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Tussar Silk - Concise

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Silk, a highly prized fabric, was discovered as a weavable fiber by the Chinese empress Xi Lan Shi in 2,640 B.C. The Chinese kept the knowledge of silk culture and weaving a secret for over 2,500 years. Sericulture, the production and weaving of silk, is predominantly carried out by economically disadvantaged sections of society, making it popular and sustainable in countries like China and India.

Sericulture is practiced in more than 40 countries worldwide. Among them, India holds the second position in raw silk production, following China. However, India stands out as a unique producer of five distinct types of silk: Mulberry, Tropical Tasar, Temperate Tasar, Eri, and Muga. This makes India exceptional in the global silk production landscape. Mulberry silk accounts for the majority share of 86.5% in the overall silk production, while the remaining 13.5% is attributed to the production of non-mulberry silk (Singh and Chakravorty, 2006; Ray and Mohapatra, 2021).

Vanya Silk

Non-mulberry silks, such as Tasar, Eri, Muga, Anaphe, and limited-production varieties like Fargana, Coan, Mussel, and Spider, also contribute to the industry (FAO, 2023). Non-mulberry silk varieties have a higher production cost due to their reliance on domesticated silk insects. Muga silk, unique to the Assam region of India, is difficult to cultivate in other parts of the country. However, Tasar silk, with its immense potential, has been naturally bestowed. Tasar silk is also known as tussar silk, kosa silk, and vanya silk, and sometimes referred to as wild silk. In some regions, it's also called tusaar, tusser, tushar, tusa, tassore, tussore, tussur, or tusser. Tasar cultivation presents a promising opportunity as an additional activity in the world's forests. On one hand, it helps to mitigate deforestation, while on the other, it enables the profitable utilization of this abundant natural resource. Tasar silk is known for its copperish colour and is primarily used in furnishing centers.

Tasar Silkworm

Tasar silkworms are plant-feeders and rely on specific primary and secondary food plants for their sustenance. The genus Antheraea, which includes Tasar silkworms, comprises more species of sericigenous insects than any other genus (Mohanty, 1998).

Tasar silk is produced by different eco-races of Tasar silkworms, which are primarily influenced by natural environmental conditions. There are two main types of Tasar silkworms: tropical and temperate. The species *Antheraea mylitta* feeds on various host plants such as *Terminalia tomentosa* (Asan), Terminalia arjuna (Arjun tree), *Ziziphus mauritiana* (Ber), *Terminalia catappa* L. (Badam tree), *Quercus* spp. (Oak), *Terminalia tomentosa* (Indian laurel), and *Shorea robusta* (Sal) (Bambhaniya *et al*., 2017).

The major Tasar silk-producing states in India include Jharkhand, Odisha, Chhattisgarh, West Bengal, and Andhra Pradesh. Tasar silk rearing plays a vital role in the livelihoods of many tribal communities in these regions (Gautam *et al*., 2022).

Life cycle

Egg: The egg is oval in shape, dorso-ventrally flattened and bilaterally symmetrical along the anterio-posterior axis. Eggs of tropical tasar measure about 3 mm in length and 2.5 mm in diameter and weighs approximately 10 mg, while, oak tasar, eggs measure about 2.5 x 2 mm and weighs about 7 mg. Freshly laid eggs are dark brown in colour. After washing, it becomes white, light yellow or creamy. The eggs hatch in around 12 days from the day of hatching.

Larva: The newly hatched larva is dull brownish yellow with black head, measuring about 7mm long and 1 mm diameter and weighs about 8 mg. The larva at maturity measures about 13 cm long and 2.1 cm diameter and weighs about 50 gm. Various types of tubercles are present on the body. There are several hairs and setae, which are white, minute and irregularly distributed over the body. Shining spots are also present at the base of dorsal tubercles. The tasar silkworms moult four times and pass through five instars. The larval period varies between 30 and 70 days during different seasons in different races. The fully grown larva spins a cocoon taking support of one or two leaves and forming a hammock and a peduncle to firmly cling to the plant. The process takes place in 4-6 days and the shell is very hard.

Pupa: The pupa is the resting stage in the tasar insects (Fig 1). Pupal period varies greatly lasting from days to months depending upon the voltinism.

Moth: Females are bigger (4.5 cm) with a broad abdomen and narrow bipectinate antennae of 1.5 cm long. Males are smaller (4.0 cm) with a narrow abdomen and broad antennae. The females are gray or yellow, whereas, males are brown or yellow or gray. Mouthparts are reduced, as moths do not feed. In male, the wingspan is about 16 cm, while, in female, it is about 18 cm. Post-median lines (PM) is red with a white line on the border. The ocellus with a transparent area is prominently positioned at the centre of the wing. Each female moth lays around 200 eggs which continue their generation.

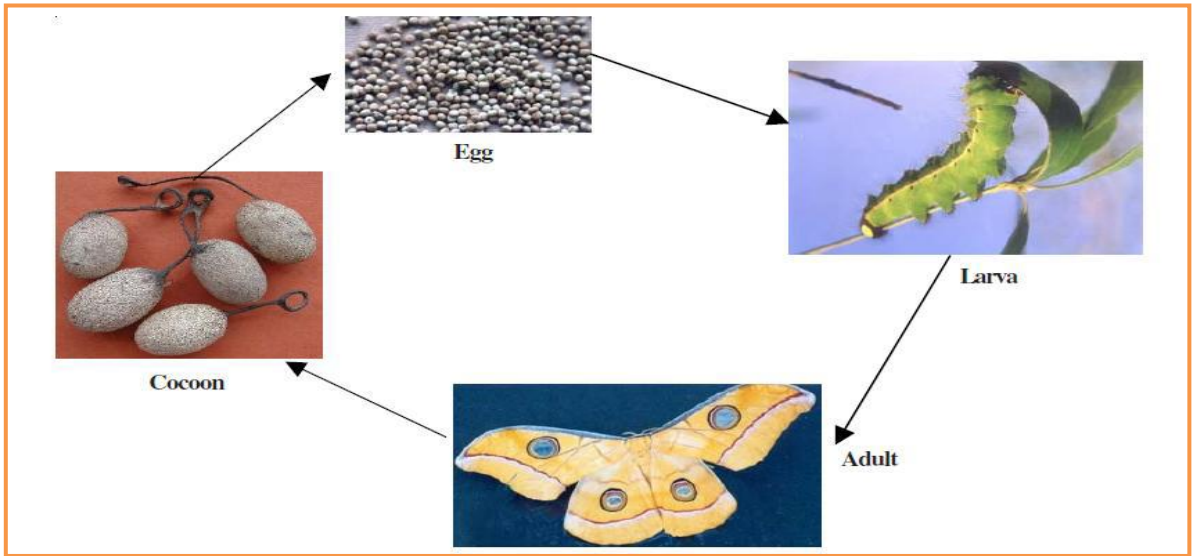

Fig 1. Life cycle of Tasar silkworm

Significance

The Tasar culture also plays a vital role in the conservation of bioresources. It offers substantial financial returns, employment opportunities for both genders, and serves as a strong foundation for Tasar silk-based rural cottage industries. Studies worldwide emphasize the recommendation and promotion of sericulture to restore environmental stability, safeguard endangered silk insects, and preserve related flora and fauna for future generations.

The investigation of food plants for Tasar silk production is important not only for the sustainable exploitation of wild silk insects but also for the conservation of wild biodiversity. Conservation efforts aimed at preserving Vanya silk entomo fauna indirectly contribute to the preservation of overall biodiversity (Novotny *et al.,* 2002). Biodiversity conservation has

become a matter of livelihood and sustenance for humanity, making it essential to preserve sericulture biodiversity, especially the endangered Tasar silkworm germplasm and its food plants. Initiating conservation awareness programs for rural communities and promoting silk worm rearing can provide economic benefits to tribal communities while supporting forest and biodiversity.

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