

28/4/20

SUB-SCIENCE

CLASS-VII

CHAPTER-3

* Write Q/A in #C.

Q13. What are caterpillars or silkworms?

Ans. The female silkworm lays eggs from which larva hatch, these are called caterpillars or silkworms.

Q14. Discuss life history of silkworm.

Ans. The caterpillar or silkworm swing its head in form of figure 8 along with protein fibre secrets. The fibre hardens with air and becomes silk fibre. The silkworm soon cover itself completely and becomes cocoon. Then we get silk fibre from cocoon of silkworm.

Q15. Write down some types of silk.

Ans. Tassar silk, moonga silk, kosa silk etc. which are obtained from different types of silkworms.

Q16. Which is the most common silkworm?

Ans. Mulberry silkworm.

Q17. What is meaning of reeling of silk?

Ans. The process of taking out threads from cocoon for obtaining silk is called reeling of silk.

Chapter finished

Occupational hazard

Wool industry is an important means of livelihood for many people in our country. But sorter's job is risky as sometimes they get infected by a bacterium, **anthrax**, which causes a fatal blood disease called sorter's disease. Such risks faced by workers in any industry are called occupational hazards.

Boogho is wondering why it hurts when someone pulls his hair but not when he goes for a haircut.

Boogho is wondering why a cotton garment cannot keep us as warm in winter as a woollen sweater does.

Activity 3.4

Debate amongst your classmates whether it is fair on the part of humans to rear sheep and then chop off their hair for getting wool.

3.2 Silk

Silk fibres are also animal fibres. Silkworms spin the 'silk fibres'. The rearing of silkworms for obtaining silk is called **sericulture**. Find out from

your mother/aunt/grandmother the kind of silk saris they have. List the kinds of silk.

Before we discuss the process of obtaining silk, it is necessary to know the interesting life history of the silk moth.

Life history of silk moth

The female silk moth lays eggs, from which hatch larvae which are called **caterpillars** or **silkworms**. They grow in size and when the caterpillar is ready to enter the next stage of its life history called **pupa**, it first weaves a net to hold itself. Then it swings its head from side to side in the form of the figure of eight (8). During these movements of the head, the caterpillar secretes fibre made of a



(a) Male



(b) Female

Adult silk moths



(c) Eggs on mulberry leaves



(d) Silkworm



(e) Cocoon



(f) Cocoon with developing moth

Fig. 3.9 (a to f) Life history of silk moth

protein which hardens on exposure to air and becomes silk fibre. Soon the caterpillar completely covers itself by silk fibres and turns into pupa. This covering is known as **cocoon**. The further development of the pupa into moth continues inside the cocoon (Fig. 3.9). Silk fibres are used for weaving silk cloth. Can you imagine that the soft silk yarn is as strong as a comparable thread of steel!

The silk yarn (thread) is obtained from the cocoon of the silk moth. There is a variety of silk moths which look very different from one another and the silk yarn they yield is different in texture (coarse, smooth, shiny, etc.). Thus, *tassar* silk, *mooga* silk, *kosa* silk, etc., are obtained from cocoons spun by different types of moths. The most common silk moth is the **mulberry silk moth**. The silk fibre from the cocoon of this moth is soft, lustrous and elastic and can be dyed in beautiful colours.

Sericulture or culture of silkworms is a very old occupation in India. India produces plenty of silk on a commercial scale.

Activity 3.5

Collect pieces of silk cloth of various types and paste them in your scrap book. You can find them in a tailor's shop among the heap of waste cut pieces.

Take help of your mother, aunt or teacher and identify the types of silk such as mulberry silk, *tassar* silk, *eri* silk, *mooga* silk, etc. Compare the texture of these silks with that of the artificial silk pieces, which contain synthetic fibres. Try and collect pictures of different moths whose caterpillars provide the various types of silk.

Activity 3.6

Take an artificial (synthetic) silk thread and a pure silk thread. Burn these threads carefully. Did you notice any difference in the smell while burning? Now, burn a woollen fibre carefully. Did it smell like burning of artificial silk or that of pure silk? Can you explain why?

To remember when the cocoon stage is reached in the life history of the silk moth, try the following activity.

Activity 3.7

Photocopy Fig. 3.9. Cut out pictures of the stages of the life history of the silk moth, and paste them on pieces of cardboard or chart paper. Jumble them. Now try and arrange the stages in the correct sequence in a cyclic form. Whoever does it fastest wins.

You may also describe the life history in your own words. Write it down in your scrap book.

In India, women are significantly involved in various kinds of industries related to silk production. These are rearing of silkworms, reeling of silk from cocoons and processing of raw silk into fabrics. By their enterprise, they contribute to the nation's economy. China leads the world in silk production. India also ranks among the leading silk producing countries.

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From cocoon to silk

For obtaining silk, moths are reared and their cocoons are collected to get silk threads.

Rearing silkworms: A female silk moth lays hundreds of eggs at a time [Fig. 3.10 (a)]. The eggs are stored carefully on strips of cloth or paper and sold to silkworm farmers. The farmers

keep eggs under hygienic conditions and under suitable conditions of temperature and humidity.

The eggs are warmed to a suitable temperature for the larvae to hatch from eggs. This is done when mulberry trees [Fig. 3.10 (b)] bear a fresh crop of leaves. The larvae, called caterpillars or silkworms, eat day and night and increase enormously in size [Fig. 3.10 (c)].



(a) Female silkworm moth with eggs



(c) Larva (Caterpillar / Silkworm) feeding on mulberry leaves



(b) Mulberry tree



Leaf of Mulberry



(d) Cocoons

Fig. 3.10 Rearing silkworms

Discovery of silk

The exact time of discovery of silk is perhaps unknown. According to an old Chinese legend, the empress Si-lung-Chi was asked by the emperor Huang-ti to find the cause of the damaged leaves of mulberry trees growing in their garden. The empress found white worms eating up mulberry leaves. She also noticed that they were spinning shiny cocoons around them. Accidentally a cocoon dropped into her cup of tea and a tangle of delicate threads separated from the cocoon. Silk industry began in China and was kept a closely guarded secret for hundreds of years. Later on, traders and travellers introduced silk to other countries. The route they travelled is still called the 'silk route'.

The larvae are reared in trays. The cocoons are collected and moved to a suitable temperature for the larvae to hatch from eggs. This is done when mulberry trees bear a fresh crop of leaves. The larvae, called caterpillars or silkworms, eat day and night and increase enormously in size.

Process

The silkworms are reared in trays. The cocoons are collected and moved to a suitable temperature for the larvae to hatch from eggs. This is done when mulberry trees bear a fresh crop of leaves. The larvae, called caterpillars or silkworms, eat day and night and increase enormously in size.

The larvae are kept in clean bamboo trays along with freshly chopped mulberry leaves. After 25 to 30 days, the caterpillars stop eating and move to a tiny chamber of bamboo in the tray to spin cocoons [Fig. 3.10 (d)]. Small racks or twigs may be provided in the trays to which cocoons get attached. The caterpillar or silkworm spins the cocoon inside which develops the silk moth.

Processing silk: A pile of cocoons is used for obtaining silk fibres. The cocoons are kept under the sun or boiled or exposed to steam. The silk fibres



Paheli wants to know if the cotton thread and silk thread are spun and woven in the same manner.

separate out. The process of taking out threads from the cocoon for use as silk is called **reeling the silk**. Reeling is done in special machines, which unwind the threads or fibres of silk from the cocoon. Silk fibres are then spun into silk threads, which are woven into silk cloth by weavers.

Keywords

Cocoon	Scouring	Silk moth
Fleece	Sericulture	Silkworm
Reeling	Shearing	Sorting

What you have learnt

- Silk comes from silkworms and wool is obtained from sheep, goat and yak. Hence silk and wool are animal fibres.
- The hairs of camel, llama and alpaca are also processed to yield wool.
- In India, mostly sheep are reared for getting wool.
- Sheep hair is sheared off from the body, scoured, sorted, dried, dyed, spun and woven to yield wool.
- Silkworms are caterpillars of silk moth.
- During their life cycle, the worms spin cocoons of silk fibres.
- Silk fibres are made of a protein.
- Silk fibres from cocoons are separated out and reeled into silk threads.
- Weavers weave silk threads into silk cloth.