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University of Texas, Austin. A cactus-supplemented banana food for cultures of Repleta group Drosophila.

A number of investigators over the years have found that the addition of various plant extracts resulted in improved cultures of certain "problem" species of Drosophila. However, it is frequently a problem to be approached anew for a new series of experiments, since food formulations for routine stock cultures rarely are published.

Recent studies with Drosophila aldrichi and D. mulleri required efficient culturing of large numbers of isofemale lines. When the wild female is placed into a vial, the low density of eggs and frequent high density of mold spores result in failure of flies to develop from most of the vials.

By using a cactus-banana food in 7/8" (ID) vials, we were able to get about 80% fertile isofemale lines from aldrichi and about 95% fertile isofemale lines from mulleri. The food formula used was

5 l. water
110 g. flake agar (S. B. Penick, Jersey City, N.J.)
2 Tbs. malt extract (Blue Ribbon)
14 bananas
200 g. brewer's yeast (Fleishman's, type 2019)
170 ml. white Karo syrup
5 l. prickly pear slurry
56 ml. 95% ethanol
56 ml. propionic acid stock solution

The prickly pear (Optunia lindheimeri) stems were gathered at various times during the year, and the season of gathering had no discernible effect upon its benefit to the flies.

The cactus was diced into about 1" - 2" pieces, autoclaved for 45 minutes at 118° C, and ground thoroughly in a food blendor (Waring Commercial Blendor). To improve circulation during blending, about 200 - 300 ml. of water was added to each batch of cactus (about 1200 ml.) being ground. In order to use the food dispensing pump (Faberge and Cave, D.I.S. 26: 129) this slurry must also be strained through 1/4" ("Hardware cloth") wire mesh to remove the vascular tissue which is not cut by the blendor knives sufficiently to prevent clogging the pump.

The propionic acid stock is made by mixing 5 ml. propionic acid and 1 l. water.

It was found beneficial to periodically add a few drops of dilute baker's yeast (Fleishman's) to the culture vials, after the larva were present. It is questionable if the yeast had any effects, but certainly the water was beneficial. The frequency of adding the yeast suspension varied with the humidity of the season, but the surface of the food was never dry nor "soupy."

Similar food modifications have been tried before. For example, Crow (1942, Univ. Texas Pub. no. 4228) added prickly pear fruit for culturing these species. Also Wagner (1944, Univ. Texas Pub. no. 4445) extensively examined the food components which gave good cultures for these two species. The cactus fruit juice alone was an incomplete medium for either aldrichi or mulleri, while an addition of any of several yeast strains gave good survival. Thus the yeast growing on the food was of great importance, probably from its contribution of sterols to the diet of the fly.

Also Spieth (personal communication) has used pieces of sterile cactus placed on the surface of banana food to culture several species of the Repleta group. We have also tried this method, which works well for larger numbers of flies in a vial, but a single female frequently becomes stuck in the mucilaginous cactus juice. Also the labor of placing pieces of cactus in vials is much greater than mixing it in the food.

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