B.Sc. Part III (Zoology Hons)

Paper VI

Sericulture (Part-I)

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Sericulture is the process of commercial scale to yield a precious fibre silk. Silk is obtained from the cocoon of a silk moth, by boiling it at certain temperature. Silk-moth or Silk-worm, is zoologically called Bombyx mori and belongs to Phylum Arthropoda.

Systematic Position —

Phylum - Arthropoda
Class - Insecta
Order - Lepidoptera
Genus - Bombyx
Species - mori

Habit & Habitat :- It is completely domesticated organism and is never found wild. The adult moths seldom eat and are primarily concerned with reproduction. Their larvae are voracious eaters. They feed on the leaves of mulberry trees. Silk moths are single brooded or univoltine

while others are many brooded or multivoltine. Owing to domestication, a large no. of strains have evolved out, which produce cocoons of various shapes, sizes, weights and colours ranging from white to yellow. Only one generation is produced in a year by worms in Europe and other countries where the length of winter far exceeds duration of Summer.

External Features :— The adult male is about 25 mm long with a wing-span of 40 to 50 mm. The female silkmoths are larger than the males. The moth is quite robust and creamy white in colour. The body is distinctly divisible into three regions - namely head, thorax and abdomen. The head bears a pair of compound eyes, a pair of branched feathery antennae and the mouth parts. The thorax bears three pairs of legs and two pairs of wings. The cream coloured wings are about 25 mm long and are marked by several faint or brown lines. The entire body is covered by minute scales.

Life History or Life Cycle :— The silkworm is dioecious, i.e. the sexes are separate. Fertilization is internal, preceded by copulation. The development include a complicated metamorphosis.

A Eggs :- After fertilization, each female moth lays about 300 to 400 eggs. These eggs are placed in clusters on the leaves of mulberry leaves. The female covers the eggs by a gelatinous secretion which glues them to the surface of the leaves. The eggs are small, oval and woolly, slightly yellowish in colour. The egg contains a good amount of yolk and is covered by a smooth hard chitinous shell. After laying the eggs the female moth doesnot take any food and dies within 4-5 days. In the Univoltine (a single brood per year) they make take months because overwintering takes place in this stage but the multivoltine broods come out after 10-12 days. From the egg, hatches out a larvae called caterpillar.

B Larvae :- The larva of silkworm moth is called caterpillar larva. The newly hatched larvae is about 4 to 6mm in length. It has a rough, wrinkled, hairless and yellowish white or greyish worm-like body. The full grown larvae is about 6 to 8 cm in length. The body of larvae is distinguishable into a prominent head, distinctly segmented thorax and an elongated abdomen. The head bears mandibulate mouths and three pairs of ocelli. A

distinct hook like structure, the spinneret, is present for the extrusion of silk from the inner silk gland. The thorax bears a hump and consist of three segments. Each of the three segment bear pair of jointed true legs. The tip of each leg has a recurved hook for locomotion and ingestion of leaves. The abdomen consist of ten segments of which first nine are clearly marked, while the tenth one is indistinct. The third, fourth, fifth, sixth and ninth abdominal segment bear ventrally a pair of unjointed stumpy appendages each. These are called prolegs or Pseudo-legs. Each leg is retractile and more or less cylindrical. The eighth segment carries a short dorsal anal horn. A series of respiratory spiracles or ostia are present on either lateral side of the abdomen.

The larvae is a voracious eater and strongly gregarious. In the beginning, chopped young mulberry leaves are given as food but with the advancement of age entire matured leaves are provided as food. The caterpillar moves in a characteristic looping manner. The larval life lasts for 2-3 weeks. The larvae moults four times.