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Traditional Phytoremedies Used by Traditional Healers of Sisaket and Ubon Ratchathani Provinces of Northeastern Thailand to Treat Menstrual Disorders

Suphannachat Nusawat, Kanjana Deelurd, Patthamawan Inthasoi, Pitchanan Thiantongin*

Faculty of Thai Traditional and Alternative Medicine, Ubon Ratchathani Rajabhat University, Mueang Ubon Ratchathani District, Ubon Ratchathani 34000, Thailand

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ABSTRACT

Nowadays, traditional medicine in women's care is still popular in many areas of Thailand including Sisaket and Ubon Ratchathani provinces. The purpose of this study was to investigate and record the unique indigenous knowledge about the use of herbal remedies to treat menstrual disorders from highly experienced traditional healers. Therefore, qualitative research approaches and semi-structured interviews were conducted in Sisaket and Ubon Ratchathani Provinces, northeastern Thailand. The key informants who have comprehensively experienced the treatment of these ailments were selected using a purposive sampling strategy. Twenty-three herbal remedies were recorded for treating postpartum disorders, menstrual cramps, sexually transmitted diseases, leukorrhea, fever (during the menstruation), hypermenorrhea, or consumed as blood tonics and for increasing lactation. Fifty-three different medicinal plant species, mostly belonging to the Fabaceae family (7 species), were used to treat women's reproductive condition. *Biancaea sappan* (L.) Tod. was documented with the highest use-value index (the UV= 0.875) which has also been used as a blood tonic in various traditional medicines. Interestingly, there were several remedies which have been employed to treat dysmenorrhea. Further pharmacological investigation of these herbal remedies and highlighted medicinal plants will provide alternative remedy for the management of women's reproductive conditions. This is the first finding of unique indigenous knowledge about the use of herbal remedies to treat menstrual disorders by traditional healers in the provinces of Sisaket and Ubon Ratchathani in northeastern Thailand, and it is important information for further utilization of medicinal plants.

***Keywords*:** Polyherbal medicines, Ethnobotanical, Menstrual disorders, Medicinal plants, northeastern Thailand

Introduction

Menstrual disorders such as oligomenorrhea, amenorrhea, and premenstrual syndrome (PMS) are very common among women of reproductive age. For example, oligomenorrhea occurs in approximately 10-15% of women of reproductive age, and the prevalence of secondary amenorrhea is reported to be 3-4%.[1-3] Despite being disruptive to women's daily activities, these symptoms are generally not perceived as major health concerns by global health organizations. However, several studies have shown that menstrual problems have a huge impact on women's quality of life, psychological stress, professional and social life, etc.[4,5] In low- and middle-income countries where the accessibility to sanitary facilities or analgesics is limited, these problems can be disruptive to performance patterns and daily routines. [1,6] In addition to hormone therapy which is well-known as the mainstay of the treatment for menstrual disorders, nonsteroidal anti-inflammatory drugs (NSAIDs) are also widely used. [7,8] The use of oral hormonal contraceptives can cause amenorrhea or mid-cycle breakthrough bleeding.[9] Furthermore, some adverse effects such as indigestion, headaches, and drowsiness have been reported from the use of NSAIDs for treating these symptoms.[7] Therefore, the number of women in Asia, Latin America, and Africa continue to rely on their traditional medicine for the management of menstrual disorders.[10-14]

According to the World Health Organization (WHO) definition, traditional medicine refers to the health knowledge, skills, and practices founded on the theories, beliefs, and experiences unique to diverse cultures. [15,16] In traditional medicine, herbal, animal, and mineral-based medicines, together with spiritual therapies and physical techniques and exercises, are used alone or in combination are employed to prevent, cure, diagnose, or prevent illnesses or maintain well-being. [16] Herbal remedies and folk healers are well-accepted as an integral aspect of rural life in many countries. Many medicinal plants and traditional knowledge have been utilized for treating reproductive health issues in Dominica[14], India[17], China[18], Iran[19], etc. Thailand has a long history of employing medicinal plants in traditional medicines, as have been reported earlier.[13,20] In the last decade, traditional medicine has become very popular in Thailand, partly due to a high level of support from the government and the establishment of their clinical studies and other scientific studies.[20] Even though herbal remedies and folk healers are well-accepted as an integral aspect of rural life in many parts of Thailand, there is a piece of limited information recorded. Despite the fact that the scientific information revealed the utilization of either polyherbal formulation or individual herbs in the treatment of several ailments,[21,22] only a few reports have focused on the use of Thai traditional medicine for reproductive and post-reproductive disorders.In order to fill gaps in

*Corresponding author. E mail: pla_pitcha@hotmail.co.th
Tel: +66-4535-2000/+66-87-4465416

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our knowledge of Thai traditional medicine, the current study aims to investigate and record the unique indigenous knowledge about the utilization of herbal medicines in the management of menstrual disorders from highly experienced traditional healers who live in Sisaket and Ubon Ratchathani Provinces, northeastern Thailand.

Materials and Methods

Description of the study area

The present study was for the first time carried out in 2 provinces, Sisaket and Ubon Ratchathani, which are located in the northeast of Thailand. Sisaket is geographically situated 120 meters above sea level, between 14 -15 North latitudes and 104-105 East longitudes in lower northeastern Thailand, consisting of 22 districts with an area of 8,839.976 km^2. It is bounded by Yasothon province and Roi Et province in the north, Cambodia in the south, Ubon Ratchathani province in the east, Surin in the west. The province had a GPP (the Gross Provincial Product) of 70,516 million baht (US$ 2,235,658.30) and a GPP per capita of 73,958 (US$2,345.04). Ubon Ratchathani is the 2nd largest province in the northeast of Thailand and is bounded by Yasothon province, Amnat Charoen province, and Laos in the north, Sisaket province, and Cambodia in the south, Laos in the east, Sisaket province, and Yasothon province in the west. Ubon Ratchathani had a GPP of 186,314 million baht (US$ 25,899,746.65) and the GPP per capita of 96,736 (US$3,063.20). Even though the accessibility of modern health care services in the area can be easily reached in these provinces, traditional healers continue to play an important role as health care providers in the rural area.

Informant selection techniques and ethics statement

This study adhered to the Ethical Standards of Ubon Ratchathani Rajabhat University (Project No. HE631019; 003/2564). The information and objective of the study were explained to the traditional healers, and written informed consent was obtained from all participants before the study. Furthermore, the agreement has been signed that all information obtained from this study was for the purpose of supplying the society with knowledge on the traditional medicine used and will not be employed for commercial purposes.

The informants who were being licensed and have been registered as traditional healers in the provinces with over 20 years of experience in treating diseases and have encountered at least 20 individuals with menstrual disorders in their care were chosen. Eight traditional healers who met the criteria have interviewed this study as key informants following a purposive sampling strategy. The data saturation was determined based on preferences of diagnostic procedures, causations, and medical applications for menstrual disorders.

Ethnobotanical data collection tools, identification, and preservation

During 2020-2021, an ethnobotanical survey was conducted in Sisaket and Ubon Ratchathani provinces to collect data and record traditional knowledge of folk remedies for the treatment of menstrual disorders from traditional healers, who were selected through purposive sampling. The study was conducted using qualitative research by in-depth interview, participation observation and semi-structured interviews which were modified from the Department of Thai Traditional and Alternative Medicine[23] and data was content-analyzed. The sociodemographic information was gathered, including name, gender, age, education level, and occupation. The questions about the origin of their traditional knowledge and their working status as traditional healers were then discussed. The details on the definition and explanation of menstrual disorders, i.e., the names and types, common symptoms, strategies for diagnosis, and causes according to the healer's experiences, were reviewed and recorded. A panel of questions on the management of this disease on treatment procedures was made, and details of each herbal remedy used were recorded.

Plant collection and taxonomic identification

Field trips with traditional healers were organized, and medicinal plants used in the preparation of mentioned herbal remedies were collected. Photographs and herbarium specimens of the plants were performed *in situ* and processed according to the plant taxonomic procedure. The specimens of plant species were identified and deposited at the herbarium of Faculty of Thai Traditional and Alternative Medicine (specimen number PS01-53), Ubon Ratchathani Rajabhat University. The Use Value (UV) of each medicinal plant was calculated using the following formula: $UVc = \Sigma U / ns$; where ΣU is the total number of use mentioned by all healers for a given species divided by the total number of informants (ns; ns = 8).

Statistical analysis

The data were analyzed using descriptive statistics (frequency and percentage).

Results and Discussion

Several ethnobotanical studies have highlighted the roles of traditional medicines and herbal remedies in the management of women's health, especially for menstrual disorders.[11,17-19] The knowledge, theories, or clinical studies in managing menstrual disorders using Ayurveda,[24] traditional Chinese medicine,[18] Japanese traditional herbal medicine,[25] Greco-Arabic medicine (Unani)[26] have been intensively reported. However, only information from *Mahaachortarat* scripture[13] and medicinal plants used for menstrual disorders from southern Thailand [21,22] have been documented in Thai traditional medicine. For the first time, the present study reports on causes and treatment procedures of menstrual disorders based on the theories of Thai traditional medicine conducted by traditional healers from northeastern Thailand.

Eight traditional practitioners who have had intensive experience in the treatment of menstrual disorders for more than 20 years were included as the key informants of this present work. As given in Table 1, all the traditional healers are Buddhists, males aged between 59 to 90 years. Five traditional practitioners were categorized in the age group of 71 to 80 years. These healers work as full-time farmers, and their education levels were at either primary or secondary school. The key source of their traditional medical knowledge for treating menstrual disorders was familial inheritance.

According to the information gathered from the healers, the model of illness of women's reproductive condition is based on the imbalance of the internal elements (*tart*; in Thai) theory which consists of earth, water, fire, and wind. For example, dysmenorrhea is defined as the imbalance of the fire. Menstruation is considered 'a hot property'; therefore, the introduction of excess 'cold conditions' such as consuming cold foods and beverages, living in cold places, etc., is believed to cause menstrual cramps. The dramatical reduction in the fire (*tart fai*; in Thai) due to the excess cold conditions reduce the flow of the wind (*tart lom*; in Thai) and subsequently affect the flow of the water (*tart narm*; in Thai), which is the menstrual blood;

Table 1: Sociodemographic profiles of traditional healers selected for this study (n = 8).

Parameters			Respondents	
			N	(%)
Gender (male)			7	87.5
Age (year)	59-70		2	25.0
	71-80		5	62.5
	81-90		1	12.5
Religion	Buddhism	8	100	
Occupation	Farmers		8	100
Education	Primary school	7	87.5	
	Secondary school		1	12.5
Original of traditional healing knowledge	Familial heritance	8	100	

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therefore, contractions in the uterus (*tart din*; in Thai) is believed to be increased for enhancing the flow of the menstrual blood.

Similar to previous ethnopharmacological studies in Dominica[27] and Argentina[28], menstruation is classified as a 'hot' condition that is directly affected by the introduction of 'cold' foods and beverages or the excess of 'hot' conditions. According to the beliefs of Thai traditional medicine, menstrual cramps (dysmenorrhea) are mainly caused by the introduction of excess 'cold conditions,' including consuming cold foods and beverages, living in cold places, etc. It seems that dysmenorrhea is the most common menstrual disorder which patients require the prescription of traditional medicine. This finding is comparable with several reports on the utilization of traditional medicine for treating dysmenorrhea in Ayurveda, traditional Chinese medicine, and traditional Korean medicine.[18,24-26] The benefits and adverse effects of traditional remedies are required before they could well be safely and effectively incorporated into conventional practice. Therefore, previous research concentrated on the efficacy and safety of several herbal remedies from different cultural backgrounds, such as Dangguijagyagsan,[29] Siwutang,[30] Ashokarista,[31] Prasaplai,[12] which have been utilized in Korean, Chinese, Indian, and Thai traditional medicines, respectively. However, it should be noted that none of the folk remedies in Thailand has been explored on their safety and effectiveness. Therefore, this present work has additionally recorded four herbal remedies used by traditional healers to treat dysmenorrhea and requires a panel of intensive studies to support their uses. Interestingly, a foundational blood tonic formula used in traditional Chinese medicine, Siwatang, has also produced a positive effect on dysmenorrhea.[18] There is a possibility that the two blood tonic remedies discovered in this study should be included in subsequent research for the management of dysmenorrhea. As indicated by the key informants, eight clinical symptoms were traditionally defined as menstrual disorders and described in Table 2**.** Five healers have prescribed six health-promoting herbal remedies for blood tonics and increasing breast milk supply. Furthermore, some remedies have been used for the treatment of postpartum disorders (n = 4), menstrual cramps (n = 4), sexually transmitted diseases (n = 3), leukorrhea (n = 3), fever (during the menstruation) (n = 2), and hypermenorrhea (n = 1).

The herbal medicines which the traditional healers used for treating menstrual disorders consisted of 23 different remedies comprising three single-ingredient recipes and 20 multi-ingredient recipes (Figure 1A). The polyherbal remedies could contain from 2 to 11 various ingredients. Fifty-three different medicinal plant species belonging to 36 families, alum and potassium nitrate, were used in the preparation of the herbal remedies. The major plant families (Figure 1B) were Fabaceae (7 species), Annonaceae (3 species) (Figure 1C), and Zingiberaceae (3 species). Of the 53 species recorded, 18 (34%) were categorized as trees, followed by shrubs and herbs (n = 12, 23%), and climbers (n =11, 21%). The main parts used for treating this disease recorded in this study were the underground plant parts (n = 16; 30%), followed by the whole plant (n = 10), wood (n = 9), and stem bark (n = 8), which accounted for 27% of the plant parts used (Figure 1D). From this result, traditional healers concerned about the extinction especially underground plant part, therefore these plant samples were collected with special techniques of the healer wisdom without causing extinction such as limiting the collection of each plant and planting in large numbers. As described in Table 3, the water decoction was the main preparation procedure recorded from 19 remedies (83%), and the oral administration route accounted for 87% of the formulations, whereas the remedies named CT-LK-1, BV-FM-4, and SJ-PD-1 were prepared as moxibustion, paste, ethanol extraction, respectively. Fifteen remedies (65%) were clearly suggested to consume for 3-7 consecutive days. Twelve herbal preparations were suggested to be taken three times a day, whereas 10 remedies were prescribed to be taken as needed. In this present study, the tastes of these medicinal plants were noted as bland and unpalatable flavor (Table 4), which accounted for 40% of recorded tastes, followed by bitter or astringent (n = 19; 36%) and pungent (n = 9; 17%). The use-value (UV) indexes of these medicinal plants were calculated and presented in Table 5. Based on the UVs, *Biancaea sappan* (L.) Tod. was found to have the highest UV index of 0.875 and has been used for treating menstrual cramps and postpartum disorders and consumed as blood tonics and enhancing breast milk supply. Seven remedies, including BV-MC-2, KR-BT-1, KR-MC-2, MS-PD-1, NA-BT-2, BV-IB-1, and PP-MC-1, were made using this herb. Moreover, *Dracaena cochinchinensis*, *Lysiphyllum strychnifolium*, and *Mansonia gagei* with the UVs of 0.5 has been cited in four remedies for treating menstrual disorders. At least 128 medicinal plant species have been used by women in the south and southeast Asia for treating painful menstruation. [14] Dysmenorrhea is caused by an increase in the production of prostaglandins, which trigger or intensify uterine contractions. Inhibiting key enzymes in the prostaglandin biosynthesis pathway may alleviate menstrual discomfort by preventing uterine contraction or relaxing its smooth muscles.[8] Therefore, several previous studies of medicinal plants have focused on their inhibitory effect on prostaglandins biosynthesis, which subsequently induces smooth muscle relaxation.

Table 2: Menstrual disorders and phytoremedies provided by the interviewed traditional healers

Characteristics of menstrual disorders	Phytoremedies*,**	Respondents N (%)
Puerperal (or postpartum) disorders	NA-PD-1, SJ-PD-1, JN-PD-1, MS-PD-1	4 (50)
Blood tonic	NA-BT-2, KR-BT-1	2 (25)
Increasing breast milk supply	NA-IB-3, SJ-IB-2, JN-IB-2, BV-IB-1	4 (50)
Sexually transmitted diseases	SJ-STD- 3, SJ-STD-4, SJ-STD-5	3 (37.5)
Menstrual cramps	JN-MC-3, KR-MC-2, PP-MC-1, BV-MC-2	4 (50)
Hypermenorrhea	JN-HM-4	1 (12.5)
Leukorrhea	JN-LK-5, MS-LK-2, CT-LK-1	3 (37.5)
Fever during menstruation	MS-FM-3, BV-FM-4	2 (25)

*** Characteristics of menstrual disorders**
PD = Puerperal (or postpartum) disorders BT = Blood tonic, IB = Increasing breast milk supply, STD = Sexually transmitted disease, MC = Menstrual cramps, HM = Hypermenorrhea, LK = Leukorrhea, FM = Fever during menstruation
*** * Name of traditional healers**
NA = Nu Aumporn, SJ = Sian Jannawong, JN = Jareunkaew Nilaphat, MS = Mungkorn Sainchat, KR = Kampun Rangngein, BV = Boonrod Vongsalurd, PP = Prasert Pumesing, CT = Chonthicha Thangchob

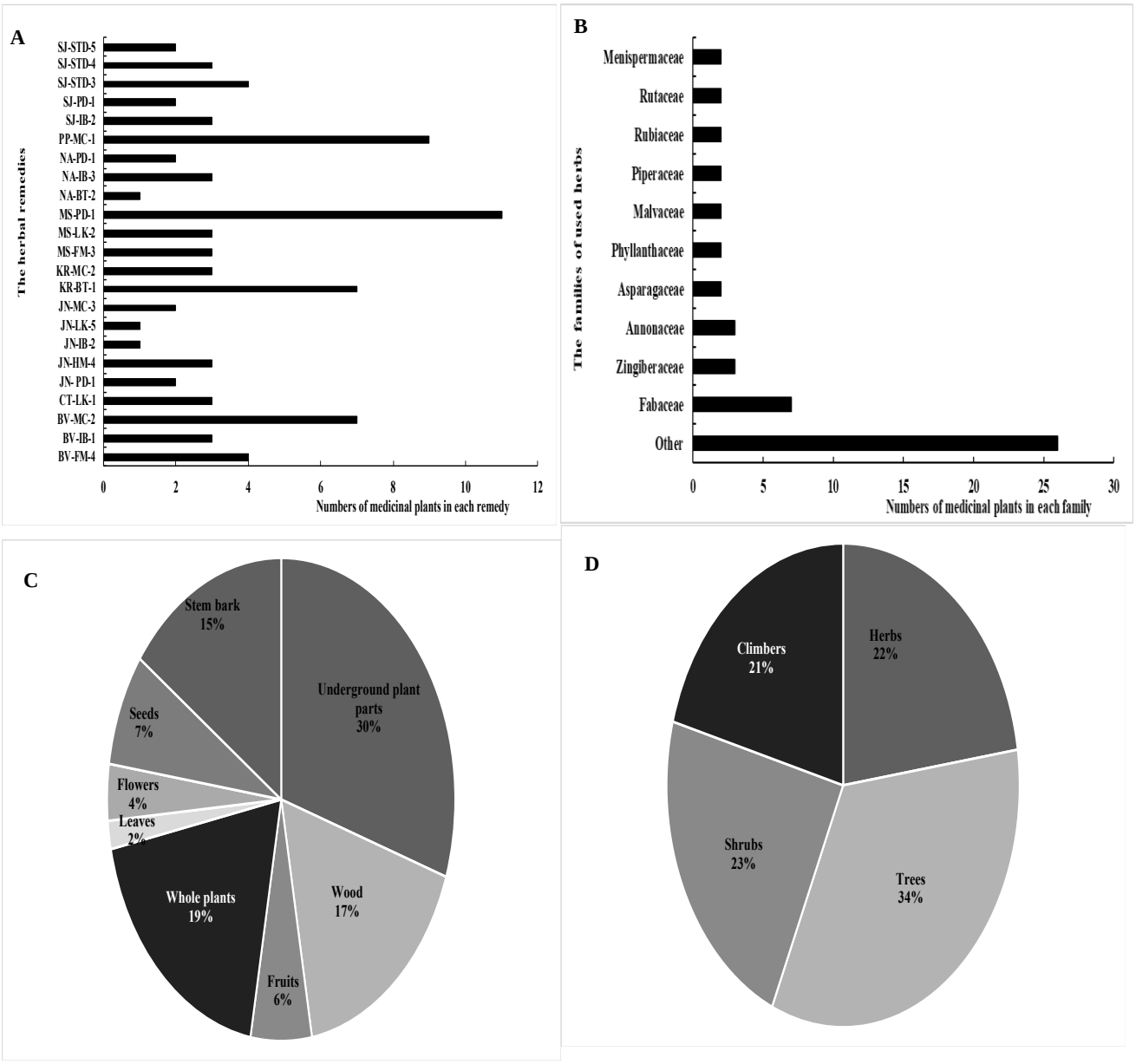

Figure 1: Twenty-three herbal-based formulations collected from eight interviewed traditional healers. The number (n= 53) of medicinal plants used in the preparation of each remedy (A), plant families (B), plant habits (C), and plant parts used (D) were described.

This hypothesis has been proven clinically for *Z. officinale* [34] and Prasaplai, [12] a Thai traditional remedy which consists of *Z. officinale*, *Citrus hystrix*, *Acorus calamus*, *Allium sativum*, *Eleutherine americana* Merr., *Piper nigrum*, *Piper retrofractum*, *Curcuma zedoaria*, and *Nigella sativa*, and sodium chloride and camphor which have been shown to possess the positive effects in the management of dysmenorrhea. It should be noted that *Z. officinale* is also a medicinal component of PP-MC-1, a polyherbal remedy documented for treating dysmenorrhea in this present work.

According to the use-value index, the most citation of medicinal plants recorded in this study was found to be *Biancaea sappan*, followed by *Dracaena cochinchinensis*, *Lysiphyllum strychnifolium*, and *Mansonia gagei*. *B. sappan* is an herbal component of BC-MC-2, JN-MC-3, KR-MC-2, and PP-MC-1, which prescribe for the management of painful menstruation. *B. sappan* methanol extract and isolated compounds, brazilin and hematoxylin, possessed relaxant effects on an isolated rat thoracic aorta. [40] A recent review has additionally speculated that the vasorelaxant effect observed from brazilin, an active constituent of *B. sappan*, possibly through inhibition of prostaglandin synthesis. [41] Furthermore, in this investigation, *B. sappan*, which was given as a blood tonic, was used in numerous traditional medical systems. [40-42] Even though *D. cochinchinensis*, *L. strychnifolium*, and *M. gagei* were documented as herbal constituents of BV-MC-2, a remedy for menstrual cramps, and their relaxant effects haven't been tested. The efficacy in the treatment of dysmenorrhea of some medicinal plants such as *Citrus× aurantifolia (Christm.)* *Ocimum gratissimum*, *Zingiber officinale*, *Matricaria recutita* (Chamomile), *Rosmarinus officinalis* (Rosemary), and *Psidium guajava* [32-37] was speculated due to their smooth muscle relaxing properties. The essential oils obtained from *C. aurantifolia*, and *O. gratissimum* were proved to inhibit the spontaneous contractions of rabbit jejunum muscle [38] and guinea pig ileum. [39]

Table 3: Preparation methods and herbal constituents of traditional remedies used in the management of menstrual disorders

Remedy	Preparation procedures	Herbal components
BV-FM-4	Squeezed with water, give to drink (p.r.n.*) for 3 days a.c.**	*Dracaena cochinchinensis* (Lour.) S.C.Chen, *Streblus asper* Lour., *Tarenna hoaensis* Pit., *Mansonia gagei* J.R.Drumm. ex Prain
BV-IB-1	Decoction, give to drink (p.r.n.) for 3 days p.c.***	*Biancaea sappan* (L.) Tod. *Xantolis cambodiana* (Pierre ex Dubarb) P.Royen, *Piper nigrum* L.
BV-MC-2	Decoction, give to drink (t.i.d.) for 3 days	*Dracaena cochinchinensis* (Lour.) S.C.Chen, *Biancaea sappan* (L.) Tod., *Tiliacora triandra* (Colebr.) Diels, *Lysiphyllum strychnifolium* (Craib) A. Schmitz, *Piper retrofractum* Vahl., *Mansonia gagei* J.R.Drumm. ex Prain, *Eurycoma longifolia* Jack.
CT-LK-1	Moxibustion, 5 minutes for 3 days p.c.	*Nigella sativa* L., *Cinnamomum verum* J. Presl, *Curcuma longa* L.
JN- PD-1	Decoction, give to drink (t.i.d.****)	*Mammea siamensis* (Miq.) T. Anderson, *Thunbergia laurifolia* Lindl.
JN-HM-4	Decoction, give to drink (t.i.d.) for 3 days a.c.	*Combretum quadrangulare* Kurz, *Senegalia rugata* (Lam.) Britton & Rose, *Imperata cylindrica* (L.) Raeusch.
JN-IB-2	Decoction, give to drink (t.i.d.) for 7 days	*Scleropyrum pentandrum* (Dennst.) Mabb.
JN-LK-5	Decoction, give to drink (t.i.d.)	*Dipterocarpus intricatus* Dyer
JN-MC-3	Decoction, give to drink (t.i.d.) for 3 days a.c.	*Mimosa pudica* L., *Dalbergia cochinchinensis* Pierre.
KR-BT-1	Decoction, give to drink (p.r.n.) for 7 days p.c.	*Canarium subulatum* Guillaumin, *Biancaea sappan* (L.) Tod., *Sophora tomentosa* L., *Lysiphyllum strychnifolium* (Craib) A. Schmitz, *Paederia linearis* Hook.f., *Ziziphus oenoplia* (L.) Mill., *Antidesma ghaesembilla* Gaertn.
KR-MC-2	Decoction, give to drink (p.r.n.) for 7 days p.c.	*Cissampelos pareira* L. var.hirsuta (Buch. ex DC.) Forman., *Biancaea sappan* (L.) Tod., *Xantolis cambodiana* (Pierre ex Dubarb) P.Royen
MS-FM-3	Decoction, give to drink (t.i.d.) a.c.	*Dracaena cochinchinensis* (Lour.) S.C.Chen, *Tarenna hoaensis* Pit., *Mansonia gagei* J.R. Drumm. ex Prain
MS-LK-2	Decoction, give to drink (t.i.d.) a.c.	*Asparagus racemosus* Willd., *Ananas comosus* (L.) Merr., *Hymenocardia punctata* Wall. ex Lindl.
MS-PD-1	Decoction, give to drink (t.i.d.) for 3 days a.c.	*Dracaena cochinchinensis* (Lour.) S.C.Chen, *Cyanthillium cinereum* (L.) H.Rob., *Biancaea sappan* (L.) Tod. *Cissampelos pareir*a L. var.hirsuta (Buch. ex DC.) Forman., *Tiliacora triandra* (Colebr.) Diels, *Streblus asper* Lour., *Osbeckia stellata* Buch.-Ham. ex Ker Gawl., *Rhodomyrtus tomentosa* (Aiton) Hassk., *Lysiphyllum strychnifolium* (Craib) A. Schmitz, *Mansonia gagei* J.R.Drumm. ex Prain, *Eurycoma longifolia* Jack.
NA-BT-2	Decoction, give to drink (p.r.n.) for 7 days	*Biancaea sappan* (L.) Tod.
NA-IB-3	Decoction, give to drink (p.r.n.) for 3 days	*Uvaria siamensis* (Scheff.) L.L.Zhou, Y.C.F.Su & R.M.K.Saunders, *Hydnocarpus castaneus* Hook.f. & Thomson, *Polyalthia evecta* (Pierre) Finet & Gagnep.
NA-PD-1	Decoction, give to drink (t.i.d.)	*Thunbergia laurifolia* Lindl., *Lysiphyllum strychnifolium* (Craib) A. Schmitz
PP-MC-1	Prepared as a bolus, given (t.i.d.) for 3 days a.c.	*Allium sativum* L., *Biancaea sappan* (L.) Tod., *Pueraria candollei* Graham ex Benth. var mirifica (Airy Shaw et Suvat.) Niyomdham., *Zingiber officinale* Roscoe, *Cinnamomum verum* J. Presl, *Piper nigrum* L., *Piper retrofractum* Vahl., *Zingiber montanum* (J.Koenig) Link ex A. Dietr, *Citrus hystrix* DC.
SJ-IB-2	Decoction, give to drink (p.r.n.) for 7 days	*Uvaria argentea* Blume, *Hymenocardia punctata* Wall. ex Lindl., *Coriandrum sativum* L.
SJ-PD-1	Ethanol extract, give to drink (t.i.d.)	*Scindapsus officinalis* Schott, *Citrus aurantifolia* (Christm.) Swingle
SJ-STD-3	Decoction, give to drink (p.r.n.) for 7 days	*Pandanus tectorius* Parkinson ex Du Roi, *Magnolia champaca* (L.) Baill. Ex Pierre var., *Ananas comosus* (L.) Merr., *Gossypium herbaceum* L.
SJ-STD-4	Decoction, give to drink (p.r.n.) for 7 days	*Achyranthes aspera* L., *Pandanus tectorius* Parkinson ex Du Roi, *Borassus flabellifer* L.
SJ-STD-5	Decoction, give to drink (p.r.n.) for 7 days	*Elaeocarpus hygrophilus* Kurz, *Ziziphus oenoplia* (L.) Mill.

*p.r.n. = pro re nata
**a.c. = ante cibum
***p.c. = post cibum
****t.i.d. = ter in die

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Table 4: Taste of herbal components used for the preparation of 23 herbal-based remedies

Scientific names	Families	Taste of the medicinal plants
Achyranthes aspera L.	Amaranthaceae	bitter
Allium sativum L.	Amaryllidaceae	pungent
Ananas comosus (L.) Merr.	Bromeliaceae	sweet
Antidesma ghaesembilla Gaertn.	Phyllanthaceae	bland
Asparagus racemosus Willd.	Asparagaceae	bland-cold
Biancaea sappan (L.) Tod.	Fabaceae	bitter-sweet
Borassus flabellifer L.	Arecaceae	bitter-cold
Canarium subulatum Guillaumin	Burseraceae	unpalatable flavor
Cinnamomum verum J. Presl	Lauraceae	pungent
Cissampelos pareira L. var.hirsuta	Menispermaceae	bland-cold with aroma
Citrus× aurantifolia (Christm.) Swingle.	Rutaceae	sour
Citrus hystrix DC.	Rutaceae	pungent
Combretum quadrangulare Kurz	Combretaceae	bitter
Coriandrum sativum L.	Apiaceae	bland-cold with aroma
Curcuma longa L.	Zingiberaceae	bitter, unpalatable flavor
Cyanthillium cinereum (L.) H.Rob.	Asteraceae	unpalatable flavor-cold
Dalbergia cochinchinensis Pierre.	Fabaceae	bland, unpalatable flavor
Dipterocarpus intricatus Dyer	Dipterocarpaceae	astringent, bitter
Dracaena cochinchinensis (Lour.) S.C.Chen	Asparagaceae	bitter, cold
Elaeocarpus hygrophilus Kurz	Elaeocarpaceae	unpalatable flavor
Eurycoma longifolia Jack.	Simaroubaceae	bitter
Gossypium herbaceum L.	Malvaceae	pungent
Hydnocarpus castaneus Hook.f. & Thomson	Achariaceae	astringent
Hymenocardia punctata Wall. ex Lindl.	Phyllanthaceae	unpalatable flavor
Imperata cylindrica (L.) Raeusch.	Poaceae	sweet
Lysiphyllum strychnifolium	Fabaceae	bland-cold
Magnolia champaca (L.) Baill. Ex Pierre var	Magnolidaceae	bitter, unpalatable flavor
Mammea siamensis (Miq.) T. Anderson	Calophyllaceae	bland-cold
Mansonia gagei J.R.Drumm. ex Prain	Malvaceae	bitter
Mimosa pudica L.	Fabaceae	bland, unpalatable flavor
Nigella sativa L.	Ranunculaceae	pungent
Osbeckia stellata Buch.-Ham. ex Ker Gawl.	Melastomataceae	bitter
Paederia linearis Hook.f.	Rubiaceae	bitter
Pandanus tectorius Parkinson ex Du Roi	Pandanaceae	bitter
Piper nigrum L.	Piperaceae	pungent
Piper retrofractum Vahl.	Piperaceae	pungent
Polyalthia evecta (Pierre) Finet & Gagnep.	Annonaceae	unpalatable flavor-cold
Pueraria mirifica Airy Shaw & Suvat.	Fabaceae	unpalatable flavor-cold
Rhodomyrtus tomentosa (Aiton) Hassk.	Myrtaceae	bitter
Senegalia rugata (Lam.) Britton & Rose	Fabaceae	sour
Scindapsus scortechinii Hook.f.	Araceae	unpalatable flavor
Scleropyrum pentandrum (Dennst.) Mabb.	Santalaceae	astringent
Sophora tomentosa L.	Fabaceae	bland-cold
Streblus asper Lour.	Moraceae	astringent
Tarenna hoaensis Pit.	Rubiaceae	bitter

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Thunbergia laurifolia Lindl.	Acanthaceae	bland-cold
Tiliacora triandra (Colebr.) Diels	Menispermaceae	bland, bitter
Uvaria argentea Blume	Annonaceae	unpalatable flavor-cold
Uvaria siamensis (Scheff.) L.L.Zhou, Y.C.F.Su & R.M.K.Saunders	Annonaceae	unpalatable flavor-cold
Xantolis cambodiana (Pierre ex Dubarb) P.Royen	Sapotaceae	astringent, unpalatable flavor
Zingiber montanum (J.Koenig) Link ex A. Dietr	Zingiberaceae	pungent
Zingiber officinale Roscoe	Zingiberaceae	pungent
Ziziphus oenopolia (L.) Mill.	Rhamnaceae	bland, unpalatable flavor-cold

Table 5: Use-value (UV) index and parts used of medicinal plants employed for herbal-based remedies

Scientific names	**UV values/Parts used**	**Compositions of the remedy named**
Achyranthes aspera L.	0.125/Whole plants	SJ-STD-4
Allium sativum L.	0.125/Underground plant parts	PP-MC-1
Ananas cokmosus (L.) Merr.	0.25/Underground plant parts	SJ-STD-3, MS-LK-2
Antidesma ghaesembilla Gaertn.	0.125/Underground plant parts	KR-BT-1
Asparagus racemosus Willd.	0.125/Underground plant parts	MS-LK-2
Borassus flabellifer L.	0.125/Underground plant parts	SJ-STD-4
Biancaea sappan (L.) Tod.	0.875/Wood	BV-MC-2, KR-BT-1, KR-MC-2, MS- PD-1, NA-BT-2, BV-IB-1,PP-MC-1
Canarium subulatum Guillaumin	0.125/Wood	KR-BT-1
Cinnamomum verum J. Presl	0.25/Bark	CT-LK-1, PP-MC-1
Cissampelos pareira L. var. *hirsuta* (Buch. ex DC.) Forman	0.25/Underground plant parts	KR-MC-2, MS-PD-1
Citrus× aurantifolia (Christm.) Swingle.	0.125/Seed	SJ-PD-1
Citrus hystrix DC.	0.125/Fruits	PP-MC-1
Combretum quadrangulare Kurz	0.125/Bark	JN-HM-4
Coriandrum sativum L.	0.125/Underground plant parts	SJ-IB-2
Curcuma longa L.	0.125/Underground plant parts	CT-LK-1
Cyanthillium cinereum (L.) H.Rob.	0.125/Whole plants	MS-PD-1
Dalbergia cochinchinensis Pierre.	0.125/Bark	JN-MC-3
Dipterocarpus intricatus Dyer	0.125/Bark	JN-LK-5
Dracaena cochinchinensis (Lour.) S.C.Chen	0.5/Wood	BV-FM-4,BV-MC-2, MS-FM-3, MS-PD-1
Elaeocarpus hygrophilus Kurz	0.125/Bark	SJ-STD-5
Eurycoma longifolia Jack.	0.25/Underground plant parts	BV-MC-2, MS-PD-1
Gossypium herbaceum L.	0.125/Seed	SJ-STD-3
Hydnocarpus castaneus Hook.f. & Thomson	0.125/Wood	NA-IB-3
Hymenocardia punctata Wall. ex Lindl.	0.25/Wood	SJ-IB-2, MS-LK-2
Imperata cylindrica (L.) Raeusch.	0.125/Underground plant parts	JN-HM-4
Lysiphyllum strychnifolium (Craib) A. Schmitz	0.5/Whole plants	MS-PD-1, BV-MC-2, KR-BT-1, NA-PD-1
Magnolia champaca (L.) Baill. Ex Pierre var.	0.125/Wood	SJ-STD-3
Mammea siamensis (Miq.) T. Anderson	0.125/Flowers	JN- PD-1
Mansonia gagei J.R. Drumm. ex Prain	0.5/Wood	MS-PD-1, BV-FM-4, BV-MC-2, MS-FM-3
Mimosa pudica L.	0.125/Whole plants	JN-MC-3
Nigella sativa L.	0.125/Seed	CT-LK-1
Osbeckia stellata Buch. Ham. ex Ker Gawl.	0.125/Underground plant parts	MS-PD-1
Paederia linearis Hook.f.	0.125/Whole plants	KR-BT-1
Pandanus tectorius Parkinson ex Du Roi	0.25/Flowers	SJ-STD-4, SJ-STD-3

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Piper nigrum L.	0.25/Seed	BV-IB-1, PP-MC-1
Piper retrofractum Vahl.	0.25/Fruits	BV-MC-2, PP-MC-1
Polyalthia evecta (Pierre) Finet & Gagnep.	0.125/ Underground plant parts	NA-IB-3
Pueraria mirifica Airy Shaw & Suvat	0.125/ Underground plant parts	PP-MC-1
Rhodomyrtus tomentosa (Aiton) Hassk.	0.125/Whole plants	MS-PD-1
Senegalia rugata (Lam.) Britton & Rose	0.125/Leaves	JN-HM-4
Scindapsus officinalis Schott	0.125/Whole plants	SJ-PD-1
Scleropyrum pentandrum (Dennst.) Mabb.	0.125/Wood	JN-IB-2
Sophora tomentosa L.	0.125/Fruits	KR-BT-1
Streblus asper Lour.	0.25/Bark	MS-PD-1, BV-FM-4
Tarenna hoaensis Pit.	0.25/Wood	BV-FM-4, MS-FM-3
Thunbergia laurifolia Lindl.	0.25/Whole plants	JN- PD-1, NA-PD-1
Tiliacora triandra (Colebr.) Diels	0.25/Whole plants	BV-MC-2, MS-PD-1
Uvaria argentea Blume	0.125/Whole plants	SJ-IB-2
Uvaria siamensis (Scheff.) L.L. Zhou, Y.C.F.Su & R.M.K.Saunders	0.125/Underground plant parts	NA-IB-3
Xantolis cambodiana (Pierre ex Dubarb) P.Royen	0.25/Bark	KR-MC-2, BV-IB-1
Zingiber montanum (J.Koenig) Link ex A. Dietr	0.125/Underground plant parts	PP-MC-1
Zingiber officinale Roscoe	0.125/Underground plant parts	PP-MC-1
Ziziphus oenopolia (L.) Mill.	0.25/Bark	KR-BT-1, SJ-STD-5

Conclusion

In summary, traditional healers living in Sisaket and Ubon Ratchathani have rich knowledge of using herbal remedies to treat menstrual disorders, particularly dysmenorrhea, fever during menstruation hypermenorrhea, and other female reproductive system conditions such as leukorrhea, sexually transmitted diseases, and postpartum disorders. In addition, health-promoting herbal remedies for blood tonics and increasing breast milk supply were gathered from five healers. There is scientific information indicating that some medicinal plants could be used to treat dysmenorrhea, but the recorded remedies haven't been clinically tested. There appears to be a need for continued activity to assess the pharmacological qualities, benefits, and hazards of these traditional therapies used to treat these ailments.

Conflict of Interest

Authors declare no conflict of interest.

Authors' Declaration

The authors hereby declare that the work presented in this article is original and that any liability for claims relating to the content of this article will be borne by them.

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