



A COST-EFFECTIVE & SCALABLE PROCESS FOR PRODUCING A BIOPESTICIDE

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INTRODUCTION OF TECHNOLOGY

A cost-effective and scalable process for producing a biopesticide using insect larvae to grow Baculovirus. The virus is safe to use and found to be effective in controlling major insect pests widely known to damage important crops. Field trials conducted in Malaysia have produced promising results by increasing the crop yield by up to 30%.

INVENTION

Baculoviruses have been used for a variety of applications to date including the production of recombinant proteins and use as biopesticides. The problem with commercially using Baculovirus has been the inability to produce large amounts of infectious Baculovirus.

The Baculovirus occur only in invertebrate animals and so are regarded as excellent candidate microbial agents to control pests. Invertebrate pathology has revealed their virological characteristics. No similar viruses have been noted in the records and researches of medicine, veterinary science, animal collections and zoos. This is a body of safety evidence that is vast in scope and time, because vertebrates, including man, have been continually exposed to these invertebrate viruses in nature. Therefore, the organism can be safely handled by farmers in controlling important insect pests.

Several factors are important for the development of processes for the production of Baculovirus on a commercial scale. These include optimisation of conditions for growth in host insect cells propagated in large-scale bioreactors and development of improved insect cell culture media. In many respects, these factors are highly interdependent and optimisation of one may limit the available ranges for other factors that have bearing on the overall goal of maximising viral growth.

New types of insect cell culture media optimised for particular cell lines are also a key factor in achieving the goals of many commercial processes and are not currently widely available. Optimised media formulations and prolific cell lines, which lead to high yields and perform at all scales of production, are all critical factors for success. The process developed can be optimised for large scale production the virus for commercial application.

APPLICATION

Range of pests tested:

Oriental Leaf Worm Moth (*Spodoptera litura*), Beet Armyworm (*Spodoptera exigua*), Diamondback Moth (*Plutella xylostella*)

Range of crops tested:

Cabbage, sawi, chosam, sweet potato, chilli, okra, corn, peanut, paddy, starfruit, tobacco and some medicinal herbs



Beet armyworm
Spodoptera exigua



Diamondback moth
Plutella xylostella

ADVANTAGES

The Baculovirus biopesticide -

- Safe to handle
- Existing farming equipment can be used to spray the virus
- Small inoculum of virus required as it rapidly spreads within days
- Demonstrated increase in crop yield by up to 30%
- Does not intensify or create new pest problems
- The pests are unable (or very slow) to develop resistance
- Control is self perpetuating for each crop cycle

The process for the production of Baculovirus -

- Cost-effective
- Safe
- Scalable
- Results in high-yields of the virus
- No multiple serial passages of the virus in the process that could affect viral stability
- Resulting viral particles stable at room temperature up to 2 years



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