast was used in place of fresh yeast by Winchester and by Gershenson. The authors have recently experimented with a systematic series of modifications of the Russian food mixture with the addition of dry or fresh yeast. Fifty different modifications have been tried, approximately twenty vials being employed for each trial and counts of the offspring made. Each ingredient was tested in different concentrations. As a result the following formulae have been found the best for obtaining high productivity. (A. with dry yeast) - Water 80 cc., Agar 1.5 gr., Dry yeast 1.5 gr., Raisins 4 gr., Syrup 5 gr., cornmeal 5 gr., Nipagin .15 gr. The agar is dissolved by bringing the water slowly to the boiling point, dry yeast (that has been disintegrated in a small part of water) is added and the mass is kept boiling for another ten minutes, so as to make sure that all the yeast cells are killed. Then the mashed raisins, syrup and cornmeal are added. with continuous stirring, and the food will be ready for distribution. The addition to the liquid mass of "Nipagin T" Naehmittelfabrik Julius Penner A.G. Berlin-Schoeneberg as found in Dr. Nachtsheim's laboratory, is important for cultures which

contain few larvae or develop slowly.

The layer of food should be somewhat deeper than 1/2 inch and its surface seeded with pure live yeast (fresh or dried). Adding paper and making the surface appetizing with fruit juice did not increase the yield in our case. 200 flies per vial and 1000 per half pint bottle should be considered a good average. This means that a vial can be employed where formerly a bottle was required, and a bottle can take the place of a group of bottles. Not only the number, but the size of flies is considerably increased. When fresh yeast is easily available it can be employed advantageously by substituting 15 grams fresh yeast for 1.5 grams of dry yeast in our formula.

The preceding formulae enable us to prepare food of each of the three types by the use of ingredients which will not spoil. A laboratory can thus provide itself with a year's supply at once, avoiding further trouble in this connection.

We desire to call special attention to the convenience offered by the new type of medium here described: The syrup-agar for the preservation of the P. flies, for the great elasticity it introduces in current laboratory work.

Parker, D.R. Food formula The food used in the University of Texas laboratory is made according to the following formula:

1 pound bananas (250 cc)
20 grams agar-agar
125 cc Karo syrup (white)
15 grams dried brewer's yeast (sterilized)
625 cc water
.15 gram Moldex A (dissolved in 95% alcohol)
Total 1 liter of food

The water and agar are heated until the agar is completely dissolved. When the bananas have been mashed thoroughly, they are added along with the other ingredients to the melted agar and the food is poured immediately, a glass funnel with rubber tube and spring stopcock being used for this purpose. Bottles are plugged with cotton stoppers, whereas the vials are covered with cloth towels until cool, after which they are sprayed with a thick suspension of fresh Fleischmann's yeast, punched, papered, and stoppered in the usual fashion. (According to suggestions by Muller in DIS-3: 52) Bottles are treated in the same manner; when they are cool, the stoppers are removed and paper toweling is added in the place of confetti. In both cases, by using a glass tube about 1/4" inside diameter and a large rubber bulb, a small hole is punched in the food at the side of the container in order to release gases formed in fermentation.

Spencer, W.P. Food formula

1 liter water
25 grams chopped agar
1000 grams mashed ripe or over-ripe banana.

It has been my experience that this medium is distinctly auperior to corn-meal-molasses-agar for many species of Drosophila, and equal to it for all species tested, which will grow on corn-meal.