FRUIT FLY OF CUCURBITS IN SEMI ARID REGION OF NORTH GUJARAT

CHAUDHARY, F. K. *

KRUSHI VIGYAN KENDRA
SARDARKRUSHINAGAR DANTIWADA AGRICULTURAL UNIVERSITY
DEESA-385 535 , DI. BANASKANTHA (GUJARAT), INDIA

E-Mail: fk_43@yahoo.co.in

ABSTRACT

The present survey for cultivated and wild hosts of fruit fly was carried out in Sardarkrushinagar Dantiwada Agricultural University Campus area as well as in Hasanpur and Ghodiyal village of Vadgam taluka (District : Banaskantha) at fortnight interval during the year 2003-04 and 2004-05. The results showed that cultivated cucurbitaceous plants *viz.*, pumpkin, *Cucurbita moschata* Duch ex Poir.; Karingada, *Citrullus lanatus* (Thunb.); ridge gourd, *Luffa acutangula* Roxb.; sponge gourd, *Luffa cylindrica Roemer* and cucumber, *Cucumis sativus* (L.) and wild cucurbitaceous plants *viz.*, little gourd, *Coccinia grandis* (L.); Kan Kareli, *Momordica charantia* (L.); Gothamada, *Cucumis callosus* (Rott.) Cogr.; Tutar Vela, *Luffa acutangula* (L.); Tumada, *Citrullus colocynthis* (L.); Kankoda, *Momordica dioica* Roxb. and Ankhfooti, *Trichosanthes bracteata* (Lam.) were recorded as hosts of fruit flies in Banaskantha district of north Gujarat. Melon fly, *Bactrocera cucurbitae* Coquillett and Ethiopian fruit fly, *Dacus ciliatus* Loew were the major fruit fly species infesting these cucurbitaceous plants. The proportional occurrence of both the species was nearly equal in cultivated hosts, whereas *D. ciliatus* was more abundant in wild hosts.

KEY WORDS: Cucurbits, fruit fly, occurrence

INTRODUCTION

Fruit fly belonging to family Tephritidae order Diptera is the most important pest of cucurbitaceous fruits and vegetables. Presently, there are 199 species of fruit flies known to occur in India. Among these, *Bactrocera cucurbitae* Coquillett., *Bactrocera zonata* (Saunders), *Bactrocera dorsalis* (Hendel), *Bactrocera diversa* Coq., *Bactrocera correcta* (Bezzi), *Bactrocera tau* (Walker), *Dacus ciliatus* Loew, *Carpomya vesuviana* Costa and *Mylopardalis pardilana* Bigot are common one (Kapoor, 1970). *B. cucurbitae* is commonly known as melon fly or cucurbit fruit fly. *B. cucurbitae* is strong flier and highly mobile polyphagous multivoltine tropical and sub-tropical species. *D. ciliatus* is also the pest of cucurbits and known as Ethiopian fruit fly. Patel (1974) recorded 62.50 per cent fruit damage in bitter gourd by fruit fly, *D. cucurbitae* in Junagadh district, whereas there was 3 to 100 per cent damage recorded by Ethiopian fruit fly, *D. ciliatus* in little gourd at Anand (Patel, 1976). Basketful literature is

available on association of fruit fly with host plants and management tactics, but the work on proportional occurrence of various species in different hosts was lacking. Hence, the present study was initiated at Sardarkrushinagar Di. Banaskantha, head quarter of Sardarkrushinagar Dantiwada Agricultural University situated in semi arid area of nNorth Gujarat.

MATERIALS AND METHODS

The survey for cultivated and wild hosts of fruit fly was carried out in Sardarkrushinagar Dantiwada Agricultural University Campus area as well as in Hasanpur and Ghodiyal village of Vadgam taluka (District : Banaskantha) at fortnight interval during the year 2003-04 and 2004-05. The wild hosts were identified at the Department of Bioscience, Sardar Patel University, Vallabh Vidhyanagar. From each cultivated and wild hosts, five damaged fruits were collected and kept in a round galvanized cage (35 cm diameter, 10 cm height), containing a layer of 5 cm sieved soil to facilitate pupation. Number of adults emerged from pupae were recorded and sorted species wise. They were sent at IIHR, Bangalore for identification. Data obtained were used to calculate the proportional occurrence of both the species in cultivated and wild cucurbitaceous plants.

RESULTS AND DISCUSSION

The results presented in Table 1 indicated that five cultivated cucurbitaceous hosts *viz., C.moschata, C, lanatus, L. acutangula, L. cylindrica* and *C. sativus* and seven wild cucurbitaceous host *viz., C. grandis, M. charantia, C. callosus, L. acutangula, C. colocynthis, M. dioica* and *T. bracteata* were recorded as hosts of fruit flies in North Gujarat. Melon fly, *Bactrocera cucurbitae* and Ethiopian fruit fly, *Dacus ciliatus* were found infesting the fruits of host plant surveyed.

In past, the hosts of *B. cucurbitae* were recorded as cucurbitaceous vegetables and some wild cucurbit vines (Doharey, 1983). The hosts of *D. ciliatus* were also reported by various workers as *Coccinia indica* (Patel, 1994), cucurbits (Qureshi *et al.*, 1974), pumpkin (Daiber, 1966), and karingada (Tahiliani and Butani, 1981). Thus, the present findings on the host of *B. cucurbitae* and *D. ciliatus* are in close confirmation with the earlier reports.

The Proportional occurrence of both the species of fruit flies on various hosts are presented in Table 2. The cultivated hosts supported both the species of fruit fly from the month of July to March during both the year. The occurrence of *B. cucurbitae* was higher (> 50 %) during first fortnight of July to first fortnight of August which ranged between 81.04 and 100.00 per cent in comparison to *D. Ciliatus*. From second fortnight of August to second fortnight of February, the abundance of *B. Cucurbitae* ranged between 37.26 to 82.16 per cent except during the first fortnight of March where the activity of *B. cucurbitae* was completely absent. The occurrence of *D. ciliatus* during the corresponding period ranged between 17.84 and 62.74 per cent except during the first fortnight of March, where *D. ciliatus* only was active. Thus, the mean occurrence of *B. cucurbitae* was slightly higher (52.79 %) than that of *D. ciliatus* (47.21 %) in cultivated hosts which may be considered nearly to equal. The wild hosts harboured both the

fruit fly species throughout the year. The proportional occurrence of *B. cucurbitae* ranged between 4.17 and 47.25 per cent, while that of *D. ciliatus* ranged between 52.25 to 95.83 per cent. Thus, the mean occurrence of *D. ciliatus* was higher (71.22 %) than that of *B. cucurbitae* (28.78 %) in wild hosts. The above findings on proportional occurrence of both the species in their different cucurbitaceous hosts are to be taken into consideration during formulating management strategy for this pest instead of over reliance on chemical control.

CONCLUSION

Cultivated cucurbitaceous plants namely, pumpkin, *Cucurbita moschata* Duch ex Poir.; Karingada, *Citrullus lanatus* (Thunb.); ridge gourd, *Luffa acutangula* Roxb.*;* sponge gourd, *Luffa cylindrica Roemer* and cucumber, *Cucumis sativus* (L.) and wild cucurbitaceous plants viz., little gourd, *Coccinia grandis* (L.); Kan Kareli, *Momordica charantia* (L.); Gothamada, *Cucumis callosus* (Rott.) Cogr.; Tutar Vela, *Luffa acutangula* (L.); Tumada, *Citrullus colocynthis* (L.); Kankoda, *Momordica dioica* Roxb. and Ankhfooti, *Trichosanthes bracteata* (Lam.) were recorded as hosts of fruit fly species *viz.*, Melon fly, *B, cucurbitae* and Ethiopion fruit fly, *D. Ciliatus* in semi arid region of north Gujarat. The proportional occurrence of both the species was nearly equal in cultivated hosts, while *D. ciliatus* was more abundant in wild host surveyed. This relation of fruit flies with hosts surveyed could be taken in to account while formulating effective management strategies.

ACKNOWLEDGEMENT

Authors is thankful to Shri **H. S. Madhura,** Indian Institute of Horticultural Research, Bangalore and **Dr. A. S. Reddy,** Sardar Patel University, Vallabh Vidhyanagar for identifying the specimens of fruit fly and wild cucurbitaceous host, respectively.

REFERENCES

Daiber, C. C. (1966). Notes on two pumpkin fly species (Diptera : Trypetidae) and some of their host plants. *South Africa J. agric. Sci.,* **9** (4) : 863-876.

Doharey, K. L. (1983). Bionomics of fruit flies (*Dacus spp.*) on some fruits. *Indian J. Ent.,* **45** (4) : 406-413.

Kapoor, V. C. (1970). Indian Tephritidae with their recorded hosts. *Oriental Insects,* **49** (2): 207-251.

Patel, M. M. (1974). Studies on bionomics and control of cucurbit fruit fly (*Dacus cucurbitae* Coq.) under Junagadh condition. M.Sc. (Agri.) Thesis, Submitted to Gujarat Agricultural University, Sardarkrushinagar.

Patel, R. K. (1994). Bionomics and control of fruit fly, *Dacus ciliatus* Loew (Tephritidae : Diptera) infesting little gourd, *Coccinia indica* Wight and Arnott. Ph.D. Thesis, Submitted to Gujarat Agricultural University, Sardarkrushinagar.

Patel, S. N. (1976). The bionomics and control measures of the Ethiopian fruit fly *Dacus ciliatus* Loew (Tephritidae: Diptera). M.Sc. (Agri.) Thesis, Submitted to Gujarat Agricultural University, Sardarkrushinagar.

Qureshi, Z. A., Ashraf, M. and Bughio, A. R. (1974). Relative abundance of *D. cucurbitae* and *D. ciliatus* in common hosts. *Pakistan J. Sci., Ind. Res.,* **17** (4-5) : 123-124.

Tahiliani, B. D. and Butani, D. K. (1981). A new host record of *Dacus ciliatus* Loew. *Pestology.*, **5** (10) : 22-23.

Table 1: Host plants of fruit fly species

Host plants	Common/local name		Scientific name
Cultivated	1.	Pumpkin	*Cucurbita moschata* Duch ex Poir.
	2.	*Karingada*	*Citrullus lanatus* (Thunb.)
	3.	Ridge gourd	*Luffa acutangula* Roxb.
	4.	Sponge gourd	*Luffa cylindrica* Roemer
	5.	Cucumber	*Cucumis sativus* (L.)
Wild	1.	Wild Little gourd	*Coccinia grandis* (L.)
	2.	*Kan Kareli*	*Momordica charantia* (L.)
	3.	*Gothamada*	*Cucumis callosus* (Rott.) Cogr.
	4.	*Tutar Vela*	*Luffa acutangula (*L.*)*
	5.	*Tumada*	*Citrullus colocynthis* (L.)
	6.	*Kankoda*	*Momordica dioica* Roxb.
	7.	*Ankhfooti*	*Trichosanthes bracteata* (Lam.)

Table 2: Mean proportion of fruit fly species in different hosts

Period of survey		Proportion (%)			
Month	**Fortnight**	**Cultivated host***		**Wild host***	
		B. cucurbitae	*D. ciliatus*	*B. cucurbitae*	*D. ciliatus*
July	**I**	81.04	18.96	15.83	84.17
	II	100.00	00.00	22.15	77.85
August	**I**	93.28	6.72	19.03	80.97
	II	37.26	62.74	45.36	54.64
September	**I**	46.56	53.44	43.31	56.69
	II	53.52	46.48	47.92	52.08
October	**I**	54.19	45.81	41.64	58.36
	II	52.34	47.66	47.25	52.75
November	**I**	46.81	53.19	31.80	68.20
	II	52.27	47.73	24.03	75.97
December	**I**	82.16	17.84	33.00	67.00
	II	66.92	33.08	34.08	65.92
January	**I**	48.40	51.60	12.96	87.04
	II	60.79	39.21	10.90	89.10
February	**I**	54.69	45.31	14.67	85.33
	II	45.75	54.26	4.17	95.83
March	**I**	00.00	100.00	14.24	85.76
	II	40.06	59.94	24.88	75.12
April	**I**	-	-	9.85	90.15
	II	-	-	13.34	86.66
May	**I**	-	-	5.89	94.11
	II	-	-	5.00	95.00
June	**I**	-	-	18.34	81.66
	II	-	-	22.73	77.27
	Host mean	**52.79**	**47.21**	**28.78**	**71.22**

**** Mean of five hosts, ** mean of seven hosts***

[MS received: October 07, 2012] *[MS accepted: November 01, 2012]*