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Traditional Knowledge and Terminologies in Eri culture used by various Tribal Communities in the Dimoria Development Block of Kamrup district, Assam, India

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Abstract:
Eri culture is predominantly practiced in the north-eastern states of India, with Assam being the leading producer of Eri Silk in India due to its congenial climatic conditions. Eri culture is an agro-based cottage industry of Assam which provides livelihood to a large segment of rural populations in Assam. The practice is especially popular among the tribal communities of Assam due to its compatibility with their traditional way of life and the high demand for both Eri silk and pupae. Women folks from these communities are primarily engaged in Eri culture during their leisure time to contribute to household income, thereby improving their economic condition. Although modern techniques for Eri rearing have been developed, most rearers continue to rely on traditional methods, guided by generations of traditional knowledge and experiences. Their reluctance to adopt advanced practices stems from a deep-rooted trust in the traditional techniques. Interestingly, various tribes involved in Eri culture also use unique terminologies specific to their communities and cultural richness to the in Eri culture.

Keywords: Eri culture, tribal, traditional, terminologies, multivoltine, polyphagous

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Introduction:

The Eri silkworm (*Samia ricini* Donovan*)* is a lepidopteron insect known for producing Eri silk, one of the popular natural fibers of animal origin. Eri silk is highly durable and has a specific thermal property, which renders it as an alternate fiber to wool. Due to its ability to retain warmth, it is considered as an ideal fabric for use during the cold season (Singh and Benchamin, 2001).

Eri fabric is known as the "Poor man's Silk" due to its relatively low cost compared to other varieties of silk. It is also called as "Ahimsa silk"(non-violent silk), as the process of extraction of Eri silk does not involve killing the pupae. In contrast, the production of other types of silk such as Muga, Tasar and Mulberry typically requires the pupae to be killed within the cocoon to obtain raw silk.

Eri culture has been a traditional practice of Assam since time immemorial and continues to serve as a part-time occupation for the rural population especially among women. Assam's favourable climatic and environmental conditions make it a natural habitat for silk producing worms and their food plants especially for Muga and Eri silkworms, whereas the rearing of Mulberry and Tasar silkworms rearing is not widely practiced in Assam (Dutta, 1983).

The history of Ericulture in India, particularly in the North-East India is deeply rooted and is considered as ancient as Indian civilization itself. The undivided North-East region is believed to be

the original home of Eri silk from time immemorial (Devi, 1999). While the production of Eri silk is mainly concentrated in Assam, it is also practiced on a smaller scale in Meghalaya, Manipur, Mizoram, Arunachal Pradesh, Nagaland, Bihar, and Odisha. Among these, Assam holds a central and pivotal role in Eri silk production.

The Eri silkworm is multivoltine and polyphagous in nature feeding on a variety of food plants, such as castor (*Ricinus communis* L), Kesseru (*Heteropanax fragrans* Roxb.), Tapioca (*Manihot esculenta* Crantz), Payam (*Evodia flaxinifolia*), Barpat (*Ailanthus grandis*), among others. Unlike other non-mulberry silkworms, Eri silkworms are reared completely under indoor condition, similar to mulberry silkworm for the production of cocoons.

Eri culture is an agro-based cottage industry in Assam, providing livelihood to approximately 2.40 lakh families (Anonymous 2024)[1]. Assam, including the Bodoland region, is the largest producer of Eri silk in India, contributing around 5488 MT of Eri raw silk accounting for nearly 75% of the country's total production (Anonymous 2024)[2].

Eri rearing is practiced across various castes and creeds in Assam, but it is mostly popular among the tribal groups due to the nature of the work and demand for both Eri silk and pupae. Ericulture has been a supplementary occupation for rural women belonging to different ethnic communities in the Brahmaputra valley of Assam. Among the major tribes engaged in Eri culture are the Misings, Kacharis, Bodos, Mikirs, Rabhas, Karbis and Tiwas. These tribes practice this culture during their leisure time to partially meet their needs for warm clothing and to generate additional income through the sale of cocoons, yarns and pupa. Eri pupae have high market demand and are considered a protein-rich delicacy among the tribal populations of Assam.

Although research institutes have developed advanced rearing techniques in recent years, Eri rearers in Assam continue to rely on traditional practices, showing reluctance to move away from their traditional knowledge and experiences in rearing of Eri silkworm. Throughout the entire process of Eri culture from silkworm rearing to spinning and weaving of yarns, Eri rearers adopt various indigenous traditional methods that have been passed down through generations.

To understand Eri culture at farmer's level, it is necessary to be familiar with the traditional terminologies used by the rearers. This knowledge of traditional terminologies in Eri culture not only offers insight into indigenous technical knowledge (ITK) associated with the practice but also helps farmers and sericulturists better comprehend and preserve the cultural and technical heritage of Eri silk production.

This paper explores the traditional practices and terminologies associated with Ericulture as followed by the Assamese, Karbi, Tiwa and Boro tribes in the Dimoria development block of Assam.

Methodology:

The study was conducted in few villages within the Dimoria Development Block of Kamrup Metropolitan district of Assam. Both primary and secondary data sources were utilized for the study. Primary data were collected from sixty (60) families selected through random sampling from various Eri silkworm rearing villages in the Dimoria block. Four communities, viz., Assamese, Karbi, Tiwa and Boro were covered under the study, and fifteen (15) samples were drawn from each group for field surveys and interviews.

A semi-structured questionnaire was developed to collect primary data from the Eri rearers. In addition to the survey, several formal and informal discussions were conducted with Eri rearers from the selected villages to get more in-depth information on the subject. The data collection process encountered a few challenges, including language barriers, limited understanding among respondent, and a low literacy rate. However, every effort was made to ensure the accuracy and reliability of the information gathered from the respondents.

Secondary data were collected from various official and published sources, including the Economic Survey of Assam, publications from the Directorate of Economics and Statistics, Government of Assam, the Statistical Handbook of Assam and the Annual Reports of Central Silk Board. In addition, several research journals related to Eri culture were consulted to gain a comprehensive understanding the sector.

Result and Discussion:

Eri silkworm rearing is a traditional practice and throughout the rearing processes several indigenous methods or practices are employed by the rearers. During the course of the study, it was observed that while some of those practices have a scientific basis, others are rooted in superstition. The traditional technologies adopted by Eri silkworm rearers are the results of age-old knowledge passed down through generations.

The life cycle of Eri silkworm consist of four main stages- eggs *(Koni)*, larva (P*olu)*, pupa *(Leta)* and moth (*Sokori*). During the larval stage, the silkworm undergoes five growth phases, passing through four instars before entering the pupal stage.

The Eri silkworm is multivoltine in nature and it can be reared up to six times (broods) in a year provided there is a consistent supply of food leaves. The primary host plants for Eri silkworms are Castor (*Ricinus communis* L.) and Kesseru (*Heteropanas fragrans* Roxb.). Among these, Castor is more commonly used and is either cultivated or found growing wild. Due to limited land holdings, most Eri rearers are unable to establish systematic plantations sufficient for large scale rearing. As a result, they largely rely on wild castor plants for leaves. Castor is a fast-growing, suckering shrub that can reach heights of 5 to 12 meters. It is a hardy plant, requires low input, thrives in marginal soils, is drought tolerant and can be easily established in the field. In rural areas, it is commonly found on fallow land, roadsides, and homestead areas.

Rearers generally preferably to produce layings (silkworm eggs) themselves using seed cocoons from the previous crop following traditional methods. It was observed that no scientific technique applied during the egg preparation process. Instead selection is based on a few observable morphological traits such as cocoon size, larval feeding behaviour, and response to physical touch. Seed cocoons (locally known as *Bidhan or Kothia*) are selected based on the health of the larvae and compactness of the cocoons, both considered key indicators of quality. These selected cocoons are typically stored in bamboo tray *(Dola or Chaloni)*, or Bamboo basket for the production of layings. In some cases, rearers also prepare garland of cocoons to facilitate easier emergence of moths. Moth emergence usually occurs during the evening hours. After emerging from the cocoons, male moths fly around for a while and then pair with female moths. Rearers often keep the moths coupled for a day, although 3 to 6 hours is generally sufficient for successful mating.

The fertilized females moths, once decoupled are placed on a locally prepared straw stick called *Kharika*, although some rearers use pieces of cloth for egg laying. The fertilized female moths start laying eggs after two to three hours and continue to do so for three to four days, with the highest number of eggs laid on the first day. After egg laying, the eggs are carefully collected, wrapped in a piece of cloth and preserved in a safe place. The eggs generally hatch between the 8th and 9th day after oviposition, though hatching can be delayed up to 15 days during winter seasons. Newly hatched larvae are transferred to bamboo trays and provided with tender food leaves. The larvae are fed four to five times daily at regular intervals. As the larvae mature, they are given only mature leaves to feed on. At this advanced stage, rearing is done in horizontally placed bamboo poles, with bunches of leaves tied to the bamboo poles for allowing the larvae to climb up from the bamboo trays. Some rearers also use rearing stands to facilitate feeding and management.

It was observed that when castor leaves were unavailable, rearers used Kesseru leaves for silkworm rearing. According to the rearers, silkworm fed on Kesseru leaves produced smaller sized cocoons compared to those fed on castor leaves, however, the cocoons from Kesseru fed worms were more compact. Rearers typically switched between different types of leaves depending on the availability or scarcity of food plants. When Kesseru was used and castor leaves later became available the worms were shifted to castor leaves. However, if the worms were initially fed on castor leaves, it was difficult to shift them to Kesseru when castor leaves became scare. This challenges is especially evident during the dry season, when castor leaves are scare, while Kesseru leaves are available round the year.

During the moulting period, silkworms stop feeding and at this period rearers do not provide food leaves to the silkworms. Rearers take care to avoid feeding wet, dirty, dusty, or yellow leaves to the worms to prevent the risk of disease. The leaves are thoroughly washed and dried before being fed to the silkworms. At the mature stage, the rearing beds are regularly cleaned to remove litter. Throughout the entire rearing period, rearers take proper care to protect the worms from pests such as flies, and rats, as well as from silkworm diseases. Eri silkworms are more resistant to diseases than other types of silkworms. Although Pebrine is a deadly disease in silkworms, Eri silkworms exhibit a high level of resistance to Pebrine compared to other silkworms. During the discussion with the rearers, a few mentioned that they use lime powder, either dusted on the ground or in a circular line around the bamboo poles of the rearing stand to restrict crawling of ants during rearing time. Additionally, rearers use ant wells or in rural areas unused plates, dishes or bowls to protect the worms from insects. Although Uzifly (Makhi) attacked silkworms throughout the year, the infection was severe during the rainy season. The uzifly lays its eggs on the silkworm's body and presence of black scars on the silkworm body is a clear sign of Uzi fly infestation, which is referred to called as *Mahipora* or *Sahipora*. To protect the silkworms from Uzifly infestation, rearers often cover the silkworms and the rearing stands with mosquito nets.

As the silkworms mature, their skin becomes thin and they stop eating, start crawling to the top of bundles in search of a place to hide and begin cocooning. To confirm the worm's maturity, rearers gently rub them between their fingers, listening for a distinct sound that indicate readiness for cocooning.

As the worms mature, they are transferred to a mountage (Jali) for cocooning. The Jali is typically made using dry leaves of banana, mango, jackfruit etc. Some rearers use bamboo basket filled with dry leaves to facilitate cocoon spinning, while others place the dry leaves under a nylon net or a piece of cloth to serve as the mountage.

Scientifically, the rearing house should be a separate structure with verandas on all sides and an adequate number of doors and windows to ensure proper cross ventilation. However, in most cases, local rearers were found to rear Eri silkworm either in their verandas, under makeshift shades or inside their dwelling houses. Only a few rearers in the study area had separate rearing house for Eri silkworm rearing, which were provided under a central government project.

Almost all the rearers sell their Eri cocoons and yarn to local middlemen or traders. Only the more experienced and progressive rearers of the study area sell seed cocoons to the nearby Central Silk Board (CSB) center at Topatoli for DFL (Disease-Free Layings) production. It was also noticed that a few rearers preserve a part of their cocoons for spinning and weaving at home.

Spinning of Eri silk is carried out using a simple traditional hand-held device known as *Takli*. While spinning with a *Takli* is slow and labour-intensive, spinner prefers to use *Takli* due to its ability to produce yarn with satisfactory twist and texture. A few spinners in the area also use improved devices, such as the Choudhury type spinning machine, which is significantly more efficient than the *Takli*. However, operation of these machines requires training and their adoption is limited due to the high cost, which most rearers in the study area cannot afford because of financial constraints.

In terms of weaving, traditional looms are commonly used for Eri fabric production. Weavers prefer *Takli*-spun yarn for its uniform twists, particularly for warp, while yarn produced by spinning machine is often preferred for the weft due to its softness and ease of use. A notable product is the Eri or Endi chadar-a traditional shawl that is especially popular in Assam during the winter season. The average size of the shawl for men is approximately 2.75 metres in length and 1.35 metres in width, while for women it measures around 2 metres in length and 1 metre in width. Apart from traditional shawls, weavers have begun producing other garments such as wash coats, stalls, and traditional attire worn by local tribal communities, reflecting a gradual diversification in Eri silk fabric production.

Below are some of the most commonly used traditional terminologies by the rearers in the Dimoria Development block of Kamrup district, Assam:

Table 1: Terminologies used by different tribes of the study area

Sl. No	Terminologies	Assamese	Karbi tribe	Tiwa tribe	Boro tribe
1.	Castor plant	Era Goch	Enki kime arong	Singru fang	Asa bifang/ bungfunk
2.	Kesseru plant	Kesseru Goch	Kansor arong	Konsor fang	Kusru bungfunk
3.	Tapioca	Mitha Alu/ Simalu Alu	Sangkru	Simli fang	Thasimala
4.	Silkworm egg	Koni/Sanch	Ati	Singru tudi	Bidwi, Taudi
5.	Eri Silkworm	Eri Polu	Engki kime	Singru	Asa, Imfwi
6.	Seed cocoon	Bidhan/Kothia	Asili	Khutia	Kuthia
7.	Round bamboo tray without sieve	Dola	Baleng	Sangra	Songrai/Dala
8.	Bunch of thatch stick used for egg laying	Kharika/Kathi	Aden	Khati	Bantukura, Oslai
9.	Round shape bamboo sieves	Chaloni	Ingkrung	Sangni	Salani/Sandri
10.	Crop	Khon	Akhen	Samoi	Fisnai

Sl. No	Terminologies	Assamese	Karbi tribe	Tiwa tribe	Boro tribe
11.	Male Moth	Chokra	Alo sukuri	Mawa sukuri	Huwa sikiri
12.	Female Moth	Chokri	Ape sukuri	Margi sukuri	Hinjau sikiri
13.	Moulting	Sal kata	Kasikarlok	Sakala salaiwa	Sal hangbai
14.	First moulting	Ek sal	Abar kasingther	Abar salawa	Gase tohangbai
15.	Second moulting	Dui sal	Barni kasingther	Tibar salaiwa	Ganei thangbai
16.	Third moulting	Tin sal	Bartom kasingther	Thinibar salawa	Gatham thangbai
17.	Fourth stage moulting	Mahari Jor	Asik singtherdo	Maharisar	Lamjanai
18.	Moult out from fourth stage	Mahari oloa	Ape kasingther	Mahari fiwa	Bima jabai
19.	Instar	Sal kota	Areng	Kur	Bigur
20.	Coupling of moths	Jora Khoa/ Bondha	Sihap	Jara nawa	Lamjanai
21.	Decoupling	Jora Bhonga	Sihap patikang	Jara arawa	Lamja khagnai
22.	Diseases- Pebrine	Phutuka	Adak	Tag	Tag
23.	Grasserie	Phula Bemar	Kangfe bemar	Fula pemar	Udi dunai
24.	Flacherie	Mukh laga	Amot kiwon	Mukh nanga	Shuganagnai
25.	Muscardine	Bhekur Bemar	Bhukura kiwon	Bhukura pemar	Pakhara bamar
26.	Rearing of worms	Polu puha	Ingki kiparheng	Singru khaiwa	Imfu fisnai
27.	Maturation of worms	Polu poka	Ako kiwang	faka fiwa	Gaman fainai, daunai
28.	Litters of Silkworm	Laad	Asik	Khay	Asa khinai, Imfu khinai
29.	Hand spinning device	Takli/Takuri	Takuri	Thakura	Kundur lunai
30.	Spinning of cocoon (Cocooning)	Leta Kunda	Sipaham	Bas khaiwa	Haha khabai
31.	Cocoon	Leta/Lat	Ahom	Sakola	Fithop
32.	Pupa	Poka	Aleta	Singru latha	Pithop, Latha
33.	Double cocoons	Jora leta	Janja ahom	Sanja latha	Jioya fithop
34.	Mountage made of dry leafy twigs	Jali	Ajhali	Bas	Jali/ Baha
35.	Harvesting of cocoons	Jali bhanga	Ahom kisang	Bas khaiwa	Jali/Baha gusarbai
36.	Person spun yarn by traditional Takli	Katoni	Kifer	Suta khaiwa	Khundung lunai
37.	Uzifly	Makhi/Mahi	Butu	Thamsu	Thamfoi
38.	Black scar/spot on the body due to Uzi fly infestation	Mahi pora/Sahi pora/Makhi bindha	Butu kangduk	Makhi pindhawa	Thamfoi kaubai
39.	Eri yarn	Eri huta	Shunki shan	Endi shut	Endi kundur
40.	Shawl made of Eri yarn	Endi chadar, Eri chadar	Shunki pay	Endi ray	Endi hisma, Endi hi

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Photographs

	
Castor plants in the homestead area for rearing	Kesseru plants in the homestead area for rearing
	
Brushing newly hatched silkworms	Rearing early-age silkworm on Castor leaves
	
Rearing of early-age silkworms on *Dola*	Rearing silkworm on hanging bunches of leaves

	
Cleaning and bunching castor leaves for feeding	Replacing with fresh bunches of leaves for feeding
	
Rearing of Eri silkworm in the Varandah	Rearing under a mosquito net
	
Application of lime powder on the floor to protect against ants, rats and other pests.	Ant well used to protect the worms from insects

	
Matured worms ready for cocooning	Jali made from dry banana leaves
	
Cocooning on a Jali made of dry banana leaves	Jali made of dry leaves covered with a plastic net
	
Harvesting of cocoons from the Jali	Selection of seed cocoons for egg preparation

	
Seed cocoons preserved for the production of DFLs	Supply of seed cocons for DFL production
	
Emergence of the adult Eri moth	Emergence of moth from cocoon garlands
	
Egg laying on Kharika	Spinning with the traditional *Takli*

	
Spinning using an improved spinning machine	Eri yarn spun on traditional *Takli*
	
Eri yarn spun with an improved spinning machine	Weaving of Eri silk on the traditional loom
	
Eri shawl crafted from Eri silk	Traditional attire made from Eri silk