

STUDIES ON OCCURRENCE OF EGG SURFACE FUNGI IN MUGA AND ERI SILKWORM DURING SUMMER CROPS

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ABSTRACT: Muga (*Antheraea assamensis* Helfer) and Eri silkworm (*Samia ricini* Donovan) are multivoltine lepidopteran insect. The silkworms can be reared five to six crop in a year. Aherua (June-July) and Bhodia (August-September) are the main seed crops of muga and eri silkworm which are link with Katia commercial crop. Generally hatching problem was observed in muga and eri silkworms eggs in summer crops. Therefore, a study was undertaken to find out the association of different fungal species on egg surface of muga and eri silkworm during these two seed crops. Standard Blotter technique and Agar plate method were used for isolation of egg surface fungi in muga and eri silkworms. Results showed that 10 different fungal species were isolated from muga silkworm eggs in both the seed crops. Similarly 8 different fungal species were isolated from the eri silkworm eggs. Among the different fungal species *Chetomonium* sp., *Fusarium oxysporum*, *F. monoliformae*, *F. solani*, *Aspergillus flavus*, *Aspergillus* sp. *Penicillium citrinum* and *Phoma humicola* were common to eggs of both the silkworm.

KEY WORDS: *Antheraea assamensis*, commercial, egg, hatching, *Samia ricini*

The muga silkworm (*Antheraea assamensis* Helfer) and eri silkworm (*Samia ricini* Donovan) are multivoltine, polyphagous lepidopteron insects, feeding on number of food plants. They are endemic to Assam and its bordering regions with other states, Meghalaya, Nagaland, Arunachal Pradesh and Mizoram. The predominance of these worms in these region is perhaps because of the distinctive ecological requirements met with this region. Assam serves as an exclusive ecological niche for muga silkworm (Choudhury, 1981; Subba Rao, 1983). Apart from silk production, the eri pupae are also consumed as delicious food by large mass of tribal population in North- East India. These silk worms can be reared five to six crops in a year. Aherua (June-July) and Bhodia (Aug-Sep) are the main seed crops of muga silkworm and eri silkworm which are link with Katia commercial crop. Documented information on various aspect on eri silkworm and muga silkworms are predicted by various workers. But literature survey has showed that studies on egg surface fungi in eri silkworm and muga silkworms have not be studied yet, but other information on seed production aspects are available on eri silkworm based on records in a few textbooks (Jolly et al., 1979; Chowdhery, 1982; Sarkar, 1988) and incase of muga silkworm seed production aspects are studied by many scientist (Rao & Kakoty, 1977-78; Thangavelu et al., 1985-86; Barah et al., 1987-88; Sahu & Benchamin, 2000). Hence the present study was taken up to find out the fungal species associated with eggs of muga and eri silkworm.

MATERIALS AND METHODS

Standard International Rule for seed testing were followed throughout the study. The fungal flora associated with the eggs of muga silkworm and eri silkworm were detected separately by subjected to blotter method and Agar plate

tests (ISTA, 1985; Anonymous, 1976; Musket, 1948). Eggs of muga silkworm and eri silkworm were collected from Deptt of seed technology, CMER&TI, Lahdoigarh, Jorhat. 200 eggs of each worms were considered for isolation of fungal flora associated with them externally.

200 numbers of eggs were placed in each Petri plate containing PDA medium. The same number of eggs were placed in Petri plates containing sterilized blotting paper and there were 5 replication for each treatment. Another 200 eggs were taken for isolation of fungal species. These eggs were sterilized with 0.1% HgCl₂ solution before isolation.

The Petri plates were incubated at 28± 1°C and examined daily for growth of fungi up to seven days. The isolated fungi were purified by single sporing or hyphal tip method and then characterized and identified with the help of the “ manual of microbiological methods of the society of American Bacteriologists, A manual of soil fungi (Gilman, 1995) & “Illustrated Genera of Imperfect fungi (Barnett, 1987). The percentage infection by different fungi were calculated by the following formulae:

$$\% \text{ infection} = \frac{\text{No of eggs infected}}{\text{Total no of eggs}} \times 100$$

RESULT AND DISCUSSION

The result obtained from the present studies were presented in Table 1 and Table 2 Results showed that ten different fungal species were isolated from un-sterilized eggs of muga silkworm and 7 different fungal species were isolated in sterilized eggs of muga silkworm. Among the different fungal species *Chetomium sp.*, *Penicillium citrinum*, *P. chrysogenum*, *P. digitatum*, *Aspergillus flavus*, *Fusarium moniliformae*, *Aspergillus sp.* were dominant and found in both sterilized and un-sterilized eggs.

Similarly, 8 different fungal species were isolated from un-sterilized eggs of eri silkworm and 4 fungal species in sterilized eggs. Among the different fungal species *Chetomium sp.*, *Aspergillus flavus*, *Aspergillus sp.*, *Fusarium moniliformae* were dominant and found in both sterilized and un-sterilized eggs. All the above fungi were identified to infect eggs of muga silkworm and eri silkworm and this study leads to formulation of a package of practice for eggs of muga silkworm and Eri silkworm. To avoid the infection of these mycofungi, following measures should be taken i.e the disinfection of eggs prior to consigning in the well disinfected incubation room, incubate the eggs in the incubation room that is well ventilated and the incubation room should be cool shady and prohibition of entry of persons in the incubation hall without proper washing in disinfectant and use of well disinfected laboratory dresses. These mycofungi on eggs injure the eggs and have negative effect on hatching and sometimes some weak, lethargic and disease showing worms were emerge from these infected eggs.

LITERATURE CITED

- Anonymous.** 1976. International rules for seed testing. Seed Sci. Technol., 4: 51-177.
Borah, A., Goswami, M. & Samson, M. V. 1987-88. Annual Report, RMRS, Boko, pp. 38-39.
Burnet, H. L. & Hunter, B. B. 1987. Illustrated genera of imperfect fungi. (Fourth Edition) Macmillan Publishing Campus N.Y., Collar Macmillan Publishers London, pp 216.
Choudhury, S. N. 1981. Muga Silk industry, Department of Sericulture, Assam.
Choudhury, S. N. 1982. Eri Silk Industry, Directorate of Sericulture and Weaving, Assam, pp. 1-177.
Gilman, C., Joseph 1995. A manual of Soil Fungi, Printwell, Jaipur (India).
ISTA 1985. International rules for seed testing. Seed. Sci. Technol., 13: 307-520.
Jolly, M. S., Sen, S. K., Sonwalkar, T. N. & Prasad, G. K. 1979. Non Mulberry Silks. FAO.

- Musket, A. E.** 1948. Technique for the examination of seeds for the presence of seedborne fungi. *Trance Brit. Mycol.Soc.*, 30: 74-83.
- Rao, G. S. & Kakoty, P. K.** 1977-78. Preservation of muga seed cocoons at low temperature, *Annual Report, CMERS, titabor*, pp. 35.
- Sahu, A. K. & Benchmin, K. V.** 2000. *Seed Technology in Muga culture*, A review. Central Silk board, Benglore. Pp. 51.
- Sarkar, D. C.** 1988. *Ericulture in India*, Central Silk board, Benglore. Pp. 51.
- Subba Rao, G.** 1983. *National Seminar on Silk Research and Development*. Central Silk Board, Benglore, India.
- Thangavelu, K., Samson, M. V., Chakravorty, A. K. & Bora, A.** 1985-86. *Annual Report, RMRS, Boko*, pp. 38-39.

Table 1. Percentage occurrence of fungal species in eggs of Muga silkworm.

SSI. No	Fungal species	Un-sterilized egg	Sterilized egg
1.	<i>Chetamium sp.</i>	28	12
2.	<i>Fusarium oxysporum</i>	11	0
3.	<i>Penicillium citrinum</i>	20	8
4.	<i>Aspergillus flavus</i>	14	9
5.	<i>Fusarium moniliformae</i>	9	7
6.	<i>Penicillium chrysogenum</i>	14	6
7.	<i>Phoma humicola</i>	8	0
8.	<i>Aspergillus spp.</i>	11	9
9.	<i>Penicillium digitatum</i>	16	13
10.	<i>Fusarium solani</i>	12	0

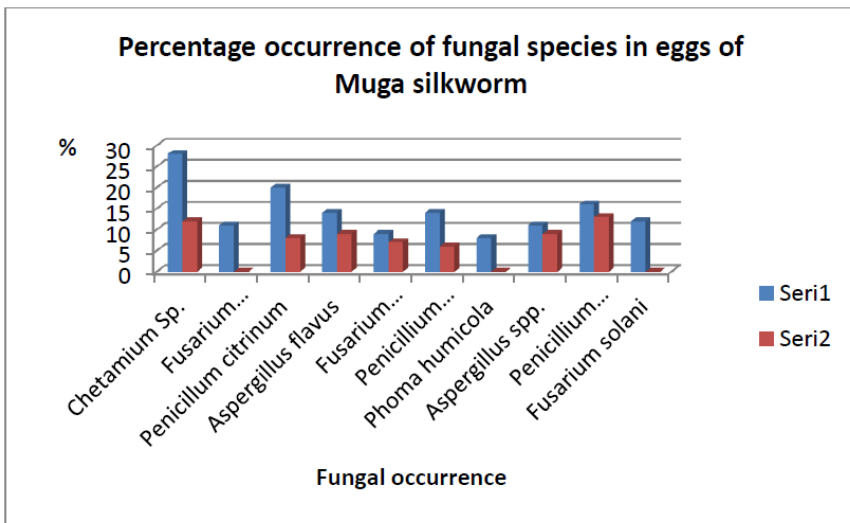


Table 2. Percentage occurrence of fungal species in eggs of Eri silkworm.

Sl. No	Fungal species	Un-sterilized egg	Sterilized egg
1	<i>Chetanium sp.</i>	25	13
2	<i>Fusarium oxysporum</i>	9	0
3	<i>Penicillium citrinum</i>	6	0
4	<i>Aspergillus flavus</i>	15	8
5	<i>Fusarium moniliformae</i>	17	9
6	<i>Phoma humicola</i>	6	0
7	<i>Aspergillus spp.</i>	13	11
8	<i>Fusarium solani</i>	8	0

