



SERICULTURE

BY

Prof. Borhade D. R.
Department of Zoology



Introduction



- **Sericulture** : Rearing of silkworm for the production of raw silk.
- Silk production has a long history. Silk was discovered by Xilingji (Hsi-ling-chi), wife of China's 3rd Emperor, Huangdi (Hoang-Ti), in 2640 B.C.
- While making tea, Xilingji accidentally dropped a silkworm cocoon into a cup of hot water and found that the silk fiber could be loosened and unwound.
- Fibers from several cocoons could be twisted together to make a thread that was strong enough to be woven into cloth.
- Thereafter, Hsiling chi discovered not only the means of raising silk worms, but also the manners of reeling silk and of employing it to make garments.

Taxonomy



- Silk producing insects are commonly referred to as serigenous insects.
- Silkworm is a common name for the silk-producing caterpillar larvae of silk moths.
- Silk moths belong to

Phylum - Artropoda

Class - Insecta

Order - Lepidoptera

Super family - Bombycoidea

- Bombycoidea comprises eight families of which only Bombycidae and Saturnidae are the two important families the members of which produce natural silk.
- There are several species of silkworm that are used in commercial silk production .
- These are: (i) Mulberry silk worm
 - *Bombyx mori* (Bombycidae)
 - *Bombyx mandarina* (Bombycidae)

Life Cycle



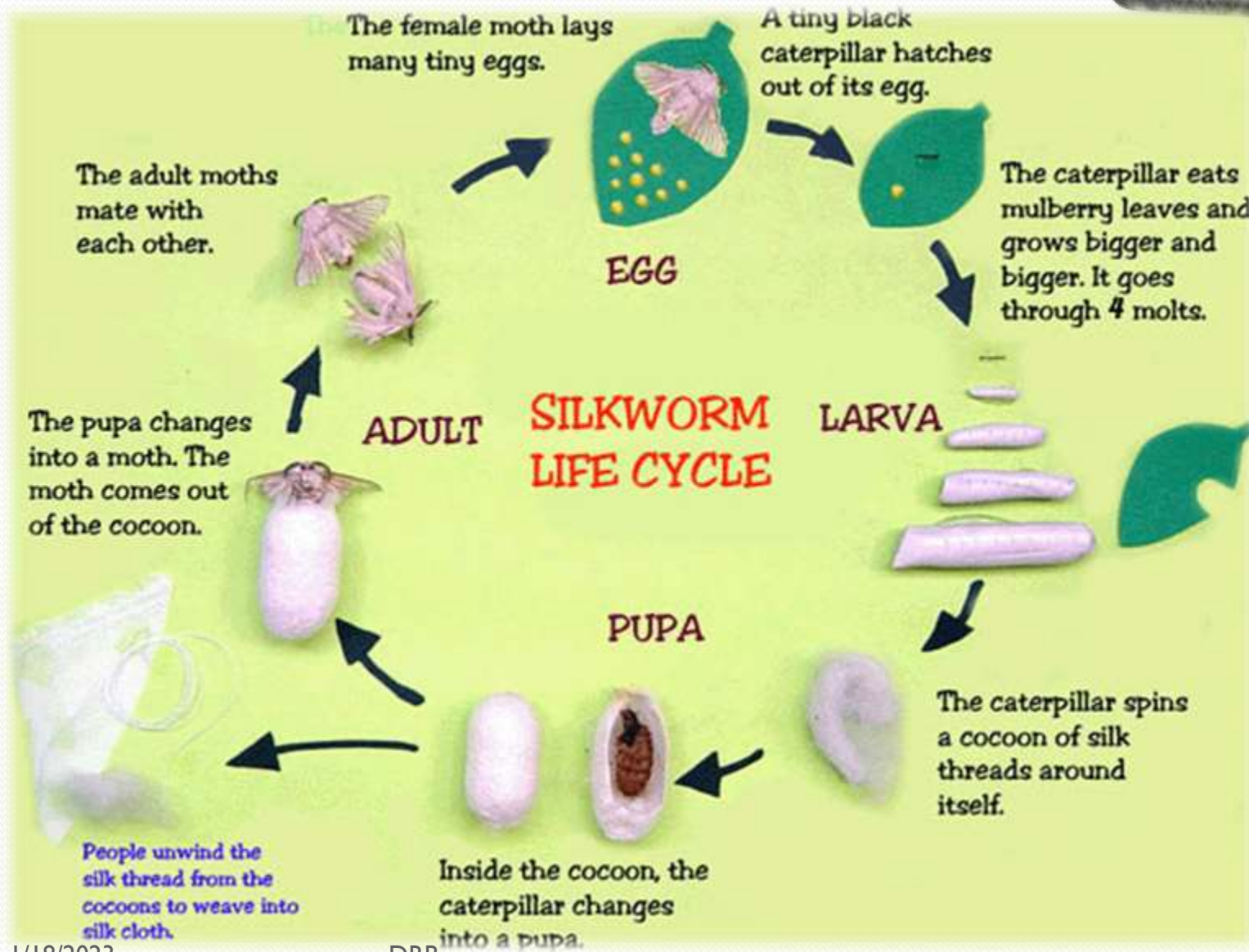
Life cycle of the silkworm consists of four stages i.e.

- Egg -
- Larva -
- Pupa -
- Adult -

The duration of life cycle is six to eight weeks depending upon racial characteristics and climatic conditions.

Multi-voltine races found in tropical areas have the shortest life cycle with the egg, larval, pupal and adult stages lasting for 9-12 days, 20-24 days, 10-12 days and 3-6 days, respectively.

In uni-voltine races, the egg period of activated egg may last for 11-14 days; the larval period, 24-28 days; the pupal period, 12-15 days and the adult stage, 6-10 days.





□ Egg :

- Egg is round and white.
- The weight of newly laid 2,000 eggs is about 1.0 g. It measures 1-1.3 mm in length and 0.9-1.2 mm in width.
- With time, eggs become darker and darker.
- Races producing white cocoons lay pale yellow eggs; while races producing yellow cocoons lay deep yellow eggs.
- In case of hibernating eggs laid by bi-voltine and uni-voltine races, the egg colour changes to dark brown or purple with the deepening of colour of the serosal pigments.



□ Larva :

- After 10 days of incubation, the eggs hatch into larva called **caterpillar**.
- After hatching caterpillars need continuous supply of food, because they are voracious feeders.
- Newly hatched caterpillar is about 0.3 cm in length and pale yellowish white.
- The larval body is densely covered with bristles.
- The larval body is composed of head, thorax and abdomen.



□ Pupa :

- Pupa is the inactive resting stage of silkworm.
- It is a transitional period during which definite changes take place.
- During this period, biological activity of larval body and its internal organs undergo a complete change and assume the new form of adult moth.
- The mature silkworm passes through a short transitory stage of pre- pupa before becoming a pupa.
- During the pre-pupal stage, dissolution of the larval organs takes place which is followed by formation of adult organs.
- Soon after pupation the pupa is white and soft but gradually turns brown to dark brown, and the pupal skin becomes harder.



□Adult :

- The adult of *Bombyx mori* is about 2.5 cm in length and pale creamy white.
- After emergence the adult is incapable of flight because of its feeble wings and heavy body.
- It does not feed during its short adult life.
- The antennae are conspicuous, large and bipectinate.
- The meso- and meta-thorax bear a pair of wings.
- The front pair overlap the hind pair when the moth is at rest.
- The moth is unisexual and shows sexual dimorphism

