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Incidence and management of rice hispa, *Dicladispa armigera* (Oliver) through Bio Intensive Pest Management (BIPM) at Raipur, Chhattisgarh

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Abstract
The experiment on the incidence and management of rice hispa, *Dicladispa armigera* (Oliver) through Bio Intensive Pest Management (BIPM) was conducted during the *kharif*, 2018-19, at the Instructional research farm of IGKV, Raipur, Chhattisgarh. Results indicated that, the incidence of rice hispa, *D. armigera* initiated in the 35th SMW *i.e.* during the first week of September with 8.12% leaf damage increasing up to 17.81% during 36rd SMW i.e. second week of September, there after the percentage leaf damage declined. After treatment, Farmers practice (T2) and BIPM (T1) showed minimum (5.59% leaf damage and 5.72% leaf damage) which was significantly superior Than Control (T3) with maximum (6.79% leaf damage).

Keywords: Rice hispa, BIPM, farmers practice, incidence

Introduction
Rice (*Oryza sativa* L.) belongs to the family Gramineae. It is the staple cereal food for more than 50% of the world's population and is 2nd to wheat in its importance, providing at least 50% of the daily calories consumed by humans globally (IRRI 2011) [3]. In rice cultivation, India has a long history. Worldwide, India stands 1st in cultivation of rice (area) and followed by China in production. In India, rice crop occupies an area of 439.93 million hectare with the production of 109.698 million tons and productivity of 2494 kg/ha (INDIA STAT, 2016-17) [2]. In Chhattisgarh, it is cultivated over an area of 3792.10 thousand hectares with the production of 4725.50 tons and productivity of 1822 kg/ha (INDIA STAT, 2017-18) [2].
Major insect pests of rice are yellow stem borer (*Scirpophaga incertulas*), leaf folder (*Cnaphalocrocis medinalis*), brown plant hopper (*Nilaparvata lugens*), rice hispa (*Dicladispa armigera*), rice gundhi bug, (*Leptocorisa acuta*). Among them rice hispa, *Dicladispa armigera* (Oliver) (Coleoptera: Chrysomelidae) is also one of the major pests. Rice hispa scrapes the upper surface of leaf blades leaving only the lower epidermis and it also tunnels through the leaf tissues. Consecutive uses of toxic insecticides for pest management led to the destruction of natural enemies, pest resurgence and outbreak, pollution of environment and retention of toxic elements of pesticides in food grains and cattle feed along with development of pest resistance (Jena *et.al*, 2012)[4]. To reduce these problems, adoption of integrated pest management (IPM) module is highly preferred in execution of the pest management strategies. In view of above the points, the present studies focusing on bio-intensive pest management strategies (BIPM) were chalked out and carried out at the Instructional Research farm of Department of Entomology, College of Agriculture, IGKV, Raipur, Chhattisgarh.

Material and Methods
The experiment was conducted during the *kharif*, 2018-19, at the Instructional research farm of IGKV, Raipur, Chhattisgarh. In the experiment, the variety tested was 'Swarna' under Randomized Block Design (RBD) with three treatments replicated ten times. The treatment was Biointensive pest management (BIPM), Farmer's practice (FP) and control. The BIPM and FP comprised of a number of practices as mentioned below. Later the seedlings of sufficient age were transplanted to main field with a spacing of 20 × 15 cm^2 and all the agronomical practices *viz.* irrigation, fertilizer application and intercultural operations were followed as recommended for rice crop in this area to raise the crop. No chemical pesticides were applied in BIPM throughout the crop period to get a natural pest incidence on the crop and chemical pesticides were applied only in Farmers Practice plot.

Control plot was devoid of any practice *i.e.* neither chemical nor non - chemical.

Treatment details

a.) BIPM Details

- Seed treatment with *Trichoderma harzianum* @ 15gm/kg of seeds.
- Seedling dip with *Pseudomonas fluorescence* 2% solution.
- Spray of Azadirachtin 1500 PPM @ 3ml/lit. At 45 and 65 DAT against foliar and sucking pest.
- Erection of bird perches @25/ha.
- Release of *Trichogramma japonicum* @ 1,00,000/ha (6 releases to be made during season) at 10 days interval starting from 25 DAT for stem borer and leaf folder infestation.

b.) Farmers practice Details

- Chlorocyper (Chloropyriphos 50% EC + Cypermethrin 5% EC) insecticide @ 2ml/lit water.
- Seed treatment with Bavistin @ 2g/kg seed.

c.) Control Details

- Untreated.

Observations were recorded at weekly intervals on five randomly selected hills for the number of damaged leaves by rice hispa, *D. armigera* and total leaves, in BIPM, Farmers Practice, and Control plots each replicated ten times.

The percentage of leaf damage was calculated as follows

$$\text{Damaged leaves (\%)} = \frac{\text{Damaged leaves}}{\text{Total leaves (Healthy + Damage)}} \times 100$$

Results and Discussion

The incidence of rice hispa, *D. armigera* (Coleoptera: Chrysomelidae) was first observed in 35^{th} SMW *i.e.* during the first week of September with 8.12% leaf damage going up to 17.81% during 36^{rd} SMW *i.e.* second week of September, there after the percentage leaf damage declined. Thus, the major activity period of rice hispa was observed during the first fort night of September. (Table 1)

From the data presented in table 2, it is clear that after treatment, Farmers practice (T2) and BIPM (T1) showed minimum (5.59% leaf damage and 5.72% leaf damage) which was significantly superior than Control (T3) with maximum (6.79% leaf damage). Least damage in Farmers practice can be attributed to the chemical insecticide sprayed.

Results of the present findings differs from Sharma *et al.* 2018 [5], who mentioned that the population of rice hispa was initially observed in rice crop during 26^{th} SMW and it goes upto the crop maturity *i.e.* from 40 to 44^{th} SMW but shows some similarity with the findings of Chakraborty and Deb 2012 [1] who stated about the appearance of rice hispa from 29^{th} SMW, which steadily increased up to 35^{th} SMW and reached its maximum at about 36^{th} SMW which was kept up to about 38^{th} SMW.

Table 1: Percentage leaf damage caused by rice hispa, *D. armigera* during *kharif* 2018

	35 SMW	36 SMW	37 SMW	38 SMW	39 SMW	40 SMW	41 SMW	42 SMW	43 SMW	44 SMW	45 SMW	46 SMW	47 SMW	48 SMW
T1	10.23 (18.59)	21.17 (27.36)	14.84 (22.56)	7.15 (15.47)	2.50 (8.12)	3.57 (10.82)	5.17 (13.07)	1.37 (5.58)	1.12 (4.17)	0.33 (1.05)	0	0	0	0
T2	7.80 (16.17)	15.67 (23.27)	12.91 (21.02)	8.60 (17.03)	4.64 (12.40)	5.10 (13.01)	4.64 (12.40)	2.24 (8.49)	1.59 (5.52)	0.44 (1.98)	0	0	0	0
T3	8.12 (16.49)	17.81 (24.92)	16.25 (23.71)	9.68 (18.09)	7.06 (15.38)	7.07 (15.40)	4.02 (11.55)	3.10 (10.10)	1.94 (6.61)	0.90 (3.02)	0	0	0	0
S.Em+	0.493	0.501	0.516	0.165	0.871	0.273	0.274	0.815	1.444	1.232	NS	NS	NS	NS
C.D.	1.477	1.499	1.545	0.494	2.608	0.816	0.819	2.440	NS	NS	NS	NS	NS	NS

*Figures in parentheses are angular transformation value

SMW- Standard meteorological week

Table 2: Overall leaf damage caused by rice hispa during *kharif* 2018

Treatments	Pre-treatment	Post treatment
T1	10.23 (18.59)	5.72 (13.82)
T2	7.80 (16.17)	5.59 (13.65)
T3	8.13 (16.49)	6.79 (15.08)
S.Em+	0.493	0.164
C.D.	1.47	0.49

*Figures in parentheses are angular transformation value

SMW- Standard meteorological week

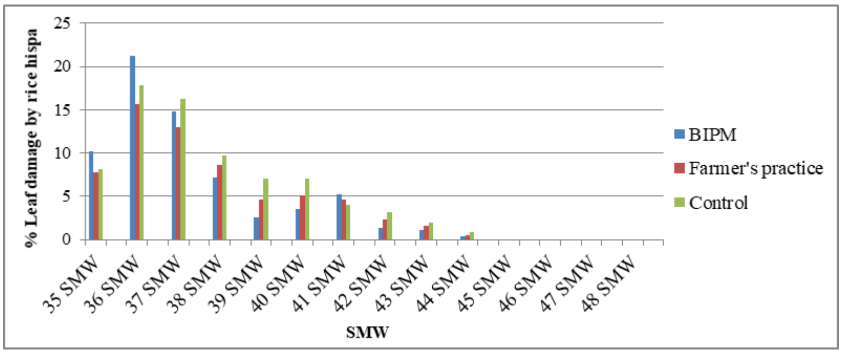

Fig 1: Percentage leaf damage caused by rice hispa during *kharif* 2018

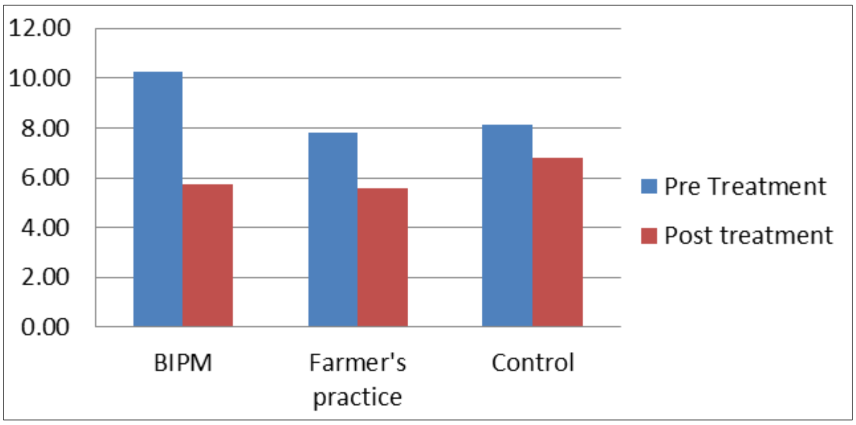

Fig 2: Overall leaf damage caused by rice hispa during *kharif* 2018

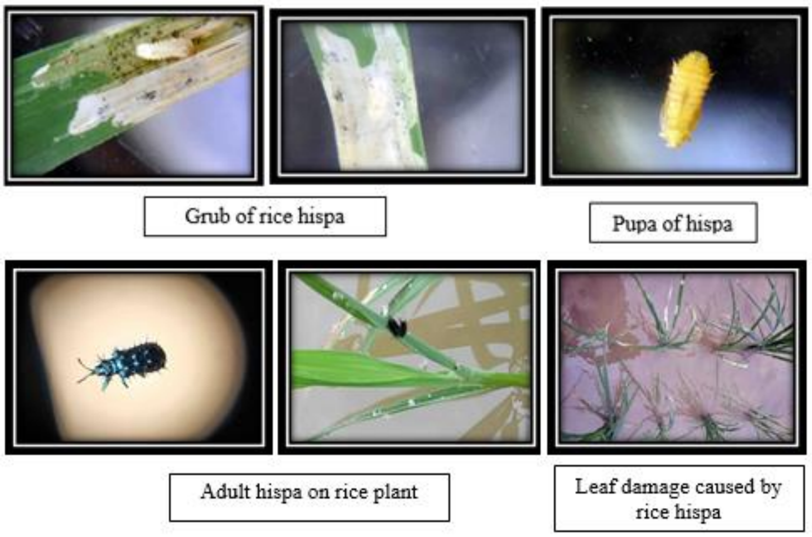

Fig 3: Different life stages and damage symptoms of rice hispa

Conclusion

Thus, the present studies conducted on the incidence and management of rice hispa, *Dicladispa armigera* through Bio Intensive Pest Management (BIPM) at Raipur, Chhattisgarh revealed that the maximum number of leaf damage was observed during 36rd SMW i.e. second week of September with 17.81% after that the percentage leaf damage declined. It was observed that the damage percentage was 10.23, 7.80 and 8.12% on T1-BIPM, T2-Farmer's practice and T3-Control, respectively, after the treatment the result revealed that damage percentage reduced to 5.72, 5.59 and 6.79% on T1-BIPM, T2-Farmers practice and T3-Control.

References

1. Chakraborty K, Deb DC. Incidence of Rice Hispa, *Dicladispa armigera* (Coleoptera: Chrysomelidae) on kharif paddy in the agro climatic conditions of the northern parts of West Bengal, India. Global Journal of Science Frontier Research Biological Sciences, 2012, 12(7).
2. https://www.indiastat.com/agriculturedata/2/agriculturalproduction/225/rice/7194/stats.aspx.
3. IRRI. Opportunities for global rice research in a changing world. Technical bulletin, 2011, 15.
4. Jena BC, Gupta S, Das SK. Effectiveness of integrated pest management modules in suppression of major insect pests of rice. J Plant Prot. Environ. 2012;9(1):57-59.
5. Sharma S, Shera PS, Sangha KS. Impact of bio-intensive integrated pest management practices on insect pests and grain yield in basmati rice. Journal of Biological Control. 2018;32(2):137-141.