

**PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION
OF SHATAVARYADI CHOORNA – A FORMULATED COMPOUND****Dr. Anu M. S.*¹, L. P. Dei², Harisha C. R.³ and V. J. Shukla⁴**

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ABSTRACT

Nutritional demands are very high in pregnancy and so food supplementation in terms of micronutrients is absolutely necessary for the proper growth and development of the foetus. In India, Maternal Mortality Rate and Infant Mortality Rate are very high; and are mostly associated with the deprivation of the nutrition. *Shatavaryadi Choorna* (*Anubhoot Yoga*) is a formulated combination comprises of equal quantities of powders of Indigenous drugs such as *Shatavari*, *Amalaki*, *Guduchi*, *Bala*, *Draksha* and *Arjuna*. These drugs possess *Rasayana*, *Balya*, *Brimhana*, *Medhya*, *Vayastahapana* and *Prajasthapana* property. Hence this formulation is assumed to be beneficial for the physical as well as psychological growth and development of foetus and for the continuation of pregnancy. Till date there is no published

research work available on this formulation. So the present work was carried out to standardize the *Shatavaryadi Choorna* in terms of its identity, quality and purity. Pharmacognostical and physico-chemical observations revealed the specific characters of all active constituents of the drugs used. The pharmaceutical analysis showed the values; Loss on drying 8.19% w/w, Water soluble extracts 24.6% w/w, pH 6.5 etc. HPTLC study revealed 9 peaks at 254 nm and 5 peaks at 366 nm wave lengths. This shows the presence of certain

definite constituents in the formulation and is helpful for the easy separation of these constituents.

KEYWORDS: HPTLC, Pharmaceutical analysis, Pharmacognosy, Pregnancy, *Shatavaryadi Choorna*.

INTRODUCTION

In a woman's life cycle, pregnancy and child birth are one of the most critical events that maintain the continuity and existence of this world. Nutritional demands are very high in pregnancy as it plays a very important role in deciding the foetal as well as maternal well being. Any negligence or deprivation in the nourishment may affect the physical and mental growth of foetus or it may lead to miscarriage, premature labour and low birth weight. Nutrition and immunity are also interlinked. Maternal immunological status has direct role in the establishment and continuation of health & immune status of the foetus. Maternal mortality rate is 167 per 1,00,000 live births in India.^[1] Maternal death arises from the risks attributed due to the pregnancy and child birth as well as from improper nutrition. Infant mortality rate is very high (40/1,000 live births)^[2] due to the increasing incidence of IUGR, preterm birth and low birth weight in India; and are mostly associated with the deprivation of the nutrition.

Ayurveda has strong footings in the field of healthy progeny through month wise *garbhini paricharya*; that includes the *Aahara* (Specific dietary regimen), *Vihara* (daily activities), *Oushada* (medicines and therapeutic procedures) and modifications in psychological behaviour of the pregnant woman. *Shatavaryadi Choorna* is a formulated combination comprises of equal quantities of powders of Indigenous drugs such as *Shatavari*, *Amalaki*, *Guduchi*, *Bala*, *Draksha* and *Arjuna*. Almost all drugs are having *Sheeta veerya*, *Madhura vipaka* and *Rasayana* property. Along with physical excellence (excellence of dhatus), the *rasayana* drugs improves the psychic excellence and thus promotes the growth and development of foetus. *Rasayana* drugs boosts the ojas, acts as antioxidant as well as immunomodulator.^[3] The drugs in *Shatavaryadi choorna* also possess *Balya*, *Brimhana*, *Vayasthapana*, *Prajasthapana*, *sramahara*, *Hridya*, *Pushtidayaka*, *Sonita prasadana*, *Agnideepana* and *Medhya* property.^[4-10] Thus these drugs are beneficial for the physical as well as psychological growth and development of foetus and for the continuation of pregnancy.

Quality and therapeutic effect of the finished drug depends entirely on the quality and genuineness of the raw materials. Therefore proper identification of raw material is a must as there are chances of adulteration or substitution due to the scarcity of the drugs. The expected therapeutic effect from an administered drug can be achieved only if the finished product keeps quality in standard level. Hence it is inevitable to analyze *Ayurvedic* products and draw out results according to modern scientific pharmaceutical and pharmacognostical parameters for the global acceptance of *Ayurveda*. Since *Shatavaryadi choorna* is a formulated combination (*Anubhoot yoga*), it is necessary to evaluate the finished product with perspectives of safety, efficacy and quality by modern science. In the present study pharmacognostical and pharmaceutical analysis were done in order to ensure the quality standards of the *Shatavaryadi choorna* such as identity, quality and genuineness of ingredients and finished product along with preliminary physico-chemical and pharmaceutical parameters.

MATERIALS AND METHODS

Collection, identification and authentication of raw drugs

The raw materials except *Draksha* and *Bala* were procured from the pharmacy of Gujarat Ayurved University, Jamnagar. *Draksha* and *Bala* are procured from an ayurvedic medicinal shop in jamanagar. The raw drugs were identified and authenticated for quality and purity in the Pharmaconosy labouratory, Institute for Post Graduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar.

Ingredients

Table No. 1: Ingredients of *Shatavaryadi Choorna*.

Name of drugs	Latin name	Part used	Ratio
<i>Shatavari</i>	<i>Asparagus racemosus</i> Willd.	Dried root	1
<i>Amalaki</i>	<i>Embllica officinalis</i> Gaertn.	Dried fruit	1
<i>Guduchi</i>	<i>Tinospora cordifolia</i> Miers.	Dried stem	1
<i>Bala</i>	<i>Sida cordifolia</i> Linn.	Dried root	1
<i>Arjuna</i>	<i>Terminalia arjuna</i> (Roxb.)	Dried stem bark	1
<i>Draksha</i>	<i>Vitis vinifera</i> Linn.	Dried fruit	1

Preparation of Drug

The raw drugs were washed properly, then dried and made into fine powder and mixed well into a homogenous mixture in the Pharmacy of G.A.U, Jamnagar and kept in air tight containers.

Pharmacognostical Study of *Shatavaryadi choorna*

Pharmacognostical analysis of the *Shatavaryadi choorna* was carried out in the Pharmacognosy laboratory of I.P.G.T. & R.A., G.A.U., Jamnagar. It was carried out in two steps.

1. Organoleptic Study

The organoleptic characters of *Shatavaryadi choorna* i.e. Color, Touch, Odor and Taste were analyzed with the help of sense organs^[11] (*Darshana, Sparshana, Aaghrana* and *Rasana Pareeksha* mentioned in *Ayurveda*).

2. Microscopic Study – Powder Microscopy

Small quantity from the *Shatavaryadi choorna* was dissolved in distilled water. Few drops of this is spread on a glass slide and covered with a cover slip and excessive water was removed with filter paper. Microscopic examination was done with the prepared slide first without staining and then stained with Phloroglucinol and concentrated HCl under Carl Zeiss Trinocular microscope. Photomicrographs were taken by using Carl Zeiss Trinocular research microscope attached with camera.^[12]

Pharmaceutical Study of *Shatavaryadi choorna*

Physico-chemical Analysis

Shatavaryadi choorna was analyzed using various standard physico-chemical parameters such as Loss on drying, Ash value, Water soluble extract, Alcohol soluble extract and pH.^[13]

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+ Ethyl acetate+ Diethyl amine (7:2:1) solvent system and observed under visible light. The colour and R_f values of resolved spots were noted.^[14]

RESULTS AND DISCUSSION

Organoleptic characteristics of *Shatavaryadi choorna*

Organoleptic characteristics of *Shatavaryadi choorna* like Colour, Touch, Odour and Taste were recorded and shown in Table No.2.

Microscopic Characteristics of *Shatavaryadi choorna*

Diagnostic characters of *shatavaryadi choorna* were observed under the microscope and presence of all ingredients showed their different characters such as Cluster crystals of *Arjuna*, Oval shaped starch grains of *Guduchi*, Compound starch grains of *Shatavari*, Simple trichome of *Bala*, Simple fibre of *Amalaki*, Silica deposition of *Amalaki*, Tanin content of *Arjuna*, Sclerides of *Amalaki*, Rhaphides of *Shatavari*, Mesocarp of *Amalaki*, Fragments of stellate trichome of *Bala*, Border pitted vessels of *Guduchi*, Epicarp cells of *Amalaki*, Septate fibers of *Bala*, Lignified septate fibers of *Bala*, Cork cells with tanin content of *Arjuna*, Lignified border pitted vessels of *Guduchi*, Lignified sclereids of *Amalaki*, Collenchyma cells of *Guduchi*, Annular and scalariform vessels of *Shatavari*, Scalariform vessels of *Shatavari*, Starch granules with hyaline of *Draksha*, Oil globules of *Draksha*, Annular vessels of *Draksha*, Compound starch grain of *Draksha*, Yellow content of *Draksha*, Acicular crystals of *Draksha*, Microcrystals of *Draksha*, Lignified pitted vessels of *Draksha* etc. (Microphotographs Plate 1).

Physico-chemical analysis

Physico-chemical analysis of *Shatavaryadi choorna* revealed the values such as Loss on drying 8.19%w/w, Ash value 4.45.%w/w, Water soluble extract 24.6%w/w, Alcohol soluble extract 28.32%w/w, pH value 6.5, and shown in Table No.3.

HPTLC Study

The chromatographic study (HPTLC) was carried out under densitometer at 254 nm and 366 nm UV to establish fingerprinting profile. Chromatogram shows 9 prominent spots at 254 nm with maximum Rf value 0.03, 0.21, 0.27, 0.38, 0.65, 0.67, 0.88, 0.94, 0.97 and 5 spots at 366 nm with maximum Rf value 0.03, 0.21, 0.64, 0.93, 0.96.

Table No. 2: Organoleptic characteristics of *Shatavaryadi choorna*.

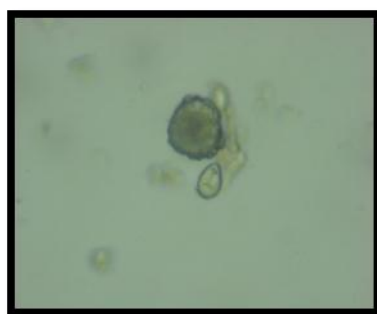
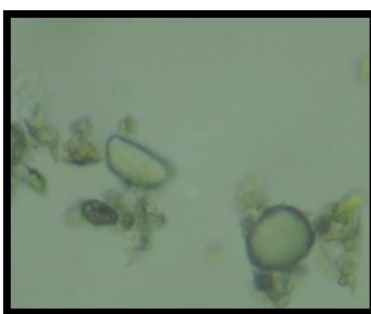
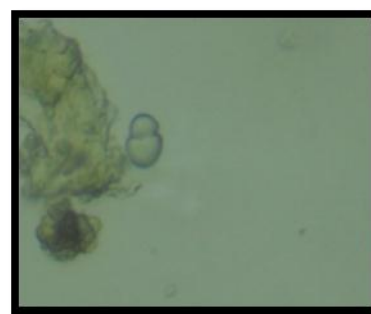
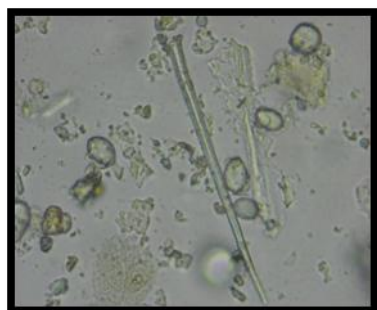
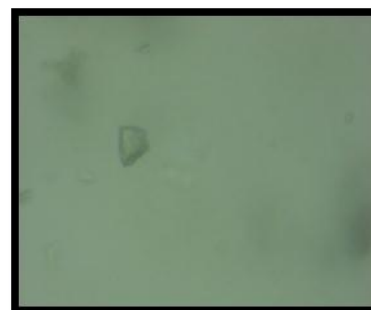
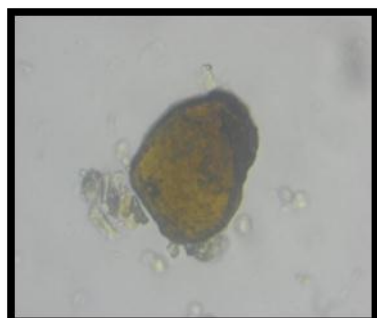
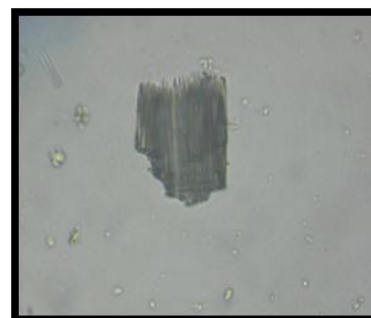
Sl no:	Character	Observation
1	Colour	Chocolate brown
2	Odour	Characteristic
3	Touch	Smooth
4	Taste	Bitter followed by astringent

Table No. 3: Pharmaceutical Evaluation of *Shatavaryadi choorna*.

Sl no:	Test	Result w/w
1	Loss on drying	8.19%
2	Ash value	4.45%
3	Water solusble extract	24.6%
4	Alcohol soluable extract	28.32%
5	pH (5% solution)	6.5

Table no. 4: HPTLC of *Shatavaryadi choorna*.

Wave length	Number of Spots	Rf value
At 254 nm	9	0.03, 0.21, 0.27, 0.38, 0.65, 0.67, 0.88, 0.94, 0.97
At 366 nm	5	0.03, 0.21, 0.64, 0.93, 0.96

Plate 1: Microphotographs of *Shatavaryadi choorna*.Fig 1: Cluster crystals of *Arjuna*.Fig 2: Starch grain of *Guduchi*.Fig 3: Compound starch grain of *Shatavari*.Fig 4: Simple trichome of *Bala*.Fig 5: Simple fibre of *Amalaki*.Fig 6: Silica deposition of *Amalaki*.Fig 7: Tanin content of *Amalaki*.Fig 8: Sclereids of *Amalaki*.Fig 9: Raphides of *Shatavari*.

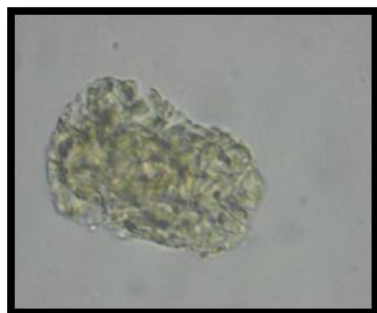


Fig 10: Mesocarp of *Amalaki*.

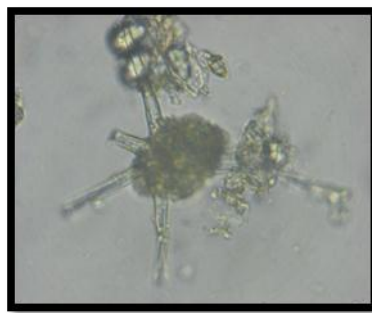


Fig 11: Fragments of stellate trichomes of *Bala*.



Fig 12: Border pitted vessels of *Guduchi*.

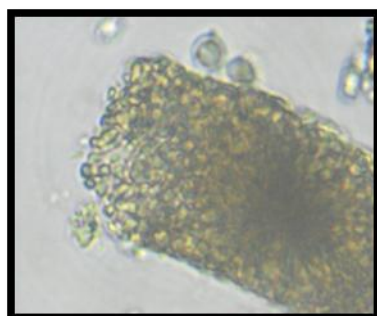


Fig 13: Epicarp cells of *Amalaki*.

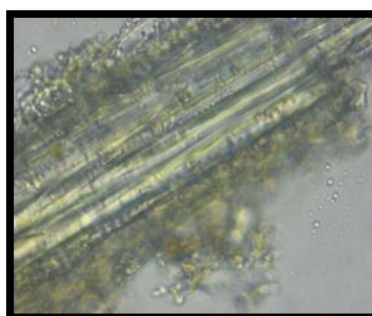


Fig 14: Septate fibers of *Bala*.

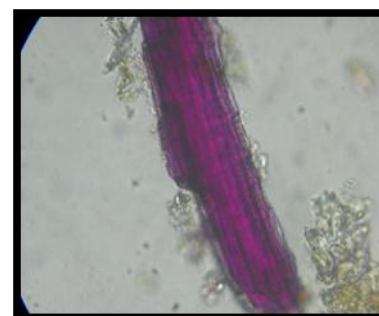


Fig 15: Lignified septate fibers of *Bala*.

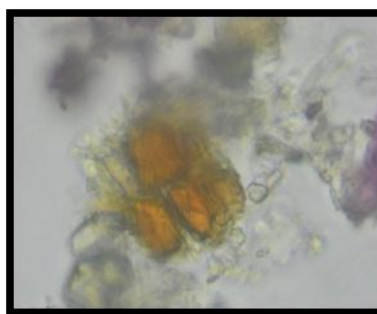


Fig 16: Cork cells with tannin content of *Arjuna*.

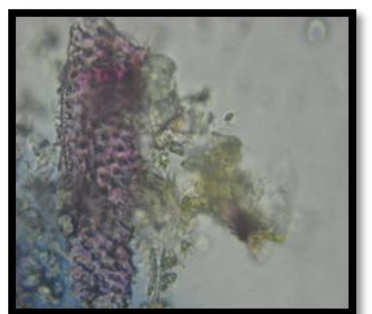


Fig 17: Lignified border pitted vessels of *Guduchi*.

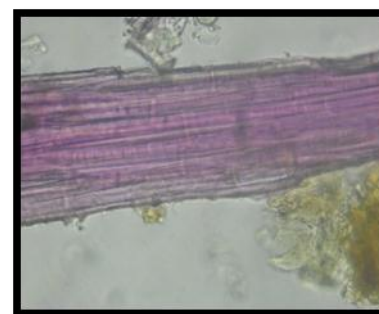


Fig 18: Lignified septate fibres of *Bala*.

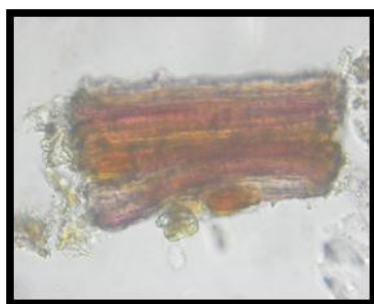


Fig 19: Lignified sclerides of *Amalaki*.



Fig 20: Collenchyma crystals of *Guduchi*.



Fig 21: Annular and Scalariform vessel of *Shatavari*.

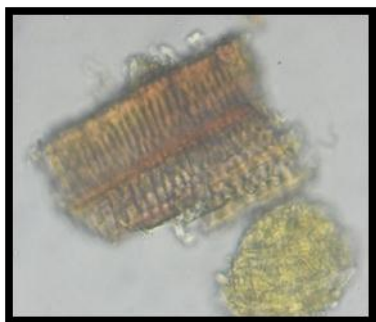


Fig 22: Scalariform vessel of *Shatavari*.

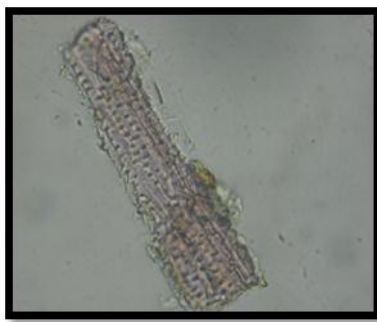


Fig 23: Lignified pitted vessels of *Bala*.

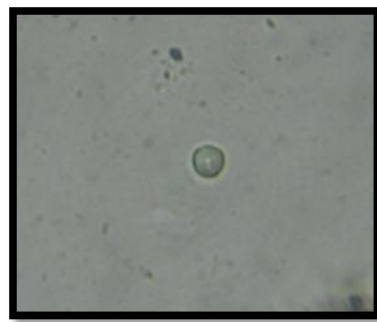


Fig 24: Starch granule with hyaline of *Draksha*.

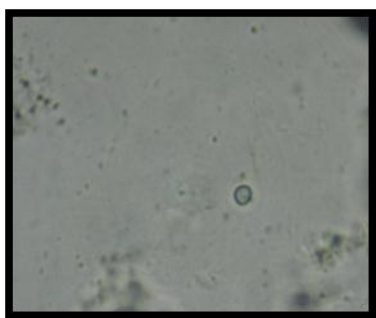


Fig 25: Oil globules of *Draksha*.



Fig 26: Simple starch granules of *Draksha*.

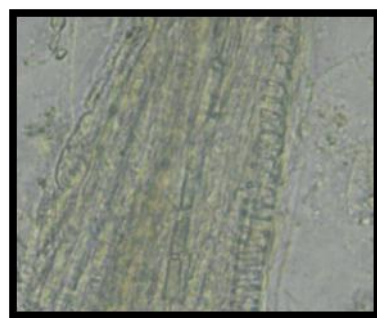


Fig 27: Fibre with annular vessels of *Draksha*.

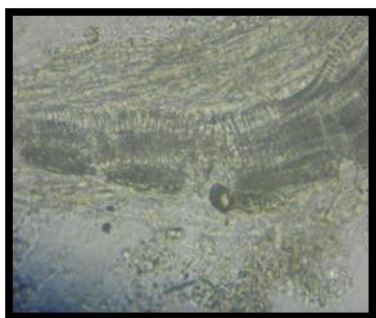


Fig 28: Annular vessel of *Draksha*.



Fig 29: Compound starch granule of *Draksha*.

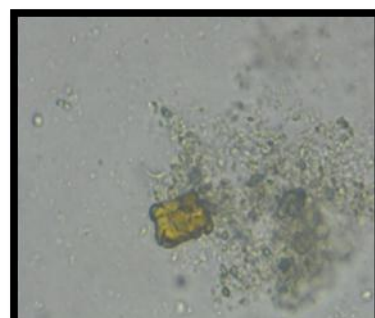


Fig 30: Yellow content of *Draksha*.

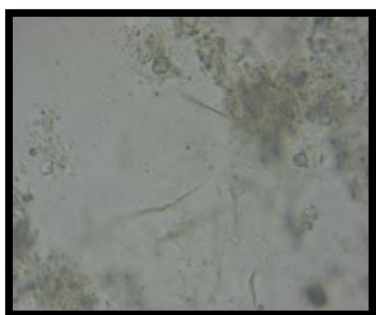


Fig 31: Acicular crystals of *Draksha*.

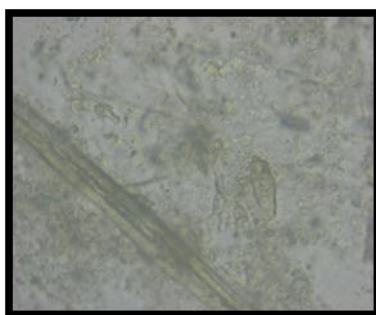


Fig 32: Mesocarp cells with fibre of *Draksha*.

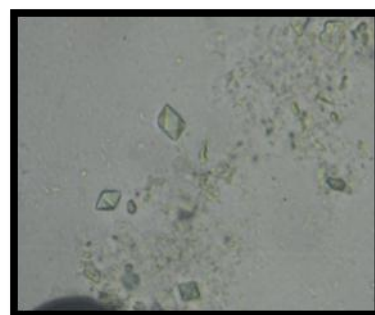


Fig 33: Microcrystals of *Draksha*.



Fig 34: Lignified pitted vessel of *Draksha*.

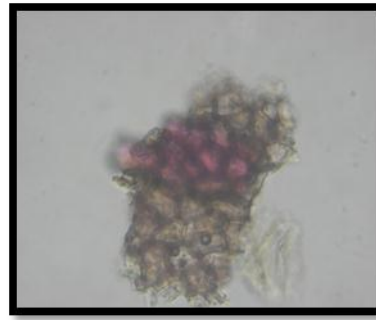


Fig 35: Lignified cork cell of *Arjuna*.

Plate 2: Densitogram of *Shatavaryadi choorna* at 254 nm and 366 nm.

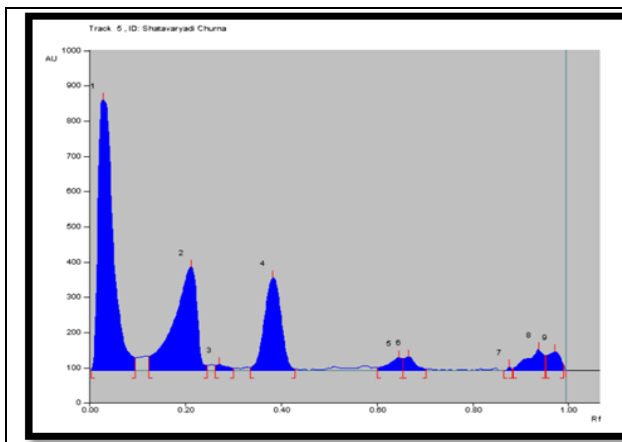


Fig 1: 254nm Peak display.

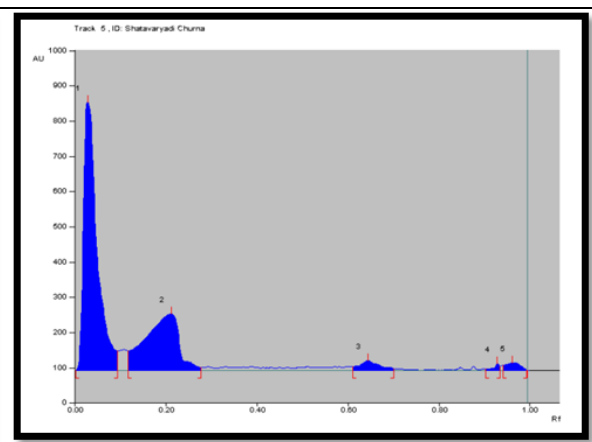


Fig 2: 366nm Peak display.

Plate 2: Three Dimensional HPTLC (3D) Densitogram.

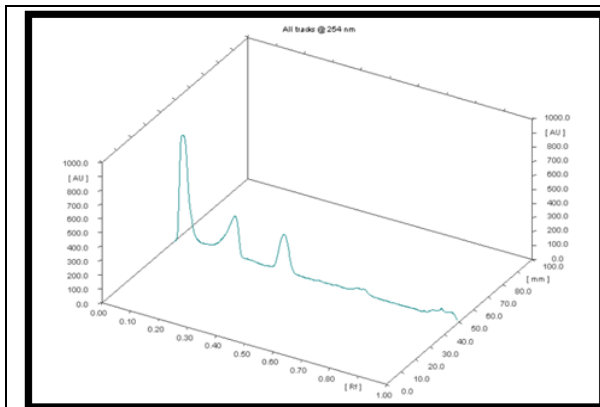


Fig 1: 254nm.

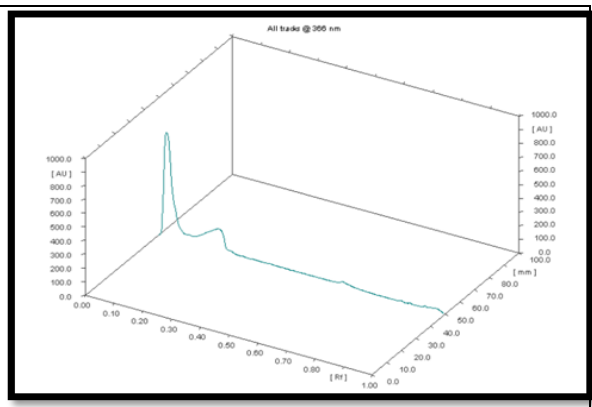


Fig 2: 366nm.

Shatavaryadi choorna is a formulated combination; consist of six herbal ingredients which were proved to be genuine by assessing the pharmacognostical parameters. The therapeutic effect depends on the quality of the drug administered. All the physico-chemical parameters

analyzed were found to be within the normal reference range. Evaluation of physico-chemical parameters and qualitative analysis helped to identify the presence of specific ingredients in a formulation and application of chromatographic techniques aid in recognition of number of ingredients and also to assess the purity by comparing with the standard ones.

CONCLUSION

As *Shatavaryadi choorna* is a formulated combination and intended to given for pregnant ladies, it is necessary for the authentication of ingredients and standardization to ensure the quality control. Pharmacognostical characteristic of *Shatavaryadi choorna* under the microscope showed characters of all the ingredients of finished product and there is no major change in the microscopic structure of the raw drugs during the pharmaceutical processes of preparation of the drug. The physicochemical analysis are 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 this formulated yoga, enabling the reproducibility of the formulation.

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