

**VECTOBAR™**  
*Bacillus thuringiensis var israelensis*  
Strain VCRC B 17 Serotype 11-14  
**BioLarvicide for Mosquitoes** (*Culex* spp. *Anopheles* spp. and *Aedes* spp)  
(Regd in Central Insecticides Board, Govt of India)  
**APPROVED AS MOSQUITO LARVICIDE**

### Introducing VECTOBAR™

VECTOBAR™ is a biological larvicide based on a selected strain of naturally-occurring beneficial soil bacteria *Bacillus thuringiensis var israelensis* (VCRC Strain B 17 Serotype 11-14) that parasitizes the Mosquito Larvae. It is formulated as 4,000 IU/mg Micro Emulsion / Liquid Formulation and used as an effective foliar spray. VECTOBAR™ is a tropicalised formulation that is stable for 24 months at a temperature of 45 Degree Celsius.

Larvicides are more effective and less toxic than adult mosquito sprays and the applications are unlikely to result in adversely affecting human health.

VECTOBAR™ is registered by Indian Pesticides Regulatory Authority - Central Insecticides Board, Govt of India. VECTOBAR™ is approved for use as Bio Larvicide and in Integrated Mosquito Management.

### A Historical Brief

*Bacillus thuringiensis var. israelensis* This subspecies of Bt was discovered in 1976 by Dr. Joel Margalit and Mr. Leonard Goldberg. It was isolated from a stagnant riverbed pool in Israel and named Bt variety *israelensis*.

### Mode of Action

Protein formation: Bt I is a stomach toxin. It can produce five different microscopic protein pro-toxins that are packaged into a protein container or a crystal. The crystal form of the toxin is referred to as delta-endotoxin. If the endotoxin is ingested, the five proteins are released into the alkaline environment inside the insect's gut. The toxins work alone or together to break down the gut wall. This leads to paralysis and eventually death for the mosquito larva.

Bt I strains have pBtoxis plasmid which encodes numerous Cry and Cyt toxins, including Cry4, Cry10, Cry11, Cyt1 and Cyt2. The crystal aggregation which these toxins form contains at least four major toxic components but the extent to which each Cry and Cyt protein is represented is not known and likely to vary with strain and formulation. Both Cry and Cyt proteins are pore forming toxins which lyse midgut epithelial cells by inserting into the target cell membrane and forming pores

## Method of Application

### Foliar application

Mix VECTOBAR™ in water and spray on breeding sites. Mix 250 ml of VECTOBAR™ in 10 L of water and spray evenly @ 20 ml / Sq mt

5 L /Ha gives 80% control in breeding of *Culex* spp. In casurina pits / drains / disused wells the control is upto 19 days. It is recommended to use 0.50 ml / Sq Meter. Mix 250 ml / 10 L of water and spray evenly @ 20 ml / Sq mt

10 L /Ha gives 80% control in breeding of *Anopheles* spp. in breeding pools upto 4 weeks. It is recommended to use 1 ml / Sq Meter. Mix 500 ml / 10 L of water and spray evenly @ 20 ml / Sq mt

10 L /Ha gives 80% control in breeding of *Aedes* spp. In tree holes cesspits / drains / disused wells it gives a control upto 19 days. It is recommended to use 1 ml / Sq Meter. Mix 500 ml / 10 L of water and spray evenly @ 20 ml / Sq Meter.

Time of application: The application of VECTOBAR™ for larval control is very time-specific. Mosquito larvae go through four life stages called instars. They do not feed between each instar, nor do they feed much during the fourth instar, as they prepare to become pupae. Therefore, it is crucial that the VECTOBAR™ is not applied during these non-feeding periods. Otherwise, the application is wasted and control is not achieved. It is best to treat larval habitats with VECTOBAR™ when the larvae are in their second or third instar. Larval kills can be observed within one hour of ingestion of the VECTOBAR™. However, higher larval mortality is noted within twenty-four hours of application.

Note: It should not be mixed with strong alkaline chemicals or bactericides. Since it is poisonous to silkworm, it is advised not to use VECTOBAR™ near Sericulture area

### Target Pests

*Culex quinquefasciatus* , *Anopheles stephensi*

### Compatibility

VECTOBAR™ is compatible with BioPesticides.

### Shelf Life

VECTOBAR™ is stable for a period of 24 months from the date of manufacturing.

## Mass Composition

CONSTITUENT	W/W %	FUNCTION
<i>Bacillus thuringiensis var. Israelensis</i>	5.00%	Active
Sodium alginate	4.00%	Inactive
Glycerol	20.00 %	Inactive
Liquid paraffin	10.00 %	Inactive
Citric Acid	0.10 %	Inactive
Sodium benzoate	0.20 %	Inactive
Congo Red	0.05 %	Inactive
Sterile Water	q.s	Inactive

## BIOLOGICAL COMPOSITION

CONSTITUENT	IU	FORMULATION
<i>Bacillus thuringiensis var. Israelensis</i>	4000	Liquid
Spore Count	$6.6 \times 10^7 / ml$	

## OTHER FORMULATIONS AVAILABLE

<i>Bacillus thuringiensis var. Israelensis</i>	1200	Wettable Powder
<i>Bacillus thuringiensis var. Israelensis</i>	1200	Liquid

Free from Salmonella, Shigella , E.Coli

## Cautions for handling and use of product

1. Avoid inhalation and skin contact while diluting as there could be spillage / splashes of the product.
2. Mixing and spraying equipment is to be thoroughly rinsed with water and detergent before using the same equipment for spraying other pesticides.
3. Surplus spray solution should not be disposed in crop lands / stagnant water / flowing water where there is a possibility of causing pollution to natural resources
4. Do not eat / drink / smoke during application.
5. Direct incidence of VECTOBAR<sup>™</sup> may cause irritation and therefore it is recommended that the operator should use protective gear viz gloves, apron, mask, eye gear and hood.

## Symptoms and Antidotes

**Symptoms:** Occasional symptoms include head ache and nausea.

**Antidote:** In the case of ingestion: symptomatic treatment is advised. In the case of contact with Eyes: Flush with water liberally for 20 minutes. In case of skin contact, wash the affected area with plenty of water and soap.

## Citations

There are many citations in public domain on effectiveness of *Bacillus thuringiensis var. Israelensis* as a BioLarvicide

## Commitment to Nature

- VECTOBAR™ is approved for use as an effective Bio Larvicide.
- VECTOBAR™ can be used as an effective component in Integrated Mosquito Management (IMM) programmes, thereby leading to a reduction in use of chemicals creating a safer environment.
- VECTOBAR™ does not lead to residue problems and doesn't cause resistance or resurgence problems.

## Benefits from VECTOBAR™

- VECTOBAR™ effectively controls mosquito larvae
- VECTOBAR™ is earthworm friendly , pet friendly , eco friendly and infant friendly