



NON-SPINNING SYNDROME IN SILKWORMS AND ITS MANAGEMENT

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Introduction

The non-spinning syndrome is a discouraging condition that occasionally affects the silkworm which is having enormous economic importance because of its role in the production of silk. Sericulture is severely affected by this syndrome, which causes large financial losses for silk producers because mature silkworm larvae are unable to start or finish cocoon spinning. This syndrome is mainly associated with viral infections, genetic mutations, and contamination by pesticides, particularly insect growth regulators (IGRs) that disrupt hormonal balance and silk gland function.

Causes of Non-Spinning Syndrome

1. **Viral Infections:** The abnormal growth or degeneration of the silk glands caused by viral infections like BmDNV and BmNPV prevents the larvae from producing or properly organising the silk proteins required for cocoon formation.
2. **Genetic Factors:** Mutations in genes involved in the development of silk glands or the synthesis and regulation of silk proteins (e.g., FibH gene). These mutations result in impaired silk secretion and underdeveloped or degenerated silk glands.
3. **Pesticide Contamination:** Contamination of mulberry leaves with pesticides, especially IGRs like pyriproxyfen, fenoxycarb, and methoprene, is a leading factor. These chemicals maintain juvenile hormone levels abnormally high, disrupting larval metamorphosis and causing prolonged fifth instar with failure to spin cocoons.
4. **Environmental Stresses:** Environmental factors like temperature, humidity, and diet

have a significant impact on silkworms' physiological health and their capacity to spin. High temperatures have the potential to speed up the cocooning process, which may result in a poor silk formation or even the spinning process stopping entirely. Unusually low temperatures have the potential to severely slow larval development, which can result in the formation of incomplete or delayed cocoons. High humidity levels during the spinning phase can also induce diuresis and lead to stained cocoons which making them undesirable for reeling

Symptoms and Effects

- Silkworm larvae fail to spin silk or produce weak cocoons.
- Larvae may appear larger and darker.
- Prolonged larval stage without pupation.
- Increased larval mortality.
- Defective, flimsy, or malformed cocoons produced by affected larvae.

Management of Non-Spinning Syndrome

1. **Disease Control:** Use disease-free silkworm seeds and maintain strict hygiene during rearing. Removing infected or non-spinning larvae early reduces the spread of viral infections.
2. **Pesticide Management:** Avoid the use of harmful pesticides near mulberry plantations. Careful monitoring and controlling pesticide drift from non-mulberry crops help prevent contamination of mulberry leaves.
3. **Environmental Management:** Maintain optimal temperature (23-28°C) and humidity (70-85%) conditions in rearing

houses to prevent stress on silk gland development and function.

4. Genetic Improvement: Select and breed silkworm strains free from non-spinning genetic traits, leveraging molecular techniques to identify and manage mutations causing the syndrome.

Conclusion

By adopting integrated management strategies to address the complex issues caused by non-spinning syndrome, the sericulture sector can increase productivity and guarantee the long-term sustainability of silk production. The incidence of non-spinning syndrome can be decreased with proper management that combines genetic selection, pesticide control, and good rearing techniques which will safeguard the silk production and farmers' livelihoods.

References

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