CHAPTER 5

EXPEIMENT RESULT

5.1 Preliminary Studies

Before the experiment was carried out, a preliminary research was performed in order to get the optimum dose of cucumber extract to be used which will have an optimum impact in repelling the ants. Concentrations of cucumber extract used in the preliminary studies are 50%,60% and 70%. The result from the preliminary studies is shown in Attachment 1. According to the results from the preliminary studies, 65%,70% and 75% concentrations of cucumber exreact is determined to be used int his experiment.

5.2 Research Results data

The result of the experiment testing the potential repellent effect of cucumber extract on the fire ants is shown in the table below.

Table 5.1 Total Number of Fire Ants which Crosses the Tube during Four Experiments

Time Hour	Number of Fire Ants which is found in the Sugar Food Source													
	Negative Control	Positive Control	Cucumber extract 65%				Cucumber extract 70%				Cucumber extract 75%			
			E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
1	13	0	0	0	0	0	0	0	0	0	0	0	0	0
2	15	0	0	0	0	0	0	0	0	0	0	0	0	0
3	15	0	0	0	0	0	0	0	0	0	0	0	0	0
4	15	0	1	1	1	1	1	0	1	1	0	0	0	0
5	15	0	1	1	2	2	1	1	1	2	1	1	1	1
6	15	0	1	1	2	3	1	1	2	2	1	2	3	2

Where: E1=Experiment 1, E2=Experiment 2, E3=Experiment 3, E4=Experiment 4

The total number of recorded ants in the sugar container at each different concentration tested an the time intervals are then analyzed to know the potential repellency effect using the following equation.

$$\text{Repellency (\%)} = 100 - (T \times 100) / N$$ (Thavara,et al.,2007)

Where,

T = the number of ants found inside the bottle which contains the sugar food source

N =the total number of ants used

Table 5.2 Potential Repellency of Cucumber Extract on Fire Ants

Repellency of Cucumber towards Fire Ants per Hour

Time Hour	Repellency of Cucumber towards Fire Ants Per Hour				
	Negative Control	Positive Control	Cucumber extract 65%	Cucumber extract 70%	Cucumber extract 75%
1	13.330	100	100	100	100
2	0	100	100	100	100
3	0	100	100	100	100
4	0	100	93.3300	94.9975	100
5	0	100	90.0000	93.3300	93.3300
6	0	100	88.3325	90.0000	86.6675

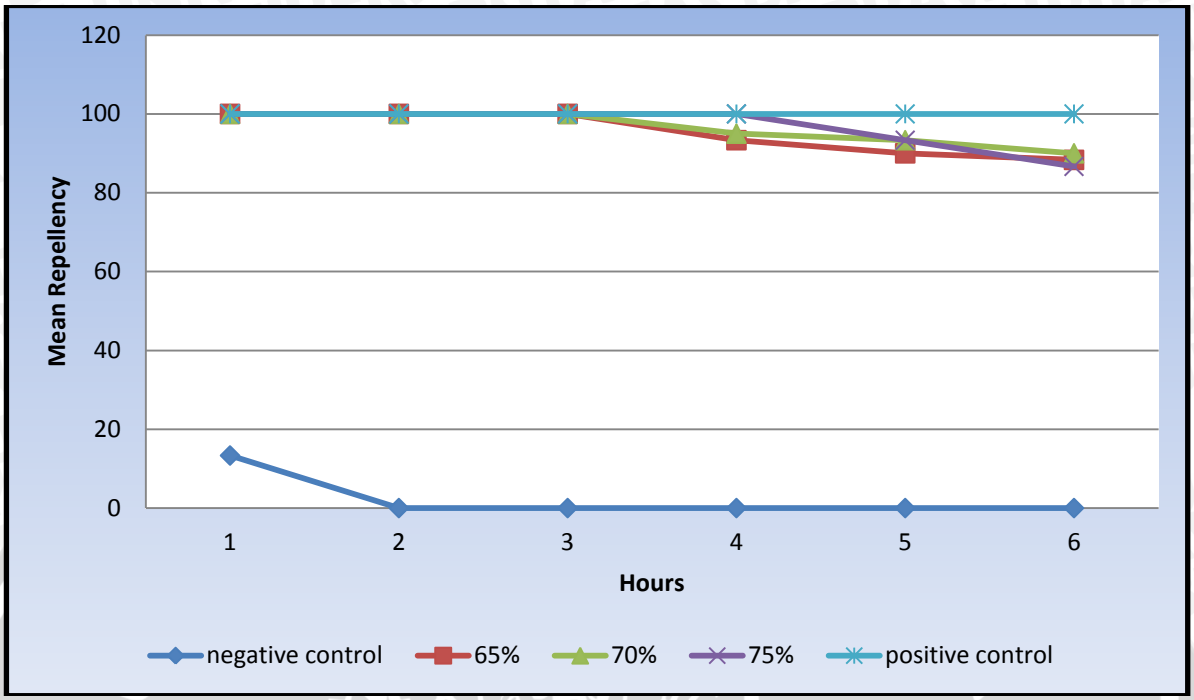

Figure 5.1. Line Chart of Repellency in Every Treatments per Hour

Figure above described overall repellency of cucumber towards fire ants in every cooncentrations per hour. Repellency decreases with the longer time of exposure.

5.3 Data Analysis

Repellency data is statistically analyzed by SPSS version 17.0. To determine an appropriate test for statistic analysis, several tests were needed to be performed. The appropriate statistical test for this research is Anova Test since the dependent variable (repellency) is numeric type, and there are 2 independent variables (time and concentrations). Before performing *One Way ANOVA (Anayisis of Variance)* test, the data of repellency is tested for homogeneity and normality distribution. *Homogenity of variance* test (*levene test*)

is used to determine whether data have homogeny variance and *kolmogorov smirnov test* is used to determine whether data have normal distribution. Anova test could only be performed if the data showed normal distribution and has homogeny variance. Levene test shows homogeny variance if the p value is more than 0.05. In this research, P value for levene test is 0.060 ($p>0.05$),which means the repellency data have homogeny variance. Kolmogorov smirnov test showed normal distribution if the p value of this test is more than 0.05 too, and the p value for normality test of repellency is 0.070 ($p>0.05$). Therefore, the data of repellency is eligible to be analyzed by using Anova test.

5.3.1 Anova Test for Repellency

One Way Anova test for each hour was performed to analyze the effect of extract on repellency. It determines whether different dose give different effect on repellency or not. It can be said that there is significant difference of repellency among all extract concentrations if the p value < 0.05, and there is no significant difference of repellency if the p value > 0.05. Based on the One Way Anova test being performed for this research, it showed that cucumber gives significant effect on repellency in every hour (all p value = 0.000; $p<0.05$).

The following statistical test is Post hoc Tukey test, a statistical test performed to analyze the different repellency of the 2 groups being compared. Post hoc Tukey test shows that there is no significant difference of repellency among concentration 65%, 70% and 75% ($p>0.05$), meanwhile all time of incubation gave significant difference on repellency. Based on those test we can conclude that the optimum dose of cucumber for repellent is 65% and the best time is the first hour.

Pearson correlation test is a statistical test to determine the correlation between dependent variable (repellency) and independent variable (time and concentration). P value less than 0.05 means there is significant correlation. The result of Pearson correlation test showed p value = 0.000 for concentration against repellency and p = 0.370 for time against repellency. It means that repellency has significant correlation with concentrations but not time of incubation. The repellency is affected by dose of cucumber rather than time of exposure. The correlation coefficient (r value) for concentration is 0.992, this value show us that the strength of correlation between concentration and repellency is very strong. (r < 0.500 weak correlation; r = 0.500-0.699 moderate correlation; r = 0.700-0.799 strong correlation; r>0.799 very strong correlation) (Gerstman,2008)

The Linier Regression test is a statistical analysis test performed to investigate the magnificence of independent variable (extract dose/concentration and time) affecting dependent variable (the repellency). Based on the R square value in model summary table (see appendix statistic analysis), 98.3% (R^2 x 100%) of dependent variable is influenced by independent variable, while 1.7% of dependent variable (repellency) is affected by external factor. The linier regression test also produce the predictive equation that could predict the repellency in any concentrations not observed. The formula of regression is y = 1.325X1-2.310 X2+11.153 (y = repellency; x1 = concentration; x2=time of exposure).