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Pharmacognostical and Pharmaceutical Analysis of *Sanjivani vati*-An Ayurvedic Polyherbal Formulation

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Abstract

Sanjivani Vati is a polyherbal formulation containing various *Ayurvedic* medicinal drugs and is mentioned in *Sharangadhara Samhita*, specially indicated for the treatment of *Ama*, *Ajirna*, *Gulma*, *Visuchika*, *Sarpavisha* and in the condition of *Sannipata.* For assurance of quality of herbal compounds pharmacognostical and pharmaceutical analysis should be done. **Methods:** *Sanjivani Vati* was subjected to microscopic evaluation for pharmacognostical study, physic-chemical analysis like hardness, weight variation, loss on drying, ash value, acid insoluble extract, pH value, water soluble extract, alcohol soluble extract, and high Performance thin layer chromatography(HPTLC). **Results:** Pharmacognostical study showed the presence of certain identifying characters of all of the ingredients of *Sanjivani Vati* that is *Vidanga, Shunthi, Pippali, Haritaki, Bibhitaki, Amalaki, Vacha, Guduchi, Bhallataka, Vatsanabha* and *Gomutra* (*Bhavana Dravya*). In pharmaceutical study, preliminary physico-chemical analysis showed that hardness of *Vati* was 6.9 Kg/cm^2 ash value 14.03%w/w, acid insoluble ash value 0.3%w/w, loss on drying 16.44%w/w, water soluble extract 32.565w/w, alcohol soluble extract 13.94%w/w. HPTLC analysis showed eleven spots in 254nm and seven spots in 366nm. **Conclusion:** Present work was carried out to standardize the polyherbal formulation *Sanjivani Vati* in terms of its identity, quality and purity. Pharmacognostical and physico-chemical observations revealed the specific characters of all active constituents in the preparation and it was found to be suitable as per the parameters of API.

Keywords
Sanjivani Vati, Pharmacognocy, Pharmaceutics.

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INTRODUCTION:

Sanjivani Vati, a polyherbal formulation contains equal amount of ten herbal drugs (Table no 1) that is *Vidanga (Embelia ribes* Burm*), Shunthi (Zingiber officinale Roxb), Pippali* (*Piper longum* Linn.), *Haritaki* (*Terminalia chebula* Retz.), *Bibhitaki* (*Terminalia bellirica* Roxb.), *Amalaki (Emblica officinalis* Gaertn.*), Vacha* (*Acorus calamus* Linn.), *Guduchi* (*Tinospora cordifolia* Willd. Miers.Ex Hook.), *Bhallataka* (*Semecarpus anacardium* Linn) and *Vatsanabha (Aconitum ferox* Well. Ex Seringe*).* It also contains *Gomutra* (Urine of cow) as *Bhavana Dravya*.

Sanjivani Vati is mainly indicated for the treatment of *Ama* in a classical text of *Ayurveda* like *Sharangadhara Samhia*[i]. It is also indicated for the treatment of *Ajirna*, *Gulma*, *Visuchika*, *Sarpavisha* and in the condition of *Sannipata. Sanjivani Vati* possesses *Katu*, *Tikta Rasa*, *Laghu*, *Ushna* and *Ruksha Guna*, *Ushna Virya* and *Katu Vipaka*. Thus, *Sanjivani Vati* mainly pacify *Kapha* and *Vata Dosha*. In the case of internal administration of herbal formulation which contain *Visha Dravyas* should be safe but effective and free from adulteration, with appropriate quantity and ingredients. It is difficult to identify herbal drug in dry or powdered form. This condition leads to increase in adulteration. So, it is a need of time to set proper parameters for standardization of herbal drugs. Pharmacognostic studies reveals plant identification and sets parameters for standardization which can also be done in the case of herbal traditional medicine. Generally, physiochemical analytical study of drugs helps to interpret the pharmacokinetics and pharmacodynamics involved. With the help of physiochemical analytical studies, it is possible to standardize the drug and differentiate the adulterants. High performance liquid chromatography (HPLC) and thin-layer chromatography (TLC) are the conventional methods used in the analysis of secondary metabolites originating from plants. It is necessity of time in the field of *Ayurveda* to go for quality control of the raw drugs as well as final products using modern parameters which provides credibility to *Ayurvedic* medicines and treatment and also help in the globalization of *Ayurveda.*

AIMS AND OBJECTIVES:

1. To evaluate raw drugs of *Sanjivani vati* for authenticity through various pharmacognostical procedures.
2. To develop the pharmacognostical and phyto-chemical profile of *Sanjivani vati.*

MATERIALS AND METHODS:

Collection, Identification and Authentication of raw drugs

The raw materials were collected from the pharmacy of Gujarat Ayurved University, Jamnagar. All the raw drugs were identified and authenticated in the Pharmacogonosy Laboratory, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar.

Preparation of Drug

Fine powder of all ingredient of *Sanjivani Vati* ware taken in equal parts. Eight *Bhavana* of *Gomutra* was given and *Vati* of 125 mg was prepared and preserved in hygienic condition.[ii]

PHARMACOGNOSTICAL STUDY

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

Organoleptic Study

The Organoleptic characters of polyherbal drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters i.e. taste, colour, odour and touch of *Sanjivani Vati* were scientifically studied as per the standard references.[iii]

Microscopic Study

Sanjivani Vati was powdered and dissolved with water and microscopy of the sample was done without stain and after staining with phloroglucinol + HCl. Microphotographs of *Sanjivani vati* ware also taken under Corl-zeisstrinocular microscope.[iv]

PHYSICO-CHEMICAL ANALYSIS

Sanjivani Vati was analyzed using various standard physico-chemical parameters. The common parameters mentioned for compressed tablets in Ayurvedic Pharmacopia of India [v] and CCRAS [vi], guidelines are loss on drying, total ash value, acid insoluble ash, pH value, water soluble extract, methanol soluble extra total ash, and water and alcohol soluble extractives.

HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY[vii]

High Performance Thin Layer Chromatography (HPTLC) is a powerful analytical method suitable for the separation and quantitative determination of a considerable number of compounds even from complicated matrix. HPTLC is used for identification of active constituents, identification and determination of impurities and quantitative analysis of active constituents. Principle of HPTLC remains the same as of TLC i.e. adsorption. One or more compounds were spotted in a thin layer of adsorbent coated on a chromatographic plate. The mobile phase solvent flows through because of capillary action against gravitational force. The component with more affinity towards stationary phase travels faster. Thus, the components were separated on a thin layer chromatographic plate based on the affinity of the components towards the stationary phase.[viii]

Steps involved in H.P.T.L.C were as follows:

1. Sample and standard preparation
2. Selection of chromatographic layer
3. Layer pre-washing
4. Layer pre-conditioning
5. Application of sample
6. Chromatographic development
7. Detection of spots
8. Scanning and documentation

Methanol extract of *Sanjivani Vati* were spotted on pre-coated silica gel GF CO254 aluminum plate as 5 mm bands, 5 mm apart and 1 cm from the edge of the plates, by means of camag, linomate V sample applicator fitted with a 100 µL. Hamilton syringe was used as the mobile phase. After development, densitometry scanning was performed with a camage TLC scanner III reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (V 1.2.1 manufactured by CAMAGE Switzerland).The slit dimensions were 6.00 x 0.45 mm and the scanning speed was 20 mm per second[ix].

RESULTS AND DISCUSSION:

Organoleptic characters of *Sanjivani Vati*

Organoleptic characters contents of *Sanjivani Vati* like colour, taste, Touch and odor were recorded. The color of *Sanjivani Vati* was blackish brown. *Sanjivani Vati* having smell like *Gomutra* and its taste was *Katu-Kashaya* which is shown in Table- 2.

Microscopic Study of *Sanjivani Vati*

Identifying characters of ingredients of *Sanjivani Vati* under the microscope were epicarp, lignified pitted stone cells and brown content filled stone cells of

Vidanga, fibers ,iodine stained starch grains and simple starch grains of *Shunthi,* black debris, lignified stone cells , rhomboidal crystal and stone cells of *Pippali*, brown content and lignified stone cells of *Haritaki*, trichome of *Bibhitaki*, scleroid of *Amalaki*, stone cells and iodine stained starch grains of *Vacha*, cork cells , iodine stained starch grains, collenchymal cells and starch grains of *Guduchi*, mesocarp cell with oil content, pitted stone cells field with oleoresin and stone cells of *Bhallataka*, aleuron grains of *Vatsnabha* and silica deposition of *Gomutra*. [Plate 1(1 to-25)].

Physico-chemical analysis of *Sanjivani Vati*

Physico-chemical analysis of *Sanjivani Vati* revealed the value as hardness 6.9 Kg/cm2, ash value 14.03% w/w, acid insoluble ash value 0.3% w/w, loss on drying 16.44% w/w, water soluble extract 32.56% w/w, alcohol soluble extract 13.94% w/w and pH value was 6.5. [Table No–3.]

High performance thin layer chromatography of *Sanjivani Vati*.

On performing HPTLC, the chromatogram of *Sanjivani Vati* showed 11 peaks with maximum R_f values 0.06,0.22,0.31,0.38,0.42,0.53,0.56,0.66,0.73,0.79 and 0.81 at short wave UV 254nm; while at long wave UV 366 nm, the chromatogram showed 7 spots with maximum R_f values 0.06,0.22,0.32,0.35,0.38,0.56 and 0.73. [Table No.4]

Table 1: Ingredient of *Sanjivani Vati*

SI NO	DRUG	BOTINICAL NAME	PART USED	PROPORTION
1	*Vidanga*	*Embelia ribes* Burm.	Fruit	1
2	*Shunthi*	*Zingiber officinale* Roxb.	Root	1
3	*Pippali*	*Piper longum* Linn.	Fruit	1
4	*Haritaki*	*Terminalia chebula* Retz.	Fruit	1
5	*Bibhitaki*	*Terminalia bellirica* Roxb.	Fruit	1
6	*Aamalaki*	*Emblica officinalis* Gaertn.	Fruit	1
7	*Vacha*	*Acorus calamus* Linn.	Root	1
8	*Guduchi*	*Tinospora cordifolia* Willd. Miers.Ex Hook.	Stem	1
9	*Bhallataka*	*Semecarpus anacardium* Linn.	Fruit	1
10	*Vatsanabha*	*Aconitum ferox* Well. Ex Seringe	Root	1
11	*Gomutra*	Urine of cow	Urine	Q.S.

Table 2: Organoleptic characters of *Sanjivani Vati*

Drug	Colour	Odour	Taste	Consistency
Sanjivani Vati	Blackish brown	*Gomutra Gandhi*	*Gomutra,Katu-Kashaya*	Hard, *Vati*

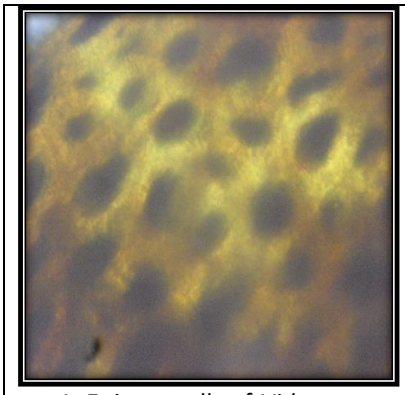
Table 3: Physico-chemical parameters of *Sanjivani Vati*

Name of the Analysis	Value of *Sanjivani vati*.
Loss on drying percentage	16.44% w/w
Acid insoluble Ash	0.31%w/w
Ash value percentage	14.03% w/w
pH value (5% aquious)	6.5
Water soluble extract percentage	32.56% w/w
Alcohol soluble extract percentage	13.94% w/w
Weight variation of *Vati*	Average wt. 0.132gm Highest wt. 0.129gm Lowest wt. 0.110gm

Table 4: HPTLC results for methanolic extract of *Sanjivani Vati*

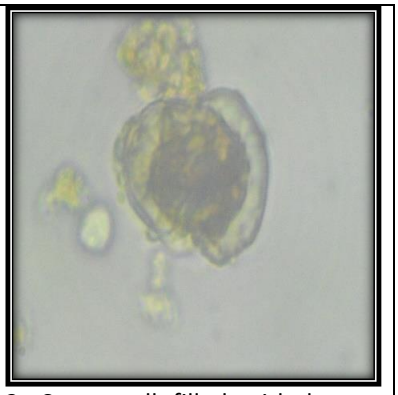
	254 nm		366nm	
	No. of Spots	R_f Value	No. of Spots	R_f Value
HPTLC	11	0.06, 0.22, 0.31, 0.38, 0.42, 0.53, 0.56, 0.66, 0.73, 0.79, 0.81	7	0.06, 0.22, 0.31, 0.38, 0.42, 0.53, 0.56, 0.66, 0.73, 0.79, 0.81

Plate no 1: Microphotograph of *Sanjivani Vati*

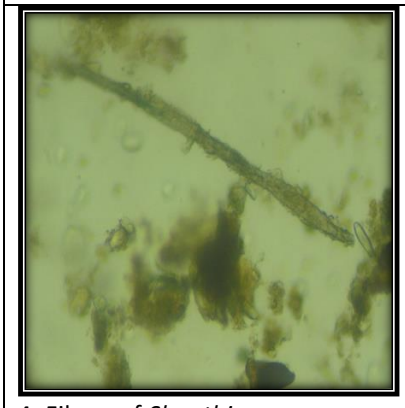


1: Epicarp cells of *Vidanga*

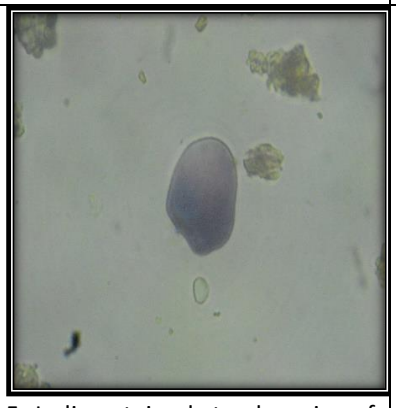
2: Lignified pitted stone cells of *Vidanga*



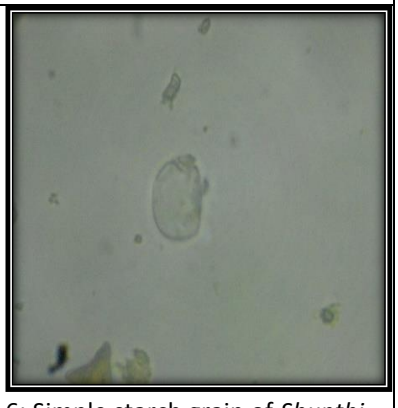
3: Stone cell filled with brown content of *Vidanga*



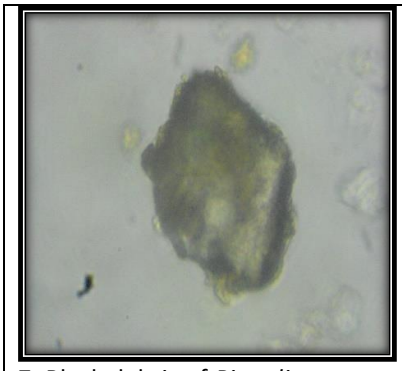
4: Fibers of *Shunthi*

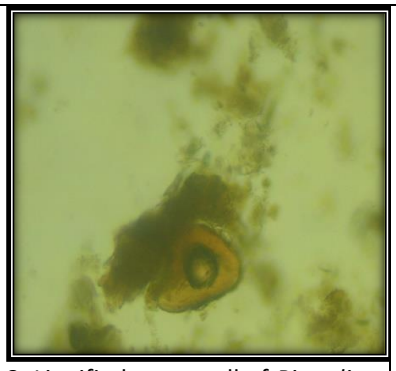


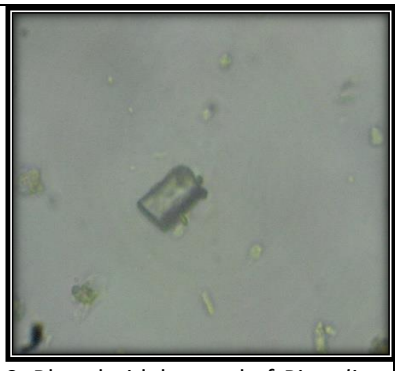
5: Iodine stained starch grains of *Shunthi*



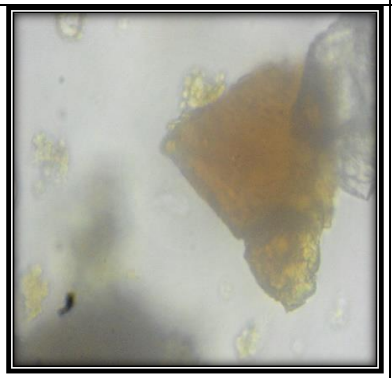
6: Simple starch grain of *Shunthi*

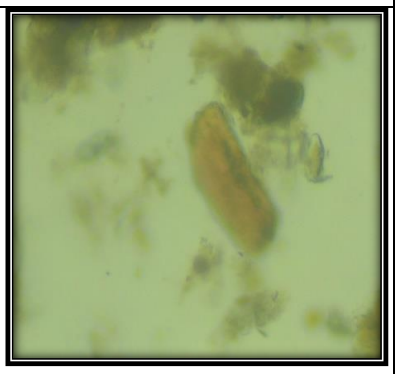

7: Black debris of *Pippali*


8: Lignified stone cell of *Pippali*

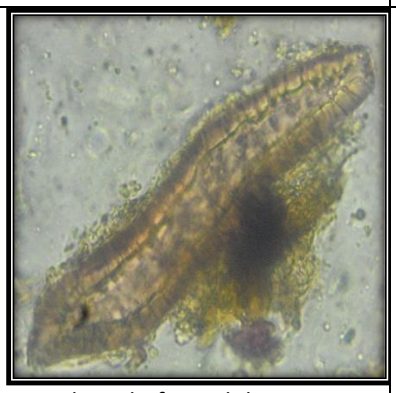

9: Rhomboidal crystal of *Pippali*

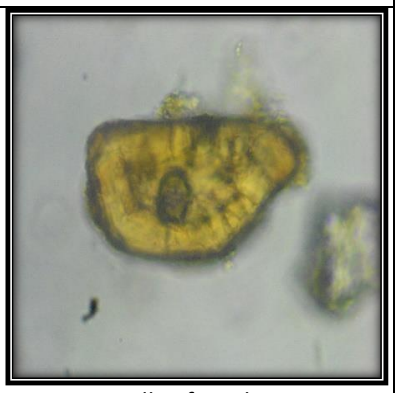

10: Stone cells of *Pippali*

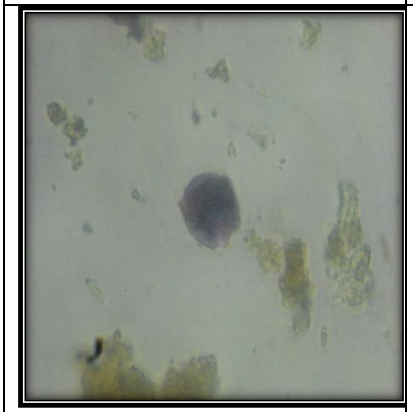

11: Brown content of *Haritaki*

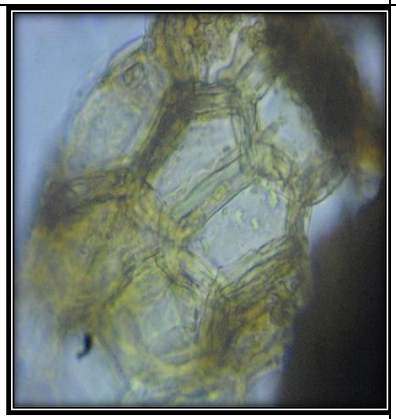

12: Lignified stone cell of *Haritaki*

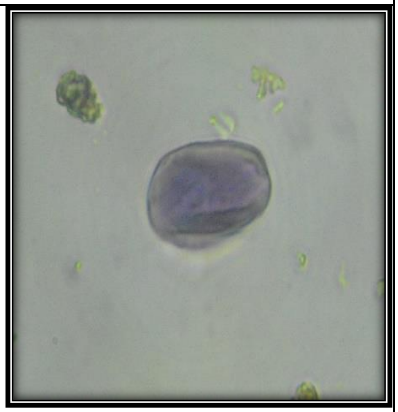

13: Trichome of *Bibhitaki*

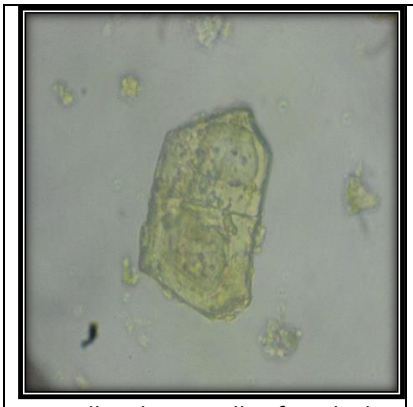

14: Scleroid of *Amalaki*

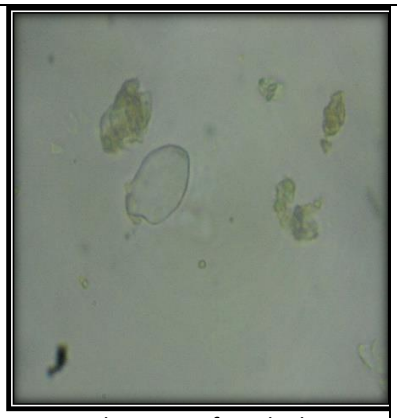

15: Stone cells of *Vacha*

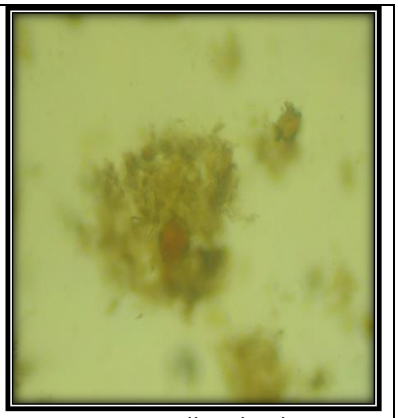

16: Iodine stained starch grains of *Vacha*

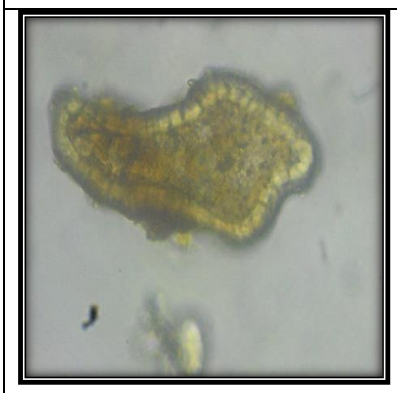

17: Cork cells of *Guduchi*

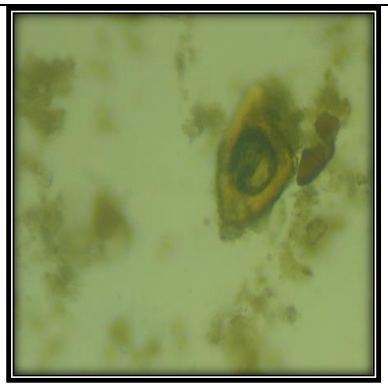

18: Iodine stained starch grains of *Guduchi*

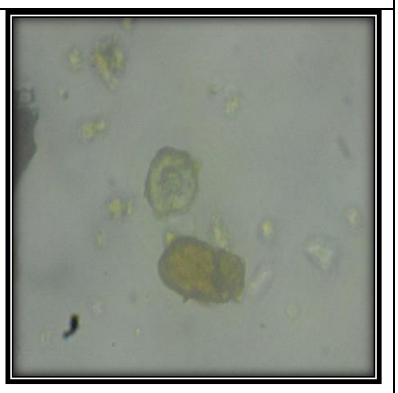

19: Collenchyma cells of *Guduchi*


20: Starch grains of *Guduchi*


21: Mesocarp cell with oil content of *Bhallataka*


22: Pitted stone cell of *Bhallataka* filled with oleoresin


23: Stone cell of *Bhallataka*


24: Aleuron grains of *Vatsanabha*

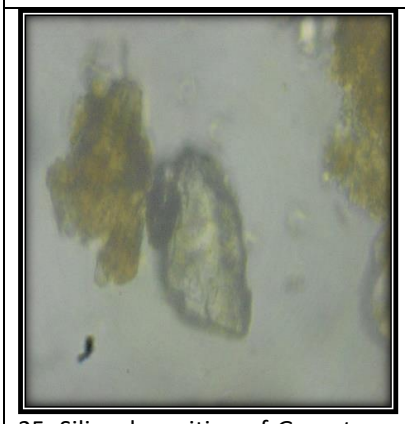
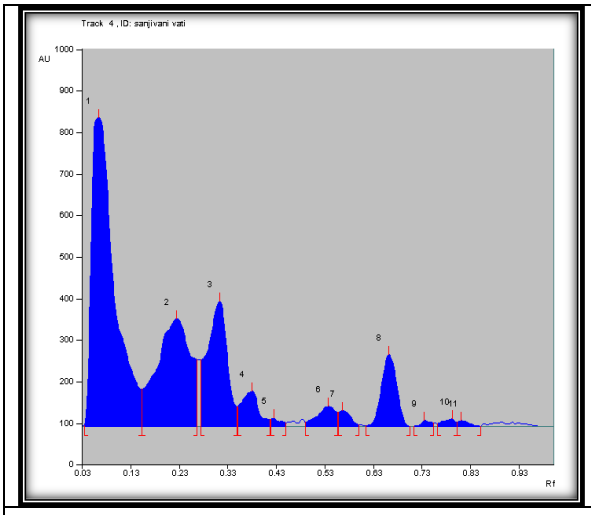
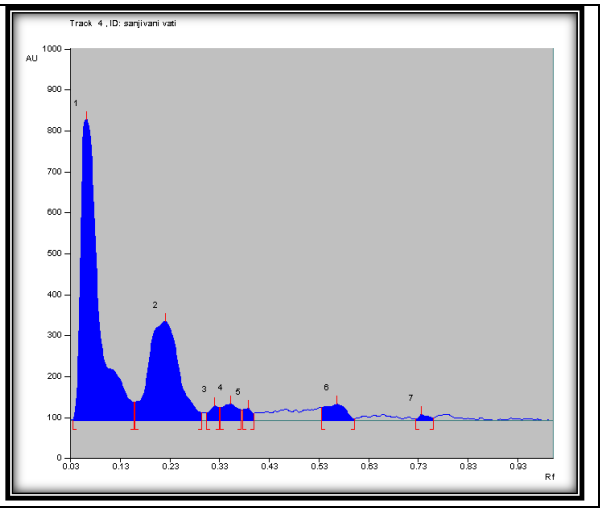

25: Silica deposition of *Gomutra*

Plate no 2: Densitogram of *Sanjivani Vati* at 254nm and 366nm.

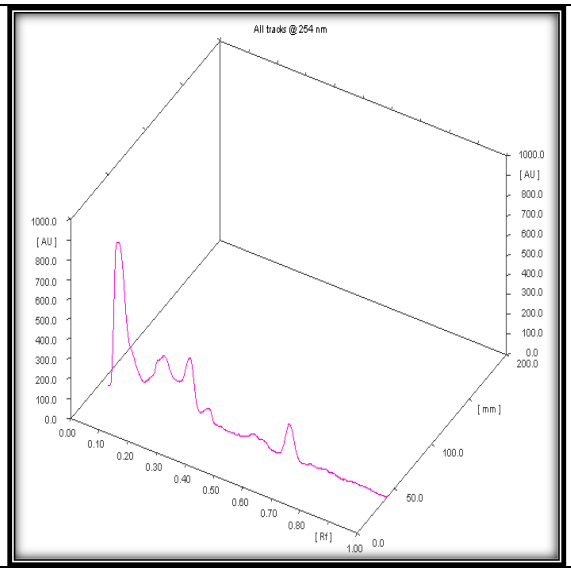


Peak Disply at 254 nm

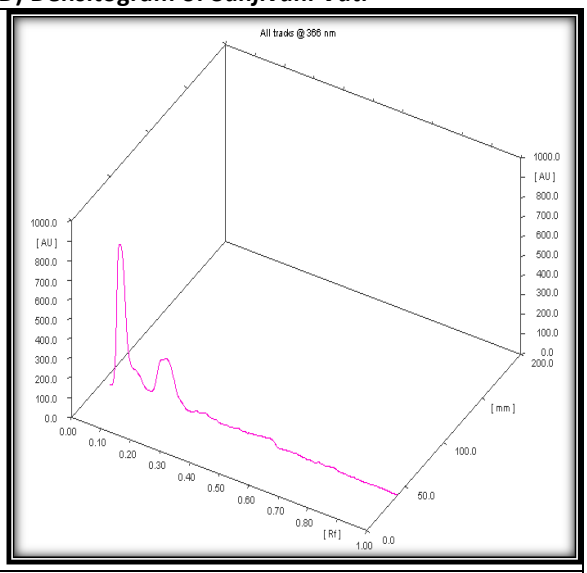


Peak Display at 366nm

Plate 3: Three dimensional HPTLC (3D) Densitogram of *Sanjivani Vati*



254nm



366nm

CONCLUSION:

The Pharmacognostical and Physico chemical analysis of *Sanjivani Vati* confirmed the purity and genuinety of the drug. A published information is not available on pharmacognostical and physico-chemical profiles of *Sanjivani Vati*. Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

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