

Life tables and intrinsic rates of increase of *Cyrtorhinus lividipennis* Reuter (Heteroptera : Miridae)

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ABSTRACT : Life tables were constructed for the predatory mirid bug *Cyrtorhinus lividipennis* Reuter under laboratory conditions. An average of 4.7 females/ female/day on the fourth day were produced when *Nilaparvata lugens* Stal (BPH) nymphs alone were used while 3.8 females were produced on the fourth day when a mixture of *N. lugens* and *Sogatella furcifera* (Horvath) (WBPH) was used. However, the innate capacity of increase for *C. lividipennis* was found to be 0.13 with BPH alone as prey while it reached 0.30 with a mixture of BPH and WBPH nymphs.

KEY WORDS : *Cyrtorhinus lividipennis*, intrinsic rate of increase, life table, *Nilaparvata lugens*, *Sogatella furcifera*

The mirid bug, *Cyrtorhinus lividipennis* Reuter is one of the common predators on the eggs and immature stages of hoppers in the rice ecosystem. Attempts made to mass rear and release this predator in the field have met with limited success. The present study deals with the fecundity and life table of the mirid on different prey species.

MATERIALS AND METHODS

Females of the mirid were obtained from a laboratory culture maintained on *Nilaparvata lugens* eggs. The method suggested by Sivapragasam and Asma (1985) for studying the biology of *C. lividipennis* was modified to construct life tables. Ten pairs of newly emerged adult males and females were confined to glass petri dishes lined with moist filter paper (12.5 cm dia.) at the rate of one pair per petri dish. Rice stems (10 cm long) with *N. lugens* eggs were provided every day for feeding and oviposition by the mirid. The stems were replaced daily with a fresh one until the females died. The stems were incubated in an environmental chamber at 27 ± 1 °C, 80 per cent relative humidity and 12:12 (L:D) photophase. The emerging first instar nymphs were fed with 10 per cent honey water solution in a cotton swab and later on with eggs of *N. lugens*. The life tables were constructed utilising the age specific fecundity. The intrinsic rates of natural increase of the population of the mirid were calculated using Birch's (1948) formula as elaborated by Howe

(1953) and Watson (1964) :

$$e^{-r_m x} l_x m_x = 1$$

where 'e' was the base of the natural logarithms, 'x' the age of individuals in days, l_x the number of individuals alive at age 'x' as a proportion of one and ' m_x ' the number of female offsprings produced/female in the age interval 'x'. The sum of the products ' $l_x m_x$ ' was the net reproductive rate (R_0), the rate of multiplication of population for each generation measured in terms of females produced per generation.

The approximate value of the cohort generation was calculated as follows:

$$T_c = \frac{l_x m_x x}{l_x m_x}$$

The arbitrary value of innate capacity for increase ' r_c ' was calculated from the formula:

$$r_c = \frac{\log_e R_0}{T_c}$$

This was an arbitrary value for r_m and the value of r_m up to two decimal places was substituted in the formula until the two values of the equation which lie immediately above and below 1096.6 were calculated.