Effect of Host Age and Intercropping on Parasitization of *Clavigralla gibbosa* Eggs by *Gryon* sp

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Clavigralla gibbosa Spinola (Hemiptera: Coreidae) is a widely distributed and occasionally serious pest of pigeonpea (*Cajanus cajan* Millsp.) in India (Bindra and Singh 1971, Lateef and Reed 1990). Eggs are laid in clusters of 2–60 on pods and leaves. An egg parasitoid, *Gryon* sp (Hymenoptera: Scelionidae), parasitizes up to 60% of *C. gibbosa* eggs in the field (Nawale and Jadhav 1978, Shanower et al. In press). Information about the biology of this species is generally lacking.

Three aspects of *C. gibbosa* bionomics, and their effect on *Gryon* sp were studied: the size of egg clusters, the effect of egg cluster age on parasitization, and the effect of intercropping on parasitization.

A laboratory colony of *C. gibbosa* was established from egg clusters collected on the ICRISAT research farm at Patancheru, India, between January and March 1994. Females produced smaller egg clusters in the laboratory than in the field (Fig. 1). Thus, data on *C. gibbosa* fecundity from laboratory studies may not fully reflect its fecundity in the field. Egg cluster size is important because it has been shown to effect *Gryon* sp parasitization rates (Shanower et al. in press).

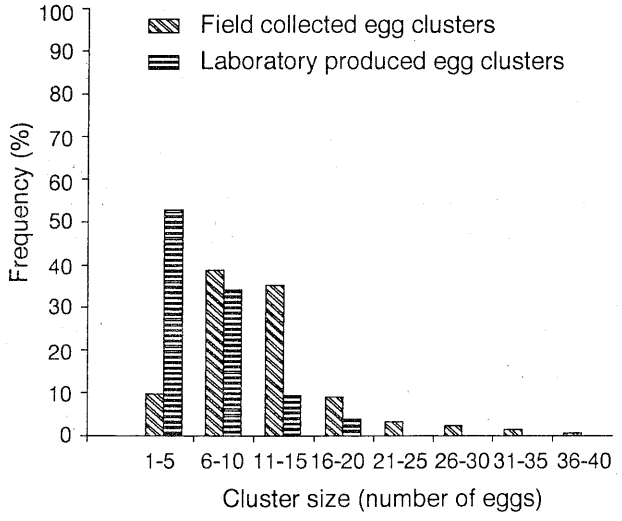

Figure 1. Distribution of different sizes of egg clusters of *Clavigralla gibbosa*.

Table 1. The effect of age of *Clavigralla* eggs on parasitization rate of *Gryon* sp.

Egg age(h)	Number of eggs	Parasitized eggs (no.)	Parasitization (%)
00- 10	20	13	65.0
11- 20	00	00	0.0
21- 30	25	16	64.0
31- 40	05	01	20.0
41- 50	23	04	17.4
51- 60	13	01	7.7
61- 70	11	07	63.6
71- 80	18	00	0.0
81- 90	09	00	0.0
91-100	22	00	0.0
101-125	08	00	0.0

The effect of host (*C. gibbosa* eggs) age on parasitization rate was tested using newly laid eggs from the laboratory colony. These eggs were held for varying periods of time before exposing them to female *Gryon* sp. The data in Table 1 show that *Gryon* sp females successfully oviposited in *C. gibbosa* eggs less than 3 days old (<70 hours). *Clavigralla gibbosa* eggs require 7–20 days to hatch under field conditions (Bindra 1965), and are thus susceptible to parasitization by *Gryon* sp for less than half of that period.

Table 2. Parasitism of *Clavigralla gibbosa* eggs by *Gryon* sp in pigeonpea (ICPL 87119)/cotton (PA 32 and NHH 44) intercropping systems.

Cropping system	Eggs collected (number)	Percentages (mean) Eggs hatched	Parasitism
ICPL 87119 with PA 32	1133	78.8 (62.9)[1]	19.9 (26.0)
ICPL 87119 with NHH 44	1155	89.3 (71.3)	10.7 (18.7)
ICPL 87119 (sole)	1196	70.9 (57.6)	28.3 (31.9)
Trial mean		79.7	19.6
SE (m)		± (2.41)	± (2.58)
LSD (0.05)		(7.59)	(8.13)

1. Figures in parentheses are corresponding arc sine values.

The effect of intercropping on parasitization of *C. gibbosa* eggs was studied in a pigeonpea/cotton intercrop. Pigeonpea (ICPL 87119) was either intercropped with two cotton cultivars (NHH 44 and PA 32), or was grown alone. Eggs were collected during February 1994 and held at ambient temperature in the laboratory until parasitoids of *C. gibbosa* nymphs emerged. A significantly higher percentage of *C. gibbosa* eggs were parasitized in the sole pigeonpea treatment than in either cotton intercrop treatment (Table 2). This is the first record of the effect of intercropping on *C. gibbosa* parasitization rates. Further observations are needed before we can confirm the importance of the host plant in the management of this pest.

References

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Antibiosis in Pigeonpea to *Helicoverpa armigera* Hübner

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Antibiosis is one of the important resistance mechanisms in plants to insects. The effects of antibiosis may be reduction in size and weight, fecundity, abnormal length of life and increased mortality of the insects (Owens 1975). To study such effects of antibiosis, the biology of the gram pod borer, *Helicoverpa armigera* Hübner was studied with two resistant (ICPL 270 and ICPL 84060) and one susceptible (BDN 2) pigeonpea varieties from Dec 1991 to Feb 1992 at Anand, Gujarat, India. The average minimum room temperature during the study was 18.8°C and the maximum temperature was 28.9°C. Freshly emerged male and female moths of *H. armigera* from field-collected larvae were confined in a rearing cage (30 × 30 × 30 cm). Noninfested fresh twigs, leaves, flowers, and pods were provided to moths for oviposition, and 5% honey solution was provided for food. The newly hatched larvae obtained from the eggs were transferred with a hair brush to specimen tubes (8 × 4 cm) containing flowers and developing pods of pigeonpea. Initially 30 larvae were released into each specimen tube. The effect of food was studied every day (Table 1). The following calculations were made from the observations:

Larval mortality (%) during 7 days of hatching.

Larvae pupated (%).

Adult emergence (%).

$$\text{Growth index} = \frac{\text{percentage larvae pupated}}{\text{larval period in days}} \times 100$$

This study revealed that the larval and pupal mass of larvae fed on developing pods of resistant varieties were significantly lower and the duration of both the stages were longer than those for larvae fed on the susceptible variety. The larval mortality remained high, and larval pupation, adult emergence, fecundity and growth index were adversely affected.

When the larvae were reared on flowers of a resistant variety, the larval mass was high, but there were no difference in the pupal masses or the lengths of the larval or pupal instars. Although larval pupation, adult emer-