

## 1.0 TITLE

A laboratory evaluation of household insecticide product, aerosols, against cockroaches (*Periplaneta Americana* and *Blatella germanica*) using Glass Cylinder Method.

## 2.0 OBJECTIVES

To evaluate the bioefficacy of household insecticide product, aerosols, against cockroaches (*Periplaneta americana* and *Blatella germanica*) using the Glass Cylinder method.

## 4.1 RESEARCH PERSONNEL

Associate Professor Dr Zairi Jaal (Principal Investigator)  
Mr Adanan Che Rus (Senior Research Scientist, Vector Control Research Unit)  
Supporting staff of VCRU, USM to assist.

## 4.0 MATERIALS AND METHODS

### 4.1 Test Samples

A minimum of 6 bottles for each aerosol formulation will be provided by the company.  
The samples to be tested are as follow:

Insecticides	Active ingredient (% w/w)
SSF/024/07	Cypermethrin 1.7% w/w
SSF/025/07	Prallethrin 0.05%, Imiprothrin 0.05%, Cypermethrin 0.1% w/w
MS Standard	Bioallethrin 0.1% w/w, Permethrin 0.5% w/w

### 4.2 Test Methods

#### Glass Cylinder Direct spray Method

A total of ten cockroaches (male or female) were released into a cylindrical steel container (diameter = 14 cm) with a netting bottom (30 mesh wire screen). The container was then placed at the bottom of a glass cylinder (diameter = 20 cm, height = 60 cm). The discharge rate (gm/sec) of each can of aerosol been tested was predetermined. Based on the dosage required, an estimated time of aerosol was sprayed into the glass cylinder. Knockdown of cockroaches was observed at the indicated intervals up to 20 minutes. After 20 minutes, all cockroaches were then collected and placed in clean glass containers with food and water. Mortality was recorded at 24 hours post-treatment. The mortality value was based on a combination of dead and moribund cockroaches over the total number of cockroaches initially sprayed. All test was conducted at temperature of 26-28 °C and relative humidity of 65-85%. For each aerosol sample, a minimum of three tests was conducted. The results were statistically analysed to obtain the knockdown values (KT50 and KT95) and regression slope, using a probit analysis (SPSS Version 2000 computer programme).

5.0 RESULT

TABLE 1

Discharge rate (gm/sec) and dosage used for aerosol samples received from MSR Green Corporation (S) Pte Ltd and MS Standard Aerosol tested against *Periplaneta americana* and *Blatella germanica* cockroaches using the Glass Cylinder method.

(Application No: MSR Green/006/2007; Dated: 17 September 2007)

Samples	Cockroaches	Discharge rate (gm/sec)	Spraying time (sec)	Total Discharge Per Test (gm)
SSF/024/07	<i>Periplaneta americana</i>	2.04	1.47	2.85
	<i>Blatella germanica</i>	2.04	1.47	2.88
SSF/025/07	<i>Periplaneta americana</i>	2.06	1.46	2.96
	<i>Blatella germanica</i>	2.06	1.46	2.98
MS Standard	<i>Periplaneta americana</i> & <i>Blatella germanica</i>	2.53	1.19	2.90

TABLE 2

Time-response values (KT50 and KT95) of aerosol samples received from MSR Green Corporation (S) Pte Ltd and MS Standard aerosol tested against *Periplaneta americana* cockroaches. Knockdown values from Glass Cylinder method. A minimum of 30 cockroaches were used for the test and three replicates were conducted.

(Application No: MSR Green/006/2007; Dated: 17 September 2007)

Samples	KT50 & Confidence limit (min)	KT95 & Confidence limit (min)	Regression Coefficient ± SE	24 HRS MORTALITY
<i>Periplaneta americana</i> (male)				
SSF/024/07	2.89 2.54-3.29	5.74 4.57-9.84	5.53±1.22	100±0.00
SSF/025/07	1.39 1.03-1.69	4.53 3.42-7.85	3.21±0.60	100±0.00
Ms Standard	6.65 5.86-7.66	23.50 17.30-39.01	3.00±0.40	100±0.00
<i>Periplaneta americana</i> (female)				
SSF/024/07	3.91 3.55-4.31	6.53 5.50-9.86	7.41±1.65	100±0.00
SSF/025/07	2.59 2.13-3.02	9.39 7.27-14.17	2.94±0.40	100±0.00
Ms Standard	9.49 8.42-10.69	35.14 26.82-53.83	2.89±0.35	100±0.00

TABLE 3

Time-response values (KT50 and KT95) of aerosol samples received from MSR Green Corporation (S) Pte Ltd and MS Standard aerosol tested against *Blatella germanica* cockroaches. Knockdown values from Glass Cylinder method. A minimum of 30 cockroaches were used for the test and three replicates were conducted.

(Application No: MSR Green/006/2007; Dated: 17 September 2007)

Samples	KT50 & Confidence limit (min)	KT95 & Confidence limit (min)	Regression Coefficient $\pm$ SE	24 HRS MORTALITY
<i>Blatella germanica</i> (male)				
SSF/024/07	0.73 0.65-6.80	1.51 1.25-2.17	5.20 $\pm$ 0.91	100 $\pm$ 0.00
SSF/025/07	0.34 0.28-0.40	0.90 0.70-1.45	3.86 $\pm$ 0.64	100 $\pm$ 0.00
Ms Standard	0.70 -0.62-0.80	1.85 1.45-2.88	3.91 $\pm$ 0.61	100 $\pm$ 0.00
<i>Blatella germanica</i> (female)				
SSF/024/07	1.26 1.18-1.35	2.10 1.84-2.65	7.41 $\pm$ 1.11	100 $\pm$ 0.00
SSF/025/07	0.45 0.39-0.54	1.16 0.86-2.06	4.04 $\pm$ 0.72	100 $\pm$ 0.00
Ms Standard	1.30 1.20-1.41	3.00 2.54-3.89	4.55 $\pm$ 0.54	100 $\pm$ 0.00

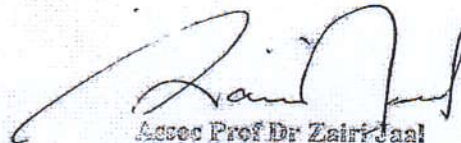
\* A heterogeneity factor is used in the calculation of confidence limits

## 6.0 COMMENTS

Aerosol samples SSF/025/07 and SSF/024/07 performed better than MS Standard aerosol for the efficacy tested in the Glass Cylinder method against *Periplaneta Americana* male and female. The efficacy tested in Glass Cylinder method against *Blatella germanica* male and female, aerosol sample SSF/024/07 performed within the norm of MS Standard while aerosol sample SSF/025/07 performed better than MS Standard aerosol.

**7.0 REFERENCES**

- WHO. 1996. Report of the WHO Informal Consultation on the evaluation and testing of insecticides in WHO/HQ, Geneva, 7-11 October 1996. CTD/WHOPES/IC/96/1.
- WHO. 1998. Report of the WHO Informal Consultation on the guideline specifications for household insecticide products. CTD/WHOPES/IC/98.3



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## 1.0 TITLE

Laboratory evaluations of aerosol samples (SSF/024/07 and SSF/025/07) against vector mosquitoes, *Aedes aegypti*, and *Culex quinquefasciatus* and using Glass Chamber method.

## 2.0 OBJECTIVES

To conduct laboratory evaluations of aerosol sample (SSF/024/07 and SSF/025/07) against vector mosquitoes, *Aedes aegypti*, and *Culex quinquefasciatus* using Glass Chamber method.

## 3.0 RESEARCH PERSONNEL

Associate Professor Dr Zairi Jaal (Principal Investigator)  
Mr Adanan Che Rus (Senior Research Scientist, Vector Control Research Unit)  
Supporting staff of VCRU, USM to assist.

## 4.0 MATERIALS AND METHODS

### 4.1 Test Samples

A minimum of 6 cans of aerosol sample will be provided by the company. The products was thoroughly shaken before dispensing.

Sample	Percentage of active ingredient in aerosol (%)
SSF/024/07	Cypermethrin 1.7% w/w
SSF/025/07	Prallethrin 0.05%, Imiprothrin 0.05%, Cypermethrin 0.1% w/w
MS Standard	Prallethrin 0.07%, d-phenothrin 0.05%

### 4.2 Test Methods

The test was conducted essentially following WHO guidelines (WHO 1996, 1998) and Malaysian Standards (SIRIM 1990). The following was the test chamber and methodology used:

#### Glass Chamber Method

This test was conducted in a Glass Chamber measuring 70 x 70 x 70 cm. A total of 20 laboratory-cultured sucrose-fed adult female mosquitoes aged 2-5 days was released into the chamber. The insecticide was sprayed into the chamber by using an electronic dispenser. The discharge rate (gm/spray) of the sprayer was predetermined. Based on the dosage required, the insecticide was discharged into the Glass Chamber for an estimated period of time. Knockdown of mosquitoes was observed at the indicated intervals up to 20 minutes. After 20 minutes, all mosquitoes was then collected and placed in cylindrical polyethylene containers with 10% sucrose pad. Mortality was observed after 24 hours post-treatment. All tests was conducted at a temperature of 26-28 °C and relative humidity of 65-85%. A minimum of three tests was conducted. The knockdown values (KT50 and KT95) and regression slope was obtained using a probit analysis (SPSS Version 2000 computer program).