Eco. Env. & Cons. 27 (February Suppl. Issue) : 2021; pp. (S159-S161)
Copyright@ EM International
ISSN 0971–765X

Hyblaea puera Cramer: Ravager of *Avicennia marina* from Raigad Coast, Maharashtra

Ajit B. Telave, Sourabh R. Chandankar and Ganesh P. Pawar

Post Graduate Research Center, Department of Botany,
Tuljaram Chaturchand College of Arts, Science & Commerce, Baramati 413 102, M.S., India

(Received 9 July, 2020; Accepted 24 August, 2020)

ABSTRACT

Hyblaea puera Cramer is commonly known as Teak defoliator attack mostly the teak plant. This defoliator has migratory behavior feed on young tender leaves of teak. In the absence of young leaves it appears to found on other alternate host. During the field survey on the mangrove habitat of Maharashtra coast this defoliator was observed on *Avicennia marina*. The infection was very heavy and has damaged almost all individuals of *A. marina*. It was also recorded that the domestic crow generally feeds on this pest and exhibits the bio-control mechanism.

Key words : *Infestation, Defoliation, Bio-control, Mangroves*

Introduction

Hyblaea puera Cramer (Lepidoptera: Hyblaeidae), is two seasonal defoliator pests commonly known as the teak defoliator and attack teak (*Tectona grandis*) and affect the growth of the trees considerably. The infestation begins with the first monsoonal showers and successively becomes very severe to complete defoliation of the trees within a short period of time (Nair *et al.*, 1985, 1996).

This moth shows either migratory behavior or enters diapauses as pupae or adults and complete life cycle within 18-27 days (Beeson, 1941). The migration of the moth begins in April – May and end by June –July in most years but the other wave of migration seems to be occurred in August – September followed by sudden defoliation. The major defoliation in teak was noticed during April to September (Vaishampayan and Bahudur, 1983). Upon the onset in February-March, the population starts increasing for several generations and when it reaches to critical level the migratory behavior is triggered. The migration is at least 20-30 Km away from Teak forest (Nair and Sudheendrakumar, 1986).

Arun and Mahajan (2012) reported the remarkable outbreak of this *H. purea* in the mangrove forest along the Mumbai coast and causes complete defoliation of *Avicennia marina*. For *H. purea* the *Avicennia* is an alternate host while the teak is believed to be the primary host (Javaregowda, 2005). The teak plant is deciduous which shows heavy leaf fall during November to January and flowers appear from June to September. The infection of moth on teak restricted during July to September (Khan *et al*., 2017).

Methods

The field survey was conducted on Raigad district of Maharashtra. The various sites such as Uran, Dharmantar, Revdanda, Alibag etc. screenedfor the defoliation of *A. marina* leaves and photographs were taken

Results

During the field survey it was recorded that, the patch of *Avicennia marina* throughout the coast of Raigad was defoliated due to infestation of *Hyblea puera*. It was noticed that, the infestation was very severe and the leaves of the plant are being eaten fully or partially. As the infestation progresses the moth find alternate host ie. *Acanthus illicifolius* and it start feeding on the leaves. The entire patch at some places was full of the moth. It is interesting to note here that, though the patch was fully occupied by the moth, at Revdanda, the affected site, domestic crows were feeding on *H. purea* and there is partial natural control, i e. bio control of the moth by domestic crow.

Discussion

The moth usually prefer young tender leaves and when the leaves becomes mature they shift to other individuals or sapling or migrated to other host (Nair and Sudheendrakumar, 1986), this may be possible reason for migration on *Avicennia* in search of young tender leaves (Fig. 1). It is to be noted here that, among the mangroves *A. marina* has non succulent tender leaves, than *Rhizophora*, *Sonneratia* etc. the common mangroves species along the coast. As there are several generation, 14 generation during the year (Nair and Sudheendrakumar, 1986) and when there is complete defoliation on teak plant, during summer, there may be a migration to *Avicennia* is the other reason. The infection of *H. puera* was recorded earlier in 2006 and 2009 by Arun and Mahajan (2012) and also suggested that, the infection may because of prolonged monsoon and flood condition. This year in 2019, the monsoon is also prolonged and stretched up to October and heavy rainfall causing flood condition in many parts of Maharashtra including the coastal areas.

Fig. 1. Complete defoliataion of *A. marina*, **Fig. 2.** Infestation in Mixed patch, **Fig. 3.** *H. puera* on *Acanthus illicifolius,* **Fig. 4.** Defoliation of *Acanthus illicifolius*, **Fig. 5.** Biocontrol by domestic crow

This may be a third possible reason for heavy infestation of *H. puera* on *A. marina.*

During the field survey at Kurul near Alibag that, one mature individual of *A. marina* was totally defoliated (Fig) and the moth landed on *Acanthus illicifolius* saplings where it starts feeding on *Acanthus.* Vaishampayan and Bahudur (1983) reported the larvae nibbled on *Lantana* leaves. Khan *et al*. (2017) also reported *Vitex negundo* have been attacked by these larvae. Similar to these observations, the moth may appear and feed on *Acanthus* (Fig. 3 & 4). There is no earlier report of these moths on *Acanthus.* This indicates that this moth has wide host range. It is also interesting to note here that, in the earlier report, Arun and Mahajan (2012) suggested that the moth is severe in mono specific population but in our observation the severity is similar in mono specific and mixed population (Fig. 2) and they may infest the other species like *Acanthus* in the absence of defoliated or young leaves on *Avicennia*. Mehling and Mehezes (2005) reported complete defoliation of mono specific *A. germinus* and mixed population in the immediate neighborhoods remains unaffected.

The control and management of these defoliators in large plantations is often difficult and no effective methods of control have been developed (Remadevi *et al*., 2010). Whereas the bio control will be an effective method as the Egrets, Pond herons and domestic crows were abundant in the mangroves areas infested with *Hyblarea* (Arun and Mahajan, 2012). In our observation, several domestic crows were feeding on the moth at Revdanda (Fig. 5) but this is not a common observation for the other sites of infestation.

Conclusion

The infestation of *H. purea* is not common among the mangroves, but the moth visits *A. marina* as an alternate host and causes severe damage to the host. This is not common phenomenon but it occurs during prolonged monsoon. This pest also occurs on other species in the vicinity and can be naturally controlled by the domestic crow.

Acknowledgement

Authors are thankful to the Department of Science and Technology (Science and Engineering Research Board) for financial support through major research project entitled "Resource Monitoring and Integrated Management of Mangroves on Maharashtra Coast India".

References

Arun, P.R. and Mahajan, M.V. 2012. Ecological Costs and Benefits of Teak Defoliator (*Hyblaea puera* Cramer) Outbreaks in a Mangrove Ecosystem. *Marine Science.* 2 (5) : 48-51.

Beeson, C.F.C. 1961. *The Ecology and Control of the Forest Insects of India and the Neighboring Countries,* New Delhi, Govt. of India, 767p.

Javaregowda, 2005. Studies on the seasonal incidence, biology and management of Teak Defoliator, *Hyblaea puera* Cramer (Hyblaeidae: Lepidoptera), *University of Agricul-Tural Sciences*.

Khan, S., Soni, N. and Yousuf, M. 2017. Teak defoliator: changing host preference- may be climate effect in Madhya Pradesh, India. *Entomon.* 42 (4) : 339-342.

Mehlig, U. and Menezes, M.P.M. 2005. Mass defoliation of the man-grove tree *Avicennia germinans* by the moth *Hyblaea puera* (Lepidoptera Hyblaeidae) in Equatorial Brazil, *Ecotropica.* (1) : 87–88.

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, KFRI Research Report No. 30. Kerala Forest Research Institute, Peechi, 78.

Nair, K.S.S., Sudheendrakumar, V.V., Varma, R,V., Chacko, K.C. and Jayaraman, K. 1986. Effect of defoliation by *Hyblaea puera* and *Eutectonam achaeralis* (Lepidoptera) on volume increment of teak, pp. 257–273.

Nair, K.S.S. and Sudheendrakumar, V.V. 1996. The teak defoliator *Hyblaea puera* defoliation dynamics and evidences for short-range migration of moths. In: *Proceedings of Indian Academy of Science (Animal Sciences).* 95 : 7-21.

Remadevi, O.K., Sasidharan, T.O., Bhattacharya, J., Vossbrinck, C.R. and Rajan, P.D. 2010. Some pathological effects and transmission potential of a microsporidian isolate (*Nosema* sp.) from the teak defoliator *Hyblaea puera* (Lepidoptera: Hyblaeidae). *International Journal of Tropical Insect Science.* 30 (3) : 138-144.

Vaishampayan, S.M. and Bahadur, A. 1983. Seasonal activity of adults of teak defoliator *Hyblaea puera* and teak skeletonizer *Pyraustamachaeralis* (Pyralidac: Lepidoptera) monitored by light trap catch; In *Insect Interrelations in Forest and Agro-Ecosystems,* (eds) P.K. Sen-Sarma, S.K. Kulshrestha and S.K. Sangal (Dehra Dun: Jugal Kishoreand Co.) pp. 137-146.