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PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF SEETARAMA VATI IN THE MANAGEMENT OF RHEUMATOID ARTHRITIS

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ABSTRACT

Rheumatoid Arthritis (RA) is caused by type III hypersensitivity reaction by forming antigen antibody complex which deposits at the joints is caused Arthritis of the joints. According to *Ayurveda* main culprit of the disease is *Ama*. Due to mal function of *Agni* at any level causes formation of *Ama*. This *Ama* is very similar to free radicals which results from intermediate production of metabolism of carbohydrates, protein and fat. This *Samavastha* when associated with *Madyama Roga Marga* which is obstructed by function of *Vata* due to *Avarana* of *Ama* of *Srothas* cause pathogenesis of *Amavata*. Main clinical manifestations of disease are producing pain all over the body, joints, loss of taste, thirst, lack of enthusiasm, heaviness, fever, indigestion and swelling of the body parts (Joint). On pharmacognostical study, Oil globules of *Jeeraka*, *Krishna Jeeraka*,

Ajwain, Jatiphala, Kushtha, Tulsi and *Kesara*. Pitted stone cell of *Jatiphala*, Cork cells of *Kushtha*. Trichome of *Tulsi*. Epicarp cells of *Dhanyaka*, Rhomboidal crystal *of Kutaja*, Pollen Grainand Epidemal Cells with oil globules of *Lavanga*, Trichome of *Drona Pushpi*, Stone cells of *Pippali* were identified. Analytical study showed 07 spots at 254 nm and 09 spots at 366 nm.

KEYWORDS: Rheumatoid Arthritis, *SeetaramaVati*, *Amavata.*

INTRODUCTION

Rheumatoid Arthritis (RA) is a chronic inflammatory multisystem disease involving articular and extra articular tissue, the cause of which is still uncertain. It is characterized by persistent bilateral symmetric arthritis (Synovitis) involving the peripheral small joints resulting in cartilage destruction and bony erosions with subsequent joint deformities.[1] Rheumatoid Arthritis(RA) is seen throughout the world and affects all races.The prevalence of RA is approximately 1% of the population. Women are affected approximately three times more often than men. However onset is most frequent during the fourth and fifth decades of life with 80% of all patients developing the disease between the age of 35 and 50years.[2] According to *Ayurveda, Ama* and vitiated *Vata* play main role in the pathogenesis of *Amavata*.[3] Patients of *Amavata* may present with acute, sub acute, or chronic stage and with complication.The goals of Rheumatoid Arthritis management are to control pain and swelling, delay disease progression, minimize disability and improve quality of life. *Seetarama Vati* is the Sri Lankan Traditional medicine drug[4] which is being used by traditional practitioners in Sri Lanka, to manage to sub acute case of *Amavata* which contains *Deepana, Pachana, Anulomana* and *Vatakapha Shamaka Drugs*, targeting the *Agni* which is the main seat of pathogenesis.

The trial drug *Seetarama Vati* explained in *Vatikaprakarana* which is the one of traditional book of Sri Lanka for the management of any type of *Amaja* and *Kaphaja* conditions. It consists of thirty seven of ingredients. Twenty eight are herbal and nine are minerals. Most of the drugs are having *Deepana, Pachana* properties due to their *Ushna* and *Thekshana Guna* simultaneously are having *Vedanahara*(Analgesic) and *Shothahara*(Anti Inflammatory) action.It is a powerful antioxidant, protecting cells from the damage of free radicals.[5,6]

MATERIALS AND METHODS

Collection of raw drug

The raw drugs for the preparation of *Seetarama Vati* were procured from Ayurvedic Drug Corporation, Old Kottawa Road, Navinna, Maharagama, Sri Lanka. The ingredients & parts used in the preparation of the final product are listed in the Table No: 1.

Preparation of drug

The final product i.e. *Seeatarama Vati* was prepared in the Ayurvedic Drug Corporation, Old Kottawa Road, Navinna, Maharagama, Sri Lanka.

Pharmacognostical study

The Pharmacognostical study comprises of organoleptic study and microscopic study of finished product.

Organoleptic Study

The organoleptic characters of *Ayurvedic* drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters like taste, colour, odour and touch were scientifically studied in pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, Gujarat, India[7] Table No: 2.

Microscopic Study

Seetarama Vati was powdered and dissolved with water and microscopy of the sample was done without stain and after staining with Phloroglucinol + HCl. Microphotographs of *Seetaram aVati* was also taken under Corl-zeisstrinocular microscope[8] Plate 1.

Physico-chemical analysis

Seetarama Vati was analyzed using various standard physico-chemical parameters such as loss on drying, water soluble extract, alcohol soluble extract etc. Results are show in Table No: 3.

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene+ Ethylacetate+ Acetic acid (14:4:2) solvent system and observed under visible light. The colour and R_f values of resolved spots were noted.[9]

RESULTS

Organoleptic characters of *Seetarama Vati*

Organoleptic characters of *Seetarama Vati* such as color, odour, taste etc. Examined by sensory organs and results are as shown in Table No: 3.

Microscopic characters of SeetaramaVati

Diagnostic characters of *Seeatarama Vati* were observed under the microscope and microscopic evaluation of *Seetarama Vati* was conducted, characters were noted down and microphotographs were taken they are Fig-01 oil globule of *Jeeraka,* Fig-02 oil globule of *Krishna Jeeraka,* Fig-03 oil globule of *Ajvin,* Fig-04 oil globule of *Jatiphala,* Fig-05 pitted stone cells of *Jatiphala,* Fig-06 oil globule of *Kushtha,* Fig-07 cork of *Kushtha*,Fig-08 oil globule of *Tulsi*, Fig-09 trichome of *Tulsi,* Fig-10 oil globule of *Kesar*, Fig-11 olioresin of *Vacha,* Fig-12 paranchyma cells of *Lasuna*, Fig-13parquetary arranged of lignified parenchyma cells of *Dhanyaka,* Fig-14 epicarpcells of *Dhanyaka,* Fig-15 romboid crystal of *Kutaja*, Fig-16 pollen grain of *Lavang,* Fig-17. Epidermal cell of *Lavang* Fig-18 trichome of *Drona Pushpi,* Fig-19 fibre of *Toddaliya,* Fig-20. Fibre of *Kutaja*, Fig- 21 cork cells of *Nimb,* Fig-22 Stone cells of *Pippali*, Fig-23 Silica deposition of *Katuki*, Fig-24 thick wall parenchyma of *Katuki,* Fig-25 lignified fibre of *Rakta Chandana*, Fig-26 aluerone grains of *Yavani*, Fig-27 prismatic crystals of *Nirgundi*, Fig-28 cork cell of *Nirgundi*, Fig-29 crystal fibre of *Nirgundi*, Fig-30 fibre of *Nirgundi*, Fig-31 stone cells of *Maricha*, Fig-32 black debris of *Maricha*, Fig-33 crystal fibre of *Yestimadhu* in plate 1.

Physicochemical parameters of *Seetarama Vati*

Physicochemical parameters of *SeetaramaVati*such as ash value, water soluble extract, alcohol soluble extract, pH etc. Results are show in Table No: 3.

HPTLC Study

Chromatogram shows 07 prominent spots at 254nm with maximum R_f value 0.01,0.25,0.39,0.53,0.57,0.66 and 0.87 and 9 spots at 366nm with maximum R_f value 0.01, 0.24, 0.37, 0.47, 0.52, 0.57, 0.64, 0.72, 0.90 (Plate 2, Fig. 1-3**).**

DISCUSSION

Pharmacognostical study reveals authentification of *Seeatarama Vati*. Oil globules, Pitted stone cell, Cork cells, Trichome, Oleoresin, Paranchyma,Parquetary arranged lignified parenchyma cells, Epicarp cells, Rhomboidal crystal, Pollen Grain, Epidemal Cells with oil

globules, Trichome, Fibre, Silicadeposition andthick wallparenchyma, Lignified Fibre, Alueronegrains, Prismatic crystals, Cork cells, Crystalfibre, Stone cells and Black debbries, Starch grains, Crystaslfibre, Cork cells, and Stone cells. All the characters whichwere observed under the microscope which were used as ingredients. All the physico-chemical parameters i.e. Loss on drying, Water soluble extract, Methanol soluble extract and pH value were analyzed and found to be within the normal reference range. The physicochemical analysis showed Loss on drying (3.3 % w/w), Water soluble extract (33.8 % w/w), Methanol soluble extract HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene + Ethyl acetate +Acetic acid (14:2:2) solvent system and observed under visible light. The colour and R_f values of resolved spots were noted.

Table No: 1: **Contents of *Seetarama Vati.***

Sr. No.	Drug Name	Scientific Name	Part Used	Proportion
1	ShvetaJiraka	Cuminumcyminum L.(Umbelliferae)	Fruits	5
2	KrishnaJiraka	Nigella sativa L.(Ranunculaceae)	Fruits	5
3	MahaJiraka	Foeniculum valgare Mill.(Apiaceae)	Fruits	5
4	Ajamoda	Trachyspermum ammi L.spar(Apiaceae)	Fruits	5
5	Shatapuspha	Anethumgra violens L. (Apiaceae)	Fruits	5
6	ShuddhaVatsanabha	Aconitum palmatum D.Don.(Rununculaceae)	Tuberous root	5
7	Kashmira	Saussurea costus Falc.(Asteraceae)	Stem	5
8	YastiMadhu	Glycyrrhiza glabra L.(Fabaceae)	Root	5
9	Shunti	Zingiber officinale Roscoe. (Scitaminae)	Rhizome	5
10	Maricha	Piper nigrum L.(Pipperaceae)	fruit	5
11	Pippali	Piper longum L.(Pipperaceae)	fruit	5
12	Jatipala	Myristica fragrans Houtt.(Myristicacea)	Seed	5
13	Jatiphala	Myristica fragrans Houtt.(Myristicacea)	Coat	5
14	Lavang	SyzygiumaromaticumL.Merr.and Perry. (Myrtacea)	Fruit	5
15	Lasuna	Allium sativum L.(Amaryllidaceae)	Stem	70
16	YashadaBhashma (RidiTutta)	Calamine(Fe_3O_4)		**4**
17	ShodhitaManhshila	Realgar(Arsenic sulfide)(AS_2S_4)		**4**
18	Dhanyaka	Coriandrumsativum L.(Umbelliferae)	Fruit	4
19	Thutthaka (Thursi)	Copper Sulphate ($CuSO4,5H_2O$)		**4**
20	ShodhitaSphatica (Sinnakkaram)	Gypsum (Sulfate Minerals(Al/K)		**4**
21	Sahindav	Rock Salt (Mineral form of Nacl)		**4**
22	Pushkara	Borax($Na_2B_4O_7$) (Nadium Biborate)		**4**
23	Kutaja	Holarrhena antidysenterica	Flowers	4

		Wall.(Apocyanaceae)		
24	RaktaChandana	Pterocarpus santalinus L.f.(Fabaceae)	Heart wood	32
25	Ativisha	Aconitum heterophyllum Wall. at.**(Rununculaceae)**	Stem	3
26	(Unknown) (Galmada)	Alum**(** Hydrated potassium aluminiums ulfate (potassiumalum))($KAl(SO_4)_2.12$ H2O)	Powder	**3**
27	Katuki	Picrorhiza kurrooa Royle ex Benth. (Plantaginaceae)	Rhizome	3
28	ShodhitaHingula (Sadilingam)	Cinnabar(Mercury(II) sulfide, HgS)		**3**
29	ShodhitaHiritala(Hiriyal)	Yellow arsenic(Arsenic trisuphate)(As_2S_3)		**3**
30	Hingu	Ferula assa – Foetida L.(Apiacea)	Resin	15
31	Tulasi	Ocimum teniflorum L.(Lamiaceae)	Leaves	24
32	Nirgundi	Vitexnegundo L.(Verbenaceae)	Leaves	24
33	Tilaparni	Cleome gynandra L.(Cleomaceae)	Leaves	24
34	Kanchana	Toddalia asiatica L.(Rutacea)	Leaves	24
35	Nimba	Azadirechta indica A.Juss. (Meliaceae)	Leaves	24
36	DronaPushpi	Leucaszeylanica L.(Lamiaceae)	Leaves	24
37	Vacha	Acorus calamus L.(Acoraceae)	Rhizome	12

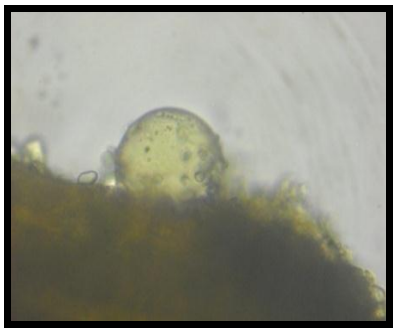
Table No: 2: Organoleptic characters of *Seetarama* Vati.

Sr. No.	Characters	Results
1	Colour	Brownish Black
2	Odour	Characteristic
3	Taste	Strong pungent
4	Weight of Each *Vati*	80 mg

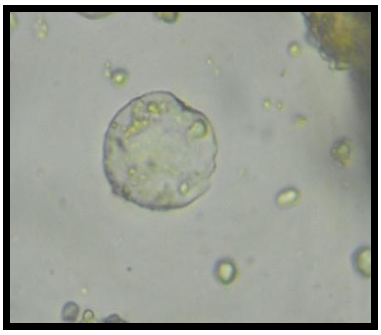
Table No: 3: Physicochemical parameters of *Seetarama Vati.*

Sr. No.	Test	Result
1	Weight Variation	
	Mean Weight	80.95mg
	Highest Weight	97mg
	Lowest Weight	66mg
2	Hardness of Tablet	$6Kg/cm^2$
3	Loss on Drying	3.3 % w/w
4	Ash Value	12.45 % w/w
5	Water soluble extract	33.8 % w/w
6	Ethanol soluble extract	16.16%w/w
7	pH	6.33

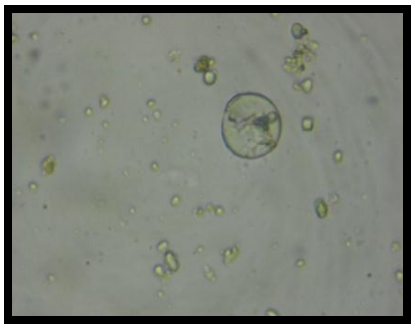
Plate 1: MICROPHOTOGRAPHS of *Seetarama Vati.*



1.Oil globule of *JEERAKA*

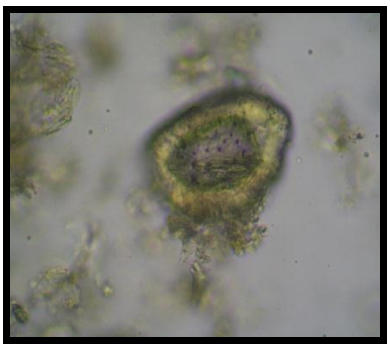


2. Oil globule of *KRISHNA JEERAKA*



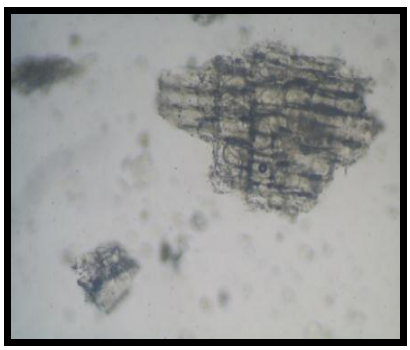
3. Oil globule of *AJVIN*

4.Oil globule of*Jatiphala*

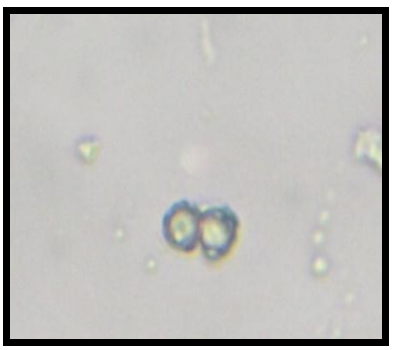


5.Pittedstone cells of *Jatiphala*

6.Oil globule of*Kushtha*

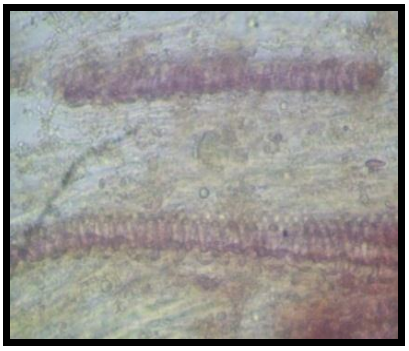


7.Cork of *Kushtha*

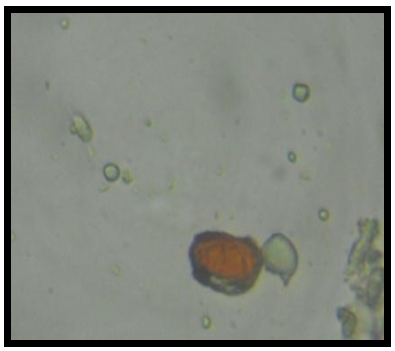


8.Oil globule of *Tulsi*

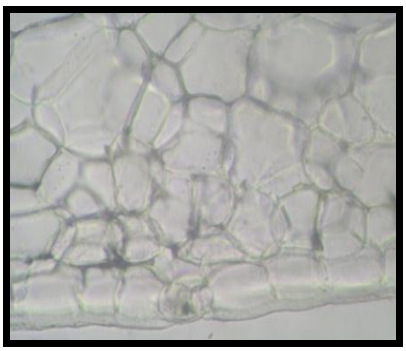
9.Trichome of *Tulsi*



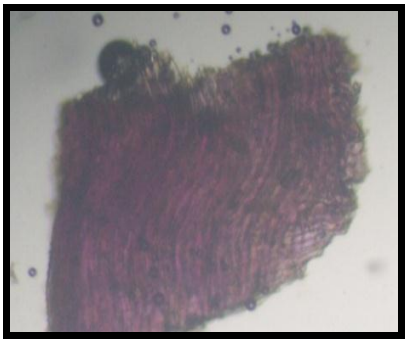
10.Oil globule of *Kesar*



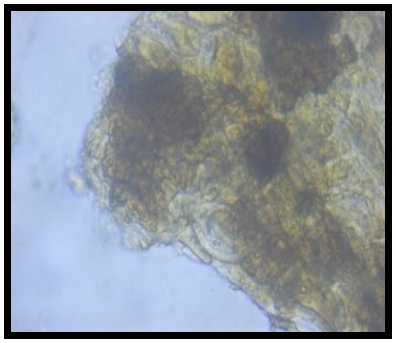
11.Olioresin of *Vacha*



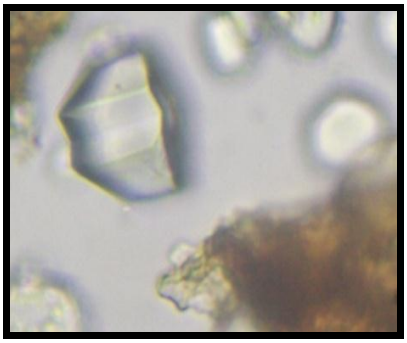
12.Paranchyma cells of *Lasuna*



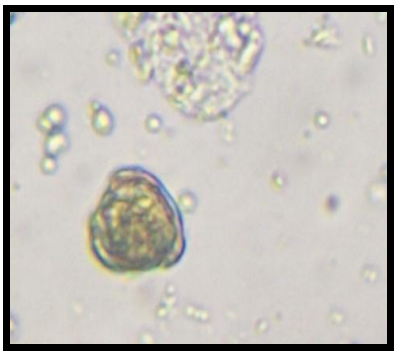
13.Parquetary arranged of lignified parenchyma cells of *Dhanyaka*



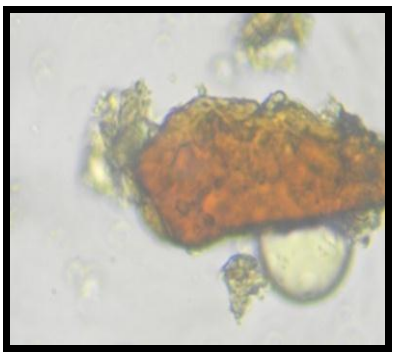
14.EpicarpEpicapcells of *Dhanyaka*



15. Romboid Crystal of *Kutaja*



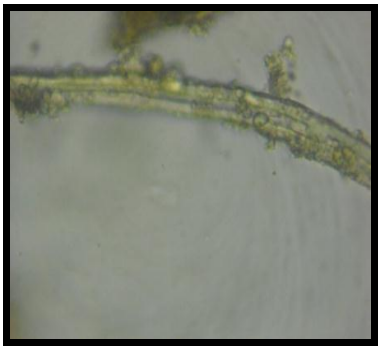
16. Pollen Grain of *Lavang*



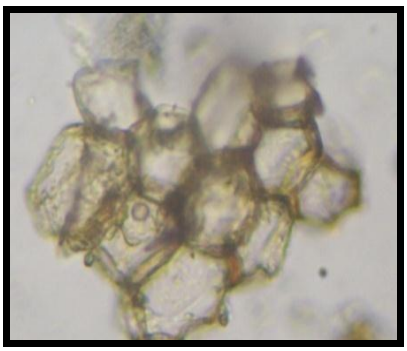
17. Epidermal cell of *Lavang*

18. Trichomeof *Drona Pushpi*

19. Fibre of *Toddaliya*

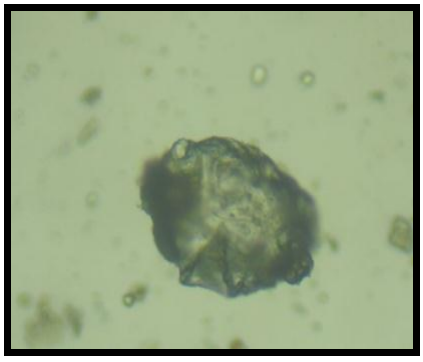


20. Fibre of *Kutaja*

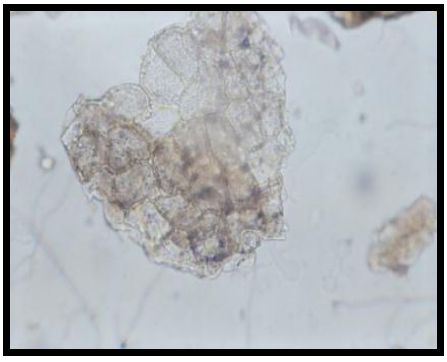


21. Cork Cells Of *Nimb*

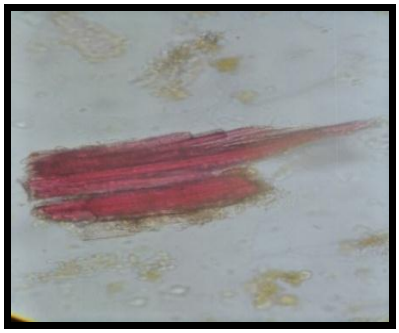
22. Stone cells of *Pippali*



23. Silica deposition of *Katuki*

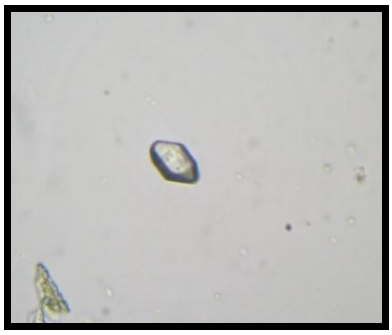


24. Thick wall parenchyma of *Katuki*



25. LignifiedFibre of *Rakta Chandana*

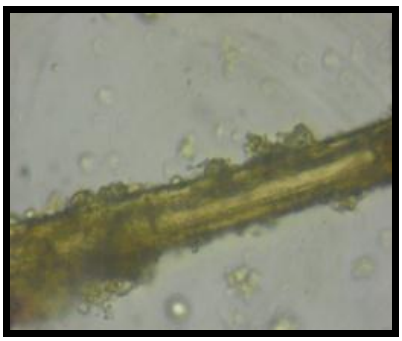
26. Aluerone grains of *Yavani*



27. Prismatic Crystals of *Nirgundi*

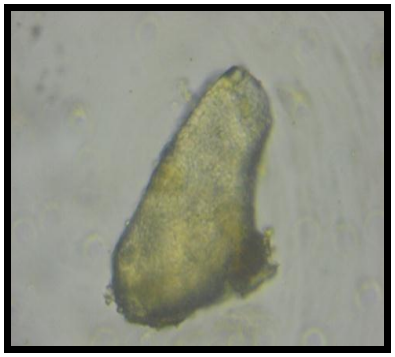
28. Cork cell of *Nirgundi*

29. Crystal Fibre of *Nirgundi*



30. Fibre of *Nirgundi*

31. Stone cells of *Maricha*



32. Black debris of *Maricha*

33. Crystal fibre *Yashtimadhu*

PLATE No: 2 (Fig. 1-3): HPTLC: at 254 nm & 366 nm of *SeetaramaVati.*

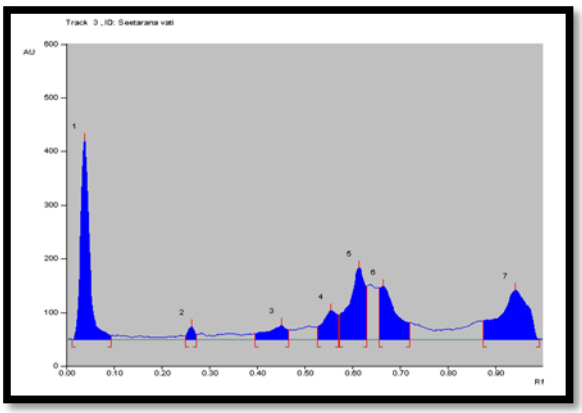


Fig 1. 254nm Peak display.

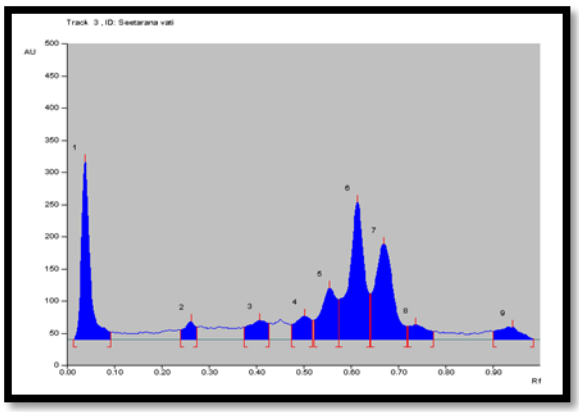


Fig 2. 366nm Peak display

PLATE 3. HPTLC: Densitogram at 254 nm & 366 nm of *SeeatramaVati.*

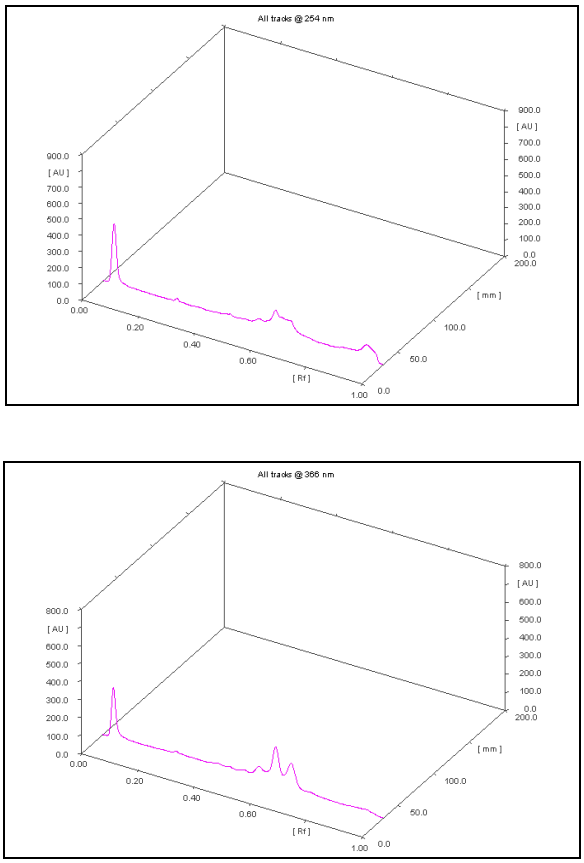


Fig 3: 254nm & 366nm 3D.

CONCLUSION

Pharmacognostical study findings confirm that all characters were found in ingredient drugs of *Seetarama Vati.* The physicochemical analysis inferred that the formulation meets maximum qualitative standards and all the parameters discussed here may be used as identifying tools for the quality assessment of *Seetarama Vati.*

REFERENCE

1. S. N. Chung. Text book of medicine for MBBS, Published by Arya publication, Edition, Reprint, 2013; 02: 972.
2. Longo.L, 2012, Harrison's principles of Internal Medicine, 18th Edition, MC Grow Hill Medical publisher.
3. Shrikantha Murthy K.R., *Madhava Nidanam* of *Madhavakara* text with English Translation, Critical Introduction and Appendix, *Chaukambha Orientalia, Varanasi*., 2013.

4. Ponnamperuma, A., "*VatikaPrakaranaya* Hevat *ehet Guli Kalka Pota Pilibanda Paryeshanatmaka Adhyayanayak*", Department of *Ayurveda*., 2004.
5. https://timesofindia.indiatimes.com/life-style/health-fitness/diet/Health-benefits-of-pure-ghee/articleshow/17140129.cms, Access on 3/12/2017, 3.00pm.
6. http://ijarnp.org/index.php/ijarnp/article/viewFile/225/pdf_16, Access on 3/12/2017, 3.00pm.
7. Trease and Evans, Pharmacognosy, 15th Ed., W.B. Sunders Company Ltd., 1996; 569: 570.
8. Wallis TE, Text book of Pharmacognosy, 5th Ed., New Delhi: CBS Publishers & Distributors, 2002; 123-132: 210-215.
9. Stahl E; Thin-layer chromatography a laboratory hand book. 2nd edition. Springer-Verlag New York, 1969; 125-133.
10. Ayurvedic Pharmacopoeia of India PDF-1, Govt. of India, Ministry of health and family welfare, Delhi, appendix-2.2.9, 2007; 5: 214.
11. Robbins and Cotran, Pathologic basis of disease, south edition, volume I, Published by RELX India Private Limited, Haryana, India. 2017.