

Studies on the Feeding Media for the Mass Rearing of *Corcyra cephalonica* (Staint.)

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Caterpillars of the rice moth, *Corcyra cephalonica* (Staint.) are ideal alternate hosts for the mass multiplication of hymenopterous parasites used for biological control purposes. In Kerala these are used for the multiplication of *Bracon brevicornis* and *Perisierola nephantidis*, two important larval parasites of the black headed caterpillar of coconut, *Nephantis serinopa*. Though the growth of *Corcyra*, on a variety of natural and synthetic diets, has already been observed (Krishna Iyer, 1934; Seshagiri Rao, 1954, Uberoi, 1960 and 1961, Singh, 1965) no objective study has been made so far to find out a food medium which can yield robust larvae within the shortest period and with least mortality. The present studies were, therefore, undertaken with a view to fix a suitable medium for the insect with the above said attributes.

Materials and Methods

Finely ground wheat, maize, rice, ragi (*Elucine coracana*), tenai (*Setaria italica*), samai (*Panicum miliare*) barley, blackgram, greengram and redgram were used in the present investigations. Fifteen grams of each medium was taken in a petridish and ten first instar larvae (0-12 hours old) were transferred to it with a small camel hair brush. Eight such dishes were prepared for each medium. The dishes

were closed and kept at room temperature and humidity. When the full grown larvae completed their spinning of the silken cocoon they were considered to have entered in their pupa instar. The average weight of the larva was obtained by weighing twenty full grown larvae collected at random and then striking the average.

The moths were observed to lay more eggs in the presence of the larval food than in its absence. Hence for assessing the fecundity of the moths the following procedure was adopted: One end of a hurricane chimney was closed with a piece of 8 mesh per inch wire gauze and placed on the larval food medium contained in a petridish in such a way that the medium entered the chimney and spread within the wire gauze surface. The medium consisted of fine particles which had been passed through a fine meshed sieve through which the eggs of *Corcyra* could not pass. Ten newly emerged pairs of male and female moths were put in the chimney and the top end was closed with another petridish. At the end of every 48 hours the chimney with the moths was removed and the eggs laid in the medium were collected by sieving and counted. This process was continued till all the female moths died. Average eggs laid per female was calculated.

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Observations and Discussion

The data on the larval duration, larval mortality, weight of the larva, pupal

mortality and average number of eggs laid per female, when reared on different food media are given in Table I.

TABLE I

The duration, mortality and weight of the larvae, mortality of pupa and fecundity of moths of *Corcyra cephalonica* when reared on different food media

Media	Larval duration (days)	Larval mortality %	Average wt. of full grown larva (mg.)	Pupal mortality %	Average No. of eggs per moth
T 1. Wheat	33.52	10.00	47.5	35.20	347.60
T 2. Maize	29.19	5.00	47.5	41.79	338.00
T 3. Rice	35.23	20.00	36.0	39.58	225.00
T 4. Ragi	33.74	11.66	42.5	22.61	294.40
T 5. Tenai	32.47	26.66	39.0	40.43	156.00
T 6. Samai	39.38	21.62	33.5	40.43	253.60
T 7. Barley	46.77	26.67	30.5	27.27	238.80
T 8. Black gram	35.80	13.33	30.0	30.77	366.00
T 9. Green gram	31.75	20.00	37.5	20.83	424.40
T 10. Red gram	51.48	23.30	31.0	22.73	503.00

The average larval duration in the different media ranges from 29.19 days in maize to 51.48 days in ledgram. Statistical analysis showed the values significantly different and the various media could be ranked as T 10, T 7, T 6, T 8, T 3, T 4, T 1, T 5, T 9, T 2 with reference to larval duration. Thus the lowest larval duration observed in maize is significantly different from the larval duration with the rest of the media. This is closely followed by the duration on green gram and tenai. there being no significant difference between them. Krishna Iyer (1934) had observed that the total life cycle of the insect was

least when reared on maize and ragi than when reared on wheat, tenai and rice. But Seshagiri Rao (1954) found the duration of the life cycle of the moth to be more on maize than on rice and ragi. Uberoi (1961) found the duration of total life cycle on different food media in the order wheat < maize < green gram < barley < rice < black-gram < redgram. These differences are unable to be explained at present.

As regards larval mortality the lowest of 5% was observed in maize and the highest of 26.67% in barley and tenai. Statistical analysis showed significant difference in the percentage mortality in the various media

and the media could be ranked as $\overline{T2, T1, T3, T4, T5, T6, T7, T8, T9, T10}$ with reference to larval mortality. Thus maize and wheat showed significantly low mortality among larvae when compared with other food media, there being no significant difference between them.

The percentage of moth emergence recorded by earlier authors in these media are comparatively very low. Uberoi (1961) recorded only 56.6% moth emergence from maize and 70% from wheat. Seshagiri Rao (1954) observed only 60% emergence of moths from wheat. These incidently indicate high mortality occurring at the pupal stage. The observations in the present investigations also showed a very high percentage of pupal mortality in the above media. But though pupal mortality affects the overall production of moths it will not affect the larval population which is more important from the view point of mass multiplication of the larvae for biological control purposes.

The average weight of the larvae reared on different media showed that wheat and maize yielded the best sized larvae. This is an essential quality for the rearing of the parasites. The average weight ranged from 30 mg in black gram to 47 mg in wheat and maize

The data given in the table show that proteinaceous diet given to the larvae increased the fecundity of the moths. It was 5.4 to 44.9% higher for pulses than the best among the rest viz., wheat. There was no significant difference in the fecundity of moths reared from wheat and maize.

Considering the larval duration, percentage mortality and larval size, maize thus appears to be the best medium for rearing the moths. Wheat comes next to it in

which larval mortality and duration are slightly higher, Greengram and tenai are next best to maize with regard to larval duration. But they showed a high percentage of larval mortality and poor larval size. Though the fecundity was highest for moths reared in redgram the poor larval characters rendered them inferior for mass rearing. The difference in the fecundity of moths reared in wheat and maize was not significant.

Statistical analysis of the data revealed that the carbohydrate, protein and vitamin (B_1) content of the various media did not show any significant correlation with the larval duration, larval mortality or larval weight at fullgrown stage. But a significant negative correlation was found to exist between the larval duration and the average weight of the larvae grown in various media, ($r = -0.7054$). Similarly the fecundity of the moths appeared to be directly influenced by the protein content of the diet on which the larvae grow as shown by the significant positive correlation ($r = 0.7180$) obtained for them in the analysis.

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