



## Growth rate of sugarcane adapted strain of *Trichogramma chilonis* Ishii (Hymenoptera: Trichogrammatidae)

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**ABSTRACT:** Growth rate of *Trichogramma chilonis* Ishii (Sugarcane strain) was carried out on eggs of *Corcyra cephalonica*. Net reproductive rate ( $R_n$ ) was found to be 42.99, while the mean duration of a generation was 10.52 days. The intrinsic rate of natural increase ( $r_m$ ) was found to be 0.3619. The finite rate of increase ( $\lambda$ ) was 1.436 per female per day.

**KEY WORDS:** Growth rate, life table, population, sugarcane, *Trichogramma chilonis*

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*Trichogramma* spp. are being used commercially against sugarcane borers, ignoring bioecological potentiality of the population. Knowledge of population growth potential is crucial for studying population dynamics and for developing management tactics against a target pest. Estimation of population growth can be achieved with fertility life table because it synthesizes data on reproduction and mortality of a population (Maia *et al.*, 2000). In view of this, the present work was carried out to gather information on growth rate of egg parasitoid, *Trichogramma chilonis* Ishii (Sugarcane strain).

Population of *T. chilonis* was collected on egg masses of internode borer (*Chilo sacchariphagus indicus*) at Indian Institute of Sugarcane Research Farm, Lucknow in August 2001 and reared on the eggs of *Corcyra cephalonica* at  $25 \pm 2$  °C and  $75 \pm 5$  percent relative humidity. The culture of host insect, *C. cephalonica* was maintained at  $28 \pm 2$  °C and  $60 \pm 5$  percent relative humidity. Experiment was started

with 20 pairs of newly emerged mated females. The parasitoid was kept singly in glass vials (70 x 30mm). The females were fed on streaks of honey-water solution (1:1 v/v), after feeding for about 10 min a small egg card bearing 50 host eggs was offered to the parasitoid on 1st day and 25 host eggs on subsequent days till it died. Daily observations on number of surviving females, eggs laid per female and death of females were recorded.

The life and fertility table was constructed according to Southwood (1978) and Birch (1948). The  $r_m$  value was obtained by the formula  $e^{-r_m \times 1} = m_x^{-1}$  ( $m_x = 1096.6$  (Birch, 1948)).

The adults of *T. chilonis* survived for 1-4 days (mean 3.5 days). The maximum fecundity was observed during the first days; thereafter the egg-laying capacity was reduced. The eggs laid for 1st day was 66.4 percent of total egg laying (Table 1). The total female progeny produced during life span was 42.99, while mean generation time was 10.52 days (Table 2). The intrinsic rate of natural increase

**Table 1. Life and fertility table of *T. chilonis* (Sugarcane strain)**

Pivotal age in days (x)	Age specific longevity ( $l_x$ )	Age specific fecundity ( $m_x$ )	$l_x m_x$	$\sum l_x m_x$
1-9	Immature stages			
10	1.0	30.32	30.32	303.20
11	1.0	6.73	6.73	74.03
12	0.9	2.51	2.26	27.12
13	0.6	6.13	3.68	47.81
Total			42.99	452.16

**Table 2. Life and fertility statistics of *T. chilonis***

Parameter	Value
Net reproductive rate ( $R_0$ )	42.99
Cohort generation time ( $T_c$ )	10.52
Capacity to increase ( $r_c$ )	0.357
Intrinsic rate of natural increase ( $r_m$ )	0.3619
Finite rate of increase ( $\lambda$ )	1.436
Net generation time (T)	10.39

( $r_m$ ) and finite rate of increase ( $\lambda$ ) were 0.3619 and 1.436, respectively. In other words, the Lucknow population increases at the rate of 1.436 females/female/day in a generation time (T) of 10.39 days (Table 2). Thus, the intrinsic rate of natural increase and finite rate of increase was highest of sugarcane strain as compared to 0.3263 and 1.386, respectively for *T. chilonis* reported by Nagarkatti and Nagaraja (1978). Jalali and Singh (1993) recorded  $\lambda$  value of various eco types ranging from 1.182-1.364 females/female/day on *C. cephalonica* eggs and Jalali and Singh (2001) also recorded  $\lambda$  value 1.41 on *C. partellus* eggs, which was also less than 1.436, recorded for *T. chilonis* during this study.

The potential for relatively high rates of oviposition soon after release may be a significant feature underlying the biological control potential of this parasitoid. The superiority of *T. chilonis*

(Sugarcane strain) has been reflected in different field trials conducted against sugarcane borers in subtropical India (Tanwar and Varma, 1996; Tiwari *et al.*, 1996). Thus, this strain of *T. chilonis* may find a place in IPM strategy against sugarcane borers in subtropical India.

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