

B.Sc 1st Semester (Zoology Major)
Salbari College , Baksa (BTR)
Life Cycle of Eri Silkworm

By : J K Nath (Asst. Professor)

Life Cycle of Eri Silk Worm

Eri silkworms are known for their unique ability to feed on a variety of plants, including castor, tapioca, and papaya. This adaptability contributes to their significance in sericulture. The life cycle of the Eri silkworm can be divided into four main stages: egg, larva, pupa, and adult.

Egg :

The first stage of the Eri silkworm's life cycle is the egg stage. The female Eri moth lays tiny eggs, usually in clusters, on the leaves of host plant or in the khorika to which the moth is tied. These eggs are round and initially yellow but gradually turn brown as they mature. The incubation period lasts for about 7 to 10 days, during which the eggs undergo subtle changes in colour, signaling the imminent hatching of the larvae.

Larva :

Upon hatching, the second stage begins—the larval stage. The newly hatched larva is greenish yellow in colour . The body colour changes gradually to pure yellow by the end of the third day . The Eri silkworm larva is voracious, feeding on the leaves of its host plant. As the larvae grow, they molt or shed their exoskeletons multiple times to accommodate their increasing size. This process is known as instar. The larval stages can be divided into 1st instar larva, 2nd instar larva, 3rd instar larva, 4th instar larva and 5th instar larva.

1st instar larva :

The first instar larva is covered with tiny black hairs and is dark yellow in colour with black lines. The small larva which is about 0.7-0.8 cm in length.

2nd instar larva :

During 2nd instar larva the worms becomes fleshy but different strains can not be distinguished as they have similar shades of yellow colour.. The second instar larva is almost similar to the first instar larva . The 2nd instar larva is about 1.4-2 cm in length.

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3rd instar larva :

The 3rd instar larval colour does not exhibit any distinct variation but the black spots and black zebra stripes are visible on the body of the larva. The larva is about 2.3-2.6 cm in length .

4th instar larva :

In 4th instar larva , colour variation between yellow and greenish blue is distinct. Prominent spots and stripes appear in the larval body which help to clearly distinguish the eri silkworm into six strains. The length of the larva is about 4.5-5cm long and 0.8-1 cm in breadth.

5th instar larva :

The 5th instar larva is a voracious feeder. The larva in this stage is approximately 8-10 cm in length. The fifth instar larva of the Eri silkworm represents the final developmental stage before pupation. The fifth instar larva is characterized by its fully developed features and is the largest among all instars. During the fifth instar, the Eri silkworm larva exhibits vibrant colours, typically ranging from light green to yellowish-brown. Its body is covered with fine setae or hairs, giving it a distinct appearance. The primary focus of the fifth instar larva is to accumulate the necessary nutrients for the impending pupation. It consumes a substantial amount of leaves from the chosen host plant during this stage to support the energy requirements for metamorphosis.

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Pupa and Cocoon :

The pupa is a prelude to moth stage with all the appendages of future moth. The pupal stage usually lasts for about 2 to 3 weeks. The pupa is immobile and appears quiescent from the exterior. Inside the cocoon, however, intricate biological changes are occurring. The pupa is usually light brown or tan in colour. Within the cocoon, the pupa undergoes metamorphosis, a profound restructuring of its body tissues. This process involves the development of adult structures from the larval body. Various organs and features, including wings and reproductive organs, take shape during this stage. The female pupa is bigger and much heavier than the male one.

The fifth instar larva spins a silk cocoon as it prepares to enter the pupal stage. The cocoon serves as a protective covering for the pupa during the transformative process. The silk threads are secreted from specialized spinnerets near the larva's mouthparts. Eri cocoons are elongated, soft and unreelable. These are spindle shaped. The cocoons exhibit colour polymorphism being creamy-white and brick red. They measure 5.5* 2.5 cm and weigh about 3 g. The inner side of the cocoon is quite smooth.

Moth or Adult :

The adult Eri silk moth is the final and fleeting stage in the life cycle of silkworm. The adult Eri silk moth does not engage in feeding. Its feeding apparatus is not fully developed, and it relies on energy reserves accumulated during the larval stage. The adult stage is characterized by a short lifespan, lasting only a few days to a week. During this time, the primary focus is on reproductive activities. Female Eri moths release pheromones to attract males, initiating the mating process. Once mating is successful, the female seeks out suitable host plants to lay clusters of eggs, typically on the undersides of leaves.

When the adult moth emerges from a cocoon it makes a hole to get out. The Eri silk moths are stout, brownish or blackish and covered with white scales. The male moth is smaller than the female. Wings are buff coloured with white-coloured strips in the

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marginal portion. Wings are covered with scales of different colours and shape. Forewings are longer and narrower than hind wings.

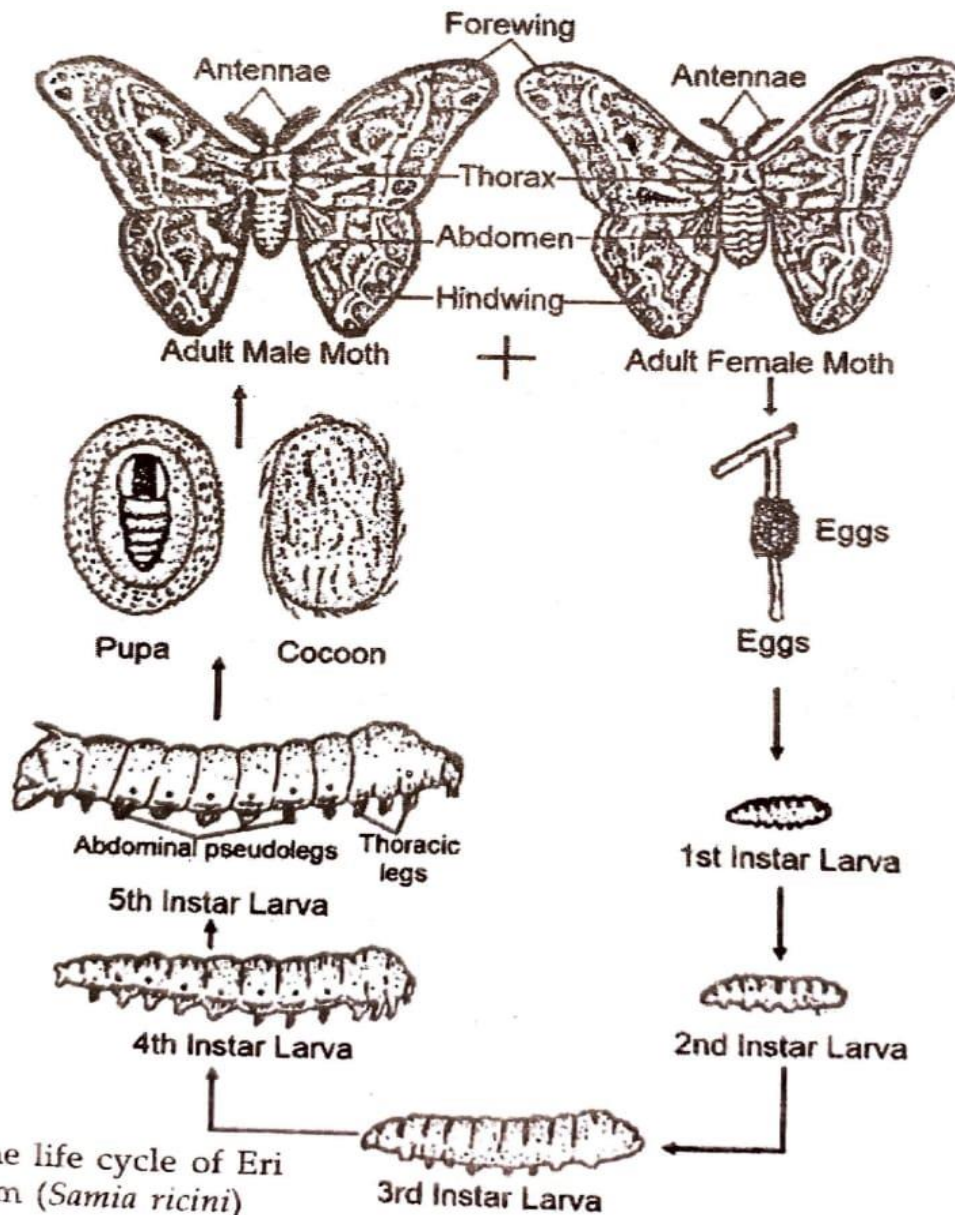


Fig 3.2: The life cycle of Eri Silkworm (*Samia ricini*)