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BIODIVERSITY IN ERI SILKWORM *SAMIA RICINI* (DONOVAN) GENETIC RESOURCES AND ITS CONSERVATION

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INTRODUCTION

In Saturniidae, the family of wild silk moths consists of many silk producing insects namely, Indian tropical tasar silk moth, *Antheraea mylitta* Drury, Chinese oak tasar silk moth, *A. Pernyi* G.M., Indian golden-yellow silk moth, *A. assamensis* W.w., Japanese oak silk moth, *A. yamamai* and India castor silk moth, *Samia ricini* Donoran. The silk produced by these insects play a pivotal role in strengthening rural economy of many developing nations. Among the saturniids, the species of the genus *Samia* have special relevance to mythological magnates namely, Uranus, Jupiter, Saturn and other personality's lineage indicated in respective places of discussion.

Distribution

Samia is distributed in entire East Asian Region. It is found along the Himalayas from Pakistan to Vietnam, covering all tropical South Eastern Asia. In China, it is available in half of the South Eastern Region particularly in one third of its eastern parts. It is also spread along the Palearctic territory of Korea, Japan, all the Philippine islands, whole of Indonesia, except Western New Guinea, this latter zone is now the part f Papuan sub-region of the Indo-Australian region.

Thus, the genus *Samia* can biogeographically be described as covering all of the oriental region (including India, Southern Asia, East Indies and Philippine islands) and eastern Palearctic region (Europe, North Africa and Asian north of the topic of cancer). All the species are tropical or sub-tropical and have little or no tolerance for freezing temperatures with the exception of one Japanese and two Chinese species.

Origin of Saturniidae

A voluminous literature is available on Lepidoptera. More than two dozen books which are particularly dealing with Saturniidae, where details of popularly known wild silk moths, giant silk moths, royal silk moths and emperor moths are available. A brief review of some classic literature on Saturnidae was presented by Peigler (1989). Some authors namely, Werner (1956), Oberprieler (1995), Lemaire and Minet (1999) indicated that the family Saturniide takes its name from "Saturn" the ringed planet, next beyond Jupiter and next to Jupiter in size, because the eye spots on the hind wings of many saturniids are sourrounded by concentric rings. Peigler and Noumann offered a different opinion regarding the origin Saturniidae Since the family name is derived from "Saturnia" the question is to be "What" is the origin of the generic name?"

In 1802, it was proposed by German botanist namely, Franz Paul Von Schrank. Later, Raugeot (1971) indicated that "Saturn" was the surname of 'JUNO' the mythological Roman goddess (the wife of Jupiter) who was accompanied by a peacock (in Rougeots words: "Nommed apres le surname de" "JUNON", qu' un paon accompagnait"). Peacock is part of the vernacular names in several languages of the three European species of SATURNIA. 'JUNO' (Here in Greek) was the daughter of the TITAN (one of a race of giant gods) named SATURNUS (KRONOS in Greek Mythology), the ancient Roman deity of sowings and harvesting. The connection between 'Peacock' and Saturn is therefore, tenuous and it may be impracticable to know reasoning of Von schrank.

Peigler and Nauman (2003) assumed that the origin of the name ' Saturnia' is simply one more example of naming these moths after mythological personalities with no particulars appropriateness. Look at our solar system, the planets were also named after mythological figures. The names figured are Uranus, Jupiter and Saturn chronology being mentioned Table 1 to 3.

Origin of the genus "Samia"

It is really some being astonishing that Linnaeus and Fabricius (1787, 1793) did not cite a group of common and wide ranging insects such as Samia, though they acquired insect specimens from all around the world. On Samia, the first published reference were by Drury (1773) and Cramer (1775). Even though the generic name Samia was proposed by Hubner (1819), the name reviewed only scattered and contradictory usage for more than a century. Even today many workers insist or remain in using the incorrect name *Philosamia, peigler &* Naumann (2003) stated that "this is remarkably amateur lepidopterists, sericultursits and those who study insect physiology and biochemistry, i.e., groups who traditionally have little or no who study insect physiology and biochemistry, i.e., groups who traditionally have little or no training and understanding of Zoological nomenclature. Many of the authors in India even in 21st century name the genus as Philosamia due to lack of professional expertise. Eligene Louis Bouvier, in his final monograph (1936) eventually discarded the name of Philosamia in complaisance to Samia Jacob Hubner (1761-1826) of Augsburg, Bavaria, published monographs beautified with hand-colored plates, in which he proposed hundreds of generic names for Lepidoptera (Rebel, 1910). Hubner worked simultaneously soon after Linnaeus and his student Fabricius when the number of known species within the order Lepidoptera was low enough that they could all be classified into only a handful of Linnian genera, such as PAPILIO, BOMBYZ, NOCTUA, GEOMETRA ec. Most of the moth names in combination with PHALAENA (eg. *Phalaena bombyx*). Kirby (1897) reported that as material of new species from all over the world was increasingly being received in Europe. Hubner correctly saw the need to propose many new genera, but unfortunately his contemporaries did not share his foresight and generally did not accept the new names. Specimens collected by Hubner eventually went to the Natural History Museum in Vienna (Nature Historisches Museum wien) but the collection was destroyed there by a fire in 1848 (Kudra and Wiemers, 1990). When the name Samia was proposed by Hubner (1816), he included three nominal species, all of which he erroneously attributed to Cramer. Hubner verzeichpoisc beekanter schemeitlinge was established by International Commisison on Zoological Nomenclature (Hemming, 1949). The three nominal species that Hubner included were Cynthia (*S. Cynthia*), Cecropia (*S. Cecropia*) and Promethea (now in callosamia). Before the concept of the genus solidified, regardless of the name applied, these insects were first considered to be silk moth (Bombyx, saturnia) and later "Small atlas moth" (Attacus). The taxa that were considered to become a part under *Hyalophora* are *Cecropia* (Linnaeus), Columbia (S. Smith) Goloveri (Strecker) and Euryalus (Boisduval (=rubra Neumogen and Dyar), and a generic synonym is Platysamia Grote. The name Samia has also been applied occasionally to other Attacini such as in original descriptions of *Callosamia secunfera* (Maassen), *Callosamia angulfers* (Walker).

According to Eliot and Soule (1902) who interpreted that scientific name of the genus, Samia of Lepidoptera was derived from "Samian" and has no appropriateness to the moths. Samian (from the Latin samius) refers to an object or native or inhabitant of "Samos", a Greek island in the Aegean Sea, north of Dodecanese near the coast of Turkey. In samos, remains of the temples of "HERA" (16th C.B.C.) are available. That was at its height of prosperity in 6th C.B.C.

Peigler and Naumann (2003) consider that this proposed origin of the generic name of the moths is likely, becaue Linnauns, Hubner, and other contemporaries, entormologists often applied names of personalities from ancient Greek and Roman mythology to large buytterflies, moths and beetles, particularly Papilionidae (Hawk moth). Later the name served as an origion for more generic names proposed in the family Saturniidae, such as

Table 1. List of Passport Data

Sl No	Accn.No.	Race Nam	Donor	Origin	Class	Percentage
1	SR-001	Borduar	RERS, ME(	ASM	O(RCU)	OR
2	SR-002	Titabar	RERS, ME(	ASM	O(RCU)	OR
3	SR-003	Khanapara	RERS, ME(	ASM	O(RCU)	OR
4	SR-004	Nongpoh	RERS, ME(	MEG	O(RCU)	OR
5	SR-005	Mendipat	RERS, ME(	MEG	O(RCU)	OR
6	SR-006	Dhanubha	RERS, ME(	MEG	O(RCU)	OR
7	SR-007	Chuchuyir	CMERTI,A	NAL	N	OR
8	SR-008	Lahing	CMERTI,A	ASM	N	OR
9	SR-009	Barpethar	CMERTI,A	ASM	N	OR
10	SR-010	Diphu	CMERTI,A	ASM	N	OR
11	SR-011	Adokgiri	CMERTI,A	MEG	N	OR
12	SR-012	Lakhimpu	CMERTI,A	ASM	N	OR
13	SR-013	Dhemaji	CMERTI,A	ASM	N	OR
14	SR-014	Kokrajhar	CMERTI,A	ASM	N	OR
15	SR-015	Imphal	CMERTI,A	MAN	N	OR
16	SR-016	Cachar	CMERTI,A	ASM	N	OR
17	SR-017	Dhakuakh	CMERTI,A	ASM	N	OR
18	SR-018	Genung	RERS, ME(	MEG	N	OR
19	SR-019	Jonai	CMERTI,A	ASM	N	OR
20	SR-020	Dhanustri	CMERTI,A	NAL	N	OR
21	SR-021	Sadiya	CMERTI,A	ASM	N	OR
22	SR-022	Tura	CMERTI,A	MEG	N	OR
23	SR-023	Jona Kach	CMERTI,A	ARP	N	OR
24	SR-024	Barpeta	CMERTI,A	ASM	N	OR
25	SR-025	Ambageo	CMERTI,A	ASM	N	OR
26	SR-026	Rongpipi	CMERTI,A	ASM	N	OR

MAN- Manipur; ARP - AndraPradesh; O - Old;
RCU - Rice in current use; N - New; OR - Original rice

Callosamia, *Philosamia*, *Platysamia* and *Metasamia*. Occasionally word "Samia" is alos ued as a woman's given name and it is also the name of a town I Western Kenya.

There is no hesitation that the suites of species that the genus Samia forms a monophyletic assemblage, obvious to any one viewing the actual insects. The closely relatives of the genus, Samia are the African Epiphora and North American Collosamia and Hyalophora.

Samia spp- Vernacular names

Samia Cynthia (Drury). The common names (in English) of *Samia Cynthia* are *" Cynthia moth"* and *"ailanthus silk moths"* is still being used in United States and other English Speaking countries. In reference to the *Crescentric discal marks,* a French common name is 'le croissant". In dutch, "de sikkelv linder" (the sickle moth) (Duponet and Scheepmaker 1936), the latter applied to *Samia insularis* and *S. Cynthia*.

1. *Samia Cynthia*: The vernacular names are *Cynthia moth*, ailanthus silk moth, Cynthia silk moth, Chyn can (Chu can) (Chinese: ailanthus silk worm), le croissant (French: the Crescent), le var a soie de I' ailante (French), Ailanthus spinner (German), sikkelv linder (Dutch), bombica dell' ailanto (Italian), Dalvanyfa-pavarzen (Hungerian), Zhong guo mei wen wanger (Taiwan: Chinese crescent

Table-2 Listing of morphological traits of germplasm			
Sl.No.	Acc.No.	Larval body colour	Cocoon colour
1	SR-001	Plain & zebra on yellow and blue	White
2	SR-002	Plain & zebra on yellow and blue	White
3	SR-003	Plain yellow and blue	White
4	SR-004	Plain yellow and blue	White
5	SR-005	Plain blue	White
6	SR-006	Plain yellow and blue	White
7	SR-007	Plain yellow	White & brick red
8	SR-008	Plain & zebra on yellow and blue	White
9	SR-009	Plain & zebra on yellow and blue	White & brick red
10	SR-010	Plain & zebra on yellow and blue	White
11	SR-011	Plain yellow and blue	White
12	SR-012	Plain & spotted on yellow and blue	White
13	SR-013	Plain & zebra on yellow and blue	White & brick red
14	SR-014	Plain yellow and blue	Brick red
15	SR-015	Plain yellow and blue	White
16	SR-016	Plain yellow and blue	Brick red
17	SR-017	Plain yellow and blue	White & brick red
18	SR-018	Plain yellow and blue	White
19	SR-019	Spotted on yellow	White
20	SR-020	Plain yellow	White
21	SR-021	Plain yellow	White
22	SR-022	Plain yellow	White
23	SR-023	Plain yellow	White
24	SR-024	Plain yellow and blue	Brick red
25	SR-025	Plain yellow	White
26	SR-026	Plain yellow and blue	Brick red

emperor moth), ga-joong na moo go-chi nabang (Korean: ailanthus tree silkworm moth).

2. *Samia Canningi*: It is one of the most brightly coloured species in the genus, even though there is variability. Vernacular name is Fagarta silkmoth (a name also applied to Attacus atlas)

- *Fagara Seiden* spinner (German)
- Kuan dai chu can (Chinese: wide-banded ailanthus silk worm)
- Yin du fen dai mei win wang er (Taiwanese: Indian powdery-banded crescent emperor moth)
- Ak si ek (Myanmar: Star excrement)
- Ngal dak (Chin language in Myanmar: bell of the enemy)

How the name "*Canningi*" originated?

Samia canningi (Hutton): The name "Cunningi" has been regularly misspelled as "Cunningi" becaue that misspelling was used by several early

Table 3. Listing of performance details of each accessions

Sl.No.	Accn.No.	Fecundity	Hatching %	Larval wt (g)	val period (da)	Effective rearing	Cocoon w (g)	Shell wt (g)	Shell Ratio (%)
1	SR-001	441.99	95.04	8.27	23.00	90.06	3.64	0.50	13.74
2	SR-002	458.91	94.35	8.25	22.00	90.52	3.70	0.48	12.97
3	SR-003	435.46	94.05	7.31	23.00	88.12	3.55	0.48	13.52
4	SR-004	442.74	92.56	8.47	21.00	87.31	3.52	0.46	13.07
5	SR-005	455.44	91.77	8.42	23.00	89.25	3.61	0.47	13.02
6	SR-006	459.50	92.61	8.43	22.00	88.24	3.56	0.47	13.20
7	SR-007	385.44	76.89	7.97	22.00	85.22	3.79	0.42	11.08
8	SR-008	413.00	78.90	7.73	23.00	82.00	3.13	0.39	12.46
9	SR-009	345.00	71.20	7.92	22.00	80.00	3.32	0.40	12.05
10	SR-010	418.50	90.42	8.00	23.00	87.50	3.10	0.38	12.26
11	SR-011	366.50	89.33	8.11	21.00	85.25	3.56	0.45	12.64
12	SR-012	318.50	86.78	8.14	22.00	90.50	3.10	0.36	11.61
13	SR-013	385.00	84.92	7.62	22.00	81.50	3.24	0.37	11.42
14	SR-014	348.00	79.50	7.80	23.00	76.65	3.87	0.46	11.89
15	SR-015	414.75	91.40	8.19	21.00	79.50	3.62	0.44	12.15
16	SR-016	340.40	89.56	8.17	21.00	88.65	3.08	0.37	12.01
17	SR-017	371.50	87.45	7.79	23.00	86.50	3.17	0.38	11.99
18	SR-018	635.79	92.20	8.48	22.00	89.96	4.51	0.59	13.08
19	SR-019	357.50	85.04	7.64	23.00	90.06	2.95	0.37	12.54
20	SR-020	472.00	84.35	8.19	24.00	90.52	3.09	0.38	12.30
21	SR-021	353.00	84.05	7.48	25.00	88.12	3.62	0.49	13.54
22	SR-022	442.74	72.56	8.14	25.00	87.31	3.11	0.40	12.86
23	SR-023	255.44	91.77	8.11	25.00	89.25	3.24	0.41	12.65
24	SR-024	359.40	82.61	8.00	25.00	88.24	2.85	0.35	12.28
25	SR-025	430.00	94.00	8.43	18.00	85.00	3.01	0.45	14.95
26	SR-026	380.00	92.00	6.65	20.00	92.00	2.00	0.30	12.55

authors such as Gue Rinmeneville (1862) Cotes and Swin Hoe (1887) and Buttler (1889). Even workers like Seitz (1928), Schubler (1932-1934) also committed the same mistake The name "Cunningi" was proposed by Captain Thomas Hutton to honor Carles, John Canning (1812-1862), who was governor general and first Vice roy of India, serving from 1856 till 1862. "Mr. Canning " Proposed many agendas in the British colony of which Sericulture was only one. There is a town bearing his name Southeast of Calcutta (Kolkata).

Relating the life and career of "Canning", Mac Lagan (1982) wrote a book. *Samia canningi* is a larger and attractive species that is distributed over much of the mainlands of South Eastern Asian Region. *S. Canningi* is well documented to thrive well on *Ailanthus altissima*, in captivity in England and in North East India. The cocoons were exported from India to England during 20th century. Canningi was first reported form the mountains and foot hills of temperate and tropical India at altitudes of 150 to 2,500 meters. Later the silkworms were unhesitatingly found on different host plants (trees and shrubs) spread in mountains and foothills of temperate and tropical India. In Assam, its primary food plant is *Ailanthus excelsa* a sub-Himalayan Species similar to *A. altissima.* Both species of *Ailanthus* are food plants of *S. Canningi*. Hutton (1861:63) reporte Coriaria nepalensis, a shrub found in Northern India as one of its food plants. Incidentally, Hutton also discovered that Indian moon moth larvae (*Actia selene*) commonly fed on *Coriaria nepelensis* at Mussoorie (Moore,

1859). Vaelschow (1904) saw it feeding on barberry (Berberies asiatica) along with Attacuc atlas in a proince of Kumeon (Kurseong, sikkim) in North India (Voelschow, 1904). In places like Southern Yunnam and Myanmar (Burma) where specimens of S. canningi and S. Kohlli appeared to be similar because the individual specimens could not be identified by wing colour and pattern through dissection of the genitalia which forms the reliable basis of species determination.

The dark sepia form of *S. canningi* can be considered to be *semi-melanic*. Among *samia, "melanism"* (abnormal development of dark coloring matter in the skin, feathers etc. opposed to albinism or excessive darkness of the eyes, hair, skin etc. due to extreme pigmentation); only species group of Cynthia. The same has been seen in *S. Cynthia* (Pyle, 1975), *S. canningi* and some forms of *S. ricini*. The wings of semi-melanic specimens of *S. canningi* superficially resemble hybrids between *Callosamia* and *Samia. S. canningi* varies in its ground colour more than any other species in the genus. Polymorphism must be polygenic (Mayr, 1999) as intermediates are also observed. The polymorphism could be a defensive adaptation in some regions to counter against search images formed by avian predators (Evans, 1984).

This hypothesis works among many of the completely isolated populations of Lepidoptera available in a wide range of habitats like foothills, mountains and low lands where the genes which code for wing color expression become fixed or lost quickly, Allen (1993) observed that, in Nepal, there are at least two forms, a smaller pale form flying in the terrain (low lands) and foothills of Eastern Nepal and a larger, more intensely marked form flying in the mid-hills of central Nepal.

3. Samia ricini: It is the lonely and only one species of Saturniidae that has become fully domesticated. It does not occur in the wild. It is derived from S. canningi according to the structure of the genitalia, wing pattern and chromosome number. The main distinguished feature of *samia ricini* is the diffusion of the abdominal white tufts, some times resulting in individual with a solid white abdomen. It was raised to the rank of individual species for convenience of communication and stability of nomenclature, I the accepted tradition of naming like that of other domesticated forms such as the *mulberry silk moth (bombyx mori)* derived from *Bombyx mandarina* and dog *(Canis familiaris)* derived from wolf *(Canis lupus)*.

The Vernacular names of Samia ricini are:

- En silk moth
- Bi ma can (Chinese: castor silkworm)
- Bi ma mei win wang er (Taiwanese: castor crescent emperor moth)
- Pimojoo nooe nabee (Korean: castor silkworm butterfly)
- Pigmajoo nooe nabang (Korean: castor silkworm moth)
- Le bombyx du ricin (French)
- Ver a soie du ricin (French)
- Erisan (Japanese)
- Himasan (Japanese: castor silkworm)
- Eri spinner (German)
- Eri-seiden spinner (German)
- Rizinus spinner (German)
- Ricinussein raupe (German: castor silkworm)
- Bombice del ricino (Italian)
- Bicho-da-seda da mamona (Portuguese)
- Enia, arrindi, andi
- Endi (Bhutan)

Actually endi, eri and arrandi mean the castor plant so that eri silk, endi silk and eriseide mean castor silk. The words ricin, nicino and rizinus also refer to the castor plant (Ricinus). Thus the name of eri culture persists predominantly by cultivating castor and rearing of silk worm and naming the silkworm species *ricini* under genus *Samia*.

4. *Samia wangi:* lesser atlas moth (English in Hong kong), mai win wang ir (Taiwan: cresent emperor moth)

5. *Samia pryeri*: Japanese (Ailanthus moth), Ribin chu can (Chinese: Japanese Ailanthus silkworm), mit sugi kaiko (Japanese), shinjusan (Japanese: Ailanthus silk moth)

6. *Samia watsoni*: Jiao ban chucan (Chinese: angled-spot Ailanthus silkworm) Dam u win wanger (Taiwanese: large crescent emperor moth), Taiwanshinjusan (Japanese: Taiwanese Ailanthus silkworm).

7. *Samia peigleri:* Yin ni xi mii wen wang ir (Taiwan: Indeonesian narrow crescent emeror moth)

Cytogenetics of Saturniidae

Majority of Asian workers had reported cytogenetics of Saturniidae. The chromosome members in different taxa were simply reported without further details. The model number for Saturniidae observed is n=31. This is the number for species in the genera namely *Actias, Hylophora, Antheraea, Cricula* and even *Automeris*, the later belonging to the sub-family Hemileucinae (Belyakava and Lukhtanov, 1994), The lower chromosome number n=29 was reported in *Callosamia promethean* (Drury). This reduced number of chromosome supports that *Callosamia* is closely related to Samia. Based on stock from north eastern China (Lining, Shandong and Shanghai) and Korea (Yosida, 1953; Wu, 1962), the chromosome number for S. Cynthia is n=13 and S. Wangi from Taiwan is n=13. Crosses were made by Wu (1962) between. *S. ricini* and *S. Cynthia* walkeries and observed one trivalent and 12 bivalent chromosomes in the hybrids. *S. canningi* (Khasi hills, Meghalaya, India), *S. ricini* (India and Korea), *S. pryeri* (Jpana) reported to have chromosome number n=14. narang and Gupta (1979 a,b) from India studied the cytogenetic.

From the available cytogenetic date the following taxonomic opinions originated are:

a) *S. Cynthia* and *S. pryeri* are not conspecific.

b) *S. Cynthia* is most closely allied to S.w angi whose chromosome number n=13

c) The taxon S.ricini was originally derived from *S. Canningi* in India, but probably some cultures also contain genes obtained from *S. pryeri.*

Ecoraces of *Samia ricini*

Based on the morp 26 eco-races of Samia ricini has been identified. These 26 Eri silkworm Germplasm are maintained at Central Eri, Muga Research and Training Institute, Central Silk Board. Ladoigarh, Assam. The characterization of Eri silkworm is mainly based on the heritable morphological characters of Samia ricini. 10 descriptors have been utilized for investigation of the 26 eri silkworm Germplasm accessions based on larval colour with rearing performance and cocoon colour with economic traits. These include larval colour, cocoon colour, fecundity, hatching percentage, larval weight, larval period, effective rate of rearing, cocoon weight, shell weight and shell ratio.

Samia and Human culture

The majority of Samia are exploited for sericulture by human beings. The pupae of Samia ricini are also utilized in some Asian culture s as sources of highly nutritious food for humans, mainly by the tribal inhabitants and to some extent other habitants particularly in Norht eastern India including West Bengal, Nepal etc. Pupae contain crude protein (60%). Free amino acids (5.8%) including Citrulline, cysteine, Methionine, Aspargin, a-alanine, arginine and hydroxyl-praline, total lipid (26%) including glycerol triolene, neutral lipid, phospholipid, and cholesterol, vitamins including pyridoxal, riboflavin, thiamine, ascorbic acid and folic acid and mineral like calcium, iron and phosphorus.

Conservation of Eri Silkworm Germplasm

Biodiversity is the complete variability in all living organisms and the ecological complexes that they inhabit and has three levels in diversity namely ecosystem, species, and genetic diversity. India is blessed with rich natural beneficial insect fauna. For conservation of biodiversity we require intensive co-operation of all concerned who utilizes the products arising from biodiversity. It was decided in the global biodiversity conservation conference that the concerned parties would adopt strategic plan effectively and coherent implementation of the objectives of CBD and to prevent biodiversity loss at global, national and regional level. Central Silk Board Ministry of Textiles Government of India, has established Central Sericulture Germplasm Resources Centre, at Hosur for conserving the diversity in the mulberry and its silkworm genetic resources and presently conserving 1190 mulberry genetic resources and 443 silkworm genetic resources, which includes 73 MV, 350 BV and 20 Mutants. Further with a view to conserve the biodiversity and to augment the Eri silkworm Seed sector and its primary and secondary host plants Castor (*Ricinus communis*) amd Tapioca (*Manihot utilissima*);

Central Silk Board has also established an Eri P2 Basic Seed Farm in South India *i.e.* in Hosur Tamil Nadu. The prime function of the Basic Seed Farm is to conserve the Eri silkworm biodiversity which includes 26 eco races along with primary host plant Castor (*Ricinus communis*) and secondary host plant Tapioca (*Manihot utilissima*).

Ahimsa silk

While rearing mulberry silkworm *Bombyx mori,* exclusively for silk, it is always essential to kill the pupae to extract the silk from the cocoons, whereas the rearing of eri silkworm (*Samia ricini)* is just opposite because its cocoons are used for processing spun silk wherefrom moths have already emerged. Therefore, culturing eri silkworm (*S. ricini*) has been favored by the people whose religious practices forbid the taking of silkworm life such as Buddhists in Sri Lanka. Brain (1904) and Myers and Bean (1994), Suryanarayana and Chouba Singh (2003), chouba singh and Suryanarayana (2003). Hence the eri silk can be called "Ahimsa silk".

Eggs of *Samia ricini* are used to culture *Anastatus spp*. (Eupelmidae) and *Trichogramma dendrolini* Matsumura, tiny parasitic wasps used in biological control against pests of *Dendrolimus sibiricus* and *D. punctatus* Walker (Lasiocampidae). Pathogens, *Beauveria* spp. and *Bacillus thuringiensis* Berliner re also cultured in larvae or pupae of *S. ricinis* to ue against the pine pests in China (Anonoymous, 1980), Another increasing common value is that *Lepidoptera* are reaching the public in Insect zoos (*Arthropadaria*) and Butterfly houses. Butterfly houses in Britain often exhibit *Lepidoptera* live stocks from India. (Collin, 1987)

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