Rearing Calliphoridae

Copious numbers of blowflies - *Calliphora vomitoria*, *C. vicina* and *Lucilia sp.* (probably *L. sericata* - can be reared leading to multiple generations for research purposes. The most important thing is to look after them - **daily**. Many people make the mistake of thinking that they can simply walk away and leave them for days and that they will look after themselves. This is not the case. Weekends can be the most difficult if the colonies are based in a laboratory with restricted out-of-hours access. If this is the case leave as late as possible on Friday and be sure to clean and top up water and food before leaving and do the same as early Monday morning as possible.

Setting up a colony

BugDorms available from Watkins & Doncaster (https://www.watdon.co.uk/acatalog/E61011-bugdorm-44545.html) are ideal for the purpose. Per species reared, three or four BugDorms will be required (more if you wish to rear multiple generations of flies).

A BugDorm is an insect rearing tent, size 47.5x47.5x47.5cm (smaller sizes are also available). It is comprised of a clear plastic front panel that facilitates observation, white nylon mesh top and sides, and white vinyl floor. It is easy to assemble with a lightweight fibre-glass framework, constructed outside the enclosure. The front panel has two openings, a larger zip opening and a smaller stockinet

Place the BugDorm in a warm, draught-free location.

Start by placing one or two sheets of laboratory paper towel (or kitchen roll) in the bottom. This can be replaced as often as needed (it soon gets messy). Keeping this hygienically clean will keep fungus from invading the colony and using it provides an easy means to take away the dead flies and faeces that collect on the bottom.

A petri dish with water (or sugar water if you wish) under a layer of cotton wool will provide enough moisture. Change this daily (or twice daily if the weather is hot and dry).

The adult flies will also need to be provided with animal liver (pig or beef from the supermarket is suitable), preferably organic so that it contains as few added chemicals as possible. Slice thin round medallions about the size of a petri-dish and 3-4mm thick maximum. Change the liver whenever it gets dry or when it is apparent that it is going bad, and especially if you see fungal growth. Fungal growth must be avoided at all costs as it can severely damage a colony.

BREEDING

Develop a breeding stock by catching flies in the field and introducing only a single species into each BugDorm. Females that are ready to lay eggs are referred to as gravid and gravid females can be told apart from males and non-gravid females by the low frequency buzz of their wings. Ideally, to begin with, it is best to select gravid females. Simply watch to see if females lay eggs on the medallion of liver (they look like small white rice grains, sometimes closely packed into bunches).

When eggs are observed, delicately lift them with a damp artists paint brush:

and transfer them to fresh liver in a separate BugDorm. This time the piece of liver should be much larger than the medallions sliced for the females to oviposit onto. Rectangular food tubs are ideal and when filled with liver, provide enough food, replenished once or twice if needed, for the developing larvae.

At first, finely score the surface of the liver in a cross-hatch pattern so that the hatching first instar larvae can easily gain access to inside the liver. Unlike adults that are phototrophic (moving toward light), larvae are photophobic, so will move away from any light source.

Cover the container containing the liver with cotton-gauze held tight with elastic bands to prevent the larvae crawling out - they get very active once larger. Once they reach third instar (about 18mm) you will notice that when touched they contract both ends to the centre in what is known as the "balling" reaction. This means that they are ready to pupate.

Remove the elastic bands and gauze and place the container inside a third Bug Dorm with no adults, on a thick (about 3cm) layer of vermiculite (it is used in plant pots, so a hardware store or plant nursery should sell backs of it).

The mature larvae will migrate into the vermiculite, from where they can he carefully removed to a clean BugDorm (this could be one of the smaller types) either with fresh vermiculite (1-2 mm thick) or just with two layers of laboratory paper towel (place puparia between the layers).

Pupae take about 10 days to develop into adults of the next generation and after several days will reach maturity, start mating and so the next life cycle begins.

Keep all areas very clean and thorough wash the BugDorms between generations.

That's it really, although, it doesn't sound much, it is actually quite a lot of work. It is easy to maintained about half a dozen colonies each with something close to 300 files. Good luck and please feel free to ask for help if you need it.