

DROSOPHILA COLLECTING TECHNIQUES

Fly survey supplies:

sheet sponges: avoid sponges that claim they resist bacteria or are ‘treated’; these will ‘kill’ the bait

based on experience flies appear to favor pink & yellow over blue & other colors

K Mart & Don Quixote have a version with little waffles on surface, this seems to help hold the bait juices

Cut sponge in half to make two oblong strips



Yeast:

classic or faster rising “rapid” as used in bread machines are both OK

Bait base:

two bait ‘flavors’ are proven attractants:

Banana baby food (commercial puree)
Mushrooms, aged white button type



Vials: glass works well, tubes should be long, kept very clean (so fly doesn’t see them coming)

Plugs: raw cotton (red arrow) works well to keep fly in & ants out; if other material are used (e.g., bleached cotton such as comes in medicine bottles, blue arrow), a cotton cloth cover can make the plug tight



Other equipment:

Hand lens

Aspirator

Sweep net w/medium length handle

Bait Recipes:

Mushrooms, fresh white button type (flies don't seem to like the fancy mushrooms varieties or reconstituted dry types)

Allow to age at room temperature for about 5 days

Be sure to keep mushrooms in double bagging to prevent the alien flies getting into them & laying eggs; keeping them in sunlight also helps; if you are in a hurry, to speed up the process approach produce clerks & ask for discarded mushrooms, but ones with active mold are not good!

After aging, before use add bread yeast, allow mixture to grow and develop for about 1 hour.

Squeeze juice out; whole mushrooms may be placed on sponge to act as reservoirs of 'flavor'. These are easily retrieved when removing the sponges. The mixture & mushrooms can be recycled several times until they quit attracting.

Banana baby food (commercial puree); mix in yeast sprinkled over baby food [be sure it has room to expand] about 1 hour before use

Host plants to look for: *Pisonia*, *Charpentiera*, *Urera*, *Pleomele*

Sap exudates of *Acacia koa*, *Myoporum* / naio, *Nestegis* / olopuu, *Sapindus* / aulu, *Ionomea*

This might include looking under bark or at rotting parts of the plant favored by species for egg laying or larval stages.

If sap is oozing onto ground, collect any wet soil as this may include eggs or larvae

Watched for the large and visible Kamehameha butterfly (*Vanessa tameamea*) which may feed at the same sap exudates and fluxes known as host to *Drosophila* larvae. The aerial ballet of the Kamehameha provides an easily spotted guide to *Drosophila* nurseries.

Bait site choice:

GPS the bait station area

Find a shady spot without a strong breeze; preferably near rotting larval substrates as these are known breeding site for flies (soft tissue decay in *Pisonia* trunk, *Charpentiera*, *Urera*, *Pleomele*)

Tack sponge to plant with office push pin (or similar) at eye level where you will be able to see the sponge & collected off it easily

Spread the bait on strips of sponge; dispensing from squeeze bottle worked well (for example, a cleaned mustard bottle)

Other options are to spread bait thinly on sponges using tongue depressor or back side of plastic knife, or similar flat but dull utensil

Collecting: check baits on a periodically in a line or loop;
Photograph flies on sponge with date / time stamp ON

Approach sponge with open vial and stealthily cover fly quickly with vial, insert plug

Keep vials cool, do not allow to overheat or get too cold to keep flies alive, transfer them to a sugar / agar vial to provide nutrition

Note taking: record the following

Weather

- overall forest conditions
- any specifics at bait locations
- changes during the collecting period

Collection codes

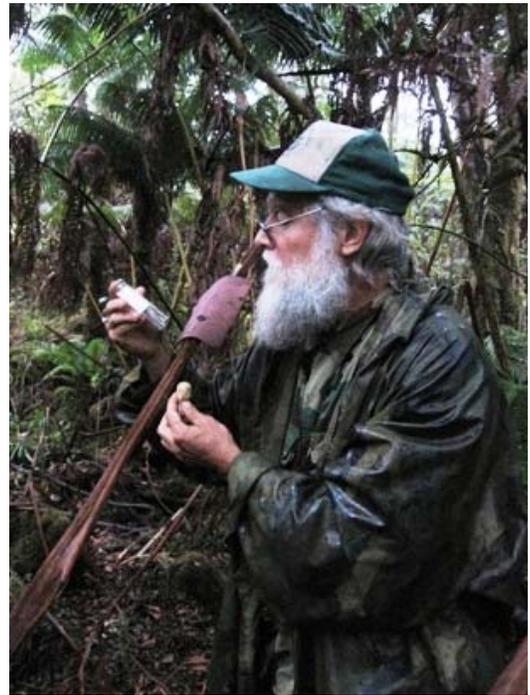
For flies that will be reared in lab stocks, it is recommended to contact the University of Hawaii fly lab¹ to coordinate a system of note taking and a stock control number reference system to ensure consistent information is collected in a way most useful in future studies.

To understand factors affecting native fly survival

- Record response by alien flies to baits (competition, predators)
- Host plants** and competing alien plants
- Potential larval breeding sites
- Overall forest botanical diversity native & non-natives
- Non-fly native and non-native invertebrates, birds, mammals
- Signs of enemies of native species such as rats, pigs, goats, deer, etc.

Collateral Activities

To extent practical pull weeds or liberate host plants from competitors



¹ University of Hawaii, Center for Conservation Research & Training, 3050 Maile Way, Gilmore Hall