

SEMESTER- 4

Core course: Sericulture Paper-IV

Silkworm and Mulberry Breeding & Genetics

(Credits: Theory-04, Practical-02)

THEORY

UNIT 1. INTRODUCTION TO GENETICS

1. Mendelian Genetics: Mendel's experiments and laws, Mono-hybrid and di-hybrid crosses.
2. Test cross and back cross.
3. Linkage and crossing over
4. Allelism: Concept of multiple alleles and e-alleles

UNIT 2. GENETICS OF THE SILKWORM, *BOMBYX MORI*

1. Pure and inbred lines, hereditary traits and effects of environment on egg, larva, cocoon, pupa & adult.
2. Genetics of cocoon colour.
3. Inheritance of voltinism, moulting, environmental influence & hormonal control.
4. Sex determination, sex limited traits and their special significance in sericulture

UNIT 3. BREEDING OF THE SILKWORM, *BOMBYX MORI*

1. Methods of breeding: Line breeding, cross breeding and mutation breeding.
2. Selection: Methods- Indirect, stabilizing and directional selection.
3. Inbreeding and out breeding: Advantages and disadvantages, effects of inbreeding and consequences of homozygosity.
4. Hybridization: Cross breeding techniques for hybridization. Introduction to heterosis.
5. Prospects of biotechnology to improve silk production.

UNIT 4. BREEDING OF MULBERRY

1. General introduction to plant breeding; Mulberry breeding: Objective and methods of mulberry breeding.
2. Induction of mutations in mulberry.
3. Polyploidy-effects of polyploidy in mulberry.
4. Tissue culture in the improvement of mulberry.

PRACTICALS

1. Study of breed characteristics of silkworms.
2. Studies on sex-limited traits egg, larva and cocoon.
3. Visit to germplasm bank and silkworm breeding stations.
4. Study of performance of silkworm hybrids.
5. Visit to various sericulture farms and nurseries.