

Full Length Research Paper

Prospective of Muga Silkworm *Antheraea assama* Ww. Rearing on its Host plant *Litsaea polyantha* Juss. under Prevailing Weather of District Bageshwar in State Uttarakhand, India

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Abstract

Present piece of work on muga silkworm rearing under prevailing weather of district Bageshwar of state Uttarakhand is a part of research studies carried out during successive years 2011-12 & 2012-13. The work was under taken in consideration to observe the parameters like hatching%, err%, yield of cocoons/100 dfls, sr% etc. For obtaining the idea in connection of performance of rearing on its host plant *Litsaea polyantha* juss. In new area district Bageshwar, Uttarakhand, India. Among all the crops, the range of hatching, err%, yield of cocoons/100 dfls and shell ratio% was recorded 35-48, 29-46 %, 1015-2208 and 8.28-10.39 for combined sex, respectively in all the crops.

Key words: muga silkworm, host plant, rearing and shell ratio

Introduction

Among all natural fibers silk is the only fibre which comes through the rearing of silkworms on the leaves of their respective host plant species. There are mainly four kind of silks i.e., Mulberry, Tasar, Eri and Muga are widely cultivated in the world. Muga silk has a unique distinction among all natural silks due to its natural fabulous gold shine which is exclusively cultivated in North-Eastern region in India in the world.

Muga silkworm *Antheraea assama* Ww. is a multivoltine, polyphagous insect and feeds on a wide range of host plants of which *Machilus bombycina* King. and *Litsaea polyantha* Juss. are the primary host plant species. Actually, rearing of muga silkworm is conducted under outdoor open weather conditions. Therefore, silkworms are exposed to various abiotic and biotic factors which affected ultimately on yield of quality and quantity of muga silk. Mainly, due to change in weather the production of muga silk is declining very fast in N-E region. Considering the problems in muga silk production and to fulfill the gap between its demand and supply of the muga silk fabric in the world, its possibilities in the states other than N-E region in India are being tried out by the concerned muga silk development agencies. In connection of exploring the new area for muga silk production, Paliwal *et al.*, (2010 & 2011) had made serious effort at Distts. Dehradun and Bageshwar in Uttarakhand in search of the possibilities of muga silk production as well as creation of a new source for muga seed supplementation to north eastern states.

As, the performance of muga silkworms rearing is influenced by abiotic as well as biotic factors under different agro-climatic conditions. Therefore, during the course of studies, the performance of muga silkworms have been recorded in different seasons under prevailing weather conditions in successive yrs 2011-12 & 2012-13 in District Bageshwar of state Uttarakhand, India.

Materials and Methods

The study on performance of muga silkworms on its primary host plant *Litsaea polyantha* Juss. and rearings of silkworms were carried out in different seasons i.e., Jetha (May-June), Bhadra (August-September) and Kartika (September-October) of two consecutive years 2011-12 and 2012-13, respectively under the weather conditions as prevails in district Bageshwar of state Uttarakhand. For the purpose of rearing of muga silkworms, initially dfls were procured from reputed muga silkworm seed producing agency i.e., Muga Silkworm Seed Organization, Guwahati, Assam, in the N-E region, India.

In order to minimize the early instar larval loss, the rearing of early stages from 1st to IInd of worms was conducted in room conditions under controlled weather at 25°C temperature and 75% relative humidity on fresh tender leaves and thereafter, the early stage reared worms were shifted on the branches of a muga host plant for rearing of later stages IIIrd to Vth of the worm. A specific device 'Jali' is used for spinning of cocoons in N-E region. After 7 days in summer and 9 days in winter the cocoons were removed from jalies.

Results and discussion

The muga silkworm *Antheraea assama* Ww. is a sericigenous insect and it is reared on its respective host plants under natural weather. The rearing of muga silkworm under natural conditions in different seasons was found to be influenced on hatching%, ERR% Cocoons Shell ratio%, etc. by the biotic as well as abiotic factors prevailing during the crop seasons (Thangavelu and Sahu, 1986; Yadav and Goswami, 1986). The heavier cocoons having better association with their shells on prediction line is a better parameter for assessing the cocoon quality for reeling since the higher shell percentage will produce high raw silk yield (Jayaswal et al., 1990).

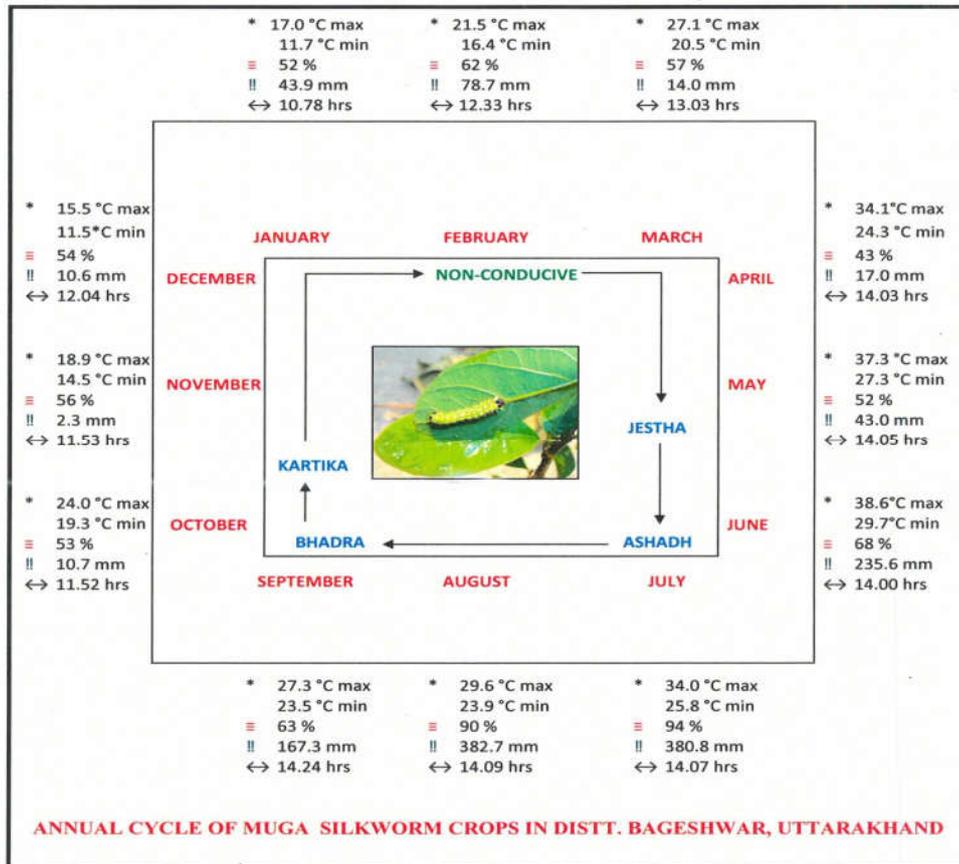


Fig: 1 Weather and its suitability for muga crops in the district Bageshwar

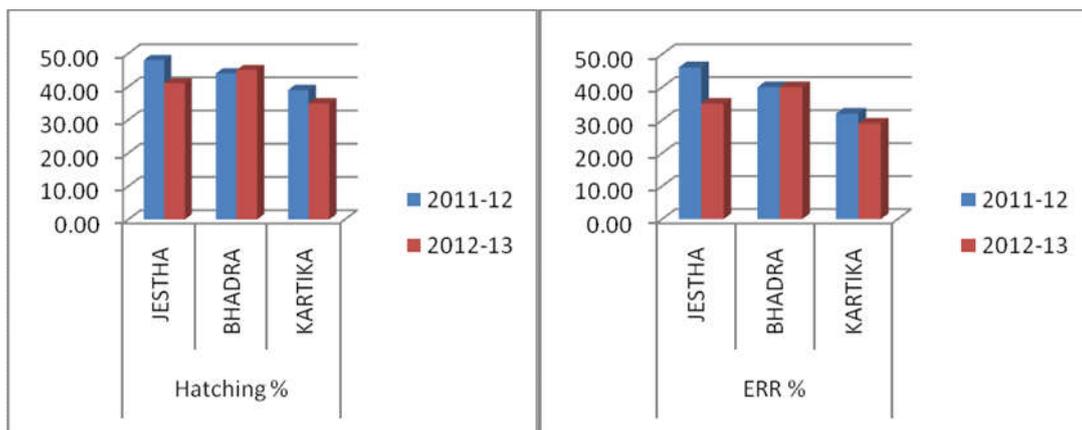


Fig: 2 Hatching% of muga silkworms in different crops

Fig: 3 ERR% of muga silkworms in different crops

Table 1. Dynamics of rearing and the grainage performance of Muga Silkworm reared on *Litsaea polyantha* Juss. under conditions of District Bageshwar

Crops	2011-12						2012-13					
	Rearing		Cocoons				Rearing		Cocoons			
	Hatching %	ERR %	Cocoon Yield / 100 dfls	Cocoon weight (gm)	Cocoon Shell weight (gm)	Shell Ratio (%)	Hatching %	ERR %	Cocoon Yield / 100 dfls	Cocoon weight (gm)	Cocoon Shell weight (gm)	Shell Ratio (%)
J	48.00	46.00	2208.00	5.1630	0.8340	9.1150	41.00	35.00	1435.00	5.2600	0.8460	10.390
B	44.00	40.00	1760.00	5.8690	0.8480	8.2800	45.00	40.00	1800.00	5.7150	0.9880	9.9350
K	39.00	32.00	1248.00	5.7735	0.9570	9.7550	35.00	29.00	1015.00	5.7850	0.0850	8.6250

Generally, the muga silkworm rearers in the N-E region conducted on average four to five crops in a year whereas weather of district Bageshwar in Uttarakhand was found suitable during the months of April-Nov (Fig.-1) for rearing of muga silkworm. As mentioned earlier, considerable variation has been observed in the rearing performance of muga silkworms during the different seasons under Bageshwar conditions. The data (Table-1) generated through rearing of silkworms on both of the host plant species in different crops have provided distinct variations i.e., hatching%, ERR%, Cocoon quality and Shell ratio % etc. Hatching percentage was observed under regulated weather conditions i.e., $25 \pm 2^{\circ}\text{C}$ temperature, $75 \pm 5\%$ humidity and semi-dark conditions as it varies in natural existing weather, the hatching of worms was found within 7- 9 days in all the seasons. As, the time require for embryo development depends on a physical factor i.e., temperature has a relation and play a vital role, the period of embryo development increases with decrease in temperature. On perusal of data it was observed that hatching percentage of eggs varied from season to season. Among all the crops, the range for hatching % was recorded highest 41-48% in Jestha whereas it was recorded between 35-45% in Bhadra and Kartika crops (Fig-2) and further the range of ERR% and yield of cocoons were found between 29-46% (Fig-3) and 1055-2208 , respectively on the host plant *L. polyantha* during different seasons to be quite satisfactory in respect of the ERR% and yield of cocoons during the crops in the years 2011-12 and 2012-13.

It is evident from the data presented in Table-1 that SR% of combined sex in general it was found lowest in Bhadra crop as compared to other crops viz., Jestha and Kartika in the year 2011-12 and showed variability in the year 2012-13 on host plant *L. polyantha*. The shell ratio% was found between 8.28 and 10.39 for combined sex in all the crops on both of the host plant species during years 2011-12 and 2012-13.

During the course of study, it was found that all of the three crops i.e., Jestha, Bhadra and Kartika in Bageshwar conditions were found to be the best crops for rearing of silkworms and produced cocoons may be utilized for reeling purpose since cocoons showed good SR %.

Conclusion

Muga silk is declining in North Eastern region due to change in weather and inbreeding practices. To bridge the gap in demand and supply of Muga fabric new areas have to be developed. *Litsea polyantha* Juss. and *Machilus bombycina* King are the major host plant species found in Bageshwar district of Uttarakhand. Our successive trials in 2011-12 and 2012-13 reveal that Bageshwar can be a potential area for Muga culture. Hence the crops namely Jestha, Bhadra and Kartika are most conducive for muga culture in Bageshwar. Moreover it will be helpful to boom the economy of the local farmers and entrepreneur.

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