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Sedative Effectiveness of Essential Oils of Red Rose Flower (Rosa Damascena) and White Jasmine Flower (Jasminum Sambac) on Male Mice (Musculus) by Olfactory Aromatherapy

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ABSTRACT

Insomia is a condition in which a person cannot sleep, often wakes up and has difficulty falling back asleep. Aromatherapy will provide a sense of calm when inhaled. Red rose and white jasmine aromatherapy contains linalool and geraniol substances that are beneficial for overcoming sleep disorders. The purpose of this study was to examine the sedative effects of red rose and white jasmine essential oils on mice. This study used an experimental method tested on male mice to test the sedative effect of red rose (Rosa damascena) and white jasmine (Jasminum sambac) oils on mice (Mus musculus) by means of aromatherapy (by inhalation) using the volume of red rose (Rosa damascena) and white jasmine (Jasminum sambac) essential oils for 4 hours with a stratified volume of 5 ml in 300 ml of solution, 10 ml in 300 ml of solution and 15 ml in 300 ml of solution. The data obtained from the results of the sedative effectiveness test of red rose oil on mice were statistically analyzed with the ANOVA one-way test. The results of the ANOVA oneway test showed that red rose essential oil and white jasmine had a sedative effect on mice at a level of 5 ml in 300 ml of solution and at a level of 10 ml in 300 ml of diffuser water solution while white jasmine essential oil volume of 15 ml in 300 ml of diffuser water with ANOVA test results of 0.000 < 0.05 with a positive control value of 43.33 minutes, negative control 13.00 minutes, 5ml oil 21.00 minutes, oil 10 ml 37.50 minutes, and 15 ml oil 67.67 minutes

Keywords: sedative, white jasmine flower essential oil, chloroform, sleep duration, rose flower essential oil, mice, sedative effect

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INTRODUCTION

Aromatherapy is widely developed and made in the form of pharmaceutical preparations to help people who are experiencing insomnia disorders or symptoms. Aromatherapy will give a sense of calm when inhaled made from various natural ingredients that give a pleasant smell (Nuraini, 2017). Insomnia is a condition in which a person cannot sleep, often wakes up and finds it difficult to fall back asleep. Insomnia can be a symptom of a disorder in the body, so preventive measures and treatment are needed (Mickey and Guantlett, 2006).

Treatments that can be used in overcoming insomnia are pharmacological and non-pharmacological therapies. Pharmacological therapy can be done by administering sedative drugs, but it will cause serious problems such as drug dependence, decreased kidney function and cognitive function impairment (Aziz, 2014). Meanwhile, non-pharmacological therapy treatments that can be used to overcome insomnia include music therapy, foot massage, relaxation, meditation and aromatherapy (Purwanto, 2008).

Red rose and white jasmine aromatherapy contains linalool and geraniol substances that are useful for overcoming anxiety, stress and sleep disorders. The administration of red rose and white melty aromatherapy is one of the non-pharmacological therapies using pure aromatic plant essences in the form of volatile plant liquid materials to overcome sleep disorders or insomnia and improve sleep quality (Ageng, 2017). The liquid is obtained through various processing methods known as essential oils or essential oils (Kushariyadi, 2011). Based on this explanation, this study aims to examine the sedative effect of aromatherapy of red rose and white jasmine oil tested on male mice (Mus musculus).

MATERIALS AND METHODS

Tools:

1. Mice cage
2. Measuring cup
3. Volume pipette
4. Measuring pipette
5. Stopwatch
6. Diffuser (300 ml water capacity)

Materials

1. Rose and jasmine essential oils each 2 bottles (@15 ml)
2. Mice (Mus musculus), healthy/non-defective mice, 2-3 months old, weighing 20-25 grams and male.
3. Aquadest as much as 300 ml
4. Chloroform as much as 1.6 ml

Method

The research method used was an experimental method to test the sedative effect of red rose (Rosa damascena) and white jasmine (Jasminum sambac) oils on mice (Mus musculus).

This sedative test experiment was carried out at the Pharmacology Laboratory of Akafarma Sunan Giri Ponorogo. The research was conducted from December to June 2023. The data obtained was then analyzed using a data processing tool, namely SPSS version 25 with the One Way ANOVA test.

Research Procedure

Procedures for implementing positive control

1. Prepare a measuring dropper
2. Take 1.6 ml of chloroform

3. Put it in the diffuser ad 300 ml aquadest
4. Prepare mice for the positive control group (6 heads)
5. Put in the cage of the positive control group of mice
6. Turn on the diffuser then observe for 4 hours the start of sleep and the duration of sleep of the mice.
7. Record the observations.

Negative control implementation procedure

1. Prepare mice for the negative control group (6 heads)
2. Prepare a measuring cup
3. Take 300 ml of aquadest, put it in a diffuser
4. Put the diffuser in the enclosure
5. Turn on the diffuser, observe for 4 hours of sleep start and the duration of sleep of mice
6. Record the observations.

Procedure for implementing treatment control (rose oil and jasmine)

1. Prepare 36 mice for 6 treatment groups (1 group of 6 heads)
2. Prepare a volume pipette and 2 bottles of rose essential oil and 2 bottles of jasmine essential oil
3. Take rose essential oil according to the dosage variation of each treatment group using a volume pipette of 5 ml, 10 ml and 15 ml
4. Put in the diffuser ad 300 ml aquadest
5. Insert the diffuser into each treatment group
6. Turn on the diffuser, observe the start of sleep and the duration of sleep of mice for 4 hours
7. Record the observations**.**

RESULTS AND DISCUSSION

In this study, before being given treatment, mice were first grouped into 48 mice and then weighed to see if there were any differences during the adaptation process. Because at the time of adaptation the mice are fed and drunk. After being weighed, the average weight of mice is still around 21-25 grams, so it does not exceed the standard weight and is still included in the requirements of this study. Then before being given the treatment, the mice were marked on the tail for a mark during observation. Then the mice were given stress induction treatment first by putting both hands and feet on a rope and the mice were stretched for 30 minutes. The observation was carried out for 4 hours for 5 days (1 day 1 group) and started at 10.25 WIB with the test parameters observed by the researchers, namely the duration of sleep of mice (duration of action) which will be seen from three groups of 5 ml, 10 ml and 15 ml oil

treatment which provides the longest and calmest sleep effect. In this study, the researcher conducted a practicum that was observed directly for data recording and to see how long the mice were asleep. Mice are said to sleep if there is a decrease in activity in mice which will slow down over time.

On the first day, the researchers conducted observations and data collection for the positive control group that used 1.6 ml of chloroform. During the study and data collection, researchers were able to observe that the average mouse could fall asleep. Judging from the mice that were silent and closed and did not make any movements but breathing was still normal.

On the second day, the researcher observed and collected data for the negative control group who used 300 ml of aquadest by inhalation which the researcher adjusted to the capacity of the diffuser. Then after taking data and making observations, the researcher can see from the existing data that there are 2 mice that are not asleep, only silent, eyes are not closed but breathing is normal, this is influenced by each different response of mice because in the negative control only using aquadest alone, it is possible that some mice are not asleep, and during observation only 4 mice are asleep.

On the next day, the researchers still collected data from the control group of red rose oil and white jasmine 5 ml, 10 ml, 15 ml for 4 hours, based on the observation of the first and second hours of data obtained during the practicum, it can be seen that some mice can sleep for a long time. Then at the third and last hour the mice were awake and did not fall asleep again. The last day, the last day, the researcher collected data from the 15 ml oil treatment control group for 4 hours, from the data obtained from the first hour, some mice were still silent, some were closed. At the second hour, the mice were able to fall asleep fairly quickly and for a long time compared to the previous oil treatment group, after which in the last hour the mice woke up and did not fall asleep again.

The results of the observation of the positive control group of Chloroform and the negative group of aquades are seen in Table 1.1

Table 1.1 Results of sleep duration of mice Control Group

No	**Control Group**	
	Cholorform Control (+)	Aquades Control (-)
1	43 minutes	15 minutes
2	50 minutes	0 minutes
3	54 minutes	28 minutes
4	45 minutes	0 minutes
5	35 minutes	35 minutes
6	33 minutes	0 minutes

The results of the observation of the sample group of red rose and white jasmine essential oils are seen in Table 1.2 and Table 1.3

Table 1.2 Results of sleep duration of mice Rose Red Oil Sample Group

No	Rose Red Essential Oil Sample Group		
	5ml	10ml	15ml
1	40 minutes	54 minutes	62 minutes
2	55 minutes	60 minutes	59 minutes
3	38 minutes	47 minutes	60 minutes
4	41 minutes	50 minutes	80 minutes
5	42 minutes	45 minutes	85 minutes
6	30 minutes	51 minutes	90 minutes

Table 1.3 Results of sleep duration in mice White Jasmine Oil Sample Group

No	White Jasmine Essential Oil Group		
	5 ml	10 ml	15 ml
1	15 minutes	35 minutes	55 minutes
2	33 minutes	45 minutes	70 minutes
3	25 minutes	40 minutes	65 minutes
4	15 minutes	35 minutes	80 minutes
5	28 minutes	45 minutes	74 minutes
6	10 minutes	25 minutes	62 minutes

In the test, the positive control group had the fastest sleep duration of 33 minutes and the longest sleep time of 55 minutes with a mean sleep duration of 44 minutes and a standard deviation of 7.797. The negative control group had the fastest sleep duration of 0 minutes (mice did not fall asleep at all) and the longest 40 minutes with a mean sleep duration of 13 minutes more than 33 seconds and a standard deviation of 14.720.

The 5ml red rose oil treatment group had the fastest sleep duration of 30 minutes and the longest sleep time of 55 minutes with a mean sleep duration of 41 minutes and a standard deviation of 8.009. The 10ml oil treatment group had the fastest sleep duration of 45 minutes and the longest sleep time of 60 minutes with the mean sleep duration of 51 minutes more than 17 seconds and the standard deviation of 5.345. The 15ml oil treatment group had the fastest sleep duration of 59 minutes and the longest sleep time of 90 minutes with a mean sleep duration of 44 minutes more than 43 seconds with a standard deviation of 21.779. From the results of the data, it can be concluded that the volume of rose oil that causes the most effect is the volume of oil 15ml (provides the longest sleeping effect).

The 5 ml white jasmine oil treatment group had the fastest sleep duration of 10 minutes and the longest sleep time of 33 minutes with a mean sleep duration of 21 minutes and a standard deviation of 8.967. The 10 ml oil treatment group had the fastest sleep duration of 25 minutes and the longest 45 minutes with a mean sleep duration of 37 minutes more than 50 seconds and a standard deviation of 7.583. The 15 ml oil treatment group had the fastest sleep duration of 55 minutes and the longest sleep time of 80 minutes with an average sleep duration of 68 minutes more than 7 seconds with a standard

deviation of 8.914. From the results of the data, it can be concluded that the volume of jasmine flower oil that has the most effect is 15ml volmue oil.

CONCLUSION

From the results of the descriptive statistical test, the essential oil of red rose and white jasmine that causes the highest sedative effect is with a volume of 15ml in 300 ml of diffuser water.

The results of the ANOVA test using SPSS version 25 obtained a p-value of 0.000 < 0.05, so it can be said that the hypothesis is accepted, meaning that red rose and white jasmine (jasminum sambac) oil has a sedative effect on male mice (Mus musculus**).**

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