



STUDIES ON THE OVIPOSITIONAL PREFERENCE OF FRUIT FLY, *BACTROCERA ZONATA* ON MANGO

Dr.N.S.Dale¹, Prof.S.N.Varpe² and Prof.G.B.Labade³

Associate professor of Entomology¹, Assistant professor of Entomology² and Assistant professor of Agril. Botany³
College of Agriculture, Loni, Tal.Rahata, Dist.Ahmednagar (M.S.)

Abstract: The female fruit fly preferred to lay their eggs under the skin of mango fruits and maximum numbers of eggs were laid on the proximal part (stalk side) and middle part of the mango fruits. The female fruit fly mostly preferred proximal part of the mango fruits for oviposition. The depth of eggs laid by female fruit fly, *B. zonata* in the mango fruits varied from 1.90 to 3.00 mm with an average of 2.45 ± 0.33 mm. Number of oviposition puncture made by *B. zonata* varied from 1 to 12 in number with an average of 4.06 ± 2.49 oviposition punctures. The number of eggs laid by female in each puncture varied from 3 to 11 with an average of 7.05 ± 2.48 eggs.

Keywords: *Bactrocera zonata*, Proximal, Oviposition and Punctures.

INTRODUCTION:

Fruit fly is an important pest of mango belongs to family Tephritidae and order Diptera. These are commonly called “Fruit fly” due to their close association with fruits. Kapoor (1970) listed 128 species of fruit flies and out of these, eight species are found infesting mango fruit in India. These species are *Bactrocera zonata* (Saunders), *Bactrocera dorsalis* Hendel, *Bactrocera correctus* (Bezzi), *Bactrocera diversa* (Coquillett), *Bactrocera hageni* De majiere, *Bactrocera cucurbitae* (Coq.), *Dacus incisus* Walker and *Dacus tau* (Walker). The adult female fruit flies insert the ovipositor inside the fruits and eggs are deposited in clusters. Dark puncture caused due to the oviposition. Maggots on hatching, feed on the pulp and brown patches appear on the fruit surface. Later on the fermenting organisms like bacteria and fungi gain entry through the oviposition puncture and fruit start rotting. Due to this, mesocarp become dirty brown and finally fruit drop down. Pupation took place in soil. The fruit fly species is active throughout the year except colder months i.e. December to middle of February. Maximum population of fruit fly was recorded in summer season and slowly decline in winter season. Looking to the apparent importance of the pest the investigation was carried out to study ovipositional preference of fruit fly *Bactrocera zonata* on mango.

REVIEW OF LITERATURE:

Atwal (1976) reported that the eggs of *D. zonatus* were laid under the skin of fruits in groups of 2 to 9 eggs. Single female of *D. zonatus* laid 137 eggs in her life time While, Rana et al. (1992) reported that single female of *B. zonata* laid 191 to 259 eggs at an average temperature of $28 \pm 2^\circ\text{C}$ when reared on guava. Kapoor (2000) mentioned that the female of *B.zonata* laid upto 150 eggs in her life time on guava fruits. .

According to Butani (1979), the eggs were laid just below the epidermis of fruits in clusters of 2 to 10 eggs. Kapoor (2000) mentioned that the female of *B. zonata* laid eggs under soft rind of the fruits about to ripen in clusters of 3-12 eggs.

MATERIALS AND METHODOLOGY:

To study the site and depth of egg laying fruits of mango provided for oviposition were critically examined for the appearance of any puncture on the fruit due to ovipositor insertion as well as site and depth of egg lying. The fruits were also measured to study the depth of egg lying under dissecting binocular microscope after opening the fruit with the help of razor blade.

RESULTS AND DISCUSSION:**Site of Oviposition by *B. Zonata*-**

In the laboratory and field conditions, it was observed that the female fruit fly preferred to lay their eggs under the skin of mango fruits and maximum numbers of eggs were laid on the proximal part (stalk side) and middle part of the mango fruits. It was confirmed by observing 100 numbers of fruits with egg laying injury and the data are presented in Table 1.

Table: 1 Site preference for Oviposition by *B. Zonata*

| Number of damaged fruits observed | Number of fruits having egg laying injury on | | | Per cent egg laying injury on | | |
|-----------------------------------|--|--------|-------------|-------------------------------|--------|-------------|
| | Proximal Part (Stalk side) | Middle | Distal Part | Proximal Part (Stalk side) | Middle | Distal Part |
| 100 | 64 | 35 | 1 | 64 | 35 | 1 |

From the table 1, it can be seen that out of 100 damaged mango fruits observed, 64 fruits (64.00 %) were punctured on proximal part (Stalk side), while 35 fruits (35%) were punctured for oviposition on middle part of fruits and single fruit (1%) was punctured for oviposition on distal part of the fruit. Thus, it can be concluded that the female fruit fly mostly preferred proximal part of the mango fruits for oviposition.

Depth of Oviposition -

The data on measurement of depth of eggs inside the fruits are presented in Table 2.

Table 2: Depth of eggs laid by *B. Zonata* in Mango fruits

| Sr.No. | Depth of eggs (mm) | Sr.No. | Depth of eggs (mm) |
|--------|--------------------|--------|--------------------|
| 1. | 1.90 | 16. | 3.00 |
| 2. | 2.00 | 17. | 2.50 |
| 3. | 2.16 | 18. | 2.30 |
| 4. | 2.18 | 19. | 2.30 |
| 5. | 2.22 | 20. | 2.40 |
| 6. | 2.00 | 21. | 2.94 |
| 7. | 2.50 | 22. | 2.30 |
| 8. | 2.32 | 23. | 3.00 |
| 9. | 2.30 | 24. | 2.30 |
| 10. | 2.16 | 25. | 3.00 |
| 11. | 2.13 | 26. | 2.40 |
| 12. | 2.46 | 27. | 3.00 |
| 13. | 2.80 | 28. | 2.40 |
| 14. | 3.00 | 29. | 2.36 |
| 15. | 2.46 | 30. | 2.82 |

| | |
|------------------|------------------|
| Min. | 1.90 |
| Max. | 3.00 |
| AV. ±S.D. | 2.45±0.33 |

It can be seen from the data that the depth of eggs laid by female fruit fly, *B. zonata* in the mango fruits varied from 1.90 to 3.00 mm with an average of 2.45 ± 0.33 mm.

Number of oviposition puncture -

The data on number of oviposition punctures made by *B. zonata* in mango fruits are presented in the Table 3.

Table 3: Number of oviposition punctures made by fruit fly, B. Zonata on mango fruits

| Sr.No. | Number of oviposition punctures | Sr.No. | Number of oviposition punctures |
|------------------|---------------------------------|--------|---------------------------------|
| 1. | 3 | 16. | 3 |
| 2. | 7 | 17. | 4 |
| 3. | 2 | 18. | 6 |
| 4. | 1 | 19. | 3 |
| 5. | 2 | 20. | 9 |
| 6. | 3 | 21. | 12 |
| 7. | 3 | 22. | 4 |
| 8. | 2 | 23. | 7 |
| 9. | 5 | 24. | 4 |
| 10. | 3 | 25. | 4 |
| 11. | 3 | 26. | 3 |
| 12. | 9 | 27. | 2 |
| 13. | 4 | 28. | 2 |
| 14. | 3 | 29. | 4 |
| 15. | 2 | 30. | 3 |
| Min. | | | 1 |
| Max. | | | 12 |
| AV. ±S.D. | | | 4.06±2.49 |

Data presented in Table 3 indicated that, number of oviposition puncture made by *B. zonata* varied from 1 to 12 in number with an average of 4.06 ± 2.49 oviposition punctures.

Number of eggs per puncture -

The data on number of eggs laid in each puncture by *B.zonata* in mango fruits are presented in Table 4.

Table 4: Number of eggs per puncture laid by, *B. Zonata* on mango fruit

| Sr.No. | Number of oviposition punctures |
|-----------|---------------------------------|
| 1. | 9 |
| 2. | 11 |
| 3. | 6 |
| 4. | 9 |
| 5. | 3 |
| 6. | 9 |
| 7. | 4 |
| 8. | 6 |
| 9. | 6 |
| 10. | 9 |
| 11. | 3 |
| 12. | 6 |
| 13. | 9 |
| 14. | 6 |
| 15. | 4 |
| 16. | 6 |
| 17. | 9 |
| 18. | 9 |
| 19. | 11 |
| 20. | 6 |
| Min. | 3 |
| Max. | 11 |
| AV. ±S.D. | 7.05±2.48 |

Data presented in Table 4 indicated that the number of eggs laid by female in each puncture varied from 3 to 11 with an average of 7.05 ± 2.48 eggs. The number of eggs per puncture has been reported by earlier worker as 2 to 9 eggs (Atwal, 1976), 2 to 10 eggs (Butani, 1979), and 3 to 12 eggs (Kapoor, 2000). The present findings is in close conformity with the reports of above workers.

REFERENCES

- Atwal, A.S. 1976. Agricultural pest of India and south –East Asia. Kalyani Publisher, Ludhiana: 189-190.
- Butani, D.K.1979. Insect and fruits. Periodical Expert Book Agency, Delhi: 297-299.
- Kapoor, V.C.1970. Indian Tephritidae with their recorded hosts. Oriental insects. , New Delhi. 4 (2): 220-241
- Kapoor, V.C.2000. IPM system in Agriculture, Fruit flies (Diptera: Tephritidae) : Status, Bioecology and management strategies (Vol. 7). Aditya Book Pvt.Ltd. New Delhi: 123-142.
- Rana, J.S.; Prakash, O and Verma, S.K.1992. Biology of guava fruit fly infesting guava fruits in Haryana and influence of temperature and relative humidity on its incidence. Crop Res., 5 (3):525-529.

