INCIDENCE OF FRUIT FLIES ON CUCUMBER IN KASMIR VALLEY (INDIA)

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Abstract : The study was carried out during 2008- 2009 at six locations namely Batamaloo, Dal and Shalimar in district Srinagar, Chadoora, Bugam and Narkara in district Budgam. Four species of fruit flies on cucumber namely *Bactrocera cucurbitae, B. dorsalis, B. tau* and *B. scutellaris* were found that infest the cucumber crop. The maximum incidence of fruit damage (9.18%) on cucumber was recorded on 41st standard week and minimum incidence of 1.98 per cent was recorded on 29th standard week in Srinagar, while as in Budgam, the incidence of fruit damage on cucumber was maximum (9.55%) on 41st standard week and minimum 2.18 per cent during 29th standard week. The per cent incidence of fruit flies on cucumber was recorded highest (6.23 and 5.32%) at Batamaloo (Srinagar) and Chadoora (Budgam) respectively.

Keywords : Incidence, Cucumber, Kashmir (India)

INTRODUCTION

Fruit flies of family Tephritidae (Order:Diptera) are one of the most serious pests of fruits and vegetables throughout the tropical and subtropical regions (Allwood and Drew, 1996; Aluja *et al*. 1996; Amstrong and jang, 1997; Hasyim *et al.* 2004 and Hasyim *et al.* 2006). In Indian subcontinent, there are more than 200 known species of fruit flies, however, the species that are considered to be the serious pests of fruits and vegetables are not more than 10. Most of these species are polyphagous, having high rate of fecundity and ability to quick spread over a wide area that makes them real vexatious pests for fruit and vegetable growers. During the crop season, melon fruit fly causes 20-70% damage to the crop, but in epidemic forms it destroys the whole crop (Rehman, 1994)

The fruit flies damage fruits and vegetables by laying eggs under the skin. The eggs hatch into larvae feeding in the decaying flesh of the fruits and vegetables. Infected fruits and vegetables quickly become rotten and inedible or drop to the ground prematurely, thus causing considerable losses in production (Holligsworth *et al.*, 1997).

Fruitflies can successfully be managed over local area by fruit bagging, field sanitation, protein bait, annihilation technique, growing fly resistant genotypes, augmentation of biological control and insecticides (Akhtaruzzaman *et. al.*, 1999; Singh *et al.*, 2000; Dhillon *et al.* 2005).

METHODOLOGY

Extensive survey was conducted during 2008- 2009 in two districts of Kashmir valley (India) in order to study the occurrence of fruit flies associated with cucurbit crops. Two districts namely Srinagar and Budgam were selected. In each district three locations were selected for this purpose. In district Srinagar, the locations were Batmaloo, Shalimar and Dal, while in district Budgam the locations were Chadoora, Narkara and Bugam. The survey was conducted at weekly intervals on different cucurbit crops viz. bottle gourd, cucumber, ridge gourd and bitter gourd. The incidence of pest damage was recorded by selecting ten plants from each location and total number of fruits was counted. Simultaneously infested fruits were counted and the disease incidence was calculated by the formula:

$$\text{Per cent incidence} = \frac{\text{No. of infested fruits}}{\text{Total No. of fruits}} \times 100$$

RESULT AND DISCUSSION

The per cent incidence of fruit fly damage on cucumber in district Srinagar presented in Table 1 indicated that the per cent damage in Batamaloo was highest (9.50%) in the 41st standard week and lowest (2.12%) in 29th standard week. The per cent damage in Batamaloo increased from 29th to 38th standard week and then decreased upto 40th standard week and again increased in the next week, where from it started decreasing. In case of Dal the highest (9.09%) incidence of fruit fly damage was recorded in the 41st standard week and lowest (1.96%) in the 29th standard week. The per cent damage increased from 29th to the 34th standard week and then decreased for the next three weeks, where after it increased in the next week i.e. 38th standard week. From onwards, the per cent damage decreased in the next two weeks and then again increased in the next week i.e. 41st standard week and then started decreasing. In Shalimar the highest (8.95%) damage was also recorded in the 41st standard week whileas lowest (1.85%) was recorded in 29th standard week. The per cent damage started increasing from 29th to 39th standard week and then decreased in the next week and again increased in the week afterward, whereafter it started decreasing. On an average the mean per cent damage started increasing from the lowest of 1.98 per cent in 29th to 39th standard week, then decreased in the next week and increased in the week afterwards i.e. 41st standard week where the per cent damage was recorded the highest of 9.18 per cent. Among the various locations selected the mean per cent damage was recorded

highest (6.23%) in Batamaloo followed by Dal (5.26%) and Shalimar (5.15%), which were significant. The low per cent damage in July was mainly due to the after effects of high temperature in June. Afterwards the increase in the per cent damage may be attributed to the conducive temperature and abundant supply of host fruits. The decrease in per cent damage in 42nd and 43rd standard week (late October) is mainly because of low temperature and shortage of host fruits. These findings are supported by Mann (1996). The high per cent damage in Batmaloo could be attributed to the surrounding unmanaged farms.

The data (Table 2) indicated that the incidence of fruit fly damage on cucumber in district Budgam ranges from 2.38 to 9.67 per cent in Chadoora, 2.12 to 8.62 per cent in Bugam and 1.85 to 7.35 per cent in Narakara. The highest per cent damage in all the three places were recorded in 41st standard week while as lowest was recorded in 29th standard week in Chadoora and Narkara and 30th standard week in Bugam. The per cent damage in case of Chadoora increased from 29th to 38th standard week and decreased in the next two weeks. In the next week the per cent damage increased whereafter it started declining. In case of Bugam the per cent damage started increasing from 30th to 35th standard week, decreased in the next week and then again increased for two weeks, it decreased in the next and then again increased in the two weeks afterwards and thereafter it started decreasing. In case of Narkara, the per cent damage started increasing from 29th to 39th standard week and then decreased in the next week and then gain increased in the following week whereafter it started decreasing. Overall the mean per cent damage increased from its lowest of 2.18 per cent in the 29th standard week to 7.62 per cent in the 38th standard week and then decreased in the next two weeks and again increased and reached to maximum of 8.55 per cent in the 41st standard week, wherefrom it started decreasing. The highest mean per cent damage was recorded in Chadoora (5.32%) followed by Bugam (5.30%) and Narkara (4.11%). Among which Narkara varied significantly with the other two locations. The highest per cent damage was recorded in the 41st standard week, while as lowest was recorded in 29th standard week. The low per cent damage in 29th standard week was mainly due to the after effects of high temperature in June. Afterwards, the increase in the per cent damage may be attributed to the conducive temperature and abundant supply of host fruits. The decrease in per cent damage in 42nd and 43rd standard week (late October) is mainly because of low temperature and shortage of host fruits. These findings draw their support from Mann (1996). In district Budgam the highest per cent damage was recorded in Chadoora (5.32%) followed by Bugam (5.30%) and Narkara (4.11%). The highest per cent damage in Chadoora could be mainly attributed to the use of local varieties of cucumber, while the lowest per cent damage in Narkara could be due to the use of hybrid varieties, large scale cultivation of cucumber resulting in high use of pesticides.

Table 1: Per cent incidence of fruit flies on cucumber in district Srinagar during 2008-2009

Dates→ / **Place↓**	**Standard weeks**															**Mean**
	29th	**30th**	**31st**	**32nd**	**33rd**	**34th**	**35th**	**36th**	**37th**	**38th**	**39th**	**40th**	**41st**	**42nd**	**43rd**	
Batamaloo	2.12	2.38	3.07	4.44	4.22	5.47	6.66	8.06	8.47	9.37	9.23	7.93	9.50	6.77	5.76	**6.23**
Dal	1.96	2.08	2.98	2.94	4.10	6.57	5.47	5.45	5.33	7.93	7.81	7.24	9.09	5.55	4.44	**5.26**
Shalimar	1.85	2.04	2.89	2.17	4.16	4.28	5.40	5.42	6.66	7.81	8.82	7.24	8.95	5.26	4.34	**5.15**
Mean	**1.98**	**2.17**	**2.98**	**3.18**	**4.16**	**5.44**	**5.84**	**6.31**	**6.82**	**8.37**	**8.62**	**7.47**	**9.18**	**5.86**	**4.84**	

The value represents mean of three replications.
CD($p \leq 0.05$)
Place = 0.026 Dates = 0.059 Places x Dates = 0.103

Table 2: Per cent incidence of fruit flies on cucumber in district Budgam during 2008-2009

Dates→ / **Place↓**	**Standard weeks**															**Mean**
	29th	**30th**	**31st**	**32nd**	**33rd**	**34th**	**35th**	**36th**	**37th**	**38th**	**39th**	**40th**	**41st**	**42nd**	**43rd**	
Chadoora	2.38	2.50	2.63	2.77	3.07	4.34	6.15	6.34	6.77	8.19	7.02	6.66	9.67	6.15	5.12	**5.32**
Bugam	2.32	2.12	2.43	2.77	4.22	4.41	6.34	4.68	6.66	8.06	6.77	8.19	8.62	7.14	4.76	**5.30**
Narkara	1.85	2.12	2.22	2.77	2.73	3.89	2.85	4.47	6.66	6.60	6.89	4.61	7.35	3.84	2.73	**4.11**
Mean	**2.18**	**2.25**	**2.43**	**2.77**	**3.34**	**4.21**	**5.11**	**5.16**	**6.70**	**7.62**	**6.89**	**6.49**	**8.55**	**5.71**	**4.20**	

The value represents mean of three replications.
CD($p \leq 0.05$)
Place = 0.050 Dates = 0.111 Places x Dates = 0.192

CONCLUSION

The maximum incidence of fruit damage (9.18%) on cucumber was recorded on 41st standard week and minimum incidence of 1.98 per cent was recorded on 29th standard week in Srinagar. While as in Budgam, the incidence of fruit damage on cucumber was maximum (9.55%) on 41st standard week and minimum 2.18 per cent during 29th standard week.

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