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Research Paper

Unveiling makahiya plant (mimosa pudica) tea: a natural approach to easing dysmenorrhea discomfort through natural process of flouration

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ABSTRACT

Dysmenorrhea, or painful menstrual cramps, is one of the most frequent gynecological illnesses. Several factors influence the expression of this biological event, including diet, lifestyle, cultural expectations and behaviors, and individual constitutions (Omani Samani et al., 2018). Mimosa Pudica is commonly utilized to treat dysmenorrhea and is often made via decoction, according to ethnobotanical research (Magtalas M. et al, 2023). The present study used phytochemical analysis to pinpoint vital compounds in Mimosa Pudica that aid in alleviating dysmenorrhea discomfort. The researchers also interviewed 15 participants who consume Mimosa Pudica tea during their menstrual cycle. The phytochemical analysis of Makahiya (Mimosa Pudica) has unveiled steroids, flavonoids, saponins, and tannins. These substances discovered through phytochemical analysis suggest that Makahiya (Mimosa Pudica) has therapeutic properties and can be used in easing dysmenorrhea. The researchers conclude that Mimosa Pudica tea can be used as an alternative treatment for dysmenorrhea providing more options to women who are suffering from this issue.

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1. INTRODUCTION

1.1. Background of the Study

Dysmenorrhea is a painful menstrual cramp of mostly all the females and considered as one of the most common gynecological disorders. This pain is mainly caused by a natural chemical called prostaglandins. The uterus contracts due to a substance called prostaglandin, which causes menstrual cramps. This is the soreness and cramping of your experience. The blood and tissue that emerges from your vagina during your menstrual cycle is called your uterine lining, and these contractions aid in shedding it. Prostaglandin levels rise right before menstruation begins and levels decrease once you get your period.

Mimosa Pudica L. is a prostrate or semi- erect sub shrub native to tropical America and Australia, as well as India. The crude extract contained carbohydrates, alkaloids, cardiac glycosides, coumarin glycosides, saponins, flavonoids, phytosterols, phenols and tannins, proteins, and terpenoids, according to a phytochemical screening. The methanol extract has the greatest extractive percentage of 11.6. The anthelmintic action was tested on Pheretima posthuma, an adult Indian earthworm. Cold extraction was used to extract the leaf separately with methanol and distilled water. Different concentrations (20, 40, 60, and 80 mg/ml) of each extract were examined for anthelmintic action by timing the worms' paralysis and death. At all doses, the aqueous and methanol extracts exhibited anthelmintic action, which is comparable to the reference medicine, albendazole (positive control). Methanol extracts outperformed albendazole and aqueous extracts in terms of anthelmintic activity. Tween 20 (1%) with saline, employed as a negative control, had no anthelmintic action [1].

Worldwide, women utilize herbal medicine extensively, and more and more studies are demonstrating its value in both treating illnesses and maintaining good health [2]. Even in the modern world, there are still a number of health problems that affect women that cannot be treated with modern medicine. In places where there are no modern medicines available, herbal medicine must be used as a backup or supplement to improve the health and quality of life of women.

A woman's menstrual cycle is a good indicator of how healthy she is. Menstruation typically happens at regular intervals. Premenstrual syndrome (PMS), dysmenorrhea, amenorrhea, and menstrual disorders (MDs) are examples of menstrual diseases (MDs) [3]. The expression of this biological event is mediated by a variety of factors, including diet, lifestyle, cultural expectations and behaviors, and individual constitutions, according to ethnographic and epidemiological studies showing significant variations in symptoms experienced by women with MDs living in different locations [4]. In contemporary medicine, hormone therapy is the primary treatment for MDs. However, more and more women are choosing to rely on herbal treatment based on their own traditional/national medicine due to the negative side effects of contemporary medicine.

People who live in poverty and cannot afford the expensive commercial synthetic medications sold by pharmacies choose to use local herbs that are affordable to them. They can find these plants in their house yards, rice fields, gardens, roadside vegetation, and rivers. A different traditional design. In the Charakasamhitha. It is mentioned that a decoction of the plant could be used to wash the vagina in case of vaginal infections [5].

Throughout history, traditional medicines have been manufactured from plants and plant products for thousands of years. Traditional medicines, as defined by the World Health Organization, are made from plant products and have been used to treat illnesses with or without little processing. These substances produced from plants served as a stand-alone foundation for the creation of contemporary medications. About 77%–80% of global population uses these herbal medicines in primary health care since plant-based products are considered as safe without any side effects and cost-effective.Phytomedicines are considered as medically important because of potential bioactive compounds. One such traditionally important phytomedicinal plant is Mimosa pudica, which is well known for its thigmonastic and seismonastic movements.The bark, leaves, and flowers are used for hundreds of years in ancient Chinese medication.

Ethnobotanical investigations revealed that medicinal herbs, including Fabaceae, Mimosa, and Mimosa pudica L were commonly utilized to treat dysmenorrhea which is commonly prepared by decoction [6]. Mimosa Pudica has been shown to have antioxidant, anti- inflammatory, and analgesic properties [7].

With the increasing demand for natural remedies, investigating the efficacy of Mimosa pudica tea offers a promising avenue for improving women's health and well-being. Furthermore, conducting a comprehensive phytochemical analysis can elucidate the active compounds responsible for their potential therapeutic effects, laying the foundation for future research and product development in the field of women's health. In conclusion, this study underscores the importance of exploring natural remedies for dysmenorrhea. While the research provides valuable insights into the phytochemical composition of Mimosa pudica tea, further investigations are warranted to fully understand its potential as a therapeutic option for dysmenorrhea management. The study contributes to the growing body of knowledge on natural approaches to women's health and encourages future research endeavors aimed at harnessing the benefits of Mimosa pudica and similar herbal remedies to enhance the well-being of individuals experiencing dysmenorrhea. Ultimately, this research opens the door to innovative and holistic solutions that can alleviate the discomfort associated with dysmenorrhea, providing women with more choices for managing this common menstrual condition.

In the Philippines, many people are accustomed to using medicinal plants because they are believed to cure diseases. One of them is the Mimosa Pudica or better known by the name “Makahiya”. Mimosa Pudica is a creeping flowering plants that can be seen beside the streets and has many uses especially in the field of medicine. It is a Neotropical legume that responds to contact by instantly closing its leaves.

1.2. Objectives of the Study

Dysmenorrhea poses a common challenge for women, impacting their quality of life. The traditional use of Mimosa pudica, or Makahiya plant, in addressing various ailments includes its potential in managing dysmenorrhea. This study aims to:

1. Evaluate the effectiveness of Makahiya plant tea in reducing menstrual pain.
2. Explore how the tea may influence hormonal levels during the menstrual cycle.
3. Conduct a thorough assessment of the safety profile and potential side effects of Makahiya plant tea, providing insights into its viability as a natural remedy for dysmenorrhea.

1.3. Significance of the Study

The finding of this study will help generate a better understanding of the following group of persons:

- **Women:** This study will help them to relieve the pain during menstrual cramps. This study can also provide more option on how they can handle their menstrual problem.
- **Future Researchers:** This study can help to provide more informational data for future researchers, and they can use this as a guide to validate or invalidate this type of study.
- **Healthcare Professionals:** They can benefit from this study by gaining insights into the potential efficacy and safety of Mimosa Pudica tea as a recommendation for dysmenorrhea relief, allowing them to offer holistic treatment options.

1.4. Scope and Limitation

The scope of our study is to provide an alternative treatment against dysmenorrhea using Mimosa Pudica. This study is limited only for women who experienced dysmenorrhea. The main purpose of our study is to point out the effectiveness of Mimosa Pudica as an alternative treatment against dysmenorrhea. This study only focuses on Mimosa Pudica and its effectiveness in treating against dysmenorrhea.

1.5. Conceptual Framework

The framework of the research has an input which is the makahiya (Mimosa Pudica) Plant which is the focus of the study. The research process includes preparing the plant, undergoing a natural process of flouration, and then collect data based on the experimentation. The output is unveiling makahiya tea for a natural approach of easing dysmenorrhea discomfort by a natural process of flouration.

1.6. Research Paradigm

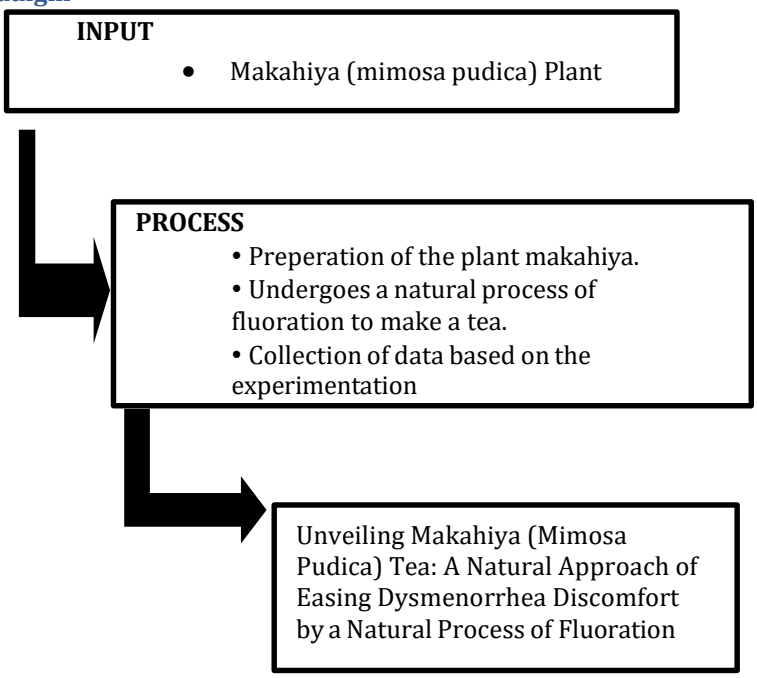


Figure 1. Methodology for the Preparation of Makahiya (Mimosa pudica) Tea for Dysmenorrhea Management

2. RELATED WORK

2.1. Literature Review

Dysmenorrhea is a Greek word defined as "painful monthly bleeding." There are two types of dysmenorrhea, which are classified as primary and secondary dysmenorrhea [8]. Primary dysmenorrhea is defined as the presence of long-lasting, crampy, lower abdomen discomfort during menstruation in the absence of demonstrable disease. The development of the same symptoms in reaction to a clinically identified or suspected underlying pathology, such as endometriosis or adenomyosis, is referred to as secondary dysmenorrhea. Although dysmenorrhea is not a life-threatening disease, it may have a significant impact on people and society [9]. It was found that dysmenorrhea is a common gynecological problem among students and has a negative impact on their academic performances [10].

Herbal medicine is widely used by women all over the world, and more and more research are confirming its effectiveness in both treating diseases and maintaining good health [2]. Due to the adverse effects of modern medicine, an increasing number of women have shifted to herbal treatment based on their own traditional/national medicine. Curing health issues was the most commonly cited goal for taking herbal medicine across all age groups [11].

Mimosa pudica Linn has been shown to be a potent herb that many traditional healers utilize in a range of ailments. a number of traditional formulas found in the Charakasamhita. It has been proposed to use the plant's decoction as a vaginal wash to treat vaginal infections. For long years, people in South Asia have utilized mimosapudica to treat a variety of illnesses. Mimosapudica Linn an annual or perennial herb, has been shown to possess a number of advantageous qualities, such as the following antihelminthic, antihyperglycemic, antiinflammatory, antipyretic, antispasmodic, antitussive, antiviral, calmative, contraceptive, depilatory, diuretic, emetic, expectorant, poison, sedative, tranquilizing. Many cultures used the plant's therapeutic qualities to cure vaginal infections, urinary tract infections, and toothaches. The presence of potent antibacterial activities in the chemical (Mohana P., 2019). Bain-bain, as this herb is known to the Ilokanos, is a versatile herb that some people even view as an ornamental plant. Instead of being used as a fence, it is now the physical hub around which Ilocanos' social, cultural, and economic activities revolve. This hermeneutic phenomenological study sought to investigate the Ilocanos' actual

encounters with the Mimosa pudica (makahiya).

The study concentrated on the customs, values, and in-depth knowledge of the plants and their therapeutic benefits held by Ilocanos. This study goes into greater detail on the symbolic interpretation, the more significant impact on sociocultural development, the cultural understanding of the sensitivity of makahiya leaves, and the significant contributions to the teaching-learning process to maintain culture and identity. The survey included a total of 15 respondents/informants. Personal interviews with community members, who are the most knowledgeable elders, yielded further information. The findings showed that Ilocano is used to treat conditions like ulcers, skin issues, and liver inflammation. Additionally, it serves as an antioxidant to restore nutrients lost as a result of diarrhea. The makahiya plant is also used medicinally and is linked to a variety of feelings or aspects of life. Makahiya was regarded as a symbol of femininity and independence [12].

A person's quality of life may suffer and their life may be at danger if care is postponed. The following socioeconomic determinants of health may lead Filipino women to choose to use herbal medicine despite price reductions on pharmaceuticals brought about by the Cheaper Medicines Act of 2008 and the Generics Act of 1988: poverty, unemployment, particularly during the COVID-19 pandemic, substandard housing, and limited access to healthcare both financially and physically. Prior ethnobotanical research documented the extensive application of therapeutic plants in the management of various gynecologic disorders, including abnormal bleeding (which includes dysmenorrhea, irregular menstruation, and delayed menstruation), infertility, gonorrhea, myoma, and uterine cancer. [13], WHO, Commercial determinants of health 2021).

2.2. Related Work

Mimosa pudica, commonly known as Lajjalu in Ayurveda, has established itself as a prominent botanical resource with versatile therapeutic applications. Within traditional medicine, it serves as a valued antidepressant and anti-asthmatic agent, playing a role in the treatment of a diverse range of [14]. This utilization is rooted in Ayurvedic practices, where the plant has been acknowledged for its potential to address psychological and respiratory health concerns.

Lyngdoh, et al., 2020 explores that the epidemiological dimension of Mimosa pudica unfolds as studies unveil the presence of essential metabolites, including phenols and flavonoid compounds. These bioactive components are of particular interest due to their suggested properties, such as potential anticancer and antidiabetic effects. The integration of such natural compounds into medicinal practices aligns with the broader exploration of botanical sources for therapeutic interventions.

Scientific research has delved into the multifaceted utility of Mimosa pudica, demonstrating its effectiveness across various diseases Azmi, 202. This body of work underscores the plant's significance within traditional medicine, portraying it as a valuable reservoir of medicinal compounds. The focus of the article on both the pharmacological and traditional attributes of Mimosa pudica seeks to provide a holistic understanding of its medicinal properties, contributing to the ongoing discourse on the integration of natural remedies into healthcare practices.

In this investigation, the chemical constituents of Mimosa tenuiflora and Mimosa pudica were scrutinized to gain insights into their potential pharmacological properties. Haddad et al. elucidated the condensed tannins in Mimosa tenuiflora, identifying procyanidin and prodelphinidins as active components. This analysis provides a foundational understanding of the molecular complexity underlying the therapeutic effects associated with Mimosa tenuiflora.

Oliveira et al. extended the chemical characterization by assessing total phenols (TP), total tannins (TT), and condensed tannins (CT) in different parts of Mimosa tenuiflora. The concentrations of these compounds in leaves and stems offer quantitative insights into the distribution of chemical constituents within the plant, potentially influencing its biological activities.

Racadio's study on Mimosa pudica focused on the ethanolic extract of its leaves, revealing the presence of alkaloids, flavonoids, saponins, and triterpenes. The absence of sterols and tannins refines our knowledge of the plant's chemical makeup and contributes to understanding its phytochemical profile.

Expanded the exploration of Mimosa pudica by conducting a comprehensive screening of

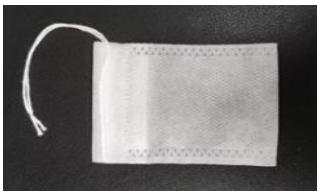
phytochemicals in the ethanolic extract of the entire plant. This research provides a broader perspective on the range of bioactive compounds present in Mimosa pudica, emphasizing its chemical richness and suggesting potential applications in traditional medicine.

3. METHODOLOGY

This chapter contains the study's methodology.

3.1. Materials

Table 1. Description and Uses of Materials Used in Tea Production

Name	Uses	Pictures
Makahiya (Mimosa Pudica)	The plant was used to manufacture a tea.	
Tea Bag	Used for the packaging of the tea.	

3.2. Product

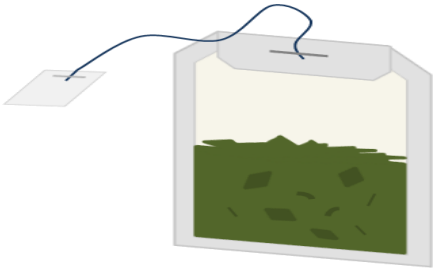


Figure 2. Diagrammatic Representation of the Herbal Tea Bag Product

3.3. Methods of Data Analysis

Descriptive and experimental methods of research were used in this study. It is descriptive because its main concern is to get a holistic view of the Makahiya tea that the researcher gave it to 45 women who experience dysmenorrhea and drink it to ease their dysmenorrhea discomfort. This study is also experimental because the makahiya leaves undergo phytochemical analysis to determine if it is safe to create tea from them. Additionally, this chapter will discuss the results of the phytochemical analysis of the makahiya leaves.

4. RESULTS AND DISCUSSION

The following data shows the results and discussions of the research. The results can be observed from the conclusions of related literature and will serve as great advantages for future research studies.

Table 2. Phytochemical Analysis

Parameter	Result
Volume of extract obtained	45mL
Alkaloids	-

Confirmatory Test (+) primary alkaloid (++) secondary alkaloid (+++) tertiary alkaloid	
Test for Quaternary Bases & Amine Oxide	+
Steroids Keller-Killiani Test: For 2- deoxysugars Lieburmann-Burchard Test: For Unsaturated Steroids	+
Flavonoids Bate-Smith & Metcalf Method: For Leucoanthocyanins	+
Saponins Froth Test Tannins Ferric Chloride Test *Brownish-green color indicates the presence of condensed tannins *Blue-black color indicates the presence of hydrolysable tannins	+ + (Brownish-green)

4.1. Discussion for Phytochemical Analysis

A thorough phytochemical analysis of Makahiya plant (Mimosa Pudica) revealed a convergence of similar bioactive compounds in this plant. The extracts contained common elements, including steroids, flavonoids, saponins and tannins.

The production of bioactive compounds aids in plants' defense against environmental stressors, both biotic and abiotic [15]. The Mimosa Pudica solely displayed steroids. Although some classes of steroids, like cardiac aglycones and alkamines, are only found in a limited number of plant families, it is becoming more and more clear that all plants contain steroids in some form and that they are critical cell constituents. Steroids are necessary for plant growth, reproduction, and responses to diverse abiotic and biotic stresses. The presence of steroids in the Mimosa Pudica helps regulate numerous processes, including the immune system, lowering inflammation, and blood pressure.

Furthermore, by acting as scavengers of newly produced reactive oxygen species (ROS), flavonoids can regulate the buildup of ROS. Because of their anti-inflammatory and antibacterial qualities, these antioxidant chemicals are very relevant to human health and play a significant role in plants' ability to withstand stress [16]. Furthermore, flavonoids protect your body from oxidative stress by scavenging free radicals and controlling cellular activity. Put another way, they shield your body from common pollutants and stresses and promote better bodily function. Strong antioxidants are also present in flavonoids. This unique chemical makeup contributes to our comprehension of this plan and has positive implications for upcoming medical and botanical study.

The phytochemical screening of the plant extract yielded positive with saponins. Saponins belong to a complex and chemically varied group of chemicals that get their name from the ability they must produce stable, soap-like foams in aqueous solutions. Clinical studies have suggested that these health-promoting components, saponins, affect the immune system in ways that help to protect the human body against cancers, and lower cholesterol levels. Additionally, the non-sugar portion of saponins has direct antioxidant action, which may have positive impacts on blood cholesterol levels and immune system stimulation. It can also be construed that it could be a potential source of medicine for cancer and heart ailments.

Tannins are natural products found in most higher plants. Due to their essential function in the plant's defense against insects, food diseases, fungi, or bacteria, they are produced in practically every part of the plant, including the seeds, roots, bark, wood, and leaves. Condensed tannins are extensively utilized in human nutrition (fruits, vegetables, tea, dates, etc.) as polyphenols or proanthocyanidins.

The presence of these phytochemicals in makahiya leaf extract is an indication that makahiya has curative effects and therefore can be used as alternative medicine.

Table 3. The Interpretation of the Data Gathered

Question	Yes	%	No	%	Total	%
1. Do you feel sleepy after drinking the makahiya tea?	41	91.1%	4	8.9%	45	100%
2. Do you feel better after drinking the Mimosa Pudica tea?	35	77.8%	10	22.2%	45	100%
3. Does Mimosa Pudica tea help you during your menstrual period?	44	97.8%	1	2.2%	45%	100%
4. Is the Makahiya tea effective in treating your menstrual cramps?	38	84.4%	7	15.6%	45	100%
5. Do you consider Makahiya tea as an effective alternative solution in treating menstrual pains?	23	51.1%	22	48.9%	45	100%
6. Do you feel any noticeable changes in your overall mood or comfort level after consuming the tea for easing dysmenorrhea?	34	75.6%	11	24.4%	45	100%
7. Is the taste and the aroma of the Makahiya tea, satisfies you?	43	95.6%	2	4.4%	45	100%
8. Is there any other alternative solution you know aside of Makahiya plant?	45	100%	0	0%	45	100%
9. Do you notice any changes in your body after drinking makahiya tea?	38	84.4%	7	15.6%	45	100%
10. Are you aware about menstrual cramps?	45	100%	0	0%	45	100%

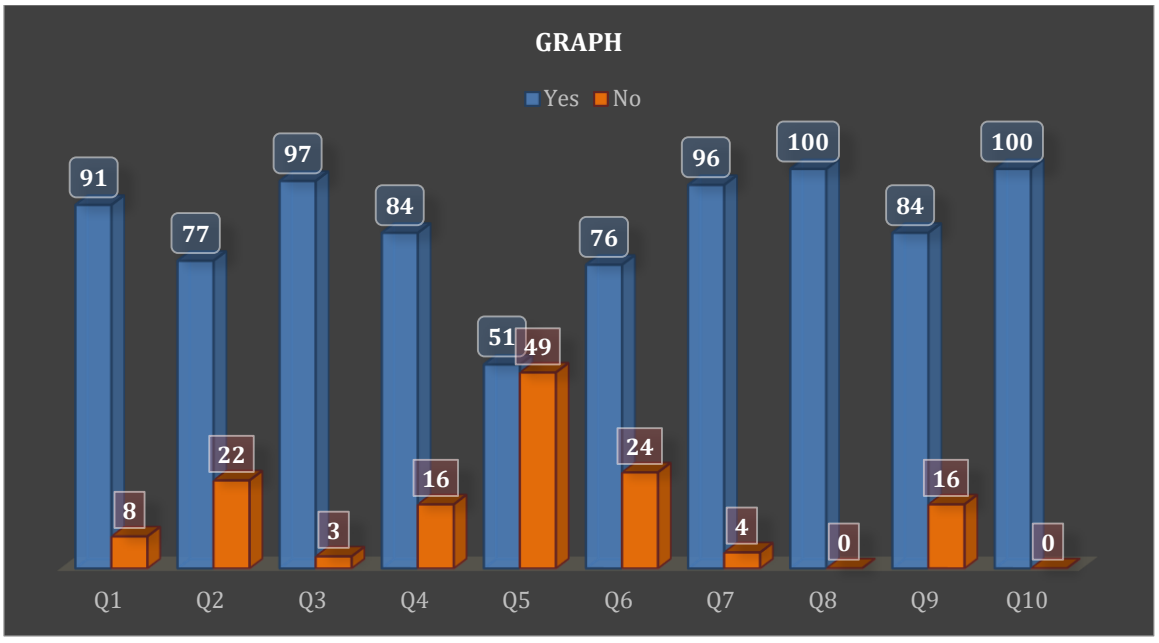


Figure 3. Distribution of Yes and No Responses across Survey Questions (Q1–Q10)

The findings showed a tendency by 45 respondents to use their knowledge and understanding about the Makahiya tea as a natural approach in easing dysmenorrhea through natural process of flouration. The findings also showed the benefits of Makahiya plant to women.

1. In the first question, 91.1% of 45 participants agreed that they feel sleepy after drinking the Makahiya tea and 8.09% of it disagreed.

2. 77.8% of 45 participants strongly agreed that they feel better after drinking the Mimosa Pudica tea and the rest 22.2% of participants disagreed with the question.
3. A total of 97.8% of the participants has agreed that Mimosa Pudica Tea helps them during their menstrual period and only 2.2% out of 45 participants disagree.
4. Out of 45 participants, 15.6% only of them disagree with the question while 84.4% of the participants has agreed that Makahiya tea is an effective solution in treating their menstrual cramps.
5. 51.1% of the participants agreed that they consider Makahiya tea as an effective alternative solution in treating dysmenorrhea and 48.9% of them disagree with this question.
6. 75.6% of 45 participants strongly agreed that they notice changes in their mood after consuming the tea and 24.4% of the participants don't feel any changes in their comfort level.
7. There are 45 participants but only 4.4% of them disagreed that they're not satisfied with the tast
8. and aroma of the Makahiya tea. 95.6% of the participants agreed with the question that is given. Vlll. All of the participants agreed that there are other alternative solutions aside from Makahiya tea in treating dysmenorrhea.
9. 84.4% of the participants has agreed that they notice changes in their body after drinking the said tea and only 15.6% of them disagreed.
10. All the participants agreed that they are aware about menstrual cramps.

5. CONCLUSION

This chapter presents the summary of findings, conclusions, and recommendations drawn by the researcher from the results obtained in this study.

5.1. Summary of Findings

The Mimosa Pudica or better known "Makahiya". Mimosa Pudica is a creeping flowering plant that can be seen beside the streets and has many uses especially in the field of medicine, also for easing dysmenorrhea. It is a Neotropical legume that responds to contact by instantly closing its leaves. Dysmenorrhea can be secondary, resulting from an underlying ailment, or primary, occurring from the start of periods and some of the symptoms of this are cramps or pain, low back pain, diarrhea, exhaustion, weakness, or headaches. The Dysmenorrhea is one of the painful menstrual cramp mostly all of the female. We come up of this study to point out the effectiveness of Mimosa Pudica as an alternative treatment against dysmenorrhea and this study including only for women from Bayugan City, Agusan del Sur who experience dysmenorrhea during their menstrual periods. The result of the research we conducted is majority of the participants' experience that the mimosa pudica tea is effective in easing dysmenorrhea.

5.2. Conclusions

In conclusion, the phytochemical analysis of Makahiya (Mimosa Pudica) has unveiled steroids, flavonoids, saponins, and tannins. These substances discovered during the phytochemical examination of makahiya leaf extract indicate that makahiya has therapeutic benefits and can be utilized as an alternative for conventional treatment. Based on the results carried out during the research, the researchers conclude that Mimosa Pudica (Makahiya) tea has shown promising results as an alternative treatment for dysmenorrhea.The high percentage of participants (84.4%) who strongly agreed that Makahiya tea is an effective solution in treating their menstrual cramps. Additionally, almost all (97.8%) participants agreed that Mimosa Pudica tea helped them during their menstrual period, indicating its effectiveness in managing menstrual symptoms. While a small percentage of participants disagreed with these statements, the overwhelming majority of respondents provided positive feedback about the usage of Mimosa Pudica tea as an alternative treatment for dysmenorrhea.

5.3. Recommendations

Increase the number of participants: Gathering more participants can be a good decision since you may gather more reliable and accurate results. Having many participants minimizes the possibility of

accidentally generating extreme or biased groups.

- **Use Another Method of Making Tea:** Consider finding a less time-consuming technique for preparing tea. To save time, it is preferable to use a food dehydrator while drying Mimosa Pudica leaves during the tea-making process.
- **Conduct A Focus Group Interview:** Conducting a solo interview might cause some inconvenience and prolonged data gathering. Performing a focus group interview can save time in getting the participants responses.

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Author Contributions Statement

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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Ritchelle Jean T. Salido		✓	✓		✓	✓		✓	✓		✓	✓		
Kristine Joy P. Dalogdog	✓	✓		✓	✓		✓	✓		✓	✓		✓	✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

Conflict of Interest Statement

The authors declare that there are no conflicts of interest regarding the publication of this paper.

Informed Consent

All participants were informed about the purpose of the study, and their voluntary consent was obtained prior to data collection.

Ethical Approval

Not Applicable.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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