



Distribution and Economic Status of Uzi Fly Exorista Bombycis Louis, A Parasitoid of Mulberry Silk Worm Bombyx Mori L. in Maharashtra

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ABSTRACT

Uzi fly Exorista bombycis Louis (Diptera:Tachinidae) is larval parasitoid of mulberry silk worm Bombyx mori L. (Lepidoptera: Bombycidae). In Maharashtra, mulberry sericulture is spread in 26 districts out of which E. bombycis was distributed in 09 districts. Uzi fly was more prevalent in the districts connected to Andhra Pradesh and Karnataka namely, Kolhapur, Sangli, Solapur, Latur, Nanded, Parbhani, Nagpur and Bhandara with percent mortalities 62%, 36%, 55%, 20%, 12%, 10%, 02% and 22% respectively in silkworms. However, the incidence and economic damage to silkworms by Uzi fly much higher in western Maharashtra than Marathwada and Vidarbha. With preventive control measures and using Uzi tab and a biocontrol agent Nesolynx thymus the Uzi fly can be controlled in Maharashtra.

KEYWORDS : Uzi fly Exorista bombycis, distribution, Bombyx mori, mortality, control

INTRODUCTION

Sericulture in Maharashtra is still in infant stage. However, it has tremendous potential since environmental conditions are very conducive for mulberry sericulture in Maharashtra. Several multivoltine and bivoltine races of *B. mori* L. are available for their use in sericulture. However, expected yield and quality of cocoons have not achieved so far because of the diseases and various insect pest including Uzi fly *Exorista bombycis* Louis on silkworms. Mulberry silkworm *B. mori* are parasitized by two species of Uzi flies namely *E. bombycis* and *E. robilans* Wiedmann. In present paper emphasis is given on *E. bombycis*. According to vander Wulp (1986) *E. bombycis* is primary parasitoid of *B. mori* and distributed in U.K. and India. It is also reported causing damage to sericulture industry from China, Thailand, South Korea and Myanmar (Tashio and Kobayashi, 1978). In India, it is widely reported from Karnataka, Andhra Pradesh, Tamilnadu and West Bengal. Sathe and Jadhav (2001) very first reported *E. bombycis* from Maharashtra from Kolhapur region. But, very little is known about its distribution and economic status in other districts of Maharashtra. Keeping in view all above facts. The present work was carried out. Review of literature indicates that Rath(1966), Sarkar (1980), Barman et al. (1990), Bhattacharya et al. (1993), Thite et al. (2005), etc worked on Indian Uzi flies in sericulture.

MATERIALS AND METHODS

Distributional record of *E. bombycis* was studied by visiting various rearing houses of farmers in the districts of Maharashtra fortnightly and consulting sericultural farmers during the years 2012-2013. Silkworm rearing houses infected with *E. bombycis* was noted in every district. The percent mortality in *B. mori* silkworms by Uzi fly was calculated by taking into account of DFLS provided to farmers and actual mortalities caused by *E. bombycis* in silkworms. Under preventive control measures farmers have been advised to adopt Uzi fly preventive lace/mesh to the windows and other ventilative exists. Uzi fly tab invented by CSR & TI, Mysore has been advised. As biological control of Uzi fly *N. thymus* was reared and used against fly.

RESULTS

Results are recorded in Table 1 and Fig.1 to 5. The results indicated that most of the districts of Maharashtra which were adjoining to Andhra Pradesh and Karnataka were attacked by Uzi fly *E. bombycis*. The highest percent of parasitism in silkworms was noticed in Kolhapur district. However, the incidence and economic damage to silkworms by Uzi fly much higher in western Maharashtra than Marathwada and Vidarbha (Table-1). Interior and northern part of was less affected by Uzi fly. The distribution of sericulture economic status of *E. bombycis* in Maharashtra is represented in fig.5. The Uzi fly entered into rearing houses through the windows, doors and other exists designed for ventilation of silk worms. Mostly 4th instar were parasitized, however, last instar silkworm were also parasitized by Uzi fly. When

4th instar parasitized, Uzi fly larvae came out from the fifth instar by breaking the body wall and killing the silkworm. However, the 3rd instar parasitoid larvae came out by breaking silkworm cocoon when Uzi fly parasitized 5th instar of silkworm. This has resulted in the break out of silken threads into numerous peaces and making the cocoon unuseful for sericulture business. Thus, the Uzi fly in Maharashtra showed very useful role in the economics of sericulture.

Following strategies have been advised as preventive control of Uzi fly.

- i) Do not collect/ purchase infected cocoons for grainage purpose.
- ii) Windows, doors and other ventilative exists of rearing houses should be made Uzi fly preventive by wire or cotton mesh.
- iii) Rearing should be made under control condition, do not rear the silkworms in thatches those are with open door.
- iv) Infected silkworms should be collected and destroyed. Parasitized worms can be identified by black kidney shaped scar on the body of silkworm.
- v) Alternative hosts in the form of caterpillars be collected from the surrounding areas of rearing houses and destroyed.

Curative control measures for Uzi fly-

- i. Uzi trap designed by CSR and TF, Mysore be placed at the base of window. Uzi flies will drop down in the trap.
- ii. *N. thymus* parasitoids should be released in and around rearing house. With 1000 individuals per week.

DISCUSSION

In Karnataka the Uzi fly *E. bombycis* was first noticed in Bilanara Sapura village of Hoskote tahasil of Bangalore district during May 1980 (Anonymous, 1981). Earlier to this, it was confined to North-Eastern sericultural regions of India specially West Bengal and Assam (Louis, 1980). In Karnataka it was well established in the districts Kolor, Tumkur, Mysore, Bangalore and Mandya around 1983 (Rajshekhara gouda and Devaiah, 1983). Now the fly has occupied entire state. According to Krishnaswami et al. (1964) *E. bombycis* was responsible for 40% cocoon crop losses. In Malda district of West Bengal more than 80% cocoon losses have been reported in 1962-1963. The cocoon yield per 100 DFL in Karnataka was reduced to as low as 5 to 100 kg (Anonymus, 1982). According to Veerana and Prasad (1993) the Uzi fly *Exorista sorbillance* (Wied.) was serious endoparasitoid of silk worm *B. mori* with a very high fecundity and survival rate depended on prevalence of climatic conditions. However, the fly has been spread very quickly throughout the sericultural districts of Karnataka after its introduction during 1980.

According to Ayuzawa et al (1972) Uzi fly completed 5 to 6 generations in Japan. The first imago was appeared in the first half of May in Japan. In tropical zones *E. bombycis* completed 7 to 8 generations

per year (Krishna swami et al., 1973). Similarly, Tashio and Kobayashi (1978) reported 5 to 6 generations per year in Japan and more than seven generations in tropics. In Kolhapur, Maharashtra 8 generations have been reported by Sathe and Jadhav (2001).

E. bombycis is well known pest (parasitoid) of *B. mori* in India in traditional states of sericulture namely Karnataka, Andhra Pradesh, Tamil nadu and West Bengal. The intensity and overlapping nature of silkworm rearings, combined with the intensive movement of cocoon over long distance and negligible of the rearers initially to destroy the affected crops helped the spread of the pest throughout the states. In Maharashtra *E. bombycis* was entered in about 2000 when infested cocoons with fly were brought for seed purpose in Kolhapur region. In 2001 silkworm rearing houses of farmers were cent per cent infected in Kolhapur district (Sathe and Jadhav, 2001).

Thite et al. (2005) studied the incidence of Uzi fly *E. bombycis* on mulberry silk worm *B. mori* in Solapur district of Maharashtra. Their survey indicated that Uzi incidence started from January in regular stock and to the seasonal crops from 1st week of September. Uzi incidence was noticed throughout the year and they reported two peaks of population on the crop during the year, first in the month of June and second in the August. Now Uzi fly in Maharashtra was noticed abundantly in all sericultural districts which are adjacent to Karnataka and Andhra Pradesh. However, less intensity of infestation of *E. bombycis* was seen in interior Maharashtra and northern region of Maharashtra. But Uzi fly incidence and economic losses to silkworm due to fly were higher in Maharashtra than Marathwada and Vidarbha and *E. bombycis* is steadily spreading in entire Maharashtra. Therefore, this is high time to adopt preventive and curative control measures suggested in the text for avoiding spread of Uzi fly in Maharashtra and in toto control of Uzi fly.

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Table -1 Economic losses in rearing houses of Maharashtra due to Silkworm parasitism by *E. bombycis*

Sr. no	District	Per cent economic loss	Sr. no	District	Per cent economic loss
1.	Latur	20	2.	Bhandara	22
3.	Nanded	12	4.	Parbhani	10
5.	Sangli	36	6.	Solapur	55
7.	Kolhapur	62	8.	Nagpur	02
9.	Pune	50	10.	Satara	32



Fig.1. Rearing house for mulberry silkworms



Fig.2. Mulberry silkworm larvae in rearing house



Fig.3. Uzi fly parasitizing B.mori



Fig.4. Cocoons of Uzi fly



Fig. 5. Map of Maharashtra showing distribution of *E. bombycis*

- 1.Ahemadanagar 2.Akola 3. Amaravati 4. Aurangabad 5. Beed 6. Bhandara 7. Buldhana 8. Chandrapur 9. Dhule 10. Gadchiroli 11. Jalgaon 12.Jalana 13. Kolhapur 14. Latur 15. Nagpur 16. Naded 17. Nashik 18. Osmanabad 19. Parabhani 20. Pune 21. Sangli 22. Satara 23. Sindhudurg 24. Solapur 25. Wardha 26. Yawatmal.

(Foot note: Highest range- above 30 %, Moderate range- above 10- 30 % and Low range- 1- 10%).

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