

SERIL CULTURE.

INTRODUCTION:- Gregarious numbers of insects existing today in the gigantic animal realm has drawn the attention of biologists as well as non-biologists from the dawn of Civilization not only due to their Innocence activity, which some times prove itself as an unprecedented loss to the human Society but perhaps due to their beneficial activity. The activity of the same of the insects are liked and cordially welcomed. This infatuation between man and insects began long before the advent of Civilization has continued without cessation to the present time, and will continue, no doubt as long as the human race endures. We commonly think of Ourselves as the lords and conquerors of the nature, but insects had thoroughly mastered the world silk which is produced by the insects is the queen of the textiles. The silk is obtained by a Caterpillar called "silk worm" belonging to order; Lepidoptera and family; Bombycidae and Saturniidae.

VARIETIES OF SILK:- Nearly 30 species of silk insects belonging to the above families are capable of producing silk of one or another kind. The important of which are the following.

a) MULBERRY SILK:-

It is creamy white in colour and is obtained from Bombyx mori and its races that feed on mulberry leaves.

b) ERI SILK:- It is creamy white but less shiny mulberry silk and it is obtained from Caterpillar of Attacus ricini feeding on Castor leaves.

c) TASAR SILK:- It is coppery coloured silk produced by Caterpillar of Antheraea mylitta feeding on Sal leaves.

d) **MUNIVA SILK**:- A golden coloured silk allied to tassar is obtained from caterpillars of Antheraea assamensis feeding on som and Campo leaves.

e) **CHINESE SILK (TASSAR)**:- A brown silk is the product of the caterpillars of Antheraea pernyi feeding on oak leaves.

f) **JAPANESE TASSAR**:- A light green silk obtained from Antheraea yamamai feeding on oak trees.

LIFE - CYCLE OF SILK WORM:-

A. **MULBERRY SILK WORM**:- This is completely domesticated insect and is never wild. The adult insect is a ~~pale~~ pale cream, white medium sized moth which very rarely flies. Though provided with the wings. The female lays numerous eggs which are whitish and seed like. The egg hatches into a caterpillar larva which is an elongated and cylindrical with a small dorsal horn on the anal segment. It measures two inches in length and has a pale yellowish white colour before undergoing pupation, the larva moults four times.

On about 24 hrs it builds a fine yellowish white cocoon of pure silk around itself and changes into the pupa inside the same and emerges as the adult moth is about 10-12 days. One cycle is completed in about 6 to 8 weeks and the variation of time is dependent on the season.

b) **TASSAR WORM**:-

This is wild silk worm found in the forest and has not yet been domesticated like Mulberry and eri-worm.

The life cycle is more or less

Similar to Eri worm. A newly hatched worm is covered with clusters of black hairs and each worm measures an average of about an inch in length. The head of the worm is black and the body is yellow. It undergoes four moults. After 3rd moult its size becomes $1\frac{3}{4}$ inch and colour becomes green. The female is larger and brilliantly yellow coloured while male is relatively small and brick red coloured.

THE REARING OF THE SILK WORM:-

1) Mulberry Silk worm:-

- 1) The rearing of the worm is carried out in a seed rearing house which is well ventilated but made up of split bamboos and straw. It usually have a clean Kukha floor and provided with two entrances and several windows.
- 2) In order to keep the temperature low inside in summer and high in winter the floor may be sprinkled with water in hot season and charcoal fire pieces in winter.
- 3) Since the mulberry worm feed voraciously on mulberry leaves a large supply of it is necessary. Along the side of seed rearing house "machans" are fixed upon which several tiers of feeding trays are kept.
- 4) The trays are rimed and generally measures 3' in size in which freshly hatched worms are fed with chopped mulberry leaves.
- 5) The feeding trays are cleaned every day by removing the leaves and transferring the worms to other trays.
- 6) When the worms are fully grown they become eager to spin the cocoons round themselves. At this time they should be transferred to another "machan" which consists of a spire 2' high upon a foundation. The worm can also be induced to spin in cocoon inside the crumpled straw paper cutting and other kind of straw materials.

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- b) **Tassar silk:-** The forest tribe usually tie the Seed Cocoon to a pole by means of Cotton thread.
- 1) The male moth fly away on emerging out of the Cocoon but the female remains sitting on them. The male visit at night and copulate. The fertilized females are transferred to earthen pots in which they lay their eggs.
 - 2) When eggs are laid they are scrapped off and kept in fresh cups made up of some materials.
 - 3) When the worms come out of the eggs they are transferred to their favourite host trees without touching by hands. The worms feeding on the leaves of the host trees grow in size and become mature in about 40 days.
 - 4) When they spin Cocoon on the branches of the trees the Cocoon are hanged from the branches by means of a stalk and dance in the air when the breezy blows. When the Cocoon are made they are plucked and kept in basket for further treatment.

PROCESSING OF THE COCOON:-

a) Mulberry Silk:-

- 1) In a day or two after pupation the Cocoon are taken into hot Sun for 2-3 days to be stifled with steam to kill the pupa inside.
- 2) Silk is reeled into a long single thread from the Cocoon so the moth coming out of the pupa not allowed to pierce the Cocoon.
- 3) For the purpose of reeling, the Cocoon are kept in a basin of hot water for about 10 minutes and continuously stirred with a few pieces of stick so that their outer position is loosened to remove in the form of long tapes and the end of the continuous filament is found.

- 4) The filaments of several cocoons are then pieced up and passed through the glass eye and reeled. The thread thus reeled forms the raw silk.
- 5) Following attention should be paid by the rearer:-
- 1) Selection of disease free seeds for rearing.
 - 2) Feeding the worms with clean leaves.
 - 3) Keeping the trays and shade for rearing thoroughly cleaned by disposing of dead worms and dry worms.

b) TASSAR SILK:-

- 1) The peduncle of the cocoon are removed and the cocoons are then dipped in 1% HCl overnight. Next day they are taken out of it cleaned with 1 tola of washing soda and placed in an earthen pot, the bottom of which is perforated of several places.
- 2) Another similar earthen pot is filled with 2 tola seeds of water and 1 1/2 tola of washing soda is added to it and the pot is placed over a little heat producing fire. Then the pot is covered with a lid.
- 3) Cocoons become steamed in about 3-5 hrs after being steamed the cocoons are washed with clean water and placed in a dry cloth bag to remove the excess of water from the cocoon.
- 4) Then the filaments are separated from the cocoons and twisted together and placed upon a spindle.

SPUN SILK INDUSTRY:-

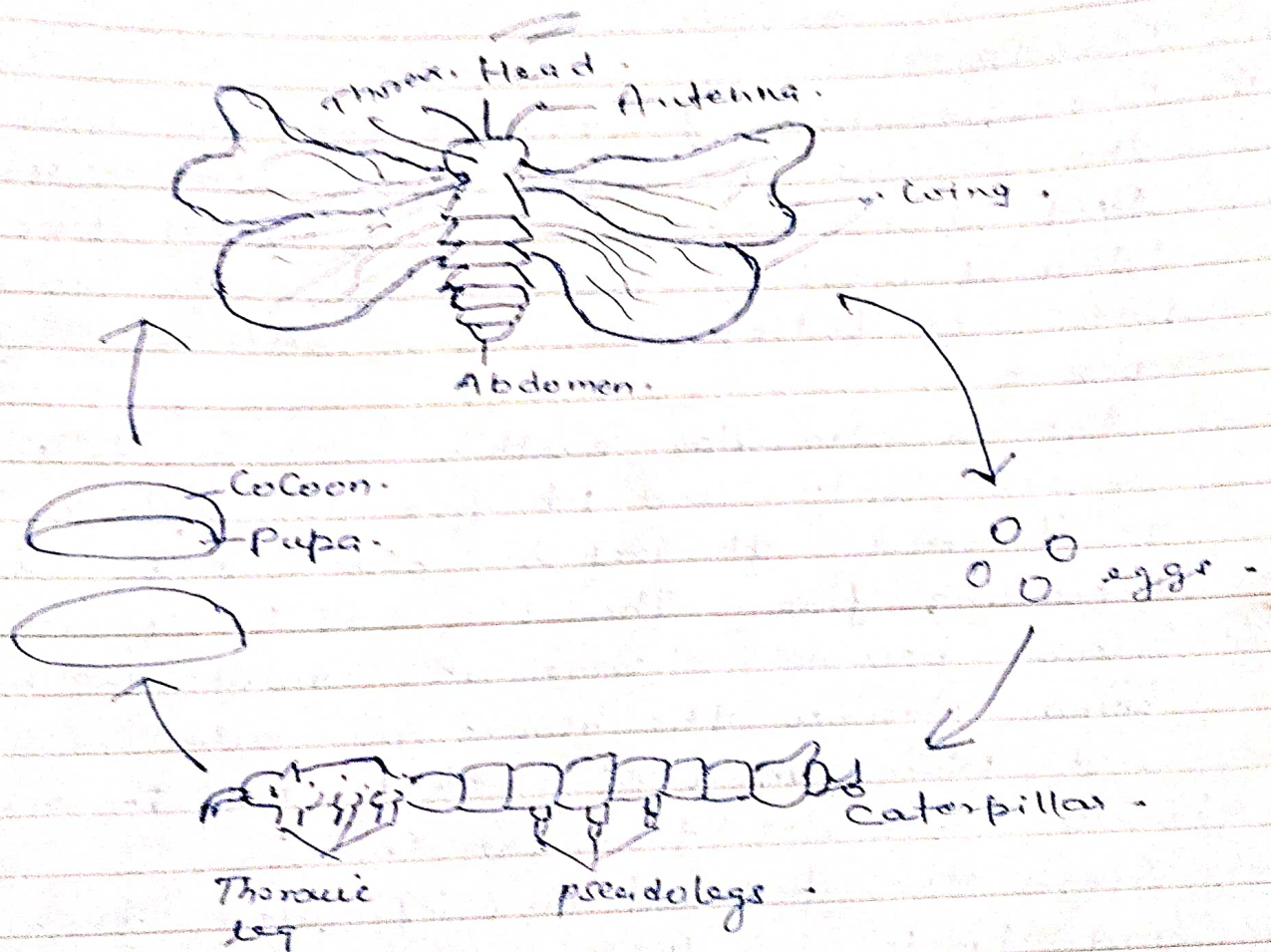
- 1) The spun silk industry utilizes the waste product of the silk industry and constitute an important subsidiary industry by itself. Outer and inner portion of cocoon are rejected as waste of reeling and the waste obtained in the process are used in silk spinning mill.

- 2) Spun silk is an important fibre silk. The only spun mill is present in India is in Mysore state. In the gal cut and unreelable cocoons are spun with the spindle (which is then into a continuous thread).

USES OF SILK

Silk is utilized in the manufacture of

- (1) Knitted fabrics for garments.
- (2) Parachutes.
- (3) Fishing threads.
- (4) Sieves for flour mill.
- (5) Insulation coils for telephone and wireless receivers.
- (6) Tyres of racing cars.



Life-cycle of silk worm.