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PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF *PIPPALI SHODHANA* IN THE DIFFERENT MEDIA

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ABSTRACT

According to ayurveda science Pippali (Piper longum.linn.) was originated during the time of Samudra Manthan (churning of the ocean in Hindu mythology). When a great seer Vasistamuni son was ceased, by which he was depressed so he wished to have more progeny and he consumed fruit Pippali by which he was wised with more progeny. So the name Pippali came to that fruit. Pippali belongs to the family Piparaceae. Shodhan concept was in existence since the time of charak samhitha (600-1000 B.C) as while enumerating the fundamentals of ayurvedic pharmaceutics purification (*Shuddhi-Karan*) is found enumerated as one of the fundamentals necessary for "*Gunanterdhana"* (alteration and or addition of properties in the drug). Till date shodhana on different media is not well established for the first time present paper Evaluated phormacognostically and phytochemical including its HPTLC study. The results of Pharmacognostical work showed that more clear characters and more secondary metabolites released in to the powder. HPTLC results showed that 9 spots are observed in both 255 and 366nm among one spot is common may be piperine. Where as in *Gogrith Bharjith choorna (ghee-roasted powder)* showed that 10 spots at both 255 and 366nm where 2 spots are common on spectrum. Pharmacognostical and physicochemical parameters study findings confirm that all characters were found in different samples *Choorna* of Pippali The discussed here may be used as identifying tools for the quality assessment and obtained results are may be helpful for the further research works on pippali shodhana on different media.

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INTRODUCTION

Ayurveda is a widely practiced system of traditional medicine in India. The knowledge about medicinal plants in the early age was documented systematically and organized scientifically in *Ayurvedic Samhitas, Nighantus* and other texts. These structure or texts provide us many references of medicinal plants. Among all this *Samhitas* of Ayurveda *Charaka Samhita* is a vast treasure of knowledge regarding medicinal plants. *Charaka* is the first person that could classify the existing plants, into pharmacological categories and given 50 classes that are known as *Dashemani. Charaka* stressed to utilize the knowledge and experience in drug identification resorting to the help of cowherds, hermits, huntsmen forest dwellers etc[1].

In *Dravyaguna Vigyan* herbal drugs are used for therapeutic uses in which poisonous plants have also been mentioned. These poisonous plants are used after purification for treating the ailments, on the other hand some medicinal plants are also recommended for the *Shodhan* because *Shodhan* is the process by which the unwanted impurities are removed from a substance and the potency and efficacy are enhanced.

Shodhan concept was in existence since the time of *charak samhita*[1] (600-1000 B.C) as while enumerating the fundamentals of *Ayurvedic* pharmaceutics sauce (*Shuddhi- Karan*) is found enumerated as one of the fundamentals necessary for "*Gunanterdhana"* (alteration and or addition of properties in the drug). *Charaksamhita* have defined the concept of *Shodhana,* it says the *Karana* (processing) is the refinement of the natural product which means impairing other properties. This information will be of use for further pharmacological and therapeutically evaluation of the species and will assist in standardization for quality, purity and sample identification. [2]

Pippali (*Piper longum.*linn.) was originated during the time of *Samudra Manthan.* When *Vasistamuni* son was ceased, by which he was depressed so he wished to have more progeny and he consumed fruit *Pippali* by which he was wised with more progeny. So the name *Pippali* came to that fruit.[3]

Therapeutically, the drug *Pippali* covers the large number of clinical management where *Pippali* is employed in various forms and formulations in addition to a single drug as well as a component of a *Trikatu* comprising (*Shunthi, Maricha, Pippali*), trio-pungent drug group occupying significant role in therapeutics of indigenous system of medicine. *Pippali* act as a *Rasayana* and its use as a *Vardhamana pippali* is well appreciated for the purpose of *Rasayana.* [4] Till date shodhana on different media is not well established for the first time present paper Evaluated phormacognostically and phytochemical including its HPTLC study through standard procedure. So in this paper research carried out on the shodhan purpose to observe the difference between before shodhan and after shodhan to evaluate the result.

MATERIALS & METHODS:

Collection of raw drug

The raw drugs for the preparation of different samples were procured from the Mahatma Gandhi Ayurved College, Hospital & Research Center, Salod, Wardha. Identification and authantification and Pharmacognostical work was done in IPGT & RA, Pharmacognosy Lab, Gujarat Ayurved University, Jamnagar and Voucher Specimen No. IPGT&RA Ph.M. 6196/15-16.

Preparation of drug

Sample Raw Pippali

Raw Pippali fruit taken as dry 100 gm. and powder grinded and shade dried used for analysis

Sample simple *Bharjit* (roasted)

pippali fruit roasted till 5 mins. at temperature 50-60 C^0 and after that powder grinded shade dried and used for analysis

Sample *Goghrit bharjit* (Roasted with ghee) Pippali

Selected Pippali fruits are roasted with Goghrit at temp 50-60 C^0 till 5 minute, shade dried and used for analysis

Sample- *Gomutra Mannjit* (cow urine dipped) Pippali

Dried Pippali fruits are taken as such and dipped in gomutra Gomutra (15 ml) 4 hour then sun dried powdered sample taken for analysis.

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.[5]

Microscopic Study

Punarnavadi Yavakuta was dissolved with water and microscopy of the sample was done without stain and after staining with Phloroglucinol + HCl. Microphotographs of *Punarnavadi Yavakuta* was also taken under Corl-zeiss trinocular microscope.[6]

Physico-chemical analysis

Punarnavadi Yavakuta was analyzed using various standard physico-chemical parameters such as Loss on drying, water-soluble extract, and alcohol soluble extract etc.[7]

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 hexane: Ethyl acetate: glacial acetic acid 3:1:0.1 solvent system and observed under visible light. The colour and R_f values of resolved spots were noted.[8]

RESULTS:

Organoleptic characters of Samples

Organoleptic characters of samples such as color, odour, taste etc. examined by sensory organs and results are as shown in Table 1.

Microscopic characters of Samples

Powder Microscopy:

Normal *Pippali* powder shows Deep moss green shows fragments of parenchyma, oval to elongated stone cells, oil globules and round to oval, starch grains, black debris, fibers, hypodermal cells, prismatic crystals and aluerone grains. (Plate 1. 1-12.) Simple *Bharjit* Pippali powder shows ash coloured moss green shows fragments of parenchyma, oval to elongated stone cells as in the case of normal *Pippali* powder but some more characters are add i.e. hypodermal cells because of *Bharjith* process. (Plate 2. 1-12.) *Gomutra Mannjit* Pippali powder shows oval to elongated stone cells, oil globules and round to oval, starch grains, black debris, fibers, hypodermal cells, prismatic crystals and aluerone grains addition of silica deposition because of *Gomutra*. (Plate 3. 1-12.) *Gogrith Bharjith* Pippali powder shows oval to elongated stone cells, oil globules and round to oval, starch grains, black debris, fibers, hypodermal cells, prismatic crystals and aluerone grains with addition of excess of oil globules occur because of Girth consist oil. (Plate 4. 1-13.)

Physicochemical parameters of Samples

Physicochemical parameters of samples such as ash value, water-soluble extract, alcohol soluble extract, pH etc. results are show in Table 2.

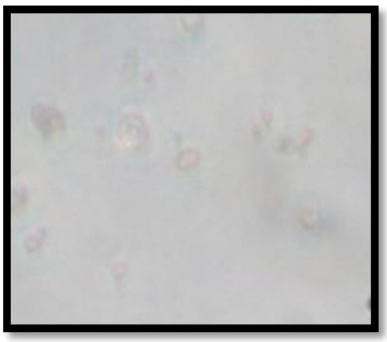
HPTLC Study

HPTLC was performed using hexane: Ethyl acetate: glacial acetic acid 3:1:0.1 solvent system and observed under visible light. The colour and R_f values of resolved spots were noted and depicted in the table (Plate 5,6) Table 3.

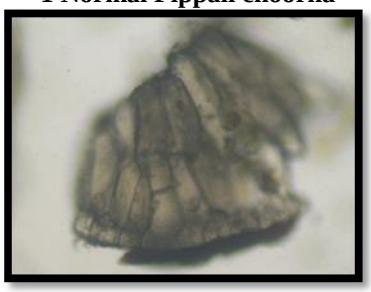
Plate1: Pippali normal Powder.

1 Normal Pippali choorna

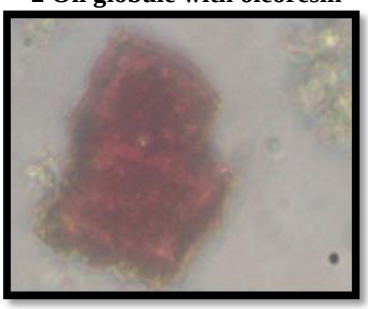
2 Oil globule with oleoresin



3 Aloerone grains

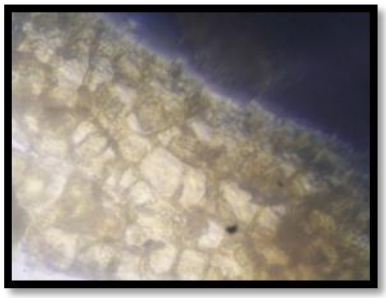


4 Compactly arrenged Black debris of epidermal cells

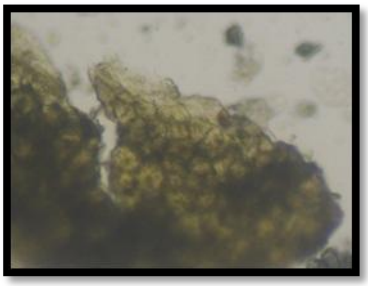


5 Bottle neck shaped stone cells

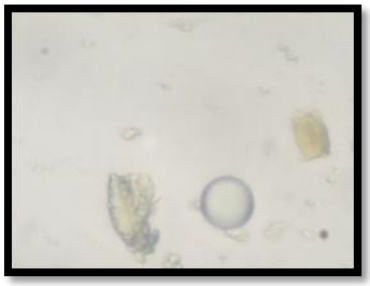
6 Fibre



7 Fragment of hypodermal cells

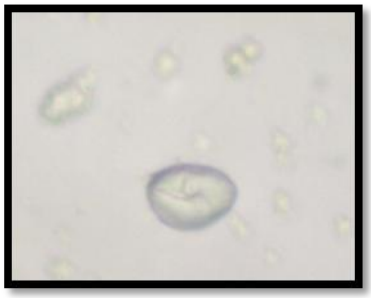


8 Mesocarp cells

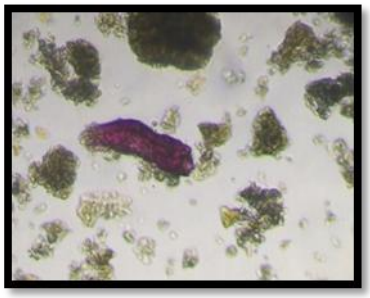


9 Oilglobule

10 Prismatic crystals



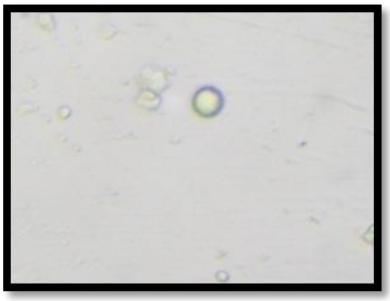
11 Starch grains



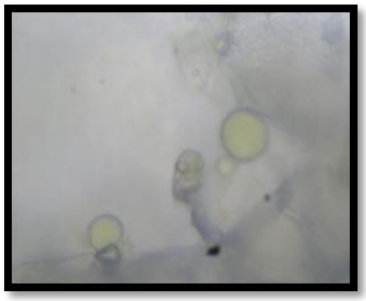
12 Stone cell

Plate 2. Pippali simple bharjita Powder.

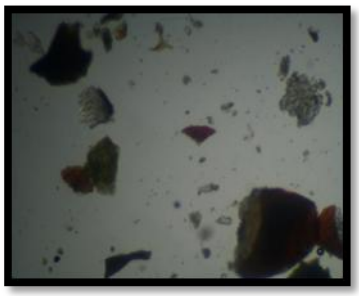
1 Simple Bharjitha Pippali choorna



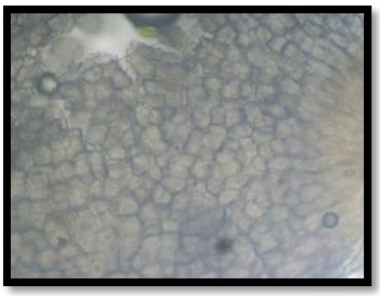
2 Oil globule



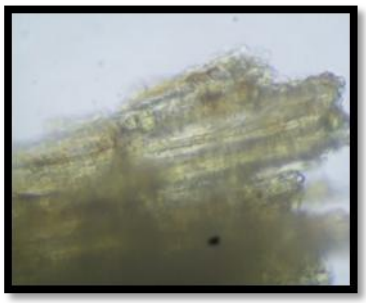
3 Oil globules



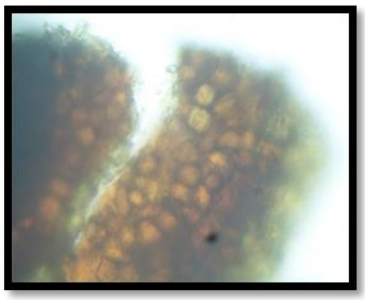
4 Cellular components compactly arrenged



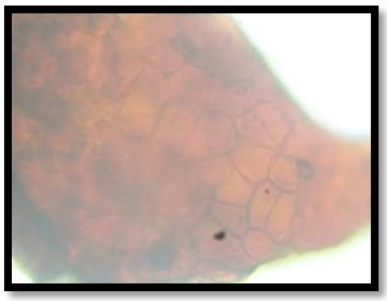
5 Compactly arrenged epidermal cells



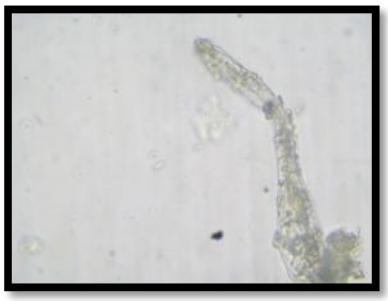
6 Compactly arrenged group of fibres



7 compactly arrenged hypodermal cells with brown contant

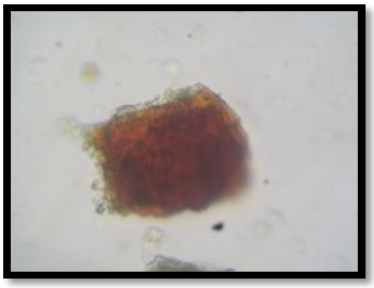


8 Hypodermal cells with brown contant

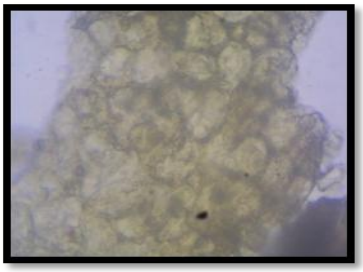


9 simple fibre with aluerone grain

10 Stone cells with hypodermal cells



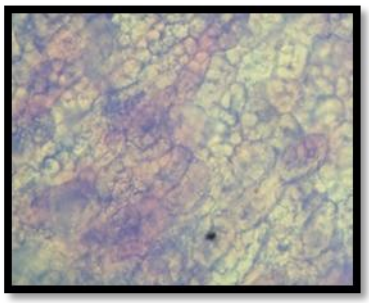
11 Tannin with olioresine contant



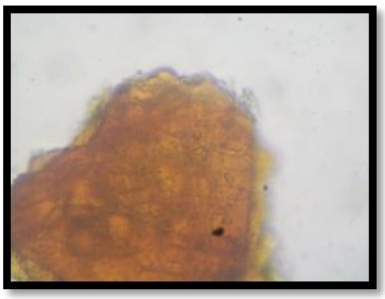
12 Wavy parenchyma cells

Plate 3. Pippali Gomutra *Mannjit* Powder.

1 Gomutra bharjita pippali choorna

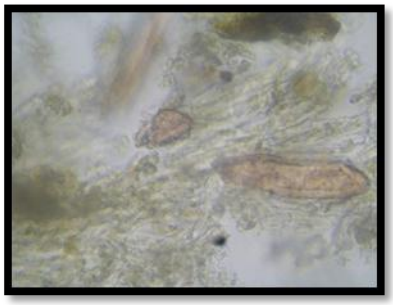


2 Hypodermal cells with stone cells

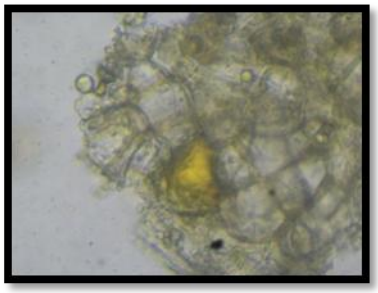


3 Hypodermal cells

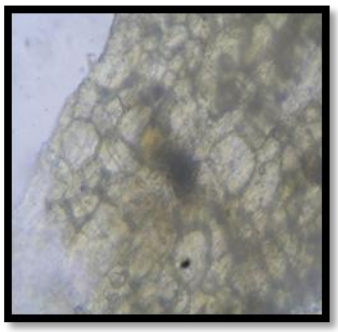
4 Lignified stone cell with black debries



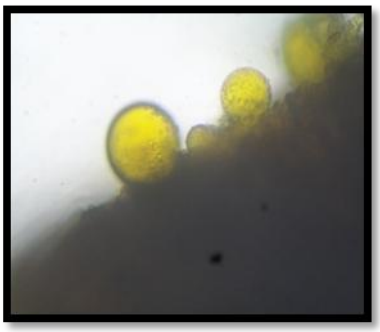
5 Lignified stone cells



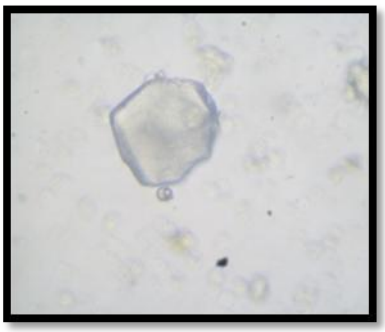
6 Mesocarp cells with olioresine



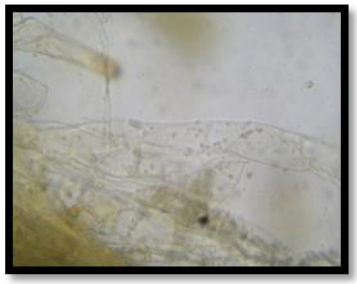
7 mesocarp cells



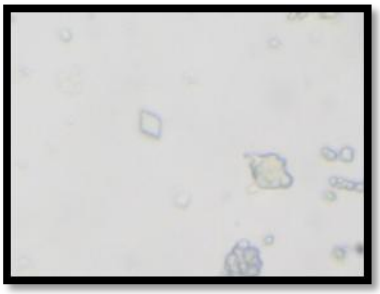
8 Oil globules



9 Oxalate deposition of cow's urine

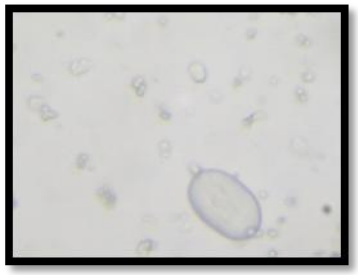


10 Palisade cells of Central axis

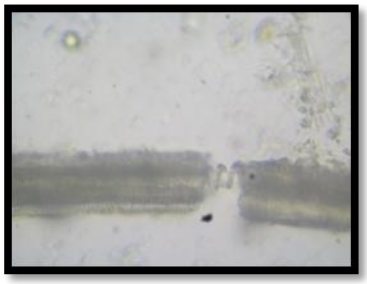


11 Prismatic crystal

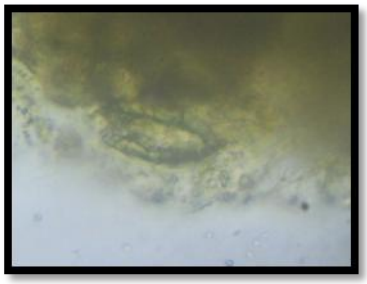
12 Simple fibres



13 Simple Starch grain with aluerone grains



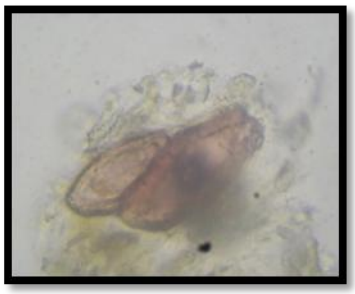
14 Spiral and annula vessels



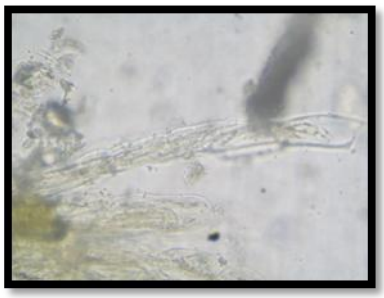
15 stone cells

Plate 4. Pippali Goghrita bharjita Powder.

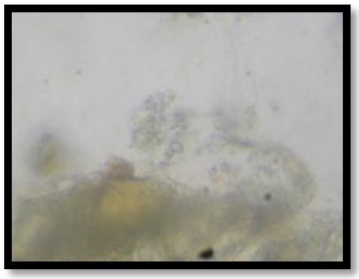
1 Pippali Goghrita bharjita



2 Lignified stone cells



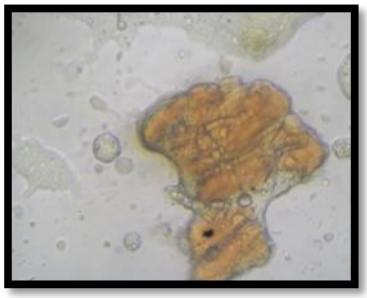
3 Palisade cells of central axis



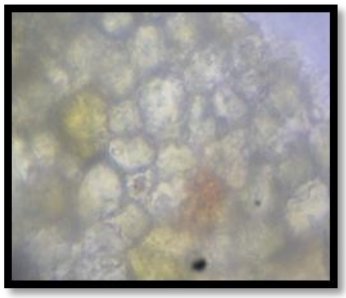
4 grains

5 anuular vessels

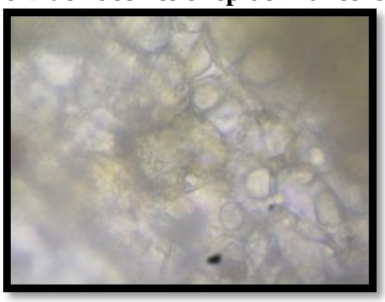
6 Black debries of epidermal cells



7 Brown contant with oil globules of grita

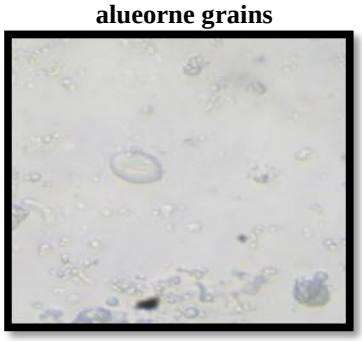


8 Parenchyma cells with alueorne grains



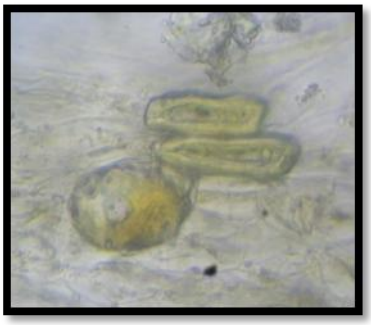
9 Parenchyma cells with oil globules

10 Simple fibre



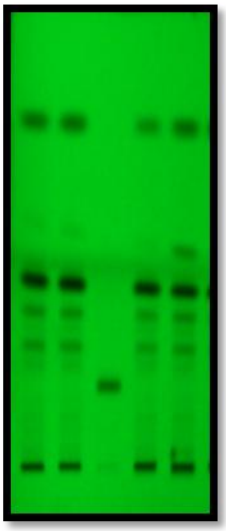
11 Simple starch grain

12 Single stone cell

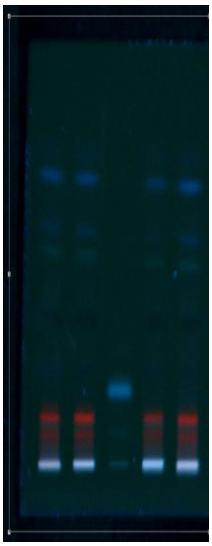


13 Stone cells in group

Plate5. HPTLC of Pippali Samples.



At 254 nm



At 366nm

After spray

Plate 6: 254nm & 366nm 3D.

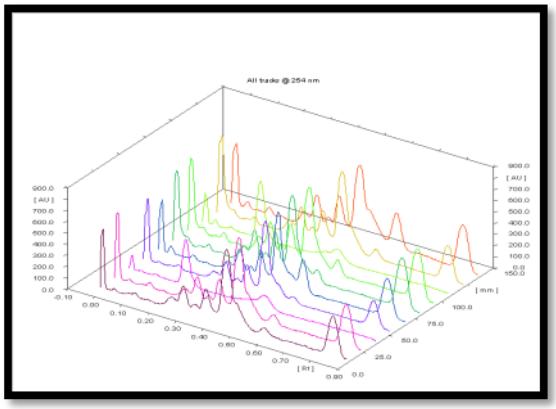


Table 1: Organoleptic characters of Samples.

Sr. No.	Characters	Pippali normal Powder	Simple Bharjitpowde	Gomootrnimmanjitt	Gogritha Bharjitha
1	Colour	Black	Black	Black	Black
2	Odour	Aromatic	Aromatic	Aromatic	Aromatic
3	Taste	Sour	Sour	Sour	Sour
4	Touch	Rough	Rough	Rough	Rough

Table 2: Physicochemical parameters of Samples.

Sr. No.	Test	Simple choorna %w/w	Simple Bharjitha % w/w	Gomootra %w/w	Gogritha Bharjitha%w/w
1	Ash Value	2.56%	2.60%	2.87%	3.12%
2	Water soluble extract	0.11%	0.19%	0.22%	0.41%
3	Methanol soluble extract	6.23%	6.31%	6.51%	6.72%
4	Acid insoluble	0.22%	0.38%	0.4%	1.7%
5	pH	5.67	6.12	6.15	6.23

Table3. HPTLC R_f Values of Samples.

Samples	At 254 nm	At 366nm
Normal Pippali choorna	0.03, 0.17, 0.36, 0.40, 0.56, 0.62, 0.70, 0.79, 0.87	0.03, 0.17, 0.34, 0.40, 0.51, 0.63, 0.68, 0.85, 0.98.
Simple Bharjith choorna	0.03, 0.17, 0.35, 0.40, 0.57, 0.62, 0.70, 0.79, 0.87	0.03, 0.17, 0.36, 0.40, 0.56, 0.63, 0.68, 0.85, 0.98.
Gomootra choorna	0.02, 0.17, 0.39, 0.40, 0.50, 0.62, 0.70, 0.79, 0.87	0.04, 0.17, 0.37, 0.40, 0.51, 0.63, 0.69, 0.85, 0.98.
Gogritha bharjith choorna	0.03, 0.15, 0.37, 0.40, 0.50, 0.68, 0.70, 0.76, 0.87, 0.90	0.04, 0.17, 0.39, 0.40, 0.54, 0.63, 0.68, 0.85, 0.95, 0.98.

DISCUSSION

Diagnostic characters of normal Pippali showed that the cleared presence of clumped black debris, prismatic crystals, group of stone cells, oil globules, oleoresins and epidermal cells, fibers aluerone grains, hypodermal cells and mesocarp cells where as in cellular components are somewhat compactly arranged i.e. Epidermal cells, mesocarp cells, brown content group of stone cells are slightly disturbed and other characters are same as observed in normal Pippali, changes due to the simple lavigation without adding anything. In *Gomootra Mannjit* Pippali deposition of silica crystals, black debris become free, isolated stone cells, smoothened fibers, hypodermal cells prismatic crystals and simple starch grains, mainly due to the cows urine consist silica deposition and also it smoothens the fiber characters and released group of stone cells. Results of *Gogritha Bharjitha* showed that the presence of more oil globules, isolated stone cells, smoothened fibers, free black debris, simple starch grains freeing with ghee which adds more oil to the *Choorna* and ultimately smoothened the surfaces of fibers and stone cells and also improves the efficacy of the *Choorna.*

Similar results existed in the HPTLC studies fewer spots observed in normal Pippali, Simple *Bharjith, Gomootra Mannjit, Gogritha Bharjitha,* increased spots observed respectively in Pippali, *simple Bharjith, Gomootra bhavitha , Gogritha Bharjitha*. Where the normal Pippali and simple Bharjith *Pippali* and *Gomootra Mannjit* samples showed the less spots and coverage area. Where the *Gogrith Bharjith Pippli* showed clear and highest piperine content, Piperine content and area of coverage is more than that of other 3 samples and got clear spots as compare to the other samples. 9 spots are observed in both 255 and 366nm among 0ne spot is common may be Pipperine. Where as in Gogrith Bharjith choorna showed that 10 spots at both 255 and 366nm where 2 spots are common on spectrum. FTIR results also support the study with more peaks in *Gogritha Bharjith* Pippali sample.

CONCLUSION

Pharmacognostical and physicochemical parameters study findings confirm that all characters were found in different samples *Choorna* of Pippali The discussed here may be used as identifying tools for the quality assessment.

The obtained results are may be helpful for the further research works on pippali shodhana on different media.

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