

Safeguarding insect mass-rearing: molecular approaches to pathogen identification and surveillance

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Insect mass-rearing is a rapidly growing field with applications ranging from sustainable protein production to biocontrol. While most research has focused on improving production efficiency, the health of reared insects has received comparatively less attention, despite its critical impact on industry sustainability.

Our work aims to bridge this gap by applying advanced scientific methods to detect and monitor pathogens threatening insect rearing operations. By combining high-throughput sequencing and bioinformatics, we identify novel pathogens associated with impaired production in mass-reared insects such as the Black Soldier Fly, the mealworm, and biocontrol agents of the *Nesidiocoris* genus. In parallel, we apply targeted molecular techniques to deliver cost-effective and tailored approaches for the detection and quantification of known insect pathogens.

Overall, these case studies highlight the importance of integrating pathogen discovery and health monitoring into standard rearing practices to ensure the resilience and safety of this emerging industry.

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