

Effect of Storage of Predatory Lady Bird Beetle, *Coccinella Septempunctata* (Linnaeus) under Refrigerator Condition

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Abstract—The pooled result showed that in cold storage study (6 to 7.5°C under refrigerator condition) eggs and larvae of lady bird beetle, *Coccinella septempunctata* could not be stored up to one week. At same condition, pupae of this predator also could not be stored for more than 15 days. The adults of this beetle could be stored successfully up to 150 days with 60% survival at 6 to 7.5°C under refrigerator condition. The results further indicated that the adults of *C. septempunctata* stored for 150 days at 6.0 to 7.5°C under refrigerator condition were found amenable to harness their reproductive ability and survival. So, result concluded that the adult of lady bird beetle can be stored under refrigerator condition (6.0 to 7.5°C) for 150 days without hampering their longevity and reproductive ability.

1. INTRODUCTION

Lady bird beetle, *Coccinella septempunctata* (Linnaeus) (Coleoptera: Coccinellidae) has been proved to be one of the most efficient predator to control various pests. Storage of different stages (eggs, larvae, pupae and adults) of *C. septempunctata* at low temperatures is an essential prerequisite in biological control. During the mass rearing of bio-agent and its storage at end user, sometime it becomes necessity to keep the bio-agents in unused position prior to its utilization either for mass rearing or field release. Little information on storage technique for well known bio-agent except egg parasitoids is available in published literature and the study is highly needed to have a sound technique for time period storage of potential predator with a view to synchronize with its mass rearing programme and field liberation. (Jalali and Singh, 1992)

2. MATERIALS AND METHODS

The experiment was undertaken at Biocontrol Research Laboratory, JAU, Junagadh during 2010-11, 2012-13, 2013-14. For these purpose fresh eggs, larvae and pupae of *C. septempunctata* were collected from existing rearing unit. The eggs were placed in plastic vials (3.5 cm diameter and 7.5 cm in height). The larvae were placed in plastic jars. Sets of

(20sets) known numbers (10) of the bio-agent was kept in domestic refrigerator (Maintaining 6 to 7.5°C temperature) and its viability (Survival rate) was observed at 15 days interval (1, 3, 5, 7, 10, 20, 30, 45, 60, 75, 90, 105, 120, 135, 150, 165, 180 days). These sets were replicated 3 times and kept in BOD incubator at 6.5-7.0, 10, 12 and 15°C temperatures. All the stages (egg, larva, pupa and adult) of predator were studied for its storability. Storability of each stage was determined on the basis of storage period with a maximum survival rate.

3. RESULT AND DISCUSSION:

Twenty of different stages (adults, pupae and eggs) of *C. septempunctata* were stored under refrigerator condition (6 to 7.5°C) in plastic jars. They were removed from each storage period and recorded the hatchability of eggs, larvae and adult's emergence from pupae and per cent survival rate, longevity and fecundity of adults. The present finding supports the results reported by Joshi (1993).

Egg

The eggs were completely failed to hatch out after one week in all the years hence, experiment was not taken further.

Larva

The larvae could not store and died within one week in all the years.

Pupa

The data on adult emergence from the stored pupae indicated that after 15 days of storage only 7.00 per cent pupae succeeded to emerge the adults in all the years.

Adult

Pooled (2010-11, 2012-13 and 2013-14) results indicated that the 100 per cent survival rate of *C. septempunctata* was

observed up to 75 days, 62 per cent at 150 days storage and 34 per cent at 180 days storage. The adults those removed from storage were reared at room temperature and provided with the mealy bug every day; it was observed that after two to three days of removal, the adults started to feed on the food. The pooled results also indicated that there was not effect of storage periods on adult longevity as during that period longevity of adults was ranged from 29.69 to 27.48 days. The result further indicated that the adults of *C. septempunctata* started egg laying after 2 to 3 days of each storage period. Number of eggs laid by one pair was 134.01 to 161.68 eggs per female in all storage period. (Abdel-Salam AH, Abdel-Baky NF 2000)

Table 1: Survival rate, Longevity and Fecundity of *C. septempunctata* adults stored at 6.0-7.5⁰ C

Storage period (Days)	Pooled data of 2010-11, 2012-13 & 2013-14		
	Survival rate	Longevity	Fecundity
1	90.00 (100.00)	5.43 (29.46)	12.72 (161.68)
3	90.00 (100.00)	5.28 (27.84)	12.61 (158.91)
5	90.00 (100.00)	5.24 (27.48)	12.49 (155.99)
7	90.00 (100.00)	5.38 (28.95)	12.42 (154.14)
10	90.00 (100.00)	5.30 (28.06)	12.54 (157.19)
20	90.00 (100.00)	5.35 (28.65)	12.57 (158.01)
30	90.00 (100.00)	5.43 (29.53)	12.71 (161.48)
45	89.11 (99.98)	5.39 (29.05)	12.62 (159.36)
60	90.00 (100.00)	5.38 (28.99)	12.48 (155.84)
75	87.84 (99.86)	5.45 (29.69)	12.45 (154.98)

90	79.58 (96.73)	5.36 (28.76)	12.19 (148.53)
105	71.50 (89.93)	5.40 (29.17)	12.09 (146.06)
120	66.09 (83.58)	5.41 (29.24)	12.05 (145.14)
135	55.99 (68.72)	5.36 (28.77)	11.92 (142.05)
150	52.15 (62.35)	5.41 (29.28)	11.82 (139.79)
165	41.50 (43.91)	5.34 (28.53)	11.73 (137.59)
180	35.92 (34.42)	5.33 (28.46)	11.58 (134.01)
S.Em. ±	1.20	0.03	0.11
C.D.	3.46	0.09	0.32
C.V. %	8.00	1.86	2.55
Y			
S.Em.±	0.50	0.01	0.04
C.D. at 5 %	1.45	NS	0.13
YXT			
S.Em.±	1.93	0.03	0.14
C.D. at 5 %	5.41	0.08	0.39

Data in parenthesis are retransformed values, while outsidess were squared root transformed values

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