Study of Seeds of Emblica officinalis with Special Reference to Shwetpradar

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Abstract

Shwetpradar (white vaginal discharge) is a common gynaecological concern, often affecting women of reproductive age. Traditional Ayurvedic texts suggest several herbal remedies, including Emblica officinalis (Amla), known for its rejuvenating, antioxidant, and antimicrobial properties. However, specific studies on the seeds of E. officinalis in relation to Shwetpradar are limited.

Objective: To explore and analyse the pharmacognosy and therapeutic potential of Emblica officinalis seeds in the management of Shwetpradar.

Materials and Methods: Seeds of E. officinalis was collected, authenticated, and subjected to standard pharmacognostical evaluation including macroscopy, microscopy, and physicochemical parameters. A clinical observational study was carried out on selected patients suffering from Shwetpradar to assess therapeutic efficacy.

Results: Pharmacognostical analysis revealed characteristic features such as taste structure, presence of tannins, and crystalline deposits. Clinical outcomes demonstrated a notable reduction in the frequency and quantity of discharge, along with relief in associated symptoms such as itching and fatigue.

Conclusion: Seeds of Emblica officinalis exhibit promising potential in the management of Shwetpradar due to their antimicrobial and astringent properties. Further studies with larger sample sizes and controlled clinical trials are recommended.

Keywords: Emblica officinalis, Amla seeds, Shwetpradar, vaginal discharge, Ayurveda, phytochemistry

Introduction

Ayurveda is science and art of living a meaningful life, but the main objective of Ayurveda is to protect the health of the healthy and to alleviate the ailments of the sick[1]. But for the fulfilment of this objective, medicinal substances are very much needed which is proved by the availability of substances in the four Sthambh, in the absence of substances, treatment cannot be achieved successfully.[2]

Without the knowledge of substances, a clinician is as useless as a warrior without knowledge wielding a weapon. On one hand, their use with knowledge is life-giving like nectar, on the other hand, their use without knowledge is fatal like poison.[3] Therefore, it is necessary that along with the knowledge of substances, clinician[3] should also have knowledge of their rational use.[4]

Amalaki belongs to Euphorbiaceae family, Botanical name Emblica officinalis. It is a small to medium sized deciduous tree with an average height of 8-18 m, with thin light grey bark exfoliating in small thin irregular flakes. The average girth of the main stem is 70 cm. The main trunk is divided into 2 to 7 scaffolds very near to the base. Leaves are 10 -13 mm long, 3 mm wide, closely set in pinnate fashion which makes the branches feathery in appearance. Flowers are unisexual, 4 to 5 mm in length, pale green in colour, borne in leaf axils in clusters of 6 to 10. Fruits are fleshy, almost depressed to globose shape, 2.1-2.4 cm in diameter, 5.3-5.7 g in weight, 4.5-5.0 mL in volume. It is commercially cultivated in Uttar Pradesh in India. It is also grown in Tamil Nadu, Rajasthan and Madhya Pradesh.[5,6,7]

Rasapanchaka[8]

Rasa: Amla (Sour), Kashaya (Astringent),

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Tikta (Bitter), Katu (Pungent), Madhur (Sweet). Sour and astringent are the predominant rasa

Guna (qualities): Guru (Heavy), Ruksha (Dry), Sheeta (Cold)

Veerya (nature): Sheeta (Cold)

Vipaka: Madhur (Sweet)

Effect on Doshas: Tridoshashamak, is especially effective for Pitta Dosha.

Acharya Charak has described the use of both Amalaki and Amalaki seeds in Pandurasrigdar (White discharge). In case of leucorrhoea, the paste of amalaki seeds should be mixed with sugar and honey and drunk with water.[9]

Due to some condition such as Garbh sraav or Garbhpaat, irregular menstruation and various conditions like vaginal unhygienic condition, vibandha etc., Kapha gets vitiated and then causes the Rasa Dhatu in female genital parts to produce painless secretion of white colour due to the predominance of its liquidity.[10]

Consuming excessive Kaphavardhak ahar is the main cause of leucorrhoea. It is clear in the description of Shleshmaj yoni Vyapad that by consuming excessive Kaphavardha ahar, the Kapha gets distorted and increases the qualities like Guru, Pichhil, Snigdha, sheet, sthir etc. and then Produces white discharge from the passage.[11]

Excessive amount of white discharge from the vagina is the main symptom of Shwetpradar. The word Pandur can be used for local characteristics of Shukla, Shubra, Shwet, Harit, Peet varna.[12]

- Local symptoms -Yoni kandu (Vaginal irritation), Yoni daha (vaginal inflammation), Yoni Pichilta (vaginal laxity), vaginal pain.[13]

- General Somatic Symptoms: Katishool, Dourbalya(weakness), Bhram (Delusion), Aruchi (loss of appetite), weakness, numbness, etc. can be described under Shwet pradar. [14]

The word leucorrhoea is derived from the combination of the two words "Leukos" and 'rrhoea. Leukos means white and rrhoea means running or to flow. Running of white substance is called Leucorrhoea. [15]

Leucorrhoea is defined as an excessive normal vaginal discharge. This is a symptom of pouring out discharge per vagina other than blood or urine. Leucorrhoea in the strict sense of the word means excessive amount of normal secretions, but it is loosely applied to include both excessive physiological and pathological discharges. Leucorrhoea should fullfil the following criteria-[16]

- The excess secretion is evident from persistent vulval moistness or staining of the under garments, brownish yellow on drying need to wear a vulval pad.
- It is non-purulent and non-offensive.
- It is non-purulent and never causes pruritus

Leucorrhoea was formerly described as acute catarrh of vagina.

Characters of Vaginal Secretions

The vaginal secretion is very small in amount to make the surface of the vagina moist and lubricated, but without staining or moistening the underclothes. Vaginal secretion is about 1-2ml.[17] But it increases in certain physiological conditions. The vaginal secretion consists of tissue fluid, epithelial debris, some leucocytes (never contains more than an occasional pus cell), electrolytes, protein, and lactic acid (in a concentration of 0.75%). Apart from Doderlein bacilli, it contains many pathogenic organisms, including Cl. welchii. The glycogen content is highest in the vaginal fornix to the extent of 2.5-3mg, and is lowest in the lower third, being 0.6-0.9mg per cent.[18,19]

Materials and Methods

Drug Quality Standardisation

The following physicochemical tests of the research medicine (both the Amla fruit and seeds separately) were done.

(1) Determination of Foreign Matter

(2) Determinaion of Moisture Content

(3) PH Value

(4) Total Ash

(5) Acid Insoluble Ash

(6) Water Soluble Ash

(7) Water Soluble Extractive

(8) Alcohol Soluble Extractive

(9) Ether Soluble Extractive

(10) Analysis of vitamin C

(11) Thin Layer Chromatography

Study Design

For this study 30 patients were selected, who fulfilled the criteria of selection and attended the OPD and IPD of department of Dravyaguna Vigyan of Government Autonomous Dhanvantari Ayurveda College and Hospital Ujjain.

30 patients are divided into following groups:-

- GROUP A- In this group 10 gm amalaki seeds churna with sugar and honey is given for 21 days.
- GROUP B- In this group 10 gm amalaki fruit churna with sugar and honey is given for 21 days.
- GROUP C- In this group 10 gm amalki fruit and seed powder with sugar and honey is given 21 days.

Clinical features :

- White/pale vaginal discharge and vaginal odour, vaginal itching, vaginal inflammation, vaginal pain were kept as the main symptoms for the study.

  Patients with backache, lower abdominal pain, confusion, drowsiness, anorexia, dizziness, insomnia, diuresis and headache as other symptoms also included in the groups.

Laboratory Tests -

- Hb%, TLC, DLC
- Urine-routine, Urine-microscopic
- Wet Vaginal Swab Preparation Microscopically for: Pus Cells, Trichomonas Vaginalis, Candida Albicans
- Vaginal Swab Culture for any pathogenic bacteria

The above tests were performed pre-treatment and post-treatment.

Scoring for clinical features

Vaginal discharge volume

Continuous excessive vaginal discharge (Need to Vulval Pad)	3
Continuous vaginal wetting (Wetting the Under Garments)	2
Occasional vaginal discharge (in addition to normal conditions).	1
Absent	0

Vaginal itching

Intense unbearable itching all week. Presence of Scraping Marks in Vaginal Examination	3
3-4 days a week	2
Once a week	1
Absent	0

Vaginal pain

Always severe pain during and after sexual intercourse	3
Slight pain during sexual intercourse	2
Occasional pain during sexual intercourse	1
Absent	0

Burning sensation

Burning during whole day	3
Burning during micturition and during sexual intercourse	2
Only during sexual intercourse	1
Absent	0

Vaginal odour - on P/V test

Very strong intolerable odour	3
Moderate odour	2
Mild odour	1
Absent	0

Body ache

Always severe pain in entire body	3
Pain while doing most of the daily activities	2
Sometimes pain while doing daily activities	1
Absent	0

Katishool

Always pain even at rest	3
Pain while doing daily activities	2
Occasionally pain while doing daily activities	1
Absent	0

Pain in lower abdomen

Always severe Pain	3
Related to menstruation (before/after)	2
Occasionally	1
Absent	0

Delusion

Delusion while sitting/sleeping/walking	3
Positional Delusion (while changing position, getting up, sitting etc.)	2
Occasionally once a week	1
Absent	0

Drowsiness

Drowsiness throughout the day	3
Drowsiness during the day except after meals	2
Drowsiness in the morning	1
Normal after meals	0

Aruchi

Disinterest in the sight and smell of food	3
Aversion to food and less intake of food	2
No interest in food but eats food	1
Interest in food	0

Constipation

No normal daily tendency, lumpy stool tendency	3
Daily tendency Lumpy stool tendency	2
Daily tendency, occasionally lumpy	1
Fair tendency	0

Insomnia

1-2 hrs sleep	3
2-4 hrs sleep	2
4-6 hrs Sleep	1
6-8 hrs Normal sleep	0

Diuresis

Burning with tendency to urinate throughout the day	3
Burning with 2-4 urinary tract infections in 24 hours	2
Burning once in 24 hours	1
Absent	0

Headache

Daily	3
2-3 times a week	2
Once a week	1
Not even once a week	0

Drug Preparation

Amla collection and preservation

Ripe fruits should be picked in Magha and Phalgun, and dried in the shade and kept in sealed boxes in a cold area, air-dust-free, humid place.

Drug Preparation for Group A

"Amalaki seeds powder+ sugar+ honey"

For research work good quality amalaki fruit purchased. Amalaki fruit was cut into small pieces, then seeds were removed from flesh and dried under the sun, then seeds were converted into powder and given to patient with honey and sugar.

Selection of Drug – In Jan- Fab month completely ripe, yellowish, fleshy was purchased. Fruit had 6 lines and were 6-12gm in weight.

Drug Preparation for Group B

Amalaki fruit powder+ sugar+ honey

Same method mentioned for group A drug preparation process was followed but fleshy part without seeds was taken and kept under the sun. on completely drying seeds were converted into powder and then sieved.

This powder was given to patient with double dose of honey and sugar.

Drug Preparation for Group C

Amalaki fruit+ Amalaki seed converted into powder and given to patient with twice dose of sugar and honey.

Observations

Table No. 1 Comparative Analytical Study of Emblica officinalis Fruit and Seed Powder[20]

S. No.	Determination of	Emblica officinalis seed powder	Emblica officinalis Fruit Powder	API Standards	Reference
1.	Foreign matter	No Foreign matter	No Foreign matter	Not more than 1%	API/Appendix I Page No. 142/2.2.2 2.
2.	PH	5.13	3.30	Not mentioned	API/Appendix III / Page No. 156/3.3
3.	Moisture content	5.65%	6.96%	Not mentioned	API/Appendix I Pg No. 142/2.2.2
4.	Total Ash	10.3%	5.25%	Not more than 7%	API/Appendix I pg. 143/2.2.3
5.	Acid Insoluble Ash	0.85%	1.70%	Not more than 2%	API/Appendix 1 pg. 143/2.2.4
6.	Water soluble Ash	.055%	2.15%	Not Mentioned	API/Appendix I pg. 143/2.2.5
7.	Water Soluble Extractive	5.88%	60.5%	Not less than 50%	API/Appendix I pg. 143/2.2.7
8.	Alcohol Soluble Extractive	6.9%	48.58%	Not less than 40%	API/Appendix I pg. 143/2.2.6
9.	Ether Soluble Extractive	.720%	3.94%	Not Mentioned	API/Appendix I pg No. 143/2.2.8
10.	Vitamin C	3 mg/gm	5.8 mg/gm	6 mg/gm fruit (WI)	Vogle's Chemical analysis

- All the above standards given in API are for Amla fruit only, no standards have been obtained for Amla seeds.
- pH, Water Soluble Ash, Ether Soluble Extractive are not mentioned in the standard API.

Table No. 2. TLC Profile of Emblica officinalis

	Fruit powder		Seed powder	
Name of Extract	RF Value	Colour of Band	RF Value	Colour of Band
Benzene	.05	Brown	.11	Dark Yellow
	.10	Light Brown	.32	Pale Yellow
	.25	Dark Yellow	.52	Brown
	.50	Brown	.61	Yellow
	.62	Yellow	.80	Greyish
	.78	Light Yellow		
Chloroform	.46	Yellow	.43	Yellow
	.63	Yellow	.58	Brown
	.85	Brownish Yellow	.92	Dark Brown
Methanolic Extract	.05	Brown	.38	Brown
	.30	Pale Yellow	.70	Brownish Yellow
	.68	Yellow	.79	Reddish Brown
	.90	Dark Brown	.82	Yellow
	.99	Dark Brown		

Table No. 3 Showing the Pattern of Clinical changes in all subjective parameters n=10 (Group-A)

S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Vaginal discharge	2.9	0.7	2.2	75.86	0.63	0.2	11	<.001	H.S.
2.	Vaginal odour	0.5	0	0.4	80	0.84	0.26	1.5	>0.1	I.S.
3.	Vaginal itching	0.9	0.6	0.3	33.33	0.82	0.26	1.115	>0.1	I.S.
4.	Burning sensation	0.8	0.4	0.4	50	0.69	0.22	1.80	>0.1	I.S.
5.	Pain	0.9	0.4	0.5	55.55	0.70	0.22	1.80	<0.1	I.S.
6.	Body ache	2	0.7	1.3	65	0.82	0.28	4.99	<.001	H.S.
7.	Backache	2	1	1	50	5.66	0.21	4.74	<0.1	S.
8.	Lower abdominal pain	2.1	0.6	1.5	71.42	0.84	0.26	5.58	<.001	H.S.
9.	Delusion (Bhram)	1.3	0.4	0.9	69.23	0.73	0.23	3.85	<.01	S.
10.	Lethargy (Tandra)	1.1	0.1	1	90.90	0.81	0.58	3.87	<. 01	S.
11.	Aruchi	1.5	0.5	1	66.66	0.94	0.29	3.35	<.01	S.
12.	Insomnia	1.5	0.5	1	66.66	0.94	0.29	3.35	<.01	S.
13.	Constipation	1	0.4	0.6	60	0.84	0.26	2.25	>.05	I.S.
14.	Burning Micturition	0.8	0.3	0.5	62.5	0.70	0.22	2.23	>.05	I.S.
15.	Headache	1.2	0.5	0.7	58.33	0.94	0.3	2.33	<.05	S.

Table No. 4 Showing the Pattern of Clinical changes in all subjective parameters n=10 (Group-B)

S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Vaginal discharge	2.8	1	1.8	64.28	0.91	0.29	6.19	<0.001	H.S.
2.	Vaginal odour	0.1	0	0.1	0	0.31	0.1	1	>0.1	I.S.
3.	Vaginal itching	1.5	0.3	1.2	80	1.22	0.38	3.08	<0.02	S.
4.	Burning sensation	1.2	0.1	1.1	91.66	0.99	0.31	3.49	<.01	S.
5.	Pain	1.4	0.3	1.1	78.57	1.1	0.34	3.16	< 0.02	S.
6.	Body ache	2.5	0.7	1.8	72	0.78	0.24	7.21	<.001	H.S.
7.	Backache	2.2	1	1.2	54.54	0.78	0.24	4.81	<.001	H.S.
8.	Lower abdominal pain	2.5	0.88	1.66	65.21	0.97	0.32	5.14	<.001	H.S.
9.	Delusion (Bhram)	1.4	0.2	1.2	85.71	0.78	0.24	4.81	<.001	H.S.
10.	Lethargy (Tandra)	1.4	0.4	1	71.42	0.81	0.25	3.87	<.01	S.
11.	Aruchi	1.1	0.2	0.9	81.81	0.99	0.31	2.86	<.02	S.
12.	Insomnia	1.1	0.5	0.6	54.54	0.84	0.26	2.25	>0.05	I.S.
13.	Constipation	1.9	0.8	1.1	57.89	0.99	0.31	3.49	<0.01	S.
14.	Burning Micturition	1.5	0	1.5	100	0.97	0.30	4.88	<.001	H.S.
15.	Headache	1.4	1	0.8	57.14	0.78	0.24	3.20	<.02	S.

Table No.5 Showing the Pattern of Clinical changes in all Subjective parameters n=10 (Group-C)

S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Vaginal discharge	2.8	1	1.8	64.28	1.22	0.38	4.63	<.01	S.
2.	Vaginal odour	.3	0	0.3	100	0.94	0.3	1	>0.1	I.S.
3.	Vaginal itching	0.3	0.2	0.1	33.33	0.31	0.1	1	>0.1	I.S.
4.	Burning sensation	0.6	0.3	0.1	50	0.67	0.21	1.40	>0.1	I.S.
5.	Pain	1.3	0.3	1	76.92	1.24	0.39	2.53	<0.05	S.
6.	Body ache	2.4	0.9	1.5	62.5	0.97	0.30	4.88	<.001	H.S.
7.	Backache	2.4	0.9	1.5	62.5	0.97	0.30	4.88	<.001	H.S.
8.	Lower abdominal pain	2.5	0.4	2.1	84	0.73	0.23	9	<.001	H.S.
9.	Delusion (Bhram)	1.2	2.1	1.1	91.66	0.87	0.27	3.97	<.01	S.
10.	Lethargy (Tandra)	1.1	0.1	1	90.90	0.81	0.25	3.87	<.01	S.
11.	Aruchi	1.4	0.4	1	71.4	0.81	0.25	3.87	<.01	S.
12.	Insomnia	0.6	0	0.6	100	0.96	0.30	1.96	>.05	I.S.
13.	Constipation	1.1	0.4	0.74	63.63	0.82	0.26	2.68	<.05	S.
14.	Burning Micturition	1	0.6	0.4	40	0.69	0.22	1.80	>0.1	I.S.
15.	Headache	1.7	0.8	0.9	52.94	1.1	0.34	2.58	<.05	S.

Table No.6 Showing The Pattern of Changes in all Objective Parameters n=10 (Group-A)

S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Hb	10.95	11.1	-1.5	13.6↑	0.57	0.18	8.18	<.001	H.S.
2.	TLC	6.2	6.23	-.03	0.48↑	490.01	154.95	1.5	>0.1	I.S.
3.	Polymorph	54.6	55.8	-1.2	2.19↑	2.25	0.74	1.68	>0.1	I.S.
4.	Eosinophils	0.4	0.7	-0.3	75↑	0.94	0.3	1	>0.1	I.S.
5.	Basophils	0	0	0	0	0	0	0	>0.1	I.S.
6.	Monocytes	1.6	1.7	-0.1	6.25↑	1.10	0.34	0.28	>0.1	I.S.
7.	Lymphocytes	43.4	41.6	1.8	4.14↓	1.98	0.62	2.26	<.02	S.
8.	Urine/Pus cell	2.6	2.4	0.2	7.69↓	1.75	0.55	0.36	>0.1	I.S.
9.	Urine Bacteria	1.4	1.4	0	0	0.31	0.25	0	>0.1	I.S.
10.	Vaginal culture/ pathogenic bacteria	1	0	1	100↓	0.81	0.25	3.87	<.01	S.
Vaginal Swab Microscopically										
11.	For Pus cells	2.3	1	1.3	56.52↓	1.05	0.33	3.88	<.01	S.
12.	For T. vaginalis	0.1	0	0.1	100↓	0.31	0.1	1	>0.1	I.S.

Table No.7 Showing The Pattern of Changes in all Objective Parameters n=10 (Group-B)

S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Hb	10.95	11.1	-1.5	13.6↑	0.57	0.18	8.18	>.001	H.S.
2.	TLC	6.2	6.23	-.03	0.48↑	490.01	154.95	1.5	>0.1	I.S.
3.	Polymorph	54.6	55.8	-1.2	2.19↑	2.25	0.74	1.68	>0.1	I.S.
4.	Eosinophils	0.4	0.7	-0.3	75↑	0.94	0.3	1	>0.1	I.S.
5.	Basophils	0	0	0	0	0	0	0	>0.1	I.S.
6.	Monocytes	1.6	1.7	-0.1	6.25↑	1.10	0.34	0.28	>0.1	I.S.
7.	Lymphocytes	43.4	41.6	1.8	4.14↓	1.98	0.62	2.26	>.02	S.
8.	Urine/Pus cell	2.6	2.4	0.2	7.69↓	1.75	0.55	0.36	<0.1	I.S.
9.	Urine Bacteria	1.4	1.4	0	0	0.31	0.25	0	>0.1	I.S.
10.	Vaginal culture/ pathogenic bacteria	1	0	1	100↓	0.81	0.25	3.87	<.01	S.
Vaginal Swab Microscopically										
11.	For Pus cells	2.3	1	1.3	56.52↓	1.05	0.33	3.88	<.01	S.
12.	For T. vaginalis	0.1	0	0.1	100↓	0.3 1	0.1	1	>0.1	I.S.
13.	For Monilial	0.1	0	0.1	100↓	0.31	0.1	1	>0.1	I.S.

Table No. 8 Showing The Pattern of Changes in all Objective Parameters n=10 (Group-C)

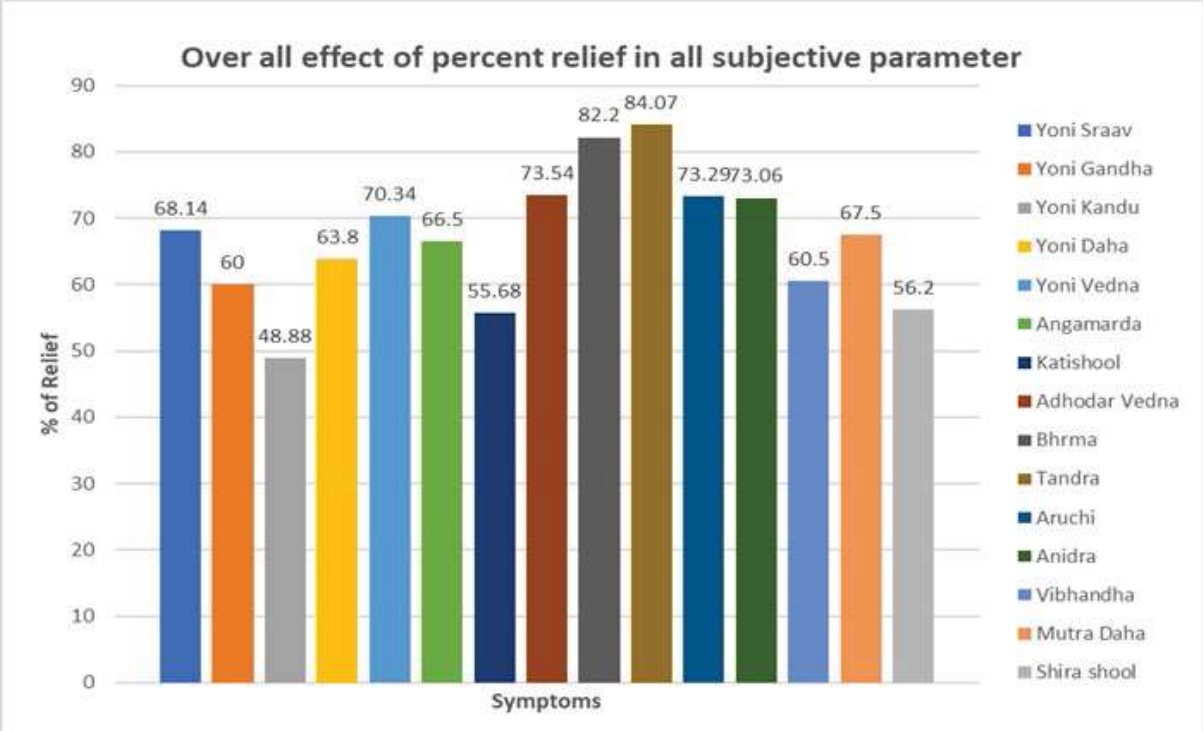
S. No.	Symptom	Mean			% Of Relief	± S.D.	S.E.	t	p	Relief
		B.T.	A.T.	D.						
1.	Hb	11.1	11.3	0.2	1.80↑	0.948	0.3	0.66	>0.1	I.S.
2.	TLC	6.30	6.32	-0.02	0.31↑	0.55	0.17	0.11	>0.1	I.S.
3.	Polymorph	55.4	55.6	-0.2	-0.36↑	4.39	1.38	0.14	>0.1	I.S.
4.	Eosinophils	0.1	0.1	0	0	-0.47	0.149	0	>0.1	I.S.
5.	Basophils	0	0	0	0	0	0	0	>0.1	I.S.
6.	Monocytes	1.9	1.3	0.5	26.31↓	1.58	0.5	1	>0.1	I.S.
7.	Lymphocytes	42.1	43	-0.9	-2.13↑	3.38	1.06	0.84	>0.1	I.S.
8.	Urine/Pus cell	2.6	2.2	0.4	17.09↓	1.26	0.4	1.11	>0.1	I.S.
9.	Urine Bacteria	1.6	1.1	0.5	31.25↓	0.52	0.16	3	<0.02	S.
10.	Vaginal culture / pathogenic bacteria	0.5	0.2	0.3	60↓	0.82	0.26	1.15	>0.1	I.S.
Vaginal Swab Microscopically										
11.	For Pus cells	2.2	1.2	1	45.45↓	1.15	0.36	2.73	<0.05	S.
12.	For T. vaginalis	0.2	0	0.1	100↓	0.42	0.13	1.5	>0.1	I.S.

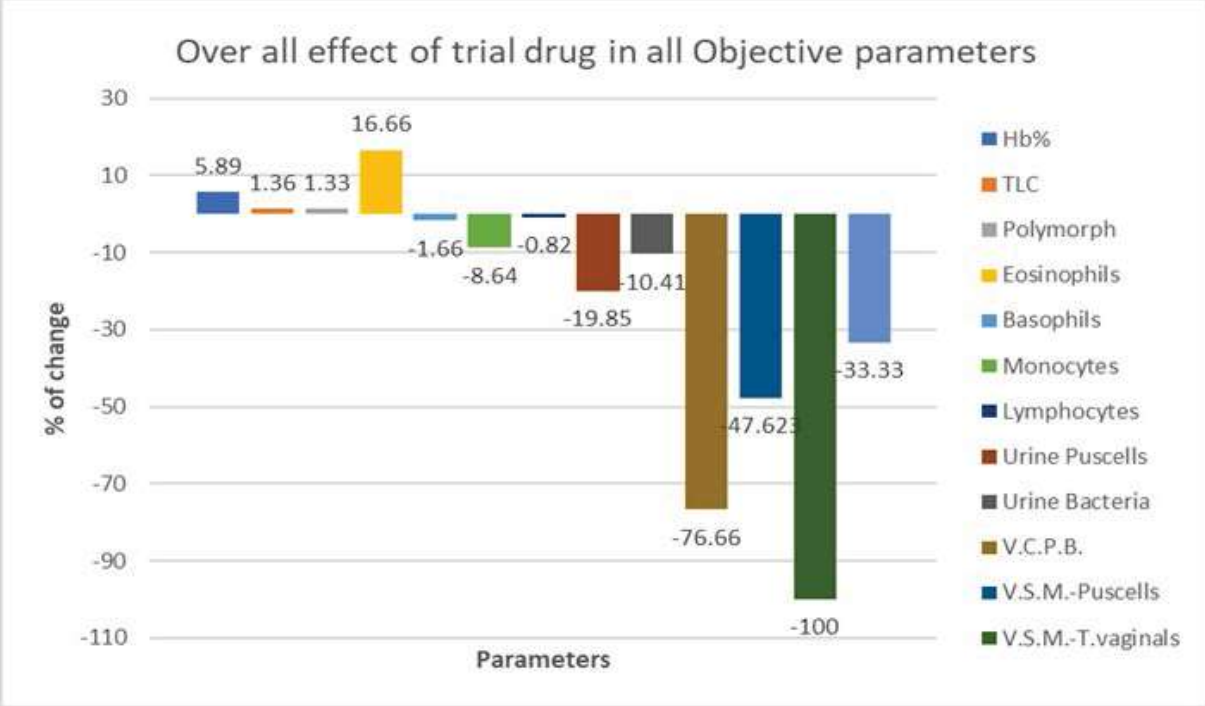
Table No. 9 Overall Percentage Relief of Trial Drug in all Subjective Parameter

S. No.	Symptoms	Group 'A'	Group 'B'	Group 'C'	Total
1.	Vaginal discharge	75.86	64.28	64.28	68.14
2.	Foul smell	80	100	100	99.99
3.	Vaginal itching	33.33	80	33.33	48.88
4.	Burning sensation	50	91.96	50	63.80
5.	Pain	55.55	78.57	76.92	70.34
6.	Body ache	65	72	62.92	66.5
7.	Backache	50	54.54	62.5	66.5
8.	Lower abdominal pain	71.42	65.21	84	73.54
9.	Delusion (Bhram)	69.23	85.71	91.66	82.2
10.	Lethargy (Tandra)	90.90	71.42	90.90	84.07
11.	Aruchi	66.66	81.81	71.4	73.29
12.	Insomnia	66.66	54.54	100	73.06
13.	Constipation	60	57.89	63.63	60.5
14.	Burning Micturition	62.5	100	40	67.5
15.	Headache	58.33	57.14	52.94	56.20
16.	Total relief in %	63.69	74.33	67.65	68.55

Table No.10 Overall effect of percent Relief in all Objective parameter

S. No.	Symptome		Group 'A'	Group 'B'	Group 'C'	Total
1.	Hb%		13.6↑	2.28↑	1.80↑	5.89↑
2.	TLC		0.48↑	3.3↑	0.31↑	1.36↑
3.	Polymorph		2.19↑	1.46↑	0.36↑	1.33↑
4.	Eosinophils		75↑	83.33↓	88.33↑	16.66↑
5.	Basophils		0	5↓	0	1.66↓
6.	Monocytes		6.25↑	5.88↓	26.31↓	8.64↓
7.	Lymphocytes		4.14↓	0.466↓	2.13↑	0.82↓
8.	Urine pus cells		7.69↓	34.78↓	17.09↓	19.85↓
9.	Urine bacteria		0	0	31.35↓	10.41↓
10.	Vaginal culture Pathogenic bacteria		100 ↓	70↓	60↓	76.66↓
11.	Vaginal swab Microscopically for	Pus cells T. Vaginalis	56.52↓ 100↓	40.90↓ 100↓	45.45↓ 100↓	47.623↓ 100↓
		Monilial	Not found	100↓	Not found	33.33↓

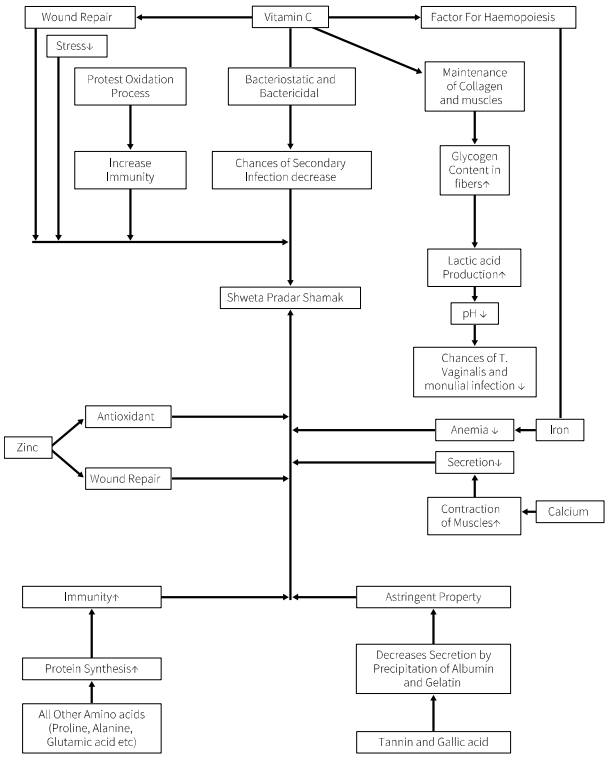




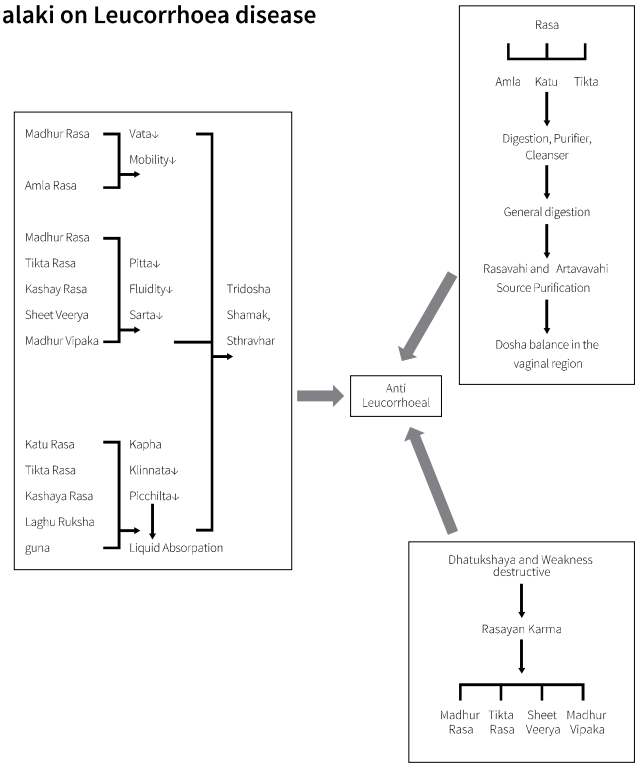
V.C.P.B.= Vaginal Culture Pathogenic Bacteria
V.S.M.= Vaginal Swab Microscopically

DISCUSSION [21,22]

Probable Mode of Action of Amalki According to Chemical Constituents



Possible effectiveness of Amalaki on Leucorrhoea disease



Effect on Vaginal Discharge

Vaginal discharge is the main symptom of leucorrhoea. There was 75.86% benefit in group A, 64.28% in group B and 64.28% in group C. From the statistical point of view, all the three results were found to be fully significant.

Amla fruit contains five rasa and mainly amla rasa is predominant. And Amla seeds are mainly kashaya and madhur rasa, and both are ruksha in nature. Therefore, due to being kashaya and ruksha in nature, they work to stop secretion. Amalaki is a substance rich in tannin and vitamin C, so it does the sthambhan process properly.

- **Effect on Vaginal Odour**
  80% in group 'A', 100% in group 'B' and 'C', 100% results were obtained. On studying statistically, the results were found to be insignificant in all three groups because out of 10 patients in each group, this symptom was found in only 1-2 patients. Vaginal odour is a symptom of vikrat pitta Amla is tridosha pacifier and due to its Madhur rasa and sheet veerya, it is pitta pacifier.

- **Effect on Vaginal Itching**
  33.35% benefit in group 'A', 80% in group 'B' and 100% in group 'C' ' showed 33.33% benefit. Itching is a symptom of vikrat kapha, and Amalaki being ruksha in nature and containing kashaya rasa, is a kapha pacifier and also removes obstruction of the lower tracts.

- **Effect on Burning Sensation in Vagina**
  Group 'A' showed 50% relief on Vaginal Burning, Group 'B' showed 91.66% relief and Group 'C' showed 50% relief. Vaginal Burning is a symptom of vikrat Pitta and Amalaki It is a pitta pacifier.

- **Effect on Vaginal Pain**
  There is 55.55% positive result in group A, 78.57% in group B and 76.92% in group C. According to statistical analysis group A shows less significant results and group B & C shows significant results. Vaginal pain mainly occurs due to vata prakopa and amalaki is vata shamaka.

- **Effect on Body ache**
  Group 'A' got 65% benefit and Group 'B' got 72% benefit and Group 'C' got 62.5% benefit. And the results were found to be statistically significant in all the three groups. Angamard is especially a symptom of Vata dosha. Amalaki is a Tridosha pacifier and being rasayan potent, it is also beneficial in Angamard.

- **Effect of Backache (Katishool)**
  Results of 50% benefit were obtained in Group 'A', 54.54% in Group 'B' and 62.5% benefit in Group 'C'. The results of Group 'A' were statistically significant and the results of Group 'B' and 'C' were found to be significant. Back ache is symptom of Vata Dushti and Amalaki is Tridosha pacifier.

- **Effect on Lower Abdominal Pain**
  71.42% benefit was found in group 'A' and 65.21% and 84% benefit was found in group 'B' and 'C' respectively. The results were found to be effective in all three groups.

- **Effect on Delusion**
  69.23% benefit was found in group 'A', 85.71% benefit was found in group 'B' and 91.66% benefit was found in group 'C'. Delusion is a symptom of Vata Dushti, Delusion is a symptom of anemia and rasa dhatu kshaya, hence Amalaki is a rasayan, analgesic and Vata pacifier.

- **Effect on Drowsiness (Tandra)**
  In group A 90.90%, group B 71.42% and group C 90.90% results were positive. According to statistical analysis all three group results were significant.

- **Effect on Reluctance (Aruchi)**
  66.66% benefit results were obtained in group 'A', 81.81% in group 'B' and 71.4% in group 'C'. Statistically significant results were obtained in all three groups. Aruchi is a symptom of Kapha dosha. Amalaki works as a laxative by reducing Kapha.

- **Effect on Insomnia (Anidra)**
  66.66% benefit results were obtained in group 'A', 54.54% in group 'B' and 100% in group 'C'. Statistically, significant results were obtained in group 'A' and insignificant results were obtained in group 'B' and 'C'. Insomnia is a symptom of Vata dosha.

- **Effect on Constipation (Vibandh)**
  60% in group 'A', 57.89% in group 'B' and 63.63% in group 'C'. Constipation is a symptom of Agnimandaya and Amotpatti. Amalaki is the agni prakashaka and sthrotho sodhak. Hence, it will be effective in constipation.

- **Effect on Burning Micturition**
  The research medicine on urinary burning showed 62.5% benefit in group 'A',

maximum 100% benefit in group 'B' and 40% benefit in group 'C'. From the statistical point of view, the results were insignificant in group 'A' and 'C' and significant in group 'B'. Hence, despite the presence of Amla rasa, Amalaki fruit is especially pitta shamak.

- **Effect on Headache**
  In headache group A shows 58.53% results, group B shows 57.14% results and group C shows 52.94% results. All the group shows significant results.
  Amalaki is tridosh shamak and works as rasayan that's why it works of headache.

Effect of drug on laboratory test

- **Effect on Hb%**
  There was 13.6% increase in group 'A', 2.28% increase in group 'B' and 1.80% increase in group 'C'. It is clear that Amalaki increases Hb% as is also found in the description of anemia, and the use of Amalaki in Anaemia has been described as beneficial in WI, DBMP, IMP etc. Amalaki is rich in Vitamin C and Tannin. And Vitamin C increases the absorption of Iron.

- **Effect on TLC**
  There was an increase of 0.48% in group 'A' 3.3% in group 'B' and 0.13% in group 'C'.

- **Effect on DLC**
  In Polymorph there was a change of 2.19% in group 'A', 1.46% in group 'B' and the lowest change was 0.36% in group 'C'. Eosinophils increased by 75% in group 'A', decreased by 83.33% in group 'B' and there was no change in group 'C'. Statistically insignificant results were obtained in all three groups. There was no change in Basophils in group 'A' and 'C' and decreased by 50% in group 'B'. Monocytes increased by 6.25% in group 'A' and increased by 5.88% in group 'B' and decreased by 26.31% in group 'C'. In Lymphocytes there was a decrease of 4.14% in group 'A', a decrease of 0.46% in group 'B' and an increase of 2.13% in group 'C'. Significant results were obtained in group 'A' and insignificant results were obtained in group 'B' and group 'C'. The reduction of lymphocytes also indicates the antibacterial properties of the medicine.

- **Effect on Urine pus cells Urine**
  There was a 7.96% decrease in pus cells in group 'A', 34.78% decrease in 'B' and 17.09% decrease in group 'C'. This also shows the antibacterial properties of Amalaki.

- **Research drug effect on Vaginal Swab Pus Cells**
  On testing the Vaginal Swab microscopically, 56.52% benefit was obtained in group 'A', 40.90% in group 'B' and 45.45% in group 'C'. Significant result was obtained in group 'A' and 'C' and completely significant result was obtained in group 'B'.

- **Research drug effect on Trichomonas Vaginalis**
  On testing microscopically, Trichomonas was absent after treatment in all the three groups 'A', 'B', 'C'. Thus, there was 100% relief in all the three groups, but statistically the results were insignificant. Since this symptom was present in only one patient out of 10 patients in group 'A' and 'B' before treatment and in group 'C' this symptom was found present in only two patients. Anthelmintic action of Amalaki has been clearly described in WI.
  Trichomonas is also a protozoan, hence Amalaki is definitely effective on Trichomonas vaginalis.

- **Research drug effect on Candida Albicans (Moniliasis)**
  Candida albicans was not found before and after treatment in group 'A' and 'C'. And in group 'B', Candida albicans was present in only one patient before treatment and it was absent after treatment. Hence, there was 100% benefit and the results were found to be insignificant from the statistical point of view. In IMP[2], the antifungal action of Amla has been clearly declared.

- **Research Drug Effect on Vaginal Culture Pathogenic Bacteria**
  100% benefit was obtained in group 'A', 70% in group 'B' and 60% in group 'C'. Statistically, significant results were obtained in group 'C' and 'B' and insignificant results were obtained in group 'C'. Hence, antibacterial properties are found in both Amalaki seed and Amalaki fruit.

Conclusion

It is clear from the above study that Amalaki seed proved to be more effective than Amalaki fruit in reducing the vaginal discharge in excessive amount, the main symptom of Leucorrhoea. And in all other symptoms mentioned in the scriptures, Amalaki fruit (group 'B') had a higher average percentage of benefit. This is self-evident because of the astringent juice predominant in Amalaki seed

and the acid juice predominant in the fruit and chemical properties

Amalaki fruit is particularly acidic and contains five rasa, and in Kai. Ni. the Amalaki seed is mainly described as astringent and sweet. Amla fruit is mainly aphrodisiac, chemical, mental enhancer, age enhancer, eye and hair. Amla fruit is especially said to be anti-diarrheal, anti-hepatitis, anti-aging, tridoshagna, anti-fever and other important diseases. It is also said to be anti-sugar and anti-leucorrhoea. In other texts, Amla fruit is mentioned for use in Leucorrhoea. In Indian medicinal plant by kirtikar', Amla seed is also mentioned to be useful in Leucorrhoea. Viamin C and tannin are mainly found in the chemical composition of Amla. According to WI, one Amla contains three times more protein and 160 times more Vitamin C than an apple.



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References:

1. Agnivesha. Charaka Samhita, elaborated by Charaka and redacted by Dridhabala. Sutra Sthana, Chapter 1, Verse 30. In: Sharma RK, Dash B, translators. Varanasi: Chaukhambha Sanskrit Series Office; 2014. p. 24.
2. Agnivesha. Charaka Samhita, elaborated by Charaka and redacted by Dridhabala. Sutra Sthana, Chapter 9, Verses 3–5 (Chikitsa Chatushpada). In: Sharma RK, Dash B, translators. Varanasi: Chaukhambha Sanskrit Series Office; 2014. p. 171–173.
3. Agnivesha. Charaka Samhita, elaborated by Charaka and redacted by Dridhabala. Sutra Sthana, Chapter 1, Verses 124–126. In: Sharma RK, Dash B, translators. Varanasi: Chaukhambha Sanskrit Series Office; 2014. p. 86–87.
4. Agnivesha. Charaka Samhita, elaborated by Charaka and redacted by Dridhabala. Sutra Sthana, Chapter 9, Verse 4. In: Sharma RK, Dash B, translators. Varanasi: Chaukhambha Sanskrit Series Office; 2014. p. 171.
5. Anonymous. The Ayurvedic Pharmacopoeia of India. Part I, Vol. I. New Delhi: Government of India, Ministry of AYUSH; 2001. p. 7–9.
6. Anonymous. The Wealth of India: Raw Materials. Vol. III: D–E. New Delhi: Council of Scientific and Industrial Research; 1952. p. 126–132.
7. Kirtikar KR, Basu BD. Indian Medicinal Plants. Vol. II. 2nd ed. Dehradun: International Book Distributors; 1999. p. 2220–2223.
8. Sharma PV. Dravyaguna Vigyana. Vol. II. Varanasi: Chaukhambha Bharati Academy; 2012. p. 758–760.
9. Agniveśa. Charaka Saṁhitā, elaborated by Charaka and redacted by Dṛḍhabala. Cikitsā Sthāna, Chapter 30 (Pāṇḍu Cikitsā), verses 89–90. In: Sharma RK, Dash B, translators. Varanasi: Chaukhambha Sanskrit Series Office; 2014. p. 525–526.
10. Vāgbhaṭa. Aṣṭāṅga Hṛdaya. Uttara Sthāna, Chapter 33 (Yonivyāpada), verses 19–21. In: Murthy KRS, translator. Varanasi: Chaukhambha Krishnadas Academy; 2016. p. 306–308.
11. Suśruta. Suśruta Saṁhitā. Uttara Tantra, Chapter 38 (Yonivyāpada), verses 9–11. In: Sharma PV, translator. Varanasi: Chaukhambha Visvabharati; 2014. p. 392–394.
12. Bhāvamiśra. Bhāvaprakāśa. Madhyama Khanda, Yoniroga Prakaraṇa (Śveta Pradara). In: Chunekar KC, editor. Varanasi: Chaukhambha Bharati Academy; 2015. p. 764–766.
13. Vāgbhaṭa. Aṣṭāṅga Hṛdaya. Uttara Sthāna, Chapter 33 (Yonivyāpada), verses 24–27. In: Murthy KRS, translator. Varanasi: Chaukhambha Krishnadas Academy; 2016. p. 309–312.
14. Bhāvamiśra. Bhāvaprakāśa. Madhyama Khanda, Yoniroga Prakaraṇa (Śveta Pradara). In: Chunekar KC, editor. Varanasi: Chaukhambha Bharati Academy; 2015. p. 764–766.
15. Dutta DC. Textbook of Gynaecology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2003. p. 180–182.
16. Jeffcoate N. Principles of Gynaecology. 6th ed. London: Butterworths; 2001. p. 531–533.
17. Basu SK, Mallick B. Studies on normal vaginal discharge. J Obstet Gynaecol India. 1970; 20:425–429.
18. Dutta DC. Textbook of Gynaecology. 4th ed. New Delhi: Jaypee Brothers Medical Publishers; 2003. p. 176–179.
19. Jeffcoate N. Principles of Gynaecology. 6th ed. London: Butterworths; 2001. p. 528–531.
20. Anonymous. The Ayurvedic Pharmacopoeia of India. Part I. Appendices I & III. New Delhi: Ministry of AYUSH, Government of India; 2001. p. 142–143, 156.
21. Sharma PV. Dravyaguna Vigyana. Vol. II. Varanasi: Chaukhambha Bharati Academy; 2012. p. 758–760.
22. Bhāvamiśra. Bhāvaprakāśa Nighaṇṭu. Haritakyādi Varga, verses 39–41. In: Chunekar KC, editor. Varanasi: Chaukhambha Bharati Academy; 2015. p. 12–14.