

EFFICACY OF *Blattisocius tarsalis* (BERLESE) (ACARI: ASCIDAE) FED ON EGGS OF *Citotroga cerealella* (OLIVIER) (LEPIDOPTERA: GELECHIIDAE) AT DIFFERENT TEMPERATURES

Romeih, Amal H.M.

Faculty of Agriculture-Cairo Univ.-Giza

ABSTRACT

The ascid mite *B.tarsalis* was reared on eggs of *C.cerealella* at 20, 25 and 30°C. This species successfully fed and developed from larva to adult under the previous conditions. The temperature 30 °C was most suitable for this species life cycle for both female and male. The female of *B.tarsalis* consumed eggs of *C.cerealella* more than the male through its life span at all the previous temperatures.

Keywords: *Blattisocius tarsalis* - *Citotroga cerealella*-consumption rate-biological control.

INTRODUCTION

The predatory mite *B.tarsalis* is a predator on moth eggs, it found primarily in stored products and it seems cosmopolitan in distribution (chant, 1963; Haines, 1981 and Nielsen, 2003). The predatory mite *B.tarsalis* could be relevant species for biological control (Hansen, 1988; Nielsen 1999a). This research was carried out to study the possibility to control the *C.cerealella* by the predator *B.tarsalis*.

MATERIALS AND METHODS

a): Source of prey and predator:

Individuals of *Blattisocius tarsalis* were found as contamination on eggs of *Corcyra cephalonica* and *Ephestia kuehniella*. Source of *Citotroga cerealella* were brought from dept. of insect and pesticides Fac. of Agric. Cairo Univ.

b) Rearing of the predator:

The main culture were reared in a large trays on the leaves of *Ficus dicora* which put on cotton pad, and the prey source was added continuously

c) Solitary rearing of the predator:

Deutonymph was isolated from the main culture to a plastic rings and supplied with the prey up to adult. When the individual reach the maturity one male was put with on female, where as every male cane mating more than one female. After egg deposition, it was transferred to solitary rings to study the biological aspects of the predatory mite.

RESULTS AND DISCUSSION

Results showed that the life cycle of the ascid mite *B. tarsalis* differed according to sex and temperatures; it was 8.31, 5.53 and 4.78 days at 20, 25 and 30°C for the male and 7.70, 6.41 and 5.42 days for female, respectively. The male life span was 16.72, 19.53 and 15.68 and the female was 45.28, 54.01 and 27.32 days at 20, 25 and 30°C, respectively. The larva was non feeding stage on the opposite of all the remain movement stages. Table (1)

Temperature was an effective factor on the fecundity. 25°C was the most suitable degree more than others. The total number of eggs was 30.22, 63.54 and 10.80 at 20, 25 and 30°C, respectively. Table(2)

Consumption rate was affected by both of temperature and sex. The longevity reached the maximum value at 30°C. (49.0). in case of female, on the other hand it reached the low value in case of male at 20°C(8.41) as shown in Table(3)

Table(1):average periods(days) of different stages of *B.tarsalis* when fed on *C.cerealella* at 20,25 and 30°C

Stages	Sex	Temperatures		
		20°C	25°C	30°C
Egg	♀	0.05±1.81	0.00±1.04	0.75±0.01
	♂	0.08±1.05	±0.021.05	0.80±0.08
Larva	♀	0.02±2.04	1.16±0.03	0.89±0.05
	♂	0.01±1.97	0.98±0.01	0.85±0.06
Protonymph	♀	0.02±2.27	2.40±0.33	0.92±0.03
	♂	0.01±2.17	1.88±0.05	0.93±0.07
Deutonymph	♀	0.26±1.58	1.81±0.19	2.86±0.06
	♂	0.54±2.42	1.62±0.26	2.20±0.25
Total immatures	♀	0.40±5.89	5.37±0.37	4.67±0.07
	♂	0.53±6.56	4.48±0.25	3.98±0.30
Life cycle	♀	0.30±7.70	6.41±0.37	5.42±0.08
	♂	0.52±8.31	5.53±0.26	4.78±0.36
longevity	♀	3.14±37.58	47.6±2.04	21.9±2.87
	♂	0.86±8.41	14.0±1.26	10.9±1.08
Life span	♀	3.40±45.28	54.01±3.89	27.32±3.09
	♂	1.30±16.72	19.53±1.88	15.68±1.50

Table (2):Influence of temperature on adult longevity and fecundity of *B.tarsalis* when fed on *C.cerealella* at 20,25 and 30°C

Temperatures	Average in days			No. of eggs/female	
	Preoviposition	oviposition	postoviposition	Total average	Daily rate
20	8.83±2.22	1.2415.66±	13.08±1.65	0.0830.22±	±1.011.93
25	7.1±0.83	1.2026.6±	13.9±1.30	63.54±0.7	2.39±0.03
30	4.80±0.74	1.486.7±	11.4±1.80	10.8±1.31	1.61±0.41

Table (3): average number and daily rate of *C.cerealella* consumed by different stages of *B.tarsalis* at 20, 25 and 30°C

Stages	Sex	Temperatures					
		20°C		25°C		30°C	
		T	D	T	D	T	D
protonymph	♀	8.66±0.47	3.74±0.18	5.07±0.45	2.15±0.20	3.6±0.48	3.89±0.24
	♂	7.75±0.43	3.56±0.18	3.50±0.50	1.85±0.24	2.00±0.00	2.52±0.31
deutonymph	♀	4.67±0.48	3.02±0.60	4.6±0.66	2.53±2.20	6.4±0.48	2.24±0.75
	♂	3.67±0.40	1.63±0.29	3.0±0.01	1.91±0.34	2.0±0.00	1.03±0.31
longevity	♀	37.11±1.11	4.42±0.15	48.0±1.71	1.02±0.3	49.0±1.34	2.34±0.07
	♂	8.41±0.49	0.97±0.09	9.3±1.18	0.67±0.04	12.3±1.85	1.15±0.07
Preoviposition	♀	9.67±1.28	1.15±0.08	8.1±0.83	1.41±0.01	12.2±0.97	2.72±0.52
oviposition	♀	17.0±1.41	1.15±0.03	27.0±0.00	0.99±0.03	27.1±2.07	4.19±0.65
postoviposition	♀	10.5±0.64	0.81±0.015	12.9±1.30	0.93±0.1	9.7±1.61	0.85±0.08

Nielsen (1999b) studied the effect of temperatures on the activity and consumption rate of *B.tarsalis*, he found that 33% of the predaceous individuals can walk 1.5cm/min; on the other hand at 12°C all these individuals were active. Food consumption below 13°C was very low, where as it was very high at 27 °C.

Nielsen (2001) noted that the mean developmental time of *B.tarsalis* at 15, 21 and 25°C on the prey *Ephestia kuehneilla* were 22.4, 8.05 and 7.0 days, respectively. Also the same author (2003) studied the predation of *B.tarsalis* on eggs of *Ephestia kuehneilla* at 15, 21 and 27°C and he found that the mean predation rate was 2.2-7 eggs destroyed in 24 h. and he considered this predator good biological control agent against *Ephestia kuehneilla*.

Romeih et al. (2004) successfully reared the predaceous mites, *Amblyseius californicus*, *A. swirskii*, *Euseius scutalis* and *Agistemus exertus* on insect eggs; *Corycera cephalonica* and *Ephestia kuehneilla* as alternative preys.

From this work and other works, it can be concluded that this predaceous mite considered good insect egg predator. It is promising bioagent and can be used in IPM programme.

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دراسات بيولوجية للنوع بلاتوسيس ترسالييس علي بيض حشرة سيتوتروجا سيراليليا علي درجات حرارة مختلفة
امل حسن معاذ رميح
كلية الزراعة - جامعة القاهرة جيزه - مصر

تم تربية النوع بلاتوسيس ترسالييس علي بيض حشرة سيتوتروجا سيراليليا علي ثلاث درجات حرارة مختلفة 20 و 25 و 30 حيث مر هذا النوع بجميع مراحل نموه بنجاح علي الثلاث درجات حرارة والتغذية السالفة الذكر. كانت افضل درجة حرارة هي 30 لتمام دورة الحياة لكل من ذكر وانثي الاكاروس محل الدراسة.
نجحت انثي الاكاروس في افتراس عدد اكبر من الفريسة محل الدراسة اكثر من الذكر علي الثلاث درجات حرارة.