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EFFECTIVENESS DECOCTION OF RED BETEL LEAVES (PIPER CROCANTUM) AGAINST DECREASED SYMPTOMS OF FLUOR ALBUS IN HIGH SCHOOL GIRLS

EFEKTIVITAS DEKOKSI DAUN SIRIH MERAH (PIPER CROCANTUM) TERHADAP GEJALA PENURUNAN FLUOR ALBUS PADA ANAK PEREMPUAN SMA

Research Report
Penelitian

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A B S T R A C T

Background: *Fluor albus is excessive fluid from vagina that is not menstruation. To reduce the symptoms of fluor albus, non-pharmacological treatment from the decoction water of red betel leaves (Piper crocantum) was used in the present study. These red betel leaves (Piper crocantum) contain alkaloids that the green betel leaves do not have, and the alkaloids play a role as an antimicrobial agent. Besides, the red betel leaves have antiseptic power that is twice higher than the green betel leaves'. The red betel leaves (Piper crocantum) also contain carvakrol which is anti-fungal and disinfectant, and it that can be used as an antiseptic medicine to maintain oral cavity health, cure fluor albus disease, and alleviate bad odor.* ***Purpose:*** *To discover the effectiveness of the decoction of red betel leaves in reducing the fluor albus symptoms.* ***Method:*** *This study uses quasi-experimental research design with one group undertaking pre- and post-tests. It involved 20 adolescent girls of Al-Adzkia Sentul Boarding School in which the sample was taken using purposive sampling techniques. Further, a closed ended questionnaire is used to collect data, then analyzed using paired T-test.* ***Result:*** *The results showed a meaningful difference before being given treatment for 13.40. After treatment the value became 8.27 with a p-value < of a (0.005).* ***Conclusion:*** *The results this study indicated a decrease in symptoms of vaginal discharge after the use of red betel leaf decoction and recommended it to be used as a form of non-pharmacological therapy or traditional medicine in reducing fluor albus symptoms in adolescent girls.*

A R T I C L E I N F O

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Fluor albus, Piper crocantum, Alternative treatment

A B S T R A K

Latar belakang: *Fluor albus* adalah cairan berlebih dari vagina yang tidak haid, untuk mengurangi gejala *fluor albus* non-farmakologis pada daun sirih merah (*Piper crocantum*) mengandung alkaloid yang tidak dimiliki sirih hijau. Daun sirih merah sebagai anti-mikroba dan memiliki daya antiseptik dua kali lipat dari daun sirih hijau. Daun sirih merah (*Piper crocantum*) mengandung *carvakrol* yang merupakan anti-jamur dan desinfektan yang dapat digunakan sebagai obat antiseptik untuk menjaga kesehatan rongga mulut, menyembuhkan penyakit *fluor albus* dan bau tak sedap. **Tujuan:** Mengetahui efektivitas rebusan daun sirih merah untuk mengurangi gejala *fluor albus*. **Metode:** Menggunakan desain penelitian quasi-experimental dengan desain *one group pre-post design*. Jumlah sampel adalah 20 remaja putri pondok pesantren Al-Adzkia yang diambil dengan teknik *purposive sampling*. Menggunakan lembar angket kemudian dianalisis menggunakan uji T berpasangan. **Hasil:** Menunjukkan perbedaan bermakna sebelum diberikan perlakuan sebesar 13,40. Setelah perlakuan sebesar 8,27 dengan nilai p-value < dari (0,005). **Kesimpulan:** Hasil penelitian ini menunjukkan adanya penurunan gejala keputihan setelah penggunaan rebusan daun sirih merah dan direkomendasikan untuk digunakan sebagai salah satu bentuk terapi non-farmakologis atau obat tradisional dalam mengurangi gejala *fluor albus* pada siswi SMA.

Kata kunci:
Fluor albus, Piper crocantum, Pengobatan tradisional

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INTRODUCTION

According to WHO, reproductive health is the complete physical, social and mental well-being, so it is not only the absence of diseases or weaknesses in everything related to the reproductive processes and functions. Especially in women, the reproductive organs not only serve to reproduce or get pregnant, but also function in the menstrual and sexual processes (Sari *et al*., 2011). National Center for Biotechnology Information discovered about 75 percent of women in the world experienced the vaginal discharge, at least once in a lifetime and as many as 45 percent of women experienced vaginal discharge twice or more. While the whitish rate of the women in Europe was 25 percent, of which 40-50 percent would experience recurrence (Baety *et al*., 2019)

The main causes of *Fluor albus* are the presence of bacterial infections, namely *Trichomonas vaginalis* and *Candida albicans*. In general, *Fluor albus* can be caused by several factors such as washing the female organ in the wrong direction, not paying enough attention to the cleanliness of the female organ, not immediately replacing the pad when menstruating, experiencing psychiatric conditions such as severe stress, going through exhausting physical activities, using female organ cleaning soap excessively, having unhealthy lifestyle, having unbalanced hormonal conditions, being in humid weather conditions, and often scratching the female organs. This condition can damage the inner reproductive organs and result in infertility. Therefore, maintaining personal hygiene is very important to prevent the occurrence of *Fluor albus* (Widarti, 2010; Irianto, 2015)

Fluor albus can be overcome in various ways; for instance, cleaning personal hygiene (Paryono *and* Nugraheni, 2016), using panties made of cotton or panties that absorb sweat, maintaining a healthy diet, resting sufficiently, exercising regularly and avoiding stress. In addition, fluorine can also be overcome through pharmacological drugs such as fluconazole and metronidazole class drugs (Isnawan, 2012). Further, *Fluor albus* can be treated in many different ways. Moeljanto *and* Mulyono (2003) explained that the symptoms of *Fluor albus* could be alleviated through non-pharmacological therapies such as washing the intimate organs with antiseptic liquids after defecation and urination (Firmanila *et al*., 2016). Treatment with non-pharmacological can be done by using red betel leaves (*Piper crocantum*) in the form of the decoction of the red betel leaves (*Piper crocantum*) in which it can be used to wash the intimate organs once a day (Wahyuni *et al*., 2009)

Red betel leaves (*Piper crocantum*) have a distinctive aroma because each of them contains essential oils of 1-4.2 percent, protein, water, carbohydrates, fat, phosphorus, calcium, vitamin A, vitamin B, vitamin C, iodine, starch and sugar. Among these contents in essential oils, there are natural phenols having antiseptic power that is five times stronger than ordinary phenols (Bactericids and Fungicides) (Manoi, 2007). Red betel leaves (*Piper crocantum*) also contain flavonoids; in this case, the flavonoids serve as an antibacterial agent by forming complex compounds against extracellular protein that interferes with the integrity of bacterial cell membrane. They are phenol compounds that can be protein coagulator (Manoi, 2007).

Therefore, the researchers are interested in conducting this study that examines the effectiveness of the decoction of red betel leaves (*Piper crocantum*) against the reduced symptoms of *Fluor albus* in adolescent girls of Al-Adzkia Sentul Boarding School.

MATERIAL AND METHOD

This is a quantitative study with a quasi-experimental design, having one group undertaking pre-test and post-test with paired T-test. The paired T-test was employed because this study only involved one group of respondents that were measured twice, before and after being given a treatment. The respondents of the study included 20 adolescent girls of Al-Adzkia Sentul Boarding School that experienced symptoms of *Fluor albus*. The sample of this study was taken by using purposive sampling techniques from the entire female student population of Al-Adzkia Sentul Boarding School. The present study was carried out for four weeks starting from 14 September to 4 October 2021. During those four weeks, the respondents were being given the treatment of red betel leaf decoction (*Piper crocantum*). The decoction of red betel leaves (*Piper crocantum*) was produced by adopting Manoi research (2007).). In that case, 4-5 sheets of red betel leaves were boiled in 500-600 ml of water on a medium heat for 10-15 minutes. After the fire was put out, and the decoction water became warm, it was ready to use. Before use, it was filtered. Then, it was used to wash genital organs in the morning, at noon, and at night.

This study used questionnaire and interviews to collect the data. The questionnaire was made in a structured manner based on the characteristics of *Fluor albus* symptoms put forward by Elmart (2012) and Wiknjosastro (2005). It was a closed ended questionnaire and used a check-list form of univariate and bivariate analyses. The hypothesis test used was the difference test two mean T-dependent (paired t-test) with a two-mean different test with one treatment group before and after the treatment of decoction of red betel leaves (*Piper crocantum*) in young women. Besides, the interviews contained several statements made by the researchers to ask respondents the symptoms of *Fluor albus* they had experienced before and after being treated with the decoction of red betel leaves (*Piper crocantum)*. Before conducting the interviews, the respondents were asked to fill in questionnaire sheets that were later compiled by the researchers.

After all respondents agreed to take a part in this study, the researchers interviewed them based on the questionnaire sheets that they had filled and submitted to the researchers to find out the value of *Fluor albus* symptoms they experienced. After that, they were given the decoction water of red betel leaves (*Piper crocantum*) that was stored and locked. After the intervention was completed, the respondents were interviewed again by the researchers to find out the value of *Fluor albus* symptoms after being given the treatment. The statistical data showed p-value ≤ from α (0.05) that means there was effectiveness of the decoction of red betel leaves (*Piper crocantum*) against the decrease in the symptoms of fluor albus in the adolescent girls.

RESULT

The distribution of respondent characteristic are shown on Table 1. Distribution of frequency values of *Fluor albus* respondents before being given decoction of red betel leaves (*Piper crocantum*) was shown Table 2. Table 3 is distribution of frequency values of *Fluor albus* respondents after being given decoction of red betel leaves (*Piper crocantum*) and statistical test results of effectiveness of decoction red betel leaves (Piper Crocatum) against symptoms of *Fluor albus* was shown Table 4.

Table 1. Distribution of respondent characteristics

Characteristik	Category	No.Subject	Percentage (%)
Age	13 years	7	35
	14 years	6	30
	15 years	7	35
BMI	(17.0-18.5) thin	3	15
	(>18.5-25.0) normal	13	65
	(25.0-27.0) fat	4	20
Age of menarche	8-12	12	60
	13-15	8	40

On Table 1, from the 20 respondents studied, there were 7 respondents (35%) aged between 13 and 15 years old, 6 respondents (30%) aged 14 years old. Most BMI was within normal limits (65%) for 13 subjects and there were 12 subjects whose age of menarche was between 8-12 years old (60%).

Table 2. Distribution of frequency values of *Fluor albus* respondents before being given decoction of red betel leaves (*Piper crocantum*)

No	*Fluor albus* Symptoms Values	Number of subject	Percentage (%)
1	12	3	15
2	13	3	15
3	14	9	45
4	15	4	20
5	16	1	5
	SUM	20	100

On Table 2, the value of the most frequently experienced fluor albus symptoms by the respondents before being given the decoction of red betel leaves (*Piper Crocantum*) is 14 coming from 9 subjects (45%), while the lowest *Fluor albus* symptom value is 16 coming from 1 subject (5%).

Table 3. Distribution of frequency values of *Fluor albus* respondents after being given decoction of red betel leaves (*Piper crocatum*)

No	*Fluor albus* Symptoms Values	Number of subject	Percentage (%)
1	7	1	5
2	8	13	65
3	9	5	25
4	10	1	5
	SUM	20	100

Based on Table 3, the value of the most frequently experienced fluor albus symptoms by the respondents after being given the decoction of red betel leaves (*Piper crocantum*) is 8 derived from 13 subjects (65%), while the lowest *Fluor albus* symptom value is 7 and 10 derived from 1 subject (5%).

Table 4. Statistical test results of effectiveness of decoction red betel leaves (*Piper crocatum*) against symptoms of *Fluor albus*

Variable	Mean	SD	p-value	N
Before	13,85	1,0894	0,000	20
After	8,3	0,6569		20

Based on Table 4, paired T-test results obtained from the average symptoms of *Fluor albus* experienced by the respondents before being given the treatment is 13.85 with the standard deviation of 1.0897. After being given the treatment of the decoction of red betel leaves (*Piper crocantum*) in which the respondents washed their genital organ using the decoction for four weeks, the average symptoms of *Fluor albus* experienced by the respondents are 8.3 with the standard deviation of 0.6569. The p-value = 0.000 in α 5% which means that the value p-value < of the α, and it can be concluded there is effectiveness in giving the decoction of red betel leaves (*Piper crocantum*) to reduce the symptoms of *Fluor albus* in adolescent girls.

DISCUSSION

Based on the data obtained from the study, the value of the most frequently experienced *Fluor albus* symptoms by the respondents before being treated with the decoction of red betel leaves (*Piper crocantum*) was 14 derived from 9 subjects (45%). On the other hand, the value of the least frequently experienced *Fluor albus* symptoms was 16 coming from 1 subject (5%). The data above showed that the most frequently experienced *Fluor albus* symptom in the women childbearing ages came from personal hygiene. In this case, women must have greater awareness about their lifestyles and have sufficient knowledge related to their reproductive problems and consequences that can be caused by diseases.

The data also indicated that the value of the most frequently experienced *Fluor albus* symptoms on the respondents after being treated with the decoction of red betel leaves (*Piper crocantum*) was 8 coming from 13 subjects (65%), whereas the value of the least frequently experienced *Fluor albus* symptoms was 7 and 10 derived from 1 subject (5%). According to the respondents that experienced smelly, itchy, and yellowish *Fluor albus* symptoms, their symptoms became reduced after using the decoction water of red betel leaves ((*Piper crocantum*).

According to the previous study by Putriningrum *et al*. (2015), phytochemical compounds contained in red betel leaves are alkaloids, saponins, and flavonoids. Other chemical contents found in red betel leaves include hydroxyikavicol, kavibetol, kavicol, allylprokatekol, karvakrol, pcymene cineole, eugenol, caryofelen, terpenene kadimen estragol and phenyl. Karvakrol is disinfectant and antifungal so it can be used to overcome vaginal discharge. Chavikol and chavibetol are compounds that have antiseptic properties. Eugenol is a derivative of the phenol compounds of essential oil compounds. It is antifungal by inhibiting the growth of yeast (budding cells) of *Candida albicans* by changing the structure (Proshanta Guha, 2019) aand inhibiting the growth of cell walls causing disruption of cell wall function and increased permeability of membranes to foreign bodies, and causing cell death (Alves *et a*l., 2014).

The symptoms of *Fluor albus* experienced by the respondents before being treated with the decoction of red betel leaves (*Piper crocantum*) were 13.85. After being treated with the decoction of red betel leaves, the average vaginal discharge experienced by the respondents declined into 8.27. The results of the paired t-test of whitish experiences before and after treated with the decoction of red betel leaves (*Piper crocantum*) on 20 respondents showed that p-value = 0.000 in α-5% which means the p-value < of α. It can be concluded that the decoction of red betel leaves (*Piper crocantum*) brings an effect to the symptoms of fluor albus that results in the reduced and overcome vaginal discharge.

In summary, this study showed that the decoction of red betel leaves (*Piper crocantum*) causes the reduction in *Fluor albus* symptoms in the adolescent girls. The results of the study obtained from the questionnaire before being treated with the decoction water of red betel leaves (*Piper crocantum*) indicated that the respondents were worried about themselves and felt discomfort. Since being treated with the decoction water of red betel leaves (*Piper crocantum*), almost all respondents experienced a decrease in the symptoms of *Fluor albus*. After using the decoction water of red betel leaves, the respondents could feel the changes on their vaginal discharge as they no longer felt itchy, and the vaginal discharge became odorless. A couple of respondents who routinely used the boiled water of red betel leaves (*Piper crocantum*) stated that their fluor albus symptoms were significantly decreasing.

The findings in this study are also supported by a previous study conducted by Putriningrum *et al*. (2015), that found out the comparison between the bland power of antiseptic solution povidone iodine and betel leaf extract against *Candida albicans* which caused vaginal discharge problems *in-vitro*. The study was carried out on five isolates of *Candida albicans* with an aquedical control solution. The results of the study indicated that the antiseptic solution povidone iodine had an inhibition against *Candida albicans*. Betel leaf extract with a concentration of 20 percent also has an inhibition against *Candida albicans*. The statistical analysis from the ANOVA test, a *post-hoc* test, showed meaningful differences between the bland power of the povidone iodine solution and the 20 percent betel leaf extract against the control group ($p < 0.05$). It can be concluded that a solution of povidone iodine and 20% betel leaf extracts inhibited the growth of *Candida albicans* that caused vaginal discharge problems *in-vitro*.

Research by Budiardja (2009), showed that betel leaves had more meaningful properties compared to placebo. The test involved 40 patients with vaginal discharge who were not pregnant, did not have diabetes mellitus, liver, or kidney disease. There were 20 of them getting betel leaves and the rest were given a placebo. Both betel leaves and placebo were applied

to the vagina before the patient slept for seven days. Of the 40 patients, 22 received re-examinations, each of 11 patients received a placebo and betel leaves. The results of this test proved that about 90.9% of patients who received betel leaf treatment recovered, while the placebo treatment group was only 54.5%.

Based on the study by Eykman also stated (Sari *et al*., 2011), one-thirds of the essential oil consisted of phenol and most of it was kavikol. Kavikol is the one that gives the distinctive smell of betel leaves and has an anti-bacterial agent power five times stronger than the regular phenols. In addition, betel leaves can also relieve itching, eugenol can kill whitish-causing fungi and is analgesic, and tannins (leaves) serve as an astrigen i.e. reduce fluid secretion in the vagina (Sari *et al*., 2011).

The present study is also in line with a previous study by Firmanila *et al*., (2016). The results of the study indicated that the boiled red betel leaves (*Piper crocantum*) brought an effect in reducing vaginal discharge in women with the p-value = 0.001 (< α 0.05). In addition, red betel leaves are alkaloid that green betel leaves do not have the antimicrobial property. Moreover, the red betel leaves (*Piper crocantum*) have antiseptic the power twice higher than green betel leaves (Manoi, 2007). Not only are the antiseptic and antimicrobial properties of red betel leaves higher than the green betel leaves' are, but also the boiled water of red betel leaves (*Piper crocantum*) contains carvakrol which is anti-fungal and disinfectant so that it can be used as an antiseptic oral drug to maintain cavity health, to reduce bad odor, and cure vaginal diseases (Werdhany *et al*., 2008; Brooks *et al*., 2007)

The efficacy of other red betel leaves (*Piper crocantum*) that has also been proven to overcome vaginal discharge can be seen from the content of red betel leaves (*Piper crocantum*) that has been tested by Ajizah (2004); Erna *and* Normasasi (2022). They discovered that the substance of red betel leaves (*Piper crocantum*) had an effect in reducing the symptoms of pathological vaginal discharge due to carvakrol which was anti-fungal and disinfectant, so the red-betel-leaf substance could be used as an antiseptic drug. Further, flavonoids are antioxidant, anti-fungi, antiseptic, and anti-inflammatory. They contain essential oil that act as anti-bacterial, antimicrobial properties (Pasril and Yuliasanti, 2014). Besides, tannins also have anti-bacterial power (Firmanila *et al*., 2016)

Sudewo (2007) also found out the efficacy of red betel leaves (*Piper crocantum*) to reduce *Fluor albus* symptoms and maintain female organs because one of the properties of red betel leaves (*Piper crocantum*) played a role as an antiseptic agent. Red betel leaves (*Piper crocantum*) also contain phytochemical compounds, namely essential oils, alcoloids, saponins, flavonoids and tannins where the chemical content is thought to have the potential as antimicrobial (Putriningrum *et al*., 2015). The useful chemical substances or compounds found in red betel leaves (*Piper crocantum*) have very broad benefits as herbal medicinal ingredients (Candrasari *et al*., 2012).

Flavonoids in red betel leaves (*Piper crocantum*) work by forming complex compounds against extracellular proteins that interfere with the integrity of bacterial cell membrane (Cushnie *and* Lamb, 2005). Likewise, alkaloids play a role as antibacterial agent. The alleged mechanism is to disrupt the constituent components of peptidoglican bacterial cells, so that the lining of the cell wall does not form intact and causes dead cells. Essential oils act as antibacterial agent by interfering the process of forming cells or membrane wall, so that they are not formed or formed imperfectly (Farida *et al*., 2009)

Based on the studies above as well as the results of the statistical tests in this study, it can be concluded that the boiled water of red betel leaves (*Piper crocantum*) can reduce the symptoms of *Fluor albus* experienced by women and it is very good to maintain the health of female organs due to active compounds in red betel leaves (*Piper crocantum*) such as alkaloids, flavonoids, polyphenolic compounds, tannins, and essential oils that play multiple roles as being disinfectant, anti-fungal, anti-inflammatory, anti-bacterial and antiseptic

CONCLUSION

The present study on the effectiveness of the decoction of red betel leaves (*Piper crocantum*) against *Fluor albus* symptoms in the adolescent girls of Al-Adzkia Sentul Boarding School, Tembelang, Jombang, conclude that the decoction of red betel leaves (*Piper crocantum*) has an effect in reducing symptoms of *Fluor albus* in vaginal discharge with p = 0.000 (< α 0.05).

The decreased symptoms of fluor albus should be enhanced and the health of the female genital organ should be maintained to avoid becoming pathological that may lead to cervical cancer. Further, it is hoped that the researchers will be able to undertake further research on red betel leaves (*Piper crocantum*) in reducing *Fluor albus* symptoms in women of childbearing age even with other non-pharmacological treatments and add the control group in the design that in this present study became one of the limitations of this study.

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