

Formulation and Evaluation of Herbal Tea for Menstrual Disorders

Nikita Satish Chakor¹, Sayali Ravindra Labade², Kiran Kudale³

^{1,2}B Pharmacy, Pravara Gramin Shikshan Sanstha College of Pharmacy (Women) (1522), Chincholi, Sinnar-422103, Nashik, Maharashtra, India.

³M Pharmacy, Pharmacognosy, Pravara Gramin Shikshan Sanstha College of Pharmacy (Women) (1522), Chincholi, Sinnar-422103, Nashik, Maharashtra, India.

ABSTRACT:

The motive of this review was to examine the evidence related to the clinical efficaciousness and assurance of herbs. These studies looked at the use of herbs to improve women's health, mainly for menstrual disorders and aim is to prepare herbal tea with new combinations using plant species such as ashwagandha, Chasteberry, fennel, chamomile, shatavari, ginseng, coriander seeds, cinnamon.

In spite of fact that plant materials form the basis of drug development and herbal formulations are popular, there are few articles on clinical efficacy and safety. In this article, we will discuss how herbs can be useful in certain areas of clinical and preventive health, and what further analysis is needed to understand whether habitually use can promote healthy lifestyles more commonly.

KEYWORDS: 1. Phytotherapies, 2. Menstrual disorders, 3. Menstruation, 4. Herbal tea

INTRODUCTION:

Menses is the most important aspect of women's reproductive cycle. In most cases, it's associated with certain diseases called menstrual diseases which negatively affects the quality of life of large of the world's woman population in reproductive age.

Some of common menstrual diseases among the female:

Menorrhagia, Dysmenorrhea, PMS, Leucorrhoea, Amenorrhea, PCOS, PCOD^{14]}

Herbal tea was defined as a fluent infusion in hot or cold water for an unidentified quantum of time to withdraw the phytochemical constituents of plants.

The sensitive appeal of tea, like a food product, is an important consideration in new product development. Herbal tea in particular are gaining increasing consumer attention due to growing perception of health benefits acquire from their consumption. Herbal tea is made from herbal plants, fruits, seeds, roots steeped in hot water. There are numerous different herbs that can be set up in herbal tea, each with a different use and purpose.

Some pivotal herbs include Ashwagandha, Chasteberry, Fennel, Chamomile, Shatavari, Ginseng, Coriander seeds, Cinnamon.

Thus, at present lifestyle intervention and diet differences are the major concern for the above- mentioned menstrual diseases. Also, further cases are concluding for herbal treatment. A Pharmaceutical Branch of Ayurveda has contributed several innovative dosage forms. In spite of all these dosage forms we prepare

an herbal tea for the treatment of menstrual disorders which we named as “**Tisane for Artava Vyapath Chikitsa**”

NEED OF PRESENT INVESTIGATION:

- To make Adolescent Girls, women’s aware about the importance of menstrual hygiene for better lifestyle, reduction in academic disturbances and changes in normal physical activities.
- Formulation of the combine investigational Herbs is unique and Easy to use and can be taken regularly as a Health Drink.

AIM:

Formulation and Evaluation of Herbal Tea for Menstrual Disorders.

OBJECTIVE:

- To prepare Herbal tea for the treatment of Menstrual Disorders.
- To evaluate the formulation with respect to various physical parameters.
- To evaluate phytochemical screening of given crude drug.
- To promote healthy lifestyle and develop a feasible low- cost menstrual disorder management intervention.

LITERATURE REVIEW:

Sr No.	Title of Paper	Author	Information
1.	Comparison of Herbal Medicines used for Women's Menstruation diseases in different areas of world.	Majing Jiao, Xinquiao Liu, yougshen ren and Zhinan Mei	Onset of menstruation is associated with absence of fertilization whereby progesterone and estrogen levels decrease to low levels
2.	A Literature review on Menstruation and Mental Health.	Vandana Singh Malid, Dor. Krishan kumar and Dr. Rakesh kumar Behmani:	Common Menstrual Disorders among Females.
3.	A review of its traditional uses, chemical constituents, Pharmacological activities and Quality control studies	Yun- le Dai, Ying li , Qi wand and Lina Gao Chamomile	Interface of chamomile with GABA system can normalise luteinizing hormones secretion and increases dominant follicles for improving reproductive functions
4.	Effect of Fennel seed : On women health International journal of advances in nursing management	D. Divya	Fennel due to phytoestrogen compounds and according to traditional believes has potential for management of (PCOD)

5.	Therapeutic effects of Cinnamon on PCOS	Alireza Valizadeh, Ali Hanafi	Low levels of chasteberry extract results in decrease estrogen levels and increases progesterone levels
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METHODOLOGY:

• MATERIALS:

1. Chamomile:

- **Synonyms:** German Chamomile
- **Biological Source:** Consist of dried flower heads of *Matricaria chamomila* L
- **Family:** Compositae
- **Chemical Constituents:** Flavonoids, Terpenes, Volatile oils.

Chamomile is an annual or perennial plant belonging to family Asteraceae. Chamomile extract terminates the production of prostaglandins and leukotrienes. Chamomile has been used for treatment of stomach problems, cramps, and other infections. Interface of chamomile with GABA system can normalise luteinizing hormones secretion and increases dominant follicles for improving reproductive functions^[23] Flavonoids one of the most important compounds in chamomile increase levels through their direct effect on pituitary gland, can be effective in modulating PMS.



2. Coriander Seeds:

- **Synonyms:** Fructus Coriandri
- **Biological Source:** Consist of dried ripe fruit of *Coriandrum sativum* L
- **Family:** Umbelliferon
- **Chemical Constituents:** Volatile oils such as D (+) Linalool, Coriandrol, Terpenes.



Coriander (*Coriandrum sativum* L) a member of Apiaceae family is among most extensively used medicinal plant. Coriander is most useful herb because it has antioxidant properties that remove toxins out from the body. It kills microbes which are main cause of Leucorrhoea. Effectiveness of coriander seeds, by soaking water on Leucorrhoea and women with complaints of itching burring and soreness^[52]

3. Shatavari:

- **Synonyms:** Asparagus
- **Biological Source:** Consist of dried tuberous roots of *Asparagus racemosus* W
- **Family:** Liliaceae
- **Chemical Constituents:** Steroidal saponins such as shatavarins,
Shatavari is medicinal herb belonging to the family Asparagaceae in traditional Ayurvedic medicine. Shatavari has its chief constituent saponin which helps to maintain uterine mobility hence, Useful in painful bleeding during premenopause. Helpful in treatment of fertility problems as it elevates the process of folliculogenesis. Main constituent of shatavari are steroidal saponins that propose its use as estrogen regulator Phytoestrogen help in regulation of ovarian cycle in women. Heavy bleeding and pre- menstrual symptoms are also corrected by herb.



4. Chasteberry:

- **Synonyms:** Hemp tree, Monk pepper
- **Biological Source:** Consist of dried fruit of *Vitex Agnus Castus*
- **Family:** Verbenaceae
- **Chemical Constituents:** Flavonoids, 1.8 Cineole

Chasteberry (*Vitex agnus- castus*) is the fruit (Berries) from the chaste tree belongs to Verbenaceae family. Chasteberry functions by decreasing inflammation and balancing hormones^[45]. *Vitex agnus castus* (Chaste tree berry) is a hypothalamic-pituitary ovarian (HPC) regulator and because HPO imbalance is related with PCOS it is likely to be of profit in managing the condition. Hyperprolactinemia and altered response progesterone are also associated with PCOS.



5. Cinnamon:

- **Synonyms:** Ceylon Cinnamon, Saigon Cinnamon
- **Biological Source:** Consist of dried bark of coppiced shoots of *Cinnamomum zeylanicum* nees
- **Family:** Lauraceae
- **Chemical Constituents:** Cinnamic aldehyde, Eugenol

Cinnamon (*Cinnamomum Zeylanicum*) is commonly used spice belongs to family Lauraceae Cinnamon contains eugenol which helps to balance the hormones that causes problems during periods. Cinnamon rises high density Lipoprotein and insulin sensitivity while low density Lipoprotein, triglyceride and blood

glucose were decreased in patients Symptoms ,Cinnamon has two active constituents name cinnamaldehyde and Eugenol. Cinnamaldehyde works as anti- Spasmodic and eugenol prevents synthesis of prostaglandins and reduces inflammation.^[41]



6. Ashwagandha:

- **Synonyms:** Withania root
- **Biological Source:** Consist of dried roots and stem of *Withania somnifera* dunal
- **Family:** Solanaceae
- **Chemical Constituents:** Alkaloid withanine as the main constituent and somniferine

Ashwagandha or *Withania Somnifera* or indian Ginseng is an ayurvedic herb. . An evergreen woody shrub of Solanaceae family. Species name has been ascribed as “*Somnifera*” which means "Sleep inducer" in latin owing to its prodigious anti-Stress activity.^[11] Ashwagandha normalizes the level of Cortisol (stress hormone) in the body which helps to regulate moods and decreases the overall state of Stress, anxiety and irritability. Ashwagandha is adaptogen, which is a substance that helps the body to adapt various kinds of Stress.^[13] Ashwagandha contains compounds that are steroids, these reduces inflammation High level cortisol production in body which interferes with production of progesterone and thyroid hormones. Progesterone and thyroid hormone distraction interferes with menstrual cycle. Regulating cortisol also has of positive effect on regulation of hormone.



7. Ginseng:

- **Synonyms:** Ginseng root
- **Biological Source:** Consist of dried roots of *Panax ginseng*
- **Family:** Araliaceae
- **Chemical Constituents:** Saponin Glycosides, ginsenosides, Panaxosides.

Ginseng is any one of perennial plant which are included in genus *Panax* and family Aralliaceae. Ginsenoside is believed to be the active compounds of ginseng herb. Herb Contain phytoestrogens which can reduce the severity of PMS symptoms. Phytoestrogens such as genistein and daidzein, have shown protective effects on Conditions related to decreased estrogen including Menopause, osteoporosis and cognitive dysfunctions



8. Fennel:

- **Synonyms:** Fructus foeniculi
- **Biological Source:** Consist of dried fruits of *Foeniculum vulgare miller*
- **Family:** Umbelliferae
- **Chemical Constituents:** Contains volatile oils of anethole, fenchone.

Foeniculum vulgare as the member Apiaceae family with common name fennel is well known medicinal plants in traditional and modern Medicines.^[4] Fennel is proposed to improve menstrual pain by lowering prostaglandin levels in blood. Fennel inhibits the response of uterine to oxytocin and prostaglandin E2 by reducing its contraction frequency and intensity. Fennel due to phytoestrogen compounds and according to traditional believes has potential for management of (PCO)^[6]

Fennel's phytoestrogen concentration aids in Lowering inflammation in PCOS and improving resistance Anethole have estrogen like activity and inhibit spasms in smooth muscles. Fennel can increase production of bile used in treatment of infant colic, to promote menstruation in women.



METHODS:

• SELECTION and COLLECTION OF CRUDE DRUGS:

Dried powder of Crude drugs such as Chamomile, Fennel, Chasteberry, Ashwagandha, Ginseng, Shatavari, Cinnamon, and Coriander seeds were selected and collected from the Local Market (Ayurvedic Store) at Sinnar, Nashik.

• METHOD OF PREPARATION:

- ✓ **Preparation of herbal Tea powder:** All the herbal ingredients are in dry form and grinded to make uniform and fine powder.
- ✓ **Weighing:** All the required herbal powders for herbal tea preparation were accurately weighed individually by using digital balance.
- ✓ **Mixing:** All these fine ingredients were mixed thoroughly with the help of Mortar and Pestle to get uniform mixing.
- ✓ **Sieving:** Fine tea powder was passed through sieve no. 63, to get the sufficient quantity of fine powder.
- ✓ **Collection and Storage:** Tea Powder mixture was collected and stored in suitable air tight container. 5 Different types of Formulations were prepared out and further used for doing Evaluation Parameters. (Fig.no: 1)



• **FORMULATION OF HERBAL TEA:**

(Table no. 1)

Sr no	Ingredients	Formulation(gm)				
		B1	B2	B3	B4	B5
1.	Chamomile	3.2	2	3	3.5	2.5
2.	Coriander seeds	1	2	1.5	1.4	1.3
3.	Shatavari	0.97	1	0.95	0.98	0.99
4.	Chasteberry	17.19	17.20	17.15	17.16	17.17
5.	Cinnamon	11.2	11.3	11.1	11	11.4
6.	Ashwagandha	2	2	1	1.5	1.9
7.	Ginseng	0.70	0.75	0.69	0.73	0.74
8.	Fennel	3.8	3.8	3.6	3.7	3.5

EVALUATION PARAMETERS:

• **Physicochemical Evaluation:**

▪ **Organoleptic Evaluation:**

By utilizing sensory organs like eyes or nose, the examination of the formulation is performed under this evaluation, and it includes macroscopic characteristics of the drug or product, such as colour, odour, texture and appearance.

▪ **Physicochemical Evaluation:**

- Ph:** Ph of aqueous solution of the formulation was measured by using a calibrated digital PH meter at constant.
- Loss on drying:** Weight about 2 gm of the powdered drug into a weighed flat and thin porcelain dish. Dry in the oven at 100°C or 105" C. until two consecutive weighing do not differ by more than 0.5 gm. Cool in desiccators and weight. The loss in weight in usually recorded as moisture.

Formula for % LOD: $\frac{\text{Initial weight} - \text{Final weight}}{\text{Initial Weight}} \times 100$

Initial Weight

1. Ash content:

Total Ash Value

Place about 2-4gm of the ground air-dried material, accurately weighed, in previously Ignited and tared crucible (usually of platinum or silica). Spread the material in an even layer and ignite it by gradually increasing the heat to 500-6000°C until it is white, indicating the absence of carbon. Cool in a desiccator and weigh. If the carbon free ash is not obtained wash the charred mass with hot water, collect residue on ashless filter paper incinerate(white ash) add to dish. Evaporate to dryness, calculate % of total ash.

(fig no:2)

% Total ash: $\frac{\text{Weight of total ash}}{\text{Weight of crude drug}} \times 100$

Weight of crude drug



Acid Insoluble ash:

Boil ash with 25 ml of 2M HCL for 5 min then collect the residue (insoluble matter in crucible or on ashless filter paper) wash with hot water, then ignite. Cool on desiccator ,Weigh and Calculate % of acid insoluble ash.

$$\% \text{ Acid insoluble ash: } \frac{\text{Wt. of acid insoluble ash} \times 100}{\text{Wt. of crude drug}}$$



Water soluble ash:

Boil ash with 25 ml of Water for 5 min then collect the residue (insoluble matter in crucible or on ashless filter paper), then ignite. Cool on desiccator ,Weigh and Calculate % of water-soluble ash.

$$\% \text{ Water Soluble ash: } \frac{\text{Wt. of total ash} - \text{Wt. of water-soluble ash} \times 100}{\text{Wt. of crude drug}}$$

Rheological Evaluation:

▪ **Tapped density:**

Tapped density is an increased bulk density attained after mechanically tapping a container containing the powder sample. After observing the initial powder volume of mass, the measuring cylinder or vessel is mechanically tapped for min and volume or mass readings are taken until little further volume or mass change was observed. It was expressed in grams per millilitre.

Tapped Density = Mass/Tapped Volume



- **Bulk density:** ratio between the given mass of a powder and its bulk volume. Required amount of the powder of the is dried and filled in a 50 ml measuring cylinder up to 50 ml mark. Then the cylinder is dropped onto a hard wood surface from height of 1 inch at 2 sec intervals. The volume of the powder is measured. Then the powder is weighed. This is repeated to get average values.

Bulk density: Mass / Bulk Volume

▪ **Angle of repose:**

It is defined as the maximum angle possible in between the surface of pile of powder to the horizontal flow. It required amount of dried powder is placed in a cylinder tube open at both ends is placed on a horizontal surface. Then the funnel should be raised to form a heap. The height and radius of heap is noted and recorded. For the above method, the angle of repose can be calculated by using the formula.

$$\Theta : \tan^{-1} (h/r)$$

Where, h is the height of pile in cm

r is the radius of circle in cm

Phytochemical Evaluation:

1. Detection of Flavonoids:

- a. Aq. Extract of powder + caustic alkalies(NaOH) gives yellow colour
- b. Shinoda test: alc. Test solⁿ + few Mg turnings + conc. HCL dropwise gives pink scarlet, crimson red or blue colour appears.
- c. Lead acetate test: lead acetate solⁿ + test solution gives yellow ppt
- d. Sulphuric acid test: Sulphuric acid + test solution gives red colour.
- e. Zinc HCL test: zinc dust+ conc. HCL gives red colour after few mins.

2. Detection of Alkaloids:

- a. Mayer’s test: Filtrate+ Mayer’s reagent gives cream/yellow colour
- b. Dragendroff’s test: Filtrate+ Dragendroff reagent gives reddish brown colour
- c. Wagner’s test: Filtrate+ Wagner’s reagent gives reddish brown colour
- d. Hager’s test: Filtrate + Hager’s reagent gives yellow ppt

3. Detection of Glycosides:

- a. Killer killani test: Add 0.4 ml of glacial acetic acid and few drops of 5% FeCl₂ solution +0.5 ml of conc. Sulphuric acid gives blue colour in acetic acid.
- b. Legal test: Dissolve pyridine in drug extract up on+ sodium nitroprusside solution to it and made alkaline gives pink or red colour.

4. Detection of Volatile oils:

Powder drug + Sudan red III gives orange red colour.
 Volatile oil+5ml alc.+1 drop of ferric chloride gives green colour.

5. Detection of Saponins: Foam Test: 1 gm of drug+10-20ml H₂O, Shake for few min formation of froth about 2cm high.

6. Detection of Terpenes:

- a. Salkowski test: Alc. Extract of powder was evaporated to dryness and extracted with CHCl₃ from side well of test tube to CHCl₃ ext. gives yellow colour at the junction of two liquid was not formed.
- b. Liberman- Burchard test: Extract+ acetic anhydride(boil and cool)+ conc. Sulphuric acid gives brown ring at the junction of two layers.

7. Detection of Tannins:

- a. FeCl₃ Test: Aq. Extract + FeCl₃ solution gives dark colour
- b. Lead acetate test: Aq. Extract + Lead acetate gives white ppt
- c. Potassium permanganate test: Aq. Extract + Potassium permanganate gives decolorization.

HOW TO TAKE HERBAL TEA:

Pour one Tea bag in cup of Hot water or warm Milk.

RESULTS AND DISCUSSION:

➤ **Morphological Evaluation:**

(Table No: 2)

Evaluation	B1	B2	B3	B4	B5
Color	Creamish brown	Creamish brown	Creamish brown	Creamish brown	Creamish brown

Odor	Sweet &aromatic	Sweet &aromatic	Sweet &aromatic	Sweet &aromatic	Sweet &aromatic
Taste	Light, Natural sweetness	Light with mild Natural sweetness	Light, Natural sweetness	Light, Natural sweetness	Light, Natural sweetness

➤ **Physicochemical Evaluation:**

(Table No: 3)

Sr no.	Parameters	B1	B2	B3	B4	B5
1	Ash Value	17	17.5	11.5	12	10
2	Acid insoluble ash	9.5	10.5	9.5	9	10
3	Water soluble ash	837.5	862.5	564.2	588.0	488.2
4	LOD	0.171	0.192	0.212	0.143	0.191
5	Bulk Density	0.307	0.285	0.333	0.298	0.294
6	Tapped Density	0.476	0.465	0.416	0.444	0.465
7	Angle of Repose	0.694	0.643	0.617	0.656	0.630
8	Hausner's Ratio	1.550	1.631	1.249	1.489	1.581
9	Carr's Index	35.50	38.70	0.199	0.328	0.367
10	Ph	6.5	6.5	6.5	6.5	6.5

➤ **Phytochemical Screening:**

(Table no: 4)

Chemical Tests	B1	B2	B3	B4	B5
a) Flavonoids:					
• Alkali Test:	+	+	+	+	+
• Shinoda Test:	-	-	-	-	-
• Lead acetate test:	+	+	+	+	+
• Sulphuric acid Test:	+	+	+	+	+
• Zinc HCL Test:	+	+	+	+	-
b) Alkaloids:					
• Mayer's Test:	+	+	+	+	+
• Dragendroff's Test:	+	+	+	+	+

• Wagner’s Test:	+	+	+	+	+
• Hager’s Test:	+	+	+	+	+
c) Glycosides:					
• Killer Killani Test:	+	+	+	+	-
• Legal Test:	+	+	+	-	+
d) Volatile oils:					
• Sudan red III	+	+	+	+	+
• FeCl ₂	+	+	+	+	+
e) Saponins:					
Foam Test:	+	+	+	+	+
f) Steroids:					
• Salkowski Test:	+	+	-	+	+
• Libermann-burchard Test:	+	+	-	+	+
g) Tannins:					
• FeCl ₃ Test:	+	+	+	+	+
• Lead Acetate Test:	+	+	+	+	+
• Potassium Permanganate test:	-	+	+	+	+

DISCUSSION:

Morphological Evaluation of herbal tea powder was done. The decoction of tea was tested. It was found that B2 Batch was most acceptable than other 4 formulations, as it possesses a unique Light with Mild Natural Sweetness Taste.

Physicochemical evaluation of all 5 herbal tea formulations were done. The total ash value was found to be more in B2 Formulation (17.5) whereas acid insoluble was found to be more in B2 (10.5) and Water - soluble ash was found to be more in B2 (862.5). Bulk density was found to be more in B3 (0.333), Loss on Drying was found to be more in B3 (0.212), Tapped density was found to be more in B1(0.476), Hausner’s and Carr’s ratio was found to be more in B2 formulation. Ph was herbal tea was found to be 6.5.

Phytochemical Evaluation of Aq. Extract of all the five formulations in house was carried out in which Flavonoids, Tannins, Alkaloids, Steroids, Saponins, Glycosides, Terpenes and Volatile oils were found to be Positive.

SUMMARY:

Sensitive appeal of tea, like food product, is an important consideration of new product development. Herbal tea in particular are gaining increasing consumer attention due to growing perception of health benefits acquire from their consumption. Herbal tea by improving Menstrual flow, nourishes the stomach, normalize LH secretion and increases dominant follicles for improving reproductive function in PCOS, lowering prostaglandin levels to reduce menstrual pain, irregularities of menstrual cycle.

Tea consists of Herbs which normalizes the cortisol (Stress Hormone) in the body, regulating cortisol has positive effect on regulation of Hormones. Phytoestrogen helps in regulation of ovarian cycle in women. Has Antioxidant properties that remove toxins and kills microbes which causes menstrual disorders.

Herbal tea has beneficial effects on Menstrual irregularities and habitually use can promote healthy lifestyles more commonly.

CONCLUSION:

Consumption of tea as a beverage, health drink or medicated tea needs to be promoted for research and its publication. The detailed literature survey was done, and it was found that the herbal tea can be an interesting topic of research. Here a new combination of herbal tea has been prepared by using the plant material like ashwagandha, Chasteberry, fennel, chamomile, shatavari, ginseng, coriander seeds, cinnamon and the evaluation was performed by studying its morphological, physicochemical, and phytochemical parameters. To prepare an ideal herbal tea we have selected the above herbs which have various beneficial uses in Menstrual Diseases. Synthetic drugs might have side effects on prolonged or long-term use. However, herbal drugs are safe and provide therapeutic effects with less or no side effects as compare to synthetic drugs.

From the above data, we conclude that the B2 batch has maximum amount of Phytoconstituents. This formulation was also appreciated in terms of Taste by majority of people. So, we can conclude that B2 formulation serves as best herbal tea than any other tea because this tea provides various phytoconstituents which we never include in our daily diet. This tea can be served as ideal tea for Menstrual irregularities. So, we can conclude that this tea can help in maintaining healthy lifestyle in every Women with a cup of tea.

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List of Abbreviations:

Abbreviations	Name
PMS	Premenstrual Syndrome
PCOS	Polycystic Ovary Syndrome
PCOD	Polycystic Ovary Disease
LH	Luteinizing Hormone
FSH	Follicle Stimulating Hormone

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