

RELATIVE ABUNDANCE OF DACUS CUCURBITAE AND DACUS CILIATUS IN COMMON HOSTS*

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Abstract. Studies were carried out on the relative abundance of *Dacus cucurbitae* Coquillett and *Dacus ciliatus* Loew among common hosts like *Citrullus vulgaris* var. *fistulosus* Stocks, *Cucumis melo* L., *Cucumis sativus*, L., *Luffa aegyptiaca* Miller and *Momordica charantia*, L. The data collected from 1970 through 1972 clearly demonstrated the dominance of *D. ciliatus* over *D. cucurbitae*.

Dacus cucurbitae Coquillett and *Dacus ciliatus* Loew are serious pests of cucurbitaceous vegetables in Pakistan. Both the species attack *Benincasa cerifera* Savi, *Citrullus vulgaris* Schrad, *Citrullus vulgaris* Schrad var. *fistulosus* Stocks, *Cucumis melo* L., *Cucumis melo* var. *Utilissimus* Duthie and Fuller, *Cucumis mederaspatana* L., *Cucumis sativus* L., *Cucurbita maxima* Duch., *Luffa acutangula* Roxb., *Luffa aegyptiaca* Miller and *Momordica charantia* L.¹

The studies conducted at the Agricultural Research Institute, Tandojam during 1961-63 on the relative abundance of *D. cucurbitae* and *D. ciliatus* have shown the dominance of *D. cucurbitae* over *D. ciliatus*.² However, the observations made in subsequent years (1964-66) in this regard have provided evidence of considerable fluctuation in the abundance of these two species of fruit flies.³ The present investigation was, therefore, undertaken during 1970-72 to determine the relative abundance status of *D. cucurbitae* and *D. ciliatus* among common hosts in Hyderabad area. The information thus collected will be of great significance in the control strategy of fruit flies.

Materials and Methods

The random samples of fruits of *C. vulgaris* var. *fistulosus*, *C. melo*, *C. sativus*, *L. aegyptiaca* and *M. charantia* were collected from various vegetable growing areas near Hyderabad. Each of the materials was weighed and kept separately in wooden box having wire-gauze screen at the bottom, and placed over another box containing sterilized sand as pupating medium for larvae. The pupae from each box were sieved daily and kept in screen cages (23 × 23 × 30 cm) in petri dishes for each host separately. Upon emergence the adults were identified and counted.

Results and Discussion

The data on relative abundance of *D. cucurbitae* and *D. ciliatus* among common hosts for the year 1970-72 are given in Table 1. The results clearly

indicated that *D. ciliatus* outnumbered *D. cucurbitae* in all hosts tested during the period of study. For example the total number of *D. ciliatus* adults recovered from *C. vulgaris* var. *fistulosus* were 1582, 2966 and 1304 during 1970, 1971 and 1972 respectively as against 10, 66 and 20 adults of *D. cucurbitae*. Similarly, in *L. aegyptiaca* 1603, 3163 and 1504 adults of *D. ciliatus* were found as against 41, 222 and 23 *D. cucurbitae* during 1970, 1971 and 1972 respectively. No fly of *D. cucurbitae* was collected from *C. sativus* whereas 323, 170 and 198 *D. ciliatus* flies were found to infest this host during three years of study. In case of *C. melo* and *M. charantia* also very low population of *D. cucurbitae* was found as compared to *D. ciliatus*.

It is interesting to note that relative abundance pattern of these two species changed since 1964-65 prior to which the dominance of *D. cucurbitae* over *D. ciliatus* was recorded.³ The dominance attained by *D. ciliatus* over *D. cucurbitae* in recent years seems to be due to interspecific competition among both the species. The observations made at Tandojam on the behaviour of both species revealed that *D. ciliatus* is a far more active species than *D. cucurbitae*. Possibly *D. ciliatus* deposits eggs in the egg punctures made by *D. cucurbitae*, thereby affecting the egg hatch and larval development of the latter species. However, to confirm this phenomenon further investigations are needed. Similar competition between the Oriental fruit fly, *D. dorsalis* Hendel and Mediterranean fruit fly, *Ceratitidis capitata* (Wiedemann) has been reported by Christenson and Foote.⁴ They observed that shortly after *D. dorsalis* was found in Hawaii, the population of *C. capitata* declined to such a level that very rarely adult flies or infested fruits could be found in littoral areas. Andrewartha and Birch⁵ have also noted the replacement of *C. capitata* by Queensland fruit fly, *D. tryoni* (Froggatt) around Sydney, Australia.

The observations on the parasitization of fruit flies revealed that the parasitism does not seem to play any significant role in reducing the population of either species so as to influence the dominance of one species over the other. Our results on relative abundance of both the species among common hosts clearly demonstrated the dominance of *D. ciliatus* over *D. cucurbitae*.

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TABLE 1. RELATIVE ABUNDANCE OF *Dacus ciliatus* AND *Dacus cucurbitae* IN COMMON HOSTS DURING 1970-72.

Month	Host	Weight (kg)	No. of pupae recovered	No. of adults emerged	
				<i>D. ciliatus</i>	<i>D. cucurbitae</i>
1970					
July	<i>C. vulgaris</i> var. <i>fistulosus</i>	1.4	371	358	0
	<i>C. melo</i>	0.7	110	94	0
	<i>C. sativus</i>	0.5	125	105	0
	<i>L. aegyptiaca</i>	0.6	159	141	0
August	<i>C. vulgaris</i> var. <i>fistulosus</i>	1.7	555	491	0
	<i>C. sativus</i>	1.3	286	218	0
	<i>L. aegyptiaca</i>	3.1	508	360	12
Sept.	<i>C. vulgaris</i> var. <i>fistulosus</i>	5.7	972	733	10
	<i>C. melo</i>	1.7	472	293	61
	<i>L. aegyptiaca</i>	9.4	1560	1102	29
	<i>M. charantia</i>	1.1	152	119	0
1971					
April	<i>C. sativus</i>	1.0	199	170	0
	<i>L. aegyptiaca</i>	1.3	262	140	15
May	<i>L. aegyptiaca</i>	9.6	1355	396	81
	<i>M. charantia</i>	1.3	862	593	19
June	<i>C. melo</i>	0.5	158	129	0
	<i>L. aegyptiaca</i>	19.2	1695	822	1
July	<i>C. vulgaris</i> var. <i>fistulosus</i>	1.4	565	416	11
	<i>C. melo</i>	1.1	730	557	13
	<i>L. aegyptiaca</i>	0.6	301	276	0
	<i>M. charantia</i>	0.4	55	44	0
August	<i>C. vulgaris</i> var. <i>fistulosus</i>	3.8	1708	1321	55
	<i>C. melo</i>	2.2	263	223	23
	<i>L. aegyptiaca</i>	7.6	1342	1107	116
Sept.	<i>C. vulgaris</i> var. <i>fistulosus</i>	8.1	1923	1229	0
	<i>C. melo</i>	0.8	263	181	27
	<i>L. aegyptiaca</i>	3.1	554	422	9
	<i>M. charantia</i>	1.2	145	112	0
1972					
April	<i>C. sativus</i>	1.5	230	198	0
	<i>L. aegyptiaca</i>	1.9	369	211	23
May	<i>C. vulgaris</i> var. <i>fistulosus</i>	11.0	2188	1304	20
	<i>L. aegyptiaca</i>	2.7	1060	248	0
	<i>M. charantia</i>	9.1	906	438	0
June	<i>L. aegyptiaca</i>	1.3	1200	1045	0
	<i>M. charantia</i>	2.7	153	122	0

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