

# Tasar Silkworm Culture

## Tasar Silkworm

Several species of *Antheraea* are exploited for production of wild silk known as tasar silk. These are *Antheraea mylitta*, *A. pernyi*, *A.yamamai*, *A.paphia* and *A.royeli*. *A. mylitta* and *A.*



*paphia* are reared in central and north eastern parts of India. Many regional strains known by different local names are also found. Three types of voltinism, namely Uni-, Bi- and Multi-voltine are found in *A. mylitta* and *A. paphia*. These are reared on trees of *Terminalia tomentosa* (Vern. Asan), *Terminalia arjuna* (Vern. Arjun), *Shorea robusta* (Vern. Saal) and *Zizyphus jujuba* (Vern. Ber). Rearing of *A. pernyi* and *A. royeli* has been introduced recently in Manipur. These are reared on *Quercus* or Oak. *A. pernyi* and *A.yamamai* are the tasar silk worms of China and Japan respectively. These species feed on Quercus or Oak trees and are normally bivoltine.

The tasar moths are fairly large insects. Females are larger and yellowish brown in colour, while males are smaller and brick red in colour. Both have prominent and colourful eye spots on their wings. The antennae of males are bushy, and abdomen is narrower in comparison to female.

## Rearing of Tasar Silkworm

Cultivation of food plants is generally avoided, as tasar silkworms are wild in nature and need to be reared outdoors. However, modern sericulturists prefer to cultivate the food plants for better supervision. Cultivation is done with seeds

or saplings being raised in nurseries. Saplings are transplanted to fields 20-25 feet apart. Agronomic practices are carried on regularly. Pruning is done regularly to maintain better foliage growth.



It is the bi-voltine variety of tasar worm that is used for commercial purpose. The cocoons of bi-voltine variety harvested in November/December go into diapause at pupal stage and moths generally emerge in May/June of following year. The rearing of worms from eggs produced in May/June is completed by June/July. This is the summer crop. These cocoons do not undergo diapause. The moths emerge in 15-20 days, and the layings prepared out of this crop are used for rearing the second crop during September/October. The summer crop is seed crop for second crop which is commercial crop. The rearers usually keep the necessary quantity of seed cocoons from the previous year crop for preparation of egg laying. Emergence is usually in the evening. The males are active and copulate with the females soon after emergence. After copulation the females are decoupled and kept in bamboo baskets for about 48 hours to lay eggs. A single female lays about 150-200 eggs in 2 days. The eggs are oval and dorso-ventrally flattened. Eggs are soaked in 2% formalin, washed with water, dried and allowed to hatch. Life cycle of tasar worm consists of adult, egg, larva and pupal stages.

The larvae hatch out in ten days. The hatching larvae are kept in cups made up of leaves and the cups are uniformly distributed over the host trees. These larvae crawl in search of food. The larval period lasts for 30-35 days in summer, which may prolong in winter. The larvae pass through four moults and 5 instar stages. The hatched 1<sup>st</sup> instar larvae are brown and change to green colour at second instar. There are a number of tubercles on the body, which carry the setae.

The final instars are green in colour with violet tubercles distributed over the body. A prominent brown and yellowish lateral line is visible on either side of the body. The tubercles are violet. The dorsal tubercle carries brick red dorsal spots, and lateral tubercles carry mirror like shining lateral spots.



The larvae feed voraciously on leaves and defoliate trees. In *Antheraea*, cocoon formation takes about in two days. It follows gut purging, initiated by ecdysone production in which larva expels gut contents by a series of waves of contraction passing along the abdomen from front to back. Subsequently, the larva enters an active wandering phase, which ends when it finds a suitable site in which to pupate. The first phase of cocoon formation is the construction of a scaffold of silk threads between leaves of food plant and the production of stalk or peduncle which attaches the cocoon to the leaf petiole /tree twig. Subsequent behavior consists of a series of cycles in which the larva weaves loops of silk by figure of eight movements of the head to construct one end of the cocoon and then turns through 180° to form the other end. After a period of about 14 hours, by which time a complete layer of silk has been produced, the insect turns from one end of the cocoon to the other at much shorter intervals, and at the same time, it coats the inside of cocoon with a liquid from the anus containing crystals of Calcium Oxalate produced by the Malpighian tubules. The hydration of silk by secretion promotes cross-linking and tanning of the silk protein sericin, and the wall of cocoon becomes stiff and yellowish-brown. This period of impregnation lasts for an hour. After this more silk is added to the inside of the cocoon. The rearers then harvest the cocoons. In addition to systemic rearing, the cocoons are

collected in forests by the tribes and forest men, as the tasar worms thrive naturally in wild.

### **Post Cocoon Processing**

Cocoon are first soaked in 5% Soda ( $\text{Na}_2\text{CO}_3$ ) solutions for 18 hours and then subjected to steam cooking in pressure chambers for 2½ hours to bring about the stifling of cocoon. After 24 hours, the stifled cocoons are washed in 0.5% formalin for 15-20 minutes followed by washing with water. Water is then squeezed out, and cocoons are reeled on reeling machine.

The waste outer layer, damaged cocoons and peduncles are teased, and then silk thread is spun on earthen matka. The spun silk is commonly known as katia matka.