FLACHERIE DISEASE AND ITS MANAGEMENT IN SILKWORM REARING

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Flacherie is a major disease in silkworm and flaccidity of larva is the major symptom. The disease is common during summer and rainy seasons in all the sericultural areas of India.

Causes:

- Physiological weakness of silkworm combined with the pathogenic/non-pathogenic microbes is the primary cause of Flacherie disease in silkworm.

- The adverse environmental conditions during egg incubation and silkworm rearing, starvation of silkworm, feeding of silkworms with poor nutritive quality of mulberry and improper handling of silkworm during the rearing are the causes for weakness in silkworms.

- The physiological weakness in silkworms make them susceptible to pathogenic microbes such as different bacteria (*Streptococcus* sp.,/*Staphylococcus* sp.,/*Bacillus thuringiensis/ Serratia marcescence*) cause Bacterial Flacherie and non occluded viruses (BmIFV/BmDNV) cause Viral Flacherie.

- In such physiologically weak larvae, even the non-pathogenic bacterial micro flora of the mid gut multiply at faster rate, alter the gut environment and penetrate to haemolymph and cause flaccidity.

- Improper handling of silkworm leads to physical injury. The wound gets infected with microbes leading to Flacherie.

Causative agents:

The main causative pathogens are different bacteria *viz*., *Streptococcus* sp., *Staphylococcus* sp., *Bacillus thuringiensis* and *Serratia marcescence* and non-occluded viruses such as infectious flacherie virus (BmIFV) and densonucleosis virus (BmDNV). Flacherie is also caused by the combined infection of bacteria and viruses.

Symptoms:

- At the early stage of infection, symptoms are not clear and difficult to identify.
- The larvae become soft and flaccid.
- The growth of affected larvae retards, become inactive and vomit gut juice (Fig.1a).
- The faeces become soft with high moisture content. Sometimes chain type of excreta is observed. Often, rectal protrusion is also observed.
- Cephalothoracic region becomes translucent.
- When infected with *Bacillus thuringiensis*, symptoms of toxicity such as paralysis and sudden death are observed. After death larvae turn black in colour and give foul smell. (Fig.1b). Sometimes, the dead larvae turn red when infected with *Serratia marcescence* during injury.

Fig.1a & b. Flacherie larvae

Management:

- Procure silkworm eggs produced from healthy parent moths so that the progeny would be least susceptible to microbial infections.
- Incubate silkworm eggs under optimum environmental conditions.
- Ensure meticulous disinfection of silkworm rearing house, appliances and the surroundings of the rearing house and use quality disinfectants at recommended concentration, quantity and schedule. Ensure rearing and personal hygiene during the rearing.
- Feed silkworm with quality mulberry leaves, so that they grow physiologically strong and express high level of resistance to microbial infection.
- Rear silkworms under recommended optimum temperature and humidity conditions so that the larvae grow healthy and resistive to infection. Avoid rearing silkworms under fluctuating

temperature and humidity. Such conditions make silkworm weak and lose ability to resist infection.

- Never feed the silkworms with mulberry sprayed with insecticides/pesticides before the completion of the recommended ‘safe period’. The silkworms fed on such leaves develop flacherie symptoms.
- Avoid overcrowded rearing of silkworm. It leads to larval starvation, undesirable environmental condition, resulting in loss of resistance to infection. Provide good cross-ventilation in the rearing room.
- Avoid feeding excess mulberry leaves, which may lead to accumulation of uneaten leaves. The uneaten leaves as well as accumulated faeces ferment leading to increased bed temperature and humidity and make silkworm weak and lose resistance to infection.
- Avoid improper handling of silkworm causing injury especially during feeding, bed extension and mounting.
- Pick up suspected diseased larvae as early as possible and dispose them by burning/burying.
- Dust bed disinfectant, Ankush or Vijetha or as per the recommended schedule and quantity.
- Feed Amruth (Nandi Amruth or Rainbow Amruth) as per recommended schedule and quantity to control flacherie disease in silkworm.