

Drosophila Culture Notes

The vinegar fly (fruit fly) *Drosophila melanogaster*, is famous through its use in genetics since 1909 to demonstrate the principles of heredity, e.g. Mendelian ratios, sex linkage, dominance and variation. The life cycle is completed within twenty days and hence many generations of flies are produced in a relatively short period of time.

Please note that your *Drosophila* are usually supplied by Southern Biological on **FRESH** culture medium. The reason for this is that some schools require *Drosophila* for population studies, not for genetics work. You may choose to leave them on this medium, but it will take 10-14 days at 22°C until progeny start to emerge, ready for mating. This time is increased at lower temperatures.

For maximum statistically significant results, we recommend that 250 ml bottles be used in order to breed large enough numbers of flies. One can also employ 2.5 cm x 10 cm vials, although far smaller numbers of flies will result. All containers should be plugged with foam stoppers or cotton wool plugs covered with muslin.

MALE OR FEMALE?

Females have slightly smaller abdomens than males and have small lines across the tip of the abdomen. In contrast, the usually smaller males have black-tipped abdomens. Male flies also carry sex combs on the forelegs whilst the females do not.

EXAMINATION OF FLIES:

Using a bottle the same size as that used for breeding, insert a cork stopper into which a wire has been run. Attach a small wad of cotton wool moistened with ether to this wire. Shake some flies from S.B. culture into the anaesthetising bottle. As soon as the last fly stops moving, they may be removed to a piece of white paper and examined using a fine camel hair brush. Ensure that if the flies are to be used for mating, they must not remain in the ether for more than one minute.

Caution—ether is flammable.

A better alternative is to use the Carolina *Drosophila* Anaesthetizer (available from S.B.), which does not involve use of ether or any other flammable substance.

SETTING UP A MATING:

Transfer 3-5 anaesthetised flies of each sex to a vial or bottle of fresh culture medium, placing the vial on its side to prevent flies contacting the food before they recover. After 7 days, remove parent flies. Larvae and then pupae should be visible on the sides of the container. Several days later the progeny will begin to emerge. Count the progeny types daily for eight days, discarding after each days count.

ISOLATION OF VIRGIN FEMALES:

Only virgin females should be used for matings. Remove all adults from culture tubes containing pupae. Any females detected in the culture within the next 6 hrs will be virgin flies and suitable for mating.

CULTURE MEDIUM:

Use either:

- S.B. Instant *Drosophila* Culture Medium (Cat. #CM4) prepared in five minutes by adding water to powder, or
- Follow the formula set out below.

Ingredients:

Treacle 60gm, Plain Agar 3.5gm, Propionic Acid 0.5ml, Nipagin (tegosept) 0.5gm, Semolina 30gm, Bakers yeast (dried granules), Water 320ml.

Preparation:

- Cook the semolina in 160 ml boiling water stirring constantly.
- Add the agar, propionic acid and nipagin to the treacle in 160ml boiling water, bring to boil, stir and add to the semolina, stirring constantly.
- Boil gently for 5 minutes before allowing to cool to 45-50°C.
- Dispense into bottles or vials, adding 8-10 grains of dried granular bakers yeast after the medium has set.
- Incubate with loose plugs at 22-25°C for 48 hrs to evaporate any residual moisture on walls of containers before inoculating with flies.

INCUBATION TEMPERATURE:

Optimum temp. range is 22°C-25°C.

Ref: *Drosophila Culture Notes* 28.06.06