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Infestation of slug caterpillar *Parasa lepida* (L.) (Lepidoptera: Limacodidae) on mango

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Abstract
The infestation of slug caterpillar, *Parasa lepida* (L.) and its relation to weather parameters on different varieties of mango was carried out at Horticultural Instructional Farm, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during 2015. The population of *P. lepida* was started from 4th week of May and remained active upto December on mango. The maximum (26.4 percent) infestation of *P. lepida* was recorded during 35th standard week (fourth week of August) in the variety Rajapuri. The minimum (1.1 percent) infestation of *P. lepida* was recorded during 47th standard week (fourth week of November) in the variety Alphanso. From the study, it can be seen that mango variety Rajapuri was more preferred by *P. lepida* as compare to Alphanso. The study on weather parameter in relation to infestation of *P. lepida* it can be concluded that when the temperature increased infestation of *P. lepida* also increased and vice versa in the Rajapuri, Kesar and Langda varieties of mango. The varieties Dasheri, Amrapali and Alphanso had significant positive correlation with the temperature. Further, relative humidity and rainfall had no effect on infestation of *P. lepida*.

Keywords: Slug caterpillar, infestation, weather parameter, *P. lepida*

1. Introduction
Mango (*Mangifera indica* L.) is the national fruit of India [1]. Mango truly a "King" of fruits has been cultivated for about 4,000 years and its production and consumption has gradually increased as its popularity has grown [3]. Among the total world production, India rank first by producing 54 percent of total world production of mango. It is a commercial fruit crop occupies an area of 22,09,000 hectare with an annual production of 1,86,43,000 million tonnes in India [2]. There is a regular attack of different insect pests on mango trees in nature and about 150 species of insect pests have been reported but, hardly half a dozen pest species having major important [4]. The insect pest is geographically distributed in Bangladesh, Burma, China, Hong Kong, India, Indonesia, Japan, Kampuchea, Laos, Malaysia, Pakistan, Sri Lanka, Thailand and Vietnam.
The larvae of slug caterpillar are the destructive stage of this insect and the young larvae feed on the lower epidermis of the leaf [5]. As they mature, the whole leaf blade is eaten leaving the mid ribs. In heavy infestation, the larvae defoliate whole mango plant. The larvae of *P. lepida* observed on young leaves of mango at Indore (Madhya Pradesh). The leaves of younger plant damaged up to 52.6 percent in mango [5]. *P. lepida* (Cramer) is wide spread in Asia and Africa [6]. It causes severe damage in tea plantation in form of leaf destruction and some time to the extent of skeletonization [5]. The caterpillars are also a great nuisance, because they cause extreme discomfort to the workers who pluck the tea or carryout other operations on affected plantation. The larvae pupate in the soil often shed their stinging hairs on the ground surface so that workers cannot enter the plantations without wearing shoes [6]. The available literature it can be seen that no work has been done on *P. lepida* (Cramer) from Gujarat state particular. Hence, investigation had planned to study the infestation of *P. lepida* (Cramer) on mango.

2. Material and Methods
The infestation of slug caterpillar, *Parasa lepida* (L.) and its relation to weather parameters on different varieties of mango was carried out at Horticultural Instructional Farm, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during 2015. In order to study the infestation of slug caterpillar, *P. lepida*, on mango, five trees of each variety (Rajapuri, Kesar, Langda, Dasheri, Amrapali and Alphanso.) were randomly selected and from

each tree, ten twigs (50 cm length) from all the directions were selected and total number of larvae/twig were counted at weekly interval. In order to study the percent infestation of slug caterpillar, *P. lepida*, five trees from each variety of mango were randomly selected and kept free from insecticidal application. From each tree, ten twigs (50 cm length) from all the direction were selected randomly for recording the observations. Number of healthy and damaged leaves/ twig was counted. The observations were recorded at weekly interval and percent infestation was calculated by using following formula. The data of infestation was correlated with weather parameter.

$$\text{Infestation (\%)} = \frac{\text{Number of infested leaves}}{\text{Total number of leaves observe}} \times 100$$

2.1 Statistical analysis: Population data of *P. lepida* thus obtained were subjected to statistical analysis to find out the coefficient of correlation with temperature, relative humidity, Wind velocity and rainfall [7].

3. Results and Discussion

The results showed that in Table 1 and Fig.1 showed that, infestation of slug caterpillar was started from 4th week of May and remain active upto December on mango. The study was carried out to know the percent infestation of *P. lepida* on various mango varieties *viz.,* Rajapuri, Kesar, Langda, Dasheri, Amrapali and Alphanso.

Rajapuri:

The data presented in Table 1 and Fig.1 showed that in the Variety Rajapuri, maximum (26.4 percent) infestation of *P. lepida* was recorded during 35th standard week (fourth week of August). Initially infestation was started from 22nd standard week (fourth week of May) and reached to its first peak level (26.2 percent) during 28th standard week (first week of July) and second peak (26.4 percent) during 35th standard week (fourth week of August). After that, the infestation of *P. lepida* decreased from second week of September to second week of October and again increased and reached to its third peak (25.4 percent) during 45th standard week (second week of November).

Kesar:

The data given in Table 1 and graphically depicted in Fig. 1 showed that in Kesar variety, maximum (25.4 percent) infestation was observed during 36th standard week (first week of September). The infestation reached to its first peak (24.6 percent) during 28th standard week (first week of July) and second peak (25.4 percent) during 36th standard week (first week of September). Then infestation gradually decreased from third week of September to second week of October. The infestation of *P. lepida* again increased and reached to its third pick (23.3 percent) during 45th standard week (second week of November).

Langda:

The data presented in Table 1 and duplicated in Fig.1 showed that maximum infestation (18.2 percent) was observed during 44th standard week (first week of November) in Variety Langda. The infestation of *P. lepida* was started and reached to its first peak (17.3 percent) during 27th standard week (fourth week of June) and second peak (17.8 percent) during 36th stranded week (first week of September). The infestation of *P. lepida* gradually decreased from second week of September to second week of October. The infestation of *P. lepida* was again increased and reached to its third peak (18.2 percent) during 44th standard week (first week of November).

Dasheri:

Data present in Table 1 and Fig. 1 indicated that in variety Dasheri, the maximum infestation (15.5 percent) was observed during 43rd standard week (fourth week of October). The infestation of *P. lepida* was started and reached to its first peak (13.1 percent) during 27th standard week (fourth week of June). Infestation decreased from second week of July to first week of August. The infestation again increased and reached to its second peak (13.2 percent) during 33rd standard week (second week of August). The infestation of *P. lepida* gradually decreased from third week of September to second week of October. Then, infestation of *P. lepida* again increased and reached to its third peak (15.5 percent) during 43rd standard week (fourth week of October).

Amrapali:

Data presented in Table 1 and Fig. 1 indicated that in variety Amrapali, the maximum infestation was observed (9.0 percent) during 34th standard week (third week of August). The infestation of *P. lepida* started from the month of May and reached to its first peak (8.7 percent) during 27th standard week (fourth week of June). Then it was gradually decreased from second week of July to first week of August. Again, infestation was increased and reached to its second peak (9.0 percent) during 34th standard week (third week of August). Infestation of *P. lepida* was decreased from third week of September to third week of October. After that, infestation of *P. lepida* was gradually increased and reached to its third peak (8.7 percent) during 45th standard week (second week of November).

Alphanso:

Data presented in Table 1 and graphically depicted in Fig. 1 indicated that in variety Alphanso, maximum (5.8 percent) infestation of *P. lepida* was observed during 34th standard week (third week of August). The infestation was started from the month of May and reached to its first peak (5.7 percent) during 27th standard week (fourth week of June) and gradually decreased from second week of July to first week of August. The infestation was again increased and reached to its second peak (5.8 percent) during 34th standard week (third week of August). The infestation of *P. lepida* gradually decreased up to December month.

From the above study, it can be seen that mango variety Rajapuri was more preferred by *P. lepida* as compare to Alphanso. The high infestation of *P. lepida* in Rajapuri variety might be due to shape and colour of leaves of this variety. The leaf shape of Rajapuri was oblong having grooves and ridges on the surface with dark green colour. Further the leaf of Rajapuri was lanceolate and waxy margin with more chlorophyll; hence the ovipositional preference may be more for dark green colour and grooves, which in case of Alphanso variety the shape of leaves was flat ovate and colour of leaves was light green, which is not preferred by female for oviposition. There is no similar work was done as earlier to support the result.

Table 1: Population fluctuation of *P. lepida* on mango

Month	Std. week	Mango varieties					
		Rajapuri	Kesar	Langda	Dasheri	Amrapali	Alphanso
January	1	0	0	0	0	0	0
	2	0	0	0	0	0	0
	3	0	0	0	0	0	0
	4	0	0	0	0	0	0
	5	0	0	0	0	0	0
February	6	0	0	0	0	0	0
	7	0	0	0	0	0	0
	8	0	0	0	0	0	0
	9	0	0	0	0	0	0
March	10	0	0	0	0	0	0
	11	0	0	0	0	0	0
	12	0	0	0	0	0	0
	13	0	0	0	0	0	0
	14	0	0	0	0	0	0
April	15	0	0	0	0	0	0
	16	0	0	0	0	0	0
	17	0	0	0	0	0	0
	18	0	0	0	0	0	0
May	19	0	0	0	0	0	0
	20	0	0	0	0	0	0
	21	0	0	0	0	0	0
	22	5.1	4.7	4.2	3.5	2.5	1.5
	23	8.4	7.1	6.8	6.5	5.4	3.5
June	24	12.1	10.5	10.2	9.6	7.2	4.6
	25	18.6	15.3	14.4	10.2	8.1	4.8
	26	25.3	20.1	16.8	12.4	8.2	5.2
	27	24.7	22.4	17.3	13.1	8.7	5.7
July	28	26.2	24.6	15.2	11.5	8.5	5.3
	29	8.6	6.4	5.3	5.5	3.2	2.8
	30	7.3	6.0	5.0	5.3	3.1	2.6
	31	7.0	5.8	4.7	4.2	2.8	1.8
August	32	6.2	5.3	4.3	4.0	2.1	1.5
	33	22.3	20.2	16.0	13.2	8.6	5.0
	34	24.4	20.4	16.3	12.8	9.0	5.8
	35	26.4	22.3	16.4	12.0	7.3	4.8
September	36	26.3	25.4	17.8	11.0	7.6	4.5
	37	23.4	24.2	14.9	10.2	6.8	4.3
	38	7.8	6.5	5.7	5.6	4.0	3.0
	39	7.3	5.7	5.5	5.0	3.8	3.1
October	40	6.7	4.2	4.3	4.7	3.3	2.6
	41	6.0	4.0	3.8	3.5	2.8	2.3
	42	23.5	20.0	15.3	9.4	2.1	2.8
	43	24.3	22.5	17.8	15.5	8.2	2.2
November	44	25.2	22.7	18.2	9.7	8.5	2.0
	45	25.4	23.3	14.0	9.2	8.7	1.9
	46	7.3	5.0	5.8	4.3	4.1	1.7
	47	6.8	5.2	5.6	3.7	3.8	1.1
December	48	6.5	4.8	5.0	3.6	2.9	1.3
	49	5.3	4.5	4.0	2.8	2.6	1.3
	50	5.2	5.3	4.5	2.7	2.1	1.8
	51	5.1	5.3	3.4	2.2	2.0	1.3
	52	5.3	5.2	3.2	3.1	2.3	1.3

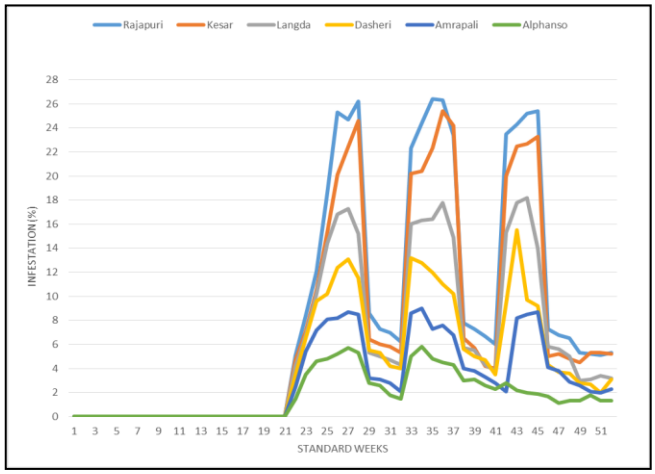

Fig 1: Percent infestation of *P. lepida* on different varieties of mango

3.1 Effect of weather parameters on slug caterpillar infestation on mango varieties

In order to study the effect of different abiotic factors *viz.*, temperature (minimum, maximum and average), relative humidity (minimum, maximum and average), wind velocity and rainfall on infestation of slug caterpillar on different varieties of mango *viz.*,Rajapuri, Kesar, Langda, Dasheri, Amrapali and Alphanso were determined through correlation analysis.

Rajapuri

The data presented in the Table 2 indicated that in variety Rajapuri, the maximum and minimum temperature had significant positive correlation while, average temperature had highly significant positive correlation with infestation of slug caterpillar. Relative humidity, wind velocity and rainfall did not show any correlation with infestation of slug caterpillar. Thus, it can be concluded that when temperature increased, infestation of slug caterpillar also increased and vice versa. While, relative humidity, rainfall and wind velocity had no effect on infestation of slug caterpillar.

Kesar

The data presented in the Table 2 showed that variety Kesar, maximum, minimum and average temperature had significant positive correlation with infestation of slug caterpillar, which indicated that when the above factors increases the infestation also increased and vice versa. Relative humidity, wind velocity and rainfall did not show any correlation with infestation of slug caterpillar indicated that there was no effect of such abiotic factors on slug caterpillar.

Langda

From the Table 2 it can be seen that variety Langda, have maximum and minimum temperature had positive significant correlation while, average temperature had highly significantly positive correlation with infestation of slug caterpillar. Relative Humidity, wind velocity and rainfall did not show any correlation with infestation of slug caterpillar. Thus, it can be concluded that when temperature increased infestation of slug caterpillar also increased and vice versa. The relative humidity, rain fall and wind velocity had no effect on infestation of slug caterpillar.

Dasheri

The data presented in Table 2 where in variety Dasheri, showed that maximum, minimum and average temperature had highly significant positive correlation, while the wind velocity had significant positive correlation with infestation of slug caterpillar. The relative humidity and rainfall did not show any correlation with the infestation of slug caterpillar. Thus, it can be concluded that when temperature and wind velocity increased the infestation of slug caterpillar also increased and vice versa while there was no any effect of relative humidity and rainfall on infestation of slug caterpillar.

Amrapali

The data presented in the Table 2 showed that variety Amrapali had maximum and minimum temperature and wind velocity shown significant positive correlation while; average temperature had highly significant positive correlation with infestation of slug caterpillar. Relative humidity and rainfall did not show any correlation with infestation of slug caterpillar. Thus, it can be concluded that when the temperature and wind velocity increased, infestation of slug caterpillar also increased and vice versa while relative humidity and rainfall had no effect on infestation of slug caterpillar.

Alphanso

The data presented in Table 2 showed that in variety Alphanso, the maximum temperature had significant positive correlation while, the temperature (minimum and average) and wind velocity had highly significant positive correlative with infestation of slug caterpillar. Relative Humidity and rainfall did not show any correlation with infestation of slug caterpillar.

Thus, it can be concluded that when temperature and wind velocity increased the infestation of slug caterpillar also increased and vice versa while, relative humidity and rainfall had no effect on infestation of slug caterpillar.

Thus, from the overall results, it can be concluded that when the temperature increased infestation of slug caterpillar also increased and vice versa in the Rajapuri, Kesar and Langda varieties of mango. The varieties Dasheri, Amrapali and Alphanso had significant positive correlation with the temperature (max., min., av.) and wind velocity indicated that when such abiotic factors increased the infestation of slug caterpillar also increased and vice versa. Further, relative humidity and rainfall had no effect on infestation of slug caterpillar.

Table 2: Correlation between infestation of slug caterpillar on different mango varieties and weather parameters

Varieties	Weather parameters							
	Temperature (^{0}C)			Relative Humidity (%)			Wind Velocity (Km/h)	Rainfall (mm)
	Max.	Min.	Av.	Max.	Min.	Av.		
Rajapuri	0.435*	0.425*	0.479**	0.117	-0.276	-0.158	0.259	-0.151
Kesar	0.381*	0.391*	0.433*	0.09	-0.229	-0.131	0.221	-0.148
Langda	0.454*	0.461*	0.511**	0.130	-0.256	-0.137	0.289	-0.143
Dasheri	0.477**	0.554**	0.585**	0.195	-0.199	-0.062	0.371*	-0.093
Amrapali	0.384*	0.457*	0.479**	0.174	-0.191	-0.066	0.378*	-0.132
Alphanso	0.395*	0.731**	0.672**	0.309	-0.014	0.132	0.595**	-0.031

* Significant at 5% level of significance (r = 0.367)

** Significant at 1% level of significance (r = 0.470)

4. Conclusion

The population of slug caterpillar was started from 4th week of May and remained active upto December on mango. From the study, it can conclude that mango variety Rajapuri was more preferred by *P. lepida* as compare to Alphanso. The study on weather parameter in relation to infestation of slug caterpillar concluded that when the temperature increased infestation of slug caterpillar also increased in the Rajapuri, Kesar and Langda varieties of mango. The varieties Dasheri, Amrapali and Alphanso had significant positive correlation with the temperature. Relative humidity and rainfall had no effect on infestation of slug caterpillar.

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6. References

1. Bommy D, Kavitha Maheswari S. Preserved Products from Mango (*Mangifera indica* L.) and its Financial Analysis and Beneficiaries Cost Ratio. International Journal of Current Research and Academic Review. 2016; (3):67-7.
2. Anonymous. Area and production of fruit crops, 2015. Avalible at http://www. nhb.gov.in, 16 March, 2016.
3. Baddi J, Vijayalakshmi D, Durgannavar NA, Chandru A. Mango peel: A potential source of natural bioactive phyto-nutrients in functional food. Asian Journal of Dairy Food Research. 2015; 34(1):75-77.
4. David BV, Ramamurthy VV. Pests of fruit trees. In: Elements of Economic Entomology. Namrutha Publications. Seventh Edition. Chennai. 2012, 153-154.
5. Kapoor KN, Deobhakta SR, Dhamdhere SV. Bionomics of the slug caterpillar, *Latoia lepida* (Cramer) (Lepidoptera: Limacodidae) on mango. Journal of Entomological Research. 1985; 9(2):235-236.
6. Viqar S, Kamaluddin AA, Isma Y, Waqar-Ul-Haq. Tea pest *Parasa lepida* (Moore) (Lepidoptera: Limacodidae) from Bangladesh with reference to its description and control strategy. International Journal of Biology and Biotechnology. 2008; 5(1-2):41-45.
7. Sharma P, Kumawat KC, Jhumar Lal. Seasonal abundance of diamondback moth and natural enemies of cabbage. Journal of Entomology and zoology studies. 2017; 5(3):176-179.