



Novel BT Isolate from Insecticidal Genes

Technology Description

The present invention involved isolation of a bacteria following enrichment in sodium acetate buffer amended Luria broth medium followed by heat treatment from soil of Bhitarkanika mangrove, Orissa, India. The microbe was identified as *Bacillus thuringiensis* based on 16s rDNA amplification. PCR analysis with the primers for 44 cry genes (30 gene families) and 32 insecticidal genes other than cry (16 gene families) resulted in successful amplification of 9 cry and 7 other insecticidal genes. Based on amplification of the conserved domains, following genes were found to be present in the isolate:

cry genes: cry7.8, cryIAb, cryIAc, cry1C, cryIF, cryIG, cry2Aa, cry2Ab, cry2Ac, other insecticidal, fungicidal and bactericidal genes: vip 3A, nheA, nheB, nheC, chit, chit 36, ZmaR

Name Of Institute: NRCPB, IARI, New Delhi
 Stage of development:
 Ready for commercialization
 Patent status: No

Scientific Experts:
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Background

Indiscriminate application of chemical insecticides over the years has led to irreparable loss to the environment and emergence and spread of resistance in vectors of human diseases and agricultural pests. The insect pathogenic soil bacterium *Bacillus thuringiensis* (Bt) has proved beneficial over conventional chemical pesticides in

Benefits / Utility

Has a potential of being an effective biopesticide/ biocontrol agent against a wide spectrum of agricultural pests/pathogens. Has the basic advantage of a biopesticide/biocontrol agent over the use of chemical pesticides, that is, it is environment friendly. Bt is safe to people and nontarget species. Formulations can be used on

Country

India

Scalability

Formulations can be made on small to large scale using different capacity fermentors. Further refinement of the technology would be needed for high scale commercialization.

Business and Commercial Potential

Business Potential: The technology will have wide acceptance as, it can be used to control insect pests across different orders of insects. Farmers can use it to control many lepidopteran pests in their fields and it can also be applied to stagnant water for the control of mosquito larvae.

Market potential: Since insect infestation is a major hurdle in crop

Potential investors to this technical innovation

Companies into sale of biopesticides /biocontrol agents



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Financials

VALUE OF THE TECHNOLOGY: Tech commercialization fee to be charged from one licensee= Rs. 20-25 lakhs Financial Required: Fix assets (Land and Building) = Rs. 200 lakhs (Variable) Machinery = Rs. 100 lakhs, Others= Rs. 25 lakhs, Pre-operative



Target Market / Customer

Potential Clients: Farmers



Limiting factors for large scale commercialization

Effective market network Short shelf life of the formulation.

Social impact of the technology

Farmers will save money on chemical pesticides. Once proven successful, it would help in increasing the income of the farmers. Moreover, being ecofriendly approach it would not create health hazards for farmers and people in vicinity of farms.

Any other relevant information

The draft genome sequencing of the bacterium is under progress. The analysis of results would help in identification of any additional cry or toxin genes present in this unique strain. The toxicity against *Helicoverpa*