Highly Effective Broad Spectrum Mosquito Larvacide

Tech ID: 32224 / UC Case 2015-442-0

BACKGROUND

Mosquitoes transmit many pathogens that cause debilitating diseases including the viruses that cause Dengue, West Nile, Zika, and protozoans causing various malarias. Over half the human population lives in areas where these mosquito-vectored pathogens are endemic. More than 3 billion people are at risk of malaria alone, with an estimated 214 million cases and greater than 438,000 deaths in 2015, most of the latter being children who die under the age of 5, making malaria the leading cause of morbidity and mortality worldwide. Synthetic chemical insecticides are still used to control mosquitoes. However, their detrimental environmental effects and resistance to these in target populations led to the development of commercial larvicides.

BRIEF DESCRIPTION

Prof. Brian Federici and his colleagues from the University of California, Riverside have developed a highly effective commercial larvicide based on two mosquitocidal bacteria, Bacillus thuringiensis subsp. israelensis (Bti) and Lysinibacillus sphaericus (Ls). By using specific chimeric proteins, this method allows for a broad-spectrum targeting domain for insecticidal proteins. Results have shown that this larvicide will have high efficacy against most major mosquitoes that transmit diseases, including Malaria, Yellow Fever, Filariasis, and newly emerging viruses such as the Zika virus. This technology serves to confront the growing need for preventing deadly diseases from being spread by insects in order to save lives.

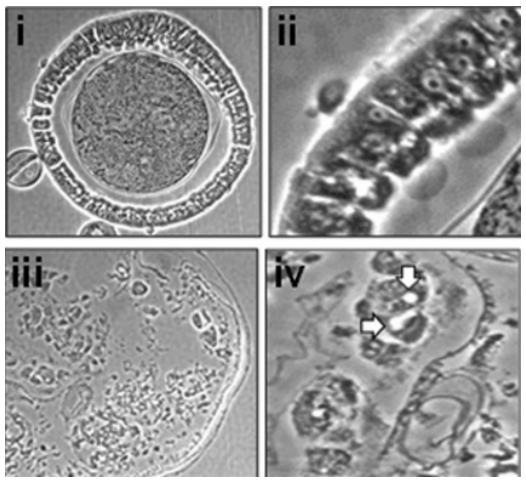

Fig 1: Midgut histopathology caused by Cyt1Aa-BinA chimera in 8 hours post-treatment at the LC95 concentration; Control midgut epithelium, (i) and (ii), respectively, 100x and 400x magnification. Midgut epithelium of a treated larva (iii) and (iv), respectively 100x and 600x magnification.

APPLICATIONS

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OTHER INFORMATION

KEYWORDS

disease vector, larvicide, Malaria, mosquitoes, lipophilic protein, larva, protein

CATEGORIZED AS

- Materials & Chemicals
  - Biological
  - Pesticides and Insecticides

RELATED CASES

2015-442-0

- To serve as an environmentally-friendly and effective tool to control mosquitoes
- To prevent the spread of deadly diseases from being facilitated by mosquitoes

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,472,397	11/12/2019	2015-442

RELATED MATERIALS

- Bideshi, Dennis & Park, Hyun-Woo & Hice, Robert & Wirth, Margaret & Federici, Brian. (2017). Highly Effective Broad Spectrum Chimeric Larvicide That Targets Vector Mosquitoes Using a Lipophilic Protein. Scientific Reports. 7. 11282. 10.1038/s41598-017-11717-9. - 09/12/2017

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