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Seasonal Incidence of Teak Defoliator, *Hyblaea puera* Cramer (Hyblaeidae: Lepidoptera) in Uttara Kannada District of Karnataka

Teak (*Tectona grandis* L.f.) is one of the most favored timber species in the world.It is known for its strength, durability and maintaining attractive appearance. Obviously, it constitutes high-class timber in the international market. The ever increasing need for teak timber has resulted in large scale plantations both within and outside its range of natural distribution. Intensification of teak cultivation in terms of improved management of plantation on one hand and rapid expansion of plantations into newer areas on the other, have generated a risk of increased pest problem.

More than 187 insect species have been found feeding on the living teak tree in India (Hutacharern and Tubtim, 1995). A majority of these insects are leaf feeders, with a smaller number of sap feeders, stem borers, inflorescence and fruit feeders and root feeders. Among these, the teak defoliator, *H. puera* Cramer is the most widespread and serious pest. Outbreaks occur almost every year in India. During these outbreaks in the early flushing period of teak, trees usually suffer a total defoliation, sometimes there is partial defoliation later in the growth season (Nair, 1988). *H. puera* has also become an economic pest in non-native teak countries such as Costa Rica and Brazil, where outbreaks appeared all of a sudden during 1995 and 1996, respectively. Nair (1988) opined that outbreaks of *H. puera* appear imminent in Latin America and Africa in the near future. Hence, a regular outbreak of *H. puera* is set to become a global problem in all these countries where teak is being cultivated. Hence, the present study was conducted to know the seasonal incidence of teak defoliator *H. puera* through monitoring and surveillance in different teak plantations of Uttara Kannada district in Karnataka.

The investigations were carried out in teak plantations at Yellapur, Mundgod, Haliyal and Sirsi Forest Divisions from May 2003 to April 2005. The area for survey was selected in three forest ranges in each Forest Division. The study plot in each Forest Division was selected in such a way that, a minimum of 250 teak plants were included with an approximate area of 0.2 hectare. The samples were collected from 10 teak plants selected randomly measuring different heights in all directions. Plants measuring less than 1 m (1-2 years), 1 to 2 m (2-5 years) and 2 to 3 m height. (more than five years) were sampled separately. In case of less than 2 m height, the whole plant was searched for larval population. In plants with 2-3 m height the three samples from each plant were collected at random by plucking the twig (20 cm length), one each from top, middle and lower portions of the plant. The number of larvae present on leaves of each twig was counted for each sample. The data collected from various samples were pooled. The incidence of defoliator damage was categorized into high, moderate, light and nil classes through visual estimation as suggested by Khan *et al.* (1988). During the field observation, if one third leaves of a sampled twig were found defoliated, the incidence was considered 'light' (up to 25%); when half leaves of the sampled twig were found defoliated it was assessed as 'moderate' (up to 50 %); if more than two third part of leaves in sampled twig were damaged it was considered as 'high' (> 50%).

The larval incidence varied from place to place and season to season during both the years (Fig1 and 2). In general, the larval population was maximum in Yellapur, Mundgod and Haliyal Forest Divisions when compared to Sirsi Forest Division in both the years. During 2003-04, the incidence of *H. puera* was observed from May second fortnight onwards in all the divisions except in Sirsi Forest Division, wherein the incidence was observed from first fortnight of September. The mean larval population per plant varied from 0.9 to 15.6, 1.0 to 13.0 and 0.8 to 13.8 in Yellapur, Mundgod and Haliyal Forest Divisions, respectively. However, it ranged from 1.7 to 5.0 in Sirsi Forest Division (Fig.1).

During 2004-05, the larval population was observed from first fortnight of June at Yellapur and Haliyal whereas during second fortnight of May at Mundgod. However, in Sirsi it was during first fortnight of September. Further the larval population varied from 1.3 to 20.6 at Yellapur, 0.5 to 12.6 at Mundgod 1.3 to 16.0 at Haliyal and 1.0 to 3.9 at Sirsi Forest Division (Fig.2).

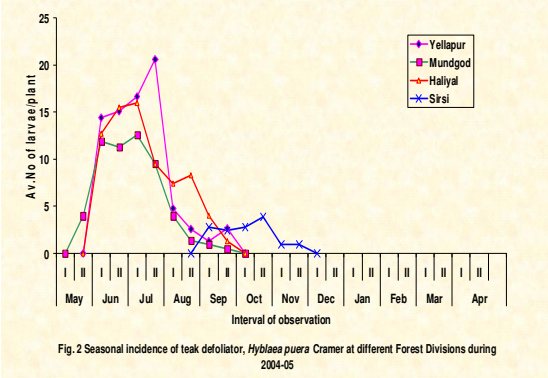

Fig. 2 Seasonal incidence of teak defoliator, *Hyblaea puera* Cramer at different Forest Divisions during 2004-05

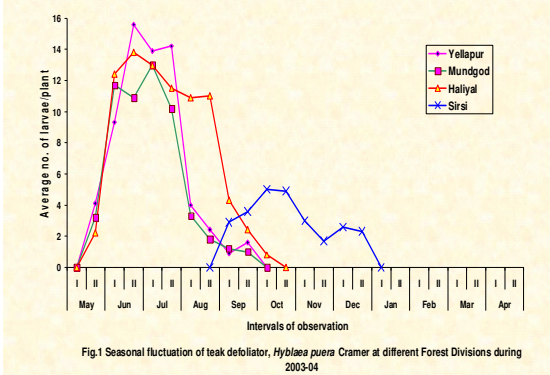

Fig.1 Seasonal fluctuation of teak defoliator, *Hyblaea puera* Cramer at different Forest Divisions during 2003-04

Peak population build up was observed during June to August in Yellapur, Mundgod and Haliyal Forest Divisions where as from September to November in Sirsi Forest Division. This pattern did not change across the years. It is clear from fig1and 2 that larval population of *H. puera* occurred from second fortnight of May to September months in Yellapur Forest Division with a peak population during June, July and August.

These observations are in confirmation with those reported by Nair and Sudheendrakumar (1986) and Katagall (1991). Strict seasonality in the larval incidence from May to September was noticed in Yellapur, Haliyal and Mundgod Forest Divisions. However, in Sirsi Forest Division, the larval incidence was found from September to December. There was no incidence during rest of the months. Nair *et al*. (1985) observed the larval incidence much earlier (April to July and August to October) in Nilambur forest area. Further, Nair and Sudheendrakumar (1986) reported defoliation for a short period from late April to September in Nilambur, Kerala. These reports are in agreement with the present findings. Peak population build up of larvae in Madhya Pradesh during June and July is also reported by Khan *et al*. (1988). Their observation over five years indicated that the major active period was during July and August and least activity was from September onwards.

The temporal pattern of larval population build up was almost similar in three Forest Divisions viz., Yellapur, Mundgod and Haliyal which corresponded to May and September months. Year to year variation was negligible. However, in Sirsi Forest Division, larval incidence was observed at its peak during September and October. This differential population build up between Forest Divisions is interesting from the view point of occurrence of host species and local climatic factors. Teak plantations in Yellapur, Haliyal and Mundgod Forest Divisions exist as monoculture plantations and are located in drier part of the divisions. Where as in Sirsi division, teak plantations occur as mosaic of plantations interspersed in Agroforestry systems and mixed with other tree species. Further, these plantations are located in relatively higher rain fall areas. Perhaps these two reasons strongly determine the differential temporal patterns of larval populations.

It can also be hypothesized that the moths can potentially migrate from eastern dry region to the western side. Nair *et al*. (1985) reported the migration of moths up to 10 km in search of suitable host trees. This report is also in agreement with Nair and Sudheendrakumr (1986) who reported the migration of moths from one locality to other. The present observations made on the peak incidence of *H. puera* corroborate with the report of Khan *et al.* (1988) and Katagall (1991) who have also observed its peak incidence during July and August while least active period was from September onwards.

The occurrence of higher population of larvae during June and July in the present study was in agreement with the report of Nair and Sudheendrakumar (1986) and Loganathan and David (1999) where in the outbreak of *H. puera* occurred on teak following the early seasonal shower during May-June.

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References

HUTACHARERN, C. AND TUBTIM, N., 1995, *Check List of Forest Insect in Thailand.* Office of the environmental policy and planning Bangkok, Thailand, 392 p.

KATAGALL, R. D., 1991, Insect pests of teak (*Tectona grandis* L.) with special reference to the bio-ecology of the defoliator *Hyblaea puera* (Cramer) (Lepidoptera : Hyblaeidae). *M.Sc (Agri) thesis,* University of Agricultural Sciences, Bangalore, pp 161.

KHAN, H. R., BHANDARI, R. S., LALJI PRASAD AND SUSHIL KUMAR, 1988, Population dynamics of *Hyblaea puera* Cramer. (Lepidoptera: Hyblaeidae) and *Eutectona machaeralis* Walk. (Lepidoptera : Pyralidae) in teak forest of Madhya Pradesh (India). *Indian Forester,* **114**: 803-813.

LOGANATHAN, J. AND DAVID, P. M. M., 1999, Rainfall : A major factor leading to outbreak of teak (*Tectona grandis*) defoliator, *Hyblaea puera* Cramer (Lepidoptera : Hyblaeidae) in commercial teak plantation. *Indian Forester,* **24** : 316-320.

NAIR, K. S. S., 1988, The teak defoliator in Kerala, India (Alan A. Berryman Ed) *Dynamics of forest insect populations: Pattern, Causes, Implications* : 268-289.

NAIR, K. S. S. AND SUDHEENDRAKUMAR, V. V., 1986, The teak defoliator *Hyblaea puera* defoliation dynamics and evidences for short-range migration of moths. In *Proceedings of Indian Academy of Science (Anim. Sci.)*, **95**: 7-21.

NAIR, K. S. S., SUDHEENDRAKUMAR,V.V., VARMA, R.V. AND CHACKO, K. C., 1985, Studies on the seasonal incidence of defoliators and the effect of defoliation on volume increment of teak. *Final Project Report. Entomology*. KFRI, Peechi, pp.78