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Optimum Temperature for Short Term Storage of Eggs of *Chrysoperla carnea* (Stephens) (Neuroptera: Chrysopidae)

N. BAKTHAVATSALAM, S.P. SINGH,
N.A. PUSHPALATHA and B.S. BHUMMANNAVAR

Project Directorate of Biological Control,
H.A. Farm Post, BANGALORE 560 024

Chrysopids being efficient predators are used against pests of several important crops (Canard *et al.*, 1984). Techniques for mass rearing of these chrysopids were developed by several workers (Morrison, 1977; Krishnamoorthy and Nagarkatti, 1981; Patel *et al.*, 1987). Elsewhere in the world, detailed studies were conducted on the long term storage of the eggs of chrysopids (Tauber *et al.*, 1993). However, reports on the storage of the eggs of chrysopids are lacking in India. An attempt was made to find out the optimum temperature and age of the eggs of *Chrysoperla carnea* (Stephens) for short term storage and the results are communicated in this short paper.

Eggs of *C.carnea* laid overnight were collected on each day and kept at laboratory conditions (24 ± 2°C and 50 ± 5RH) for 1 or 2 days. The eggs laid overnight were designated as 12 h old and the eggs kept for 1 and 2 days after collection at room temperature were designated as 36 and 60 h old respectively. Twenty five fertile eggs were randomly-selected and placed in cylindrical vials (10 x 3 cm) and stored in BOD incubator/refrigerator at constant temperature of 2,5 and 10° C for 7, 15 and 30 days. Twenty replications were maintained for each treatment. The eggs were later removed and kept at laboratory conditions for hatching along with a small quantity of eggs of *Corcyra cephalonica* Stainton. The per cent eggs hatched in each vial was noted and the data were analyzed by two factor randomized block design.

Eggs kept at 2°C shrunk and did not hatch and those kept at 5°C showed colour change after the storage period indicating the development of the embryo. However the eggs did not hatch. Highest percentage hatching was noticed with 36 hour old eggs stored at 10°C followed by 12 h old eggs (Table 1). Storing at 10°C for 15 days did not affect the hatching which was 71.25% at room temperature. Hatching did not exceed 80% at room temperature primarily due to egg predation by the larvae (Bakthavatsalam *et al.*, 1994). Tulisalo and Tuovinen (1976) also noticed that the storage of eggs of *C. carnea* at 10°C for two weeks did not reduce the hatching. At temperature beyond 15°C hatching was noticed even during the storage period and hence not desirable. The 60 h - old eggs did not hatch during storage but hatched one day after removal from the storage temperature. This indicated that the development of the embryo was completely stopped during the storage period rather than being slowed.

These studies clearly indicated that the eggs of *C.carnea* can be stored at 10°C for at least 15 days without much difference in hatching rate.

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KEY WORDS : *Chrysoperla carnea*, eggs optimum temperature, Storage

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Table 1. Per cent hatching of *C.carnea* on storage at different temperatures

Storage period in days (A)	Age of the eggs in h (B)	% mean Hatching at 5°C (ABC)	5°C (BC)	10° C (ABC)	10° C (BC)	10° C (AB)	Overall Mean (A)	Overall Mean (B)
7	12	22.40 (24.38)		64.75 (53.84)		33.58 (39.11)		
	36	11.25 (16.34)		78.35 (63.65)		44.80 (39.99)		
	60	6.40 (13.85)		72.10 (58.50)		39.25 (36.18)		
	Mean (AC)	13.35 (18.19)		67.20 (58.66)			40.27 (38.43)	
15	12	2.80 (5.18)		68.25 (56.29)		35.02 (30.74)		
	36	0.60 (1.40)		76.85 (61.83)		38.72 (31.62)		
	60	1.00 (2.22)		58.70 (50.12)		29.85 (26.72)		
	Mean (AC)	1.46 (2.93)		67.93 (56.08)			34.70 (29.51)	
30	12	0.00 (0.00)	8.40 (9.85)	0.00 (0.00)	44.33 (36.71)	0.00 (0.00)		17.58 (15.52)
	36	0.00 (0.00)	3.95 (5.91)	0.00 (0.00)	51.73 (41.83)	0.00 (0.00)		18.56 (15.91)
	60	0.00 (0.00)	2.46 (5.36)	0.80 (1.59)	43.86 (36.74)	0.40 (0.80)		15.44 (14.03)
	Mean (AC)	0.00 (0.00)		0.27 (0.53)			0.14 (0.27)	
	Overall Mean (C)	4.97 (7.04)		45.03 (38.43)				

C.D. at 5%	Temperature (C)	= 1.4788	Temperature & age (BC)	= 2.5614
	Storage period (A)	= 1.8112	Storage period & age (AB)	= 3.1371
	Temperature & Storage (AC)	= 0.6939	Temperature & Storage period & age (ABC)	= 4.4365
	Age of the eggs (B)	= 1.8112		

Figures in parenthesis are arc sin transformed values.

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