



ENVIRONMENTAL FRIENDLY FORMULATION FOR CONTROL OF VECTORS AND PESTS

BIOVECTROL® 10EW is a new concept; eco-friendly insecticide based on a unique active ingredient **Etofenprox®¹** and certain natural botanical extracts specially designed for vector control.

BIOVECTROL® 10EW, with its excellent efficacy and high repellence, offers vital role in rapid and effective control of vector-borne diseases such as those of Dengue Hemorrhage Fever, Yellow Fever, Malaria, Filaria, Chagas Disease, Encephalitis, Shigellosis, Trachoma and other diarrhea diseases.

This new potent organic vector control formula exterminates mosquitoes and biting insects and is especially effective against Anopheline Mosquitoes, Aedes Mosquitoes, Synanthropic Flies, Triatomine Bugs, Cockroaches, Fleas, etc.

By virtue of biodegradable and photodegradable properties of **BIOVECTROL® 10EW**, long term and repeated applications will not pose any environmental pollution.

¹ **ETOFENPROX**, is a unique “CHO-compound” composed of Carbon, Hydrogen and Oxygen only. **ETOFENPROX** has been highly evaluated through the **World Health Organization Pesticide Evaluation Scheme (WHOPES)** and successfully approved by the Division of Tropical Diseases, WHO in 1997 with code number **WHOPES/97.24.1**.



FEATURES

➤ **HIGH EFFICACY**

It is effective against a broad spectrum of vectors and pests including mosquitoes, flies, cockroaches, triatomine bugs, fleas, etc. Furthermore, it provides excellent persistence on wall surfaces and net fibers.

➤ **SAFE FOR MAMMALS AND ANIMALS**

It provides a safe and effective method of protection as it has no harmful influence to human and non-target organisms.

➤ **LOW IMPACT ON ENVIRONMENT AND TO NON-TARGET ORGANISMS INCLUDING FISH, BIRDS AND BENEFICIAL INVERTEBRATES – ENVIRONMENTAL FRIENDLY**

➤ **VECTORS UNLIKELY TO DEVELOP RESISTANCE**

Vectors that have developed high resistance to conventional insecticides will have no tendency to show cross-resistance.

➤ **PLEASANT ODOR, NON STAINING AND NON-IRRITANT**

Easily accepted by the community.

➤ **IMPROVEMENT OF LIVING CONDITIONS**

The reduction in larva and adult vector population (indoor and outdoor) will consequently decrease man-vector contact, thus promoting a healthier and more hygienic living environment.

ENVIRONMENT

➤ **WILDLIFE AND FISH**

- a) Mallard Duck LD₅₀ (Oral) ≥ 2,000 mg/kg
- b) Aquatic Animal



SPECIES	TLm value ($\mu\text{g/L}$, 48 hrs)
Carp	5,000
Goldfish	1,730
Ayu Fish	1,200
Water Flea	> 40,000 (3 hrs)
Short-necked Clam	490,000

➤ SOIL DECOMPOSITION

- Soil decomposition studies showed that the half-life of **BIOVECTROL® 10EW** is approximately 1- 3 weeks in aerobic soils.
- The leaching test on soils revealed that **BIOVECTROL® 10EW** was not leached into the aquatic environment.

BIOVECTROL® 10EW is thus proven to be both Environmental and Ecological Friendly.

TOXICOLOGY

➤ ACUTE TOXICITY

METHOD OF ADMINISTRATION	ANIMALS	LD ₅₀ (mg/kg)
Oral	Rats	> 42,800
	Mice	> 107,200
	Dogs	> 5,000
Dermal	Rats	> 5,000
	Mice	> 5,000
Subcutaneous	Rats	> 32,160
	Mice	> 53,600
Intraperitoneal	Rats	> 42,880
	Mice	> 53,600

➤ SUBCUTANEOUS TOXICITY

Sub-acute dietary studies for 13 weeks on rats and mice did not show any adverse effects.



➤ **CHRONIC TOXICITY, TERATOGENICITY, MULTIGENERATION STUDY AND MUTAGENICITY**

Long term feeding toxicity studies on rats, mice and dogs did not show any adverse effects. Mutagenicity, teratogenicity and three-generation reproduction studies did not show noticeable abnormalities.

➤ **IRRITATION AND INHALATION**

No skin and eye irritation on rabbits.

Inhalation toxicity (Rat) LD₅₀ > 5,900 mg/m³

➤ **SYMPTOMS OF POISONING**

No specific symptoms of poisoning are observed.

➤ **SAFETY COMARISON AMONG VARIOUS INSECTICIDES**

INSECTICIDE	LD ₅₀ mg/kg (Rat)	ODOR	Ch-Esterase Inhibition	IRRITATION
ETOFENPROX	> 40,000	X	X	X
Malathion	1,375	√	√	X
Cyfluthrin	250	√	√	√
Temephos	1,266	√	√	X
Bendiocarb	40 – 156	√	√	X
Permethrin	430 – 470	X	X	Slight
Lamda-cyhalothrin	79	X	X	√
Pyrimphos-methyl	2018	√	√	√
Deltamethrin	129	X	X	√
Cypermethrin	250	√	√	Slight
COMPARISON WITH COMPOUNDS FOR DAILY CONSUMPTION				
Common Salt	3,000	X	X	X
Sugar	29,700	X	X	X



➤ **WHO HAZARD CLASSIFICATION**

INSECTICIDE	WHO HAZARD CLASSIFICATION
ETOFENPROX	Table 5
Malathion	Table 4
Cyfluthrin	Table 3
Permethrin	Table 3
Lamda-cyhalothrin	Table 3
Pirimphos-methyl	Table 4
Deltamethrin	Table 3
Cypermethrin	Table 3

➤ **FUNDAMENTAL ACTIVITY AGAINST HYGENIC PESTS**

VECTORS / PESTS	STAGE	MEHTOD	LD₅₀ or LC₅₀
Culex Pipiens	Larva	Immersion	0.0054 ppm
Culex Quinquefasciatus	Adult	WHO test kit	0.0036 %
Anopheles Albimanus	Adult	WHO test kit	0.009 %
Anopheles Gambiae	Larva	Immersion	0.009 %
Anopheles Quadrimaculatus	Larva	Immersion	0.00085 ppm
Anopheles Stephensi	Larva	Immersion	0.0073 ppm
Aedes Taeniorhynchus	Adult	Aerosol	0.0013 ppm
Musca Domestica	Adult	Topical	0.064 µg / -
Stomoxys Calcitrans	Adult	Topical	0.0093 µg / -
Blattella Germanica	Adult	Topical	0.209 µg / -



APPLICATION EQUIPEMNT

- Hand sprayers, compressed air sprayers
- Mist-blowers (power operated)
- Aerosol generators (power operated)
- Thermal foggers (power operated)

APPLICATION METHODS

Dilute **BIOVECTROL® 10EW** with water and mix homogeneously. The dilution factor and the interval of re-treatment vary depending on the field of application.

Vectors that are mainly exophilic, but tend to feed or rest indoors briefly can be effectively controlled by indoor residual spraying. Examples of indoor residual treatment will be residual spraying to walls, ceilings, undersides of furniture, outside eaves and porch.

For vectors that are strongly exophilic and/or exophagic, those that rest and bite outdoors; exterior spraying should be employed. Exterior space-treatments with cold aerosols are carried out using hand or vehicle mounted ULV equipment.

Other control methods, such as insecticide treated mosquito nets can also be employed. Treating mosquito nets and curtains has also proven to be an effective and long lasting strategy for repelling and killing biting insects. Impregnated bednet also has the controlling effect on malaria parasite development.

When space treatment is applied from outsides, residents should be encouraged to leave windows and doors open during application to aid penetration of the insecticide.

There is no side effect on spray-men and the people living in the sprayed areas.



RECOMMENDED DILUTION

TARGET PEST	APPLICATION METHOD	DOSAGE or DILUTION RATE
Anopheles mosquito adults and nuisance insects	Bednet impregnation	Soak for 10 minutes and hang to dry in the shade. 25 ml in 1,000 ml of water (1:40 dilution)
Fly adults, Mosquito adults, Cockroaches, bedbugs, fleas and others	Space Spray Min 8L/ha	Spray directly onto flies and mosquitoes. 10 ~ 20 ml in 1,000 ml of water (1:50 ~ 100 dilution)
Fly adults, Mosquito adults, Cockroaches, bedbugs, fleas and others	Residual Spray 40ml/m ²	Spray upon the ceiling and wall where flies and mosquitoes perch frequently. 10 ~ 50 ml in 1,000 ml of water (1:20 ~ 100 dilution)
Fly Larvae	Spray upon the habitat and garbage	5 ml in 1,000 ml of water (1:200 dilution)
Mosquitoes-Larvae	Pour into the habitat	50 ~ 100 ml in 1,000 ml of water (1:10 ~ 20 dilution)

STORAGE AND HANDLING PRECAUTIONS

- Keep container closed when not in use.
- Store away from foodstuffs and feeds.
- Avoid direct sunlight and high temperature storage.
- General ventilation and industrial preventive clothing is sufficient.

PACKING

BIOVECTROL® 10EW is available in 1 liter, 5 liters and 20 liters pails. Other packing sizes are also available upon request.

