Mortality of Tasar Silkworm, *Antheraeamylitta* D. Caused by Insect Predators

B. S. Rahile
Science College Pauni, Distt. Bhandara (M.S.)

Abstract

Wild tropical tasar silkworm, *Antheraeamylitta D.* reared in forest adjoining area mainly in four districts of eastern Vidarbha; Gadchiroli, Chandrapur, Bhandara and Gondia. It is regarded as a symbol of tribal culture and has been associated with many tribal group such as; Bhill, Gond, Rajgond, Laman, Varli, Katakare, Pradhan and Dhiwar. In the present study the severity and incidences of insect predators of tasar silkworm, *Antheraeamylitta* D. were studied during year 2010-2013 at three different tasar growing locations of Vidarbha of Maharashtra during different tasar rearing crops. The mortality of tasar silkworm due to insect predators was found to vary during different seasons of the year at different locations. Most of the damage was caused by the hemipteranreduvid bug, *Sycanuscollaris*; stink bug,*Cantheconafurcellata* ; Common wasps, *Vespa orientalis* and praying mantis,*Hierodullabipapilla*.

Keywords: Tropical tasar silkworm,*Antheraeamylitta,* insect predators, reduvid bug, stink bug, common wasps, praying mantis

Introduction

Tropical tasar silkworm, *Antheraeamylitta* D. is a lepidopteranholometabolousmultivoltine and polyphagous insect. In exothermic insects, the environmental factors such as temperature, humidity, rainfall etc. play important role in growth and development in every stage (Back, 1980). Due to outdoor nature of rearing of tasar silkworm, is exposed to various rigors of the changing environment during different rearing seasons of the year, which often leads to outbreak of diseases and pest attack in rearing affecting the productivity. The predators of tasar silkworm are natural enemies in abundance in the rearing field and cause crop loss up to 20-25% (Singh et al.1992).The present study was carried out during the year 2009 to 2012 in three identified villages viz. Nisti, Tadgaon and Armori of Bhandara, Gondia and Gadchiroli district of Maharashtra respectively to study the mortality of tasar silkworm, *Antheraeamylitta*D. caused by insect predators in different rearing cycles.

Materials and Methods

The study was carried out in the tasar rearing fields one in each of districts Bhandara, Gondia and Gadchiroli of Maharashtra during year 2010 to 2013. The seed crops reared during the months of July- August and September- October and commercial crops during the months of November –January were considered for the study. In each crop attack of different insect pests was recorded. All the meteorological parameters like temperature, relative humidity and rainfall corresponding to different crops were recorded to study the correlation with incidences of different pest attack.

Results and Discussion

Three year pooled data pertaining to crop and place wise incidences of insect predators in relation to temperature, relative humidity and rainfall were collected and presented in Table 1 and 2. Variations in temperature can affect the biology, later searching ability and rate of parasitism and predation (Mack *et al.,* 1981; Flinn, 1991) and the functional response (Messenger, 1989).Variation in development time increased with decreasing temperature and larger than expected based on the general relationship for insects and mites as observed by Shaffer (1983). In the present study the predators were observed in the month of July and the population reduced in month of August. They reappeared again in September and persisted upto October. The cycle of these insect predators was well synchronized with the cycle of tasarsilkworm.The incidence was high during third crop might be due to prolongation of larval duration in winter. The result of present study is in accordance with previous observation made by Shaffer (1983) reported that in *A. calandrae* females, longevity was longer at lower temperature and shortest at higher temperature. Whereas Islam *et al.,* (2005) reported that the development period reduced with increased temperature in *Dinarmusbasalis.*

In the present study, most of the damaged caused by the hemipteran sting bug followed by wasps, mantis and reduvidbug (Fig. 2)during all the three cycles. The mortality was high due to *Canthecona* (Fig. 1)as the single bug can kill about 130-220 tasar larvae by sucking haemolymph of young instars. Senet. al., (1971) reported same trend in mortality of tasar silkworm by stink bug. Even though wasps (Fig. 3) and mantis (Fig. 4) were observed during all the three cycles the mortality was low since they attacked mostly young age larvae, and young age rearing was undertaken in the controlled conditions at young age rearing sites.

Table.1- Incidences of insect pests in tasar silkworm, *Antheraeamylitta* D. during different seasons at different rearing sites (in percent)

Location	Insect Pests	Mortality		
		June-July (First Crop)	Aug.-Sept. (Second Crop)	Nove. -Jan. (Third Crop)
Tadgaon (Gondia)	Wasp	4.12	3.12	2.19
	Praying Mantis	2.87	2.38	3.65
	Reduvid Bug	1.00	2.06	0.83
	Stink Bug	5.18	8.89	4.53
Nisti (Bhandara)	Wasp	4.13	3.09	2.71
	Praying Mantis	4.00	5.23	6.11
	Reduvid Bug	1.20	3.46	1.14
	Stink Bug	5.14	6.12	6.20
Armori (Gadchiroli)	Wasp	5.20	3.09	2.20
	Praying Mantis	5.37	5.51	3.28
	Reduvid Bug	1.85	3.00	0.91
	Stink Bug	7.43	8.36	4.60

Table. 2- Weather parameters in different locations during the occurrence and incidences of insect pests in tasar silkworm, *Antheraeamylitta*D.

Location	Weather Factor	June-July (First Crop)	Aug.-Sept. (Second Crop	Nove.-Jan. (Third Crop
Tadgaon (Gondia)	Max. Temp. (0C)	40.5	36.1	33.1
	Mini.Temp. (0C)	22.4	22.2	8.6
	Max. RH (%)	100	100	96
	Mini. RH (%)	31	46	28
	Rainfall (mm)	341	268	22
Nisti (Bhandara)	Max. Temp. (0C)	42	36.4	33.1
	Mini.Temp. (0C)	22	22	9.5
	Max. RH (%)	96	96	88
	Mini. RH (%)	32	43	29
	Rainfall (mm)	338	302	50
Armori (Gadchiroli)	Max. Temp. (0C)	41	36.5	33.6
	Mini.Temp. (0C)	22	22.2	10
	Max. RH (%)	98	96	90
	Mini. RH (%)	30	56	25
	Rainfall (mm)	286	226	17

Figure. 1- Stink bug,*Cantheconafurcellata***Figure. 2-**Reduvid bug, *Sycanuscollaris*sucking haemolymph from tasar silkworm larvae

Figure. 3- Colony of common wasps, *Vespa orientalis***Figure. 4-** Praying mantis,*Hierodullabipapilla*

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