

Notes

Paper: Applied Zoology – I (Paper I / ZO-232)

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Class: S.Y.B.Sc.

Section: Sericulture

Topic: Introduction to Sericulture

INTRODUCTION

Definition: The rearing or cultivation of silkworms for production of silk is called as Sericulture.

Sericulture is an agro-based industry. It involves rearing of silkworms for the production of raw silk, which is the yarn obtained out of cocoons spun by certain species of insects. Cultivation to feed the silkworms that spin silk cocoons and reeling the cocoons to unwind the silk filament for value added advantages like process and weaving are the major activities of sericulture. Silk has been blended with the life and culture of the Indians.

India encompasses an upscale and sophisticated history in silk production and its silk trade dates back to fifteenth century. Silk is the most elegant textile in the world with distinctive grandeur, natural radiance, and inherent affinity for dyes, high absorbance, lightweight weight, soft touch and high sturdiness and called the “Queen of Textiles” the world over Sericulture business provides employment to roughly 8.25 million persons in rural and semi-urban areas in India throughout 2015-16.

It stands for livelihood opportunity for millions owing to high employment oriented, low capital intensive and remunerative nature of its production. From these, a sizeable number of workers belong to the economically weaker sections of society, including girls. India’s ancient and culture bound domestic market and a tremendous diversity of silk clothes that replicate geographic specificity have helped the country to attain variety one position in silk business.

The caterpillars of the domestic silkworm (also called ‘*Bombyx mori*’) are the most commonly used silkworm species in sericulture. Other types of silkworms (such as Eri, Muga, and Tasar) are also cultivated for the production of ‘wild silks’. Sericulture is a very important domestic industry in many countries. India and China are the world’s leading producers of silk. The silk

output of these two countries combined accounts for over 60% of the global production. The moths belonging to two major families, *Bombycidae* and *Saturnidae* of Lepidoptera group of insects produce commercial silk in India. Based on the quality and luster of the silk fibers 4 types of silk are produced by the different forms of silk secreting moths. The main species of silk secreting moths are *Bombyx sp.*, *Attacus sp.* and *Anthracea sp.*

HISTORY

Silkworms were first discovered by the Chinese around 2,700 BC and for many centuries, the Chinese were the only civilization with the knowledge to make silk but eventually, the secrets of sericulture spread to other parts of the world. Here, we explore how silk is harvested and turned into silk threads.

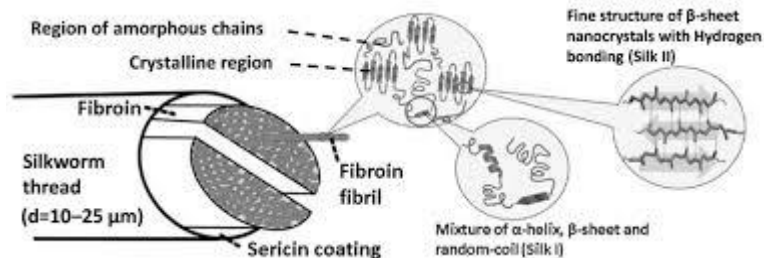
There is no authentic information regarding the origin and use of silk. But it is said that in 2640 BC, a Chinese empress, Si-Ling-Chi was sitting under mulberry tree and having a tea. A cocoon of silkworm dropped into her tea. As she tried to removed it, she found that cocoon began to unravel forming a beautiful string of fabric which is now known as Silk. She started weaving it and silk garments came into existence. The secrete of silk was kept by the royal family for thousands of years.

It is said that two monks leaked this secrete to emperor in the Constantinople and provided him with silkworm eggs and mulberry shoots. It was then cultivated in Europe as well and was further spread to rest of the world.

SILK

Silk is the outcome of sericulture industry. Silk is a strong, shiny fiber that is used to make fabrics. Silk has a natural beauty and no other fabric can match its luxury, luster and elegance. It is the most precious, natural fibre, which has a unique place in the textile world and is rightly recognized as the "Queen of Textiles." It is an ecological and non-polluting material too with which humanity has been in love since the dawn of civilization. Silk fabrics are mirrors of all the civilizations in which they have played a part. They are records of vast migrations that human beings have embarked upon over the centuries, taking with them their philosophies, technological discoveries, artistic designs and religious symbols.

Silk is a fiber made up two different proteins – sericin and fibroin. Approximately 80% of silk fiber is made up of fibroin, which is concentrated at the core. This core is surrounded by a layer of sericin (which makes up the remaining 20% of silk). The presence of pigments (such as xanthophyll) in the sericin layer of the fiber imparts color to the silk. Each type of silk has a distinct color.



PROCESS OF SRICULTURE IN BRIEF

1. Eggs of silkworms are incubated.
2. After incubation they are hatched into larvae having quarter of an inch size.
3. These larvae are placed under gauze layer and fed with finely chopped mulberry leaves.
4. While growing larvae shed their skin 4 times. This process of shedding skin is called moulting.
5. Larva eats 50,000 times of its size.
6. During their growth larvae are fed continuously with mulberry leaves.
7. After around six weeks they increase in size to upto 3 inches and change colour.
8. They also become 10,000 times heavier.
9. They are now ready to spin the silk to form cocoon.
10. They secrete about 15 meters of silk fibre per minute.
11. During this pupa formation takes place. It is a motionless stage called as pupating stage. Adult organs develop.
12. Pupa converts to adult moths and pierce the cocoon and come out. These are now ready to copulate. Such cocoons are called as pierced cocoons. These are not suitable for silk production.
13. Hence, the cocoons, before piercing are treated with hot air or boiling water to kill pupa.
14. After stifling, the reeling process starts to get the silk yarns.