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PHARMACOGNOSTICAL & PHYTO-CHEMICAL EVALUATION OF *MUNDITAKA KWATHA* –W.S.R. TO *BEEJAKOSHA GRANTHI* (OVARIAN CYST)

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ABSTRACT

To continue the process of universe the almighty have empowered all his creation to reproduce them for the continuity of human race through both the men and women are equally important, but the women share the major responsibilities. In past some years, there is a domestic rise in female related illness which was rarely seen before in history. Ovarian cyst is an emerging problem among the women of reproductive age group. In Ayurved context to *Granthi*, situated in *Beejakosha* can be correlated with Ovarian cyst. *Kanchanara Guggulu with Anupana* of *Munditaka Kwatha has* been selected in present study. *Munditaka Yavakuta* was used as *Kwatha Kalpana* as mentioned by *Sharangdhara Samhita*. All the parts of the *Sphaeranthus indicus* (Linn) are having medicinal uses. Till date there is no scientific evaluation has been observed. An attempt has been made to evaluate its Pharmacognostical and Physico-chemical profile. Pharmacognostically authenticated whole *Munditaka* plant was used for the preparation of *Yavakuta* and it was analyzed through qualitative and quantitative analysis of physicochemical parameters. High-Performance Thin Layer chromatography study (HPTLC) was also developed. Pharmacognostical results shows Border pitted vessel, Oil globules, Pollen grain, Multicellular warty trichoms, Silica deposition, Stone cells, Rhomboidal crystals, Fragment of annular vessels. Qualitative study shows that pH is 7, Ash value is 9.46% w/w, Loss on drying is 7.44% w/w, Water soluble extract is 10.3% w/w & Alcohol soluble extract is 3% w/w, Acid soluble Ash 1.35 %w/w.

HPTLC study shows that Maximum 7 spots were obtained when viewed under short wave ultra violet light both (254 nm) and (366 nm).

KEYWORD: *Beejakosha Granthi*, *Munditaka Yavakuta*, Phytochemical Analysis, Chromatography.

INTRODUCTION

To continue the process of universe the almighty have empowered all his creation to reproduce them for the continuity of human race through both the men and women are equally important, but the women share the major responsibilities. Women are the most essential factor for the perpetuation of the human race. In *Manusmruti* it has been mentioned. "प्रजास्थापनम् स्त्रियः सृष्ठाय|" In past some years, there is a domestic rise in female related illness which was rarely seen before in history. Ovarian cyst is an emerging problem among the women of reproductive age group.[1] Ovarian cysts are fluid filled sacs inside the ovary.[2] Ovarian cysts are classified according to their position within the ovary like Functional Cysts, Polycystic Ovary, Chocolate Cyst(Endometriosis), Dermoid Cyst, Cystoedenoma. Nearly 2% of the adnexal masses are ovarian carcinomas or border line tumors. Due to defective life style of women in modern era ovarian cyst is becoming a burning problem in current scenario affecting all age group of women. Ovarian cancer is 2nd most common of genital cancers and accounts for 10-15% of all gynecological cancers in developing countries including Iindia.[3]

In Ayurved, context to *Granthi*, it is included among disorders of vitiation of *Rakta, Mamsa & Meda.*[4] *Acharya Sushruta* has given elaborate description of *Granthi* from its etiopathogenesis classification and its management, but not mentioned about neoplastic swelling of female genital organs, though a reference related to *Granthi* of male genital tract is available. *Samanya Chikitsa* includes some common procedures which enhance immunity and make the patient fit for specific type of treatment as well as to bear ultimate consequences of treatment and to have an early relief. It includes various procedures of *Panchakarma* e.g. *Snehana* (*Sarshapa* oil), *Swedana* (*Pinda*), *Vamana*, *Virechana* & *Basti* etc. By which over- accumulated *Doshas* are expelled and fortified *Sneha* which are *Agni-deepaka*, *Pachaka* and *Ojo- Vardhaka*. It also includes such kind of Conservative treatment which improve immune mechanism and revert the disease process e.g. *Kanchanara Guggulu*

(B.P.44/34-44),*Chandraprabha Vati* (S.S.M.K.), *Triphala Guggulu*, *Varunshigru Kwatha* etc. Have been mentioned in Ayurveda.

Munditaka-Sphaeranthus indicus(Linn) is used as *Medhya, Galagandahara, Apachihara, Mutrakucchahara, Krumighna, Yonirogahara, Pandhuhara, Shlipadahara, Apasmarahara, Plihaghna, Medorogahara, Gudarogahara*.[5] The *Panchanga* of *Munditaka* is used here. The reference is taken from Sharangdhara Samhita Madhyam Khanda *Granthi Adhikara* mentioned as *Anupaan* of *Kanchnara Guggulu*. It is mentioned in *Gana* of *Madhuar Skandha (Charaka Samhita), Surasadi Gana (Sushruta Samhita & Ashtanga Hridya), Guduchyadi Varga (Dhanvantari, Shaligrama & Bhavaprakasha Nighantu), Parpatadi Varga (Raja Nighantu & Nighantu Shiromani), Aushadhi Varga(Kaideva Nighantu). Munditaka has Madhura Tikta Katu Rasa, Laghu Guna, Ushna Virya, Katu Vipaka, Vata Shamaka Doshaghnata , Medhya Ruchya Rasayana Karma.* All the parts of the *Sphaeranthus indicus* have medicinal uses.[6,7] In *Ayurvedic* system of medicine, the whole herb is used in Insanity, Tuberculous Glands, Indigestion, Bronchitis, Spleen Diseases, Elephantiasis, Anemia, Pain in the Uterus And Vagina, Piles, Biliousness, Epileptic Convulsions, Asthma, Leukoderma, Dysentery, Vomiting, Urinary Discharges, Pain in the Rectum, Looseness of the Breasts, Hemicrania.[8,9] The whole herb is used in *Ayurvedic* preparations to treat Epilepsy and Mental disorders.[10,11] Leaves dried in the shade and powdered are used in doses of 20 grains twice a day in Chronic Skin diseases as an Antisyphilitic and a Nervine tonic. Hot water extract of the herb is used as an Anthelminitic, as a Diuretic, as a Fish poison and as an Aphrodisiac. Flowers are tonic, cooling, alterative and used in Conjunctivitis and give strength to weak eyes. The oil prepared using the plant root is reportedly useful in treating Scrofula and as an Aphrodisiac. The external application of a paste of this herb is beneficial in treating Pruritus and Edema, Arthritis, Filariasis, Gout and Cervical adenopathy. Pulverized seeds have antimicrobial property. It is also stuffed into holes of crabs to kill them. Hot water extract of the entire plant is used for glandular swelling of the neck and for jaundice.

During the past few decades there has been increasing acceptance of natural products and therapies in the world. Also increase in use of Ayurvedic remedies globally. Therefore, quality control for efficacy and safety of herbal products is of main concern.[12,13] The development of this traditional system of medicine with the perspective of safety, efficacy and quality will help not only to preserve the traditional heritage but also to rationalize the

use of the natural products in healthcare. Initial steps in quality standardization of compound formulation are to establish the presence of each ingredient in the finished product, followed by the pharmaceutical analysis. Chromatographic techniques were adopted for the separation of active moieties present in the formulation. Therefore, an attempt has been made to standardize *Munditaka kwatha* Pharmacognostical, Physico-chemical and HPTLC fingerprint profile.

MATERIALS AND METHODS

Collection of Raw Materials

Whole plant of *Munditaka-Sphaeranthus indicus* (Linn) was collected from the local market of Jamnagar. Their characteristics were confirmed by correlating their morphological and microscopical features with relevant literature.

Preparation of the Drug

The collected *Munditaka* plant were shade dried and then made into *Yavaku*ta form. After that, the drugs were packed and kept in dry place at room temperature. The prepared *Yavakuta* of *Munditaka* was given to the patients.

Pharmacognostical Evaluation

The coarse powder (*Munditaka Yavakuta*) was dissolved in small quantity of distilled water, filtered through filter paper, studied under the Carl-Zeiss Trinocular microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope.[14,15] Organoleptic evaluation various organoleptic characters such as colour, odor, taste and touch of drugs of both the groups were observed and recorded.[16] Microscopic evaluation Sample drug was dissolved in small amount of distilled water for a while and then mounted in glycerin. Powder microscopy of both the samples was carried out without stain and after staining with phloroglucinol + HCL.

Pharmaceutical Evaluation

Physicochemical parameters Physico-chemical Parameters like Loss on drying, Alcohol soluble extractive and Water soluble extractive values, Ash value and pH were determined as per the API guidelines for the test sample.[17]

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 (9:1 v/v) solvent system. The colour and Rf values of resolved spots were noted.[18]

High-Performance Thin Layer Chromatography study Methanol extract of Sample was spotted on pre-coated silica gel GF254 aluminum plate as 6 mm bands, 5 mm apart and 1 cm from the edge of the plates, by means of a Camang Linomate V sample applicator fitted with a 100 µL Hamilton syringe. Toluene (7ml), Ethyl acetate (2ml), formic acid (0.5ml) was used as the mobile phase. After development, Densitometric scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (v1.2.1 camag). The slit dimensions were 6 mm x 0.45 mm and the scanning speed was 20 mm s-1.

RESULTS AND DISCUSSION

Pharmacognostical Study

Powder Organoleptic Characters

- Colour-Brown, Taste-*Kashaya Tikta* (Astringent Bitter), Odar-*Bitter*, Nature of the Powder–Rough.

Microscopic Characters Identified

The dried powder was mounted in the distilled water to detect the *Yavakuta* of *Munditaka* (Image 1), Annular vessels (Image 2), Bicirate trichome (Image 3), Border pitted vessels (Image 4), Group of Fibers (Image 5), Group of lignified parenchyma cells (Image 6), Lignifeied tangential view of sepal (Image 7), Lignified fibers (Image 8), Multi cellular warty trichome (Image 9), Oil globule (Image 10), Parenchyma cells (Image 11), Poolen grain (Image 12), Rhomboidal crystal (Image 13), Silica deposition (Image 14), Simple fiber (Image 15), Stomata (Image 16), Stone cells (Image 17), Tangential view of sepal (Image 18), Tennin cantain (Image 19) Poolen grain (Image 20).

Physico -Chemical Study

- **Organoleptic analysis**

The characters of the sample are tabulated in table no.2.

- **Physico-chemical analysis**

The *Munitaka yavakuta* was evaluated for Physico-chemical parameters like Loss on Drying, Ash Value, Water soluble extract, Methanol soluble extract, pH, Acid insoluble ash, HPTLC.

The results are placed at table no.3

The Common parameters mentioned for *Yavakuta* drugs in Ayurvedic Pharmacopoeia of India are Total ash, pH Value, Water and Alcohol soluble extractives etc. On its basis this parameters were selected. Presence of more moisture content in a sample can create preservation problem. Hence loss on drying was also selected as one of parameters.

Qualitative Test of *Munditaka Kwatha*

The methanol extract of the sample was analyzed qualitatively for different functional groups. Details are placed at table no.4.

HPTLC Detection: 1- Short (254nm) and long (366nm) wave UV radiation.

Maximum 7 spots were obtained in both when viewed under short wave ultra violet light (254 nm) and under long wave ultra violet light (366 nm). Rf values of the spots obtained were at a comparable level which indicates the presence of some definite constituents in the sample. Chromatogram shows 7 prominent spots at hRf 0.03,0.16,0.47,0.58,0.63,0.88,0.96 in short wave uv 254 nm and 7 prominent spots at hRf 0.03,0.34,0.43,0.54,0.58,0.86,0.96 in long wave uv 356 nm. 2 spots at hRf 0.03 & 0.96 are common in both UV light. Though it was not possible to identify particular chemical constituent from the spot obtained, the pattern may be used as a reference standard for further quality control researches. (Images: 21 - 22).

TABLE NO.1 *RASAPANCHAKA* (PHARMACODYNAMICS) OF *MUNDITAKA*

Rasa: *Madhura Tikta Katu*

Guna: *Laghu*

Veerya: *Ushna*

Vipaka: *Katu*

Doshaghnata: *Vata Shamaka*

Karma: *Medhya Ruchya Rasayana*

English: East Indian Globe Thistle[19]

Gujrati: *Gorakhmundi*[20]

Hindi: *Mundi*[21]

TABLE: 2. ORGANOLEPTIC CHARACTORS OF *MUNDITAKA YAVAKUT*

Physical Properties	*Munditaka Yavakuta*
Odour	Bitter
Taste	*Kashaya Tikta*
Colour	Brown
Touch	Coarse powder Rough

TABLE NO. 3 PHYSICO-CHEMICAL PARAMETERS

No.	**Name of the Test**	**Value**
1.	Loss of drying (at 110^{o}c)	7.44 % w/w
2.	Ash Value	9.46 % w/w
3.	Acid insoluble Ash	1.35 % w/w
4.	Water soluble extraction	10.3% w/w
5.	Alcohol soluble extraction	3 % w/w
6.	pH value by pH paper	7

TABLE NO.4 CHROMATOGRAPHIC FINGERPRINTING OF *MUNDITAKA YAVAKUTA*

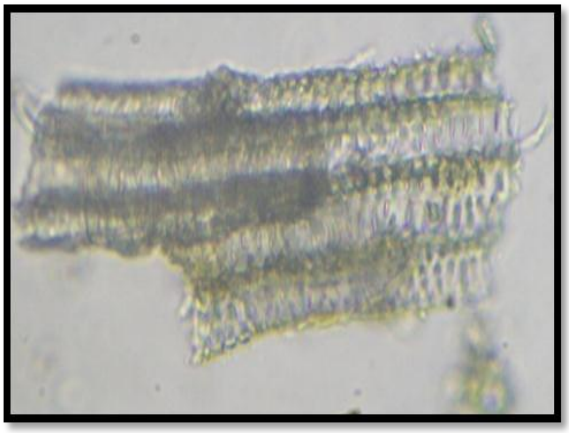
SOLVENT SYSTEM	**SHORT UV RADIATION 254 NM**		**LONG UV RADIATION 366 NM**	
	No. of spot separated	Retention factor Rf	No. of spot separated	Retention factor Rf
	7	0.03,0.16,0.47,0.58,0.63,0.88,0.96	7	0.03,0.34,0.43,0.54,0.58,0.86,0.96

PLATE NO.1 PHOTOMICROGRAPHS OF *MUNDITAKA YAVAKUTA*

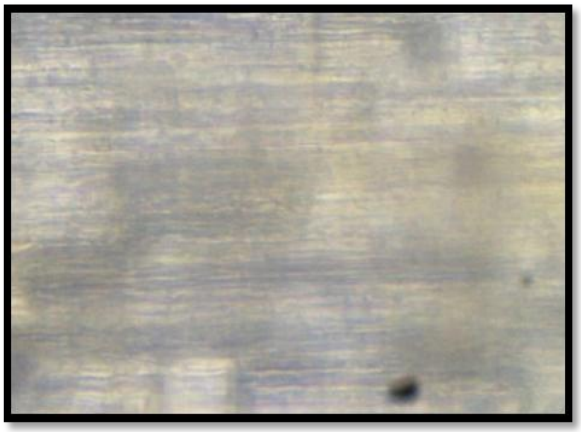
1. *Yavakuta* of *Munditaka*

2. Annular Vessels

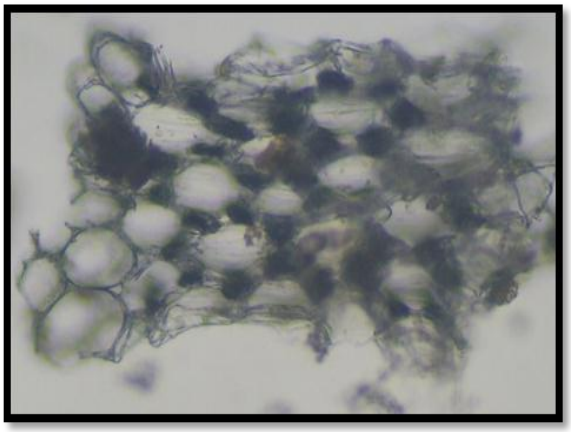
3. Bicirate Trichome



4. Border Pitted Vessels

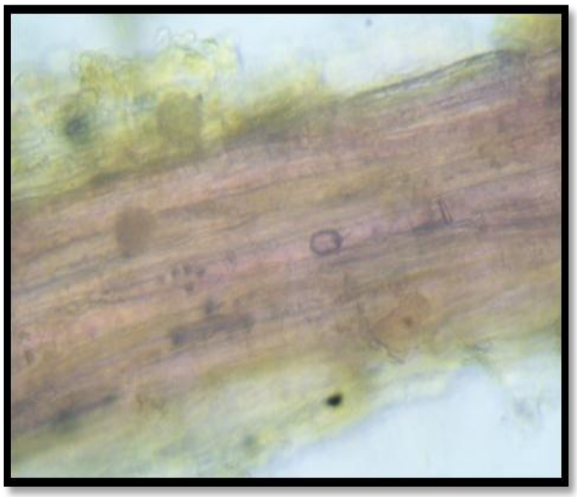


5. Group of Fibers



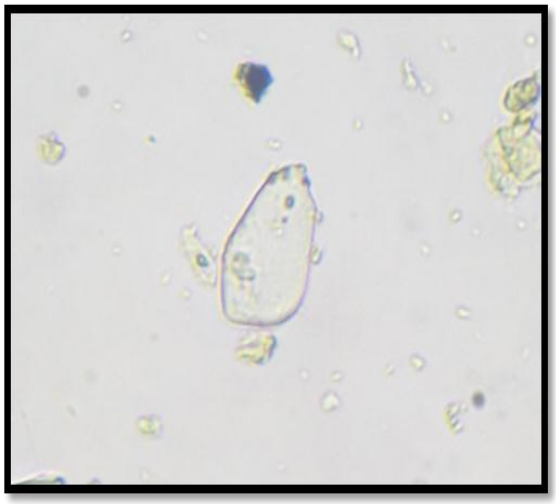
6. Group of Lignified Parenchyma Cells

7. Lignified Tangential View of Sepal

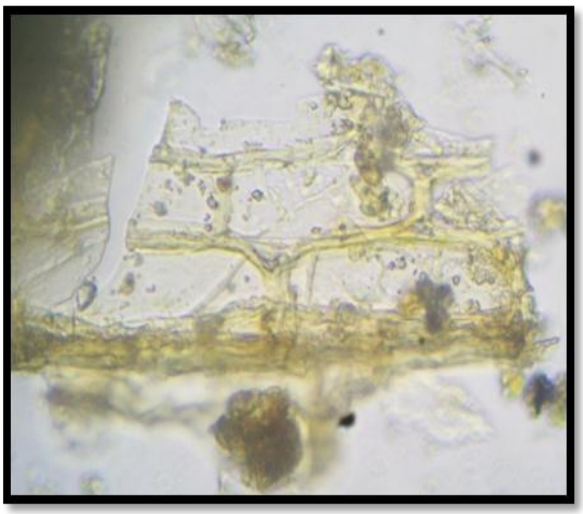


8. Lignified Fibers

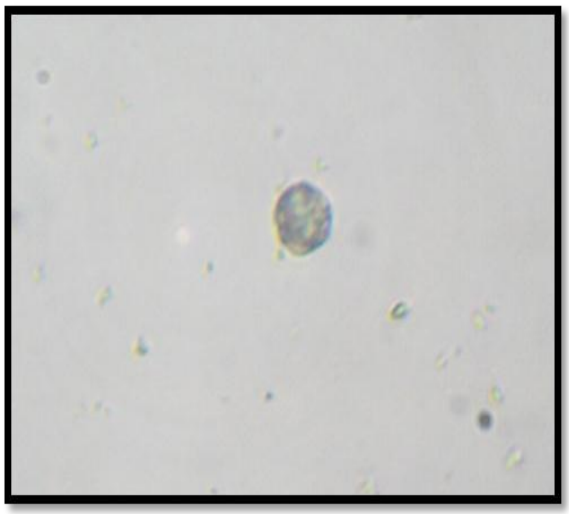
9. Multi Cellular Warty Trichome



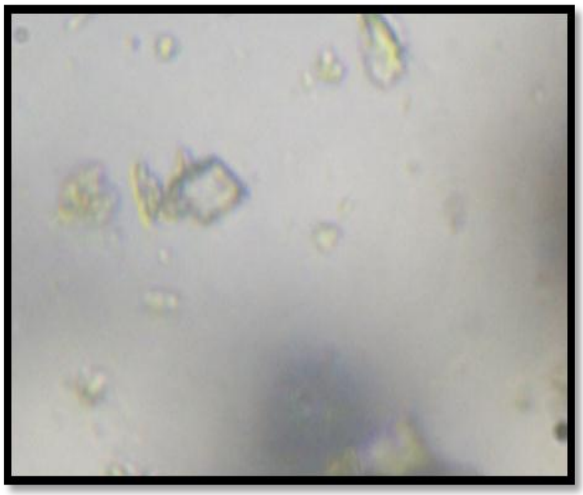
10. Oil Globule



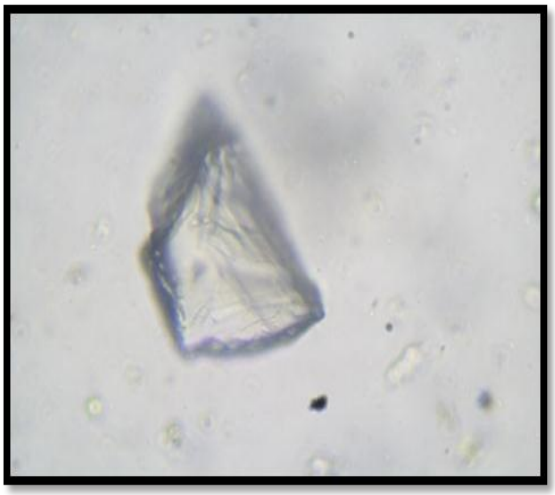
11. Parenchyma Cells



12. Poolen Grain

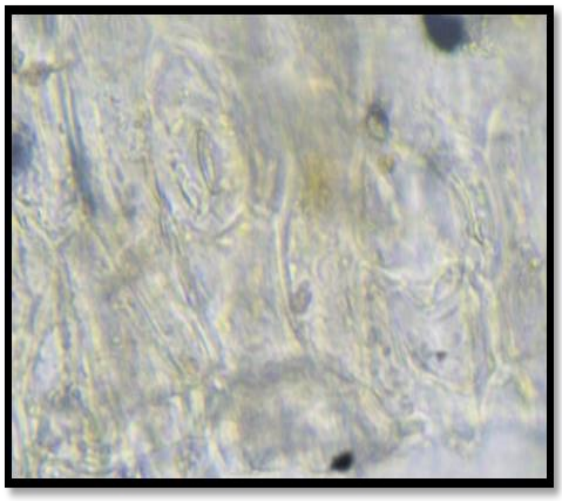


13. Rhomboidal Crystal



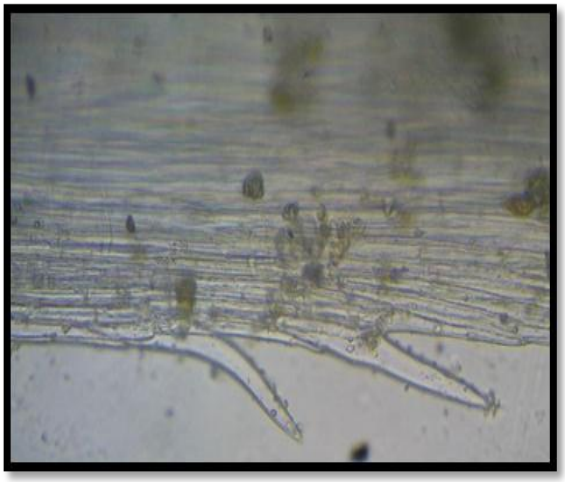
14. Silica Deposition

15. Simple Fiber

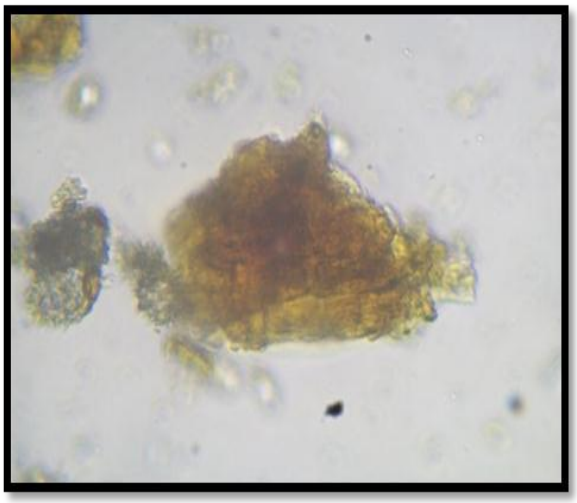


16. Stomata

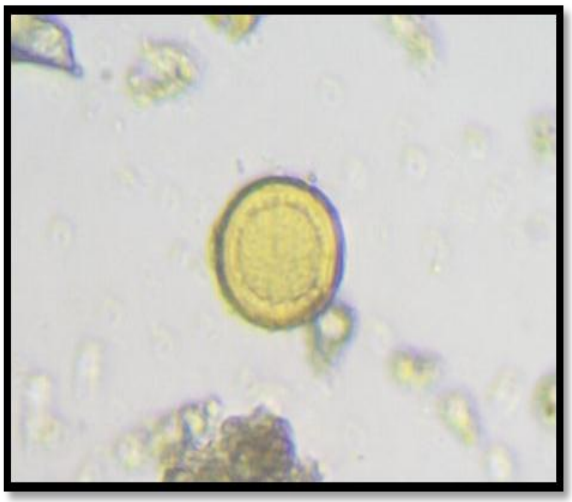
17. Stone Cells



18. Tangential View of Sepal



19. Tennin Cantain



20. Poolen Grain 2

PLATE NO.2 HPTLC RESULTS

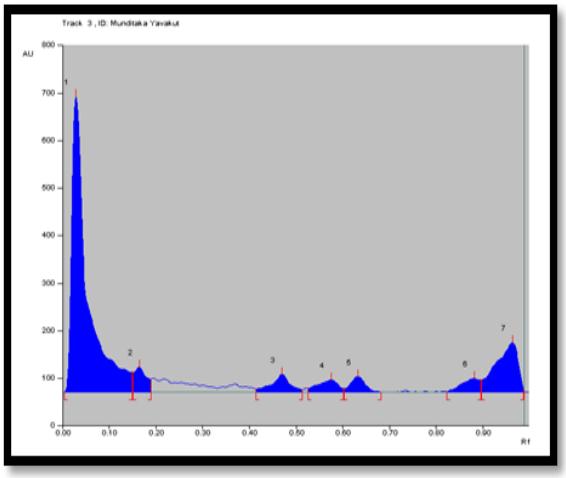


Image 21(254 nm)

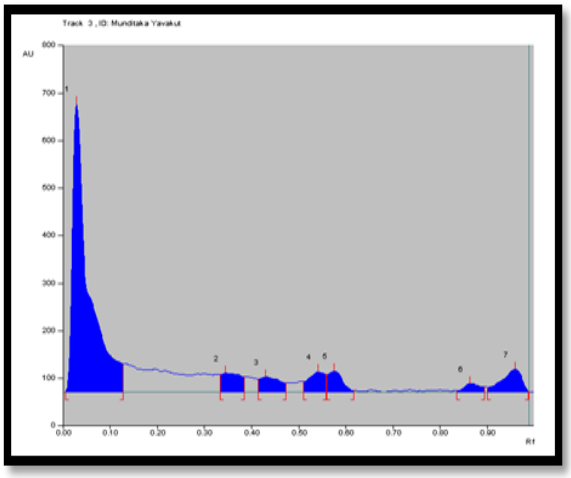


Image 22(356 nm)

DISCUSSION

Powder microscopy of *Munditaka Yavakuta* revealed the diagnostic characters like Poolen grain, Annular vessels, Bicirate trichome, Border pitted vessels, Group of lignified parenchyma cells, Lignified tangential view of sepal, Lignified fibers, Multi cellular warty trichome, Oil globule, Parenchyma cells, Rhomboidal crystal, Silica deposition, Simple fiber, Stomata, Stone cells, Tangential view of sepal, Tannin content which authenticate genuineness of the raw drugs of *Munditaka Yavakuta*.

Taste of *Munditaka yavakut*a was *Kashaya Tikta* (bitter) Rasa because having strong bitter taste results in bitterness of *Kwatha*. Odor of *Munditaka Yavakuta* is Bitter. Moisture contents should be minimum to prevent degradation of product. Excess of water in formulation encourage microbial growth, presence of fungi or insects and deterioration following hydrolysis. *Munditaka Yavakuta* contains 7.44% w/w moisture, showing that the *Yavakuta* should be protected from humid atmosphere. Ash values are the criteria to judge the identity and purity of crude drugs were total ash, water soluble are considered. *Munditaka Yavakuta* contained 9.46% w/w total ash. The results revealed that *Munditaka Yavakuta* is free from unwanted organic compounds and production site was good enough keeping sample free from dust and other solid matters. The 10.3% w/w of water soluble extractives and 3% w/w methanol soluble extractives were present in *Munditaka Yavakuta* indicating that the drug is having good solubility in water. In HPTLC study 7 spots at both 254 nm and 366 nm were obtained, indicating its possible components of matrix which may possess its therapeutic effect.

CONCLUSION

The *Munditaka Yavakuta* has a good potency for treating *Rakta, Mansaja* and *Medaja Vikaras* like *Beejakosha Granthi* (Ovarian cyst). In today's era most important is given to standardization of drug for assurance of quality. Keeping this aim in mind current study was planned. The ingredients of *Munditaka yavakuta* were identified and authenticated pharmacognostically. Pharmacognostical study reveal genuineness of drug, as all the characters of ingredients were observed microscopically. Physico-chemical and HPTLC studies inferred that the formulation meets the minimum quality standards as reported in the API at a preliminary level. Additional important analysis will be required for the identification of active chemical constituents of the test drug.

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