

New record of Indian red admiral caterpillar (*Vanessa indica* Herbst.) as a pest of ramie (*Boehmeria nivea* L. Gaud) from Assam

*S.P. Gawande, A.K. Sharma** and S. Satpathy**

Ramie Research Station, P.O. Sorbhog, District- Barpeta – 781317, Assam, India

*Central Research Institute for Jute & Allied Fibres, Nilgunj, Barrackpore, West Bengal, India

**E-mail: amit78sharma@rediffmail.com

Ramie (*Boehmeria nivea* L.) is considered as an oldest and valuable fibre crop of the country to produce the strongest and finest fibre. Ramie fibre possesses highest strength, good durability and absorbency. Ramie is a semi perennial crop and mainly grown in temperate and tropical areas (Dempsey, 1975, Lupin, 1998). In India, it is a traditional fibre crop of northeast state. The fibre is obtained from the plant and also the green portion of this crop is highly palatable to livestock. Although insect pests in ramie was not a major problem in India due to scattered and very limited area under ramie cultivation. Now-a-days, due to change in climatic conditions and also increase in the area, the ramie crop is subjected to infestation of various insect pests leading to considerable losses in yield and quality of fibre and fodder. Among the insect pests, *Vanessa indica* Herbst called Indian Red Admiral caterpillar is the butterfly found in the higher altitude regions of India causing considerable damage to the ramie crop.

Vanessa indica (Nymphalidae: Lepidoptera) has a wide distribution, ranging from eastern to southern Asia. The species appears regularly (as a migrant) in SE Siberia and has been found even in the Kamchatka peninsula (Korshunov & Gorbunov, 1995). Also found in central and eastern Asia: in the Himalaya, NE India, Nepal, Bhutan, Pakistan, Bangladesh, Myanmar, Korea, Thailand, Laos, Vietnam, Taiwan, China, Philippines Japan, Russia (Siberia and Far East Russia at Kamchatka). In this paper, we are reporting record of Red Indian admiral

caterpillar (*Vanessa indica*), its seasonal incidence, infestation and feeding behavior on ramie (*Boehmeria nivea* L.) genotypes from lower Assam state of India.

Systematic survey by plant inspection method was carried out at Ramie Research Station, Sorbhog, Assam to record the occurrence of Indian red admiral caterpillar during the first fortnight of December and January during 2012-13 and 2013-14. Different instars larvae were collected from the field by hand picking and reared in the laboratory on the host plant inside the glass chimney for further study. The larvae were reared on the natural host till pupation. The freshly emerged butterflies from pupae were put inside the killing jars (with chloroform). The dead adults were pinned properly. These specimens were sent to National Project on Insect Biosystematics (NPIB), Division of Entomology, IARI, New Delhi for taxonomic identification.

The seven elite ramie genotypes viz., R-1414, R-1415, R-1416 R-1418 R-52 R-6734 and R-1411 were grown in 6 x 6 m plots with randomized block design (RBD) with three replications to record the seasonal incidence of Indian red admiral caterpillar during first fortnight of December and January when the incidence was maximum. For this 100 numbers of plants of each elite genotype were randomly selected and percent infestation was estimated as stated below:

Per cent infestation (PI) = Number of infested plants / Total plant observed X 100.

The transformed data were statistically analyzed following Gomez and Gomez (1984). The live specimens of *Vanessa indica* (Indian red admiral caterpillar) were collected from different fields of Ramie

research station, Sorbhog, Assam causing considerable damage by feeding on young tender leaves that affect the growth of the plant. This is the first report of occurrence of *Vanessa indica* Herbst. on ramie in India.

Table 1: Abiotic factors prevailed during occurrence of *Vanessa indica*

Insect Pest (Common name)	Indian red admiral caterpillar
Species identified as	<i>Vanessa indica</i> Herbst
Incidence during the month	November to January
Percent incidence	2-8 %
Avg. Temp. (Min.- Max.)	10- 25
Avg.% RH (Min.-Max)	70 - 95

The *Vanessa indica* occurs in a moderate range on ramie crop causing considerable damage. The adults lay the eggs on tender leaves in which larvae emerge and feeds on young tender leaves. Early instars of caterpillar were observed to feed on young tender portion of leaves preferably at neck region where the stalk is attached to the leaf, due to this, leaves look like the hanging like and latter get dry. The caterpillar feeds on young leaves and by feeding on young tender leaves leads to branching which affect the growth of the plant and ultimately quantity and quality of fiber yield. Later fold the leaves in such a way that both the margins get attached by silky web and pupation takes place inside the folded leaf. Latter the adult emerge as a beautiful Indian butterfly. The larvae fold the leaves of ramie to form

shelters that also serve as food. Young larvae used small apical leaves as shelter sites. When constructing shelters, old larvae (usually third instars or older) frequently cut trenches at the bases of the leaves, whereas younger larvae do not cut and feeds on young tender leaves. This trenching behavior reduces the force required to fold large ramie leaves. Once larvae were capable of cutting trenches, they moved proximally on the host plant and used middle leaves that either had completed or were about to complete expansion. The very peculiar leaf trenching habit was also observed in ramie plant as a result of infestation of these insects and the present findings are in conformity with Jun-Ya Ide (2009) who reported that the leaf trenching behavior of *Venessa indica* in ramie crop in China.



Fig.1: Life stages and feeding behavior of *Venessa indica* Herbst.

Observations on seasonal incidence of Indian red admiral caterpillar were recorded on seven elite ramie germplasms during first fortnight of December and January. It was observed that the incidence of caterpillar was highest in the month of January where the temperature was low i.e. 10⁰C (Table 1). Among all the seven elite entries, R-6734 recorded highest incidence (6.62 and 9.75%) whereas R-1414 (3.75 and 5.42%) and R-1415 (2.62 and 5.06%) recorded moderate infestation during the first fortnight of January 2013 and 2014, respectively. Hence, the appearance of this insect pest affects the growth of the crop leads to branching which reduces fiber yield. Rong Xiulan *et al.* (2005) studied the morphology and bionomics of *V. indica* in the lab. The results showed that the origin development temperature of ovum is (10.8+0.25) deg C, its valid cumulative temperature is (38.7+13.0) day=degree.

Present investigation is inflicted similar results regarding occurrence in relation with climatic conditions and feeding habit of this insect pest.

CONCLUSION

The Red Indian Admiral Caterpillar, *Vanessa indica* Herbst was found infesting ramie crop in the lower Assam. This is the first report of occurrence of this insect pest on ramie in India. Feeding behavior and occurrence of this insect pest on seven elite ramie genotypes revealed that genotype R-6734 (Kanai) was highly susceptible to this insect pest.

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Table 2: Incidence of Indian red admiral caterpillar on elite ramie germplasm

Genotype	Mean % incidence of <i>Vanessa indica</i> at first fortnight of			
	2012-2013		2013-2014	
	December	January	December	January
R-1414	1.64 (7.31)	3.74 (10.77)	3.46 (10.69)	5.42 (13.42)
R-1415	1.05 (5.84)	2.62 (9.29)	1.89 (7.86)	5.06 (12.99)
R-1416	0.38 (3.52)	1.07 (5.93)	0.39 (3.53)	1.88 (7.87)
R-1418	0.72 (4.83)	1.85 (7.81)	1.71 (7.48)	3.01 (9.94)
R-52	1.11 (6.03)	1.55 (7.10)	2.63 (9.30)	3.24 (10.32)
R-6734	3.12 (10.15)	6.62 (14.86)	5.05 (12.97)	9.75 (18.17)
R-1411	0.57 (4.30)	1.57 (7.183)	1.05 (5.84)	2.77 (9.57)
C.D.	1.294	2.59	1.501	1.559
SE(m)	0.415	0.831	0.482	0.501
SE(d)	0.588	1.176	0.681	0.708
C.V.	12.002	16.011	10.128	7.375

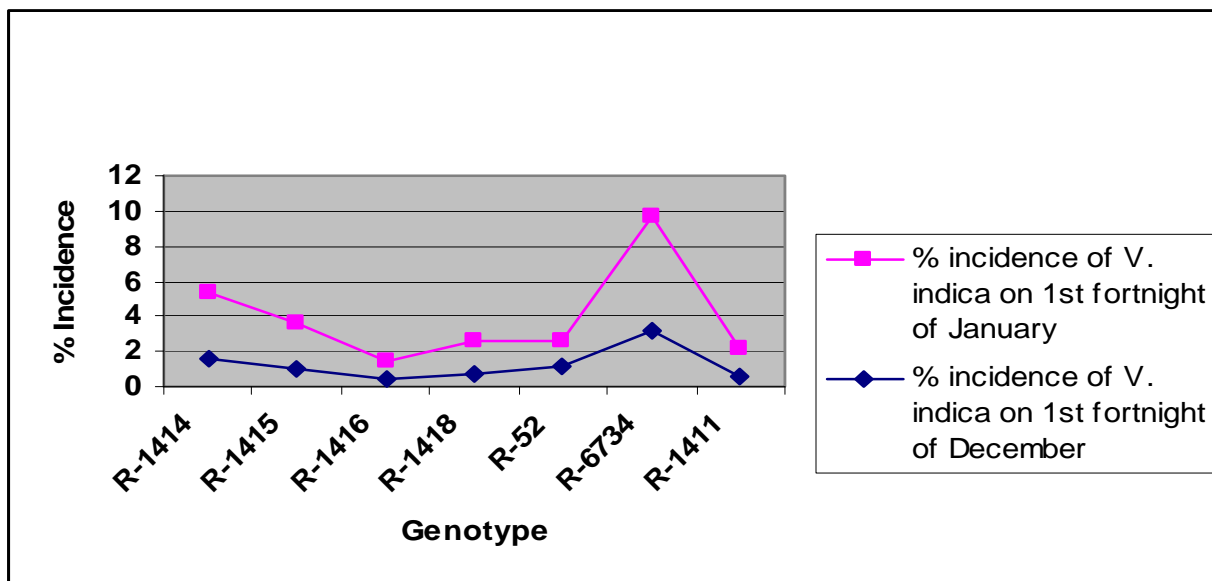


Fig. 2: Seasonal incidence of *Vanessa indica* on elite germplasm of ramie during 2012-13

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