



The Formulation of Reed Diffuser is A Combination of Cinnamon (*Cinnamomum Verum*) and Citronella (*Cymbopogon Nardus*) Essential Oil as An Anti-Stress Aromatherapy

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Abstract: This study aims to determine whether the combination formulation of essential oils between cinnamon and citronella can be used as an aromatherapy reed diffuser preparation that has acted as anti-stress aromatherapy. The method used in this research is an experimental laboratory with a post-test only control group design using mice as test animals. The population used in this study was Cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*), while the samples used were Cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*) originating from Antang Market, Makassar City, South Sulawesi. taken in the morning. Data collection was carried out using questionnaires and observation methods. A one-way ANOVA statistical test was used to analyze the obtained data. The results showed that the stability of the Reed Diffuser combination of Cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*) essential oils in organoleptic testing had a physically and chemically stable odor and color. The hedonic test of the odor produced shows a distinctive odor in all four formulas, but the most preferred is at a concentration of 2:3. In addition, the preparation of Reed Diffuser, a combination of Cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*) essential oils, is effective as an anti-stress based on the results of tests with regular use.

Keywords: Anti-stress; Aromatherapy; Cinnamon; Essential oil; Fragrant lemongrass; Reed diffuser

Introduction

Stress is a condition of environmental demands that are heavier than usual and require more responses that can affect a person's condition. Stress can occur at all ages, but certain age groups are more susceptible to stress due to changes in responsibilities, one of which is at the age of 21 years which is categorized as an adult when viewed from a psychological perspective (Maharianingsih et al., 2022). Stress is a condition that can be caused by physical demands, the environment, and uncontrolled social situations. The prevalence of stress events is quite high where almost more than 350

million people in the world experience stress and it is the 4th ranked disease in the world according to WHO. The stress prevalence study conducted by the Health and Safety Executive in the UK involved 487,000 UK residents who were still productive from 2013-2014. It was found that the number of stress events was greater in women (54.62%) than in men (45.38%) (Ambarwati et al., 2019).

Each individual when bound to a group or organization, can be a source of stress for other individuals. Likewise in the world of work, every employee can be a source of stress for other employees who are in the same company (Khairuddin, 2022).

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Mental health problems that have increased during this pandemic are stress, anxiety, and even depression. For students, this pandemic has caused stress and anxiety related to changes in the lecture process and daily life (Fauziyyah et al., 2021).

Students as one of the most numerous individuals in educational institutions have certainly felt the impact of the Covid-19 pandemic, where the learning system which is usually carried out face-to-face either on campus or practice grounds has changed to online. The changes that have occurred to students due to Covid-19 certainly have an impact on the psychology of students. The results of research by Cao et al. (2020) on 7,143 students showed that 0.9% of students experienced severe anxiety, 2.7% experienced moderate anxiety, and 21.3% experienced mild anxiety (Livana et al., 2020).

The existence of stress on a person will certainly have a negative impact on the condition of physical and mental health. Stress often causes physical fatigue, weakness, and even muscle tension and is at risk of experiencing mental health disorders such as depression. Therefore, stress must be handled immediately (Maharianingsih et al., 2022). Handling stress can be done pharmacological and non-pharmacological, but non-pharmacological treatment is considered safer because it causes lower side effects. One of the non-pharmacological treatments for stress that has been proven effective is aromatherapy.

Mood disorders and depression are some of the most frequent causes of mental disability among communities worldwide. The issue of depression, with its constant incidence growth, affects all of the world's countries; still, despite this high prevalence and severe consequence of the disease, research on pathogenesis and effective methods of treatment of depression (and other mental disorders) are much less advanced than those on other chronic complaints, such as diabetes. Numerous concepts in publications are frequently contradictory and fail to explain the symptoms observed in patients fully. A growing body of evidence nowadays suggests that pathogenesis of depression features multiple factors, including neurobiological, genetic, environmental (stress), and psychological (Ratajczak et al., 2020).

However, one of the most common uses of Ashwagandha products is for stress relief. It is now well accepted that stress can cause functional and structural changes within the brain and has been implicated in the development of most neuropsychiatric disorders, including anxiety, depression, and insomnia. The mechanisms by which stress contributes to these disorders include hyperactivity of the Hypothalamic Pituitary-Adrenal (HPA) axis and dysregulation of the immune system. Given the well-established relationship between stress and neuropsychiatric disorders, it is likely that WS's anti-stress activity plays a key role in its

potential health benefits for depression, anxiety, and insomnia, and vice versa (Speers et al., 2021).

Aromatherapy is a treatment or treatment technique using odors that use essential oils which are often used in aromatherapy (Maesaroh & Putri, 2019). Aromatherapy can be used by inhaling or applying it to the skin for massage on the skin combined with inner oil. Aromatherapy is believed to be used for dealing with respiratory problems, urinary tract, pain, and can overcome problems mental and emotional, and able to provide a calming sensation, so it can relieve stress. The sense of comfort that arises from aromatherapy can be assessed by: various indicators, such as showing the emotional response of fight or flight, interpretation of taste The resulting comfort can improve performance, increase concentration, more thoughts calm down, the soul becomes more comfortable (Baroroh et al., 2021).

Pharmacological methods are widely used to reduce anxiety; however, it has many adverse effects like confusion, fatigue and addiction. For a long time, nonpharmacological methods are preferred as an alternative for the management of procedural anxiety because of fewer side effects and more potency⁶. Among these, aromatherapy is often used. Aromatherapy is a form of complementary medicine that has been predominantly embraced by many countries for years. It can be applied through inhalation and massage. Both of them are considered to have the ability of reducing anxiety. The possible mechanism of inhalation aromatherapy is that essential oils may communicate signals to the olfactory system and stimulate the brain to secrete neurotransmitters like serotonin and dopamine. These agents further alleviate psychiatric disorders (Gong et al., 2020).

Aromatherapy is an alternative therapy that is generally defined as the application of essential oils to cure symptoms associated with discomfort and illnesses. The term "aromatherapy" was coined around 1930 by French chemist René-Maurice Gattefossé after he discovered that lavender essential oil (LEO) effectively healed his burned hand. Aromatherapy is currently used to treat various symptoms, such as stress relief, sleep disturbances, and anxiety (Yogi et al., 2021).

Among the various interventions reducing occupational stress, evidences of antistress effects produced by complementary and alternative medicine (CAM) therapies have been adequately established by a systematic review and meta-analysis. Aromatherapy, as one of CAM, is a simple, convenient and noninvasive method of stress relief. It has been identified as a strategy of stress reduction by nurses (Wu et al., 2020).

The anxiety of nurses increases the probability of error at work; therefore, the use of safe and non-pharmacological interventions to reduce the anxiety of clinical nurses is essential. Non-medicinal methods such as music therapy and aromatherapy have been

mentioned in the literature to control the anxiety of nurses (Zamanifar et al., 2020)

Aromatherapy is currently used to treat chronic pain, depression, anxiety, insomnia, improve cognitive efficiency, relieve stress and other psychological and physiological conditions related disorders. Aromatherapy is the use of essential oils extracted from the flowers, stems, leaves, roots and fruits of various plants. It is absorbed by the body by oral, inhalation, diffusion, bathing and massage to improve mental and physical health. It has been reported that the main mechanism of aromatherapy may be related to the limbic system of the brain. Aroma components stimulate olfactory cells, which transmit signals to the brain and affect the autonomic nervous system and hormone secretion. Odor particles reach the limbic system through the olfactory nerve, producing sedative and relaxing effects that affect blood pressure, heart rate, memory and stress response (Zhong et al., 2019).

Historically, EOs have been delivered as aromatherapy via inhalation or topical routes. Essential oils delivered via inhalation route may exert psychological effects, because the olfactory bulb has limbic inputs in the amygdala and hippocampus that are associated with emotion and memory. It is hypothesized that smell-triggered emotional memory may be the etiologic root of situational anxiety in some circumstances. This form of emotional memory is exemplified by state anxiety associated with the characteristic smell of the dentist's office, which has been reduced with LEO. Conversely, particular smells may be associated with positive emotions and mood, which is a core tenet of hypothesized benefits in aromatherapy (Malcolm & Tallian, 2017).

Essential oils are volatile substances with an oily consistency that are produced by plants. Essential oils can be liquid at room temperature although some are solid and exhibit different colors ranging from pale yellow to emerald green and blue to dark brownish red. Essential oils are synthesized by all plant organs, namely buds, flowers, leaves, stems, twigs, seeds, fruit, roots, and wood or bark. Several techniques can be used to extract essential oils from different parts of the plant such as water or steam distillation (Rollando & Sitepu, 2018).

Essential oil or etheric oil was originally a term used for volatile oils obtained from plants by steam distillation. This term is intended to distinguish fatty oils from essential oils from different plants that produce them. Essential oils can be produced by several methods. However, most essential oils are obtained through a distillation method which is also known as hydrodistillation. Other methods that need to be known are extraction methods that use solvents and compression methods. Of the three processing methods, the most practical and efficient way is the distillation

method. This is because the refining method only requires more production costs cheap compared to other processing methods, in addition to the relatively low cost required, the yield of essential oils produced is also quite adequate, and the quality is well received by consumers (Nur et al., 2019).

Pure water is obtained by distillation, the purpose of distillation is to obtain a pure liquid from a liquid that has been contaminated with dissolved substances, or mixed with other liquids with different boiling points. The desired liquid is boiled until it evaporates and then the steam is condensed through the condenser so that the steam melts again. The liquid resulting from this distillation is called distillate. Pure water, among others, is used for purposes in chemical laboratories, and health care (Khotimah et al., 2018).

Essential oils are oils that are volatile (volatile), because of their low boiling point, are natural substances that are known to have antimicrobial activity. Essential oils are divided into two groups, hydrocarbons and oxygenated hydrocarbons (Mulyatno, 2022).

Cinnamon has been extensively researched because it has many benefits for human life. These plants are spread in Southeast Asia, China and Australia with various types and varieties such as true cinnamon and *Cinnamomum zeylanicum* from Sri Lanka; Cinnamon cassia from China and Vietnam; *Cinnamomum tamala* from India and Myanmar (Antasionasti et al., 2021).

Cinnamon or *Cinnamomum burmannii* is one of the plants the bark of the trunk, branches and branches can be used as a spice ingredient and is one Indonesian export commodities. The biggest content of cinnamon is an essential oil that has the main content is cinnamaldehyde (60.72%), eugenol (17.62%), and coumarin (13.39%) (Djarot et al., 2019).

EOs and extracts have been isolated from the different parts of cinnamon, such as the leaves, bark, fruits, root bark, flowers, and buds. More than 80 compounds have been identified, and the compositions vary due to many factors. The main components of cinnamon EOs and extracts are cinnamaldehyde, eugenol, phenol, and linalool. Cinnamon bark EO has a higher cinnamaldehyde content (65–80%) and a low eugenol content (5–10%). The extract from leaves is rich in eugenol (10–95%). Roots are rich in camphor. The leaf extracts may also have a high cinnamaldehyde content (Spartak, 2020).

Citronella oil from citronella plants (*Cymbopogon winterianus*) is a type of essential oil which is often also called etheric oil or flying oil because of its volatile ability and has different compositions and boiling points (Kurniawan et al., 2020). Fragrant citronella still dominates and it is more common for its oil to be taken than other types of lemon grass. Lemongrass contains many nutrients including selenium, manganese, calcium and others. Lemongrass oil has many benefits, one of

which can be used as an anti-inflammatory depressants, avoid mosquito bites, maintain cholesterol levels, relieve muscle pain and joints, relieve flu symptoms, body warmers, herbs and much more Again (Al Fatina et al., 2021).

Cymbopogon citratus, also known as lemongrass, is widely cultivated worldwide due to its aromatic and medicinal properties. It is rich in minerals, vitamins, and macronutrients (carbohydrates, protein, and small amounts of fat). Its leaves are also a good source of various bioactive compounds, including alkaloids, terpenoids, flavonoids, phenols, saponins, and tannins, which has led to numerous herbal therapies currently widely used in medicine. Lemongrass has been traditionally used as a remedy for a variety of health conditions. Recent scientific studies have provided evidence supporting its antiviral, antimicrobial, antioxidant, antifungal, anticancer, sedative, and anti-inflammatory properties in several disease models. It is used as a food flavoring and as a perfume and contains 1 to 2% EO on a dry weight basis. The quality of lemongrass is generally determined by the amount of citral content, which is composed of isomers (neral and geranial), giving it the characteristic odor (Dangol et al., 2023).

In one study, the smell of cinnamon (*cinnamomum verum*) in the room helped participants concentrate and perform better. Cinnamon (*cinnamomum verum*) essential oil, as a component of recipes, is used in aromatherapy to relieve depression and fatigue and to provide relaxation, to reduce joint and muscle pain and to strengthen immunity to relieve cold and flu symptoms, to reduce pain associated with headaches and soothe nervous tension and to relieve aches and pains (Ranjith, 2020). Lemongrass is used as aromatherapy because it can reduce anxiety levels. The main component of lemongrass essential oil is citral which is thought to have an effect on reducing anxiety. Besides being effectively used to reduce anxiety, lemongrass essential oil can also restore homeostasis (Pratiwi & Subarnas, 2020).

The benefit of this research is to provide scientific information to the public that the combination of cinnamon (*cinnamomum verum*) and citronella (*cymbopogon nardus*) essential oils can be used as an alternative in reducing stress.

For policy makers (especially those dealing with pharmaceuticals), the results of this study can be recommended to the public as an aromatherapy remedy for dealing with stress.

Method

This research method is a laboratory experiment with a post-test only control group design using mice as test animals. The questionnaire method was used to

collect test data for the physical evaluation of the reed diffuser, followed by the observation method, namely direct observation on experimental animals to obtain data on the anti-stress effect of the reed diffuser in mice using a combination of cinnamon (*cinnamomum verum*) and citronella (*cymbopogon nardus*) essential oils.) against male mice (*Mus musculus*).

Result and Discussion

Stress is a phenomenon that must be experienced by all humans. In psychology, stress is a feeling of pressure and mental tension. Low stress levels may be desirable, beneficial, and even healthy. Stress, can have a positive impact, which can improve performance facilitation. Positive stress is considered as an important factor for motivation, adaptation, and reacting to the surrounding environment. However, high stress levels can result in biological, psychological and social problems and even serious harm to a person. Stress can come from external factors originating in the environment, or caused by individual internal perceptions (Nur et al., 2021).

Stress is a condition that can be caused by physical demands, the environment, and uncontrolled social situations. The prevalence of stress events is quite high where almost more than 350 million people in the world experience stress and it is the 4th ranked disease in the world according to WHO. The stress prevalence study conducted by the Health and Safety Executive in the UK involved 487,000 UK residents who were still productive from 2013-2014. It was found that the number of stress events was greater in women (54.62%) than in men (45.38%) (Ambarwati et al., 2019).

This research was conducted at the Pharmaceutical Biology Laboratory at Makassar College of Pharmacy (STIFA), Pharmaceutical Preparation Technology Laboratory, Pharmacology and Toxicology Laboratory, Faculty of Pharmacy, Megarezky University, with the aim of knowing the essential oil combination of cinnamon (*cinnamomum verum*) and citronella (*cymbopogon nardus*)) was formulated into a stable reed diffuser and to determine the antistress effect of the reed diffuser formulation of essential oils of a combination of cinnamon (*cinnamomum verum*) and citronella (*cymbopogon nardus*) on male mice (*Mus musculus*).

Table 1. Reed Diffuser Preparation Formulations

Material	Formulation				
	F1	F2	F3	F4	F5
Cinnamon (<i>Cinnamomum verum</i>)	2%	4%	6%	-	Positive control with Reed Diffuser
Citronella (<i>Cymbopogon nardus</i>)	3%	5%	7%		Lavender preparation
Sunflower	70	70	70	70	

In the process of extracting essential oils using the water vapor distillation method, in which 10 ml of essential oil was obtained, then in this study a reed diffuser formulation was made with several concentrations, namely formula I concentrations of 2% and 3%, formula II concentrations of 4% and 5%, formula III concentration of 6% and 7%, and formula IV as a negative control without essential oils.

Table 2. Organoleptic Research Results

Group	Organoleptic test	
	Smell	Color
Formula 0	Characteristic	Clear
Formula I	Characteristic	Clear
Formula II	Characteristic	Clear
Formula III	Characteristic	Clear
Formula IV	Characteristic	Clear

In this study, a physical evaluation test was carried out for reed diffuser preparations to see the stability of the reed diffuser preparations. The first test to be carried out was an organoleptic test to see the color of the aroma of the reed diffuser preparations made. The results of the observations are shown in table 2 which shows that the color of the reed diffuser preparations, both reed diffuser formulas I and II, III, IV, are clear, homogeneous, which means that the addition of essential oils does not affect the color change. And the smell or aroma in formulas I, II, III each has a distinctive aroma of essential oil combination of cinnamon (*cinnamomum verum*) and citronella (*cymbopogon nardus*), in formula IV as a negative control it does not have the smell of essential oil but the smell of carrier oil, namely sunflower oil. Formula III with the highest

essential oil concentration has a strong aroma. This is because the greater the concentration of essential oils used, the higher the volatile components.

Table 3. Hedonic Test Results

	TS	KS	BS	S	SS
Formula 0	-	-	100%	-	-
Formula I	13%	6%	13%	36%	30%
Formula II	10%	16%	23%	40%	10%
Formula III	10%	6%	16%	40%	26%
Formula IV	10%	30%	40%	20%	-

The hedonic test (liking) aims to see from consumers related to the smell or aroma of Reed Diffuser preparations by filling out a questionnaire by 30 panelists. The results of the study can be seen in table 3, namely in Formula 0, there is no special aroma that can be smelled in the Reed Diffuser preparation because it is a negative control which only contains Sunflower Oil as a carrier. In formula I, according to the panelist's assessment, the highest percentage, around 36%, liked the aroma of Reed Diffuser and 30% really liked it. In Formula II, the highest percentage was 40% liking the aroma of Reed Diffuser and 10% really liking it. In Formula III, the highest percentage was 40% liking the aroma of Reed Diffuser and 26% really liking it. In Formula IV, the highest percentage, namely 40%, said the Reed Diffuser aroma was normal and 20% liked it. So it can be concluded that of the five Reed Diffuser formulations the most preferred aroma was Formula I with a concentration of 2% cinnamon (*cinnamomum verum*) essential oil and 3% citronella essential oil (*cymbopogon nardus*).

Table 4. Body Weight Mice

Formula	Body Weight Mice (Gram)									
	Mice a		Mice b		Mice c		Mice d		Mice e	
	Before	After	Before	After	Before	After	Before	After	Before	After
K0	27.4	22.1	27.2	17.4	26.6	21.9	24.2	17.4	30.6	23.8
K1	26.5	21.9	30.6	22.2	27.8	22.1	30.8	24.5	30.4	26.9
K2	26.0	24.2	26.1	23.8	24.5	17.4	30.5	27.4	26.9	24.2
K3	28.0	24.5	29.7	22.1	30.5	25.9	27.9	24.2	28.4	17.4
K4	30.6	26.5	27.8	24.5	21.9	17.4	27.8	23.8	30.5	24.2

In this study there were also a number of things that were considered during the treatment, namely the weight of the mice before and 1 day after being treated, the mice were distressed for approximately 7 days, in this case, the body weight experienced a decrease in the rate of increase. This event is caused by stressful conditions in minutes which can increase the speed of metabolism and Nitrogen excretion which results in endogenous protein and fat reserves in the body being dismantled to become a source of energy, so it will lose weight or tend to settle down which can be seen in table 4.

Table 5. Observations of Mice Faeces

Formula	n	Consistency of Mice Faeces	
		Before	After
K0	5	Watery	Congested
K1	5	Watery	Congested
K2	5	Watery	Congested
K3	5	Watery	Congested
K4	5	Watery	Congested

The next thing to pay attention to is the consistency of the stool when it is stressed and when it is exposed, where the results can be seen in table 5. In both groups

K0, K1, K2, K3, and K4 the consistency of the stool when it is stressed looks runny. This is in accordance with Daeng's research (2018) which states that a sign of mice experiencing stress is by releasing a lot of watery feces, stress can cause diarrhea because when stressed some chemicals such as serotonin which affect the brain when anxious can change the movement of the intestines to be fast. Thus triggering diarrhea, whereas after exposure to both the Test group, the negative and positive controls both showed solid stool consistency, this happened because the mice were in the sedation phase or because they were not anxious (Daeng et al., 2018).

Table 6. Results of Urine Observation

Formula	n	Mice Urination	
		Before	After
K0	5	There is urine	There is urine
K1	5	There is urine	No urine
K2	5	There is urine	No urine
K3	5	There is urine	No urine
K4	5	There is urine	No urine

The last thing to note is the urination of mice, where the results can be seen in table 6. For groups K0, K1, K2, K3, and K4 the results showed that urination occurred during the stress process, this is in accordance with Daeng's research (2018) which stated that many urine that comes out when mice experience stress. Urination occurs because when under stress or anxiety it makes the adrenal glands secrete adrenal hormones which when these hormones are released will cause the heart to work fast, blood sugar levels to rise and metabolism to increase thereby increasing kidney performance and the urine produced increases. For urination results when exposed to mice in the K0 group there was no change in urination or in other words the mice still experienced urination, this could happen because the reed diffuser that was exposed did not have an active substance, but in the test group and the positive group it showed no urination or the mice had not experienced urination, because when exposed to aromatherapy it can suppress stress hormones so that the mice become calm and not anxious (Maryani & Himalaya, 2020).

Furthermore, after the stress phase was carried out by reducing the husks, not feeding the mice and shaking the mice for approximately 7 days. Then an anti-stress test was carried out on male mice (*Mus musculus*) using the force swimming test method or a 6-minute swimming test on mice previously exposed to a reed diffuser for 1 hour by looking at the immobility time or the level of hopelessness of the mice in trying to stay on the surface of the water or swim (Murniningsih & Trisnawati, 2022).

Table 7. Results of Immobility Time

Group	Immobility Time (Second)				
	A	B	C	D	E
K 0	350	341	335	329	288
K I	223	215	208	200	184
K II	170	168	150	145	135
K III	108	100	106	103	85
K IV	70	65	63	60	60

The results can be seen in table 7 where K0 or as a negative control mice were exposed to reed diffuser preparations without essential oils, only carrier oil, namely sunflower oil, where the five mice showed immobility time as follows mice a (350 seconds), mice b (341 seconds), mice c (335 seconds), mice d (329 seconds) and minutes e (288 seconds). The immobility time shown in the K0 group was very large because the negative control reed diffuser did not contain essential oils.

In K1 or group 1, the mice were exposed to a reed diffuser of a combination of 2% cinnamon (*cinnamomum verum*) essential oil and 3% citronella (*cymbopogon nardus*), where the five mice showed fairly low immobility from the negative control, namely mice (223 seconds), mice b (215 seconds), mice c (208 seconds), mice d (200 seconds) and mice e (184 seconds) even though there is still effort or mobility of mice to keep trying to swim or stay above the water surface.

In KII or group II, the mice were exposed to a reed diffuser of a combination of 4% cinnamon (*cinnamomum verum*) essential oil and 5% citronella (*cymbopogon nardus*) where the five mice showed lower immobility compared to K0 and KI with the immobility time as follows: 170 seconds), mice b (168 seconds), mice c (150 seconds), mice d (145 seconds) and mice e (135 seconds), in this group the immobility time of mice was lower than in the KI group.

In the KIII group, the mice were exposed to a reed diffuser combination of cinnamon (*cinnamomum verum*) essential oil 6% and citronella (*cymbopogon nardus*) 7% where the five mice showed immobility as follows: mice a (108 seconds), mice b (100 seconds), mice c (106 seconds), d mice (103 seconds) and e minutes (85 seconds). In this group, the immobility time was lower than in groups I and II, this was due to the higher levels of essential oils in the reed diffuser formula. This is directly proportional to the existing theory, namely the greater the dose given, the more it shows a decrease in immobility time in mice (Qalby, 2017).

In the KV group, the mice were exposed to lavender reed diffuser as a positive control, the immobility was obtained as follows: mice a (70 seconds), mice b (65 seconds), mice c (63 seconds), mice d (60 seconds) and mice e (60 seconds), where the five mice showed very low immobility, this is in accordance with previous studies where lavender flowers have an anti-stress effect. The mechanism of lavender aromatherapy is to affect the olfactory nerves which are sent to the limbic

system, where the stimulant stimulates the hypothalamus to release endorphins, enkephalin, and serotonin which acts as a relaxant and reduces cortisol and stress hormones (Yuliana et al., 2022).

To see the significance of anti-stress for each group in the One Way Anova statistical test, by first carrying out the pre-requisite tests, namely the normality and homogeneity tests, then proceed with the One Way Anova test. This statistical test shows that the higher the concentration of essential oil added will increase the anti-stress effect, this is known from the shorter immobility time (table 7), when compared to the negative control group. This is in accordance with the assumption that immobility time in mice is a state of despair in humans.

Based on the results of the analysis above, it can be concluded that the reed diffuser combination of cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*) essential oils has an anti-stress effect and is in accordance with the existing theory that cinnamon (*Cinnamomum verum*) and citronella (*Cymbopogon nardus*) can be used as aromatherapy in this case to deal with stress with weight loss and marked symptoms such as frequent bowel movements, urination or frequent urination.

Conclusion

Stability of Reed Diffuser essential oil combination of Cinnamon (*Cinnamomum verum*) and Lemongrass (*Cymbopogon nardus*) on organoleptic testing has a stable odor and color physically and chemically. The odor hedonic test produced is a typical odor in the four formulas, but the most preferred is the concentration of 2:3. Preparation of Reed Diffuser essential oil combination of Cinnamon (*Cinnamomum verum*) and Citronella (*Cymbopogon nardus*), effective as an anti-stress based on testing has results with regular use.

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