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Incidence of *Popillia lucida* Newman on rice in Himachal Pradesh

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ABSTRACT

Investigation on the abundance of Popillia lucida Newman on paddy was undertaken during wet season, 2011 at three locations in Kangra district of Himachal Pradesh, India. Rice crop under direct sown and transplanted conditions was observed at weekly intervals upto harvesting for recording the build up of chaffer beetle. The adults of chaffer beetle started appearing during first week of August with the panicle initiation and the maximum mean adult populations observed at three locations viz., Ansui, Amatrahar and Ladoh were 27.63, 15.00 and 19.13 adults 30 hills^{-1}, respectively. The pest activity was observed throughout the flowering period of the crop. Among the various abiotic factors, minimum temperature, relative humidity and rainfall showed positive correlation with adult population at all the three locations.

Key words: *rice, chaffer beetle, seasonal abundance*

In Himachal Pradesh, rice occupies third position in acreage after wheat and maize with 75.20 thousand hectares and total production of 128.92 thousand metric tonnes (Anonymous 2011). The most common insect-pests of rice prevalent in the state are *Scirpophaga innotata* (Walk.), *Cnaphalocrocis medinalis* (Guen.), *Nymphula depunctalis* (Guen.), *Dicladispa armigera* (Oliv.), *Hydrellia philippina* (Ferino) and *Heteronychus lioderes* Redt. *etc.* (Srivastava *et al.* 2009). In addition to these, a new insect-pest, the chaffer beetle, *Popillia lucida* Newman was found to feed on the spikelets at the flowering stage of the crop. This beetle has been reported to infest rice at panicle initiation and full panicle emergence stage in Kangra, Mandi, Una and Sirmour districts of Himachal Pradesh (Sharma *et al.* 2012). *P. lucida*, being one of the new pests of rice, information on its abundance during the crop season needs to be generated. The present study was therefore, undertaken to generate information on the prevalence of the pest in Himachal Pradesh.

The population build up of *P. lucida* was undertaken at three locations in district Kangra *viz*., Ansui, Amatrahar and Ladoh. Starting with the nursery stage, rice crop under direct sown and transplanted conditions was observed at weekly intervals upto harvesting for recording the population of chaffer beetle. Observations were recorded in an area of 2000 m^2, divided into 4 blocks of equal size (Anonymous 2010). Thirty hills in each block were randomly selected and tagged. The number of beetles were counted on tagged hills at weekly intervals in each block and mean number of beetles 30 hills^{-1} was calculated. The correlation coefficients between population of chaffer beetle and various weather factors were calculated (Panse and Sukhatme, 1978).

The data revealed that chaffer beetle population started appearing on rice during first week of August at Ansui and its number increased gradually reaching the maximum mean population of 27.63 beetles 30 hills^{-1} during first week of September (Table 1). Thereafter, the population of the pest started declining reaching the minimum of 2.00 beetles 30 hills^{-1} during end of September. At Amatrahar chaffer beetle was first noticed during second week of August with 1.63 adults 30 hills^{-1}. The mean adult population of chaffer beetle showed a rising trend up to second week of September and population varied between 1.63-15.00 beetles 30 hills^{-1}. The maximum mean population of 15.00 beetles 30 hills^{-1} was observed during 2nd week of September and thereafter, the

Table 1. Incidence of chaffer beetle adults at Ansui, Amatrahar and Ladoh during wet season 2011

Months	Standard weeks	Mean no. of beetles 30 hills^{-1}		
		Ansui	Amatrahar	Ladoh
July	27	0.00	0.00	0.00
	28	0.00	0.00	0.00
	29	0.00	0.00	0.00
	30	0.00	0.00	0.00
August	31	0.88	0.00	0.50
	32	7.00	1.63	3.38
	33	11.63	4.50	7.75
	34	16.75	8.00	13.75
September	35	27.63	11.38	19.13
	36	18.50	15.00	15.88
	37	13.13	9.00	11.00
	38	8.13	2.38	5.38
	39	2.00	0.50	1.13
October	40	0.00	0.00	0.00

population started declining. The lowest mean population was observed during the last week of September. The slight variation in the appearance of pest at Amatrahar could be attributed to the late transplanting which subsequently resulted in late flowering. The abundance of chaffer beetle at Ladoh revealed that the pest activity started with the initiation of the panicle exertion and a mean population of 0.50 beetles 30 hills^{-1} was recorded during 1st week of August. The population of adult beetle ranged between 0.50-19.13 beetles 30 hills^{-1}. The mean peak population of the pest (19.13 beetles 30 hills^{-1}) was observed during first week of September, which started decreasing gradually and the minimum population (1.13 beetles 30 hills^{-1}) was recorded during last week of September.

Table 2. Relationship between mean population of chaffer beetle and various weather factors

Abiotic factors	Correlation Coefficients		
	Ansui	Amatrahar	Ladoh
Maximum temperature	-0.3077	-0.4676	-0.0214
Minimum temperature	0.1726	0.0631	0.0804
Relative humidity	0.1688	0.3335	0.4078
Rainfall	0.4541	0.2075	0.1334

Observations on beetle population at all the three locations revealed that the pest remained active during the flowering period of rice crop starting from first week of August to the end of September. The results are in close conformity with the findings of Srivastava and Sharma (2010) who reported peak activity of chaffer beetle during last week of August to second week of September.

The average number of chaffer beetles under direct sown and transplanted condition with various weather factors *viz*., minimum temperature, relative humidity and rainfall were positively correlated at all the three locations. The pest population showed a negative but non significant correlation with maximum temperature at Ansui, Amatrahar and Ladoh (Table 2). These results are in accordance with the studies of Kumar *et al.* (2007) who observed that the minimum temperature had significant positive correlation with the emergence of beetles.

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