

SEASONAL VARIATION IN THE DISEASES OF TROPICAL TASAR SILKWORM (*ANTHERAEA MYLITTA* D.) UNDER BASTAR PLATEAU OF CHHATTISGARH AND THEIR CONTROL MEASURES

G.P. MAHOBIA AND G.S. YADAV
REGIONAL TASAR RESEARCH STATION,
JAGDALPUR-494 005, INDIA
(e-mail : mahobiag@yahoo.com)

Bastar plateau of Chhattisgarh is known for its tasar silk production. This biosphere has vast tracts of non-mulberry food plants such as *Shorea robusta*, *Terminalia tomentosa* and *Terminalia arjuna*. Local inhabitants particularly women are engaged in tasar silkworm rearing for obtaining additional income for their families but due to vagaries of nature, the productivity levels are very low. In order to identify specific reasons, a bench mark survey was conducted during 2003-04. The collected data indicated that bacterial incidence was 15.01% followed by virosis (12.08%), pebrine (10.58%) and other accounted for 7.07% at silkworm, moth and cocoon levels. The Effective rate of rearing (ERR) was 28.57 during 1st season (July-Aug.) and 17.11 % in the 2nd crop. Regional Tasar Research Station, Jagdalpur intervened and technical support as well as guidance provided to a group of farmers of Satlawand village. The farmers adopted integrated package which includes usage of nylon net for chawki rearing, application of Leaf surface microbes for control of virosis and dusting of disinfectant Resham Jyoti to control Bacteriosis. This technology enhanced the cocoon yield by 25-40.39% which helped in enhancing the income generation of the tribal farmers.

Key words : Seasonal variation, diseases, tasar silk worm, *Antheraea mylitta* D., control.

INTRODUCTION

Bastar plateau of Chhattisgarh is known for its tasar silk production since time immemorial. The biosphere has vast tracts of tasar food plants either in primary or secondary form. Local inhabitants particularly poor tribal women are engaged in tasar silkworm rearing in order to generate additional income for their families. As tasar silkworm rearing is done completely in outdoors pest and diseases govern the productivity of the silk cocoons. Hence, a benchmark survey was conducted during 2003-04 to assess the loss due to diseases and to implement a practical technology to overcome the constraints. The objective of the present study was to validate the technology and its impact on productivity.

METHODOLOGY

Disease incidence of pebrine, virosis, bacteriosis and others were obtained by microscopic testing of larva, pupa and moth level from April to March during 2003-04 and during 2004-05. An integrated disease control system was adopted. The package includes usage of nylon net for chawki, application of LSM, dusting of disinfectant Resham Jyoti and supply of full proof seed devoid of pebrine infection. The rearing performance was compared and analyzed.

Table : 1 Details of loss of tasar silkworm crop due to diseases and other.

Month	Diseases					Healthy worms
	Pebrine	Virosis	Bacteriosis	Others	Total Loss	
April	5.0	9.16	14.18	3.33	31.67	68.33
May	5.83	10.83	15.83	6.68	49.17	60.83
June	10.83	13.33	17.50	0.00	41.66	58.33
July	12.50	14.17	8.33	11.61	46.61	53.33
August	16.67	17.50	10.84	5.83	50.84	49.16
Sept.	14.16	15.00	12.50	5.83	47.49	52.50
Oct.	14.17	13.33	16.66	5.83	49.99	50.00
Nov.	10.83	10.83	22.50	8.83	52.49	47.50
Dec.	11.66	8.33	24.16	14.17	58.32	41.67
Jan.	10.00	9.17	18.83	5.83	35.83	64.17
Feb.	08.33	10.83	13.50	6.66	42.50	57.50
March	7.00	12.50	13.33	10.83	43.34	56.66
Average %	10.58	12.08	15.01	7.07	45.82	54.18

Table II : Results of Integrated Technologies (2004-05).

Crop	Treatment	E.R.R %	Cocoon weight (g)	Shell weight (g)	Silk ratio %	Productivity Coc/dfl
I	Treated	35.37	10.362	1.450	13.987	50.00
		+25.00	+3.06	+3.40	+3.40	+25.00
	Control	28.57	10.054	1.3599	13.526	40.39
II	Treated	24.02	10.468	1.320	12.614 +	35.308 +40.39
		+40.39	+0.46	+0.95	0.95	
	Control	17.11	10.420	1.302	12.495	25.00

RESULTS AND DISCUSSION

The disease incidence survey is presented in Table I. The data reveals that pebrine incidence was lowest (5 to 5.83%) during April and May months and maximum was attained during August (16.67%). Thus there was 10.58% of average infection in the year. Virosis was lowest in April (9.16%) and maximum during August (17.50%) with an average incidence of 12.08%. Bacteriosis was lowest during July (8.33%) and maximum during December (24.16%) with an overall incidence of 15.01%. Other diseases accounted for 7.07%. The overall microscopic testing indicated that out of a sample population of 100, there was 45.82% disease and 54.8% healthy population.

In order to control the disease severity, disease free eggs were supplied to the adopted farmers. This will more or less remove the pebrine infection. In order to control the virosis, leaf surface microbes were sprayed at each stage which contains the viral and bacterial diseases of the silkworm.

The rearing performances of the adopted farmers are tabulated in Table II. The data reveals that due to transfer of integrated disease management, the ERR was 35.37% against 28.57% in the first crop season. Thus, there was a 25% increase in survivality.



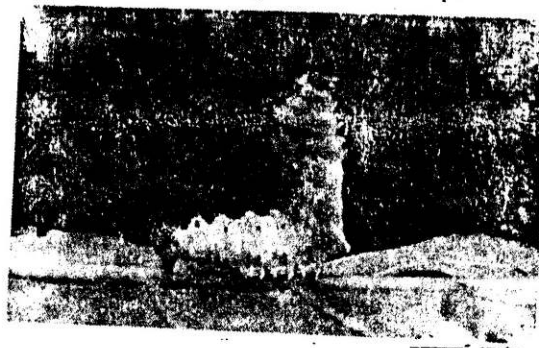
Virosis
(Causative agent : CPV)



Bacteriosis
(Causative agent : Bacterium
Micrococcus bacillus)



Pebrine
Causative agent : *Nosema* sp.



Muscardine
(Causative agent : *Penicillium citrinum*:
Paecomycetes variotei)

Disease of tropical Tasar silkworm

Similarly during second crop season, the survivality was 24.02% against 17.11% in control. Thus, there was a 40.39% of enhancement in survivality. The cocoon characters also exhibited marginal enhancement. The overall yield was 50 cocoon/df against 40 cocoon/df in the first season with 25% yield increase. In the second crop season the yield was 35.31% of yield increase. Thus during different season, farmers crop resulted in successful harvest with an average yield of 42.65 cocoon/df. The cocoons were certified disease free and thus the technology was validated. The technology was well accepted by the farmers as practical and adoptable. As such the technology is recommended for practice at all silkworm-rearing levels.

Incidence of mortality of tasar silkworm *Antheraea mylitta* Drury, due to diseases in relation to meteorological condition and larval instars was studied by Sen and Jolly, (1967) and observed that incidence of mortality during different larval instars has shown that mortality goes on increasing with advancement in larval age. Sodium hypochlorite and Aciphor recommended as prophylactic chemicals to control bacteriosis and virosis in *A. mylitta* (Bansal, 1996). Leaf surface microbe is used as biological tool to control tasar silkworm diseases (Ray *et al.*, 2000). A polyalkyl monohydric phenolic compound in combination with certain other chemicals formed a bed disinfectant "Resham Jyoti" which resulted in enhancement of 16.97% of yield (Sasidharan *et al.*, 2000).

The present study indicated integrated disease management with nylon net, microflora and bed disinfectant usage resulted in stabilizing the cocoon yield with improved shell quality.

REFERENCES

- BANSAL, A.K., SHUKLA R.M., ROY, D.K., SAXENA N.N., GOEL, A.K., SINHA, B.R.R.P. & SINHA S.S. 1996. Efficacy of Aciphor and Sodium hypochlorite in controlling the diseases of tasar silkworm *Antheraea mylitta* D. *Bull. Serr. Res.* 7 : 45-48.
- ROY, D.K., SAHAY, D.N., SINHA, B.R.R.P. & THANGAVELU, K. 2000. Leaf surface microbes-A biological tool to control silkworm diseases. *Conference on strategies for Sericultural Research and Devpt.* held at Mysore on Nov. 16-19, 2000. Abst. P. 87.
- SEN, S.K. & JOLLY, M.S. 1967. Incidence of mortality of tasar silkworm *Antheraea mylitta* D. due to diseases in relation to meteorological conditions and larval instars. *Indian J. Ser.* 1 & 2 : 67-72.
- SASIDHARAN, T.O., SINGH, R.N. & SAMSON, M.V. 2000. Efficacy of new Silkworm bed disinfectant "Resham Jyothi" under field conditions. *Ind. J. Ser.* 39(1) : 41-42