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ORIGINAL PAPER

Pheromone traps for fruit fly

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INTRODUCTION

Fruit is the economic yield from the fruit trees which gives the profits, but because of fruit files that economic yield is reduced to the greater extent. Major fruit crop are soft-skinned fruits like guava, grape, apricots, apple, loquat, avocados, pear, berries, papaya, peaches etc. and even in certain hard-skinned fruits like mango, pomegranate etc. Fruit files belong to order Diptera and family Tephritidae (It contains 500 genera, about 5,000 species) and Drosophilidae are two families of fruit files. Tephritid fruit flies are known as common fruit flies or true fruit fly, even sometimes it is called as peacock files because it has bright colours marking on the big wings (Nagel *et al*., 2021). These flies attract theunripe/ripe fruits (fruits present in fresh conditions), so these are regarded asdestructive agricultural pests especially in fruit crops, so some species of tephritid are: *Tephritis capitata* (Mediterranean fruit fly/Wiedemann) commonly occurs in fruit crops like pear, apple, peaches and even in citrus (late varieties), *Anastropha serpentina* (sapote fruit fly) *Bactrocera correcta* (guava fruit fly), *Anastrepha curvicauda* (papaya fruit fly), *Rhagoletis cerasi* (the cherry fruit fly/European cherry), Rhagoletis pomonella (apple maggot/railroad worm).

Drosophilidae (15,000 species) are commonly called as vinegar fly or wine fly or small fruit fly orpomacefly. These flieslinger around overripe or rotting fruit. *Drosophila melanogaster* has been widely used in genetics research and this species is popular model organism in developmental biology. Some of *Drosophila* species are given below are: *Drosophila suzukii*in berries, blueberries, raspberries, blackberries, peaches, nectarines, apricots, grapes.So, fruit flies have four stages are egg, larvae, pupae, adult, so adults prefer half ripe & yellow coloured fruit stage (like citrus, peaches)and fruit flies can cause direct damage to the soft-skinned fruits by using sponging-sucking mouth parts to puncturing andlay eggs. Bacteria from the fly's intestinal flora are introduced into the fruit during egg laying. These bacteria cause the tissues surrounding the egg to rot. When the eggs hatch, the maggots feed on the flesh of the fruit, forming galleries. These allow

pathogens to enter and accelerate fruit decay, making fruits unfit for human consumption. Generally, the fruit falls to the ground as the maggots pupateand, in some fruits, fruit flies' feedson fruit flesh as fuel for maturation into an adult which results in tiny holes are visible, necrosis of fruit as pulp of the fruit is eaten by maggots, foul smell, soft & pre-mature greying spots are visible these aresymptoms of fruit fly attack and as these adult attack/linger around the fruit which leads to the damage of the fruit and cause the losses in the final yield in our country and export cannot be done.

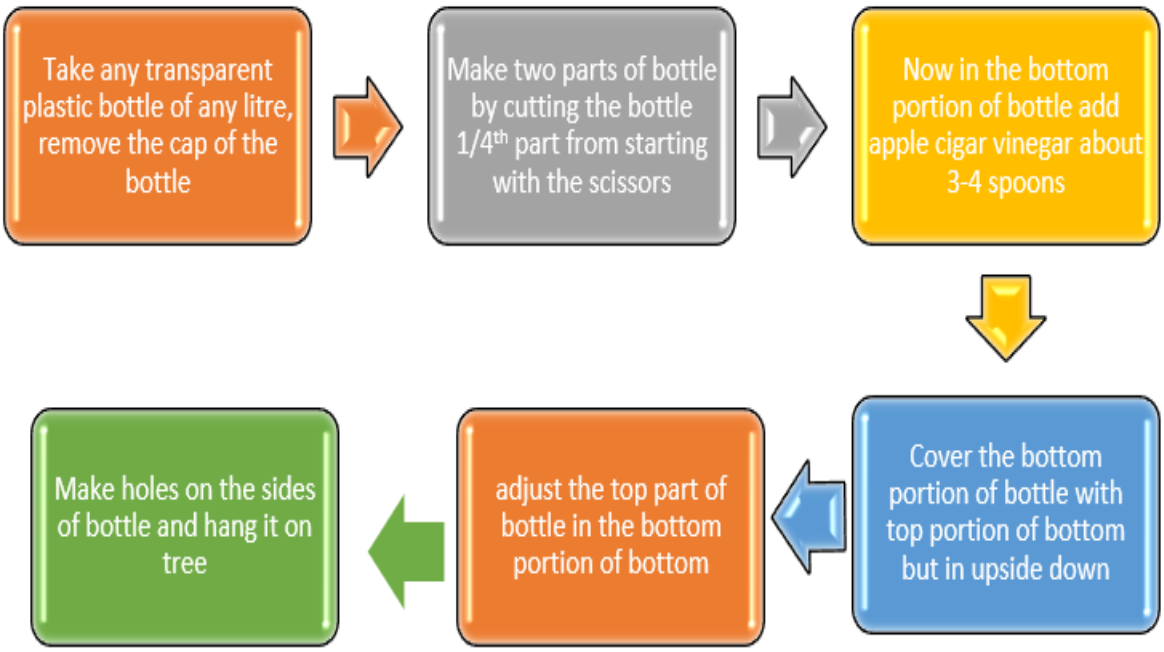
MECHANISM OF PHEROMONE TRAP

Male flies have two different types of olfactory organs one is antenne and the other is maxillary palps. Where antenne acts as a primary olfactory organs in detection of pheromones and various semiochemicals like methyl eugenol, raspberry ketone, and cue-lure released by female files and maxillary palps gives gustatory response (Ono *et al*., 2021)

PRECAUTIONS BEFORE INSTALLING PHEROMONE TRAP

- Every pheromone trap is different for every insect.
- Trap like apple cigar vinegar, fruit pieces, chemicals like luring chemical must be replaced on a regular basis in order to get effectively trap new insects.
- Make sure pheromone traps are safe in adverse climatic conditions by covering them properly or take them out.
- Keep traps away from children and pets and after using pheromones, wash your hands because pests may follow you if you smell like one of them.

PREPARATION OF PHEROMONE TRAP

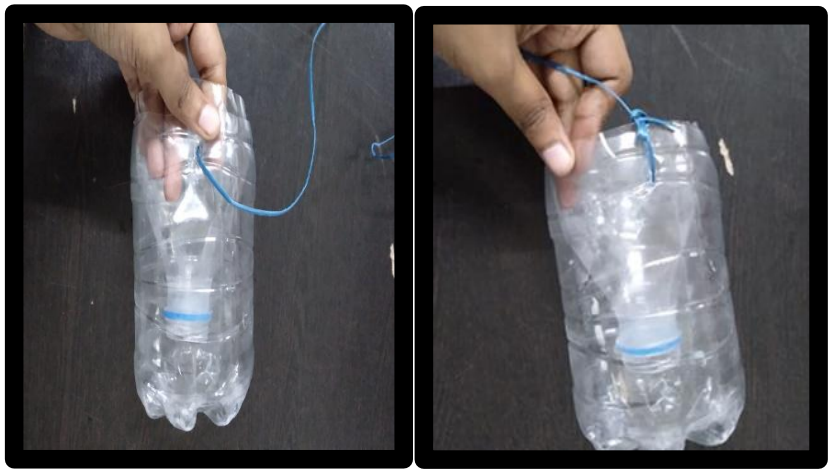


PICTORIAL REPRESENTATION OF PHEROMONE TRAP MAKING

1. Take an empty & transparent bottle
2. Use sharp knife to cut the bottle into remove the capparts (bottom ¾, top ¼)

3. Insert the top (1/4) in upside down
4. Now make two holes in opposite direction manner as done in picture by using sharp thing like knife, scissor

5. Insert a any wire like structures like plastic
6. Make a knot tightly on the bottle thread through two holes



8. Add apple cigar vinegar (5-9 table spoons), tie this pheromone trap to wood stick and hang it on the trees, now this pheromone trap is ready to lure the fruit flies.



CONCLUSION

Pheromone trap is one of the practices in the mechanical pest management which is very effective in control of pest & insects because of the lure which attracts and traps them. This is very cost effective and can be efficiently used for luring of pests & insects and can be prepared by farmers themselves. A new technique is added to trap is adding of sensors which will monitoring the pest population and pests& insects will get shock and die due to electric flow in that trap (Schrader *et al.,* 2022) this adds more future scope of pheromone trap.

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