

PHYTORESTORATIVES AGAINST IRREGULAR MENSTRUAL CYCLE AND PAINFUL MENSTRUATION IN BARPETA DISTRICT OF ASSAM (INDIA)

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Abstract:

*A total of 42 plant species belonging to 25 families have been recorded which are found to be used against two important gynecological disorders including irregular menstrual cycle and painful menstruation period. Most of the herbal recipes to treat the gynecological disorders were found to be prepared by the plants belonging to the family Combretaceae, Apiaceae, Phyllanthaceae, Fabaceae and Malvaceae growing in Barpeta district of Assam. Regarding plant parts used, leaves, bark and roots were found to be used in majority of the herbal preparations. Present investigation records for the first time that *Diplazium esculentum*, *Nymphaea rubra* and *Christella parasitica* are used by the local people against the above mentioned gynecological disorders.*

Key words: *Irregular menstrual cycle, painful menstruation, Barpeta, herbal recipes, Assam.*

Introduction:

For many centuries, plants have been the primary source of medicine. The ancient record evidencing their use by Indian, Chinese, Egyptian, Greek, Roman and Syrian dates back to about 5000 years (Rabe and Staden 1997). Having reached its zenith in chemical medicine, the world is now looking back towards the herbal medicine or phytomedicine that can repair and strengthen the body without many side-effects. This has developed renewed interest in the large amount of undocumented knowledge of the tribes regarding phytomedicines. In India, it is reported that traditional healers use 2500 plant species and 100 species of plants serve as regular source of medicine (Pie 2001).

There are about 400 families in the world of flowering plants; at least 315 are represented in India (Sharma 2003). Indian subcontinent is a vast repository of medicinal plants that are used in traditional medical treatments, and a rich source of knowledge. The various indigenous systems such as Siddha, Ayurveda, Unani and Homeopathy use several plant species to treat different ailments. Over 80,000 species of plants are in use throughout the world. In India around

20,000 medicinal plant species have been recorded. More than 500 traditional communities use about 800 plant species for curing different diseases (Verma & Singh 2008).

Assam, Arunachal Pradesh, Meghalaya, Manipur, Nagaland, Mizoram, Tripura and Sikkim collectively constitute the North-East of the country. This relatively cut-off section from the Indian subcontinent has been able to preserve its natural systems of medicine because of limited exposure to the west side. The invaluable richness of nature's bounty makes North East and specially Assam a unique land, not only in the country but also in the entire world. Assam has distinct and varied features relating to its location, climate, geology, soil and topography. The multiple effects of these rather unique regimes of physical geography exert an enriching influence on its vegetation and other life forms that are the quintessential components of the complex ecosystems of the state.

Located between latitude $24^{\circ}3'N$ and $27^{\circ}58' N$ and between longitude $89^{\circ}5'E$ and $96^{\circ}1'E$ at the foothills of the Himalayas and with two mighty rivers, the Brahmaputra and the Barak along with their tributaries flowing through it, Assam enjoys great strategic significance. Ecologically, the state is well known for its rich and unique biodiversity. Assam, along with the other state of North-East belongs to one of the 12 mega biodiversity hotspots identified worldwide in recent times. Rugged hills, expansive valleys and large rivers constitute the varied spectrum of surface features of Assam. Heavily influenced by the monsoons, Assam's climate is of tropical nature with high summer rainfall (averaging 350 cm. during the monsoon months), high humidity of 80-90% and moderate temperature with a maximum average of $36^{\circ}C$ in summer and a minimum of $5^{\circ}C$ in winter (Buragohain 2009).

Most of the districts of Assam are greatly endowed with rich and luxuriant vegetation. Barpeta like most districts of Assam is a part rich in natural flora and ethno-medicinal plants. In ancient times, Barpeta was part of Kamapitha division of Kamarupa. In colonial and post-colonial times, it became a part of Kamrup district till 1983, when new district of Barpeta was carved out. Barpeta is situated in between $26^{\circ} S' N$ to $26^{\circ} N$ latitude and $90^{\circ} 39' East$ to $91^{\circ}17' Elongitude$ occupying an area of 3245 Sq. Km. It has an average elevation of 35 metres (114 feet). It is 44 Km away from Manas National park. Three rivers-Chaulkhowa, Mora Nodi (Dead river) and Nakhanda, which are tributaries to Brahmaputra run through the district. Barpeta district enjoys tropical monsoon climate having two distinct seasons, viz. Summer and Winter (Bora and Bhattacharjya 2009).

India is home of large number of rural population. These rural people have peculiar characteristics that not only make them geographically distinct but also exhibit unique customs, traditions, beliefs and practices. Even within particular community, differences in dialect, health practices, unique customs, values and traditions are apparent (www.everyculture.com).

The rural life is full of miseries in India. Besides extreme poverty and dismal living conditions, they face poor health conditions and suffer from various diseases. Some medical conditions are more open and thus can be treated easily but when the problems concern female reproductive health, things do not come out easily. The women lead the most oppressed life and their problems are never given heed. In such cases, reproductive health is extremely poor and

women suffer in silence. According to Government of India, maternal mortality ratio is higher in rural areas compared to other population. 50% of rural women are anemic, 75% of rural women suffer from variety of gynecological sickness which affect quality of life (www.delhi.gov.in)

Unfortunately, there is not much health-care facility in the study area Barpeta, which can provide quality and affordable health services for different gynecological diseases. Women usually do not consult physician or gynecologists due to inhibition or due to lack of perception of causes of diseases and their only contact with the health care system is through the local witch doctors or *Vaids* (Singh and Bhattacharjya, 2014).

There is general agreement that the health status of rural population in India is very poor and has distinct problems because of isolated areas where modern health care facilities are not available. These groups of people may be uniformed or unresponsive to the gynecological problems as compared to urban population. Therefore, there is an urgent need to investigate and explore whether or not rural communities are more vulnerable to gynecological problems as opposed to urban women. By improving women's health, there will be long-term impact on their families and communities. Women's health is an already recognized millennium development goal. Improving women's health will improve economic condition of their families. According to WHO, maternal health is highly correlated with child health (www.who.int/maternal_health/en/); therefore, improving maternal health through better treatment of gynecological problems will improve children's health. But the fact remains that the health services in India are really scarce and reaching out to remote rural locations seems to be a distant goal. A practical solution to this problem would be through the development of our indigenous knowledge of medicine and modern research on it to increase the efficacy of drugs (Bhattacharjya and Borah 2006; Bhattacharjya *et al* 2008).

In view of the above, the present paper emphasizes in studying two serious gynecological problems out of few others of rural women in Barpeta and attempts to record the herbal medicines that are used by the *Vaids* in treating these problems.

A survey of literature on works done in this field (Jain *et al* 1997, Borthakur *et al*, 1976,1986, 1996,2004, Sarma *et al*, 2001, 2002, 2006; Nadkarini 2001, Kar and Bhattacharjya, 2008; Verma *et al*, 2008, Das *et al*, 2009; Sahu 2011, Paduranga *et al* 2011) reveals that so far as the irregular menstruation cycle and painful menstruation period are concerned no significant study has been accomplished hitherto in Barpeta district of Assam. Thus the present communication is an attempt to record the herbal remedies against the two gynecological disorders.

The menstruation period:

A normal period: A woman gets her period for three to seven days once a month. After menstruating for several years, women tend to settle into a cycle; some women can even predict down to the hour when their periods will come. The amount of bloodshed during a period varies from woman to woman. Some women routinely have heavier periods losing up to 12 teaspoons of blood each month while others may experience a period that's almost non-existent losing as little as four teaspoon of blood.

An irregular period: An irregular period is usually defined as any type of bleeding that is abnormal when compared to the last few menstrual cycles. It can include everything from a late period to early bleeding and scarce bleeding to extremely heavy bleeding. One can also consider a period irregular if she experiences heavy cramping and bloating or headaches. Every woman may experience an irregular period from time to time due to some probable factors including pregnancy, stress, diet, exercise, birth control pills, drinking too much alcohol, polycystic ovary syndrome, menopause, taking medications etc.

Pain during menstrual periods (Dysmenorrhea): Women experience monthly occurrence of menstruation. During menstruation period, mild pain, cramping and discomfort together with abnormal bleeding may occur. But sometime women feel pain that makes it difficult to perform normal household. Painful menstrual periods are periods in which woman has crampy lower abdominal pain, sharp or aching pain that appears and disappears and sometimes with back pain. Dysmenorrhea may be Primary or secondary.

Primary dysmenorrhea occurs around the time that menstrual periods first begin in otherwise healthy young women. Increased activity of the hormone prostaglandin produced by the uterus may cause this condition.

Secondary dysmenorrhea may occur due to problems in the uterus or other pelvic organs such as – endometriosis, fibroids, intrauterine device (IUD) made of copper, premenstrual syndrome (PMS), sexual transmitted infection, stress and anxiety.

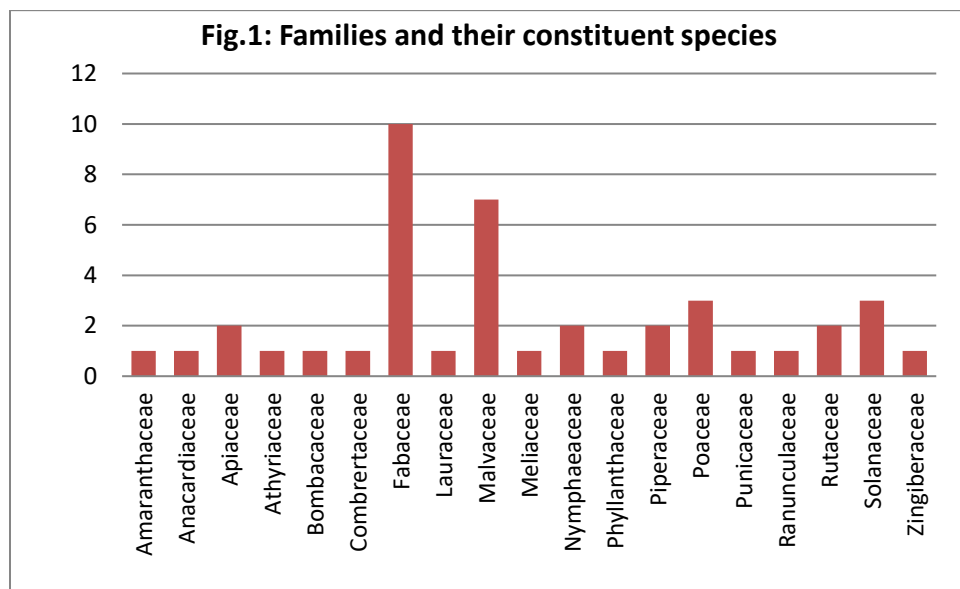
Methodology:

Ethnobotanical surveys were undertaken for more than one year in 24 interior rural pockets of Barpeta district. Surveys covered almost all the seasons of year and herbaria were prepared using the methodology of Jain and Rao (1969). While collecting information on ethno-medico-botanical aspects, standard approaches and methodologies have been followed. During oral interviews with local healers or *Vaids*, specific questions were asked according to the prepared questionnaires and the information supplied by the informant was recorded. The knowledgeable informants were taken to the field for the collection of plants for voucher specimens. At the time of collection, the use of each plant was noted down carefully by consulting the rural informants. Discussions were made at times with local healers or *Vaids* in friendly manner not only for gathering information but also for confirming the use of some plants recorded from different informants at different places. Each medicinal practice was cross checked with at least 2-3 informants, critically analyzed and documented. Plants. Then voucher specimens were collected and processed following Jain and Rao (1977) method. Plants were identified using previously identified specimens in the botanical laboratory and deposited in the Herbarium of the Postgraduate Department of Botany, M.C. College, Barpeta, Assam.

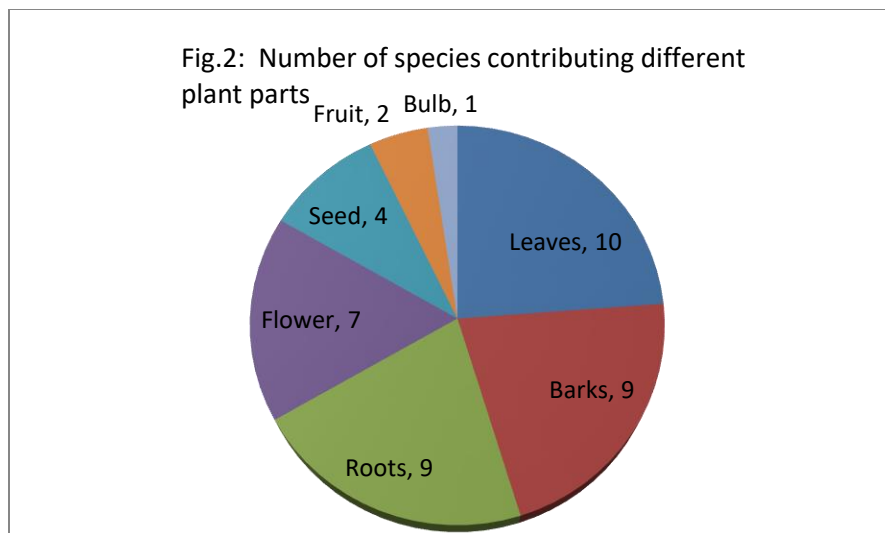
Result:

The Present study enlists a total of 42 plant species covering 25 families. These plant species are being used in 39 different formulations to cure irregular menstrual cycle and pain during menstrual cycle (Table 1 and Table 2). Table includes scientific names of the plant species grouped according to the formulations used for curing various gynecological disorders followed by vernacular name, Family name, part(s) of plants used, methods of preparation and dose of medicine used by the local people of Barpeta district of Assam against irregular menstruation and pain during menstruation.

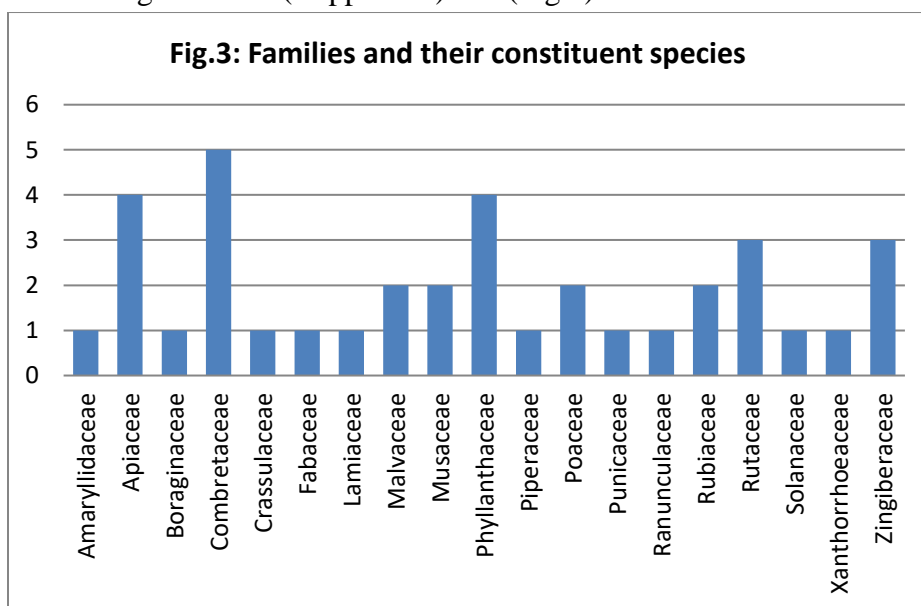
A total of 28 species belong to 19 families have been found to be used against irregular menstruation cycle of which the family Fabaceae comprises highest number of plant species (10 spp.) in preparation of the herbal recipes followed by Malvaceae (7 spp.), Solanaceae (3 spp.), Poaceae (3 spp.) etc. (Fig.1).



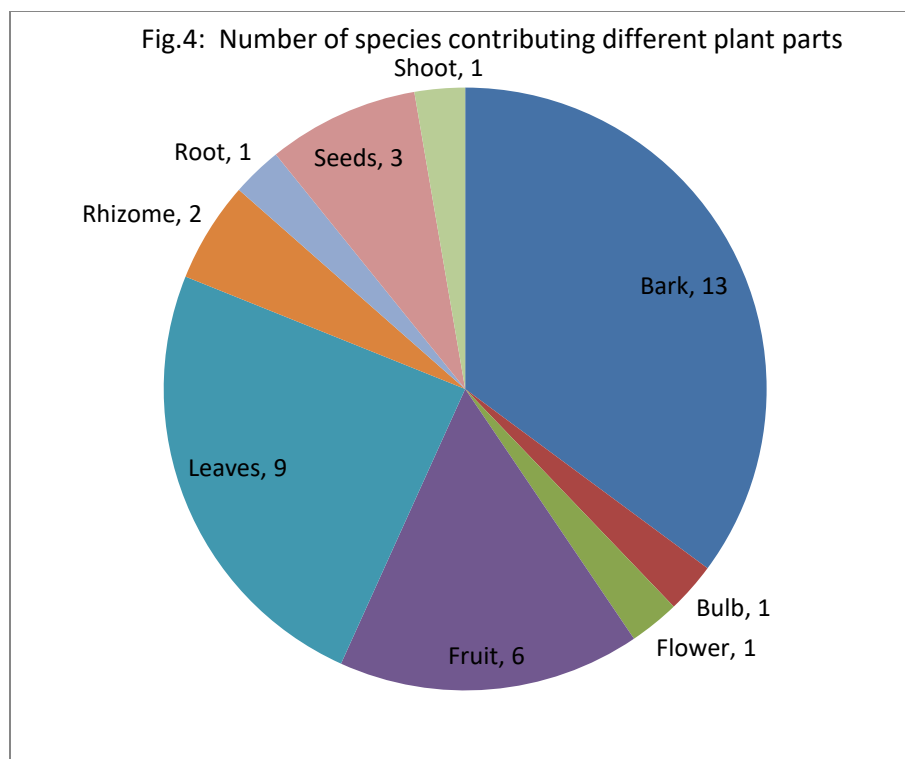
Out of the plant parts used, leaves were found to be used from majority of the species (10 spp.) followed by barks and roots (9 spp. each), flower (7 spp.), seed (4 spp.), fruit (2 spp.) and bulb (1 sp.) to treat the irregular menstrual disorder (Fig.2).



As far as the pain during menstruation is concerned, a total of 37 species belonging 19 families have been recorded to be used against the disorder of which the family Combretaceae contributes highest number of species (5 spp.) followed by Apiaceae and Phyllanthaceae (4 spp. each), Rutaceae and Zingiberaceae (3 spp. each) etc. (Fig.3).



In preparation of the herbal recipes to treat pain during menstruation, highest number of species were recorded contributing bark (13 spp.) followed by 9 spp. contributing leaves, 6 spp. contributing fruits, 3 spp. contributing seeds, 2 spp. contributing rhizome and 1 sp. each contributing bulb, flower, root and shoot (Fig.4).



Discussion:

The families Fabaceae, Malvaceae, Combretaceae, Apiaceae, Phyllanthaceae etc. along with others have contributed much of the species towards the preparation of herbal recipes in treating the troublesome gynecological disorders. Out of all the plant parts used in the preparation, leaves, roots and barks are of maximum use in the herbal formulations. *Diplazium esculentum*, *Nymphaea rubra* and *Christella parasitica* have been recorded for the first time as the ingredients of the herbal formulation against gynecological disorders thereby indicating the potential medicinal values of the species. Authors feel thorough chemical characterization of those species in search of the active ingredients having immense power to heal some sort of gynecological disorders.

The study indicates that wide spectrum of remedies are used by local healers for women to regulate the irregular menstrual period and dysmenorrhoea. Plants belonging to 25 plant families were observed to be used as treatment for gynaecological disorders in almost all the pockets of the district. The chemistry of each family has still not been documented properly (Borah and Bhattacharjya, 2009; Bhattacharjya *et al*, 2015).

It is important to collect correct part of plant during collection since a specific part may be toxic whilst another may have no harmful effect due to a difference in the concentration of active ingredients in different parts of the plant. Dosage form as well the method of preparation and administration are very important (Nadkarini 2001). In some instances the plant part is burnt and used as powder. The rest of the medicinal plants are prepared as either infusions or decoctions which are taken orally. Root infusions of some plants are taken orally for the treatment of menstrual cramps.

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Table 1: Enumeration of medicinal plants used in Irregular menstrual cycle

Formulation No.	Plant Species	Local name	Family	Plant part	Method of preparation and dose of medicines
1	<i>Adenantherapavonina</i> L.	Raktachandan	Fabaceae	Seed	Mix the powder of seed and leaves in equal amount and make tablet; taken 3 tablets 3 times daily.
	<i>Centellaasiatica</i> L.	Barmanimuni	Apiaceae	Leaves	
2	<i>Saracaindica</i> Roxb.	Ashok gash	Fabaceae	Leaves	Make juice of leaves; drink 50ml juice everyday for 30 days.
3	<i>Saracaindica</i> Roxb.	Ashok gash	Fabaceae	Bark	Make powder of bark; mix 1 tablespoon powder in 1 cup of water and drink once daily for 7 days.
4	<i>Azadirachta indica</i> A.Juss.	Neem	Meliaceae	Leaves	Mix leaves, flowers and seeds in equal amount after drying and grind them to prepare pills, take 3 pills daily till getting cured.
	<i>Diplazium esculentum</i> (Retz.)Sw.	Dhekia	Athyriaceae	Leaves	
	<i>Nymphaea lotus</i> L	Padumful	Nymphaeaceae	Flower	
	<i>Hibiscus rosa-sinensis</i> L.	Rangajoba	Malvaceae	Flower	
5	<i>Adenantherapavonina</i> L.	Raktachandan	Fabaceae	Seeds	Soak fruit and flower overnight in water; drink 1 cup of soaked water daily.
	<i>Tamarindus indica</i> L.	Teteli	Fabaceae	Fruit	
6	<i>Hibiscus rosa-sinensis</i> L.	Rongajoba	Malvaceae	Flower	Fruit and flower soaked in water for overnight, drink 1 cup of soaked water daily for 7 days.
	<i>Tamarindus indica</i> L.	Teteli	Fabaceae	Fruit	
7	<i>Murrayakoenigii</i> L. Spreng.	Narasingha	Rutaceae	Leaves	Grind leaves of both the plants and make tablets; take one tablet once daily for 7 day
	<i>Datura stramonium</i> L.	Datura	Solanaceae	Leaves	
8	<i>Cynodondactylon</i> L.	Daburibon	Poaceae	Leaves	200 ml of leaf juice mix with 1 litre of hot water; drink 1

					cup juice once daily for 7 days.
9	<i>Punicagranatum</i> L.	Dalim	Punicaceae	Bark	Grind bark of both the plants and mix with water; drink 1 cup once daily with sugar candy.
	<i>Hibiscus rosa-sinensis</i> L.	Rongajoba	Malvaceae	Bark	
10	<i>Adenantherapavonina</i> L.	Raktachandan	Fabaceae	Seed	Make juice of seeds and flowers with sugar and milk. Drink 1 cup of this juice 3 times a day.
	<i>Hibiscus rosa-sinensis</i> L.	Rongajoba	Malvaceae	Flower	
11	<i>Hibiscus rosa-sinensis</i> L.	Rongajoba	Malvaceae	Flower	Grind both flowers in to a mixture and make small tablets, take these tablets at empty stomach for 41 days.
	<i>Nymphaea rubra</i> Roxb. ex Andrews	Rongavetful	Nymphaeaceae	Flower	
12	<i>Solanum torvum</i> Sw.	Kata bengena	Solanaceae	Root	Make past of roots of both plants; eat regularly for 15 days
	<i>Piper longum</i> L.	Gulmorish	Piperaceae	Root	
13	<i>Amaranthus spinosus</i> L.	Kata khutura	Amaranthaceae	Root	Mix root and bark of plant in equal amount, add sugar candy and grind well to make pills; take one pill once daily for 7 days.
	<i>Clitoriaternatea</i> L.	Boga oporajita	Fabaceae	Root	
	<i>Terminalia arjuna</i> Roxb.	Arjun gash	Combretaceae	Bark	
14	<i>Saracaindica</i> Roxb.	Ashok gash	Fabaceae	Bark	Mix bark of both plants, grind well to make pills; eat one pill 3 times daily for 2 months.
	<i>Aegle marmelos</i> (L.)Correa.	Bel	Rutaceae	Bark	
15	<i>Cynodondactylon</i> L.	Dubribon	Poaceae	Leave	Drink juice of leaves with sugar at empty stomach for 7 days
16	<i>Solanum torvum</i> Sw.	-	Solanaceae	Root	Mix root of both plants in equal amount and make past; take 1 teaspoonful of this paste twice in a day for 21 days
	<i>Piper longum</i> L.	Jaluk	Piperaceae	Root	
17	<i>Mimosa pudica</i> L.	Lajukilota	Fabaceae	Root	Make juice of root and drink

					once daily in empty stomach for 7 days.
18	<i>Cynodactylon</i> L.	Duburibon	Poaceae	Leaves	Mix leaves and bulb and make juice. Drink 1 cup of juice once daily for 27 days.
	<i>Zingiber officinalis</i> Roscoe	Ada	Zingiberaceae	Bulb	
	<i>Hydrocotyle javanica</i> Thumb.	Sarumanimuni	Apiaceae	Leaves	
19	<i>Nigella sativa</i> L.	Kaljira	Ranunculaceae	Seeds	Eat 1 teaspoonful soaked seeds after meal at night for 7 days.
20	<i>Bombexceiba</i> L.	Simalu	Bombacaceae	Bark	Mix all barks in equal quantity and grind them, make pills; take one pill once daily in empty stomach for 7 days
	<i>Mangifera indica</i> L.	Aam	Anacardiaceae	Bark	
	<i>Litsea salicifolia</i> (J. Roxb. ex Nees) Hook. F.	Bhagnala	Lauraceae	Bark	
	<i>Sidarbombifolia</i> L.	Saruboiral	Malvaceae	Bark	
	<i>Phyllanthus bracteatus</i> (Gillespie) W.L. Wanger & Lorence	Bhuiamlokhi	Phyllanthaceae	Bark	

Table 2: Enumeration of medicinal plants used in Pain during menstruation period

Formulation No.	Plant Species	Local name	Family	Plant part	Method of preparation and dose of medicines
1	<i>Nigella sativa L.</i>	Kaljira	Renunculaceae	Seeds	Make tablet of seed after grinding them and take daily for 15days
2	<i>Musa paradisiaca L.</i>	Malbhogkal	Musaceae	Leaves	Mix and crush all the ingredients and make pill. Take one pill once daily for 3 days in empty stomach.
	<i>Allium sativum L.</i>	Rahun	Amaryllidaceae	Leaves	
	<i>Murrayakoenigii L. Sprengel</i>	Narasingha	Rutaceae	Shoot	
3	<i>SaracaindicaRoxb.</i>	Ashok gash	Fabaceae	Bark	Make tablet of bark of both plants and fruit after crushing and mixing them and take one tablet daily with juice of d.
	<i>Terminalia chebulaRoxb.</i>	Silikha	Combretaceae	Bark	
	<i>Phyllanthusamblica L.</i>	Amlokhi	Phyllanthaceae	Fruit	
	<i>Curcuma longaL.</i>	Haldhi	Zingiberaceae	Rhizome	
4	<i>Terminalia arjunaRoxb</i>	Arjungash	Combretaceae	Bark	Mix bark of all 3 by crushing them and make tablet and take one tablet daily for 7 days.
	<i>Centellaasiatica L.</i>	Bormanimuni	Apiaceae	Bark	
	<i>TerminaliaChebulaRoxb.</i>	Silikha	Combretaceae	Bark	
5	<i>MurrayakoenigiiL.Sprengel</i>	Narasingha	Rutaceae	Leaves	Mix leaves of both plants and make tablets and take one tab daily empty stomach for 3 days.
	<i>Datura stramonium L.</i>	Datura	Solanaceae	Leaves	
6	<i>Punicagranatum L.</i>	Dalim	Punicaceae	Bark	Grind the bark of both the plants and make juice and drink 1 cup daily with sugar candy.
	<i>Hibiscus rosa-sinensis L.</i>	Rongajoba	Malvaceae	Bark	
7	<i>Phyllanthusamblica L.</i>	Amlokhi	Phyllanthaceae	Fruit	Mix juice of

					fruit with honey and take one teaspoonful as dose twice daily for 7days
8	<i>Coriandrum sativum L.</i> <i>Christella parasitica H.L.</i>	Dhania BihDhekiya	Apiaceae Thelypteridaceae	Seeds Leaves	Mix powder of seeds with juice of leaves ,salt and water,drink one glass of this mixture everyday for 7days
9	<i>Curcuma long L.</i> <i>Centella asiatica L.</i> <i>Leucasplurenetii(Rotu). L</i>	Haldhi Bormanimuni Dron	Zingiberaceae Apiaceae Lamiaceae	Rhizome Bark Flower	Mix all three ingredients and make paste,take 1 teaspoonful of this paste with water every day for 15days.
10	<i>Citrus aurantiifolia (christum) swingle</i>	Nemu	Rutaceae	Fruit	Take juice of citrus and mix with sugar,drink this everyday for 15days
11	<i>Paederia foetida L.</i>	Vadailota	Rubiaceae	Seed	Make paste of seed and eat one teaspoon in the morning at empty stomach.
12	<i>Bryophyllum pinnatum(Lam)</i> <i>Aloevera L.</i>	Pategoja Chalkuori	Crassulaceae Xanthorrhoeaceae	Leaves Leaves	Soak leaves of both plants in water overnight and drink one cup of water in the morning for 31 days.
13	<i>Cynodon dactylon L.</i>	Dubribon	Poaceae	Leaves	Make juice of leaves and take 3 teaspoonful juice with sugar candy 3 times in a day

					for 7days
14	<i>Heliotropium indicum L</i>	Hatirsur	Boraginaceae	Root	Drink juice of root with sugar at empty stomach daily for 15days
15	<i>Haldinacordifolia Roxb</i>	Telicodom	Rubiaceae	Bark	Mix all the ingredients and make powder. Take this powder 2 teaspoonful daily for five days.
	<i>Piper longum L.</i>	Jaluk	Piperaceae	Bark	
	<i>Terminalia chebula Roxb</i>	Silikha	Combretaceae	Bark	
	<i>Phyllanthus amblica L.</i>	Amlokhi	Phyllanthaceae	Fruit	
	<i>Terminalia bellerica Roxb</i>	Bhomora	Combretaceae	Fruit	
16	<i>Sidarhombifolia L.</i>	Saruboiral	Malvaceae	Bark	Mix bark of both plants and crush them and make pill. Take one pill daily at empty stomach with banana
	<i>Phyllanthus bratenus G.L. Web</i>	Bhuiamlokhi	Phyllanthaceae	Bark	
	<i>Musa paradisiaca L.</i>	Malbhogkol	Musaceae	Fruit	
17.	<i>Cynodondactylon L.</i>	Duboribon	Poaceae	Leaves	Mix juice of all ingredients and drink 1 cup of this juice daily for 27days.
	<i>Zingiberoffianalis Roscope</i>	Ada	Zingiberaceae	Bulb	
	<i>Hydrocotyle javanica Thumb</i>	Sarumanimuni	Apiaceae	Leaves	