



RESEARCH ARTICLE

SEASONAL INCIDENCE AND EFFECT OF ABIOTIC FACTORS OF SAPOTA FRUIT BORER, *PHYCITA ERYTHROLOPHIA* HAMPSON ON SAPOTA DHS-2 HYBRID

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ABSTRACT

Studies on seasonal incidence of sapota fruit borer, *Phycita erythrolophia* Hampson (Pyralidae: Lepidoptera) infesting sapota *Manilkara achras* (Mill.) Forsberg were carried out at sapota orchard of DHS-2 hybrid, KVK, Saidapur farm, Dharwad, University of Agricultural Sciences, Dharwad, Karnataka, India during 2013–2014. The fruit borer was active throughout the year with a varying degree of infestation. It was recorded from a minimum of 3.83 per cent (second fortnight of October) to maximum of 15.49 per cent (second fortnight of March). Pest incidence was more during dry period i.e. from November to April and less during rainy season (July to October). A study on correlation of fruit borer with weather parameters indicated that there was a significant and positive correlation between fruit borer damage and maximum temperature in DHS-2 hybrid. Rest of the weather factors viz., minimum temperature, relative humidity and rain fall had no influence on pest population during the period of study.

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INTRODUCTION

Sapota (*Manilkara achras* (Mill.) Farsberg, syn. *Achras zapota* Linn.) Belongs to family Sapotaceae is a native of Mexico. . It is called by several names such as Chiku, Sapodilla, Zapata or Sapodilla plum in different regions. The first commercial sapota cultivation from Maharashtra was taken up in Gholvad area in 1898 (Sulladmath and Reddy 1990). India is considered to be the largest producer of sapota in the world and it is being cultivated in an area of about 163.9 thousand ha with a production of 1495.0 metric tonnes (Anon., 2014). Major sapota producing states are Karnataka, Gujarat, Maharashtra, Tamil Nadu, Kerala, Uttar Pradesh, Haryana, Punjab and West Bengal. Out of the total fruit production in India, Karnataka ranks first contributing 25 per cent of total production of sapota (Anon., 2014). The total area of sapota grown in Karnataka is about 31.7 thousand ha with an annual production of 373.7 lakh metric tonnes with a productivity of 11.8 metric tonnes per ha (Anonymous, 2014). Among the various factors affecting the yield of fruit crop damage caused by insect pests is important. More than 25 insect pests attack sapota (Butani, 1979). In recent days a new pest, sapota fruit borer occurring regularly by causing considerable damage in sapota orchards of northern dry zone of Karnataka districts. Looking to the devastation of this pest and detailed study on sapota fruit borer is lacking hence the present study was made. Sapota fruit borer *Phycita erythrolophia* Hampson was reported as a predominant species causing considerable damage to flower buds and fruits of sapota (Vishwanath *et al.*, 1978). The early instars larvae of

sapota fruit borer, *P. erythrolophia* feeds on flower buds whereas the later instars cause damage to fruits by boring into pulp and due to its continuous feeding the excretory pellets got entrapped in silken web, thus resulting in premature fruit fall and pest was found active throughout the year (Patil,1986).

MATERIAL AND METHODS

To study the seasonal incidence of sapota fruit borer, observations were done in sapota orchard, KVK, Saidapur farm, Dharwad, University of Agricultural Sciences, Dharwad, Karnataka, India. Observations were recorded on DSH-2 hybrid. No insecticidal application was done during the period of study. The observations were recorded at 15 days intervals from June 2013 till May 2014. Five medium sized trees were selected randomly. From each of the tree ten twigs having fruits were selected and in each twig all the fruits were observed for the incidence of fruit borer. The number of total damaged fruits per twig of each variety was counted for computing the percentage of infestation. Mean percentage of fruits damaged was worked out by using formula. In order to study the effect of weather parameters, the simple correlation coefficients were worked out.

$$\text{Per cent fruits damaged} = \frac{\text{Number of damaged fruits}}{\text{Total number of fruits observed}} \times 100$$

RESULTS AND DISCUSSION

The larva of sapota fruit borer, *P. erythrolophia* damages by boring into fruits and feeding on pulp. A bored hole is seen on sapota fruits and due to continuous feeding the excretory pellets are seen on bored holes (Fig.1). Usually one larva was found in each affected fruit. Larva in its entire period feeds on fruits only but sometimes early larval instars rarely feeds on flower buds.



Figure 1 Symptom of damage and larva of sapota fruit borer, *Phycita erythrolophia*

The data shows (Table-1) a varying degree of infestation throughout the year. Highest incidence of 15.49 per cent was noticed in March (second fortnight) whereas it was lowest of 3.83 per cent in October (second fortnight). The data reveals that the pest incidence was more during dry period i.e. from November to April and less during rainy season (July to October). These results are in line with the findings of Patil (1986) reported that lowest incidence of *P. erythrolophia* (9 to 15 %) was observed from first fortnight of March to second fortnight of May and maximum incidence (37 %) during first fortnight of November. This finding contradicts to present studies, it may be due to variation in the incidence of the pest, genotype grown, climatic factors.

Table1 Seasonal incidence of sapota fruit borer, *Phycita erythrolophia* during 2013-14 on DHS-2 Hybrid

Month	Fortnight	Percent fruit damage	Month	Fortnight	Percent Fruit damage
June-2013	I	9.56	December	I	10.86
	II	6.54		II	9.48
July	I	5.35	January-2014	I	11.56
	II	5.25		II	12.30
August	I	5.54	February	I	11.74
	II	4.98		II	14.45
September	I	3.62	March	I	14.93
	II	4.71		II	15.49
October	I	5.65	April	I	11.66
	II	3.83		II	8.11
November	I	6.15	May	I	6.84
	II	8.65		II	6.26

In the present study more damage of fruit borer was noticed during dry season and in the remaining season pest activity was less. Where as the pest occurrence coincides with peak crop harvesting periods (March to June).

The correlation studies (Table-2) made between the incidence of fruit borer, *P. erythrolophia* and weather parameters showed that there was a significant ($r = +0.43$) and positive correlation between fruit borer damage and maximum temperature. Whereas it was significantly but negatively correlated with morning and evening relative humidity and rainfall. Patil (1986) reported that all four climatic factors (Maximum and minimum temperature, relative humidity and rainfall) showed no significant correlation with populations of *P. erythrolophia*. The literature related to sapota fruit borer incidence and relationship between sapota fruit borer damage and various weather parameters viz., temperature (maximum and minimum), relative humidity (morning and evening) and rainfall is lacking.

CONCLUSION

The damage of fruit borer was noticed during dry season and in the remaining season pest activity was less. Whereas the pest occurrence coincides with peak crop harvesting periods (March to June). Pest indicates that there was influence of weather factor i.e. maximum temperature was played an imported role on fruit damage of sapota. So, there is a need to study the management of this pest by using different insecticides and botanicals.

References

1. Anonymous, 2014, Indian Horticultural Data Base, National Horticultural Board, Gurgaon, India, pp. 125.
2. Butani, D.K., 1979, Insect and Fruits. Periodical Expert Book Agency, Delhi. pp. 87-94.
3. Patil, R. H., 1986, Studies on insects infesting sapota (*Achras sapota L.*) with special reference to biology and chemical control of flower bud borers. *M.Sc. (Agri.) Thesis*, Uni. Agric. Sci., Dharwad.
4. Sulladmath, U. V. and Reddy, M. A., 1990, .Sapota. In 'Fruits: Tropical and Subtropical'. T.K.Bose and S. K. Mitra (Eds.). (Naya Prokash: Calcutta.), pp. 565-591.
5. Vishwanath, B. N., Rangaswamy, H. R., Govindan, R. and Sulladamath, V. V., 1978, New flower bud borer *Phycita* sp. (Lep: Phycitidae) on sapota. *Curr. Res.*, 7: 208.