

## DEVELOPMENT AND SURVIVAL OF *Bactrocera correcta* (Bezzi) (DIPTERA : TEPHRITIDAE) ON SELECTED GUAVA CULTIVARS

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**ABSTRACT:** Effect of guava cultivars *Ac 10*, *Chittidar*, *Lucknow 46* and *Lucknow 49* on larval survival, adult eclosion and size of *Bactrocera correcta* were investigated. There was significant variation in larval and pupal periods but no significant difference in pupation rates. The per cent adult emergence from puparia was found higher (90.6%) on *Chittidar* (susceptible) and lower (59.0%) on *Lucknow-46* (resistant). *Chittidar* yielded the largest adult (>2.17 mm head width). High Vitamin C, total soluble solids and total phenol in fruits were factors contributing to resistance.

**Key Words :** *Bactrocera correcta*, Guava, host plant resistance, *Psidium guajava*.

### INTRODUCTION

The guava fruit fly, *Bactrocera correcta* (Bezzi) occurs with other pest species such as *B. zonata* and *B. dorsalis* in India (Kapoor, 1989). Of the three *Bactrocera* species, *B. correcta* is a relatively less studied. This paper provides information on the development and survival of *B. correcta* on fruits of different guava cultivars and factors influencing resistance.

### MATERIALS AND METHODS

First generation of *B. correcta* flies that emerged from field collected guava fruit were kept in wooden cages (35 cm x 35 cm x 35 cm). Every week, adults were provided with sugar syrup, yeast hydrolysate, honey and water. When the adults were two weeks old, a small plastic container [250 ml capacity with 0.5 mm diameter holes at the sides] was placed inside the cage as

ovipositional device ("egg receptacles"). A sponge soaked in a 1:1 mixture of guava juice and water was provisioned as oviposition stimulant.

The cultivars were categorised as follows:

Immune	0% fruit damage
Highly resistant	1-10% fruit damage
Resistant	11-20% fruit damage
Moderately resistant	21-40% fruit damage
Susceptible	41-60% fruit damage
Highly susceptible	> 60% fruit damage

Resistance was evaluated in *Lucknow-46* (Highly Resistant), *AC 10* (Moderately Resistant), *Lucknow-49* (Susceptible) and *Chittidar* (Highly Susceptible).

Ten newly hatched maggots were transferred using a brush to a slice of fruit of selected cultivars (4.0 x 2.0 x 2.5 cm), kept in a plastic container having sterile sand with a mesh

**Table 1. Development of guava fruit fly, *B. correcta* in different cultivars**

Sl. No.	Fruit fly development	Guava Cultivar				SED	C D (P = 0.05)
		<i>Lucknow-46</i>	<i>A-C 10</i>	<i>Lucknow-49</i>	<i>Chittidar</i>		
1.	Mean larval period (days)	21.00	20.30	19.30	19.00	0.47	0.94
2.	Mean pupal period (days)	8.90	8.10	7.20	7.00	0.42	0.84
3.	Mean adult longevity (days)	7.90	8.5	9.7	9.00	0.57	1.14
4.	Sex ratio (Male : female)	1:1	1:1	1:1	1:1	-	-

cover. Fresh fruit pieces were daily provided for developing maggots daily.

Five larvae were observed per cultivar and there were five replications. Mean larval period, pupal period, per cent pupation, adult emergence, adult longevity and sex ratio were recorded. Peel thickness of the four cultivars were measured using ocular micrometer at colour break stage. Totally ten observations were recorded on each cultivar. Head width of the adult flies (at least 3 individuals from each replicate) was recorded under a stereo-binocular microscope. The biochemical composition of fruits of different cultivars was analysed (Anonymous, 1975). Data were subjected to analysis of variance (ANOVA).

## RESULTS AND DISCUSSION

Data on larval period, pupal period, adult longevity, head width and sex ratio are presented in Table 1. The results revealed significant variations as influenced by four cultivars. There were no significant differences in per cent pupation among larvae reared on different fruits of guava cultivars (Table 2).

However, the percentage of adults that emerged was significantly affected in different fruits of guava cultivars. Adult emergence was found to be less in *Lucknow-46* (59%) and more in *Chittidar* (91%). The head capsule width of adult flies was also significantly influenced by guava cultivars. Largest adult fruit flies (with head widths of 2.17 mm or more for both sexes) were seen on *Chittidar* (Table 3).

**Table 2. Effects of different fruits of guava cultivar on pupation and adult emergence from puparia of *Bactrocera correcta***

Guava Cultivar	% pupation	% adult emergence
<i>Lucknow-46</i>	57.90	59.00
<i>A.C.10</i>	63.30	81.80
<i>Lucknow-49</i>	68.90	85.50
<i>Chittidar</i>	70.60	90.60
SED	0.97	2.23
CD (P=0.05)	2.11	4.86

**Table 3. Effects of different fruits of guava cultivar on the head width (mm) of *Bactrocera correcta***

Guava Cultivar	Female	Male
<i>Lucknow-46</i>	2.00	1.94
<i>A.C.10</i>	2.09	2.05
<i>Lucknow-49</i>	2.11	2.12
<i>Chittidar</i>	2.24	2.17
SED	0.02	0.02
CD (P = 0.05)	0.04	0.04

**Table 4. Biochemical composition of fruits of different guava cultivars**

Sl. No.	Particulars	<i>Lucknow-46 (HR)</i>	<i>A.C.10 (MR)</i>	<i>Lucknow-49 (S)</i>	<i>Chittidar (HS)</i>
1.	Vitamin C (mg/100 g)	1.34	113.00	85.00	114.00
2.	Total soluble solids %	9.80	7.60	4.20	7.06
3.	Crude protein %	0.42	0.92	0.54	0.73
4.	Fat %	0.25	0.30	0.32	0.30
5.	Reducing sugars %	3.26	3.71	2.88	2.68
6.	Non-reducing sugars %	0.36	0.07	0.02	0.70
7.	Total sugars %	3.62	3.78	2.90	3.38
8.	Total carbohydrates (% as Glucose)	8.00	9.00	6.00	8.07
9.	Sugars/Acid ratio	11.30	2.25	5.70	7.52
10.	Total phenols mg/100 g	40.34	34.33	36.91	33.47

HR - Highly Resistant;  
S - Susceptible;

MR - Moderately Resistant;  
HS - Highly Susceptible

Results indicate that *Lucknow-46* was the least preferred host for *B. correcta*, while AC 10 and *Lucknow 49* were less suitable and *Chittidar* was found to be the best host for *B. correcta*. This evidently showed that there existed antibiosis mechanism in the highly resistant guava cultivar *Lucknow 46*, against *B. correcta*. Ibrahim and Rahman (1982) and Carey *et al.* (1985) have also

shown that the host fruits have significant effects on the biology of fruit flies.

The biochemical analysis (Table 4) indicated that the highly resistant *Lucknow-46* fruits possessed more of vitamin C, total soluble solids and total phenols as compared to the other cultivars evaluated. However, there was no marked difference sugars and carbohydrates

content. The suppression of developmental activity of fruit fly in the highly resistant cultivar may be attributed to the presence of more total phenolic compounds as was reported by Manoukas (1993) for olive fruit fly *Dacus oleae*.

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