TEST OF THE TONIC EFFECTS OF DRAGON FRUIT EXTRACT (Cortice hylocereus polyrhizus) ON WHITE MICE

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ABSTRACT

Stamina is the body's resistance to fight fatigue within a certain time limit of a person's physical ability to survive at work. Dragon fruit skin contains flavonoid compounds, which have a tonic effect on male mice. This study aims to examine the tonic effect and the dosage used in male mice. We use the Natatory Exhaustion method to determine how drugs affect the coordinates of motion, especially when they reduce central nervous control. This research is an experimental research study. This study falls under the experimental research category. They were divided into 5 treatment groups: group I received Caffeine 100 mg/KgBB as a positive control, group II received Na-CMC as a negative control, and groups III, IV, and V received extract from dragon fruit peel (Cortice Hylocereus Polyhirzus) at doses of 750 mg/KgBB, 1000 mg/KgBB, and 1250 mg/KgBB. We administered oral treatments to each group. Next, observe the length of the mice's swimming duration. The test results data were analysed by the ANOVA analysis method. The results indicated that the extract from dragon fruit peel had a tonic effect on male mice, compared to positive and negative control doses. The three groups of dragon fruit peel extract had different swimming durations of 5.32 minutes, 5.45 minutes, and 5.92 minutes, respectively.

Keywords: Tonic effect, caffeine, natatory exhaution, dragon fruit skin.

INTRODUCTION

Health is a state of well-being that includes physical, mental, and social aspects, which is not only free from disease or disability but also healthy or in prime condition, and is important in carrying out various daily activities of human needs to get a better life (Schramme, 2023). Stamina refers to the body's ability to withstand fatigue and the physical energy a person possesses, which enables them to survive and perform tasks with endurance (Cheng et al., 2011). The tonic effect is an effect that triggers and strengthens the organ system and stimulates the repair of muscle tone cells (Herdayanti, 2021).

This tonic effect occurs because of the stimulant effect that occurs in the central nervous system. Dragon Fruit (*Hylocereus polyrhizus*) is a plant that is effortless to find in Indonesia. People use the fruit more often than the skin, which is only used as waste and not used (Solehah et al., 2022). Thus, researchers want to study dragon fruit skin; rather than just being used as waste, it is better to use it for research on the tonic effect test for body stamina. The flavonoid compound in dragon fruit skin can cause a tonic effect on mice.

METHODE

This study uses a laboratory experimental research method. The sample used in this study is an extract from dragon fruit skin. The number of samples used in dragon fruit skin extract consists of various different doses, namely 750 mg, 1000 mg, and 1250 mg.

Tools and Materials: The tools used in this study were digital scales, blenders, measuring cups, glass beakers, porcelain cups, stirring rods, Erlenmeyers, droppers, electric stoves, water pumps, and water tanks. The materials used in this study were dragon fruit skin, CMC-Na, caffeine, male mice, distilled water, 70% ethanol, aluminium foil, and filter paper. We prepared the extract using the maceration method. We placed 350 g of dragon fruit skin simplicia into a container and macerated it with 70% ethanol solvent. The container was then securely closed and allowed to macerate for three days, with periodic stirring. After three days, the macerated sample was filtered using filter paper to produce filtrate. We then evaporated the filtrate using a water bath to obtain the dragon fruit

skin extract. After that, the extract was weighed and stored in a closed container before testing.

Tonic Effect Test: The test animals were divided into 5 groups, each group consisting of 6 test animals. Before administering the sample, we placed the test animals in a tub filled with water featuring artificial waves. The test animals were lifted back when signs of fatigue appeared, and then the duration of the test animal's swim was recorded; signs of fatigue can be seen when the test animal's head was below the water surface for 7 seconds. Next, we dried and rested the test animals. 30 minutes later, we swabbed the animals again, administering a dose to each group. The negative control group received CMC-Na 0.5%, the positive control group received 100 mg/KgBW of caffeine, and the dragon fruit skin extract group received 750 mg/kgBW, 1000 mg/kgBW, and 1250 kg/BW. After being given treatment according to the group, observe the duration of the test animal's swim and the difference in the duration of the test animal's fatigue, and then the test animals were rested again for 1 hour. We used parametric statistical methods to analyse the average duration difference data. Data on the addition of tired time of test animals were obtained and analysed using the One Sample *Kolmogorov-Smirnov* Test. For data that is normally distributed (significant > 0.05), One Way ANOVA with a 95% confidence level is used with the output to continue the analysis. To determine the real difference, show normal results (significant > 0.005). Furthermore, a post hoc test was carried out to see the best tired time or tonic effect among the treatment groups and the differences in each group.

RESULTS AND DISCUSSION

In this study, a test of the tonic effect of an extract from dragon fruit skin on white mice was conducted. The preparation of the extract was carried out by maceration using 70% ethanol solvent, aiming to extract flavonoid, saponin, and tannin compounds in dragon fruit skin. Ethanol also has the lowest toxicity properties, so it is safe for consumption by living things. We carried out the maceration process for three days until we obtained a thick

extract of 38.47 grammes. The yield obtained was 38.47%. Then the results of the Natatory Exhaustion test were obtained, and the average time difference value of the mice swimming was obtained, namely:

Table 1. Average duration difference in swimming time

No.	Test grup	Average duration difference
1	Caffeine	3,92 minute
2	CMC-Na	1,27 minute
3	Extrac dose 750 mg	5,32 minute
4	Extrac dose 1000 mg	5,45 minute

Positive control group (caffeine) 3.92 minutes, negative control group (CMC-Na) 1.27 minutes, 750 mg extract group 5.32 minutes, 1000 mg extract group 5.45 minutes, and extract group 5.92 minutes. The statistics tests yielded the following results:

Table 2. Results of normality and homogeneity tests

No	Test	Value	Result
1	Normalitas	0,200 (*p*> 0,05)	Normal
2	Homogen	0,033 (*p*> 0,05)	Not-Homogen

Based on the data output above, the value is known that the normality value and normality test are 0.200 (p > 0.05) and the homogeneity test (p) is 0.033 (p > 0.05). So it can be concluded that the different time data is normally distributed, but the data variance is not homogeneous. We then proceeded with the one-way ANOVA test.

Table 4. Post hoc test

No	Group	Group	Sig	Result
1	K +	K -	.001	Sigificant
		D 1	.719	Not- Sigificant
		D 2	.391	Not- Sigificant
		D 3	.074	Not- Sigificant
2	K -	K +	.001	Sigificant
		D 1	.060	Not- Sigificant
		D 2	.013	Sigificant
		D 3	.002	Sigificant
3	D1	K +	.719	Sigificant
		K –	.060	Not- Sigificant
		D 2	1.000	Not- Sigificant
		D 3	.983	Not- Sigificant
4	D2	K +	.391	Not- Sigificant
		K –	.013	Sigificant
		D 1	1.000	Not- Sigificant
		D 3	.985	Not- Sigificant
5	D3	K +	.074	Not- Sigificant
		K –	.002	Sigificant
		D 1	.983	Not- Sigificant
		D 2	.985	Not- Sigificant

K + : Caffeine
K - : CMC-NA
D 1 : Extrac dose 750 mg
D 2 : Extrac dose 1000 mg
D 3 : Extrac dose 1250 mg

This study used the natatory exhaustion method to determine the effects of drugs that work on motor

coordinates, especially on reducing central nervous control (Berends & Van Putten, 2009) The research data showed that dragon fruit skin extract (*Cortice hylocereus* Polyhirzus) has a tonic effect so that it can cause stamina effects in male mice. The tonic effect is an effect that triggers and strengthens the organ system and stimulates the repair of muscle tone cells. This tonic effect occurs due to the stimulant effect that occurs in the central nervous system (Ganguly et al., 2021). The results of the natatory exhaustion test obtained the results of the average difference in swimming time before and after treatment for each group, namely the positive control group (caffeine) of 3.92 minutes, the negative control group (CMC-Na) 1.27 minutes, the 750 mg extract group 5.32 minutes, the 1000 mg extract group 5.45 minutes, and the 1250 mg extract group 5.92 minutes. Dragon fruit skin extract has a tonic effect due to the presence of flavonoid compounds, the mechanism of flavonoids is the same as the mechanism of caffeine, namely by antagonizing the adenosine A1 receptor (Ősz et al., 2022). Caffeine will work by preventing adenosine from activating receptors by blocking adenosine receptors from binding, the effects felt will increase alertness, this also causes changes in various systems such as increased respiratory rate, decreased heart rate, and causing a stimulant effect which is a result of the release of neurotransmitters (Reddy et al., 2024). The effect on the central nervous system is especially on the higher centers, which results in increased mental activity and staying awake or awake (Ma et al., 2023).

CONCLUSION

The research's findings support the tonic effect of dragon fruit skin extract (*Cortice hylocereus* Polyhirzus).

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