Developing a model for chemical control of dengue vectors

Abstract:

In this three-year project, we evaluate the effectiveness and feasibility of the personal use of insecticidal aerosols as a measure to reduce the incidence of dengue fever.

First year (2005.1.1-2005.12.31): Evaluation of the feasibility of the personal use of insecticidal aerosol cans as the measure to reduce the dengue vectors.

Second year (2006.1.1-2006.12.31): Evaluation of the effectiveness of the personal use of insecticidal aerosol cans as a measure to reduce the incidence of dengue fever.

Third year (2007.1.1-2007.12.31): Developing a model for chemical control of dengue vectors

We conducted evaluation of the feasibility of the personal use of insecticidal aerosol cans as the measure to reduce the dengue vectors in the first year. The results were found that
the willing of residential usage was more in insecticidal aerosol cans group than those of the control group. In addition to, knockdown time (KT_{50}) of *Bora Bora* (control group, *Aedes aegypti*) , *Aedes albopictus and Aedes aegypti* were 0.98 ± 0.56 , 1.10±0.58 and 3.07±1.47 minutes, respectively; and mortality (twenty four hours) of *Bora Bora, Aedes albopictus and Aedes aegypti* all are 100% 。

Evaluation of the effectiveness of the personal use of insecticidal aerosol cans as a measure to reduce the incidence of dengue fever was carried out in the second year (2006.1.1-2006.12.31). The results were found that the ovitrap index were 53.3% and 83.3% at both indoor and outdoor of the households before chemical control. They were higher than those of the same period in the last year (27.2% and 69.9%). Base on the finding, they are necessary for surveillance and cleanliness the sources of dengue vectors.

In addition to, We found that three formulae of insecticidal aerosol cans had the killing effect of vectors from two years researches. Therefore, insecticidal aerosol cans can be supplementary chemical control of dengue vectors when the residents refused insecticidal fogging because of insecticide contamination or there was a delay or gap between the peak of outbreaks and the administration of insecticide fogging. Moreover, It can be additional chemical control of dengue vectors by spraying aerosol insecticides at indoor of households as the use of personal protective measures.

In the surveillance of density of dengue vectors, we found that the ovitrap index did not significantly decrease between before chemical control and three weeks after

chemical control(p＞ 0.05). These chemical control measures cab rapidly reduce the density of dengue vectors. However, the density of dengue vectors also increased in three weeks after chemical control if resources of dengue vectors exist. To effectively decrease the density of dengue vectors, it is necessary for cleanliness the sources of dengue vectors after chemical control.

Keyword: dengue, insecticidal aerosol cans, chemical control, dengue vectors