

# Life Cycle of Tasar Silkworm

**Compiled by Dr. Nidhi Garg**

# Introduction- Classification

- **Kingdom: Animalia**
- **Phylum: Arthropoda**
- **Class: Insecta**
- **Order: Lepidoptera**
- **Genus : *Antheraea***
- **Species : *mylitta D***
  
- **Common name : Tasar silkworm**



# Introduction

- The word tasar apparently derives from the Sanskrit word “**trasara**”.
- Tasar silk is mentioned in literature dating back to **1590 B.C.**
- The Indian tasar silkworm, ***Antheraea mylitta*** is a natural fauna of tropical India.
- **Wide distribution and polyphagy** of this insect species had resulted in **extensive variation in the population.**
- As high as **nineteen ecoraces** have been reported in this species which feed primarily on ***Terminalia species*** and ***Shorea robusta*** and also on number of secondary food plants.

# Introduction

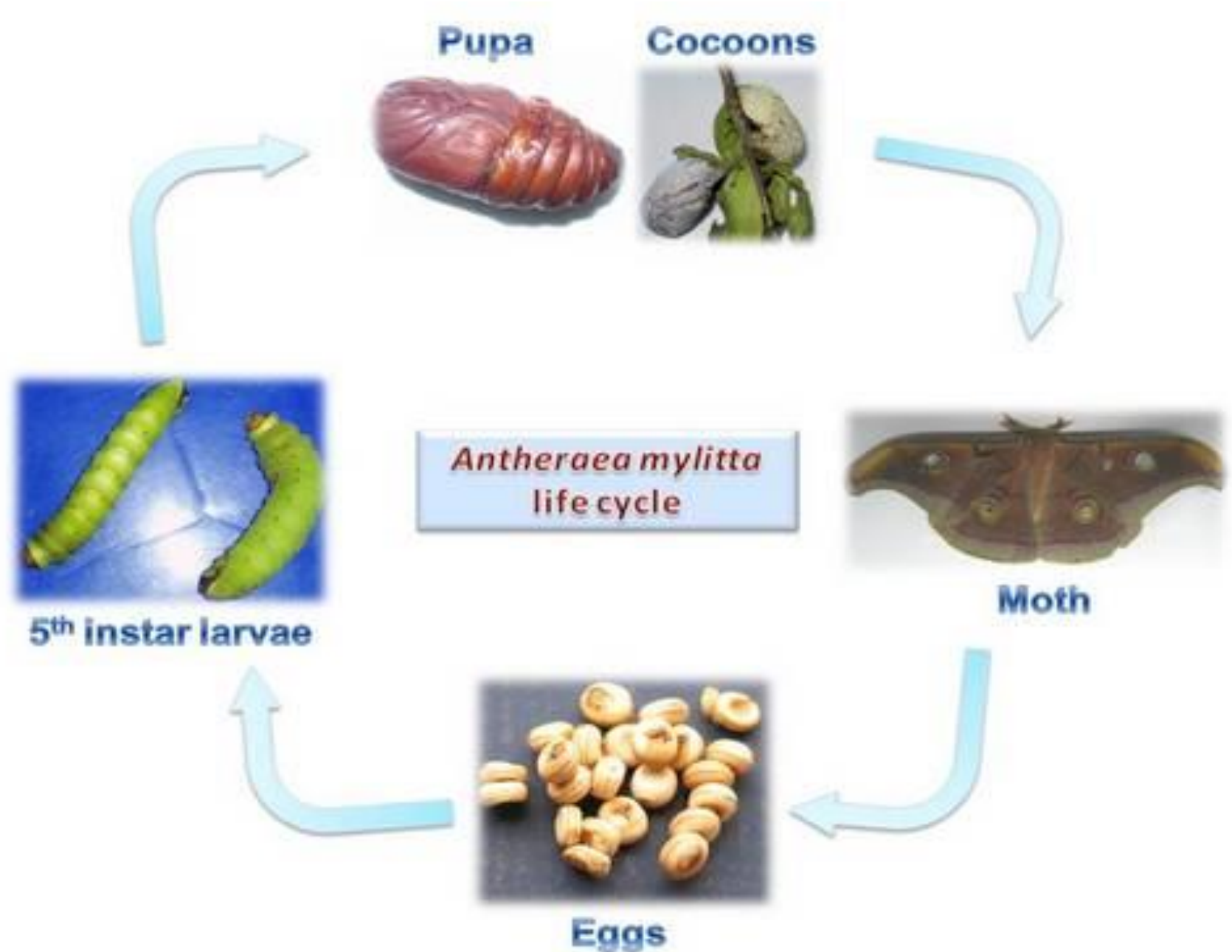
- The ecoraces are **uni, bi or trivoltine** depending upon the geo-ecological conditions and differ from each other in qualitative and quantitative traits.
- Tasar **cocoons** are reported to be **largest** among all the silk-producing insects in the world.
- Tasar silk fiber has its own **distinctive colour, is coarse to feel, but has higher tensile strength, elongation, and stress-relaxation values** than the mulberry silk fiber secreted by *Bombyx mori*.
- These properties have made tasar silk as **competent and desirable** as mulberry silk.

# Introduction

- **Host Plants:**
- The larvae of *Antheraea mylitta* are **polyphagus** and can take leaves of several host plants like **Arjun, Asan, Ber, Sal, Jam, Sidha, etc.**
- **Distribution:**
- This silk moth is available in **China, Sri Lanka** in addition to **India**.
- In India, it is available in the states of **Jharkhand, Chattisgarh, Orissa, A.P. and West Bengal**.
- **Life History:**
- The tasar silkworms are grown **only in the wild**. So they are cultivated in places where their host plants are available.

# Stages of Life History

Egg  
Larva  
Pupa  
Adult



# Adult tasar moth

- By piercing one end of the cocoon the adult moths come out.
- Adults are very large with colourful wings spanning about **15 cm**.
- **Female has yellowish grey wings and males possess yellowish red wings with prominent eye spots** on each wing (Fig. 3.24a).
- The males mate the females just after emergence.



# Eggs

- After copulation, the female starts laying the eggs. A single female can lay **100-150 eggs**.
- The egg is **oval, dorsoventrally symmetrical** along the anteroposterior axis.
- About **3mm in length** and 2.5mm in diameter, it weighs approximately **10mg**.
- At oviposition it is **dark brown** owing to the **gummy coating of meconium**.
- Two brownish parallel lines along the equatorial plane of the egg divide the surface into three zones; **disk, streak and edge**.





Adult worm



Moulting



Cocoon Stage



Moth coupling



Young worm



Hatching of worms

**Name: Antherea Mylitta**

**Duration of life cycle: 40-70 days**

**Feeds on: Arjuna and the Asan tree**

**Number of life cycles a year: 1, 2 or 3**

# Larvae

- The eggs hatch within **9-10 days during summer** and **15-20 days in winter**.
- Following hatching the larvae start taking food leaves from the host plants.
- The larva is typically **cruciform** and has a **hypognathous head** with **biting and chewing mouthparts**.
- On hatching it is **dull brownish yellow** with **black head**.
- The body normally **turns green and the head brown after about 48 hours**, but also yellow, blue and almond-coloured larvae are met with occasionally.

# Introduction

- The worms are generally **green in colour with hairs on cuticle.**
- It **moults 4 times** during the whole larval period that continues for **30-55 days during summer** and **50-60 days during winter.**
- **Body colouration is retained throughout the larval period.**
- The tasar larvae **are stout and smooth**, and have rudimentor scoli.

# Tasar Cocoon

- The mature larvae spin cocoons which are hard with **different colours according to the types of plant leaves they fed.**
- Some are light green, others are yellow, and some are grey and others almost white (Fig. 3.24c).
- Unlike mulberry cocoons, the tasar cocoon **has a stalk (peduncle) which helps in fixing the cocoon with the twig of host plant** [Fig. 3.24b(v)]. The tasar cocoon attains a size like that of **hen's egg.**

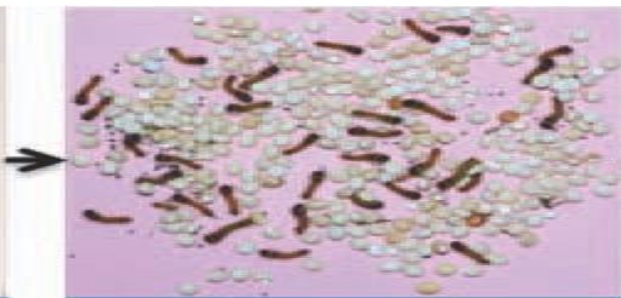


Fig. 3.24(d). Colourful tasar cocoons





**Moth**



**Eggs and larvae**



**1<sup>st</sup> instar larvae**



**2<sup>nd</sup> instar larvae**



**Larva Just emerged**

**Typical life cycle/different stages of  
non-mulberry silkworm,  
*Antheraea mylitta***



**3<sup>rd</sup> instar larva**



**Pupae taken out  
from cocoons**



**4<sup>th</sup> instar larva**



**Cocoons**



**Late spinning**



**Spinning started**



**5<sup>th</sup> instar larva**

**FIGURE 2. Typical life cycle/different stages of non-mulberry silkworm, *Antheraea mylitta***

# Life History

- **Pupa:**
- The worms grow into pupae within the cocoon.



Fig. 3.24(c). Collected tassar cocoons from wild

# Cultivation of tasar worm

- The tasar rearer **collects the female moth from the wild** and keeps it tied with the twig of host plant carefully.
- The males are then attracted by the **pheromone secreted by the female** and start copulation.
- After mating the female lays eggs which are collected by the farmers and are **gummed on long strips of paper- or leaf-made cup** which are then hung on suitable host trees, where they hatch quite naturally.
- A **barrier of some sort is coiled around the host tree trunks** to prevent the caterpillars from wandering.



# Cultivation of tasar worm

- The worms after hatching **start feeding the leaves.**
- During the larval stage, which occupies up to **eight weeks**, guard is kept against the insect's natural enemies such as **bats, birds and beetles.**
- On completion of the spinning, the **cocoons are harvested like fruit.**
- Sometimes farmers may **collect cocoons from the wild instead of eggs.**
- Nowadays from many places, Government breeding centres also supply **disease-free tasar eggs of desired breeds to the rearers.**



# Tasar silk

- By two methods, **reeling and spinning**, yarn can be produced from the cocoons.
- Tasar filaments show the **greatest length among the non- mulberry silks, 700 m.**
- The **spun yarn is generally coarse** with a denier of 270-280, while the **reeled yarn is fine and thin** with a denier value of 80-100.
- Tasar silk has natural shades of **pale gold, pinkish honey, creamy copperish, etc.** depending on the **colour of cocoons.**
- It is **less lustrous but coarser than mulberry silk.** The fabric is **light, airy, and stiff**, and has its own feel and appeal.

# Tasar silk production

- In India, the production of tropical tasar silk remained next to mulberry silk for decades, constituting about 4 per cent of the total silk production.
- There is an ever-increasing demand for tasar silk owing to its **strength, lustre and copper brown colour**.
- The tasar silk production has stagnated and declined in the recent past though the demand is increasing.
- The important reasons for low production are attributed to **traditional method of silkworm rearing on tall trees** in natural habitat, which exposes the larvae to a number of **predators, parasites and diseases apart from natural vagaries**.

# Oak Tasar silk moth

- A finer variety of tasar silk is generated by the silkworm *Antheraea proylei* and *A. pernyi*.
- China is the major producer of this tasar but in India it is available in Manipur, Assam, Meghalaya, Himachal Pradesh, Jammu & Kashmir.
- These moths feed on leaves of oak, are found in abundance in sub-Himalayan belt.
- The oak tasar is finer than the common tasar silk.