SILKWORM PATHOLOGY

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Pathology - The scientific study of the nature of disease and its causes, processes, development, and consequences. Also called pathobiology.

Silkworm *Bombyx mori* : Due continuous domestication is susceptible for

Fungal
Bacterial
Viral
Protozoan
Viral

Viral diseases of silkworm comprise of inclusion and non-inclusion types.

The inclusion virus diseases form typical inclusion bodies. They are Nuclear polyhedrosis (NPH) and Cytoplasmic polyhedrosis (CPH). The Pathogen are NPV & CPV respectively.

The non-inclusion type consists of Infectious Facheric and Densonuclcosis.
• **Nuclear Polyhedrosis**

It is one of the most serious viral diseases in tropical countries and occurs throughout the year. This disease is otherwise known as Grasseric, Jaundice, Milky disease, Fatty degeneration and Hanging disease.
- **Causes of the disease**
- This disease is caused by *Borrelina bombycis* virus belonging to the sub-group A of the family Baculoviridae. The shape is usually octadecahedral or hexahedral and sometimes tetragon or trigon.

- **Infection mostly takes place through feeding, rarely wounds.**
**Symptoms:**

During early part of the disease no symptoms are noticed except the worms being slightly sluggish.

Initially the skin shows oily and shining appearance.

As the disease advances the skin becomes thin and fragile and the body becomes milky white with intersegmental swellings. contamination.

Another characteristic symptom or this disease is that the larvae become restless and crawl aimlessly along the ridges or rims of rearing trays.
Death - 4-5 days in the young larvae
5-7 days in the grown-up larvae.

Diseased larvae lose the clasping power of abdominal legs except the caudal legs by which it hangs with the head downwards.

Melted Cocoons
Prevention and control:

- Maintenance of hygienic condition by disinfection
- Optimum Environmental Conditions
- Quality Leaf
In addition, certain bed disinfectants prevent secondary contamination and spread of the disease.

- Paraformaldehyde compounds like Reshamkeet Oushadh

- Dusted on the larvae and bed with the help of a thin cloth at the rate of 2-3 grams/0.1 sqm. area during early instars and 4-5 grams/0.1 sqm. during IV and V instars. For 100 dfls (40,000 larvae) is 3-3.5 kgs.
Protozoa

- Class: Microsporidia
- Genera: *Nosema, Pleistophora & Thelohania.*

- The major protozoan disease of the silkworm is the pebrine disease, named due to the appearance of black peppery patches following infection.
Pebrine

- Pebrine is a chronic and disastrous disease responsible for the sudden collapse of the silkworm industry of both France and Italy in 1965

- The techniques of strict mother moth examination for the supply of disease free silkworm eggs.
• **Causes of the disease**: by *Nosema bombycis* Nageli

• **Infection by both** _peros_ **and** _transovarial_

• **Primary and Secondary infection**
The mature spore is oval or ovocylindrical with 3 -4x 1.5 -2.5 µ & three layered membrane: the inner, middle and outer.

- The sporoplasm contains a pair of nuclei.
- The spore has a polar capsule and polar filament.
- Pathogen and can survive in the ordinary conditions of rearing house for more than a year. It retains its infectivity even after three years in the dried body of the female moth.
The life cycle - spore, planont and meront.

**Figure 7** Developmental cycle of Nosema bombycis
(a) Ripe spore with girdle of living substance with nuclei, two vacuoles and polar capsule
(b) Polar filament extruded; planont about to leave spore-case
(c) Planont with empty spore-case and polar filament immediately after leaving spore-case
(d) Planont with one nucleus
(e) Fusion of two planonts or division
(f) Planont about to enter gut-wall cell
(g) Meront in gut-wall cell
(h to k) Division of meront into two within gut-wall cell
(l to n) Further divisions of meront
(o) Meront ready to form spore
(p) First stage in spore formation—one main and three subsidiary nuclei and one vacuole formed
(q) Further stage in spore formation—thick spore-case secreted two vacuoles and polar capsule.
**Symptoms:**

- **In the egg stage:** poor fecundity, lack of adherence to the substratum, lack of egg uniformity, more of unfertilized and dead eggs, Pileup eggs.

- **Larvae:** Poor appetite, retarded growth and development, irregular moult leading to un-uniformity in size, sluggishness. The larval body shows wrinkled skin with rustic brown.

6 November 2013
• **Pupa:** Pupae are flabby and swollen with lusterless and softened abdomen. Sometimes irregular black spots are noticed near the rudiments of the wing and abdominal area.

• **Moth:** Have clubbed wings with distorted antennae and do not mate properly. The scales from wings and abdominal area easily come off.
Prevention and control:

1. Disease Free Layings
2. Strict Disinfection

Besides,

immersing of the silkworm eggs in hot water.
high temperature treatment of the pupae.
Dipping of the eggs in hot hydrochloric acid.

Chemotherapy by fumagillin, benomyl, bengard, bavistin, ethyl and methyl thiophanate and some of their analogues with positive results.

PREVENTION IS BETTER THAT TREATIMENT/CURE
Acknowledgements

to

i. Internet

ii. Hand book on pest and disease control of mulberry and silkworm