

Evaluation of the efficacy of a “VectoMax® FG” within a routinary campaign for *Culex pipiens* and *Aedes albopictus* control in Padua – Northeast Italy

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COMPOSITION

- Bacillus thuringiensis* subsp. *israelensis* ceppo AM65-52
- Bacillus sphaericus* ceppo ABTS 1743 50 Bsp/mg



Figure 1

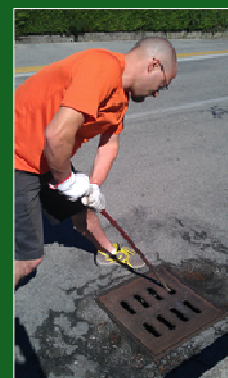


Figure 2



Figure 3

Introduction

“VectoMax® FG” is a biological larvicide composed of *Bacillus thuringiensis* subsp. *israelensis* associated with *Bacillus sphaericus*. Previous experiences permitted to evaluate the efficacy of the larvicide applied into the rain catch basins but no information are available about the practical use of “VectoMax® FG”, which is a granular formulation that doesn’t permit the typical application done by pressure pumps.

It’s not clear how the physical shape of the formulation could influence the planning of pest control services, which are contracted by the public authorities, entrusted to specialized companies or operators of municipal structures.

The present study evaluated “VectoMax® FG” through a field test developed at municipal level, integrated into the scheduled pest control plan. The object was to take more essential information for the definition of technical specifications such as the number and frequency of larvicide applications, persistence and effectiveness against the common Italian mosquito species present in catch basins and to define the optimum equipment for the distribution of the product (e.g. GPS control systems dispenser).

Materials and methods

The field test was done in Padua (Northeast of Italy) in a typical residential area with many buildings, as well as public green areas.

To evaluate efficacy and problems connected to the use of the granular formulation two non treated streets (control) and four streets where catch basins were treated 10 grams of “VectoMax® FG” were selected.

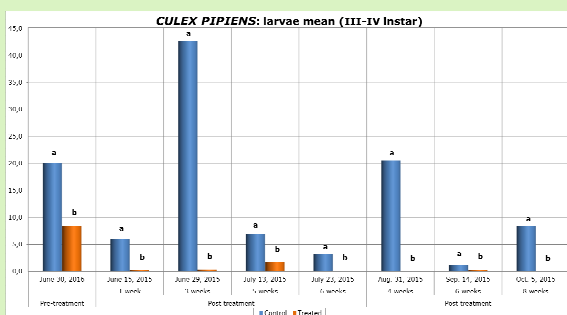
The application was done by a special device that permits to release exactly the desired quantity of product, which is connected to a Smartphone and to a satellite device (Biblionkey) by Bluetooth. The evaluation of the efficacy was done through the percentage reduction of the presence of 3rd and 4th instars mosquitoes larvae respect to untreated catch basins.

Results

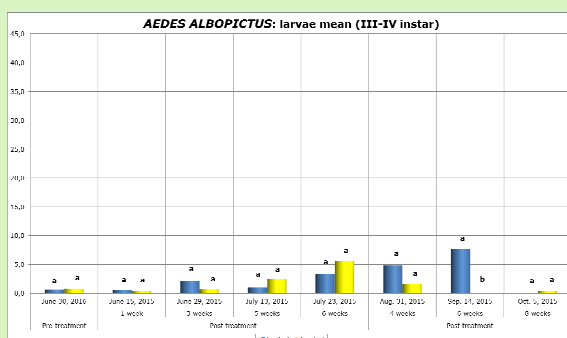
The results show clearly an efficacy of more than 30 days against *Cx. pipiens* (Graph.1) but on *Ae. albopictus* doesn’t seem to be effective (Graph.2).

The low impact on Asian tiger mosquito could be due to the low presence of this species and the consequent lack of significant differences between control and treated catch basins (Graph.2).

The reduction percentage shows high values on *Cx. pipiens* during the whole test (Graph.3), on *Ae. albopictus* its low presence requires further tests (Graph.4).



Graphic 1: population dynamic of *Culex pipiens* in control and treated catch basins.

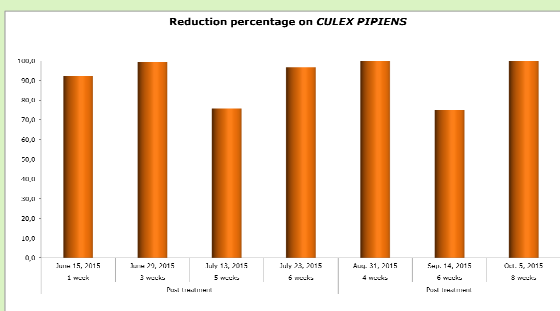


Graphic 2: population dynamic of *Aedes albopictus* in control and treated catch basins.

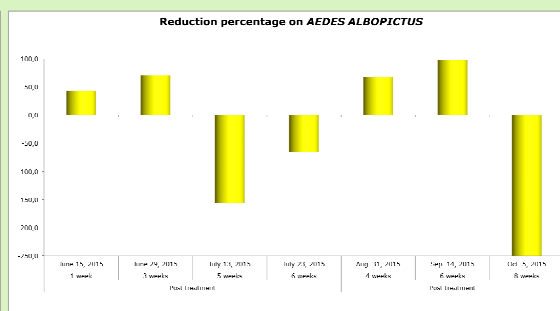
Conclusions

The use of “VectoMax® FG” into a larvicide control program may reduce the number of the applications needed, during the period since May to October, because of the long lasting action against *Culex pipiens*. Regarding the effectiveness on *Aedes albopictus* the low presence of this species doesn’t permit to take any conclusion.

Regarding the application procedures about granular formulation, it was calculated that the number of catch basins which can be treated by VectoMax® is the same if compared to the applications done with liquid larvicides or tablets (in the same area). The time to treat catch basins goes from 70 catch basins/hour for a walking worker to 180 catch basins/hour for a worker using a bike: this amount can change very much depending on the number and type of storm drain, urbanization and cars parked along the street.



Graphic 3: Reduction percentage on *Culex pipiens* in treated catch basins respect to control catch basins.



Graphic 4: Reduction percentage on *Aedes albopictus* in treated catch basins respect to control catch basins.