



GOVT. DEGREE COLLEGE, SIDDIPET (Autonomous), 502103



PROJECT WORK - 2020-2021

A report on silkworm rearing in GDC, Siddipet (A).

Submitted to the Department Of Zoology



Name of the supervisor:

M. Gunakar,

Asst. Prof. of Zoology

CERTIFICATE

This is to certify that the project titled 'A report on silkworm rearing in GDC, Siddipet (A) during 2020-21' submitted by FZC & BZC students is a record of bonafide work carried out by them along with others under my guidance and supervision.

The particulars in this student study project have not been submitted to any other Institute or University for the award of any degree or diploma or certificate.

M. Gunakar,

Asst. Professor of Zoology

List of student participants:

- | | |
|--------------------|----------|
| 1. Sara Taskeen | Bsc. FZC |
| 2. J. Sai Priya | Bsc. Fzc |
| 3. M. Arvind Naik | Bsc. Bzc |
| 4. B. Nagesh | Bsc Fzc |
| 5. Sai Tharun Goud | Bsc. fzc |

CERTIFICATE



This is to certify that the study project titled 'A report on silkworm rearing in GDC, Siddipet (A) during 2020-21' submitted by FZC & BZC students is a record of bonafide work, carried out by them along with others under the guidance and supervision of Sri M. Gunakar, Asst. Professor of Zoology, GDC Siddipet (A), by the students of B.Sc. FZC & BZC:

List of student participants:

- | | |
|--------------------|----------|
| 1. Sara Taskeen | Bsc. FZC |
| 2. J. Sai Priya | Bsc. Fzc |
| 3. M. Arvind Naik | Bsc. Bzc |
| 4. B. Nagesh | Bsc Fzc |
| 5. Sai Tharun Goud | Bsc. Fzc |

Head of the Department

Principal

DECLARATION

We hereby declare that the contents presented in this study project entitled 'A report on silkworm rearing in GDC, Siddipet (A) during 2020-21', that is being submitted to the department of Zoology is a record of original work done by us under the supervision and guidance of Sri M. Gunakar, Asst. Professor of Zoology, Govt. Degree College, Siddipet (A).

Further, this is to state that the particulars embodied in this project have not submitted to any institution or university for the award of certificate or diploma or degree.

- | | |
|--------------------|----------|
| 1. Sara Taskeen | Bsc. FZC |
| 2. J. Sai Priya | Bsc. Fzc |
| 3. M. Arvind Naik | Bsc. Bzc |
| 4. B. Nagesh | Bsc Fzc |
| 5. Sai Tharun Goud | Bsc. Fzc |

SERICULTURE

INTRODUCTION:



- Sericulture is the silk producing agro-industry
- India is the second largest silk producing country in the world after china.
- Sericulture or silk farming is the rearing of silkworm for the production of silk
- Silk is known as queen of textile and bio-steel because of its strength.

SERICULTURE: HISTORICAL PERSPECTIVE

A Chinese tale of the discovery of the silkworm's silk was by an ancient empress Lei Zu, the wife of the emperor. She was drinking tea under tree, when a silk cocoon fell into her tea cup and the hot tea loosened the long strand of silk. As she pulled it out, and started to wrap the silk thread around her finger, she felt the warm sensation. When silk ran out, an larva appeared. She realized that it was this larva that produces the silk. Soon, she taught this to people and it became wide spread.



SERICULTURE: STAGES OF PRODUCTION

Sericulture can be divided into 3 divisions as follows:

1. Cultivation of mulberry: Agricultural Division



2. Rearing of cocoon: Entomological Division



3. Reeling of cocoons: Technical/Industrial Division



CULTIVATION OF MULBERRY (MORICULTURE)

- Mulberry silkworm feeds on mulberry plants of genus *Morus* with various species:
- *M. alba*, *M. indica*, *M. serrata*, *M. latifolia*
- Alternate plants: sage, orange, lettuce, peepal trees
- Climatic conditions: Temperate to tropical regions, 15-37 °C, rainfall range 600-2500mm, altitude 300 -900m above sea level.
- Regions: Karnataka, Andhra Pradesh, Tamilnadu, Telangana
- Mulberry is deep rooted perennial, grows well in loamy soil or red sandy loamy (murrum).
- Seasons: plantation during early spring and late autumn with stem cuttings or root grafting.

Establishment of mulberry

• Land Preparation



Land for mulberry cultivation is ploughed deep with a heavy mould board plough up to a depth of 30-35 cm. Thereafter the land is repeatedly ploughed two or three times with a country plough to bring the soil to a fine tilth.

The land should be properly leveled. A basal dose of well decomposed farmyard manure (FYM) or compost is applied at the rate of 10 tonnes/ha and thoroughly incorporated into the soil.

- Spacing:



The spacing commonly followed for a rain fed garden is 90 x 90 cm pits of 35 x 35 cm are prepared. About 1 kg FYM/pit should be added.

Stakes and planting



Branches of 8-10 months old and about 50 mm in diameter should be used for the preparation of stakes of 22-25 cm length with five to six healthy buds. Three stakes are planted per pit in a triangular form with spacing of 15 cm, leaving only one bud exposed above soil surface. If planting is done with saplings, then one sapling is sufficient per pit with 3 to 4 buds exposed.





Fertilization: 50N:25P:25K (kg/ha/year) in two doses. First dose: suphala (15:15:15) 167 kg, after 2 months of planting. Second dose: urea 55 kg or cam (100 kg) or ammonium sulfonate (125 kg), at end of September or early October before cessation of monsoon rains.

Pruning and leaf harvest



The first crop should be harvested six months after plantation when the mulberry is well established. Two more crops are harvested during the first year by the leaf picking method. Mulberry should be pruned after one year at the onset of the next monsoon. Pruning is done by sharp sickle or pruning saw or cutter at a height of 25-30 cm from the ground.



Green manuring and mulching. Green manure crops can be grown as an intercrop with mulberry during the monsoon only. Green manure crops (cowpea, horse gram, dhaincha) should be incorporated into soil by ploughing before the flowering starts and well before the rains cease. Subsequently, plots may be mulched with any dry material or plants that will not cause needs.



ENTOMOLOGICAL DIVISION

This includes the rearing of silk moth. This is the most typical and time consuming process. This required the complete knowledge of the life cycle of the interested silk moth, along with its morphology and anatomy.

Mulberry silk worm

Bombyx mori



1. The insect producing mulberry silk is a domestic variety of silkworms, which has been exploited for over 4000 yrs

Life cycle of Mulberry silkworm

| Stage | Period(days) |
|------------|--------------|
| Egg | 9-12 |
| Larvae | 25-30 |
| I Instar | 3-4 |
| II Instar | 2-3 |
| III Instar | 3-4 |
| IV instar | 5-6 |
| V Instar | 7-8 |
| Pre-pupa | 4-7 |
| Pupa | 10-12 |
| Adult | 2-3 |

Egg laying

Silk moths lay eggs on specially prepared paper by using paper card method.



<---Wax coated paper used for laying of silk moth eggs

Chemical treatment of eggs

I) Formaldehyde treatment (2%) - Immersing eggs are disinfected.

II) Acid treatment (1.1 5g HCl)-eggs are immersed for 5 minuets

III) Washing in running water

IV) Air drying-keeping under the fan

Incubation

I) 1st day to 7th - keep the eggs rapped in a tissue paper.

II) 8th day-black boxing, eggs are rapped with black paper or put in to black box to prevent irregular hatching.

Hatching

- 11th day morning all the eggs are gray in color with dark spot.

- Expose eggs to light and then eggs are hatched around an hour.
- Silkworms are white but this stage is black in ant stage, which hatch into an ant called as larva of about 1/8 inches (3mm) in length.
- This can be done at breeding station or rearing station.

Brushing

- Keep the eggs cards in rearing trays and removal of warms from egg shells/cards.
- Then giving 1st feed (1cm strips of tender mulberry leaves). Warms are very attractive to mulberry leaves because it contains citral (a fragrant liquid substance)

Warm rearing station

I) feeding

II) Cleaning

III) Increasing space

Feeding the larva

- The larva at this stage has voracious appetite and requires careful nourishment.
- They are fed 5 times a day on chopped mulberry leaves.

- After four changes of skin or molting the worm reach full growth of about 3 ½ inches (9cm) long.
- At this stage the interest in the food ceases and is ready to spin its cocoon
- The silkworm begins to secrete a protein like substance through a small opening under the caterpillar's jaws which is called as the spinneret.
- The silk solidifies when it comes in contact with the air.
- On 3rd day, 20000 warms need 0.8 square meters.
- Stop feeding for about day. Molting need 20 hours
- 4th day do not feed even they do not eat.
- End of the 3rd moulting management and maintain low RH.
- 5th day-2nd instars-spacing gradually increase.
- 7th day -molting management
- 8th day-3rd instar, increase space, feeding mature leaves and cleaning
- 11th day -molting
- 12th day-4th instars.
- 16th day-molting
- 17th day-27th day-5th instar, branch feeding. This is called floor rearing or table rearing.

- Pupation-On 27th day: They leave the leaves and look for a corner to build a cocoon. Within twenty – four hours and in three days the cocoon is complete to a size and shape of a peanut shell. The filament is in the form of a double strand of fibroin, which is held together by a gummy substance called sericin, or silk gum.

As this cutting damages the cocoon, the filament cannot be unwound in one long thread. The life cycle is terminated at this point by a process known as stoving, or stifling.

*Note:

If left undisturbed, the pupae inside the cocoon develop into a moth within two weeks. To emerge, the moth breaks open the cocoon by secreting an alkaline liquid that dissolves the filament.

TECHNICAL DIVISION

This involves the extraction and purification of silk fibers from cocoon

This is the last step for sericulture

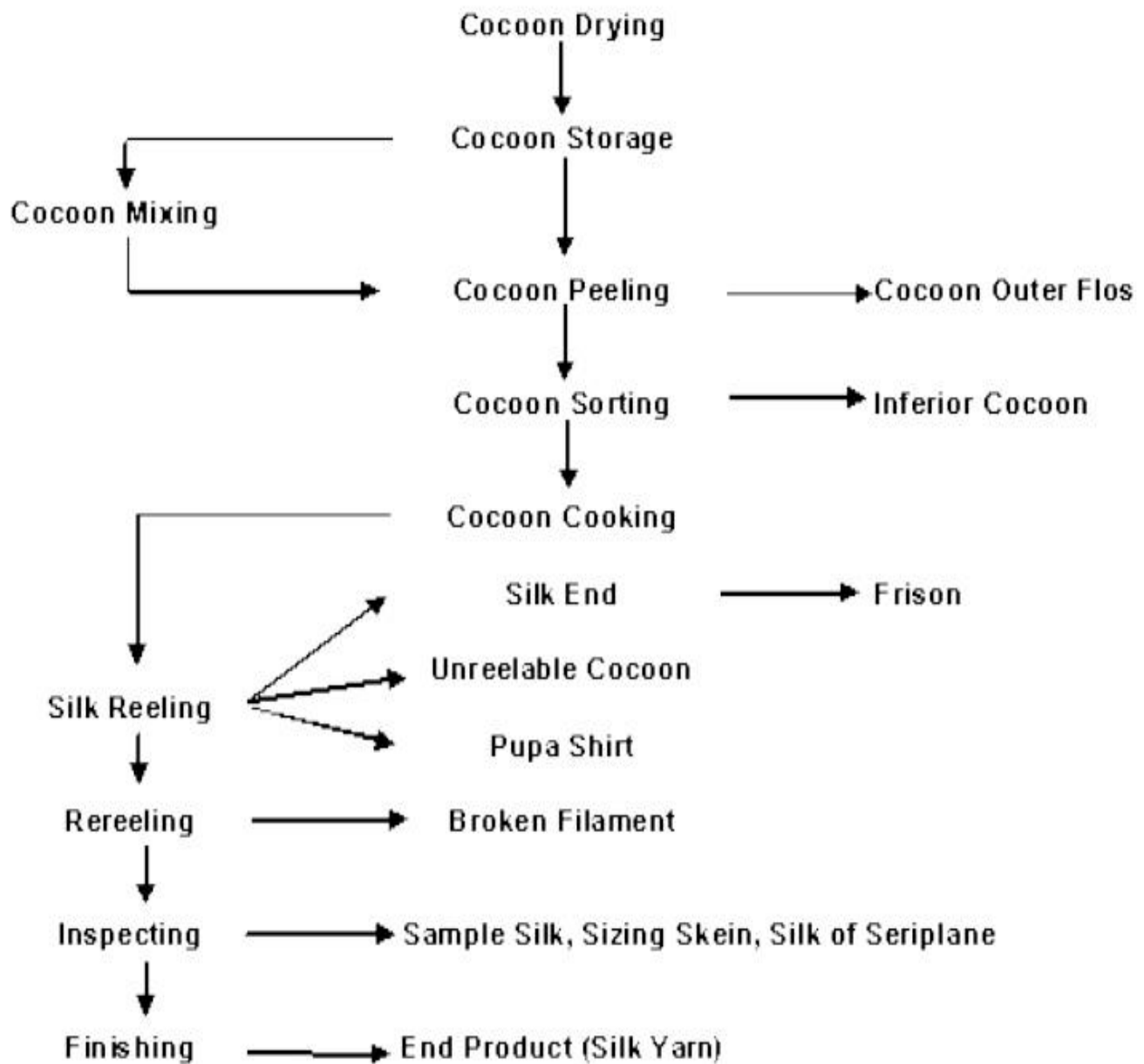
- This is the energy consuming and time consuming step.

In this, only 30-40% cocoon (pupae) of the rearing tray are allowed to complete their life-cycle, while rest are used for obtaining silk fibers

This is the post-cocoon process

To obtain 1kg of silk, 4500-6000 cocoons are required depending on the quality, compactness and weight

Technological process for silk reeling.



WHY SERICULTURE IS CHOSEN AS OUR PROJECT

- Sericulture being cottage industry plays an important role in employment.
- Returns generation and poverty alleviation: It is one of the most profitable activities in rural sector.
- Availability of indigenous technology at low cost
- Regular and quick returns. Large demand and Popularity of hand woven silks in the west.
- Strong domestic demand coupled with use of silk garments on festive occasions
- Large production gap to meet the domestic demand
- Scope for establishing the large production units and organized sector

Schedule of silkworm rearing is as under:

1. 19-11-2020 ---Received silkworm seed (eggs) from Sericulture department
2. 21-11-2020 ---- Hatching of silkworm eggs and commencement of feeding the silkworm larvae with mulberry leaves
3. 06-12-2020 ---- No. of silkworm trays increased to 3
4. 13-12-2020---- No. of silkworm trays increased to 6
5. 17-12-2020---- No. of silkworm trays increased to 12
6. 22-12-2020---- No. of silkworm trays increased to 16
7. 23-12-2020---- Cocoon formation (Development from larva stage to Pupa stage) started
8. 31-12-2020----Harvest of cocoons

Note: All these works are carried out in the premises of department of Zoology, Government Degree College, Siddipet (A).

GALLERY:





Shot on Y17
Vivo AI camera

2020.12.18 16:10

Shot on OnePlus
BY SAI GOVINDA



REDMI NOTE 8 PRO
AI QUAD CAMERA



Shot on OnePlus
BY SHAIK GOWDAR















END