

**Research Note :**

## POPULATION DYNAMICS OF ORIENTAL FRUIT FLY, *Bactrocera dorsalis* (Hendel) IN RELATION TO ABIOTIC FACTORS

Jitendra Mishra, Sandeep Singh, Akilesh Tripathi<sup>1</sup> and M.N. Chaube<sup>2</sup>

Deptt. of Entomology, C.S.Azad Univ. of Agri. & Tech., Kanpur

<sup>1</sup>Deptt. of Entomology, K.A.P.G College, Allahabad

<sup>2</sup>Deptt. of Entomology, S.D.J.P.G College, Chandeshar, Azamgarh

**Keywords:** *B. dorsalis*, population dynamics, correlation, meteorological factors.

Fruit flies are the most serious pest of fruits and vegetables not only in India but also all over the world. Fruit fly in India causes annual losses estimated as Rs. 2945 crore in mango, citrus, guava and sapota. As per the recent reports they cause upto 44% damage in guava orchards (Stonehouse *et al.* 6). Mango and guava are two important fruit crops which are severely damaged by fruit flies. Most common species attacking these two fruits are *Bactrocera dorsalis* (Hendel), *B. correcta* (Bezzi) and *B. zonata* (Saunders) (Verghese and Sudha devi, 7). Among the various alternate strategies available for the management of fruit flies, the use of methyl eugenol trap stands is the most outstanding alternative. Methyl eugenol has both olfactory as well as phagostimulatory action and is known to attract fruit flies from a distance of 800 m. Methyl eugenol, when used together with an insecticide impregnated into a suitable substrate, forms the basis of male annihilation technique. Therefore, the present research work was aimed to study the population dynamics of fruit flies and establish correlation between trap catch and meteorological parameters.

The experiments were conducted during two consecutive year (2005-06 and 2006-07) in the different orchards of the block Kakori of the distt. Lucknow. The fruit flies trapped in these traps were collected at weekly intervals starting from 10<sup>th</sup> standard week of 2005 to 9<sup>th</sup> standard week of 2007. The methyl eugenol traps used were transparent 2000 ml soft drink bottle traps. Each bottle trap had three windows of equal size and a

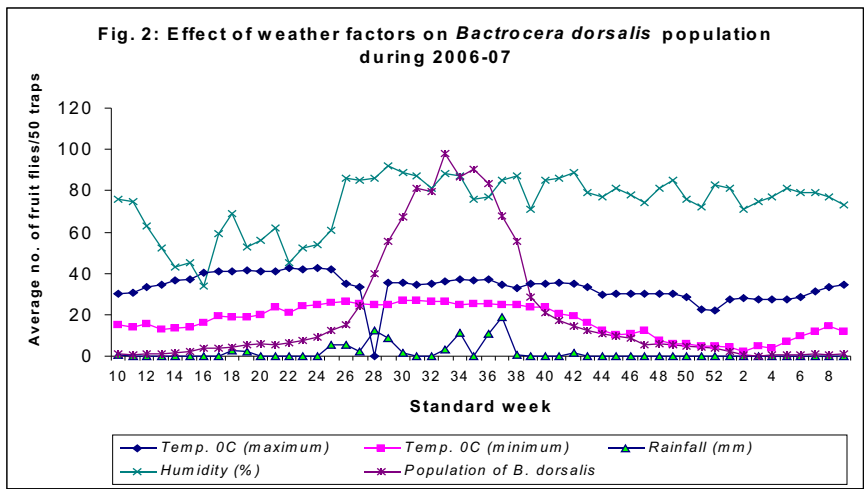
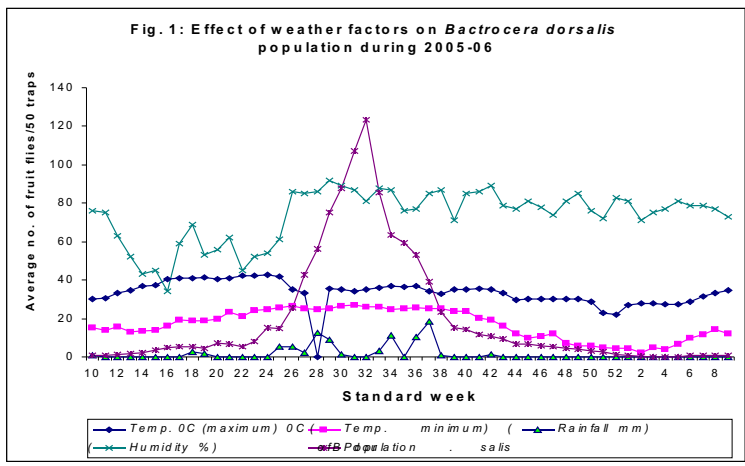
wooden piece of 5 x 5 cm charged with 6 : 4 : 1 (alcohol:methyl eugenol: malathion) placed in a loop of plastic wire. These wooden pieces were recharged at monthly interval, replicated thrice. These pieces were then, dried in shade and hung inside the bottle with the help of plastic thread. Observations on mean number of fruit flies trapped in the traps were correlated with weather parameters viz., maximum temperature, minimum temperature, relative humidity and rainfall.

### Population fluctuation

In the present investigation *B. dorsalis* was recorded as the most abundant species. The observed data in the 1<sup>st</sup> and 2<sup>nd</sup> experimental years revealed that the *B. dorsalis* population showed its peak in 32<sup>nd</sup> and 35<sup>th</sup> SW, respectively (Fig 1 & 2). This finding is supported by Gupta and Bhatia (2) who reported maximum *B. dorsalis* population during 30<sup>th</sup> SW of 1992 in mango orchard. Rajitha (4) also observed the peak incidence of *B. dorsalis* during 30<sup>th</sup> standard week in guava orchard. Deepa *et al.* (1) reported peak of *B. dorsalis* during fourth week of April, which supports the present study.

### Correlation between *B. dorsalis* and weather factors

The data recorded on the *Bactrocera dorsalis* population was studied during two consecutive years *i.e.*, 2005-06 and 2006-07. Correlation between *B. dorsalis* and weather conditions resulted in a non-significant correlation with maximum temperature while it showed positive significant correlation with minimum temperature,



**Table 1:** Coefficient of correlation (r) between trap catches of *Bactrocera dorsalis* and meteorological parameters.

Meteorological parameters	<i>Bactrocera dorsalis</i>	
	2005	2006
Maximum Temperature	0.20	0.21
Minimum Temperature	0.65**	0.63**
Relative Humidity	0.42**	0.53**
Rainfall	0.40**	0.34*

\* Significant at 5% level of difference = 0.273; \*\* Significant at 1% level of difference = 0.354

relative humidity and rainfall in both years of the experimen (Table 1).

Rajitha and Viraktamath (5) found *B. dorsalis* having significant positive correlation with minimum temperature and morning and afternoon relative humidity. The findings of Rajitha and

Viraktamath (4) were more or less reported similar results but they noticed the *B. dorsalis* population with significant positive correlation with minimum temperature and relative humidity, whereas a negative correlation with maximum temperature.

The finding of Rai et al. (3) are in full

agreement with the present results. They also found positive correlation with temperature, relative humidity and rainfall against *B. dorsalis*.

### REFERENCES

1. Deepa M., Agrawal Neerja, Viswakarma Rahul, Kumari, Kiran and Lal, K. Mitali (2009). Monitoring and weather parameters on *Bactrocera* complex through methyl eugenol traps. *Ann. Pl. Protec. Sci.*, **17**(2): 332-336
2. Gupta, D. and Bhatia, R. (2000). Population fluctuations of fruit flies *Bactrocera spp.* in submountainous mango and guava orchard. *J. Appl. Hort.*, **2** : 47-49.
3. Rai, S., Shankar, U., Bhagat, R. M. and Gupta, S.P. (2008). Population dynamics and succession of fruit fly on sub-tropical fruits under rainfed condition in Jammu region. *Indian J. Entom.*, **70** (1): 12-15
4. Rajitha, A.R. (2004). Monitoring of fruit flies using different types of traps and lures in guava and mango. *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad
5. Rajitha, A.R. and Viraktamath, S., (2006). Monitoring fruit flies (Diptera : Tephritidae) in guava orchard in Dharwad, Karnataka. *Karnataka J. Agric. Sci.*, **19**: 35-39.
6. Stonehouse, J.M., Riaz Mahmood, Ashraf Poswal, John, Mumford and Karim, Nawaz (2005). Studies on economically important fruit flies in Pakistan. *Crop Protec.*, **21** (8) : 661-669.
7. Verghese, A. and Sudhadevi, K. (1998). Relation between trap catch of *Bactrocera dorsalis* Hendel and abiotic factors In : *Proceedings of first National symposium on pest management in Horticultural crops* Bangalore pp. 15-18.