# PHARMACOGNOSTICAL AND PHYSICOCHEMICAL EVALUATION OF "SHOOLPRASHAMAN MAHAKASHAYA"

**Rajveer Gupta[1], Chetna Mourya[2], Vivek Shrivastva[3], Manoj Tripathi[4]**

[1,2]M.D scholar; Dept. of Samhita Siddhant, Govt. Ayurved College, Rewa, Madhya Pradesh, India
[3]Reader M.D; Dept. of Samhita Siddhant, Govt. Ayurved College, Rewa, Madhya Pradesh, India
[4] Senior Research Officer  & In-Charge, DRI, Chitrakoot, Satna, Madhya Pradesh, India

**Email:** guptadrrajveer@gmail.com

## ABSTRACT

Nowadays pain is probably the commonest and biggest problem seen in human beings. It may be due to inflammation or injuries. According to Ayurvedic perspective *Vata* is the main *dosha* involved in pain. Pain is present as symptoms in various diseases like arthritis, osteoarthritis, sciatica etc. The ingredients of *shoolprashaman kashaya* are *Jeerak* (cumin seeds), *Marich* (piper nigrum seed), *Ajmoda* (celery fruits), *chitrak* (Ceylon lead wart), *Sunthi* (zingier officinale), *Pippali mula* and *Pippali* all are analgesic, anti-inflammatory and muscular relaxants in properties and pacify aggravated *vata dosha*. This paper seeks to present a review on pharmacognostical and physiochemical evaluation of *shool prashaman* drugs .Also helpful to maintain drug standardization and describe quality ,efficacy and safety aspect of *shoolprashman kashaya*. The physiochemical results show pH value of 6.4, loss on drying 5.72% w/w and ash value of 9.36% w/w.

Keywords: *Shoolprashaman Mahakashaya*, Pharmacognosy, Pharmaceutics

## INTRODUCTION

Pain is a complex perception that differs enormously among individual patients, even those who appears to have identical injuries or inflammation. Today pain has become the universal disorder and serious public health issues. In this study *shoolprashamana kashaya (CharakaSamhita ShutraSthana* 4/17)[1] is used in pain (i.e. all kind of pain occurs in various disease) *jeerak, marich, ajmoda, chitark, sunthi ,chavya, pipali mula* and *pipali* are having *Agni Deepka, Pachaka*, anti-inflammatory & analgesic properties which are useful to reduces pain. In this present study it is subjected for the pharmacognostical and phytochemical aspects to evaluate the drugs.

**Table 1:** Ayurvedic properties of *Shool prashaman kashaya*[7]

| Darvya | Rasa | Guna | Virya | Vipak | Doshaghnata |
|--------|------|------|-------|-------|-------------|
| *Pippali* | *Katu* | *Laghu, Snigdha, Tikshna* | *Anushnaseeta* | *Madhura* | *Kapha-Vata-shamaka* |
| *Pippali mula* | *Katu* | *Laghu, Snigdha, Tikshna* | *Ushna* | *Madhura* | *Kapha-Vata-shamaka* |
| *Chavya* | *Katu* | *Laghu, Ruksha,* | *Ushna* | *Katu* | *Kapha-Vata-shamaka, Pitta-Bardhka* |
| *Chitraka* | *Katu* | *Laghu, Ruksha, Tikshna* | *Ushna* | *Katu* | *Kapha-Vata-shamaka,Pitta-Bardhka* |
| *Sunthi* | *Katu* | *Laghu, Snigdha* | *Ushna* | *Madhura* | *Kapha-Vata-shamaka* |
| *Marica* | *Katu* | *Laghu, Tikshna* | *Ushna* | *Katu* | *Kapha-Vata-shamaka* |
| *Ajmoda* | *Katu, Tikta* | *Laghu, Ruksha, Tikshna* | *Ushna* | *Katu* | *Kapha-Vata-shamaka,Pitta-Bardhka* |
| *Ajaji* | *Katu* | *Laghu, Ruksha* | *Ushna* | *Katu* | *Kapha-Vata-shamaka,Pitta-Bardhka* |

Contents of *shoolaprashaman kashaya* are having *katu & Tikta Rasa, Laghu, Tikshna, Ruksha & Snigdha guna, Ushna Virya, katu Vipaka* hence it work as *Agni Deepka, Pachaka*, Analgesic and Anti–inflammatory drugs and useful in conditions such as *Aamavata,* Rheumatoid arthritis, osteoarthritis and all pain full condition etc.

**MATERIAL AND METHODS –**

**Collection of Raw Drug:**

All the raw drug of *shoolaprashamana kshaya* were collected from Govt. (autonomous) ayurvedic collage, Rewa (M.P.) and Deendayal Research Institute, Chitrakoot, Satna (M.P.).

**Selection of Drug:**

Trial drugs *shoolprashamana kashaya* is a poly herbal formulation available in the form of *yavakuta*. All drugs of *shoolaprashamana Mahakshaya* described in *Charak Samhita Sutrasthana SadaVer-achana Sataseetiya Adhyaya* were combined in equal quantity and the patients were advised to make decoction with proper method. The formulation "*Shool Prashamana Mahakashaya"* prepared by using pharmacognostically authenticated sample was taken up for the study. The analysis of the drugs was carried out in the Pharmaceutical Chemistry Laboratory of Deendayal Research Institute, Chitrakoot, Satna (M.P.).

**Method of Preparation of *Shool Prashamana Mahakashaya:***

*Shool Prashamana Mahakashaya* was prepared in pharmacy of Govt. Ayurved College Rewa, (M.P.). Ingredients, part used and ratio of the drugs in given in Table-1. All three ingredients taken in equal quantity in the form of *Yavakuta* (coarse powder) and mixed thoroughly.

**Table 2:** Contents of *Shool prashaman kashaya*

| Sr.no. | Content | Botanical name | Part used | Proportion |
|--------|---------|----------------|-----------|------------|
| 1) | *Pippali* | *Piper longum* | Fruit | 1-Part |
| 2) | *Pippali mula* | *Piper longum* | Root | 1-Part |
| 3) | *Chavya* | *Piper Retrofractum Vahl.* | Stem | 1-Part |
| 4) | *Chitrak* | *Plumbago zeylanica Linn.* | Root | 1-Part |
| 5) | *Sunthi* | *Zingiber officinale Rosc.* | Rhizome | 1-Part |
| 6) | *Marica* | *Piper nigrum* | Fruit | 1-Part |
| 7) | *Ajmoda* | *Carum Roxburghianum* | Fruit | 1-Part |
| 8) | *Ajaji* | *Cuminum cyminum Linn;* | Fruit | 1-Part |

**Pharmacognostical Evaluation:**

Raw drugs taken for *Shool Prashamana Mahakashaya* were identified and authenticated by the Pharmacognosy Department of D.R.I., Chitrakoot, Satna (M.P.). The identification was carried out based on the Morphological, Organoleptic features and Microscopy of the raw drugs and *Shool Prashamana Mahakashaya* Microphotographs were taken by using Compound Microscope with Digital Camera.

**Pharmaceutical Evaluation:**

Following parameters were analyzed for different physicochemical parameters by today's routine methods at the Pharmaceutical Chemistry Laboratory, D.R.I. Chitrakoot, Satna.

**Physicochemical parameters:**

Following physicochemical parameters were carried out as per standard matter.

- Loss on Drying at $110^0$C
- Total Ash value
- Water soluble extract
- Methanol soluble extract
- pH 5% v/w Aqua solution

**OBSERVATION AND RESULTS**

**Organoleptic findings:**

The colour, odour, taste etc. of the powder were recorded and are placed in following table.

**Table 3:** Organoleptic feature of Drug

| Properties | *Shool Prashamana Mahakashaya* |
|---|---|
| Colour | Muddy brown |
| Odour | Slightly aromatic |
| Texture | Coarse powder |
| Taste | *Katu* (pungent) |
| Touch | Coarse, rough |

**Pharmacognostical study & Microscopic Evaluation[6]:**

The initial purpose of the study was to confirm the authenticity of the raw drugs used in the preparation of *Shool Prashamana Mahakashaya.* Take about 2 gm of curna and wash thoroughly with water, pour out the water without loss of material; mount a small portion in *glycerine*; warm a few mg with *chloral hydrate* solution, wash and mount in *glycerine*; treat a few mg with *iodine* in *potassium iodide* solution and mount in *glycerine*. Heat a few mg in 2 percent aqueous *potassium hydroxide*, wash in water and mount in *glycerine*. Take about 0.5 gm of sample and add 50 percent conc. *Nitric acid* in a test tube and warm over water bath till brown fumes appear; wash with water thoroughly and mount a small portion in *glycerin*. Observe the following characteristics in the various mounts:

**Ajaji fruit**
1. Sclereids from mesocarp not much longer than broad
2. Fragment of vitta
3. Epicarp in surface view with stomata and striated cuticle

**Marica fruit**
1. Parenchyma embedded with oil globules, starch grains and aleurone grains
2. Hypodermal parenchyma with stone cells

**Ajmoda fruit**
1. Glandular trichomes with striated cuticle
2. Mesocarp cells embedded with starch grains and oil globules
3. Epidermis with papillose

**Chitrak mula**
1. Cortical parenchyma
2. Thick walled cork cells
3. Thick walled parenchyma filled with starch grains

**Sunthi Rz**
1. Pitted, septate fibers with indentations on its walls
2. Cork cells in sectional view
3. Oval shape parenchyma filled with starch grains and oleo-resin

**Chavya stem**
1. Cork cells embedded with abundant starch grains
2. Reticulate thickenings
3. Single and compound starch grains

4. Stone cells with narrow lumen

**Pippali mula**

1. Lignified sclereids
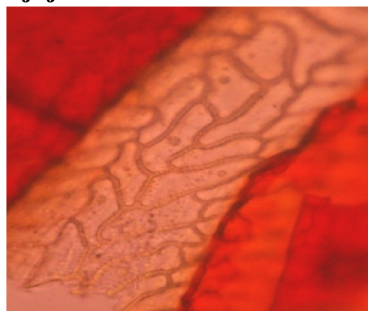2. Long thin walled fibers
3. Spiral thickening

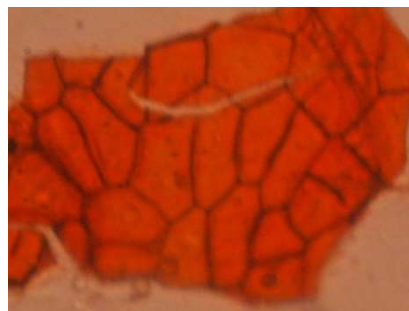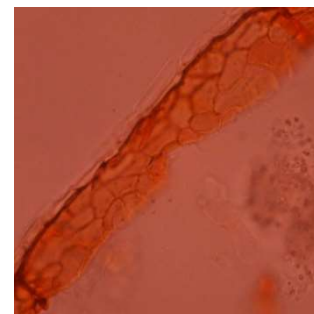4. Parenchyma filled with single and compound starch grains

**Pippali fruit**

1. Lignified spindle shaped stone cells
2. Sclereids
3. Fragments of thick walled long epicarp cells

**Plate 1:** Microphotographs of *Shool Prashamana Mahakashaya:*

1. **Ajaji fruit:-**



**Sclereids from esocarp**

**Fragment of vitta**

**Epicarp in surface view with stomata and striated cuticle**

**2. Maricha fruit:-**
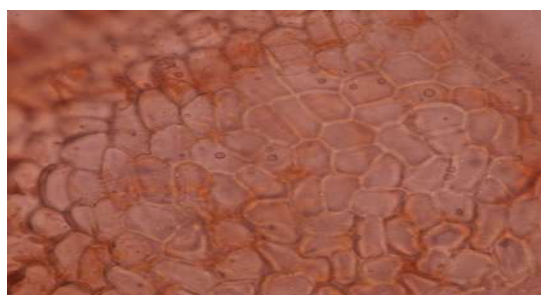


**Parenchyma embedded with oil globules, starch grains and aleurone grains**

**Hypodermal parenchyma with stone cells**

**3. Ajamoda fruit:-**



**Glandular trichomes with striated cuticle**
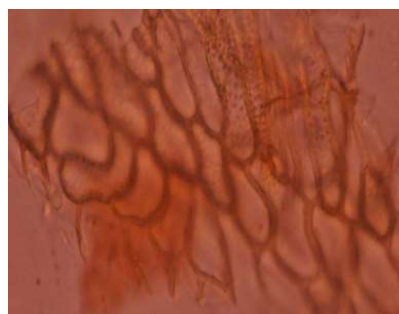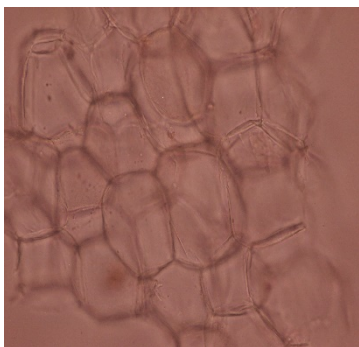
**Mesocarp cells embedded with starch grains and oil globules**

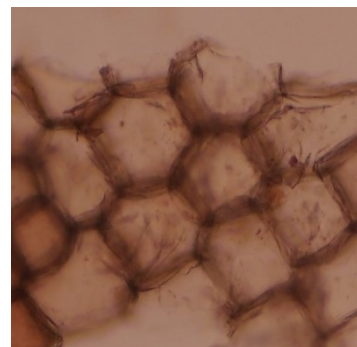**Epidermis with papillose**

## 4. Root of Chitraka:-



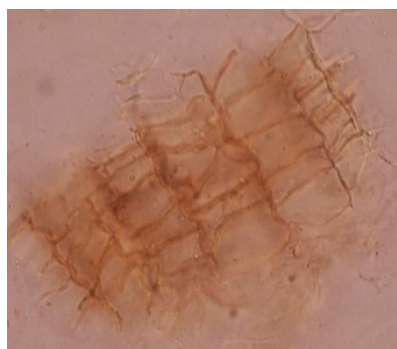Cortical parenchyma



Thick walled cork cells



Thick walled parenchyma
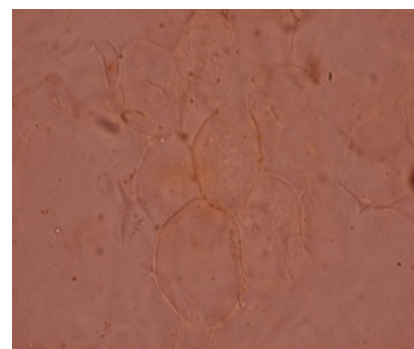filled with starch grains

## 5. Sunthi Rhizome:-
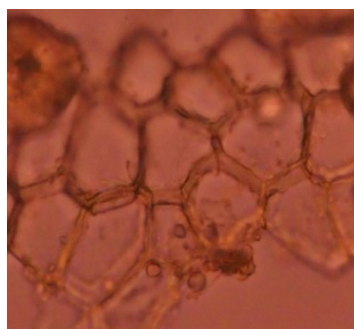


Pitted, septate fibres



Cork cells in sectional view



Oval shape parenchyma filled with
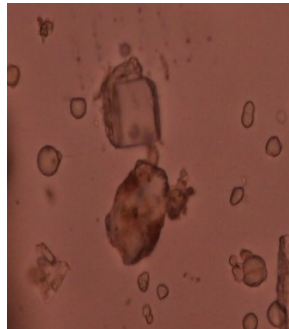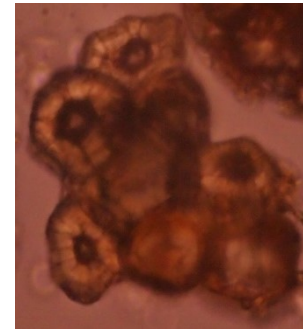starch grains and oleo-resin

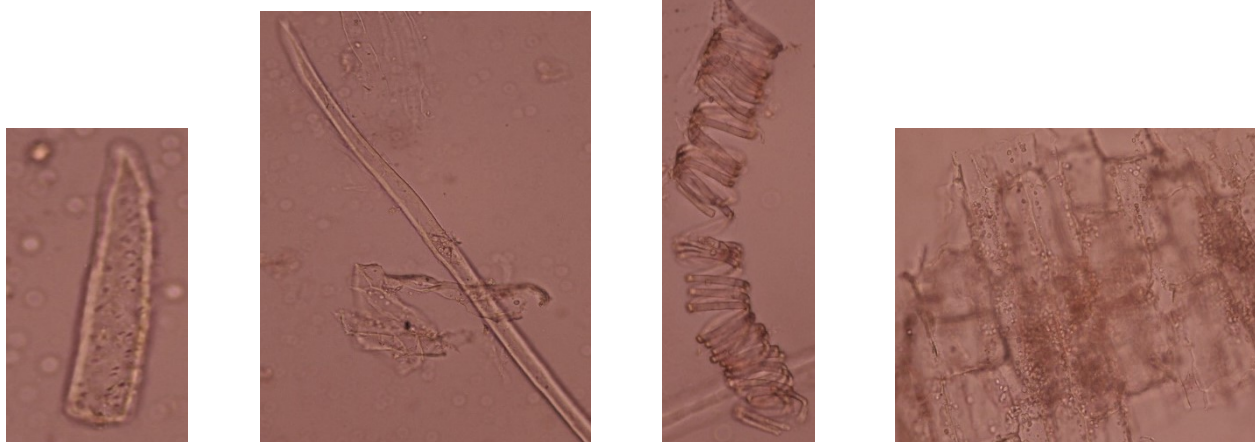## 6. Chavya stem:-



Cork cells embedded with
abundant starch grains



Reticulate thickenings



Single and compound
starch grains



Stone cells with narrow
lumen

## 7. Root of Pippali:-



**Lignified sclereids**



**Long thin walled fibres**



**Spiral thickening**



**Parenchyma filled with single and compound starch grains**

## 8. Pippali fruit:-



**Lignified spindle shaped stone cells**



**Sclereids**



**Fragments of thick walled long epicarp cells**

### Pharmaceutical Evaluation:

Physicochemical parameters of *Shool Prashamana Mahakashaya Kvatha Curna* in like Total Ash value, Water soluble extract, Methanol soluble extract, pH 5% v/w aqua solution, Loss on drying all were found to be within the normal range. Details are given in Table-4.

**Table 4:** Result of the drug analysis on physicochemical parameters:

| S.No. | Parameters | Results |
|---|---|---|
| 1 | Loss on Drying at $110^0$C | 5.72% w/w |
| 2 | Total Ash value | 9.36% w/w |
| 3 | Water soluble extract | 11.63% w/w |
| 4 | Methanol soluble extract | 6.36% w/w |
| 5 | pH 5% aqua solution | 6.4 |

**HPTLC Fingerprint's Profile:-**

Carry out HPTLC fingerprints profile on a TLC Silica Gel plate. Test solution: Extract 5 g of the *Shool Prashamana Mahakashaya Kvatha Curna* in 100 ml Methanol by refluxing on water bath for 30 minutes each. Filter the extracts, combine and concentrate to 10 ml. Apply 8 μl of the extract as band at a height of 10 mm from the base of a 20 x10 cm TLC plates and develop up to 8 cm from the base of plate using mobile phase *Toluene: Ethyl Acetate* (7:3). Dry the plate in air and examine less than 254 nm and 366 nm. Spray the plate with Anisaldehyde sulphuric

acid reagent and heat at $105^0$ till the color of the spots/bands appear without charring. Dry the plate in air and examine less than 366 nm and UV light. And $R_f$ values noted.

HPTLC was carried out organizing appropriate solvent system in which maximum 8 spots were distinguished at 254 nm and 12 spots at 366 nm Before Derivatization and 11 spots were found at 254 nm and 8 spots at 366 nm After Derivatization. Results are depicted in the Table No.5 (A&B). Table's shows No. Of spots and their Rf value observed under UV radiation.

**Table 5 (A):** $R_f$-Values in test solution of *Shool Prashamana Mahakashaya Kvatha Curna* at 254 nm and 366 nm before Derivatization-

| $R_f$ Values | At 254 nm Before Derivatization | At 366nm Before Derivatization |
|---|---|---|
| $R_f$1 | 0.15(black) | 0.15(blue) |
| $R_f$2 | 0.35(black) | 0.20(blue) |
| $R_f$3 | 0.40(black) | 0.27(fluorescent) |
| $R_f$4 | 0.44(black) | 0.31(blue) |
| $R_f$5 | 0.51(black) | 0.36(blue) |
| $R_f$6 | 0.59(black) | 0.44(blue) |
| $R_f$7 | 0.85(black) | 0.50(blue) |
| $R_f$8 | 0.94(black) | 0.58(blue) |
| $R_f$9 | - | 0.62(blue) |
| $R_f$10 | - | 0.71(fluorescent) |
| $R_f$11 | - | 0.79(blue) |
| $R_f$12 | - | 0.85(blue) |

**Table 5 (B):** $R_f$-Values in test solution of *Shool Prashamana Mahakashaya Kvatha Curna* at 254 nm and 366 nm observation under UV light (Ultra-violet light) After Derivatization-

| $R_f$ Values | At 254 nm After Derivatization | At 366 nm After Derivatization |
|---|---|---|
| $R_f$1 | 0.17(blue) | 0.14(brown) |
| $R_f$2 | 0.21(blue) | 0.25(brown) |
| $R_f$3 | 0.28(sky blue) | 0.34(brown) |
| $R_f$4 | 0.34(brown) | 0.52(brown) |
| $R_f$5 | 0.42(brown) | 0.67(brown) |
| $R_f$6 | 0.60(blue) | 0.73(brown) |
| $R_f$7 | 0.65(blue) | 0.81(brown) |
| $R_f$8 | 0.69(brown) | 0.85(red) |
| $R_f$9 | 0.73(blue) | - |
| $R_f$10 | 0.83(brown) | - |
| $R_f$11 | 0.91(brown) | - |

**Plate 1:** HPTLC Finger prints profile of test solution of Shool Prashamana Mahakashaya Kvatha Curna
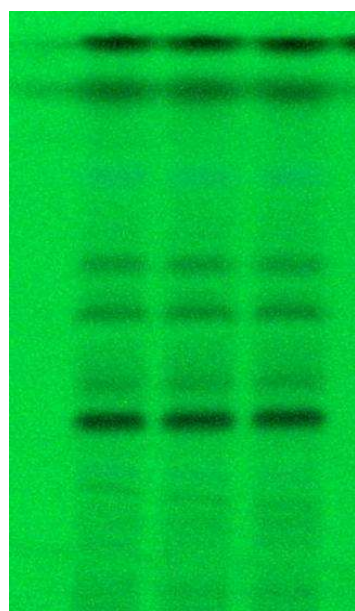


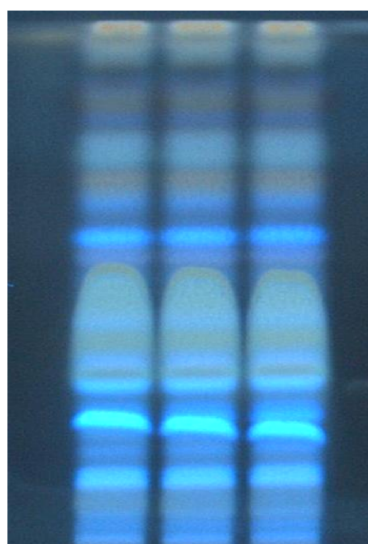**Fig.1: HPTLC profile at 254 nm**
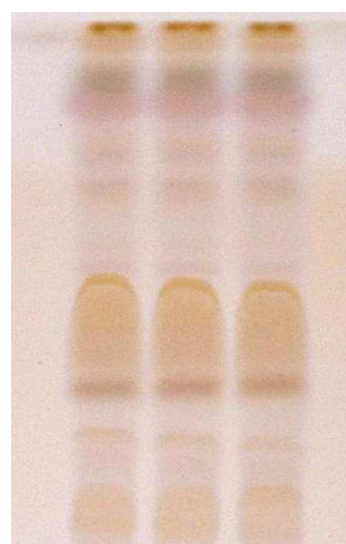**Track: 1, 2 & 3, test solution of Shool Prashamana Mahakashaya Kvatha Curna**
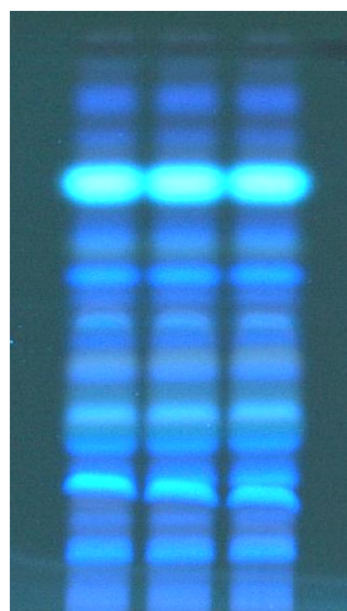


**Fig.2: HPTLC profile at 366 nm**
**Track: 1, 2 & 3, test solution of Shool Prashamana Mahakashaya Kvatha Curna**



**Fig.3: HPTLC profile at 366 nm after spraying with Anisaldehyde - sulphuric acid reagent**
**Track: 1, 2 & 3, test solution of Shool Prashamana Mahakashaya Kvatha Curna**



**Fig.4: HP TLC profile under UV light after spraying with Anisaldehyde - sulphuric acid reagent**
**Track: 1, 2 & 3, test solution of Shool Prashamana Mahakashaya Kvatha Curna**

## DISCUSSION

The ingredients of *shool prashaman kashaya* are having *katu & Tikta Rasa, Laghu, Tikshna, Ruksha & Snigdha guna, Ushna Virya, katu Vipaka* in nature with obvious alleviating action on all *Dosha*. It also has *Agni Deepka, Pachaka*, analgesic and anti–inflammatory properties which also useful in conditions such as *Amavata,* Rheumatoid arthritis, osteoarthritis pain etc. In the present study a pharmaceutical preparation of *shoolaprashaman kashaya* was carried out. Pharmaceutical properties have to be studied for authenticity of drug; hence the formulation was subjected to minimum Pharmacognostical and pharmaceutical analysis. Pharmacognostical evaluation of raw drugs used in *shoolprashaman kashaya* showed the specific characteristic features found in microscopy confirm the authenticity of the drugs.

## CONCLUSION

*Shoolprashaman kashaya* formulation was subjected to Pharmacogmostical and pharmaceutical analysis. Pharmacognostical findings confirmed the ingredients of *Shoolprashaman kashaya*. Physiochemical and HPTLC studies confirmed that ingredients of drug formulation meet the good quality standards at primary level. Generated results are specific and may consider for the further research works.

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