A New Bioinsecticide Based On RNAi Technique To Control Zika Mosquito

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Introduction: Dengue, chikungunya and Zika virus became an epidemiological issue of alert in many countries. They are transmitted by *Aedes aegypti* mosquito´s bite. Brazil is facing a large outbreak of Zika virus. Recently was demonstrated the direct relation between Zika virus infection and microcephaly and Guillain-Barré syndrome. Control of mosquito population is the better choose to avoid the diseases spreading. We developed a new bioinsecticide based on the specific silencing of chitin synthase genes (*CHS*) through ribonucleic acid interference technique. **Aims:** In this work we evaluated a strategy based on the use of double-stranded RNA (dsRNA) produced by a modified Escherichia coli, in order to verify the larvicidal effect and adjuvant capacity, combining it with other insecticide such as diflubenzuron, chemical chitin synthesis inhibitor. **Methodology**: We selected 2 different regions in N-terminus and in C-terminus of CHSA and B, separately, and a high similarity region located at catalytic site, common for CHSA and B. The sequences were cloned in pL4440 vector and transformed into E. coli HT115 strain, in order to express each corresponding dsRNA. We evaluated the effect of CHSA and B silencing in the mosquito development. CHSs expression reduction was measured by qPCR and chitin distribution was observed by microscopy using a specific chitin probe. The adjuvant effect of the bioinsecticide associated with diflubenzuron was evaluated. **Results and Discussion**: The recombinant E. coli lysated-containing dsRNA targeting a common sequence in catalytic site of both CHSs had a highest larvicidal effect with 43% when compared with control. The larvae and adults that survived of treatment had altered phenotype, being smaller and anomalous compared to controls. Association with diflubenzuron increased mortality twice when compared with diflubenzuron larvicidal effect alone. **Conclusion**: This strategy could be used for vector control, administrating the bioinsecticide alone or in association with insecticides, reducing its impact in the environment, insecticide resistance and economic aspect.

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