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Study about various Diseases of silk worm, their occurrence and management : A Review

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Abstract : Silkworm Diseases and Pest Control Diseases are the behavioral and physiological changes induced by pathogens in an organism. All diseases have specific symptoms and characteristics. Similarly, silkworms are also affected by various types of diseases caused by protozoa, fungi, bacteria and viruses. Since they cause substantial financial loss to the industry, their prevention and control assumes utmost importance. Pebrine: Pebrine is caused by a protozoan called Nosema bombycis. In the initial stages the larvae appears to be healthy, but when observed under a microscope we can see oval, shinning spores of Nosema. Pebine disease is infected to the silkworms in two methods; peroral and transovarial infection. In advanced stages of infection, silkworms stops feeding resulting in unequal size larvae, they become sluggish, and die. The dead larvae turn black in colour due to secondary bacterial infection. If infection occurs in late V instar, the larvae spin the cocoons, and the moth may also emerge. Infected female moths lay pebrine contaminated eggs in lumps one above the other. The number of eggs per laying is also drastically reduced.

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Types of Diseases :

1. GRASSERIE:

Causative agent: Bombyx mori Nuclear Polyhedrosis Virus

Occurrence: The disease prevails all through the year but its severity is more during Summer and Rainy seasons.

Source of infection: Silkworm gets infected when it feed on contaminated mulberry leaves. The milky white fluid released by the grasserie larvae, contaminated silkworm rearing house and appliances are the sources of infection.

Predisposing factors: High temperature, low humidity and poor quality mulberry leaves.

Symptoms:

- The skin of infected larvae becomes shining before moult and fails to moult.
- Inter segmental swelling appears and the colour of the body becomes yellowish.
- The infected larvae move restlessly in the rearing bed/ along the rim of the trays.
- Infected larval body ruptures easily and turbid white haemolymph oozes out.

Management:

- Practice thorough disinfection of rearing house, its surroundings and appliances with any recommended disinfectant.
- Conduct an optional disinfection with 0.3% slaked lime solution when high incidence of disease noticed in the previous crop.

- Practice personal and rearing hygiene.

- Collect the diseased larvae and ensure its proper disposal.
- Maintain optimum temperature and humidity in the rearing house.
- Feed quality mulberry leaf and avoid overcrowding.

2. FLACHERIE:

Causative agent: Bombyx mori Infectious flacherie virus/Bombyx mori Densonucleosis virus or different pathogenic bacteria viz., Streptococcus sp./Staphylococcus sp./Bacillus thuringiensis/Serratia marscesence individually or in combination of bacteria and viruses.

Occurrence: The disease is common during Summer and Rainy seasons.

Source Infection: Silkworm gets infected by eating contaminated mulberry leaf. Dead diseased silkworm, its faecal matter, gut juice, body fluid are the sources of pathogen contamination. The infection can also takes place through injuries/cuts/wounds.

Predisposing factors: Fluctuation in temperature, high humidity and poor quality of leaves.

Symptoms:

- The larvae become soft and flaccid.
- The growth of infected larvae retarded, becomes inactive and vomit gut juice. The faeces become soft with high moisture content. Sometimes chain type excreta and rectal protrusion also observed.
- Larval head and thorax become translucent.
- When infected with Bacillus thuringiensis symptoms of toxicity such as paralysis and sudden death are observed. After death, larvae turn black in color and gives foul smell.
- Some times, the dead larvae turn red when infected with Serratia sp.

Management:

- Disinfect the rearing house, its surroundings and equipments with recommended disinfectant mentioned above.
- Pick up diseased larvae and dispose them by burning.
- Provide good quality leaf grown under good Sunlight and recommended inputs. Do not provide over matured/over stored /dirty leaf to the silkworms
- Avoid starvation, overcrowding and accumulation of faeces in the rearing bed.
- Rear silkworms under optimum temperature and humidity.
- Avoid injury to the larvae.
- Apply recommended bed disinfectant as per schedule and quantity.
- Feed Amruth as per schedule to control flacherie disease.

3. MUSCARDINE:

Causative agent : Among fungal diseases, White Muscardine is common. The disease is caused by Beauveria bassiana.

Occurrence: The disease is common during Rainy and winter seasons.

Source of Infection: The infection starts when conidia come in contact with silkworm body. Mummified silkworms / alternate hosts (most are lepidopteron pests), contaminated rearing house and appliances are sources of infection.

Predisposing factors : Low temperature with high humidity.

Symptoms:

- The larvae loose appetite and become inactive.
- Presence of moist specks on the skin.
- The larva vomits and turns flaccid.
- After death, larva gradually becomes hard followed by mummification due to growth of aerial mycelia and conidia over the body and body turns chalky white.

Management:

- Disinfect the rearing house, its surroundings and equipments with recommended disinfectant as mentioned above.
- Control mulberry pests in the mulberry garden.
- Pick up diseased larvae before mummification and dispose them by burning
- Avoid Low temperature and high humidity in the rearing house. If required use heater/stove to raise the temperature.
- Regulate bed humidity during rainy season by dusting slaked lime powder during moult.
- Apply bed disinfectant, Vijetha and Vijetha supplement/Ankush/any recommended bed disinfectant as per schedule and quantity.

4. PEBRINE:

Causative agent: Nosema bombycis / different strains of microsporidia.
Occurrence: Non-seasonal
Sources of Infection: Silkworm gets infected through eggs (Transovarian/Transovum transmission) or by eating contaminated mulberry leaf. Infected silkworms, faecal matter, contaminated rearing house and appliances and alternate hosts (mulberry pest) are the sources of infection.

Management:

- Disinfect the rearing house, surroundings and with recommended disinfectant as mentioned above.

- Conduct strict mother moth examination and surface disinfection of silkworm eggs to produce and rear disease free layings.
- Follow strict hygiene maintenance during rearing.
- Control mulberry pests in and around the mulberry garden.

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