

Muga Silkworm Culture

Muga Silkworm

Muga is an Assamese word which indicates the golden brown (amber) colour of the cocoon. The Muga silk worm, *Antheraea assama* is mainly confined to the Brahmaputra valley of Assam and



foothills of East Garo hills of Meghalaya. Its distribution in the wild state, however, extends from western Himalaya to Nagaland, Cachar district of Assam and south Tripura. However, commercial exploitation is restricted only to north eastern India. The Muga silk worm is multivoltine and passes through four moults and five instar stages. Generally 4-5 crops are raised in a year. Muga silkworm is a polyphagous insect. It feeds on the leaves of several kinds of trees, but *Machilus bombycine* (Vern. som) and *Litsaea polyantha* (Vern. soalu) are the two principal host food plants of muga silkworm. The host plants are cultivated through propagation by seeds or vegetatively by air layering. The plants are trained and pruned regularly.

Like other Lepidopterans, muga silkworm is a holometabolous insect passing through a complete metamorphosis from egg (Koni) to adult (Chakari) stage through two intermediate stages of larva (Polu) and Pupa (Leta). The entire life cycle lasts for about 50 days in summer and 120 days in winter. The wings and body of the male moth are copper brown to dark brown, while those of female, yellowish to brown. Both pair of wings bears eye spots. Besides colouration, the male moth can be distinguished from the female by its slightly smaller size, slender abdomen, bushy antennae and sharply curved forewing tips. It is a semi-domesticated species in the sense that only the larval stage is spent in open, and the ripening worms are brought indoors for spinning the cocoons.

Rearing of Muga Silkworm

The seed cocoons intended for preparation of eggs are obtained from commercial rearers or from Government grainages. These are then laid in a single layer



in trays to facilitate the emergence of moths. Emergence starts from dusk and continues till morning. Male moth is smaller in size has slender abdomen and bushy antennae. The emerging adults are allowed to mate and in the coupled state itself the pair is tied with a piece of cotton thread to 1.5-2 feet long stick made of dried straw which is known as Kharika. After overnight mating, the couples separate in the morning and if they do not decouple naturally they are made to do so by heat of fire lighted some distance away. The female moth lays about 150-250 eggs on Kharika. During summer, the worms hatch out in the morning in about 8 days. The Kharikas with the hatched worms are hanged on the host plants. The larvae immediately crawl and start feeding. When the leaves are exhausted, the larvae crawl down and are collected on triangular bamboo sieves with long handles (Chaloni), which are again hanged on a fresh tree. A band of straw with a little sand or ash is tied around the tree trunk 1-1.2 m above the ground to prevent the worms from crawling down the ground. The larvae feed voraciously, pass through 4 moults and reach the mature stage. In the final stage, larvae become greenish blue with prominent tubercles. Larval period lasts for 30-35 days. The ripe worms



come down the trees searching for a suitable place for spinning of cocoon. They are then collected by rearers and put in baskets containing mango twigs and leaves, which are set as cocoonages (Jali) for the spinning of cocoons. The jalies are then hung and left undisturbed in separate rooms or at some shady place till

cocoons are formed. Spinning takes about 2-3 days in summer and 7 days in winter. Muga cocoon is golden or light brown, 4-6 cm long and 2-3 cm broad with a rudimentary peduncle without ring.

Post Cocoon Processing

The muga cocoon is compact and leathery in structure. The length of continuous silk filament ranges from 350-450 meters with 4 to 5 breaks.

Stifling

Immediately after removal from the mountages, cocoons are spread on bamboo mats in sun during hot hours of the day that partially kills the chrysalis. These are then subjected to heating in oven that kills the chrysalis completely, and the cocoons are stifled.

Degumming

It is the process by which gummy substance is softened and compact filaments are released for reeling. Cocoons are boiled in mild alkaline solutions for about 15-20 minutes.

Reeling

Almost entire reeling is done with a primitive machine called Bhir. The cocoons are kept in basin with warm water. Reeling requires two persons: one person releases the filaments from cocoons while the other twists the filament into one thread and wind it on Bhir. Two persons can reel around 100g raw silk per day on an average. Only 40-45% silk filament is reeled and rest is rejected as waste.

The other reeling machines include different types of Charkha: Chaudhary, Trivedi, Bharali, CMERS, Golden Muga, RMRS-I, RMRS II, RMRS III, Ambar Charkha. Reeling with these machines is economical, as it requires only one person. Standard wild silk thread is made up from 8 cocoons and averages 32/34 deniers. The typical finished fabrics are Rajah, Shartaug, Tussah, and Pongee etc.