

Role of Lure Traps to Control Melon Fruit Fly in Shahada Taluka, Dist. Nandubar, Maharashtra

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Abstract: The melon fruit fly, *Bactrocera cucurbitae* is distributed widely in temperate, tropical, and sub-tropical regions of the world. The melon fruit fly belongs to the family Tephritidae. It is a serious agricultural pest, particularly in Hawaii. It has been reported to damage 81 host plants and is a major pest in cucurbitaceous vegetables, particularly the bitter melon (*Momordica charantia*), musk melon (*Cucumis melo*), snap melon (*Cucumis melo* var. *Momordica*), and snake gourd (*Trichosanthes anguiana*). The extent of losses varies between 30-100 percent, depending on cucurbit species and season. The survey was carried out in Shahada tehsils of Nandurbar district as a representative of Nandurbar district. We visited the melon fruit farm at Dondwade, 425423 for the research purpose and to study the nature of melon fruit flies as per the part of the present work. After checking out the melons, we found out that the melons were slightly damaged. There were holes inside the melons made by the larvae of *Bactrocera cucurbitae*. We observed that the melons were infected. The present study concludes that melon fruit fly causes serious damage to musk melon preferably to young and immature stages. The Melon fruit fly causes about 60 percent of losses. The application of cue lure traps offers superior yield in terms of fruit size and quality and reduces melon fruit fly infestation in musk melon. Therefore, future efforts should be made to increase the application of cue lure traps to make fruit cultivation a profitable business and to protect the environment and life

Keywords: Melon fruit fly, *Bactrocera cucurbitae*, Musk melon, Snap melon.

I. INTRODUCTION

Musk melon (*Cucumis melo*) is a very common fruit that belongs to the Cucurbitaceae family. It originated in the south and East Africa, now it's distributed in other most cucurbit growing countries including Pakistan. The melon fruit is very rich in vitamins A, B & C which improves urinary discharge (Kourkoutas *et al.*, 2006).

The melon fruit fly, *Bactrocera cucurbitae* is distributed widely in temperate, tropical, and sub-

tropical regions of the world. Melon Fruit flies belonging to the family Tephritidae and order Diptera. It is a serious agricultural pest, particularly in Hawaii. The extent of losses varies between 30-100 percent, depending on cucurbit species and season. But unfortunately, musk melon is attacked by different insect pests. Among these pests, the melon fruit fly is one of the most distractive pests of musk melon (Sarwar *et al.*, 2013). Among them, melon fruit fly is regressing the number of cucurbitaceous crops (Anthony *et al.*, 2005).

It has been reported that the Melon Fruit fly damages 81 host plants and is a major pest of cucurbitaceous vegetables, particularly the bitter melon (*Momordica charantia*), musk melon (*Cucumis melo*), snap melon (*Cucumis melo* var. *Momordica*), and snake gourd (*Trichosanthes anguiana*). The extent of losses varies between 30-100 percent, depending on cucurbit species and season (Dhillon *et al.*, 2005 a, b &c).

II. MATERIALS AND METHODS

Study Site: The survey was carried out in Shahada tehsils of Nandurbar district as a representative of Nandurbar district. We visited a melon fruit farm at Dondwade, Burhanpur road, Tal. Shahada.

Field Method: We visited melon fruit farm at Dondwade, 425423 for the research purpose and to study the nature of melon fruit flies as per the part of present work. After checking out the melons, we found out that the melons were slightly damaged. There were holes inside the melons made by the larvae of *Bactrocera cucurbitae*. We observed that the melons were infected.

We had conducted a survey to investigate the population density and the percentage of damage caused by larvae of *Bactrocera cucurbitae* on musk melon. Then, we planted 12 cue lure traps from 3 ft. above the ground. This survey was conducted between March to May 2024.

Types of Traps:-

All traps used for catching fruit flies must be properly labeled with the name of the bait or lure and the date the trap was set. Keep out of reach of children.

Commercial traps:-

Protein bait- glass or plastic McPhail traps can be used; flies enter from and cannot get out.

Lure- the waxed cardboard Jackson trap, sticky insert floor to catch flies, and a cotton wick for the lure. Yellow sticky board- rectangular, yellow, sticky, boards are used with or without other attractants.

Home-made traps:-

Protein bait- Use a clear plastic bottle with several 1-inch holes; add a liquid bait mix. Lure- Use a clear plastic bottle with a few 4-inch holes; put cotton inside to absorb the mix. Harris traps- A tall container with a clear, wide cover and 1-inch diameter holes; can be used with any attractant; easier to use than sticky traps, but when used with lures, it must have insecticides to kill the flies before they escape. Sticky panels- paint cardboard or wood panels bright yellow; cover with tangle foot.

Placement of traps:-

The location and placement of monitoring traps may be more critical for medflies than other fruit flies. Research has shown that medflies can effectively be trapped in their mating areas, such as the upwind side of crowns of trees receiving some light. Traps for the other fruit flies should be placed in their resting or feeding areas. Protein traps and other mild attractants should be placed in a shady area close to the host plants. Lure traps should be placed at the borders, corners, and outside of the field before flies move into the field. Color attractants should be placed in their open for best effectiveness.

Trap density (number per area) and spacing depends on the type and amount of attractant used. Traps for monitoring do not need to cover the entire area evenly. Protein bait traps do not need to cover the entire area evenly. Protein bait traps have been used at 15-30 ft in-field spacing, and lure traps have been spaced 100 ft apart outside the field.

The visual range of fruit flies is about 15-20 ft. yellow traps should be placed within that distance from the host plants and at greater density than lure

traps. Monitoring programs on the U.S mainland recommend that traps be placed 4-6 ft above the ground.

The pheromone trap performed more effectively than other traps he used (Sharifi et al. 2013).

III. RESULT & DISCUSSION

Table 1: Biodiversity of *B.cucurbitae* catches/traps/day in musk melon fruit farm during Kharif season 2024.

Trap	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Insistal	1	2	3	4	5	6	7	8	9	0	1	1	1	1
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n														
Dates														
7 th March 24	30	39	39	55	39	43	46	49	45	49	42	45	52	51
14 th March 24	30	30	35	30	27	36	40	28	22	28	20	22	35	38
21 st March 24	10	10	51	11	91	14	12	11	10	11	61	14	12	13
28 th March 24	7	11	55	54	49	99	77	11	71	77	22	84	84	
4 th April 24	14	14	11	20	16	25	17	23	15	18	14	17	20	24
11 th April 24	8	12	53	13	11	16	91	10	10	91	12	91	12	14
18 th April 24	2	7	36	65	95	52	44	44	88	77	62	62	62	
25 th April	0	2	10	02	14	43	11	11	00	00	15	15	15	15

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2 nd May 24	9	1	8	1	1	9	1	7	1	1	1	1	1
9 th May 24	5	9	2	7	0	1	9	9	1	4	1	5	8
16 th May 24	9	3	6	2	5	8	2	6	7	1	7	3	5
23 rd May 24	0	3	2	1	2	0	1	4	1	2	1	2	1

Total	128	44	2307	1179	19
Percentage%				51.10	0.82

Table 2: Biodiversity of melon fruit fly and its parasitoids collected from infested musk melon fruit during Kharif season 2024.

Date	No.of fruits	Fruit weight (kg)	No. of pupae	<i>B.cucur bitae</i>	<i>T.daci</i>
7- Mar-2024	07	2.50	130	121	6
14- Mar-2024	07	3.00	212	158	3
21- Mar-2024	11	4.00	150	123	0
28- Mar-2024	08	3.00	199	84	0
4- Apr-2024	10	3.50	320	204	1
11- Apr -2024	10	3.00	170	124	0
18- Apr -2024	16	5.00	190	62	6
25- Apr –2024	08	3.00	221	15	0
2- May	20	6.50	240	125	2
9- May	12	4.00	205	85	1
16- May	12	3.50	160	59	0
23- May	08	3.00	110	19	0

Figure-1: Average number of *B.cucurbitae* catches/traps/day in musk melon fruit farm during kharif season 2024

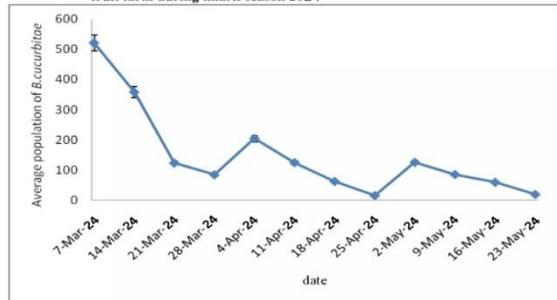


Figure-2: Average population of *Trybliographa daci* collected from musk melon infested fruit during kharif season 2024

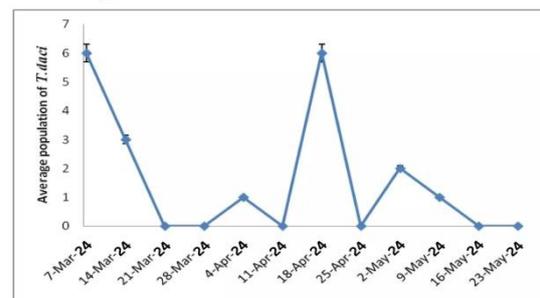


Fig.1 Dondwade fruit farm During April 2024.

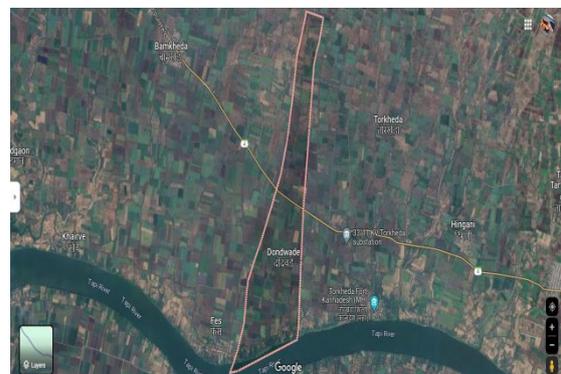


Fig.2 Google map of Dondwade fruit farm.



Fig.3 Collection and measurement of *Bactrocera cucurbitae* from the Trap.

Watermelon is one of the important commercial fruits crops of India. There are total 1200 varieties grown in 96 countries of world. In north India it is sown in the month of February to March and in northeastern and western India in November to January. Total duration of the crop is 115 days. The cropping is divided into four stages. Flower initiation and first picking occurs 60 days after sowing the seeds. Total harvesting period is of 45 days.

In the present study, *Bactrocera cucurbitae* catches per trap were recorded from March to April 2024. The record was maintained of *Bactrocera cucurbitae* catches/ trap/day in musk melon fruit farm. It was noted that on 7th March 2024 found maximum 521 catches/ trap/day (Table1). The maximum catches might be due to young and immature stage, it goes to decreased up to 28th March, again slightly increased up to 4th April and finally decreased at the end of harvesting.

Maximum numbers of catches/ trap/day showed its effectiveness, saved 60 percent of losses, and increased yield by 2-4 times higher than that of the non-baited field (M. Nasiruddin et al., 2002).

IV. CONCLUSION

- The present study concludes that melon fruit fly causes serious damage to musk melon preferably to young and immature stages.
- The Melon fruit fly causes about 60 percent of losses.
- Application of cue lure traps offer superior yield in terms of fruit size and quality and reduce melon fruit fly infestation in musk melon.
- Although cue lure traps are easy to prepare locally and effective for the management of melon fruit flies, it require more frequent applications owing to more labor cost.
- Therefore, future efforts should be made to increase the application of cue lure traps to make fruit cultivation a profitable business and to protect the environment and life.

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