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Impacts of Diseases on the Qualitative Characters of Tropical Tasar Silkworm

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Abstract – The present communication accounts for the relative impacts of four different common diseases viz, Sporozoasis (protozoan), Bacteriosis (Bacterial), Virosis (Viral) and Mycosis (Fungal) on the qualitative characters of tasar cocoons of Antheraea mylitta D. during seed crop (July—August) and commercial crop (Sep.-Oct.) seasons. The results of the experiment are indicative of the fact that all the four diseases adversely affect the qualitative characters of tasar cocoon viz; cocoon wt; shell wt; length of tasar silk filament; non-breakable filament length; filament denier and the percentage of reelability. However, the adverse effect of Sporozoasis as compared to three other diseases has been found to be more significant. The qualities of the cocoons in relation to four different diseases during commercial crop season as compared to seed crop season have been found to be relatively superior, thus account for the seasonal variation. The relative variation in respect of qualitative characters of cocoons in relation to four different diseases are presumed due to the diverse nature and mode of action of four different pathogens causing the diseases.

Key Words:- Sporozoasis, Bacteriosis, Virosis, Mycosis, Seed Crop, Commercial Crop, Cocoon.

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INTRODUCTION

Silk is the most beautiful gift of nature which is generally produced by phytophagous Lepidopteran insects commonly known as sericigenous insects and production of the fibre is known as "**Queen of Textiles"**. The scientific practices of cultivation as well as protection of food plants and rearing of the silkworm altogether constitute a branch of science termed as sericultur. Sericulture is an integral part of our rural economy in an agrarian country like India. It has tremendous potential in improving the economic status of rural people particularly tribal in India. All out efforts are being made to bring about silk revolution in the country to meet the demand of silk goods to the needs of the ever changing fashion technology in the world.

As a matter of fact the silk world is constituted of mulberry, non-mulberry and other animal products. Which are known as **Mulberry**, **Tasar**, **Muga**, **Eri**, **Anaphe**, **Mussel**, **Spider** and **Coan**silk. It is interesting that the climatic and environmental condition of India make their home land of various silk producing insects and food plants. However, India enjoys the unique distinction being the only country in the world which produces all the important four varieties of natural silks namely mulberry, tasar, eri and muga under domesticated and wild condition on the foliages of host plants during the seed crop and commercial crop seasons.

A distinct belt of humid and dense tropical forest sprawling over the central plateau is the home of tasar. It covers the principal states of Jharkhand, Bihar, M.P., Orissa, Chattisgarh, West Bengal, Assam, fingers of Andhra Pradesh and Karnataka.The famous tasar producing species such as ***Antheraeamylitta***, ***Antheraeapernyi***, ***Antheraearoylei***, ***Antheraeafrithi*** and ***Antheraeaproylei***.

Indian tasar silkworm, ***Antheraea mylitta* D**; which is of great commercial interest suffers great loss of crop (70 to 80%) due to diseases like sporozoasis, bacteriosis, virosis and mycosis. The estimated crop loss due to Sporozoasis alone in case of *Antheraea mylitta* is reported to be in the tune of 40% (Sen and Jolly, 1972). The adverse effect of different diseases on the technological characters of different cocoons of tasar silkworm have been studied (Sen et al. 1973; Choudhary etal. 1974; Sharan and Sharma, 1989). The investigations in relation to the relative effect of different pathogens causing different diseases in sericigenous insects have been carried out (Griyeghey et al., 1974; Jolly 1974; Ahsan, 1975; Akai, Hiromu 1998; Akai, 2005;Arora, S. 2006;Bhattachrya, 2005;Bhatia, 2010;Chakravorty, 2007; Chaudhury, M. 2008; Dikshit, 2007; Pandey, 1989;Pandey, 2012; Prasad, 2011;Mandar et al., 1990Qadri, 2010). The present communication is designed to evaluate the relative effect of four different diseases on the qualitative characters of

tasar cocoons in tropical tasar silkworm, ***Antheraea mylitta*D**.

MATERIALS AND METHODS

The infected cocoons of *Antheraea mylitta* due to diseases like sporozoasis, bacteriosis, virosis and mycosis were collected during seed crop (July—August) and commercial crop (Sep -Oct.) seasons. The cocoons were stored separately under normal laboratory condition and further analysed for the different qualitative parameters viz. Cocoon wt (gm), Shell wt. (gm), tasar filament length (mtr.), non-breakable filament length (mtr.), filament denier and reelability percentage as per the methods suggested by Jolly (1973). The experiments were carried out for both the seed crop and commercial crop season. A relative picture in relations to four different diseases in respect of qualitative characters of tasar cocoons has been presented in Table-1.

TABLE :-1

Table showing effect of different diseases on the qualitative characters of cocoons of tropical tasar silkworm*Antheraea mylitta D.*

Sl No.	Characters	Season	Sporozoasis	Bacteriosis	Virosis	Mycosis	Control	C.D. at 5% level for characters
1	Av. Weight of cocoons (gm)	I	10.1	10.7	10.9	11.2	12.6	
		II	10.5	10.9	11.0	11.8	12.8	
2	Av . shell weight per cocoon (gm)	I	0.98	1.20	1.30	1.40	1.60	
		II	1.0	1.30	1.40	1.60	1.80	
3	Av . length of filament per cocoon (m)	I	520	560	580	590	688	
		II	582	602	610	688	690	
4	Av. Non breakable filament length per cocoon (m)	I	232	232	234	242	247	
		II	234	238	240	248	251	
5	Av. Filament Denier per cocoon (%)	I	5.62	6.12	6.62	6.62	6.71	
		II	5.68	6.14	6.72	6.73	6.79	
6	Av. Reelability (%)	I	35.3	38.2	38.9	40.1	43.9	
		II	39.5	40.3	40.8	41.2	44.2	H.S

Season :- I : (seed crop)

II:(commercial crop)

H.S : Highly Significant

C.D. at 5% level for characters

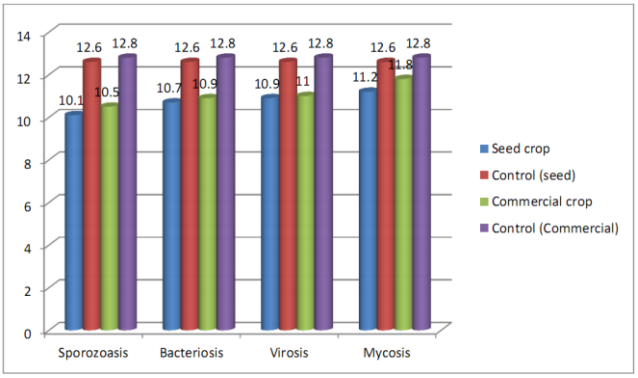

Fig :- 1 Fig showing effect of diseases on the qualitative variation on the AV. Weight of cocoons of tropical tasar silkworm *Antheraea mylitta* D.

RESULTS AND DISCUSSION

Table reveals that the qualitative characters of cocoons during seed crop and commercial crop viz, average wt. of cocoons (10.1 and 10.5) due to Sporozoasis (10.7 and 10.9) due to bacteriosis (10.9 and 11.0) due to Virosis (11.2 and 11.8) due to mycosis present evident variations during seed crop and commercial crop as compared to control (12.6 and 12.8). Similarly other qualitative characters such as average shell wt., average length of filament, average non-breakable filament length, average filament denier and reelability during seed crop (0.98, 520, 232, 5.62, 35.3) and commercial crop (1.0, 582, 234, 5.68, 39.5) due to Sporozoasis, (1.20, 560,232,6.12, 38.2) and (1.30, 602, 238, 6.14, 40.3) due to bacteriosis, (1.30, 580, 234, 6.62, 38.9 and (1.40, 610, 240, 6.72, 40.8) due to Virosis and (1.40, 590, 242, 6.62, 40.1) and (1.60, 688, 248, 6.73, 41.2) due to mycosis as compared to control (1.60, 688, 247,6.71, 43.9) and (1.80, 690, 251, 6.79, 44.2) for both the seasons. However, the pathogens also account for the variations. Although, the adverse effect of Sporozoasis as compared to three other diseases on the qualitative characters of tasar cocoons is highly significant. The table further reveals that the adverse effect of mycosis on quality of cocoons is relatively less than sporozoasis, virosis and bacteriosis. The qualitative characters of cocoons during commercial crop season have been found to be relatively better than the seed crop season, thus account for the seasonal variation.

The aforesaid results have led us to believe that the relative variations in the qualitative characters of cocoons in respect of four different diseases are probably due to different nature and mode of infection of four different pathogens. However, Sporozoasis appear to be more serious than the three other pathogens such as bacterial, viral and fungal. The relative superiority of commercial crop cocoons as compared to seed crops cocoons in respect of diseases is presumed due to the differences in the environmental conditions between the two different seasons. Thus it is logical to believe that commercial

crop season provide conducive environment for the culture of tasar silk worms than the seed crop season.

REFERENCES

- Akai, Hiromu (1998) : Global Scenario of wild silk. Indian silk, 37 (6 and 7) : 18:20.
- Akai, Hiromu (2000) : Cocoon filament characters and Post cocoons technology. Proced. 3rd. Int. Conf. on wild silkmoth Japan and CSBI, Vol (5) pp 255-259.
- Agrwal, S.C. and M.S. Jolly (1981) Protein bound amino acids in the larval and pupalhaemolymph of *Antheraea mylitta* D. Indian J. Entomol., 43(2): 145-148.
- Ahsan, M.M. (1975), Symptoms of diseases in tasar silk worms A. mylitta D. Ann. Rep. C.T.R.S. Ranchi, Proj.; p. 2-3.
- Aiwn, M.O., S.K. Swain, S.C.Sit and M.R. Suresh (1993) Outdoor chawki rearing of *A.mylitta* D. on dwarf bushes of T.arjuna. Indian Silk, 32(6): 37-40.
- Arora, S. 2006. Preliminary assessment of soil and water conservation status in drought prone foothill region of north-west India. J. World Association of Soil Water Conservation. 5: 55-63.
- Basker, H. (2006) Indian Sericulture-exciting path ahead, Indian Silk,44(11):21-26
- Begum,A. N. ; Basavraja, H. K.; Palit, A. K.; Ramaswamy, G. N.: Reddy, N. M. ; Kumar, N. S. and Kalpana, G. V. (2004) Studies on characterstics of cocoons in different breeds of silkworm *Bombyxmori* L. Sericologia, 44(4):497-491.
- Bhattachrya,A.; Sahu,A.K.; Prasad,B.C. and Chakraborty,R.(2005) Study on some economic characters of different colour polymorphs of muga silkworm *Antheraea assamensis*, Helfer, Sericologi a,45(3):339-343
- Bhatia, N.K., Bhutt, M.M and Khan, M.A. (2010) : Tropical tasar- utilization and conservation of natural resource for Tribal development. Bio-Scan.Sp. vol (1) pp. 187-198.
- Choudhary, S.N. and Ghosh, S.S. (1974), Studies on the reeling properties of diseased cocoon of tasar silk worms, Ann. Rep. C.T.R.S, Ranchi.
- Jolly, M.S. (1974), Symptoms of diseases in tesar silk worm. Ann. Rep C.T.R.S. Ranchi; p. 60-63.
- Mohanty, P.K., M.C. Dash, C.S.K. Mishra and B.K. Nayak (1992) Seasonal impact on life span of tasar moth, *Antheraea mylitta*.Proc. 79th Ind. Sc. Cong. Part-III, Abstract No. 101, p.65.
- Ojha,N.G., S.S. Sinha, M.K. Singh and S.K. Sharan (1994) Rearing and cocooning of tropical tasar silkworm *Antheraea mylitta*, Drury (Lepidoptera-Saturniidae) in indoor condition. 2nd Int. Conf on Wild silkmoths, 18-22 Aug. 1994, Hotaka, Japan.Int. Soc. wild silk moths, Abstract No.006.p.39.
- Pandey, R.K; Raina, S.K. and Sehaf, K.A. (2012): Impact of subtropical environment on silkworm survival in Kandi belt of Jammu province Eco-scan. Sp. vol (1) pp. 337-342.
- Prasad, S. and Upadhyay, V.B. 2011.Biotechnological importance of cocoon magnetization with particular refrence to the larval performance of multivoltine mulberry silkworm (*Bombyxmori* L). Middle- east j. Sci. Res. 10: 565-572.
- Qadri, S. F. I., Malik, M. A. Sabhat, A. and Malik, F. A. 2010.Adoption of improved sericultural practices by sericulturists in border area of Kashmir. Intl. J. Agricult. Stat. Sci. 6(1): 197-201.
- Sharma, K.B. and Sarfaraz Ali (2013): Impact of Environmental facotors on the Indoor rearing performances of Tropical tasar silkworm, *Antheraea mylitta* D. (Saturniidae: Lepidoptera): Eco-scan spvol (IV) 255-260.
- Sharan, K. and Sharma, K.B. (1989), A comparative study on physical and technological characters of different indoor cocoons of *A. mylitta*. Mendel, 6 (3-4); p. 385-388.
- Sen, S.K.; Jolly, M.S. and Jamney (1983), Diseases of tasar silk worms A. (Lepidoptera: Saturniidae). Ind. J. 11-14. Sen.
- S.K. and Jolly, M.S. (1972), Infection of *A. mylitta* Druray (Lepidoptera: Saturniidae) by a microsporidian (Nosemasp). Ind. Seri 11 (1); p. 52-57.