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The Supplementation of Kecombrang Extract (*Etlingera elatior*) Towards Body Weight Change of Mice (*Mus musculus*)

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Abstract: ***Kecombrang or Etligera Elatior has been carried out the study contains the presence of flavonoids, tannins, saponins, quinones, steroids. Kecombrang is able to reduce the fertility of white mice (Mus musculus) breastfeeding because it contains prolactin hormone that suppress GnRH. This research is a laboratory experimental research type of post test design with experiment and control group (Post test only control group design). This research was conducted to study the effect of kecombrang (Etlingera elatior) to change the weight of infant mice (Mus musculus). In this study, measurements of prolactin levels were observed with weight changes in mice after 12 days of administered aqueous solutions at various doses and observed on the 3rd, 6th, 9th and 12th days. Oneway Anova weight change of mice by treatment of aqueous solution at various doses showed that administration of kecombrang solution at various doses had no significant effect on weight change at 3 day observation with F-count value of 1.012 and significance of 0.399. This also happened to the next observations, i.e, observation day 6 with F-count of 2,183 (p = 0,107), observation day 9 with F-count equal to 1,087 (p = 0,367) and observation day 12 with an F-count of 0.440 (p = 0.726). Oneway Anova results there is no significant effect between the treatment of giving a solution of kecombrang at various doses of weight changes. Estrogen significantly stimulates the synthesis and release of prolactin by pituitary, this effect depends on the duration and dose of administration.***

Keywords: prolactin, kecombrang, body weight, mice

1. Introduction

A child in the womb has undergone a growth process such that when a child is born the weight has reached a normal weight. Growth and development continues throughout adulthood. This growth process is influenced by the food given to the child. The most appropriate food for children are milk Parent (ASI), because milk is intended for children as a staple food of children (Hanum Marimbi 2010: 37).

Asi Exclusive is a child only fed breast milk alone for six months, without the addition of other liquids such as milk formula, orange, honey, tea, and water, and without the addition of solid foods such as bananas, milk porridge, biscuits, rice porridge (Eny Retna Ambarwati, S.Si. T, M. Kes 2010: 30).

Kecombrang or *Etligera Elatior* research has been done to contain the flavonoids, tannins, saponins, quinones, steroids (Norasmah, 1996). The role of steroids in follicle growth through the two distinct facets of the anterior hypothalamus-first pathway and the ovaries. Folikulogenesis is a process of maturity of the ovarian follicle that is affected by both processes (Dorland, 2004). Anterior hypothalamic-pituitary that produce gonadotropin comprising FSH *(Follicle Stimulating Hormoen)* and LH *(Luteinizing Hormone)* ovary, while the second is the path through the cell theca and granulosa cells. These cells form receptors for FSH thus increasing FSH concentrations. The effect of FSH on granulosa cells and theca cells affects follicle growth, this depends on the alteration of hormonal action in the internal puasa, granulosa cells and on the follicle. FSH and estrogen are responsible for the proliferation and biosynthesis of steroids in granulosa cells while LH provides internally useful androgenic androgenic hormones useful in follicular maturation. The role of androgens in early follicular development is complex, in which low concentrations will undergo aromatization to estrogen (Speroff, 2005).

Research conducted by Adnan (1992) showed kecombrang is estrogenic, can disrupt pregnancy when administered during the period of pre-implantation and post-implantation early. Another study conducted by Akbar (2004) showed that kecombrang able to decrease the fertility of white mice *(Mus musculus)* breastfeeding. Another study conducted by Meles (1991) said that the cows in pregnant state that are fed with leaves of miscarriage and miscarriage parent suffered a loss of consciousness. In this study mentioned that kecombrang can depress the central nervous system to suppress the hypothalamus and pituitary lane will increase expenditures gonadotropin thus improve fetal growth. Research conducted by Rinaningtyas (2010) showed kecombrang is antibacterial, can reduce bacterial colonies *Entamoeba coli.* Another study conducted by Akbar (2004) showed that kecombrang able to decrease the fertility of white mice *(Mus musculus)* breastfeeding because it contains the hormone prolactin that suppress GnRH. In this study mentioned that kecombrang can suppress the central nervous system by suppressing the hypothalamus pathway and the hypophysis will increase the expenditure of gonadotropin thus increasing the growth of the fetus

Based on the description above research background, then formulated the issues to be examined in this study are as follows: Does the extract kecombrang on Changes in Body Weight Infants Mice *(Mus musculus)?*

2. Methods

This study is a laboratory experiment with the type design of *post-test* experimental and control group *(Post test only control group design)* (Zainuddin, 2000). The study was

conducted in subjects with dose variation kecombrang. K1 group as a control group of mice was given CMC. K2 group was given kecombrang0,6 g / kg / 24 hours. Kecombrang K3 group given 1.2 g / kg / 24 hours. Kecombrang K4 group given 2.4 g / kg / 24 hours in all treatment groups and all limited to only have 5. Treatment in groups K1 to K4 is given once a day. After treated 12 days then do weight infants weighing the mice every day. Average weighing results averaged and weight tested to see increased levels of prolactin and weight of the baby mice as indicator of adequacy parent prolactin levels. The results of the fourth examination of the treatment group compared with the control.

3. Result

Descriptive analysis of weight change by giving kecombrang solution at various doses presented in the following table:

Table 1: The average value and standard deviation changes in weight mice by administering kecombrang solution at various doses

Changes in weight	Size	Provision of aqueous solution at various doses			
		Control	0.6 g / kg BW / 24 hr	1.2 g / kg body weight / 24 hours	2.4 g / kg body weight / 24 hours
Observation day 3	Average	0.504	0.518	0.515	0.538
	SD	0.072	0.013	0.049	0.019
	n	10	10	10	10
Observation day 6	Average	0.867	0.851	0.861	0.819
	SD	0.059	0.027	0.058	0.029
	n	10	10	10	10
Observation day 9	Average	0.971	0.988	0.942	0.984
	SD	0.049	0, 0 73	0.080	0.047
	n	10	10	10	10
Observation day 12	Average	0.776	0.779	0.743	0.765
	SD	0.065	0.107	0.075	0.050
	n	10	10	10	10

Based on Table 1 above shows that the observation of the 3rd day of treatment administration kecombrang solution dose of 2.4 g / kg averaged the highest weight change in the amount of 0.538 g with a standard deviation of 0.019 g. P no observations day 6 control treatments resulted in changes in body weight the highest in the amount of 0.867 g with a standard deviation of 0.059 g. In observation of the 9th day of treatment at a dose administration kecombrang solution 0.6 g / kg BW / 24 hr generating an average value of weight change the largest is 0.988 g with a standard deviation of 0.073, while the observation of the 12th day of treatment at a dose administration kecombrang solution 0.6 g / kg / 24 hours resulted in the average value of the change in weight the highest, amounting to 0.779 g with a standard deviation of 0.107.

In general administration at various doses kecombrang solution generate changes in body weight of mice with higher doses kecombrang solution.

Data normality test is performed to determine whether the research data obtained follow or approach the normal distribution, the distri plugs the data with a bell shape *(bell shaped).* Good data is data that has a normal distribution pattern. Normality test data using *One-Sample Kolmogorov-Smirnov Test* with a significance level of 5%. Normality test results data for the change in weight shown in the following table:

Table 2: Normality test results of weight change mice with giving a solution of kecombrang at various doses

Changes in weight	KS-Z	Significance	Information
Observation Day 3			
Controls (P0)	0, 853	0, 461	Normal
0.6 g / kg (P1)	0, 603	0, 860	Normal
1.2 g / kg (P2)	0, 993	0, 278	Normal
2.4 g / kg (P3)	0, 894	0, 401	Normal
Observation Day 6			
Controls (P0)	0.456	0.986	Normal
0.6 g / kg BW (P1)	0.565	0.907	Normal
1.2 g / kg body weight (P2)	1,172	0.128	Normal
2.4 g / kg body weight (P3)	0.736	0.650	Normal
Observation Day 9			
Controls (P0)	1.162	0.134	Normal
0.6 g / kg BW (P1)	0.605	0.858	Normal
1.2 g / kg body weight (P2)	1.084	0.190	Normal
2.4 g / kg body weight (P3)	0.663	0.772	Normal
Observation Day 12			
Controls (P0)	0.940	0.328	Normal
0.6 g / kg BW (P1)	1,196	0.115	Normal
1.2 g / kg body weight (P2)	0.871	0.435	Normal
2.4 g / kg body weight (P3)	0.863	0.446	Normal

Based on the above table shows that changes in body weight in the control treatment (P0), 0.6 g / kg (P1), 1.2 g / kg (P2) and 2.4 g / kg h (P3) on various observations each has a significance value greater than 0.05 (p> 0.05), so the four treatments in this experiment have data spread by a normal distribution.

The homogeneity test of data in principle is to test whether a group has the same variance among the group members. Testing homogeneity of variance is done by using *Levene Statistic Test.* The homogeneity test results are shown in the following table:

Table 3: Results of homogeneity test weight changes mice by administering kecombrang solution at various doses

Weight Change	Levene Statistic F	Significance	Information
Observation day 3	1, 847	0, 156	Homogeneous
Observation day 6	1,301	0.289	Homogeneous
Observation day 9	0.690	0.564	Homogeneous
Observation day 12	0.978	0.413	Homogeneous

Based on the above table shows that the change in weight on observation day 3 F-statistic has a value of 1, 847 (p = 0.156), the 6th day amounted to 1.301 (p = 0.289), the 9th day amounted to 0.690 (p = 0.564) and day 12 of 0, 978 (p = 0, 413). The results show that each observation has a significant value above α (0.05), so that means that treatments in weight change ter s ebut having variances were homogeneous.

The average difference test is used to determine whether administration of a solution between the treatment groups at various doses kecombrang give a different effect on weight change mice. Based on the data normality test used in this study with a single factor ANOVA *(Oneway Anova),* the first factor giving kecombrang solution at various doses.
Results of *Analysis of Variance* treatment kecombrang solution administration at various doses to changes in body weight are presented in Table 4.4.

Table 4: Results of *univariate ANOVA* test changes in weight mice by administering kecombrang solution at various doses

Weight Change	F-count	Significance	Information
Observation day 3	1.012	0.399	Non-significant
Observation day 6	2,183	0.107	Non-significant
Observation day 9	1.087	0.367	Non-significant
Observation day 12	0.440	0.726	Non-significant

According to the table above, in *Oneway Anova,* changes in weight mice treated with a solution of kecombrang administration at various doses showed that administration of the various doses kecombrang solution not significant effect on weight change on the 3rd day of observation with the F-count equal to 1.012 and the significance of 0, 399. This also happened to the next observations, ie observation of the 6th day with F-count of 2.183 (p = 0.107), 9th day observation with F-count of 1.087 (p = 0.367) and observation day 12 with an F-count of 0.440 (p = 0.726).

Advanced testing with Tukey-HSD test was not carried out because the results *Oneway Anova* no significant difference between treatment administration at various doses kecombrang solution to weight changes.

4. Discussion

The result of the test of weight change of the mice with the treatment of the solution of kecombrang at various doses showed that giving the solution of kecombrang at various doses had no significant effect on the change of body weight on observation day 3 (p-value = 0,399, day-6 (p-value = 0.107), day 9 (p-value = 0.367) and day 12 (p-value = 0.726). weight is one measure that provides an overview masses of tissue, including body fluids. Weight is very sensitive to changes abruptly either due to infectious diseases or decreased consumption of food.This weight is expressed in the form of a BB / U index (weight by age) or performing an assessment by looking at changes in body weight at the time of measurement, which in its use provides an overview of the present state. the body is most widely used because it requires only one measurement, it is only dependent on the age determination, but less able to describe the trend nutritional situation changes from time to time (Kurniasih *et.al.,* 2010; Mann and Truswell, 2014).

During breastfeeding weight changes is strongly influenced by the presence of the hormone prolactin, which causes increased milk production in the body. The increase was due to the stimulus of prolactin receptors on cells to stimulate neurohormone laktotrof which would stimulate spending *Prolactin Releasing Factor (PRF).* Leaves *Sauropus androgynus* (L) Merr thought to contain terpenoid compounds that will work on cell laktotrof through steroid hormone receptors that are intracellular such as estrogen in promoting the work of synthesis and release of prolactin by the pituitary. In lactation theory it is known that increased secretion of milk during the lactation period is closely related to increased blood prolactin levels. During treatment the parent mice are healthy and protected from conditions of stress, it will inhibit the action of *Prolactin Inhibitory Factor* (PIF), so that prolactin remained in production well that will affect milk production mother rats. The opinions of the Yen and Jaffe support the above opinion which says that the effect of estrogen that is positive for *turnover* in the pituitary prolactin occur due to activation of genes and accumulation of mRNA traskripsi prolactin and estrogen have dopaminergic properties that would cause a decrease in the ability of dopamine. The production of estrogen by the placenta during pregnancy depends on precursors circulating in the blood, where steroids derived from rats and mothers are the most important source (Martin, Hoffman, 1983). During pregnancy, elevated levels of estrogen hormone in serum, estrone and estriol increase by 50 times the levels before pregnancy while estradiol is 1000 times.

Body weight increase from observation day 3, day 6 and day-to-9 and then decrease in observation day-to-12. When compared with controls at 3 days observation the treatment of a dose of 2.4 g / kg BW (P3) had a much smaller body weight change than control (P0). This also happened on the 6th day observation. In observation day 9 and day-12 it is treated with a solution of dose 1.2 g / kg body weight (P2) which changes the body weight is much smaller than control (P0), while the treatment of dosage solution 2 doses of kecombrang, 4 g / kg body weight (P3) changes in weight is greater than control (P0). The highest changes in body weight occurred on the 9th day observation showed that the optimum time of the giving of the solution was 9 days and after that the effect of the decreased decreased as indicated by the decrease of body weight change of mice on the 12th day.

Flumsy contains flavonoids, tannins, saponins, quinones, steroids, triterpenoids (Nor, 1996). These compounds are usually soluble in hot water and alcohol. This flavonoid effect is for cell growth because it can affect the AMP cycle. This compound also has a wake formula similar to the

hormone estrogen that's expected effects of flavonoid-like hormone estrogen (T Robinson, 1991). Phytoestrogens present in flavonoids have an inhibin effect (Whitehead, 2003). Inhibin selectively increases the secretion of FSH but does not increase the secretion of LH to LH produced is not periodic but continuously (Speroff, 2005).

Estrogen significantly stimulates the synthesis and release of prolactin by pituitary, this effect depends on the duration and dose of administration. According to Fang (2001), the administration of estrogen for two days, and an increase in the release of prolactin quickly and in a very convincing amount in menopausal women. The increase in prolactin levels during these estrogen preparations appears to be maintained by increasing the amplitude of episodic release of prolactin for 24 hours. Effect of estrogen that is positive for the pituitary *prolactin-turnover* occurs through various possibilities (Chatterton, 2001): First; estrogen bonding at the nuclear receptors of lactotrof cells leads to activation of gene transcription and the accumulation of prolactin mRNA. second; estrogen has antidopaminergic properties that will lead to a decrease in the ability of dopamine to inhibit the secretion of prolactin. third; estrogens increase the regulation of TRH receptors from lactotrof cells, causing an increase in TRH sensitivity in spurring prolactin release. Thus, estrogen activity to increase the synthesis and release of prolactin occurs through several mechanisms: increased prolactin DNA synthesis, increased TRH receptor and decreased dopamine (Chatterton, 2000).

5. Conclusions

Based on the results of research and discussion on the influence of kecombrang *(Etlingera elatior)* to changes in birth weight mice *(Mus musculus)*, it can be concluded that:

Provision of kecombrang extract no real effect on the baby's weight change of mice *(Mus musculus)* at 0.6 g / kg / 24 hours, 1.2 g / kg / 24 hours and 2.4 g / kg / 24 hours.

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