

Natural parasitization of sugarcane leaf hopper, *Pyrilla perpusilla* (Walk.) in Uttarakhand

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The experiment on natural parasitization of sugarcane leaf hopper, *Pyrilla perpusilla* was conducted at Crop Research Center of G.B. Pant University of Agriculture and Technology, Pantnagar. The maximum number of egg mass, nymph and adult per leaf of pyrilla observed was 6.67, 22.67 and 18.00 on 30th, 30th and 15th August, respectively. The highest parasitization of eggs masses by *Tetrastichus pyrillae* was observed in the month of October i.e. 85.33% indicating peak activity of parasitoid. The maximum population of egg, pupa and adult/ leaf of *E. melanoleuca* were 8.00, 27.33 and 18.67 on 30th Sept., 30th Oct. and 15th of Oct., respectively.

Key words : Sugarcane, *Pyrilla perpusilla*, *Epiricania melanoleuca*.

INTRODUCTION

Sugarcane is one of the major cash crops in India and is cultivated under diverse agro climatic conditions in about 84 countries of the world and hence a large number of insect pests damage the crop. Isaac in 1937 listed 79 species of insects infesting Sugarcane and Gupta and Avasthy (1957) categorized 18 as major pests and 21 as minor pests. Pests and diseases are important limiting factors in obtaining high yield in sugarcane. Sugarcane leaf hopper, *Pyrilla perpusilla* (Walk) (Hemiptera: Lophopidae) is the most destructive in subtropical India and appears periodically. It also infests sorghum, maize, pearl millet and rice crops near sugarcane fields during out break situations. Sporadic as well as large scale out breaks of the sugarcane pyrilla have been reported in Uttar Pradesh in the parts in 1934-36, 1937-38, 1947-48, 1951-53, 1968-70, 1973-74, 1976-77, 1978-79 and 1985-86 (Rajak *et al.*, 1987; Pawar, 1989). *Epiricania melanoleuca* has been extensively used for the biocontrol programme against pyrilla in the recent past (Mishra and Pawar, 1984). In northern India *Epiricania melanoleuca* has played major role in control of pyrilla epidemic. Keeping these facts in view, the experiments on natural parasitization of sugarcane leaf hopper, *Pyrilla perpusilla* (Walk.) in Uttarakhand were carried out.

MATERIALS AND METHODS

The experiment on natural parasitization of sugarcane leaf hopper, *Pyrilla perpusilla* was conducted at Crop Research Center of G.B. Pant University of Agriculture

and Technology, Pantnagar. Observations were recorded from 15th July to 30th Nov., 2006 on *Pyrilla perpusilla* for the quantification of population:

Observations were recorded from each block of sugarcane randomly where no insecticidal spray was done. The pyrilla as well as parasitoids count were taken from the leaf each at top, middle and lower portion of sugarcane plant Experiments were replicated three times. Observations on the *Pyrilla perpusilla* and per cent parasitization by *E. melanoleuca* were recorded as:

- Total no. of egg masses /leaf
- No. of egg masses parasitized
- Total no. of nymphs/leaf
- No. of nymphs parasitized by *E. melanoleuca*
- Total no. of adult/ leaf
- No. of adult parasitized by *E. melanoleuca*

Parasitized eggs along with leaf were brought to Biological control laboratory and kept in glass jars for emergence of parasitoids.

RESULTS AND DISCUSSION

Population of Pyrilla perpusilla and extent of parasitization:

Perusal of Table 1 revealed that pyrilla population *viz.*, eggs, nymphs and adult observed was lower in the month of July which gradually increased in the successive months and reached on its peak in the months of August. The average number of egg masses of pyrilla per leaf observed was 6.33 and 6.67 at 15th August and 30th August, respectively. The average nymphal population of pyrilla

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Table 1 : *Pyrilla perpusilla* population and its parasitism in sugarcane crop at Pantnagar

Date of Observation	Pyrilla population/leaf			Parasitization (%)		
	Egg	Nymph	Adult	<i>T. pyrrillae</i>	<i>E. melanoleuca</i>	
				Egg	Nymph	Adult
15 July,06	2.67	5.00	3.00	20.67	26.33	1.33
30 July,06	4.00	5.67	5.33	24.00	28.00	3.00
15 Aug,06	6.33	21.33	18.00	34.33	56.00	7.67
30 Aug,06	6.67	22.67	16.67	41.67	51.33	11.67
15 Sept,06	4.00	18.33	15.67	37.00	58.00	13.67
30 Sept,06	3.33	15.67	11.00	58.33	62.00	21.67
15 Oct,06	1.33	3.33	7.67	65.33	70.67	36.33
30 Oct,06	1.00	1.33	4.00	85.33	82.00	20.00
15 Nov,06	0.00	3.00	1.00	55.33	62.00	18.00
30 Nov,06	0.00	1.33	0.00	42.67	52.00	6.00
C.D. (P=0.50)	1.24	2.20	1.24	4.45	2.91	2.28

was 21.33 and 22.67 nymph/leaf on 15th and 30th August, respectively. The adult population of pyrilla was also maximum in the month of August. Very low population of pyrilla viz., eggs, nymphs and adult was observed in the month of September and October and negligible activity of pyrilla was recorded in the month of November.

The highest parasitization of eggs masses by *Tetrastichus pyrrillae* was observed in the month of October i.e. 85.33% indicating peak activity of parasitoid (Table 1). Lowest parasitization was observed in the months of July and August. Similar trends were also observed in parasitization of nymphs of *Pyrilla* by *E. melanoleuca* where highest parasitization i.e. 70.67 and 82.00 % on 15th Oct. and 30th Oct., respectively were recorded. The adult parasitization by *E. melanoleuca* was lower in the month of July and August which subsequently increased in the month of September and peak activity i.e. 36.00 and 20% on 15th Oct. and 30th Oct., respectively, were recorded.

Population of *Epiricania melanoleuca*:

E. melanoleuca was active in the fields but their population was low in the months of July and August and maximum population i.e. egg, pupa and adult/ leaf were observed in the months of September and October (Table 2). The maximum egg masses i.e. 6.00 and 8.00/leaf were recorded on 15th Sept. and 30th Sept., respectively. The highest pupal populations of *E. melanoleuca* were 22.00 and 27.33/leaf on 15th and 30th Oct., respectively then declined gradually in the month of November. Similar trends were also observed in the adult population of *E. melanoleuca* where maximum population i.e. 18.67/leaf was recorded on 15th of October. *E. melanoleuca* has been extensively used for the biocontrol programme

Table 2 : Population fluctuation of *Epiricania melanoleuca* in sugarcane at Pantnagar

Date of observation	<i>Epiricania melanoleuca</i> population (No./leaf)		
	Egg mass	Pupae	Adult
15 July,06	0.67	1.00	0.67
30 July,06	0.00	1.33	0.00
15 Aug,06	2.00	2.00	1.33
30 Aug,06	5.00	4.00	3.33
15 Sept,06	6.00	16.33	8.33
30 Sept,06	8.00	17.67	12.00
15 Oct,06	3.00	22.00	18.67
30 Oct,06	1.33	27.33	10.00
15 Nov,06	0.67	19.67	5.00
30 Nov,06	0.00	12.33	1.00
C.D. (P=0.05)	1.22	2.33	1.53

against pyrilla in the recent past (Misra and Pawar, 1984) and in north India *E. melanoleuca* has played major role in the control of pyrilla epidemics (Fletcher, 1939).

These efforts have resulted in successful control of pyrilla on sugarcane through conservation and augmentation of natural parasitoids. It proved again that conservation and augmentation of *E. melanoleuca* became the cardinal, ecofriendly and most cost effective principle of pyrilla management.

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