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# Test of Fruit Extract Pare (*Momordica charantia* L.) to Quality of Ejaculated Spermatozoa Mice (*Mus musculus* L.)

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**Abstract** Pare (*Momordica charantia* L.) can be used in the treatment of various diseases, such as influenza, cancer, anti-inflammatory, anti-HIV, antimetabolic and antifertility. This study aimed to determine the effect of the herbal bitter (*Momordica charantia* L.) to ejaculated sperm quality mice (*Mus musculus* L.). This research was conducted using Completely Randomized Design (CRD) with 4 treatments and 6 replications, water and fed ad libitum. First treatment is given solvent extract. Second treatments extract were given 0.2 gram, third treatment were given 0.4 gram of extracts and fourth treatment were treated extract 0.6 gram were orally for 30 days. After the mice decapitated, dissected and take sperm from vas deferens. Then, the sperm preparation determined using the improved Neubauer. Data were analyzed by ANOVA (Analysis of Varians). The results showed at doses of 0,2 gram, the average sperm count was 19.89. decrease significant when compared with the control in which the average number of sperm 29.13. So with this research the effective doses to decrease sperm count and can be used as a contraception medication dosage was 0,2 gram. It can be concluded that the extract of bitter (*Momordica charantia* L.) can decrease the quality of the ejaculated sperm of mice (*Mus musculus* L.)

## 1. Introduction

Family Planning Program has been declared by the Indonesian government as a national program. One of the efforts that have been implemented in the program is the provision of contraception. The use of contraceptives in its principle is to prevent fertilization or the fusion of a sperm cell and an egg cell. Means of contraception is more aimed at women, while men are still limited, so the development of male contraceptives is far behind compared to female contraceptives [1].

One of the plants is expected to be an antifertility is the fruit of bitter pare (*Momordica charantia* L.) which has a bitter taste that comes from cucurbitacins substances. The fruit is included in the rate Cucurbitaceae (cucumbers).

Thrives in the lowlands and can grow wild in the yard of the house to be cultivated. This fruit has a lot of content that is good for the body. Such as high calcium, fiber, vitamin C, carotene, a chemical compound lutein, lycopene, which may help prevent cancer, as an



antibiotic, antiviral, balancing blood pressure, blood sugar and helping stimulate the production of insulin.

Pare plants contain flavonoid compounds that can hamper enzyme aromatase, an enzyme that serves to catalyze the conversion of androgens to estrogen increases the hormone testosterone. The high concentration of testosterone will affect the negative feedback to the pituitary is not releasing FSH and LH, thereby inhibiting spermatogenesis.

The enzyme also catalyzes the conversion of testosterone to estradiol so mepengaruhi ovulation process. Bitter pare fruit extract also contains cytotoxic compounds such as saponins, triterpene momordikosida, and cucurbitacin which can reduce the quality and quantity of sperm cells. Seeds pare contains triterpenoids which have anti spermatozoa activity, so the use of traditional seeds pare with a view to preventing AIDS can result in infertility in men [2].

Pare consumption in the long term, either in the form of juice, salad or vegetables, can kill sperm, triggering impotension, damage the testicles and male hormones, even potentially damage the liver [3]. Bitter pare fruit extract Research has also been reported by [4], that can affect the morphology and motility of rats. The higher levels of fruit extracts Pare and the longer the administration, the motility and viability of spermatozoa is getting low, otherwise abnormal sperm morphology-tozoa increasing. This may be caused by active ingredient group triterpene glycoside contained in fruit Pare [4]. Bitter pare fruit extract 500 mg / kg / day for 14 days was found to affect the quality of spermatozoa that is, the occurrence of agglutination between head motion and circular motion in place. Circular motion can be caused due to abnormal morphology, rotational energy penghantaran no or irregular and asymmetrical tail circum stances. Furthermore, when administered for 49 days, got into abnormal morphology of spermatozoa. The abnormalities appeared in the neck bulging spermatozoa (swollen). It was allegedly caused by the swelling of mitochondria.

Sutyarso [5] concluded that the research results Pare fruit extract tends to be antifertilitas because it can inhibit spermatogenesis and the higher the dose of bitter melon fruit extract, the fewer the number of children produced mice. In addition, the effect of the fruit extracts for blocking spermatogenesis Pare is temporary (reversible). To see how it affects, then do research on Effect of Pare Fruit Extract (*Momordica charantia* L) on the Quality of ejaculated spermatozoa of mice (*Mus musculus* L.).

## 2. Material and Methods

### *Material*

This study uses a test animal mice (*Mus musculus* L.) Swiss Webster aged 11-12 weeks weighing 20-30 grams were obtained from the Department of Biological Science Laboratory UNP. Bitter melon fruit extract (*Momordica charantia* L) obtained from various processes performed at the Laboratory of Chemistry UNP.

### *Research Methods*

Mice were divided into 3 treatment groups and control. Each group consisted of six mice. The control group was given only solvent extract and the food was the same as the treatment group. Treatment B, C and D are the group treated by administration of bitter pare fruit extract orally for 30 days with a dose of 0.2 g, 0.4 g and 0.6 g.

After the test of finishes in each group, the test animals were decapitated, dissected and cut vas deferens of the left and right, place it in petridish has been charged with 10 micron PBS (*Phosphate Buffered Saline*). To calculate the number of sperm, using the method of Improved Neubauer. As for seeing the morphology of spermatozoa, using eosin staining. The data were analyzed by ANOVA (*Analysis Of Variance*).

## 3. Results and Discussion

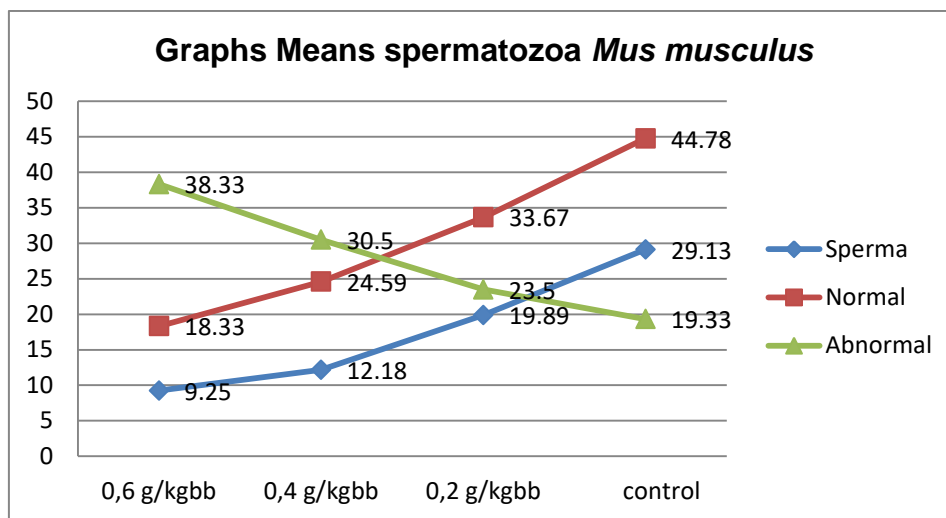
From this research it can be seen the effect of bitter pare fruit extract (*Momordica charantia* L) against the number of ejaculated spermatozoa of mice (*Mus musculus* L.). After giving the fruit

extract of bitter pare (*Momordica charantia* L) at a dose of 0.2 g, 0.4 g and 0.6 g in mice (*Mus musculus* L.) for 30 days there was a decline ejaculated spermatozoa (Table 1).

**Table 1.** Results The mean sperm, sperm Normal and Abnormal sperm ejaculated *Mus musculus* L. extract treatment with various *Momordica charantea* L.

Treatment dose	Mean Sperm Count	Mean Normal Sperm	Mean Abnormal Sperm
A (0,6 g/kgbb)	9.25 a	18.33 a	38.33 a
B (0,4 g/kgbb)	12.18 b	24.59 a	30.50 b
C (0,2 g/kgbb)	19.89 c	33.67 b	23.50 c
D (control)	29.13 d	44.78 b	19.33 c

Note: The numbers in the same column followed by the same lowercase not significant, whereas the same letter are not significantly different at  $\alpha$  level of 5%.



**Figure 1.** Graph Means Spermatozoa *Mus musculus*.

According to Hartini [1] the number of spermatozoa produced is highly dependent on the direct process that occurs during spermatogenesis in the seminiferous tubules. When spermatogenesis normal place it will produce normal sperm count as well. Conversely, if an interruption occurs during spermatogenesis process, the development of spermatogonial cells will affect the number spermatozoa formed. So with the disorder cleavage during spermatogenesis, it is expected to result in the alteration or destruction of spermatozoa produced thus might change and the damage will effect a decrease in the number of sperm ejaculated.

Based on the test results can be seen that the use of 0.2 g dose was the most effective to reduce the number of sperm ejaculated and used as an antifertility drugs. At a dose of 0.2 g is obtained by the average number of sperm 19.89 and has already seen a significant reduction in the number of spermatozoa were compared with controls who had an average of 29.13.

From examination of normal sperm morphology Table on the vas deferens mice (*Mus musculus* L.) obtained an average percentage of normal sperm morphology dose of 0.2 g , 0.4 g and 0.6 g lower when compared to the control and after a further test is statistically there are significant as a result of extract of bitter pare fruit (*Momordica charantia* L.).

In this study, the higher dose given the fewer the number of normal spermatozoa be produced. So the dose that can be used as an anti-fertility drugs are on treatment with a dose of 0.2 g B because it can inhibit or reduce the number of normal sperm.

Table it can be seen that the extract of bitter pare fruit (*Momordica charantia* L.) also cause abnormal sperm. Abnormalities in the sperm of mice (*Mus musculus* L.) allegedly because of interference maturation phase of spermiogenesis spermatozoa in this case in accordance with the theory put forward by Bardin [6] that in the seminiferous tubules, androgen function in controlling the process of spermatogenesis in meiosis and spermiogenesis process. In this study suspected antimitotic compounds contained in andrographolide has hindered produced androgen, causing disturbances in spermiogenesis phases. So if the hormone androgen is a hormone that plays a role in the process of spermatogenesis when availability is a little, it will cause the process was interrupted and can lead to abnormalities in sperm during spermiogenesis.

#### 4. Conclusion

Bitter pare fruit extract (*Momordica charantia* L.) can reduce the average amount of the ejaculate sperm of mice (*Mus musculus* L.) and reducing the number of normal sperm.

#### References

- [1]. Hartini. 2011. Pengaruh Dekok Daun Jambu Biji Merah (*Psidium guajava* L.) Terhadap Jumlah Kecepatan dan Morfologi Spermatozoa Tikus Putih Jantan (*Rattus norvegicus*). Available at: <https://www.scribd.com/> Accessed: 24 April 2013.
- [2]. Girini. MM, Ahamed RN, Aladakatti RH, 2005. Effect of graded doses of *Momordica charantia* seed extract on rat sperm: scanning electron microscope study, *J Basic Clin Physiol Pharmacol.*, 16(1):53-66.
- [3]. Basch E, Gabardi S, Ulbricht C, 2003, Bitter melon (*Momordica charantia*): a review of efficacy and safety, *Am J Health Syst Pharm.*, 60(4): 356-9.
- [4]. Wardojo BPE. 1990. *Pengaruh Fraksi Kloroform dan Air Buah Pare terhadap Spermatozoa Epididimis Tikus*. Thesis Fak. Pascasarjana UGM, h.53–102.
- [5]. Sutyarso. 1992. *Pengaruh Pemberian Ekstrak Buah Pare (Momordica charantia L.) Terhadap Fertilitas Mencit Jantan Mus musculus L. Strain LMR*. Thesis Fakultas Pascasarjana Universitas Indonesia, Bidang Ilmu Kedokteran Dasar. Jakarta, h. 123.
- [6]. Bardin, C.W. 1986 *Pituitary Testicular Axis in Reproductive Endocrinology* (2nd). Eds. S.S C Yen and R. B. Jaffe. Philadelphia Saunders.