CHAPTER 5

RESULT AND ANALYSIS

5.1 RESEARCH RESULT

5.1.1 Identification Results of *Candida albicans*

The isolates were obtained from the Microbiology Laboratory of Brawijaya University and subjected to Gram staining, Germ-tube test and culturing on Sabouraud Dextrose Agar plate. The results of the mentioned procedures are shown in the following table:

Table 1 *Candida albicans* Identification Result

Gram staining	Germ-tube test
Oval-shaped, Gram-positive cells	Pseudohyphae extension (+)

From Gram staining, the isolated were observed to be oval-shaped, gram-positive *Candida albicans* cells measuring about 2-3 x 4-6 mU. The Germ-tube test revealed an extension of pseudohyphae from a cell. The colonies formed on the Sabouraud Dextrose Agar plate were noted to be of yellowish-white in colour, smooth, mildly shiny and present with its distinct yeasty odour.
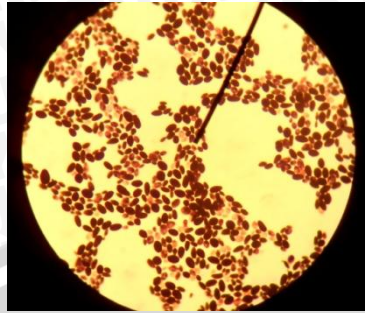
Figure 7 Oval-shaped, Gram-positive *Candida albicans* cells observed by Gram staining
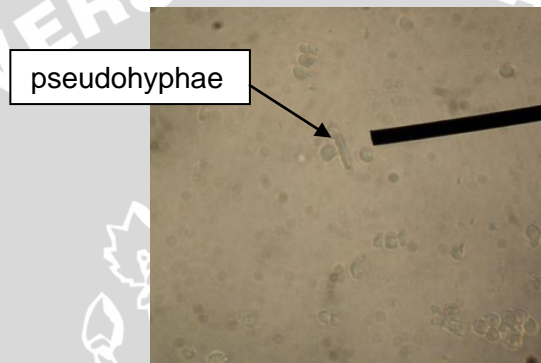

pseudohyphae

Figure 8 Pseudophyphae extension observed in the Germ-tube test

5.1.2 Determination of the Minimum Inhibitory Concentration

The Minimum Inhibitory Concentration of the soursop leaf extract could not be determined due to the turbidity of the extract itself.
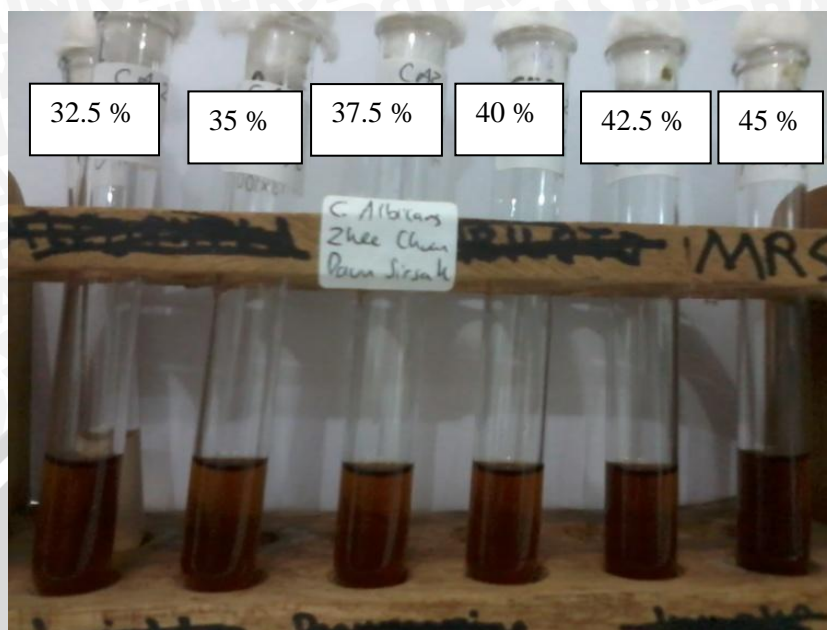
| 32.5 % | 35 % | 37.5 % | 40 % | 42.5 % | 45 % |

**Figure 9** The turbidity of the soursop leaf extract in different Concentrations

5.1.3 Determination of the Minimum Fungicidal Concentration

From the inoculation of the *Candida albicans* on Sabouraud Dextrose Agar medium, the numbers of colony that grew from a streak (approximately 0.005ml) of each concentration were counted under a colony counter. The results are shown in the following table:

Table 2 The mean number of colonies that grew in different concentrations of extract

Number of Repetitions	Number of Colonies in Petri Dish						
	32.5%	35%	37.5%	40%	42.5%	45%	0%
1	4530	2786	1463	267	63	0	4224
2	4899	2977	1412	353	50	0	4453
3	4988	2723	1349	274	66	0	4390
4	4809	2977	1514	242	76	0	4135
Mean	4806.5	2866	1434.5	284	63.75	0	4300.5
Standard Deviation	198.30	131.00	70.60	48.00	10.72	0	146.60
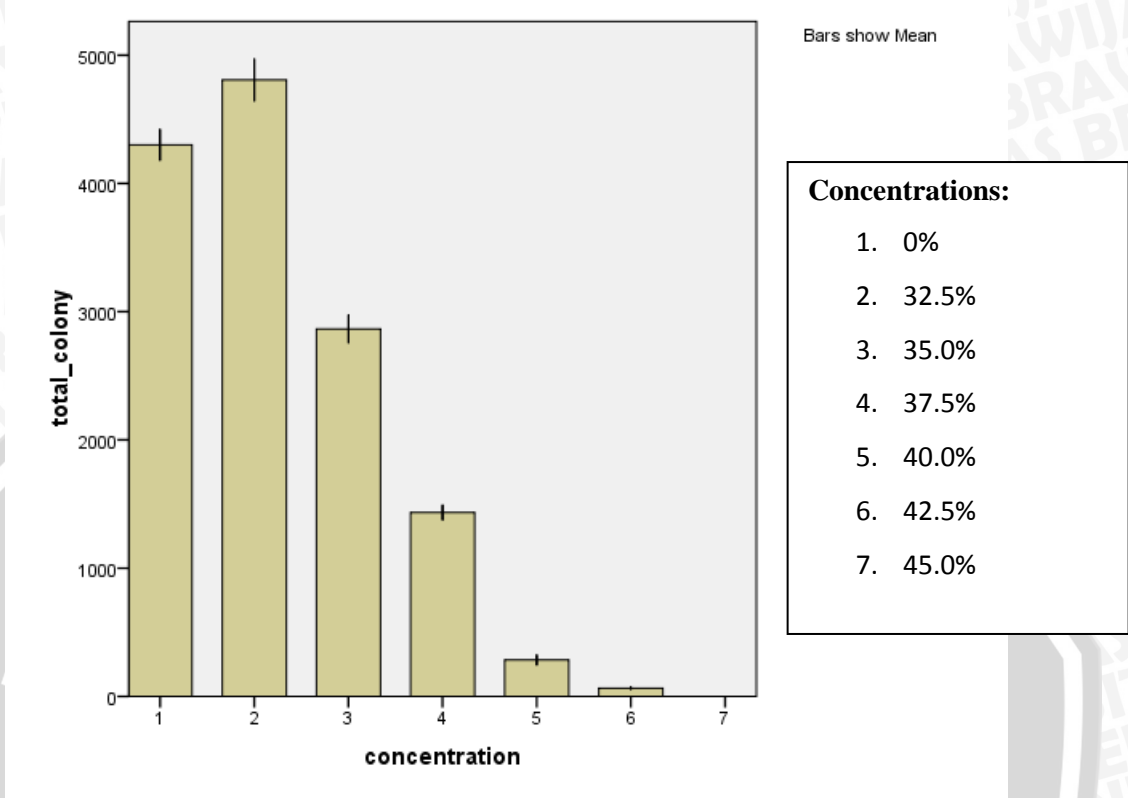
Graph 1 Result of Colony Count and the Mean Number of Colonies Post-Inoculation on SDA Medium

At a concentration of 32.5%, the average number of colonies that grew was 4807. At 35% concentration, the average number of colonies was 2866; at 37.5% concentration, the average number of colonies was 1435; at 40% concentration, the average number of colonies was 284; at 42.5% concentration, the average number of colonies was 63.75; and at 45% concentration, there was no growth observed. From the results tabulated above, there is a consistent decrease in the mean number of *Candida albicans* colonies which grew as the concentration of soursop leaf extract increased except from 0% to 32.5%. At 45% concentration, the mean number of colonies that grew was recorded as 0. Therefore, the Fungicidal Concentration is determined to be 45% of soursop leaf extract.
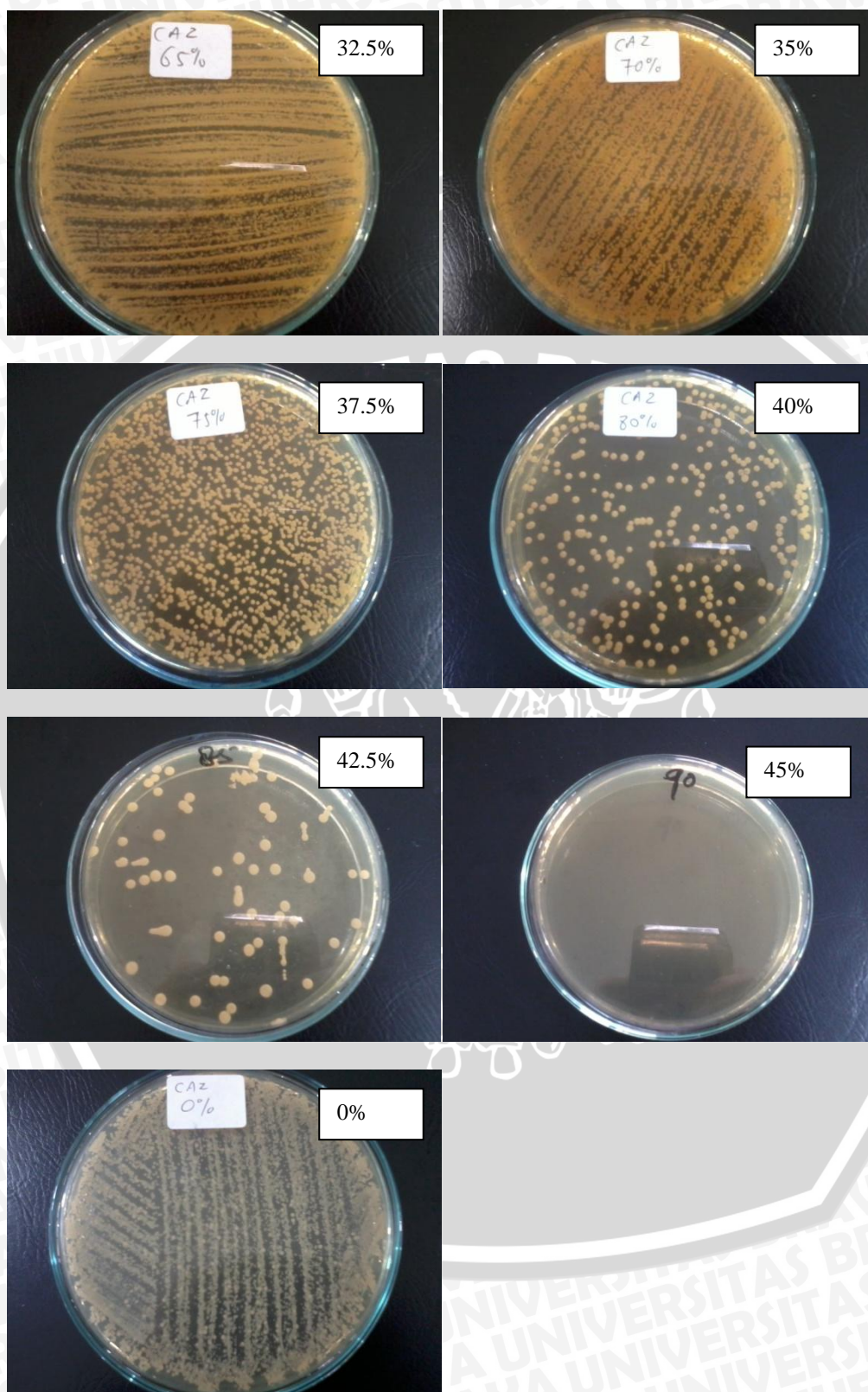
CAZ 65% — 32.5%

CAZ 70% — 35%

CAZ 75% — 37.5%

CAZ 80% — 40%

85 — 42.5%

90 — 45%

CAZ 0% — 0%

Figure 10: The *Candida albicans* Colonial Growth streaked in SDA plate

5.2 Data Analysis

The data were then analyzed using the SPSS (Statistical Package for the Social Sciences) version 15.0 for Windows.

5.2.1 Data Analysis with Normality Test and Homogeneity of Variance Test

A test of normality is used to determine whether the set of data has a normal distribution or not. Based on Kolmogorov Smirnov Normality test, data distribution was normal with p value = 0.110 (p>0.05) meaning that the data (Ho) came from normal distributed population. The conclusion of normality test was the data of *Candida* colony count had normal distribution.

Homogeneity of Variance test was performed to test the hypothesis that all treatment groups have the same data variance (Ho). It would be said that the data have homogenous variance if the p value > 0.05. The homogeneity test showed p-value = 0.003 (p>0.05), meaning that Ho was not accepted or data of *Candida* colony count was not homogenous. Because the data had normal distribution but not homogeneous, transformation is needed by using logarithm method, log(colony +1). The result of the transformed colony was p-value=0.52 (p>0.05) showing homogeneity while the corresponding Kolmogorov Smirnov Normality test for the transformed data was p=0.90 (p>0.05). As the transformed data had normal distribution and homogeny variance, it is eligible to perform One Way Anova test to analyze the difference of colony number among treatment groups or whether different concentrations would give different effect on *Candida* colony.

5.2.2 Data Analysis with One-way ANOVA

In Anova test, it would be said that there was a significant difference of colony number among groups or different concentration would give different effect on *Candida* colony number significantly if the p-value < 0,05. One way anova test performed showed p value = 0.000 (p<0.05) in the transformed data so there was a significant difference of colony number among treatment groups or different concentrations would give different effect on *Candida* colony number significantly.
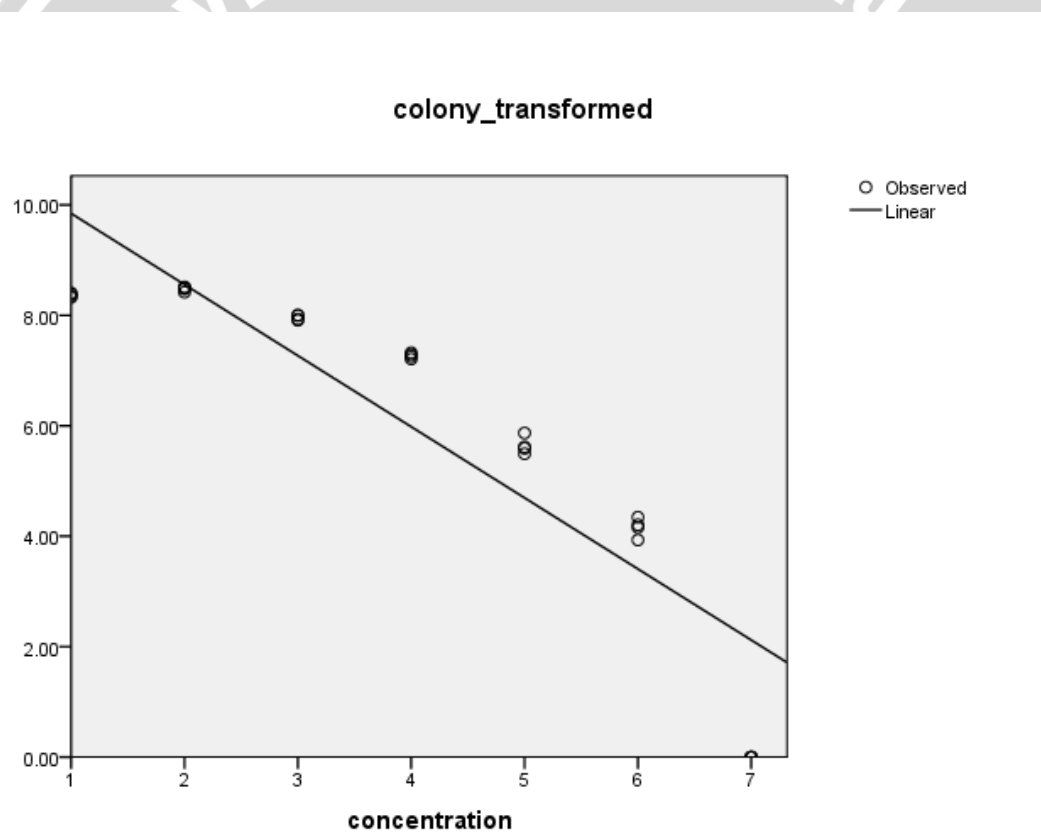
Graph 2 Anova graph of transformed colony count against concentration of soursop leaf extract.

5.2.3 Data Analysis with Post-hoc Test

Multi comparison Pos Hoc Tukey test was performed to analyze the difference of *Candida* colony number between 2 treatment groups compared.

Based on the Pos Hoc test result, there was no significant difference for control group (0% concentration) and 32.5% concentration where p value =0.646 (p<0.05). There is a significant difference for all the other concentrations except 0% and 32.5% with p value =0.00 which means that those concentrations are capable of decreasing *Candida* colony number.

5.2.4 Data Analysis with Correlation Test

Spearman's Rank Correlation test was performed to identify and test the strength of a relationship between two sets of data. Based on the Spearman's Rank correlation test above, there a was significant association between treatment and *Candida* colony number (p = 0.000 ; p < 0.05). Spearman's Rank correlation coefficient (r value) described the strength of correlation. r-value between treatment and colony number was -0.956 , meaning that there was a very strong correlation between treatment and colony number (r>0.799). The negative value of Spearman's Rank correlation coefficient shows the character of association which showed the vice versa or negative association, higher dose will give lower colony number.