

## The extent of adoption of scientific muga culture technology by the muga rearers of the Sonitpur district of Assam, Assam, India

(3823 words / 5000-6000 words).

Abstract (245 words / 300 words)

The current study, conducted in the Sonitpur district of Assam, Assam, India, during 2020-2021, aimed to assess the level of adoption of improved technologies among 120 muga farmers. The findings indicate that a majority (65.83%) of the muga rearers demonstrated a medium level of adoption, with 14.17% exhibiting a low level and 20.00% demonstrating a high level of adoption of scientific muga culture technology. Intercultural operation, brushing of *kharikas* during morning hours of the day, avoiding frequent handling of worms, selection of well-formed good cocoons for seed production as well as for reeling purpose and collection and destruction of diseased larvae and removal of affected twigs /shoots from the field are some of the practices fully adopted while use of improved mounting device for cocooning, spraying of 0.01% sodium hypochlorite solution as a disinfectant on the foliage 4 days before brushing, stifling the cocoon in hot air oven and use of new technologies and machines for re reeling, weaving etc. were not at all practiced by the muga farmers. Again, tying the tree trunk with banana leaves or *tara pat* to avoid crawling down of silkworms and protection of silkworm against ants, use of mud pellets (*batolu guti*), bow (*Dhenu*) and use of *toka* (bamboo which is split on one side) to drive away birds and predators and use of banana leaves for incubation of eggs are the ITKs practiced by all the muga silkworm farmers.

**Keywords:** Brushing, Disinfectant, Improved technology adoption, ITK, Muga culture, Rearers.

### 1. Introduction

Muga culture represents a longstanding traditional practice among rural communities in Assam, serving as a pivotal component of the local economy, particularly for small and marginal farmers. This practice holds significant potential for socio-economic advancement, facilitating sustainable income generation within rural populations (Lakshmanan and Geethadevi, 2005). Sonitpur district in Assam is a prominent hub for silk production, with a substantial segment of the rural populace reliant on sericulture for their livelihoods. Muga silk, also known as golden silk, stands as a source of pride for Assam and is deeply entrenched within Assamese culture. It is believed that the Tai-Ahom's introduced muga

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**Commented [AEFH2]:** Abstract  
The abstract should be concise and informative. It should not exceed 300 words in length.

It should briefly describe the purpose of the work, techniques and methods used, major findings with important data and conclusions.

Different sub-sections, as given below, should be used.

No references should be cited in this part.

Generally non-standard abbreviations should not be used, necessary they should be clearly defined in the abstract, at first use.

#### SAMPLE ABSTRACT:

**Aims:** Here clearly write the aims of this study. Sample: To correlate platelet count, splenic index (SI), platelet count/spleen diameter ratio and portal-systemic venous collaterals with the presence of esophageal varices in advanced liver disease to validate other screening parameters.

**Study design:** Mention the design of the study here. Place and Duration of Study: Sample: Department of Medicine (Medical Unit IV) and Department of Radiology, Services Institute of Medical Sciences (SIMS), Services Hospital Lahore, between June 2009 and July 2010.

**Methodology:** Please write main points of the research methodology applied. Sample: We included 63 patients (40 men, 23 women; age range 18-75 years) with liver cirrhosis and portal hypertension, with or without the medical history of gastrointestinal bleeding. Clinical as well as hematological examination (platelet count) and ultrasonography (gray as well as color Doppler scale including splenic index and splenorenal/ pancreaticoduodenal collaterals) was done besides upper GI endoscopy for esophageal varices. Platelet count/spleen diameter ratio was also calculated.

**Results:** Kindly make sure to include relevant statistics here, such as sample sizes, response rates, P-values or Confidence Intervals. Do not just say "there were differences between the groups". sample: Out of 63 patients, 36 patients with small varices (F1/F2) and 27 with larger (F3) varices were detected on endoscopy. Significant increase in mean splenic index from low (86.7 +/- 27.4) to high (94.7 +/- 27.7) grade varices was documented. Opposite trend was found with platelets (120.2 +/- 63.5 to 69.8 +/- 36.1) and platelets/splenic diameter ratio (1676.7 to 824.6) declining significantly. Logistic regression showed splenic collaterals and platelets are significantly but negatively associated with esophageal varices grades.

**Conclusion:** Non-invasive independent predictors for screening esophageal varices may decrease medical as well as financial burden, hence improving the management of cirrhotic patients. These predictors, however, need further work to validate reliability.

Keywords

culture to Assam, thereby making a noteworthy contribution to the region's cultural heritage (Gogoi, 1996). Assam's favourable weather and climatic conditions render it an ideal locale for muga culture. The production and productivity of muga culture primarily hinge upon the adoption of contemporary technologies (Singh *et al.*, 2014 and Goswami *et al.*, 2015). Over the past two decades, various advanced technologies related to muga culture, including the cultivation and management of muga host plants, production of disease-free laying (dfl), silkworm rearing at early and late stages, prophylactic measures against pests and diseases, and improved moutage for cocoon spinning have been developed and recommended for the benefit of farmers (Chakravorty *et al.*, 2005). Nevertheless, despite a consistent upward trajectory in the production of muga raw silk, it continues to lag behind its potential production. Barah *et al.* (2004) highlighted a significant yield gap of 50% in seed and 30% in commercial crop between demonstration centres and farmers engaged in muga culture. Additionally, Mech *et al.* (2004) observed that the non-adoption or low adoption of improved technologies among farmers leads to a reduced production of 20-40 cocoons per laying, as opposed to 50-60 cocoons per laying by technology adopters. In light of these challenges, this study aims to evaluate the extent of adoption of improved technologies. Ok objective!!!!

#### Reference style

References must be listed at the end of the manuscript and numbered in the order that they appear in the text. Every reference referred in the text must also present in the reference list and vice versa. In the text, citations should be indicated by the reference number in brackets [3]. 8 Reference. Introduction.

## 2. Materials and Methods

The current study was conducted purposively in the Sonitpur district of Assam during 2020–2021, with a sample size of 120 respondents. A multistage sampling design was employed to select the respondents for this study. Out of the 7 development blocks in Sonitpur district, 3 were chosen purposively: Naduar and Balipara blocks under the Tezpur subdivision, and Borchala block under the Dhekiajuli subdivision, due to their higher population of muga rearers. Two villages from each selected development block were chosen; Niz-Borchala and Borjhar from Borchala Development Block, Dharikati and Chariduar from Balipara Development Block, and Hatinga and Tupia Gaon from Naduar Development Block, for the study. With the study objectives in mind, a dependent and a descriptive variable were selected. The adoption of silkworm-rearing practices was assessed by constructing a

structured schedule based on the package of practices for muga rearing. Scores of '0', '1', and '2' were assigned to denote non-adoption, partial adoption, and full adoption, respectively. Respondents were categorized as having low, medium, or high adoption of improved technologies based on the extent of adoption, determined using mean and standard deviation. Statistical techniques such as simple frequencies, percentage, mean and standard deviation were calculated for data analysis and interpretation.

### 3. Results and Discussion

The majority (65.83%) of the muga rearers demonstrated a medium level of adoption of scientific muga culture technology, while 14.17% exhibited a low level of adoption, and 20.00% exhibited a high level of adoption (Table 1). Consistent with these findings, Goswami *et al.* (2015) noted in their research that the overall socio-economic condition of the muga rearers in Assam was unsatisfactory. Furthermore, their study revealed that well-educated farmers with a strong understanding of improved sericulture technologies tended to adopt recent technologies to some extent. To enhance the transfer and adoption of recent technologies, effective extension programs are deemed necessary. Similarly, Jakkawad *et al.* (2019) investigated the adoption of sericultural practices among sericulturists in the Aurangabad district of the Marathwada region and found that a majority of the sericulturists exhibited a medium level of adoption of sericulture practices.

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It is suggested that the discussion about the tables and figures should appear in the text before the appearance of the respective tables and figures.

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TABLE HAS NO EXTERNAL VERTICAL LINES. ELIMINATE FROM ALL TABLES.

TABLES THAT OCCUPY MORE THAN ONE PAGE SHOULD ON THE SECOND PAGE PUT THE TABLE HEADER AGAIN AND PLACE THE WORD CONTINUATION. MODIFY THE TABLES AND PLACE ON ONE PAGE ONLY.

IF THEY OCCUPY TWO OR MORE PAGES, COMPLY WITH THE PREVIOUSLY EXPLAINED.

**Table 1.** Distribution of the muga rearers according to their overall extent of adoption in scientific muga culture technology

(n=120)

Sl. No.	Category	Range	Frequency	Percentage	Mean	S.D.
1.	Low	Below 43.09	17	14.17	55.75	12.65
2.	Medium	Between 43.09 and 68.40	79	65.83		
3.	High	Above 68.40	24	20.00		

### 3.1.1 Extent of adoption of package of practices for raising host plants

The data presented in Table 2 indicates significant disparities in the adoption of scientific practices among the muga rearers. Specifically, the majority (80.00%) of the rearers did not adopt the scientific practice of seed collection and selection, with only 13.33% partially adopting and a mere 6.67% fully adopting this practice. Similarly, concerning the proper method of seed sowing and raising of seedlings, the majority (42.50%) did not adopt it, while 24.17% partially adopted and 33.33% fully adopted the practice. However, regarding maintaining proper spacing between the host plants, a majority (81.67%) fully adopted the practice, with 18.33% partially adopting it. Nutrient management was predominantly adopted by 46.67% of the rearers, with 27.50% partially adopting it and 25.83% not adopting it at all. Conversely, in disease and pest management, 76.67% of the rearers did not adopt the practices, while 23.33% partially adopted them. Regarding timely pruning of host plants, the majority (55.00%) did not adopt the practice, with 34.17% partially adopting and 10.83% fully adopting it. However, all the rearers fully adopted intercultural operation practice.

The poor adoption of the package of practices for raising host plants may be attributed to various factors, including the lack of proper guidance, high costs associated with chemical fertilizers and pesticides, delayed availability of inputs and reluctance to embrace new technologies. Furthermore, the understanding of proper spacing, timely pruning, nutrient management and disease and pest management is influenced by factors such as education

levels, socio-economic status, social engagement, exposure to mass media and contact with extension services.

**Table 2.** Distribution of the rearers on the basis of adoption exhibited to package of practices for raising host plants

(n= 120)

Sl. No.	Package of practices of raising host plants	Full adoption		Partial adoption		No adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Seed collection and selection	8	6.67	16	13.33	96	80.00
2.	Seed sowing and raising of seedlings	40	33.33	29	24.17	51	42.50
3.	Maintaining proper spacing between the host plants in the main field	98	81.67	22	18.33	0	0
4.	Nutrient management	56	46.67	33	27.50	31	25.83
5.	Disease and pest management	0	0	28	23.33	92	76.67
6.	Timely pruning	13	10.83	41	34.17	66	55.00
7.	Intercultural operation	120	100.00	0	0	0	0

### 3.1.2 Extent of adoption of package of practices for muga silkworm seed production technology

From the Table 3, it is evident that a majority (44.17%) of the rearers exhibited partial adoption of seed production technology for disinfection of grainage houses, while 40.00% did not adopt the practice at all, and only 15.83% fully adopted it. Regarding the examination of mother moths for dfls ???where ??? production, 17.50% fully adopted the practice, 36.67% partially adopted it, and 45.83% did not adopt it. Conversely, for surface sterilization of eggs as part of the seed production package, 20.83% fully adopted the practice, 31.67% partially adopted it, and 47.50% did not adopt it.

The partial adoption of improved technologies in seed production may stem from several factors. Firstly, there might be a lack of knowledge regarding disinfection methods and the necessary chemicals required for the process. Additionally, the high cost associated

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with acquiring a microscope for conducting mother moth examinations to produce disease-free **layings** could hinder the full adoption of the practice.

**Table 3.** Distribution of the **rearers** on the basis of extent of adoption exhibited in using scientific method of muga silkworm seed production technology. (n=120)

Sl. No.	Seed production technology	Full Adoption		Partial Adoption		No Adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Disinfection of <b>grainage</b> house	19	15.83	53	44.17	48	40.00
2.	Mother moth examination for <b>dfis</b> production	21	17.50	44	36.67	55	45.83
3.	Surface sterilization of eggs	25	20.83	38	31.67	57	47.50

### 3.1.3 Extent of adoption of package of practices for rearing muga silkworm

From **theTable 4**, it can be inferred that 26.67% of the **rearers** fully adopted the practice of considering only 1-3 days hatched worms for rearing, while 35.00% partially adopted it and 38.33% did not adopt it at all. Moreover, a majority (57.50%) of the **rearers** did not adopt the practice of wrapping the tree trunk with oil-coated polythene sheets, followed by 35.00% who partially adopted it, and 7.50% who fully adopted it. Additionally, all the **rearers** fully adopted the practice of brushing *kharikas* during the morning hours, and a majority (87.50%) fully adopted brushing *kharikas* in the right direction. Concerning the brushing of 2-3 **dfis** per plant, a majority (63.33%) fully adopted the practice, while 21.67% partially adopted it and 15.00% did not adopt it at all. Similarly, regarding the transfer of only healthy and uniformly moulted worms to new plants, a majority (51.67%) partially adopted the practice, followed by 34.17% who fully adopted it and 14.17% who did not adopt it.

Furthermore, all the **rearers** fully adopted the practices of handling worms and almost all the **rearers** fully adopted avoiding overcrowding of larvae in *chalonis* as well as in new plants. However, concerning the separation of **uzi** fly-infested larvae in different **mountages**, only 34.17% fully adopted the practice, while 31.67% partially adopted it and 34.17% did not follow the practice at all. Similarly, 70.83% of the **rearers** fully adopted the practice of using twigs with semi-dried leaves for cocoon formation, while 29.17% partially adopted it. Notably, none of the **rearers** used improved **mountages** for cocooning, and only a minority

(18.33%) of the farmers fully adopted the practice of keeping **mountages** in a semi-dark, well-aerated, and rat-proof room for better cocooning.

Moreover, a majority (100.00% and 70.00%) of the muga **rearers** fully adopted the practices of selecting well-formed good cocoons for seed production and preservation of seed cocoons at **chokari pera** wire mesh cages, respectively. However, 30.00% of the **rearers** only partially adopted the practice of preserving seed cocoons.

**Table 4.** Distribution of the **rearers** on the basis of extent of adoption exhibited to package of practices for rearing muga silkworm. (n=120)

SL. No.	Package of practices for rearing silkworm	Full adoption		Partial adoption		No Adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Considering of only 1-3 days hatched worms for rearing	32	26.67	42	35.00	46	38.33
2.	Wrapping the tree trunk with oil coated polythene sheet	9	7.50	42	35.00	69	57.50
3.	Brushing of <i>kharikas</i> during morning hours of the day	120	100.00	0	0	0	0.00
4.	Brushing of <i>kharikas</i> in the right direction	105	87.50	15	12.50	0	0
5.	Brushing of 2-3 <b>dfils</b> per plant.	76	63.33	26	21.67	18	15.00
6.	Transferring only healthy and uniformly moulted worms to new plants	41	34.17	62	51.67	17	14.17
7.	Avoiding frequent handling of worms	120	100.00	0	0	0	0
8.	Avoiding overcrowding of larvae in <b>chaloni</b> as well as in new plants	100	83.33	20	16.67	0	0
9.	Separation of <b>uzi</b> fly infested larvae in different <b>mountages</b>	41	34.17	38	31.67	41	34.17
10.	Use of twigs with semi-dried leaves for cocoon	85	70.83	35	29.17	0	0

XXX	formation						
11.	Use of improved Xmountage for cocooning	0	0	0	0	120	100.00
12.	Keeping the mountages in semi dark, well aerated and rat proof room for better cocooning	22	18.33	45	37.50	53	44.17
13.	Selection of well-formed good cocoons for seed production as well as for reeling purpose	120	100.00	0	0	0	0
14.	Preservation of seed cocoon at <i>chokori pera</i> / wire mesh cage	84	70.00	36	30.00	0	0

### 3.1.4 Extent of adoption of package of practices for disease and pest management of silkwom wrong!!!!

It is evident from the Table 5 that 26.67% of the rearers fully adopted the practice of considering only microscopically examined disease-free eggs, while 22.50% partially adopted it and 50.83% did not adopt it. Similarly, regarding the use of nylon nets as a package of practices for rearing silkworms, only 16.67% fully adopted the practice, 10.00% partially adopted it, and the majority (73.33%) did not adopt it at all. In the case of dusting a mixture of slaked lime and bleaching powder in a 9:1 ratio at 200g/m<sup>2</sup> surrounding the base of the plant two days prior to rearing, 48.33% fully adopted the practice, 27.50% partially adopted it, and 24.17% did not adopt it at all. However, no any muga rearer adopted the practice of spraying 0.01% sodium hypochlorite solution on the foliage four days before brushing.

Regarding the disinfection of rearing appliances with a 2% formalin solution, 12.50% fully adopted the practice, 18.33% partially adopted it, and 69.17% did not adopt it. All the rearers fully adopted the practice of collecting and destroying diseased larvae and removing affected twigs/shoots from the field as a part of disease and pest management. Concerning the use of a light trap to attract insect pests, 25.83% fully adopted the practice, 19.17% partially adopted it, and 55.00% did not adopt it.

Additionally, a majority (81.67%) of the **rearers** did not adopt the practice of using **lahdoi** to reduce **muscardine** disease, while 12.50% fully adopted it and 5.83% partially adopted it. Similarly, regarding the use of artificial smoke to reduce uzi fly infestation, 47.50% fully adopted the practice, 19.17% partially adopted it, and 33.33% did not adopt it for disease and pest management of muga silkworm.

**Table 5. Distribution of the **rearers** on the basis of extent of adoption exhibited to disease and pest management of muga silkworm (n=120)**

SL. No.	Disease and Pest Management	Full adoption		Partial adoption		No Adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Consideration of only microscopically examined disease free eggs	32	26.67	27	22.50	61	50.83
2.	Use of nylon net	20	16.67	12	10.00	88	73.33
3.	Dusting of mixture of slaked lime and bleaching powder in the ratio of 9:1@ 200g/m <sup>2</sup> surrounding the base of the plant 1 week prior to rearing	58	48.33	33	27.50	29	24.17
4.	Spraying of 0.01% sodium hypochlorite solution on the foliage 4 days before brushing	0	0	0	0	120	100.00
5.	Disinfection of the rearing appliances with 2% formalin	15	12.50	22	18.33	83	69.17
6.	Collection and destruction of diseased larvae and removal of affected twigs /shoots from the field	120	100	0	0	0	0
7.	Use of light trap to attract insect pests.	31	25.83	23	19.17	66	55.00
8.	Use of Lahdoi to reduce <b>muscardine</b> disease	15	12.50	7	5.83	98	81.67
9.	Use of artificial smoke to reduce the of <b>uzi</b> fly infestation	57	47.50	23	19.17	40	33.33



1.	Proper harvesting, sorting and storing of cocoons	29	24.17	66	55.00	25	20.83
2.	Stifling the cocoons in hot air oven	0	0	0	0	120	100.00
3.	Use of muga silk plus for cooking the cocoon	10	8.33	23	19.17	87	72.50
4.	Reeling of muga cocoon in CSTR power cum pedal operated muga reeling machine	0	0	23	19.17	97	80.83
5.	Use of new technologies and machines used for re reeling, weaving etc.	0	0	0	0	120	100.00

### 3.1.6 Extent of adoption exhibited to ITK use

Table 7 demonstrates various indigenous technological knowledge (ITK) practices adopted by the respondents. Specifically, 29.17% of respondents partially utilized clean water kept in a transparent polythene bag and hung it in the trees to deter flies, while 47.50% did not adopt this practice, and 23.33% fully adopted it. Conversely, control burning of undergrowth in host plantations prior to rearing was fully adopted by 60.83% of the respondents, with 19.17% partially adopting it and 20.00% did not adopt this practice.

Moreover, all the respondents fully embraced the ITKs of Tying the tree trunk with banana leaves or pseudo stem or *tara pat* to avoid crawling down of silkworms and protection of silkworm against ants, using mud pellets (*batolu guti*), a bow (*Dhenu*), and a *toka* (bamboo split on one side) to deter birds and predators, as well as using banana leaves for egg incubation.

These findings highlight the varying levels of adoption of ITK practices among the respondents, with some practices being more widely adopted than others. Additionally, it

underscores the importance of incorporating traditional knowledge and practices into modern agricultural techniques to enhance sustainability and resilience in farming systems.

**Table 7.** Distribution of the rearers on the basis of extent of adoption exhibited to ITK use. (n=120)

Sl. No.	Package of practices of ITK used	Full adoption		Partial adoption		No adoption	
		Frequency	%	Frequency	%	Frequency	%
1.	Clean water kept in a transparent polythene bag and hang it in the tree to drive flies away	28	23.33	35	29.17	57	47.50
2.	Tying the tree trunk with banana leaves or pseudo stem or <i>tara pat</i> to avoid crawling down of silkworms and protection of silkworm against ants	120	100.00	0	0	0	0
3.	Control burning in under growths of the host plantation prior to rearing	73	60.83	23	19.17	24	20.00
4.	Use of mud pellets ( <i>batolu guti</i> ), bow ( <i>Dhenu</i> ) and use of <i>toka</i> (bamboo which is split on one side) to drive away birds and predators	120	100.00	0	0	0	0
5.	Use of banana leaves for incubation of eggs	120	100.00	0	0	0	0

SO FAR 2 REFERENCES OF THE TOTAL OF 8 REFERENCES IN THE TEXT HAVE BEEN USED. THERE IS NO DISCUSSION OF THE RESULTS WITH THE RESULTS OF OTHER RESEARCH ALREADY CONDUCTED. EXPAND THE DISCUSSION AND THE NUMBER OF REFERENCES IN THIS RESULTS AND DISCUSSION ITEMS.

#### 4. Conclusion OK.

The findings suggest that most of the farmers have a moderate level of adoption of scientific muga rearing practices, indicating the need for increased efforts by extension workers to promote improved techniques and boost muga silk production. There's a lack of training exposure among the majority of the rearers, emphasizing the importance of tailored training programs to enhance their skills. There is an opportunity for extension workers to provide ongoing support and foster trust in adopting modern technologies. Identifying barriers to adoption underscores the need for systematic efforts by the authorities to address challenges, enabling farmers to make informed decisions and advance muga culture in the region.

#### Reference style

References must be listed at the end of the manuscript and numbered in the order that they appear in the text.

Every reference referred in the text must also present in the reference list and vice versa.

In the text, citations should be indicated by the reference number in brackets [3].

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Reference to a journal:

For Published paper:

1. Hilly M, Adams ML, Nelson SC. A study of digit fusion in the mouse embryo. *Clin Exp Allergy*. 2002;32(4):489-98.

Note: List the first six authors followed by et al.

Note: Use of DOI number for the full-text article is encouraged. (if available).

Note: Authors are also encouraged to add other database's unique identifier (like PUBMED ID).

## References

- 1- Barah, A.; Mech, D.; Singh, K.C. and Suryanarayana, N. (2004). Yield gap: A major prodigium in muga silk industry. *Journal of Assam Science Society*, **45**(1): 19-28.
- 2- Chakravorty, R.; Barah, A.; Neog, K.; Rahman, S.A.S. and Ghose, J. (2005). Package of practices of muga, eri and mulberry sericulture for North Eastern region of India, CMER&TI, CSB, Lahdoigarh, Jorhat, Assam.
- 3- Gogoi, B. (1996). Muga culture-The heritage of Tai-Ahoms in Assam, Souvenir, (Purbanchal Tai Shahitya Sabha, Assam).
- 4- Goswami, N.K.; Nath, P. and Saharia, D. (2015). A study on socio-economic assessment and adoption of scientific technologies by the muga rearers of Assam. *International Journal of Scientific Research*, **4**(2): 349-353.
- 5- Jakkawad, S.R.; Patange, N.R. and Ahire, R.D. (2019). Adoption of sericultural practices by the Sericulturists. *Journal of Entomology and Zoology Studies*, **7**(3): 1363-1366.
- 6- Lakshmanan, S. and Geethadevi, R.G. (2005). Studies on economics of sericulture under dryfarming condition in Chamarajnagar district of Karnataka. *Indian Journal of Sericulture*, **40**(2): 183-185.
- 7- Mech, D.; Borah, A.; Singh, K.C. and Suryanarayana, N. (2004). Adoption of improved technology package and its impact on production in muga – A case study. *Indian Journal of Sericulture*, **43**(1): 95-98.
- 8- Singh, N.I.; Goswami, D.; Ahmed, M. and Giridhar, K. (2014). Efficacy of sodium hypochlorite in controlling viral and bacterial diseases in muga silkworm, *Antheraea assamensis* Helfer. *Journal of Applied Biology & Biotechnology*, **2**(2): 012-015.

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1 REFERENCE 1996. SUGGESTION !!!!!!!

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