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INDIGENOUS KNOWLEDGE IN MUGA CULTURE AND TERMINOLOGIES USED BY MUGA REARERS OF LOWER ASSAM, ASSAM, INDIA

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ABSTRACT Muga culture is one of the major cottage industries in Assam and engaged a huge number of families for their livelihood. Assam is the highest producer of Muga silk in India. The sector is mostly associated with traditional practices and the muga rearers believe that muga culture is not only a source of livelihood for them but also a custom and tradition of Assam. Though the recent development and new package of practices are in place, most of the rearers are reluctant to adopt the recent techniques and associated with age old traditional thoughts and practices.

KEYWORDS : Muga culture, Silk, Indigenous, Terminology

INTRODUCTION:

The golden colour muga silk produced by a sericigenous insect *Antheraea assamensis* Westwood is basically confined to the Brahmaputra Valley of Assam and a few parts of north eastern region. Muga silk is considered as the Queen of all fabric due to its durability and natural golden colour. Presently, in Assam there are 4398.78 hectares of land under Muga food plantation and 27,690 families are engaged in Muga culture for earning their livelihood *(Anonymous, 2018).* Assam is the largest Muga silk producing state in the country and it alone contributes about 80% of the total muga raw silk production (Anonymous, 2019).

Sericulture is a major cottage industry and Assam has achieved the right of "Geographical Indication" in production of "Muga silk" and its fabrics under the section 17(3) (C) of GI Act in the year 2006.

Muga silkworm is polyphagous, semi-domesticated and multivoltine in nature having six broods in a year. The silkworm mainly feeds on Som (*Persea bombycina* Kost.) and Soalu (*Litsea polyantha* Juss.) and few other food plants are also used as food plant for Muga silkworm rearing. Muga culture is age old industry of Assam. Handloom weaving and rearing of Mulberry, Eri and Muga worms for production of different kinds of silk yarn were known to be patronised by the Ahom Kings during their reign from 1228 to 1826*(Borthakur, S. K., 2003).*

The silk of Assam was first made known to the world during 1962 through famous European traveller Jean Joseph Tavernier who made a special mention that in Assam silkworms are remained on trees and all round the year. Though history of muga culture is in oblivion prior to 1662, the use of silk attire mentioned in "Mahabharata" by the king Bhagadutta of ancient Assam who fought for Pandavas in the battle Kuruksetra. The Ahom king patronized the muga culture and silk weaving in Assam. The Muga silk was the royal dress of Ahom kings.

Muga silk worms were reared on "Mezankari" tress to produce royal dresses for their exclusive use. It is difficult to trace its origin at Assam and its adjoining states, but it was known to Assam from the ancient time as recorded in "Arthrashastra" and "Ramayana" *(Choudhury, 1959)*.This industry developed considerably in the Ahom-period when effective measures were adopted to encourage silk trade with other nations. Later in the 18th and 19th centuries muga silk become an important commodity of trade transacted by the east India Company *(Bharali, 1969)*. In Koutilya's "Artha Sharstra", it is mentioned that weavers of ancient Assam had earned the reputation for the best quality of silk, as a result of which the famous"Silk Road" to northern India was extended in the valley of Kamrupa.

The Muga rearers of Assam throughout the rearing processes are following a large number of indigenous practices where some of these practices have some scientific backgrounds and few of them are found to be superstitious (Unni, BG., *et. al.* 2009).

Muga culture in Assam has very strong traditional emotions and believes since a long time. In the age of emerging technologies the Muga rearer are still guided by traditional practices, customs and believes. The traditional rearers still prefer to use tools and implements innovated indigenously and other local materials for rearing the worms, spinning, reeling and weaving the cloth.

The objective of this study was to study the indigenous traditional knowledge and techniques involve in Muga culture and terminologies used by the Muga rearers of lower Assam.

METHODOLOGY:

In this paper attempt has been made to highlights the indigenous knowledge and terminologies used by the Muga rearers of lower Assam. Data were collected from **Kamrup (Rural), Goalpara, Udalguri and Kokrajhar district** of Assam by administering a questionnaire to gather information regarding indigenous knowledge and practices of the Muga rearers. Random sampling technique has been adopted for primary data collection. Total 60 respondents, 15 from each district have been randomly selected for the study. Generally in lower Assam Assamese, Rava, Garo and Boro tribes are mainly associated with Muga culture. To get detailed information on the traditional practices used by the Muga rearers a series of formal and informal interviews were carried out in the study districts. During the study period traditional practices followed by the rearers from Asasamese, Rava and Boro communities of lower Assam part of Assam were collected and documented. The secondary data have been sourced from different publications, journals, books, research papers, web sites, news papers etc.

RESULT:

The outcomes of the study have been categorized sector wise and enumerated below.

Crops of Muga Silkworm

The Muga rearing seasons are named according to the Assamese calendar and known as Jarua, Chotua, Jethua, Aherua, Bhodia and Kotia. The Jarua crop is called because the crop is used to rear during the winter season. The term Jarua derived from *Jar (cold)* which generally takes a long larval period due to slow growth rate of worms. The other crops like Chotua, Jethua, Aherua, Bhodia and Kotia are called as the rearing is conducted in the respective Assamese month. Of all these crops, early winter (Kotia) and spring (Jethua) crops are reared as commercial crop and produces best quality silk and rest are reared as seed crops.

Muga Silkworm food plant

As per the field study it is prominent that almost all the rearers used to rear muga silkworm in Som plants. Reena Chetia (2013) in her paper also mentioned that only 20% of rearers prefer to rear muga silk worm on other plants like, Soalu, Dighloti and Patihonda and rest prefer to rear only on som plants. For rearing of Muga silk worms the rearers identify and select the som plants based on their traditional knowledge and depending on the shape and size of the leaves of som plants. It has been widely accepted that there are several types of som plants namely, Nahorpitia, Kothalpotia, Ampotia, Jampotia and Belpotia where the leaves are resemble with Nahor, Kothal (Jackfruit), Am (Mango), Jam

(Jamun) and Bel (Wood apple) plants respectively. Out of those plants the rearers found Nahorpotia som plants as good for rearing of Muga silkworm as the worms like to feed on the leaves of Nahorpotia som plants due to its taste. Moreover, the worms grow well and produce good cocoons. Sarmah *et. al.,* (2010) in their study reported that the experience muga rearers identify the preferred som plants by chewing the leaves and according to the farmers the taste of the suitable plants leaves are sweet. The Nahorpotia som plants are the most preferred som variety for Muga silk worm rearing.

Muga Seed crop

Since a long period lower Assam districts are known as good seed zone for successful crop harvesting, rearers from upper Assam come down to lower Assam districts to collect quality seed cocoons. The Graineurs or commercial rearers use to visit rearing field 2-3 times to supervise the rearing, existence of diseases and condition of worms during rearing period. After physical verification the graineurs book seed cocoons with advance money and some of them also stay for a long period in the seed rearing areas and even they help in collection of mature worms. The graineurs usually prefer *Bhorpok* (maximum maturation day) cocoons for production of DFLs. Some potential areas for production of quality seed cocoons in lower Assam are Hahim, Malahi, Boko, Chhayagaon, Mangaldoi, Mendipather, Goalpara and bordering area of Garo hills, Meghalaya of lower Assam.

The importance of seed crops during Chotua and Bhodia are more because these two seed crops are the link crops for the production of commercial cocoons.The main problem is the uncongenial climatic condition prevailing in that period and rearing of silkworm is very difficult to get a good cocoon crop.

The temperature in Assam during summer crop seasons, especially in Aherua pre-seed and Bhadia seed crop remains high coupled with high humidity as a result of which success of these crops is highly uncertain leading to crop loss ranging from 14 to 40 %. (Chakravorty *et al*., 2007). On the other hand the Chotua crop suffered from uzi fly infestation causing high crop loss. (Goswami *et.al*. 2013).

Use of locally available materials for rearing

The traditional rearers of lower Assam prefer to use low cost materials that are readily available in their surroundings for muga silk worm rearing. The rearers use banana leaves or banana pseudo stem sheet to girdle the food plants to prevent crawling of ants. As a protection measure to prevent crawling of insects few farmers used to pour water on the tree trunk of the food plant. The rearers prepare small cage to keep the newly hatch worms with tenders leaves and this cage is hang on the twigs of food plants for crawling of worms to the branches. The rearers practice traditional technique by giving smoke at surrounding of the rearing field during Jarua and Chotua crop to prevent uzi fly infestation.

Care taken during rearing

Special care and attention are taken by the rearers during seed crop rearing for disease free crop harvesting. Normally the outsiders are not allowed to enter the rearing field as there are chances to carry over germs of diseases. The traditional rearers also do not allow the people to enter his rearing field those have not seen the muga worms earlier. They believe that if person praise about the well reared and good health of the muga worms, the crop will definitely destroy in subsequent days. Most of the rearers believe that flacherie disease normally caused due to bad impression of outsiders hence they call it Mukh loga disease.

The rearers and the fellow rearers do not discuss about the nocturnal birds and animals in the rearing field and they believe that if someone discuss or talk on nocturnal birds like bat, owls etc. definitely they will come to their rearing field and feed the worms.

During entire rearing period the rearers don't use oil and creams as they feel that silkworms are very sensitive to odours and it affects on their health, even they don't shave during that period. Few rearers maintain this tradition until completion of rearing and few maintain up to fourth moult and feel relax only after successful rearing. Normally the traditional rearers use to stay at the rearing yard making a temporary hut and do not go to their home and even prepare their food by themselves. During the rearing period they do not eat non-veg food and even the whole family prefer to eat vegetarian food only.

Prevention of diseases

It was observed that some traditional rearers of lower Assam used to spray garlic extract to prevent Flacherie disease. The rearers used to keep garlic extract in a bottle and as they observe the symptoms of Flacherie immediately spray garlic extract on the body of the silkworm to control disease. The first two matured worms picked up by the rearers keep very cautiously for cocooning in separate Jali and called as Burha- Burhi. The rearers keep these two cocoons till the completion of harvesting. The collected seed cocoons are kept on bamboo dalas or plastic trays in a single layer for easy emergence of moths. Few muga rearers make garlands of cocoons as they feel that moths prefer to stay in hanging vertical posture after emergence. Some graineurs use to hang Tulsi (*Ocimum sanctum* Linn.) and Neem (*Azadirachta indica* A. Juss.) leaves at grainage house to purify the air. The grainage house floor is sprinkled with wood-ash to prevent the entry of ants and insects. During grainage period no one is allowed to enter in to the room as a protection measure so that germs from outside can not enter into the grainage.

Prevention of pest and predators

Som plants are generally attacked by stem borer pests and causes serious damage to the plants. To control the attack of stem borer pests rearers pour kerosene oil on the holes of the plants and blocked the hole with mud to kill the borer pests inside it.

As Muga rearing is performed at outdoor where the worms are released to food plants for feeding and the tiny worms are exposed to various pest and predators. To protect from various birds and other animals rearers use *Ketepa*/*Batli* and bow and clay pellets. Another traditional device called Toka, made by splitting one side of a piece of bamboo which make a typical sound is use to keep the birds away from the rearing field.

It has been observed in the rearing field that few worms are very weak and lazy and they don't want to move or even not interested to eat the leaves; these types of worms are called Ledhma Muga. The rearers generally leave these worms in the rearing field.

Harvesting and cocooning

Detection of matured worm is done by slightly squeezing the worms which gives a typical sound and confirmed whether the downward moving worms are ready for cocooning or not. Few of the Assamese community rearers before brushing worms they used to pray God by lighting a *Saki* in the rearing field to get a good cocoon crop. Similarly Rava and Boro communities also pray in their traditional way for a hassle free rearing crop.

The mountage room is kept safe from insect, pests and predators. Two types of Jali are used for cocooning, called as Dang Jali and Topa Jail. During the cocooning process some worms try to escape from the Jali and such worms are called *Poloira Muga* as they do not spin. The tribal rearers of lower Assam (Rabha, Garo, and Boro) use them as delicious food.

The muga silkworm rearers use different terminologies to describe the various aspects of Muga silkworm rearing at their local languages and some of which has been enumerated below at Table No 1.

Table 1: Terminologies used by Muga rearers of lower Assam

Sl. No	Terminologies	Assamese (Lower Assam)	Rava tribe	Boro tribe
1.	Seedlings	Puli/Poli	Panchari	Bifang
2.	Air layering	Kolom dia	Agalkhandok kai	Udihwnai
3.	Leaf gall disease	Pator temna pora	Chaknathe	Bilaini Thanai Gwlwinai
4.	Som plantation	Somoni	Som Bagan	Sombari
5.	Soalu plant	Saola	Panjipor	Khawla
6.	Leaf Rust disease	Pator Mamore dhora	Chak modumkai	Bilaini Maram Homnai
7.	Stem borer	Gach bindha	So-ung Bong kai	Bifang Amfou Khurnai
8.	Pruning	Kolom dia	Pankhandok kai	Somanai Hanai
9.	Triangular shape bamboo sieves	Chelingi	Chandri	Jembla

10.	Muga Seed cocoon	Bidhan/Kothia	Chari Lata	Jwlwi
11.	Round bamboo tray without sieve	Dala	Dala	Songrai
12.	Bunch of thatch Stick used for tying moths and allow for lay egg	Khorika/Kathi	Nibek	Kathi
13.	Round shape bamboo sieves	Chalni/Chaloni	Janka	Sandri
14.	Crop	Khon	Jowa	Megon
15.	Male Moth	Chokra	Maba	Jwla Sikhiri
16.	Female Moth	Chokri	Mazju	Jw Sikhiri
17.	Silkworm egg	Koni/Sanch	Pitchi	Bidwi
18.	Silkworm	Polu	Sou-Shree	Latha
19.	Moulting	Sal kata	Khorthop traikai	Bigur Guslainai
20.	First moulting	Ek sal	Puina khorthop traikai	Sethi Bigur
21.	Second moulting	Dui sal	Ning khorthop traikai	Naithi Bigur
22.	Third moulting	Tin sal	Aantham khorthop traikai	Thamthi Bigur
23.	Fourth stage moulting	Mahari Jor	Sesa	Brwithi Bahagw
24.	Moult out form fourth stage	Mahari oloa	Jibra Changmo	Brwithiao
25.	Som plants not interested to eat by worms	Makoira Som	Aatak Jaat	Makri Som
26.	Coupling of moths	Jora laga	Mapak kai	Swkrini Athwn
27.	Decoupling	Jora bhanga	Frizo	Athwn layi
28.	Barrier on tree trunk to check the crawl down of worms	Gari bandh	Pesta Khakai	Janjai khanai
29.	Catapult	Batli/Gulti	Chelthep	Lobot
30.	Bow	Dhenu/Dhanu	Dhonu	Bwrla
31.	Clay pallets	Guli	Hadung	Saranthai
32.	Hand silk reeling device (Hand Bhir)	Bhauri	Lentha	Swrkhi
33.	Hand spinning device	Takli/Takuri	Takuri	Thaukri
34.	Hairy caterpillar (Cricula trifenestrata)	Amroli/ Amphutuki	Jongsur	Amblawri
35.	Muga rearer	Muga palak	Muga Pusikai	Muga Fishinai
36.	Diseases-Pebrine	Phutuka	Shrang-Sakai	Dobra
37.	Grasserie	Phula Bemar	Pokkai	Bunai Garai
38.	Flacherie	Mukh laga	Phate Sikai	Khuga Nangnai
39.	Muscardine	Bhekur Bemar	Modmi Sikai	Muaikhun lwmjanai
40.	Rearing of worms	Polu puha	Sou-Puskai	Latha Faligra
41.	Maturation of worms	Polu poka	Prizo	Latha Amphaw
42.	First two matured worms	Burha-Burhi oloa	Budakai Aaro Markai	Barai Braai Kharnai (Givi Amfou Mwnnai)
43.	Collection process of matured worms	Polu dhora	Sou-Roumkai	Adi Amphow Homnai
44.	Bamboo basket used for collection of matured worms	Khora	Pasi	Junga
45.	Litters of Silkworm	Laad	Sou-mi	Khi
46.	Spinning of cocoon (Cocooning)	Leta Kunda	Lata Shring kai	Khanthawthi
47.	Cocoon	Leta/Lat	Lata	Fithwb
48.	Completion of pupa	Kumari hoa	That-Ga-Mai	Latha khanai
49.	Pupa	Poka	Lata Soung	Amfou
50.	Flimsy cocoons	Letua	Chadok	Aluri
51.	Mute cocoons	Mora leta	Lata Sikai	Thwinai Amphow
52.	Double cocoons	Jora leta	Jot thakai lata	Jorase Fithwb
53.	Mountage made of dry leafy twigs	Jali	Chak thakai	Baha
54.	Mounting on Jalis	Jali dia	Chak thai	Baha Lunw Mankhwnai
55.	Harvesting of cocoons	Jali bhanga	Di- Bikai	Baha Bwkhanai
56.	Room used to kept for Jali for cocooning	Jalighor	Lata Nok	Baha Dwnnai Khotha
57.	Reeled Muga yarn	Muga suta	Muga Nengteng	Muga Khundung
58.	Spun Muga yarn	Gicha	Lesa	Khundung
59.	Person spin yarn by traditional Takli	Katoni/Kateni	Ganji Takkai	Lugra
60.	Cut & Pierced cocoons (CPC)	Juthuri	Sofla	Dakhwr
61.	Worms escape from the cocoonage	Poloira Muga	Gremini	Kharsula Muga
62.	Black scar/spot on the body due to Uzi fly infestation	Mahi pora/Sahi pora/ Makhi bindha	Sou-Seng Sukai	Thamphwi Gaonai
63.	Uzi fly	Makhi/Mahi	Sou-Seng	Thamfwi

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Photographs

Photo: Egg cage

Photo: Triangular bamboo sieves

Photo: Girdle (Gari bandh)of Banana pseudo stem

Photo: Protection measure to prevent crawling of insects

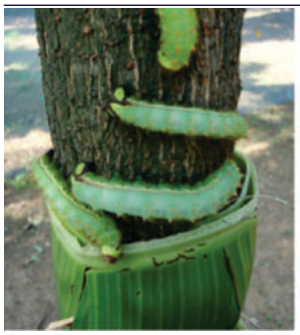

Photo: Girdle of Banana leaf

Photo: Use of Bow flew away birds and other predators

Photo: Use of Ketepa to flew away birds

Photo: Clay pellets with Ketepa

Photo: Makeshift house at Muga rearing field

Photo: Dang Jali

Photo: Topa Jali

Photo: Harvested cocoon on Dala

Photo: Reeling on Hand Bhir (Bhauri)

Photo: Muga yarn reeled on Hand Bhir

Photo: Hank of Muga yarn

Photo: Juthuri (CPC)

Photo: Spinning of Ghisa yarn with Takli

Photo: Ghisa yarn

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