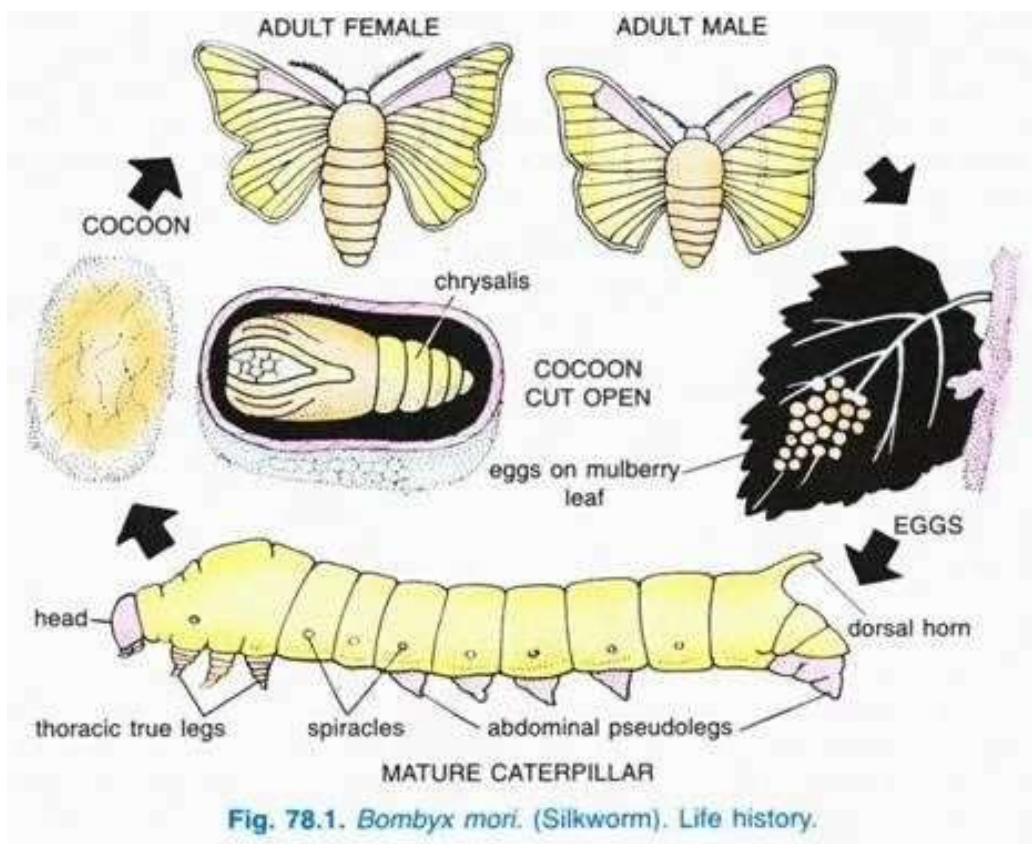


SILK FILAMENT

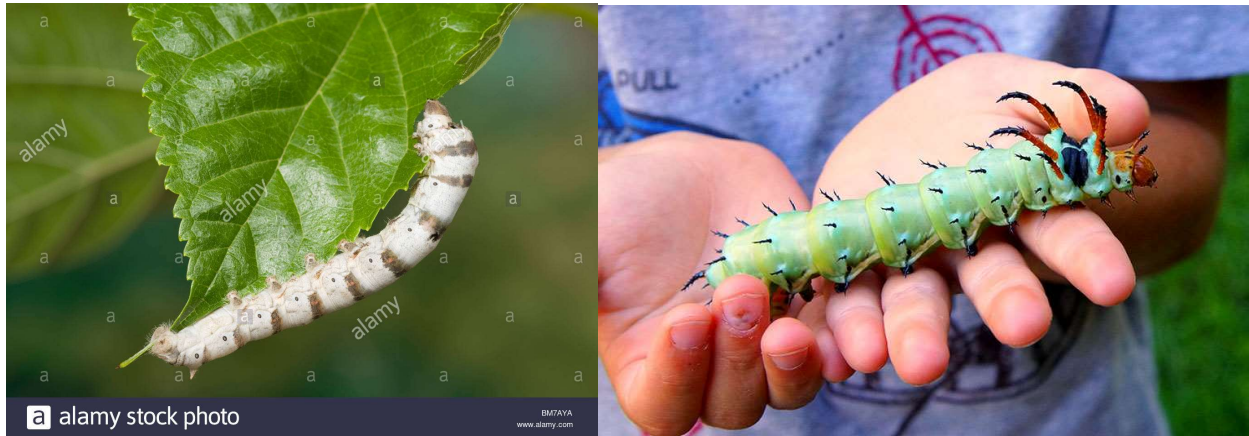
Introductions:

In the early days the silk was very famous in china, then it spread to Japan, Korea & then in south Asian countries like Pakistan & India .now a days it is also well known in European countries it is not grown in the form of hair. But it is produced by insects which makes their webs. Cocoons & climbing ropes. Almost the entire commercial silk industry is based on one insect as known “silk worm”. The silk is made by it when it wants to change in chrysalis .then a moth. It spins the silk rapes the fiber around itself is the form of a cocoon inside which it can settle down in comfort.



Production

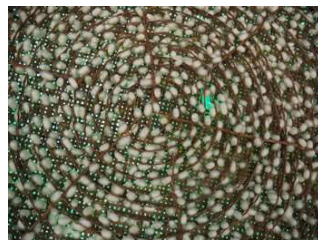
The silk worm is the caterpillar of a small moth belonging to “bombyx” it lives only on leaves of mulberry tree. The silk worm spent their life in eating leaves.



Eggs of silk worm are stored in cool place then in winter these eggs are worm up for hatching.

Hatching:

After a few days the eggs hatch out to a tiny caterpillars, less than one eighth of an inch. One ounce (28.3 grams) of eggs is yield 36000 silk worm every effort is made that no egg is being wasted because the economy of the silk production depends largely on this the worm will sleep eat and spin roughly at the same time.



Process of hatching

Hatching is done by spreading the eggs over the trays in the hatching shed. When the worm is appeared on the perforated papers which was placed over them and chopped leaves of mulberry trees are spread on the perforated paper. The worm climbs through the holes for eating the leaves. The dirt, eggs residue are left in the trays.



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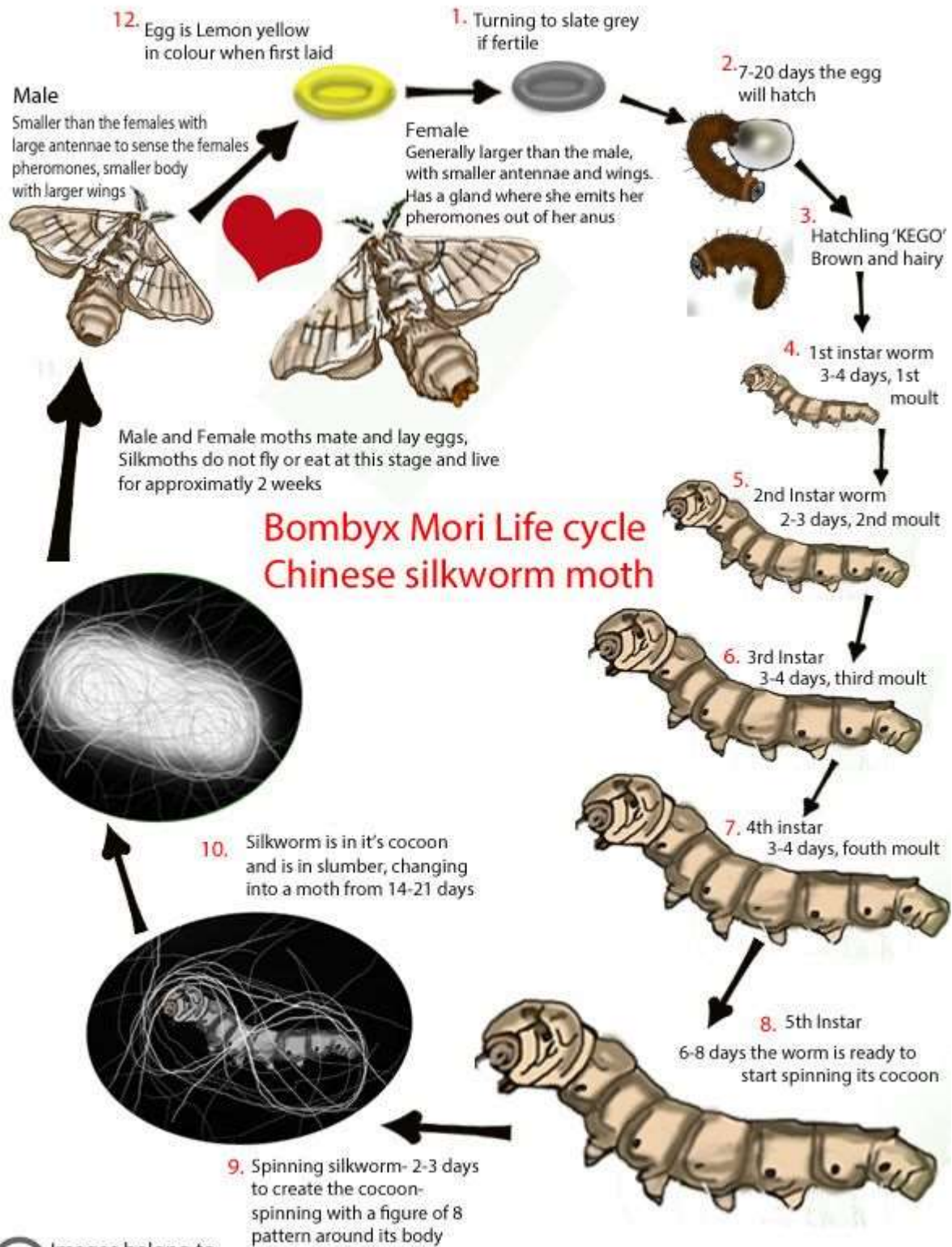


Moulting: (grown up to moths with feathers)

The silk worm settled done for a final feed (approximate 10 days) during which its feed increase 20 time as first. After 35 days of hatching worm is 10000 times as heavy as it was born and its weight is about quarter of an ounce (7.09 grams) and it has become greenish white cater pillar.

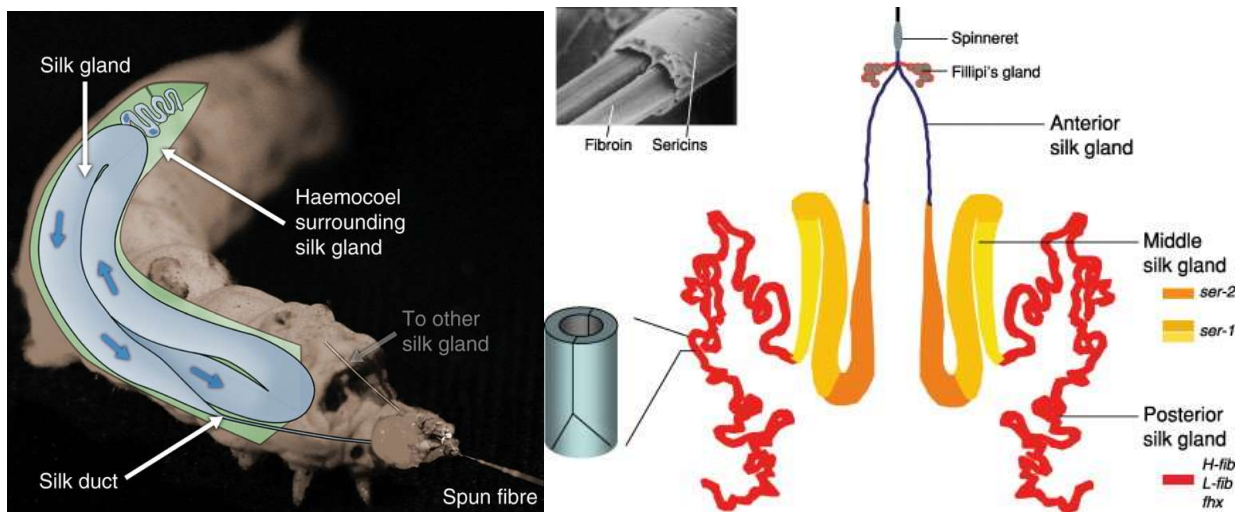


Now it is ready to start spinning, silk worm built its cocoon to settle down in it.



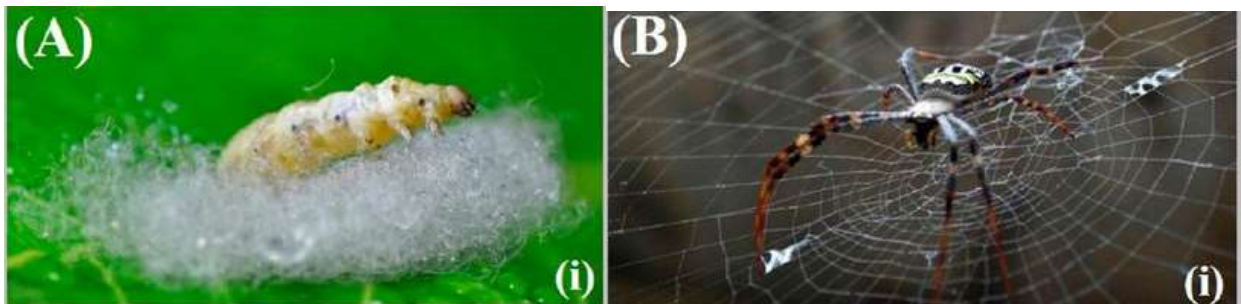
Spinning the cocoon:

The liquid silk is contained in two glands inside the silk worm. For these glands it flow in two channels to common exit tube called the spinneret in the silk worm head, as the liquid comes out it is hardened into very fine filaments which are coated by a gummy substance called sericin which comes from other two glands nearby .



The silk produced by the worm is a twine filament held together as a single strand by sericin cement.

As the Silk worm moves, it surround it self with a strongly build cocoon made from a continuous silk strand that may be up to a mile in length.



Spinning takes two or three days and then it begins to change in to chrysalis or pupa & then in to a moth.



The chrysalis must be killed before this stage as if the moth escape from the cocoon to make a hole for it can crawl out & the continuous silk filament is then broken into thousand of short pieces, which are useless for reeling.



So with in few days of making its cocoon the chrysalis is killed by heating in the sun, or in an oven or in hot air or steam. The cocoon can then be kept in defiantly without damage until it is wanted for reeling.

Reeling:

The unwinding of fine silk filament from the cocoon, is called reeling. From one pound of egg twelve ounces of raw silk is produced.



Degumming:

The natural gum, sericin is normally left on silk during reeling throwing & weaving, it acts as a sizing (Starch material) which protects the fibers from mechanical injury.

The gum is removed from the finished yarn of fabrics usually by boiling with soap in water.

Silk fabrics weaves with sericin on the yarn have a characteristic of stiffness handle; they are also dull in appearance. After degumming the silk gained its beautiful luster.

1/3 of its weight is lost by degumming. Raw material with the gum silk on the filament is called hard silk degumming silk is "soft silk".

Properties of Silk

Count of the silk yarn.

The fineness of the silk yarn is denoted by its denier, i.e. weight in grams of 9000 meters of the yarns.

Tensile strength:

Silk is strong fiber it has tenacity 3.5 g /denier. Its wet strength is 75 –78 % of dry strength.

Elongation at break:

Silk filament has elongation at break of 20-25% under normal condition, at 100% R.H the elongation at break is 33%.

Elastic property:

The elastic recovery after spinning is not as good as that of wool but much better than cotton rayon once it has stretched by about 2% of the original length still tends to remain permanent stretched.

Effect of Moisture:

Silk has SMR is 11.20 %, degumming silk will swell as it take up moisture, the swelling extend depends on RH% of atmosphere.

Effect o heat:

Silk can be stand with high temperature than wool with out decomposing; it will remain unaffected at 140 but decomposed quickly at 175 °C.

Effect of age:

Silk is attacked by atmospheric oxygen & may suffer a gradual loss of strength if not carefully stored.

Effect of sunlight:

Losses of strength take place; sun light tends to encourage the decomposition.

Chemical properties

Filament Composition:

The strand of raw silk consists of two silk filaments mix with sericin & other material about 75% is silk and 23% is sericin. The remaining material consists of wax and fats (wax-1.5%) and mineral salts 0.5%. Since silk is a fabric of animal origin therefore it is a protein.

Effects of alkali:-

Silk is less readily damaged by alkalis than wool, alkalis as much as used soap. However, more concentrated solution of alkali destroyed the luster and cause loss of strength. Silk dissolved in the solution of concentrated alkalis.

Effects of Acids:-

Like wool keratin, silk can be decomposed by strong acids into amine acids dilute acids don't attached silk under mild conditions organic acid are used for production scrape of silk. Acid are readily absorbed into silk filament & or hot easily removed.

Effects of organic solvent:

Silk is insoluble in dry organic solvents.

Dyeing:

Silk is dyed in the form of hanks & woven pieces. Every type of dye stuff can be used for dyeing count of spun silk .one of the hands per pound.

Electric properties:-

Silk is a poor conductor of electricity and tends to acquire a static charge when it is handled. This causes difficulties during manufacturing particular in atmosphere conditions.

Other properties:-

Raw silk as in rough handle and it acquires smooth and silky feel only after degumming. The scroop made by silk when it is touched. It is not an inherit property of the fiber or silk. It is given to the silk by treatment with dilute acid; scroop is not a sign of quality as it is commonly supposed.

Uses of Silk:-

Silk combine a high strength and flexibility with good moisture absorption softness and warmth, excellent of wear ability and a luxurious appearance.

Silk is versatile that it is woven and knitted into a wide variety of fabrics. Silk is cool and comfortable in summer clothes and it is hard wearing and easy to clean. In dresses, suiting the smooth surface filaments from which silk fabrics are made does not hold on to dirt.