

Effects of diet on the fecundity of continuously mated females of the Melon Fruit Fly *Zeugodacus cucurbitae* (Diptera: Tephritidae)

Tahera Hossain*, Farzana Yesmin, Md. Hasanuzzaman

Cytology and Biocontrol Research (CBR), Radiation Entomology and Acarology Division, Institute of Food and Radiation Biology, Atomic Energy Research Establishment, Bangladesh Atomic Energy Commission, GPO Box- 3787, Dhaka1000, Bangladesh.

*Corresponding author (taherahossain09@yahoo.com)

INTRODUCTION & AIM

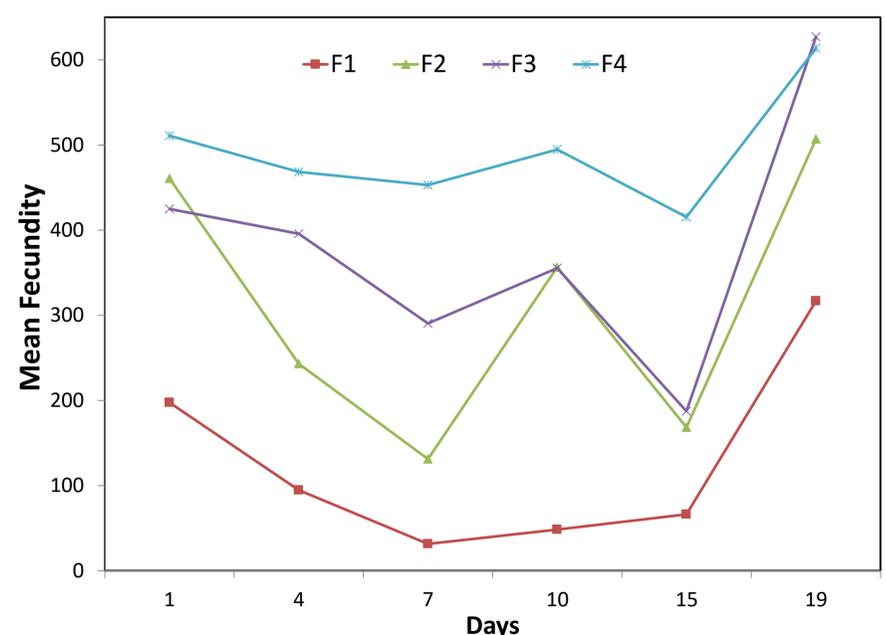
The melon fruit fly, *Zeugodacus cucurbitae*, is a major fruit pest in Bangladesh. The Sterile Insect Technique (SIT) is an effective tool in controlling the melon fly pest. It is expensive to rear a large batch of flies in the laboratory which is one of the main challenges of SIT. It is important to minimize rearing cost without compromising reproduction capabilities. If the fly colony is maintained with a good diet, competitive adult flies could bring about an effective suppression in the field population. The aim of the present study was to identify the optimal diet by altering yeast sugar ratios in an artificial diet to maximize egg production in *Z. cucurbitae*.

METHOD

- Adult flies used were sourced as pupae from established colonies maintained in the laboratory of Radiation Entomology and Acarology Division, AERE, Savar, Dhaka at $28\pm 2^{\circ}\text{C}$ temperature and about $75\pm 5\%$ relative humidity.
- Within 24h of emergence, flies were separated by sex into plastic containers and provided with ad libitum food and water. To determine the influence of adult diet on fecundity newly emerged 10 pairs of adults ($10 \text{ } \text{♀} \times 10 \text{ } \text{♂}$) were placed in small cages and Four feeds with varying yeast-to-sugar ratios were provided: F1 (0: 100, Y: S) (refers to sugar only), F2 (1.96: 98.04, Y: S), F3 (4.76: 95.24, Y: S), and F4 (25: 75, Y: S).
- At the age of 14 days plastic vials perforated with holes lined internally with oviposition medium (sweet gourd) as egg laying receptacles for egg laying twice in a week and continued for one month.
- We recorded the fecundity (no of eggs) of continuously mated females.

RESULTS

Change of fecundity with change of yeast to sugar ratio



- The results revealed that diet significantly affected female fecundity. The mean fecundity of continuously mated females maintained on the four diet types, i.e., F1, F2, F3, and F4, was 125, 311, 380, and 492 respectively.
- the mean fecundity as well as the highest fecundity increased with the level of yeast in the diet.

IMPORTANCE

Identifying the optimal yeast and sugar ratios would maximize Melon fly fecundity performance, producing a major impact on breeding *Z. cucurbitae* populations in the laboratory.

CONCLUSION

These results could be valuable for the population dynamics studies and mass rearing of *Z. cucurbitae*.