

**Studies on the Biology, Predatory Effectiveness  
and Distribution of Cyrtorhinus lividinennis  
Reuter, a predator of Hilacaryata lucens (Stål)**

**ABSTRACT**

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The present studies were undertaken to explore the feasibility of using C. lividinennis in the biological control of N. lucens in Sri Lanka.

The thesis comprises three parts:

- i) Studies on the morphology and biology of C. lividinennis found in Sri Lanka; including culture methods of C. lividinennis,
- ii) Studies on the predatory effectiveness of C. lividinennis against N. lucens and
- iii) Field studies to determine the density of N. lucens and C. lividinennis in three typical regions of Sri Lanka with varying frequencies of N. lucens infestations.

Of 3 types of cages used in rearing C. lividinennis - a large wooden sleeve cage,

a medium sized plastic sleeve cage and a chimney cage, the second was the most effective showing an increase in population of 300-500%.

No difference in morphology was observed between C. lividinennis of Sri Lanka on the one hand and Philippine and Indian populations on the other.

C. lividinennis males averaged 2.88 mm long and 0.92 mm wide and the females 2.94 mm long and 1.04 mm wide.

The length and width of the first instar are 0.87 mm and 0.46 mm, second instar 1.49 mm and 0.46 mm, third instar 1.76 mm and 0.64 mm and fourth instar 2.59 mm and 1.07 mm.

The egg measured 0.77 mm long and 0.2 mm wide.

The longevity of male and female adults averaged respectively 11.9 days and 11.1 days when cultured in test tubes and 16.47 days and 12.33 days in the chimney <sup>c</sup> cage. The nymphal durations of the first, second, third and fourth instars were respectively 2.74, 2.78 3.0 and 3.47 days.

Average fecundity of the female was 30.08 eggs when cultured in the test tube and 28.8 eggs in the chimney cage.

The average incubation period of the eggs was 7.36 days in the test tube and 6.75 days in the chimney cage.

The male adult C. lividipennis consumed an average of 2.07 H. lucens eggs per day while the female adult consumed an average of 3.3 eggs per day.

The first, second, third and fourth instar nymphs consumed an average of 1.07, 2.41, 2.94 and 3.05 eggs per day respectively.

Second instar predator nymphs consumed 0.16 first instar prey nymphs per day. Third instar predator nymphs consumed 0.21 first instar and 0.25 second instar prey nymphs per day. Fourth instar predator nymphs consumed 0.38 first instar, 0.27 second instar, 0.27 third instar and 0.05 fourth instar nymphs per day.

The adult male and female predators consumed an average of 0.16 and 0.17 male prey adults per day.

Three paddy fields was sampled in Karadinaru, Kilinochi and Jaffna. N. lugens was present during Yala 1982 in the paddy fields at Karadinaru. Both N. lugens and C. lividipennis were present in the paddy fields at Jaffna during Maha 1981-82. C. lividipennis only was present in Yala 1982. Neither N. lugens nor C. lividipennis was present at either season at Kilinochi.

The distribution of N. lugens and C. lividipennis in the paddy fields surveyed tend to be localized. Field release and augmentation of field populations of C. lividipennis may serve as an effective biological control of N. lugens in Sri Lanka.