

## INCIDENCE OF INSECT PARASITE OF *Ceroplastes floridensis* COMSTOCK AND *C. rubens* MASKELL ATTACKING ORANGE IN DARJEELING OF WEST BENGAL

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### ABSTRACT

*Coccophagus ceroplastae* (How.) Aphelinidae : Hymenoptera was recorded to parasitise *Ceroplastes floridensis* Comstock (Coccidae : Homoptera) and *Metaphycus* n. sp. m. *lichtensiae* (Howard), (Encyrtidae : Hymenoptera) was found to parasitise *Ceroplastes rubens* Maskell (Coccidae : Homoptera) infesting Orange *Citrus reticulata* Blanco in four Orchards of Darjeeling district, West Bengal. The percentage of parasitisation of *C. ceroplastae* on *C. floridensis* varied from 0 to 35.0 at Bhalukhop; from 0 to 33.33 at Ecchey; from 0 to 26.5% at Sakyong and 0 to 26.2 at Bara Mungawa. The maximum parasitisation of *C. ceroplastae* on *C. floridensis* was found in August, 1994 at Bhalukhop (35.0%) and Bara Mungawa (26.2%); and in July, 1995 at Ecchey (33.33%) and Sakyong (26.50%). The percentage of parasitisation of *M. n. sp. m. lichteniae* on *C. rubens* ranged from 0 to 32.5 at Bhalukhop; 0 to 43.5 at Ecchey; 0 to 45.0 at Sakyong and 0 to 50.0 at Bara Mungawa. High parasitisation by *M. n. sp. m. lichteniae* was recorded in August, 1994 and again in October 1994 (32.5) at Bhalukhop; in July 1994 (45.0) at Sakyong and Bara Mungawa (50.0) *Encyrtus infelix* Embleton (Encyrtidae : Hymenoptera) was found to parasitise *Coccus hesperidum* Linnaeus (Coccidae : Homoptera) only at Sakyong.

**Key words :** Insect parasitoids, Orange, Parasitisation, Natural enemies, Homopteran pests, Sternorrhynchan.

### INTRODUCTION

Natural enemies play an important role in natural control of Sternorrhynchan homopteran pests on mandarin orange, *Citrus reticulata* Blanco in different hilly areas of Darjeeling District, West Bengal. The informations regarding the insect parasitoids of these coccids from citrus growing areas of India is scarce. Ben - Dov (1970) mentioned *Coccophagus lycimnia* (Wlk.), was most common parasite of *C. floridensis* on citrus in Israel. Smith (1974) mentioned of the natural protection of *C. rubens* at Queensland, Australia by

*Metaphycus varia* (Gir) and it parasitised the adult coccids. Nath (1972) observed that *C. hesperidum* on citrus was found to be parasitised by an unidentified hymenopteran in Darjeeling, West Bengal.

In insect parasitoids of these Coccids, viz. *C. floridensis*, *C. rubens* and *C. hesperidum* were recorded from four orchards like Bhalukhop, Ecchey, Sakyong and Bara Mungawa of Darjeeling district, West Bengal, during 1994-95. The present study was taken for recording the

population of insect - parasites on these coccids from Darjeeling district of West Bengal.

## MATERIALS AND METHODS

The infested branches with this insect parasites of *Ceroplastes floridensis* and *C. rubens* were collected at random from the four orchards which were brought to the laboratory and kept in glass jars secured by covering the open end of the jar with fine mesh cloth to avoid escape of the parasitoids. Total twenty two sample were collected from the orchard during the period of study. Collection and observation were taken at 15 days intervals. The first collection was taken from the field during end of May, 1994 and first observation was recorded during first week of June, 1994. Regular observations were noted on these collections for emergence of the parasitoids from the insect host till there was complete stoppage or emergence of parasitoid adults for three consecutive days. Count was recorded on the total number of host insects, parasitised host insect and the number of parasitoids emerged. Then percentage of parasitisation was calculated and given in Table 1.

## RESULTS AND DISCUSSION

*Ceroplastes floridensis* Comstock was found to be parasitised by *Coccophagus ceroplastae* (How.), *Ceroplastes rubens* Maskell was recorded to parasitise by *Metaphycus* n. sp. nr. *lichtensiae* (How.) and *Coccus hesperidum* (Linn.) was noted to be parasitised by *Encyrtus infelix* Embleton on mandarin orange in Darjeeling district of West Bengal (Table 1).

*Coccophagus ceroplastae* showed definite seasonal activity on its host, *C. floridensis* and it was more or less identical in all the four orchards. This parasite appeared from early June, 1994 to early October, 1994 and again from March, 1995 till the last observation in August, 1995 with a period of absence from mid October 1994 to mid February, 1995 at Bhalukhop and Echhey. This parasite was found from mid June, 1994 to early October, 1994 and again in mid May 1995 till the last observation in August, 1995 where at Bara Mungawa it occurred from mid June, 1994 to early October 1994 and again in mid March, 1995 to early August, 1995. During the period of its activity the percentage of parasitisation varied from 0 to 35.0; 0 to 33.33%, 0 to 26.50 and 0 to 26.20 at Bhalukhop, Ecchay, Sakyong and Bara Mungawa, respectively. The maximum parasitisation of this parasite was recorded in August, 1994 at Bhalukhop and Bara Mungawa and in July, 1995 at Ecchey and sakyong. In general, relatively high percentage of parasitisation was noted during July - August.

*Metaphycus* n.sp. nr. *lichtensiae* could also be recorded during more or less identical period as *C. ceroplastae* on *C. floridensis*. This parasite was found from late June, 1994 to early August, 1994; from mid September 1994 to early October, 1994 from late February, 1995 to early April 1995 and again from mid May., 1995 to early August 1995 at Bhalukhop where at Ecchey it was noted from early June, 1994 to late August, 1995; in early October, 1994; from late February, 1995 to late April, 1995 and again from early June, 1995 to early August 1995. This parasite was occurred

INSECT PARASITE OF *C. floridensis* COMSTOCK & *C. rubens* MASKELLTable 1. Percentage of insect parasites of *Ceroplastes floridensis* and *C. rubens* at different locations of West Bengal

Date/ Week	<i>C. floridensis</i>		<i>C. rubens</i>		<i>C. floridensis</i>		<i>C. rubens</i>	
	<i>C. cero-</i> <i>plastae</i>	<i>M.n.sp. nr.</i> <i>lichtensiae</i> (2)*	1*	2*	1	2	1	2
1994								
June I	28.57	-	20.00	25.00	-	22.22	-	-
June III	25.0	25.0	22.22	28.57	16.66	28.57	15.38	-
July II	12.50	25.00	20.00	43.5	22.22	-	12.50	28.57
Aug. I	35.0	32.50	11.11	37.50	14.28	45.00	21.42	30.00
Aug. III	30.00	-	23.07	33.33	20.00	-	26.20	25.00
Sept. II	22.22	20.00	25.00	-	25.00	-	20.00	44.44
Oct. I	12.50	32.50	14.28	40.00	12.50	-	8.33	40.00
Oct. III	-	-	-	-	-	-	-	16.66
Nov. II	-	-	-	-	-	-	-	-
Dec. I	-	-	-	-	-	-	-	-
Dec. III	-	-	-	-	-	-	-	-
1995								
Jan. II	-	-	-	-	-	-	-	-
Feb. I	-	-	-	-	-	-	-	-
Feb. III	-	12.50	-	11.11	-	-	-	14.28
March II	16.66	14.28	9.09	16.66	-	11.11	-	10.53
April I	20.00	20.00	11.11	10.00	-	-	10.00	11.76
April III	11.11	-	16.16	11.11	-	-	12.50	12.50
May II	16.66	6.66	20.00	-	11.11	-	14.28	22.22
June I	20.00	20.00	15.38	25.00	20.00	12.50	22.22	7.14
June III	18.18	15.38	20.00	20.00	25.00	13.33	25.00	18.18
July II	23.07	21.42	33.33	16.66	26.50	-	20.00	11.01
Aug. I	25.00	20.00	18.18	18.18	22.22	14.28	14.28	8.33
Range	0-35	0-32.5	0-33.33	0-43.5	0-26.5	0-45.0	0-26.2	0-50.0

Note :-

*C. floridensis* - *Ceroplastes floridensis**C. rubens* - *Ceroplastes rubens*\*1 - *Coccophagus cero-plastae* (Howard)\*2 - *Metaphycus n.sp. nr. lichtensiae* (Howard)

in June, 1994; in early August 1994, in mid March 1995 and again in June, 1995 and in early Aug. 1995 at Sakyong where at Bara Mungawa it was recorded from mid July, 1994 to late October, 1994 and again from late February, 1995 till the last observation in August, 1995. There was wide variation in the percentage of parasitisation during the period of its activity. It was 0 to 32.5% at Bhalukhop; 0 to 43.5% at Eschey; 0 to 45.0% at Sakyong and 0 to 56% at Bara Mungawa. The maximum parasitisation at Bhalukhop was recorded twice, once in August, 1994 and then in October, 1994, at Eschey in July, 1994; at Sakyong in August, 1994 and at Bara Mungawa also in August, 1994. So the major time of activity of this parasite was usually during July - August.

*Coccus hesperidum* was parasitised by *Encyrtus infelix* only at Sakyong. The period of parasitisation was also limited from April to August, 1995 with a variation

from 6.66 to 20.83% of parasitisation. Highest parasitisation was noted in June, 1995. Shutova *et al.* (1985) observed that the parasite *Encyrtus lecaniorum* (Mayr.) was found effective for controlling this coccid on citrus in USSR.

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