

Lesson 23

Title of the Experiment: Methyl eugenol trap to attract and capture fruit flies
(Activity number of the GCE Advanced Level practical Guide - 36)

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Introduction:

Fruit flies are serious insect pests of many fruits and vegetable crops like mango, guava, snake guard, bitter gourd, and luffa. Some species of this fly also attack orange, banana, papaya, melon, and pumpkin. Fruit flies have a very short life cycle from egg to an adult completing within 8-10 days. They have an extremely fast rate of reproduction. So, they produce a large population within a very short time period. Fruit fly adults prefer to live in moist, damp places. Female flies are attracted to fruits and other vegetable crops particularly ones that are fermenting or rotting. Fruit fly adult males attract to methyl eugenol. Therefore, to get rid of this nuisance fly away from the fruits and vegetable crops in the home garden, can operate a homemade fruit fly trap using methyl eugenol. Methyl eugenol trap specifically capture male fruit flies. This trap commonly formulate as liquid concentrate of the chemical which is infused into cotton wool. When this bait is used in a trap, there will be a natural decline in its effectiveness to attract flies. This is due to evaporation and breakdown of the chemical over the time. Therefore cotton wool need to be replaced with a fresh one with eugenol when its ability to attract flies declines to less than 50%.

Traps for capturing female fruit flies are based on food or host odours. Food baits based on protein solutions, fermenting sugar solutions, fruit juices, or vinegar can be used to capture adult females of fruit flies. These liquid food baits are generally not as sensitive as methyl eugenol. The usage of liquid food baits results in capturing non-target insects as well.

Learning outcomes:

At the end of this practical session, a student will be able to;

- make an insect trap to capture fruit flies;
- explain the trapping mechanism of the baited insect trap;
- operate the methyl eugenol trap in a crop field to evaluate its effectiveness;
- understand the benefits of using specific bait for trapping fruit flies.

Materials/Equipment:

- Wide mouth plastic bottle with the lid
- Metal wire ¼" (about ½ m long)
- Cotton wool
- Methyl eugenol
- Saw blade

Methodology/Procedure:

Make a 2 cm diameter circular opening on the side of the bottle about 2 cm below the lid using a saw blade as shown in Figure 1. Then remove the lid of the bottle and hold the bottle upside down. Pierce the bottom of the bottle and pass the metal wire into the bottle. Insert a swab of cotton wool embedded with methyl eugenol in the metal wire inside the bottle. Bend the wire end to prevent the falling down of the cotton wool. Make a ring at the free end of the metal wire so that the trap can be hung on a tree or a stake.

Close the lid of the bottle tightly. Using the side opening add water/ soap solution into the lid of the bottle until the water level is about 1 cm. This is to retain attracted flies. Install the trap in a suitable crop field.

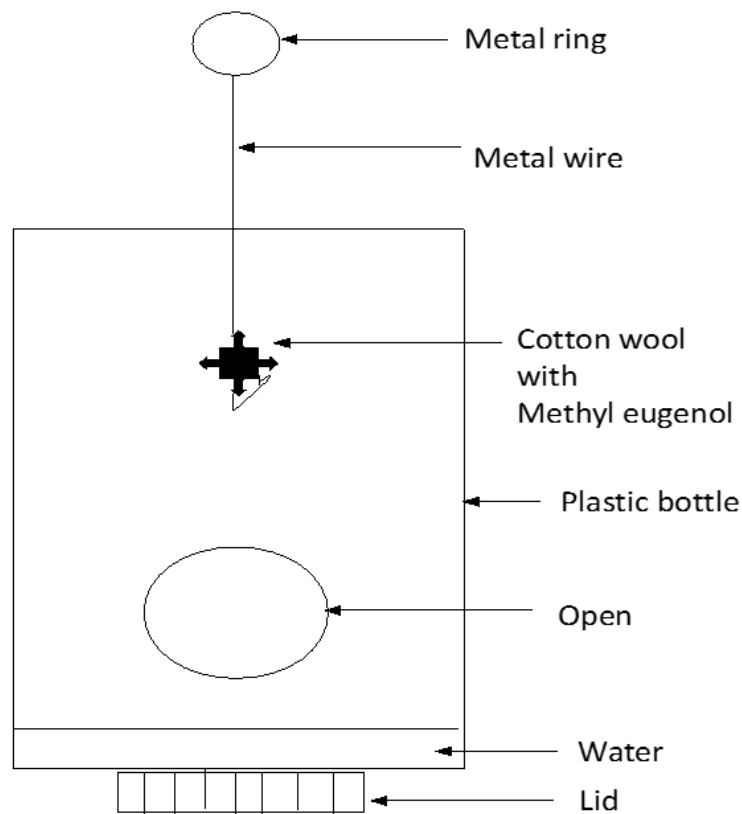


Figure 1: Methyl eugenol baited fruit fly trap

Readings/Observations:

Observations can be made to attractiveness of methyl eugenol-baited trap to fruit flies.

Count separately the numbers of fruit fly males and females caught in a trap baited with

1. methyl eugenol and water/soap solution
2. methyl eugenole and fruit juice

Methyl eugenol trap to attract and capture fruit flies

Bait trap	No. of male fruit flies		No. of female fruit flies	
	After 1 day	After 2days	After 1 day	After 2 days
Methyl eugenol and water/soap solution				
Methyl eugenol and fruit juice				

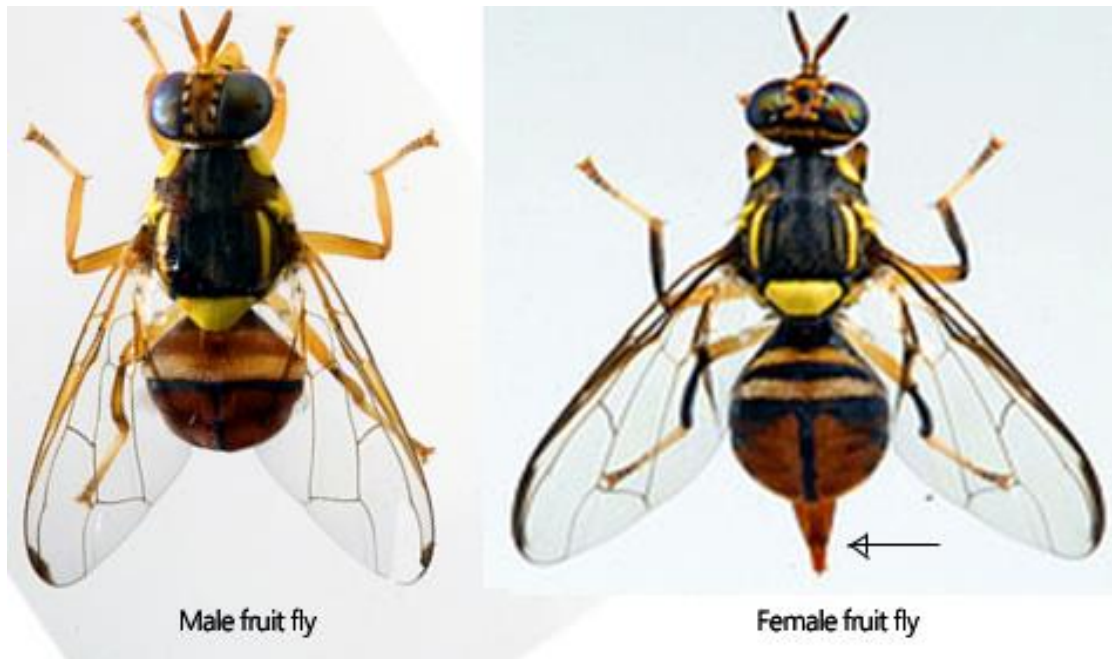


Figure 2: Male fruit fly (left) and female fruit fly (right). Note the pointed abdomen of female fruit fly

