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INFLUENCE OF TEMPERATURE AND RELATIVE HUMIDITY ON
LARVAL DEVELOPMENT AND SURVIVAL OF THE RICEMOTH,
Corcyra cephalonica (STAINTON)

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Studies were undertaken to find out the influence of temperature and relative humidity on survival and development of the larvae of the ricemoth, *Corcyra Cephalonica* (Stainton) within a temperature range from 15° to 40° (at 5°C interval) and relative humidities of 60 to 90 per cent (at 15 per cent interval) at each temperature. Lesser larval period (17.50 days) was observed at 35°C and 90 per cent R. H. Higher percentage of larval survival (78.33) was observed at 25°C and 90 per cent relative humidity

The ricemoth, *Corcyra cephalonica* (Stainton) is a storage pest of cereals and oilseeds with a wide distribution in subtropical and tropical countries.

The development of *c. cephalonica* on stored products has been studied by several authors (Chittenden, 1919; Krishna Ayyar, 1934).

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A detailed study on food range and development at temperatures between 15.5°C and 32.5°C and R.H. of above 63.5% was conducted by Seshagiri Rao (1954). A field and laboratory study was made in Egypt by Kamel and Hassanein (1967). At 25.5°C and 75% R.H. mean developmental periods (egg-hatch-adult) ranged from 46.5 to 77 days, depending on the type of food. Developmental periods were prolonged at lower relative humidities. Population increase at 26.5° and 73% RH on crushed sorghum was determined by Teotia and Singh (1975). Under above mentioned conditions the mean time for completing a generation was 44.97 days.

To provide congenial conditions for mass multiplication of *C. cephalonica* under laboratory conditions, a study on the development of this insect under different environmental conditions on larval development and survival of the ricemoth was carried out and the results are presented in this contribution.

MATERIALS AND METHODS

Constant temperatures of 15, 20, 25, 30, 35 and 40°C were maintained using B.O.D. incubators. At all these temperatures, relative humidities varying from 60 to 90 per cent (With an increase of 15 percent) with saturated solutions of salts as per Winston and Bates (1960) were provided. Freshly laid eggs of *Caryca*

were collected and kept at different temperatures and relative humidities in groups of ten in glass tubes (5 x 1.25 cm). Immediately after hatching, larvae were released in plastic containers (5 x 5 cm). Fresh food material was supplemented as and when it was necessary. The culture was maintained on broken sorghum grains (CSH - 1) in plastic containers (5 x 5cm) and kept under constant room temperature (28°C) and relative humidity of 90 per cent. All the studies were made in four replications and the data collected on larval period and survival were statistically analysed by the method of analysis of variance (Finney, 1952).

RESULTS AND DISCUSSION

The influence of temperature and humidity on larval development and survival of the ricemoth are presented in Table 1 and 2 respectively.

As will be evident from table 1, the insect has shown its ability to develop under fairly high and low temperature conditions, viz., 35°C and 15°C. Humidity also seemed to have little effect on the development of various stages (Table 2) except the larval growth. The larval period was found to be highest (66.37 days) when the insect was reared (Table 1) at 15°C and lowest larval period (24.46) was observed at 30°. However, the larval period was 56.56, 34.74, and 24.63 days at 20°C, 25°C, and 35°C. At 90 per cent

Table 1 Influence of temperature and humidity levels and their interactions on larval period of *Corcyra cephalonica* (Stainton).

Relative humidity percentage	Temperature °C					Average
	15°C (T ₁)	20°C (T ₂)	25°C (T ₃)	30°C (T ₄)	35°C (T ₅)	
60 (RH ₁)	64.16	67.67	43.20	23.67	35.33	46.85
75 (RH ₂)	68.25	59.58	25.55	35.33	21.25	41.99
90 (RH ₃)	66.47	42.44	25.70	24.17	17.50	35.22
Average	66.37	56.56	34.74	24.46	24.63	

S.Em (H)_± = 0.6868

C.D. at 5% = 1.9893

S.Em (T)_± = 0.5320

C.D. at 5% = 1.5409

S.Em (Int)_± = 1.1896

C.D. at 5% = 3.4456

Table 2 Influence of different temperature and humidity levels and their interactions on percentage larval survival of *Corcyra cephalonica* (Stainton)

Percentage relative humidity	Temperature °C					Average
	15°C (T ₁)	20°C (T ₂)	25°C (T ₃)	30°C (T ₄)	32° (T ₅)	
60 (RH ₁)	4.073** (20.00)	4.811 (40.66)	4.210 (17.33)	4.133 (15.08)	4.170 (16.00)	4.326 (21.80)
75 (RH ₂)	4.776 (39.00)	4.853 (43.00)	5.131 (56.50)	5.171 (58.50)	5.085 (54.25)	5.085 (50.25)
90 (RH ₃)	4.79 (40.00)	4.872 (43.60)	5.642 (78.33)	5.199 (60.00)	5.267 (63.00)	5.156 (57.00)
Average	4.627 (33.00)	4.847 (42.42)	4.995 (50.72)	4.855 (44.52)	4.841 (44.42)	

S. Em (H)_± = 0.01333

C. D. at 5% 0.02899

** Logit transformed values.

S. Em (T)_± = 0.01032

C. D. at 5% 0.03095

Figures within bracket are original values

S. Em(Int)_± = 0.230

C. D. at 5% 0.06934

relative humidity, the larval period was 35.22 days followed by 41.99 and 46.85 days at 75 and 60 per cent relative humidity. From the table it is clear that significant fall in larval period was observed as humidity increased.

There was significant difference, both in the larval period as well as percentage larval survival in the humidity range of 60-90 per cent and temperature range of 15° to 25°C except in one case i. e. at 20°C and 60 per cent and 75 per cent relative humidities (Table 1). Similarly at 20°C for the same humidity range there was no difference in larval survival (Table 2).

The percentage of larval survival was significantly higher at the higher

two humidity levels (50.25 per cent at 75% R/H and 57.00 at 90% R/H.) At 35°C, the larval period at 75 and 90 per cent humidity was 21.25 and 17.50 days and differed significantly (35.33 days) at lower humidity (60 per cent). Larval period was significantly highest (64.16 days) at 15°C and 60 per cent relative humidity and lowest (17.50 days) at 35°C and humidity of 90 per cent. Percentage of larval survival was similarly lower at all temperatures under 60 per cent relative humidity and significantly highest (78.33) at 25° and 90 per cent relative humidity.

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