Seasonal Incidence of Leaf Webber, *Diaphania pulverulentalis* Hamps. on Mulberry in Kerala

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SUMMARY

A survey on the incidence of leaf webber, *Diaphania pulverulentalis* in Ernakulam and Trichur, the two major sericultural districts of Kerala was carried out . The survey was conducted at weekly intervals by the fixed plot method for three years (2002-2004). Generally, the infestation increases from June onwards and decreased from January. Maximum infestation was observed during the winter months. There was a gradual increased in the incidence of leaf webber year after year in all the villages in these districts. The average incidence was 2.2, 5.3 and 12.7, respectively during 2002, 2003 and 2004.

Key words : Incidence, Kerala, Leaf webber, Mulberry.

Over 300 insect pests belonging to various orders such as Lepidoptera, Hemiptera, Coleoptera, Thysanoptera, Orthoptera and Isoptera are known to attack mulberry and cause damage (Kotikal and Devaiah, 1987). They attack mulberry during different seasons, causing severe leaf yield loss and leaf quality. Since, majority of insect pests destroy tender leaves, young age silkworm rearing will be affected which in turn affect the later stage also. Leaf webber (*Diaphania pulverulentalis* Hamps.) has recently become a major problem for mulberry cultivators in South India causing a leaf yield loss of 12.8 per cent with an average incidence of 21.77 per cent (Siddegowda *et al*., 1995; Rajadurai *et al.*, 1999). The pest incidence has been noticed in Karnataka since 1995 (Geetha Bai *et al*., 1997) and has spread to neighbouring states of Tamil Nadu, Andhra Pradesh and Kerala. The early stage larvae inhabit the apical part of mulberry shoot and feed on the tender leaves. They bind together the apical leaves by a silky thread. Sometimes a single leaf is also rolled by the web with the larvae inside and hence the name, leaf roller/leaf webber has been given. Since the larvae feed on the tender leaves, the growth of the plant becomes stunted. Systematic survey on the distribution, seasonal incidence, natural enemies as well as qualitative and quantitative loss in different areas on mulberry are essential to formulate long-standing and effective control measures against the pest.

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MATERIALS AND METHODS

A survey on the incidence of leaf webber was carried out in Ernakulam and Trichur, the two major sericultural districts in Kerala, at weekly intervals for three years (2002-2004). The survey was conducted by the fixed plot method. In Ernakulam district, Angamaly, Mallussery, Moozhikulam, Puthenvelikkara and Aduvassery villages and in Trichur district, Kottat, Thuruthiparambu, Valiyaparambu, Meladoor and Alathur villages were selected for the survey. In each of the above villages, four mulberry gardens were chosen. In each garden, five micro plots, at five different locations were demarcated. In each micro plot, twenty plants were selected randomly (100 plants in total) for recording the pest infestation. The percentage of incidence was calculated by using the formula–

$$\text{Incidence percentage} = \frac{\text{Total no. of infested plants}}{\text{Total no. of plants observed}} \times 100$$

Meteorological data such as temperature, relative humidity and rainfall during the survey period were also recorded to assess the influence of these factors on the pest incidence. The results are presented in Table 1 and Fig. 1 and 2.

RESULTS AND DISCUSSION

During 2002, maximum incidence of leaf webber was observed in the month of November (6.5%), when the average maximum temperature, minimum temperature, relative

Table 1: Meteorological data during the survey period

Season/period	2002			2003			2004		
	Temp. (ºC) (av.)	R.H (%) (av.)	R.F (mm) Total	Temp. (ºC) (av.)	R.H (%) (av.)	R.F (mm) (Total)	Temp. (ºC) (av.)	R.H (%) (av.)	R.F (mm) (Total)
Summer (Feb.-May)	30.0	78	554	32.1	70	99	30.4	71	284
Rainy (June-Sept.)	27.1	83	1922	28.8	74.8	1605	29.3	76.5	1749
Winter (Oct.-Jan.)	29.5	75.3	653	30.1	75.8	1019	29.8	73.5	1003

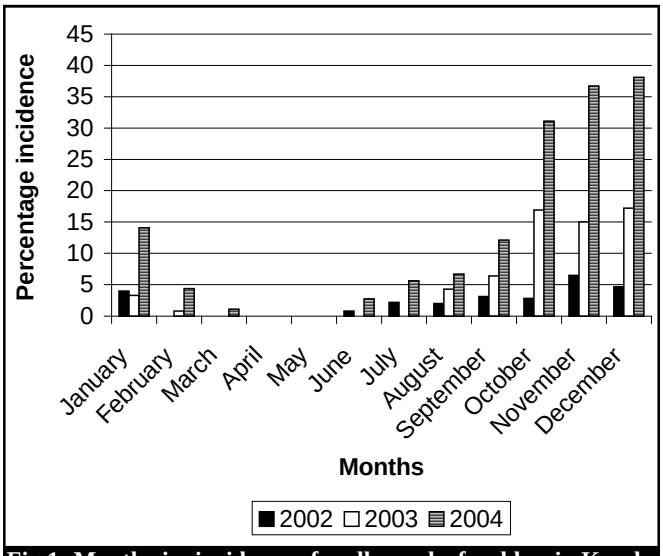

Fig.1: Monthwise incidence of mulberry leaf webber in Kerala (2002-2004)

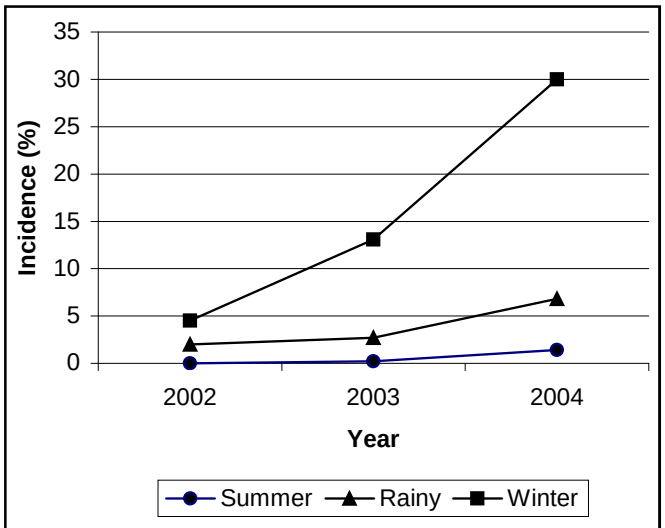

Fig.2: Seasonal incidence of mulberry leaf webber in Kerala

humidity and rainfall were 35ºC, 28ºC, 70.5 and 143 mm, respectively. This was followed by December and January (4.7 and 4.0%, respectively). From February to May, the incidence was not observed. During the year 2003 and 2004 the maximum incidence was noticed during the month of December (17.2 and 38.1%, respectively), when the average maximum and minimum temperature and relative humidity values were 34, 26 and 78.5, respectively. During the year 2003, there was no incidence from March to July, while in the year 2004, except April and May the incidence was observed in all other months The average incidence was 2.2, 5.3 and 12.7, respectively in 2002, 2003 and 2004 (Fig.1).

In India, leaf roller pests are mainly distributed in Karnataka, Andhra Pradesh and Tamil Nadu, besides Haryana and Punjab. Their spread was also reported in other Asian countries like Thailand, Vietnam, Japan, China, Formosa, Myanmar, Sri Lanka and Malaysia. (Narayanaswamy *et al.*, 2003). In the present study, the infestation was found increasing from June onwards till January and thereafter in decreasing trend. Similar observations are also reported by Rajadurai *et al.*, 1999 and Narayanaswamy *et al.*, 2003 in other states. There was a gradual increase in the incidence of leaf webber year after year in all the villages in the above districts. Though the incidence was very high during 2004, there was not much variation in the environmental factors during 2004 when compared to previous two years, indicating that there is no influence of environmental factors on the infestation of the pest. In all the three years the incidence was found to be more during winter months (October to January). The gradual increase in the infestation of leaf webber from 2002 to 2004 could be due to the gradual increase in the V1 acreage in the surveyed areas, which is known to be more prone to the attack of defoliator pests. This is the first ever study on mulberry leaf webber in Kerala.

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REFERENCES

Geetha Bai, M., Marimadaiah, B., Narayanaswamy, K.C. and Rajagopal, D. (1997). An outbreak of leaf roller pest,*Diaphania* (= *Margaronia*) *pulverulentalis* (Hampson) on mulberry in Karnataka . *Geobios New Reports*, **16** : 73-79.

Kotikal, Y.K. and Devaiah, M.C. (1987). Insect and non-insect pests of mulberry, *Morus alba* L. *Proceedings of the Seminar on Prospects and Problems of Sericulture in India*. Vellore, March 27-30, pp. 179-183.

Narayanaswamy, T.K., Srinivasagowda, R. and Sannaveerappanavar, V.T. (2003). Leaf roller on mulberry. *Indian Silk,* **42**(3) pp. 8-10.

Rajadurai, S., Manjunath, D., Katiyar, R.L., Prasad, K.S., Sen, A.K., Shekar, M.A., Ahsan, M.M. and Datta, R.K. (1999). Leaf roller-A serious pest of mulberry. *Indian Silk,* **37**(12) pp. 9-11.

Siddegowda, D.K., Gupta, V.K., Sen, A.K., Benchamin, K.V., Manjunath, D., Prasad, K. Satya, Magdum, S.B. and Datta , R. K. (1995). Diaphania sp. infests mulberry in South India.*Indian Silk,* **34**(8) : 6-8.

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