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Pharmacognostical and Pharmaceutical Evaluation of Atibala Moola

Dr. Rahul S. Gandhi[1], Prof. Dr. Anup B. Thakar[2], Harisha C. R.[3], V. J. Shukla[4]

[1] *Assistant Professor, Department of Panchakarma, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat – 361008; email – rsgandhi2003@yahoo.com; Mobile No. 9427451634*

[2] *Professor & Head, Department of Panchakarma, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat – 361008*

[3] *Head, Pharmacognosy, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat – 361008*

[4] *Head, Pharmaceutical Chemistry Lab, Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat – 361008*

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ABSTRACT: Introduction: According to Ayurvedic principles, the symptoms of diabetic neuropathy like paraesthesiae, pain and tingling sensation are indicating involvement of Vata Dosa. Whereas burning sensation is because of vitiation of Pitta Dosa. Hence drugs pacifying Vata and Pitta Dosas are useful in the treatment of diabetic neuropathy.

Atibala has Sita, Madhura, Balakrita properties and also Tridosahara properties. In addition it has Rasayana effect which reduces all the three Dosas. It is commonly used for management of Diabetic Polyneuropathy which commonly presents with burning sensation, loss of strength, loss of balance, loss of sensation, numbness etc. especially of feet. **Materials and methods:** Raw drug as coarse powder of Atibala Moola as per the reference in Dhanvantari Nighantu were purchased from the local market of Jamnagar, Gujarat. It was prepared as per the standard preparation procedure at Department of Panchakarma, IPGT&RA, GAU, Jamnagar. The final product was then subjected to pharmacognostical and pharmaceutical analysis. Pharmacognosy of Atibala Moola was carried out by preparing a slide made with glass slide and cover slip. Then this slide was observed under the Carl Zeiss Trinocular microscope. Organoleptic characters and physico-chemical parameters were noted. HPTLC was performed and observed under short UV (254 nm) and long UV (366 nm). **Results**: Pharmacognosy study of Atibala Moola revealed presence of starch, rhomboidal and rosette crystals. Analytical study of Atibala Moola showed 24 spots and 20 spots at 254 nm and 366 nm respectively. **Discussion and conclusion**: Pharmacognosy study of Atibala moola revealed starch content which suggests nourishing effect of Atibala Moola. Pharmaceutical study showed the nature and other characteristics of the solution making it possible to understand how Atibala Moola might have worked on patients of Diabetic polyneuropathy.

KEYWORDS: Atibala Moola, Pharmacognosy, Pharmaceutics.

I. INTRODUCTION:

Indigenous drugs used by different ethnic groups of the world for the treatment of diseases have special significance of having been tested on long time scale. They are relatively safe, easily available and affordable to masses of community. Traditional drugs have given the important lead in the search of new drugs. Balas in ayurvedic literature are used as Balya, or tonic for strengthening the body. Bala, Atibala, Mahabala and Nagbala belong to the genus Sida of family Malvaceae is in use for medicinal purposes for a long time, in traditional system of medicine, i.e, the ayurveda. Sida cordata (Burm.f.) Borssum is Rajbala or Bhumibala; Kharenti Bala is Sida cordifolia Linn; and Sida rhombifolia Linn. is Mahabala. The other Bala is Atibala, which is botanically known as Abutilon indicum. Literally meaning, the Ati means very and Bala means powerful, referring to the properties of this plant as very powerful.

Plant Atibala (Abutilon indicum) is a good substitute of Bala (Sida cordifolia) which is well-known for its Vata reducing qualities.

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Atibala has Sita, Madhura, Balakrita properties and also Tridosahara properties. In addition it has Rasayana effect which reduces all the three Dosas.

Keeping this in mind internal use of decoction of Atibala Moola is used to mitigate the above symptoms of diabetic polyneuropathy. Now to understand the mechanism of Atibala Moola as how does it successfully mitigate neuropathy an attempt has been made to get some clue in understanding the liquid as a whole in terms of its microscopic analysis and physico-chemical analysis. Addition to this pharmacognosy of Atibala Moola was done to authenticate the herb used.

OBJECTIVES: To analyze the pharmacognostic, phytochemical and HPTLC of Atibala Moola.

II. MATERIALS AND METHODS:

Collection and processing of raw drug:

Raw drug required for preparation of Atibala Moola coarse powder was collected from surrounding villages of Jamnagar, Gujarat. The latin nomenclature and part used of the drug is listed in Table No. [1], After collection and proper cleaning of Atibala Moola, raw Atibala Moola was shade dried and yavakuta (coarse powder) was prepared at Pharmacy, Gujarat Ayurved University, Jamnagar, Gujarat. Atibala Moola was powdered in pulverizer and passed through mesh no. 08.

TABLE 1 - Atibala Moola

Sr. No.	Drug	Latin name	Parts used
1	Atibala	Abutilon indicum	Dried Root

Preparation of Atibala Moola Kashaya:

Sample of coarse powder was subjected to pharmacognostical study for confirmation of the genuineness. Then four times (80 ml) of potable drinking water was mixed with 1 part (20 gms) coarse powder in a stainless steel vessel and kept for overnight soaking (12 h). Next day, Kwatha was prepared by applying constant mild heat until the volume reduced up to $1/4^{th}$ (20 ml) of the initial quantity. After desirable reduction of volume, the Kwatha was filtered through four folded cotton cloth and collected in a separate vessel.

Pharmacognostical study:

Atibala Moola was observed and authenticated by the Pharmacognosy department of the institute. The identification of individual drugs was done on the basis of microscopic features of the finished product. Here, pharmacognostical evaluation of Atibala Moola was carried out by preparing a glass slide with cover slip. Then this slide was observed under the Carl Zeiss Trinocular microscope. The microscope was attached with a camera. Then photographs of Atibala Moola slide (finished product) at 40x magnification were taken without staining and after that with-staining (phloroglucinol and HCl staining).

Pharmaceutical Evaluation:

Atibala Moola was subjected to testing of certain important Physico-chemical parameters (as per API) at the institutional pharmaceutical laboratory; like specific gravity, pH and total solid contents to understand characteristics of this medicated liquid. These may be helpful in understanding its mode of action especially on its application internally as a mode of Shamana oushadha in cases of diabetic polyneuropathies, etc.

High Performance Thin Layer Chromatography (HPTLC) study of Atibala Moola was performed by using Toluene: Ethyl acetate (9:1 v/v) solvent system and observed under short UV (254 nm) and long UV (366 nm). The instruments and methods were as under,

- Application Mode - CAMAG Linomat 5-Applicator
- Filtering System - Whatman Filter paper No.1
- Stationary Phase - MERCK HPTLC Silica Gel 60 F254
- Application (Y axis) Start Position - 10mm
- Sample Application Volume - 10µL
- Development Mode - CAMAG TLC Twin Trough Chamber
- Chamber Saturation Time - 30 Minutes
- Mobile Phase - Petroleum ether: Diethyl ether : Acetic acid

(9:1:0.1v/v)

- Visualisation - @254nm, @366nm and (after derivatization)
- Derivatization Mode - CAMAG-Dio tank for about 1 minute Drying Mode, Temperature - TLC Plate Heater preheated at 100±50°C
- Drying Time - 3 Minutes

III. RESULTS:

Characteristics of Atibala Moola: Microscopic evaluation of Atibala Moola was

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conducted and microphotographs were taken as seen, Photo - 1.1 Atibala Moola Coarse powder, Photo - 1.2 Brown content, Photo - 1.3 Cluster crystal, Photo - 1.4 Cork cells, Photo-1.5 Epidermal cells, Photo - 1.6 Group of fibers, Photo-1.7 Lignified fibers, Photo - 1.8. Lignified fibers (2), Photo-1.9 Lignified pitted vessel, Photo - 1.10 Lignified stone cells, 1.11 Pitted vessel, Photo - 1.12 Prismatic crystal with starch grains, Photo - 1.13 Rhomboidal crystal, Photo - 1.14 Rosette crystal, Photo-1.15 Septate fibers, Photo - 1.16 Simple fibers, Photo-1.17 Starch grains, Photo - 1.18. Stone cells, Photo-1.19 Yellow content with prismatic crystal.

Photo 1.1 – *Atibala Moola* Coarse powder

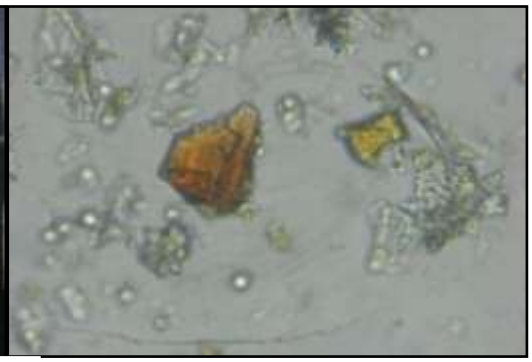

Photo 1.2 - Brown content

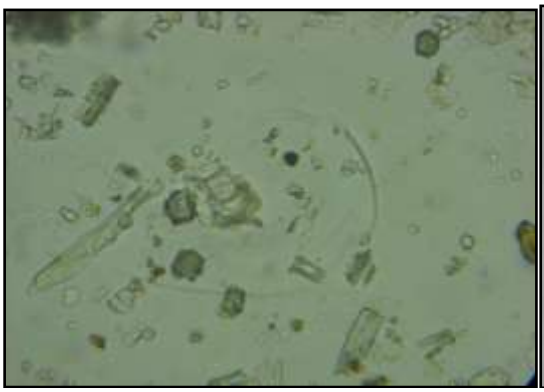

Photo 1.3 - Cluster crystal

Photo 1.4 - Cork cells

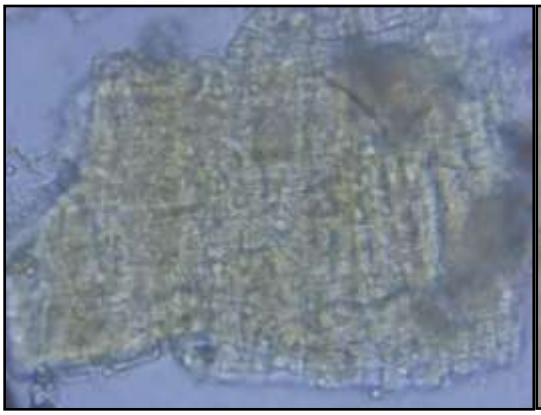

Photo 1.5 - Epidermal cells

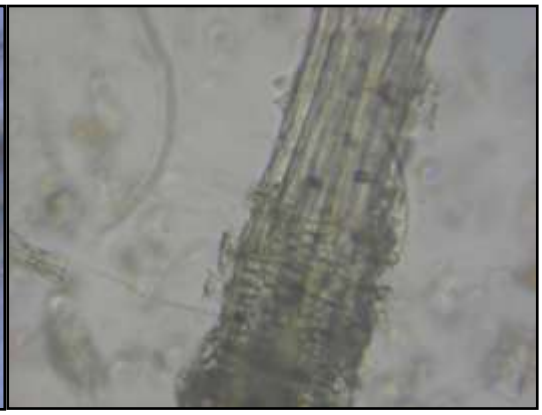

Photo 1.6 - Group of fibers

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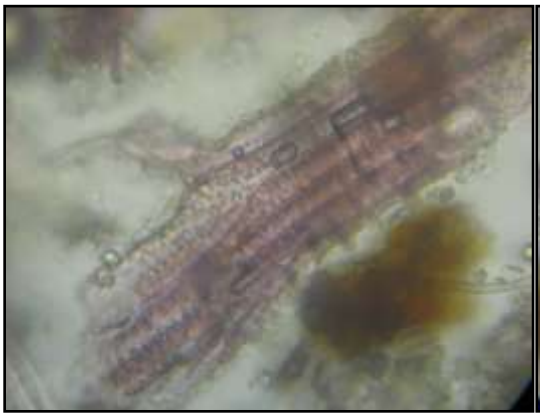

Photo 1.7 - Lignified fibers

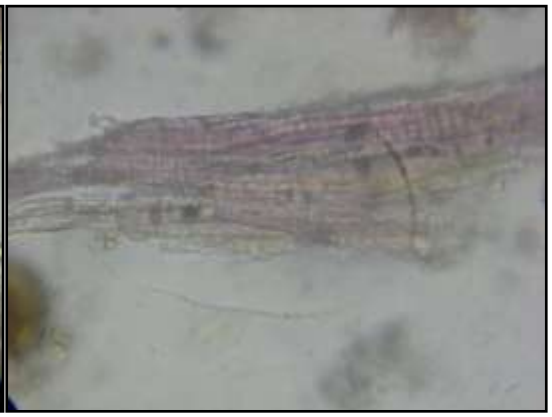

Photo 1.8 - Lignified fibers (2)

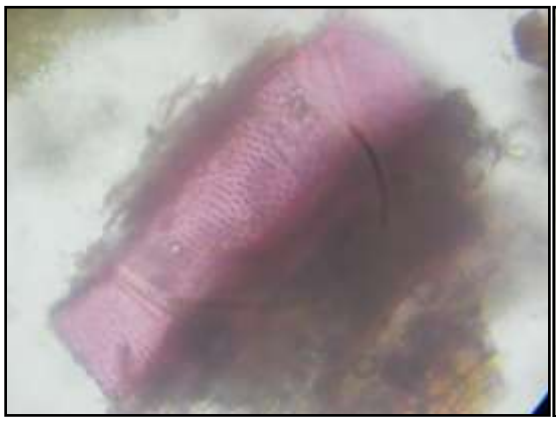

Photo 1.9 - Lignified pitted vessel

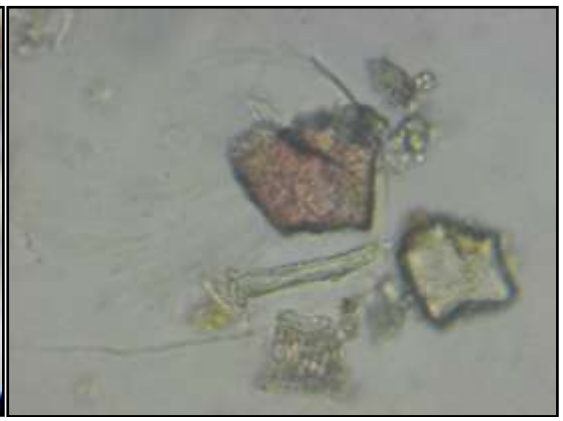

Photo 1.10 - Lignified stone cells

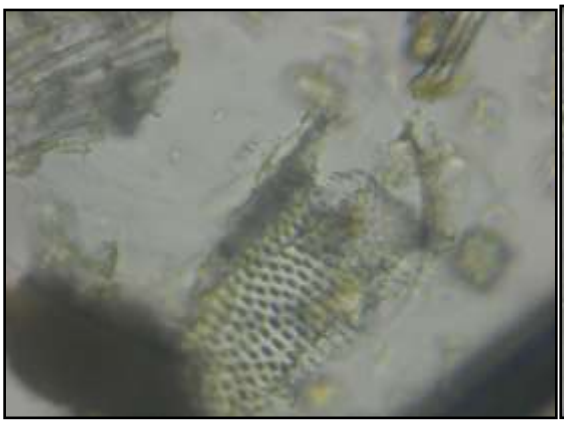

Photo 1.11 - Pitted vessel

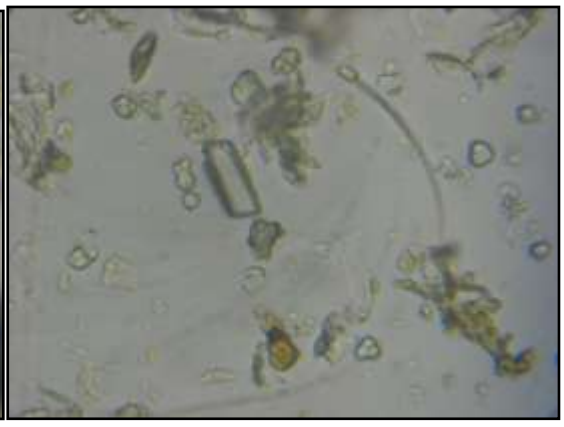

Photo 1.12 Prismatic crystal with starch grains

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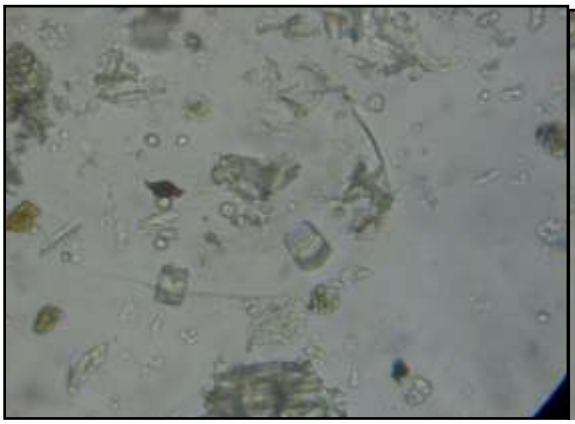

Photo 1.13 Rhomboidal crystal

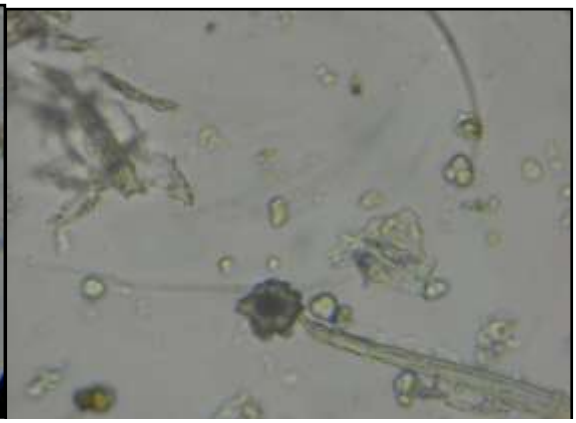

Photo 1.14 Rosette crystal

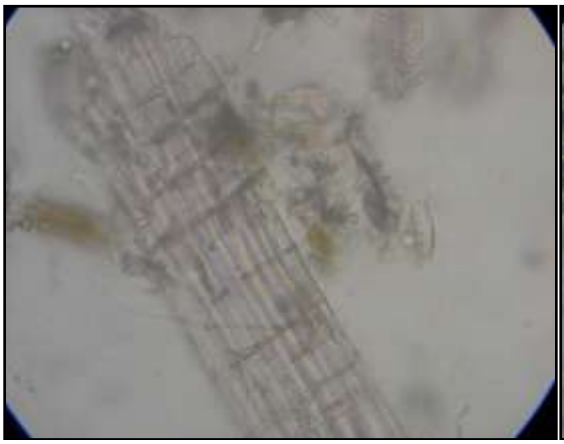

Photo 1.15 Septate fibres

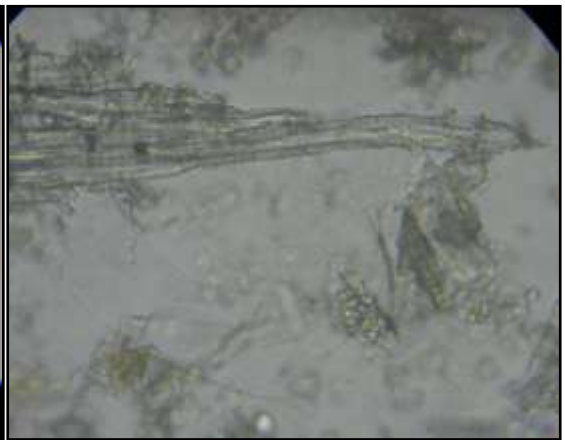

Photo 1.16 Simple fibre

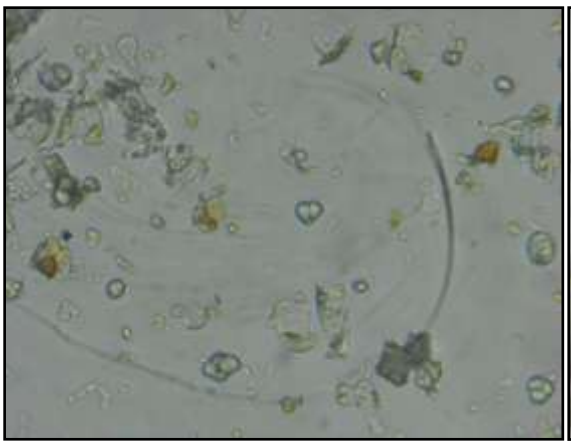

Photo 1.17 Starch grains

Photo 1.18 Stone cells

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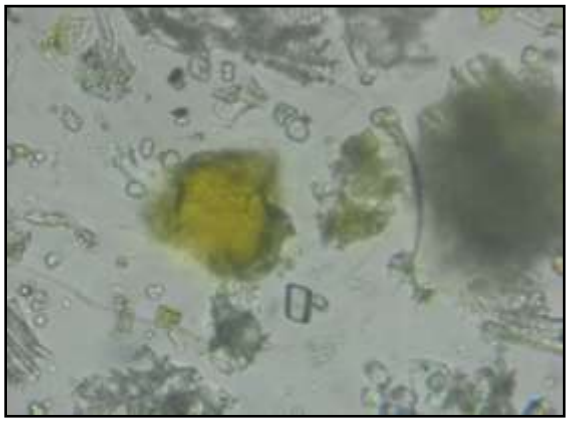

Photo 1.19 Yellow content with prismatic crystal

Details of physicochemical parameters are mentioned in Table-[2]. HPTLC profile of methanolic extract of Atibala moola was done and details of number of spots and Rf value are given in Table-[3] and HPTLC profile is given in Photo 2 showing HPTLC: Densitogram at 254 nm and Photo 3 HPTLC: Densitogram at 366 nm.

TABLE NO. - 2 PHYSICO-CHEMICAL PARAMETERS OF **ATIBALA MOOLA**

No.	**Analytical parameter**	**AtibalaMoola**
1	Lose on drying(W/W)	7.16 %
2	Ash Value(W/W)	2.38%
3	Water solubility	12.1%
4	Alcohol solubility	11.00%

Analytical study of Atibala Moola Kashaya has showed 24 spots and 20 spots at 254 nm and 366 nm respectively.

TABLE NO: 3 R_F VALUES OF **ATIBALA MOOLA**

Wavelength	**No. of Spots**	**R_f values**
Short UV (254 nm)	24	0.05, 0.13, 0.18, 0.24, 0.28,0.31, 0.34, 0.36, 0.41, 0.52,0.55, 0.61, 0.63, 0.65, 0.68,0.72, 0.76, 0.82, 0.85, 0.86,0.91, 0.93, 0.94, 0.97
Long UV (366 nm)	20	0.13, 0.17, 0.27, 0.28, 0.31, 0.34, 0.50, 0.55, 0.61, 0.67, 0.68, 0.72, 0.78, 0.82, 0.86, 0.88, 0.91, 0.93, 0.94, 0.97,

Photo 2 - Densitogram curve of Methanol extract of Atibala Moola at 254nm

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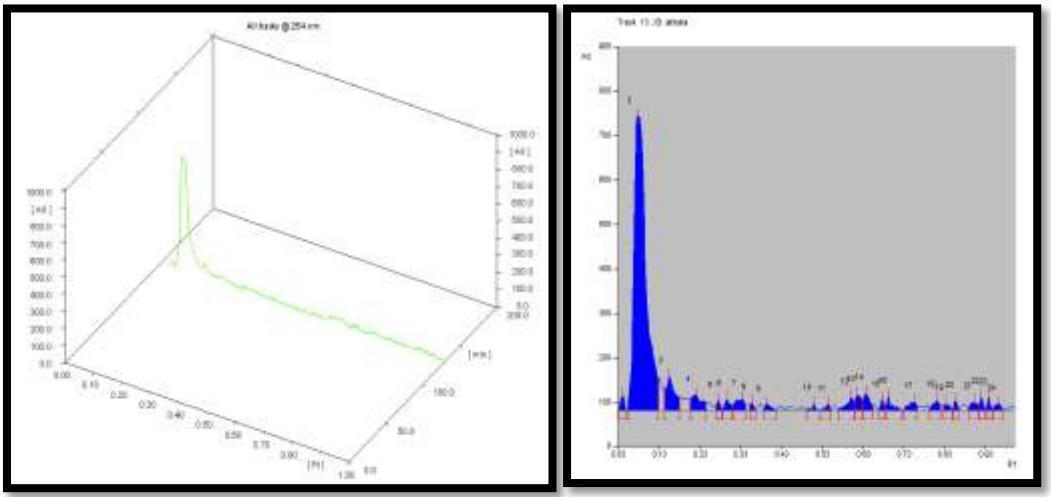
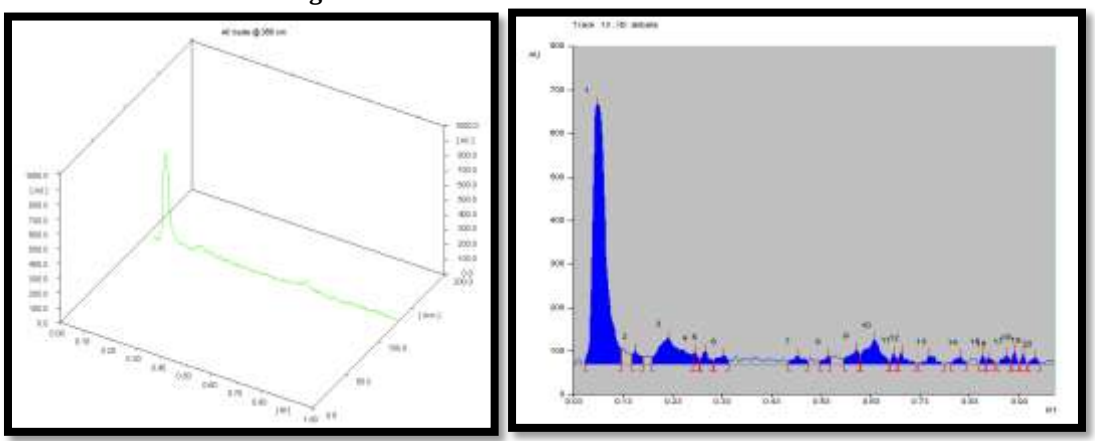


Photo 3 - Densitogram curve of Methanol extract of Atibala Moola at 366nm



IV. DISCUSSION:

Standardization is a measurement for ensuring the quality control enabling the reproducibility of the formulation. Raw drugs were authenticated and analysed before processing because good quality products mainly dependent upon genuine raw materials. Pharmacognosy study of Atibala moola revealed starch content which suggests nourishing effect of Atibala Moola. Brown content, Clustar crystal, Cork cells, Epidermal cells, Group of fibres, Lignified fibres, Lignified pitted vessel, Lignified stone cells, Prismatic crystal with starchgrains, Rhomboidal crystal, Rosette crystal, Starch grains, Yellow contant with prismatic crystal observed under the microscope. All the physico-chemical parameters i.e. Loss on dying, Ash Value (W/W), Water solubility and Alcohol solubility were analyzed and found to be within the normal reference range. The HPTLC finger printing of Atibala Moola at 254 and 366 nm wavelengths was done to record and standardize the solution for future references. This study to a certain extent has helped in throwing light on understanding probable action of Atibala Moola in Diabetic polyneuropathy.

V. CONCLUSION:

The Pharmacognostic study has showed presence of starch, rhomboidal and rosette crystals in Atibala Moola signifying that the content of Atibala Moola Kashaya has been imparted to final product. Pharmaceutical study showed the nature and other characteristics of the solution making it possible to understand how Atibala Moola might have worked on patients of Diabetic polyneuropathy. Quality control of herbal formulation is very much necessary to assess its safety, purity and universal acceptability. HPTLC

results suggest the presence and incorporation of active constituents of herbal drugs. The results of this study may be used as a reference standard in further research undertakings of its kind.

REFERENCES:

[1]. Bhavmishra, K. C. Chunekara, BhavaprakashNighantu,Purvakhanda /GuduchyadiVarga. 135,Chaukhamb ha Bharati Acadamy; Varanasi
[2]. Amritpal Singh, Dhanvantari Nighantu, Guduchyadi' Varga. 271, Chaukhambha Orientalia;Delhi.
[3]. Aacarya Vaidya Jadavaji Trikamji, Acarya Narayanram., editors. 4th ed. 10. Vol. 27. Varanasi: Caukhambha Orientalia; 1980. Susruta, Susruta Samhita, Cikitsasthana, Adhyaya.
[4]. Agnivesha, Charaka samhita of Acharya Charaka, Dridhabala krit, edited by Acharya Vidyadhara Shukla, Prof. Ravidatta Tripathi Charak Samhita, Vaidyamanorama Hindi commentary, Nidanasthana, Chapter 4, Sloka 48, Delhi: Chaukhamba Sanskrit pratisthan; p. 883
[5]. The Ayurvedic Pharmacopoeia of India, 1st edition, Govt. of India, Ministry of health and family welfare, Dept. of AYUSH, New Delhi, 2007; Part - I, Vol. I,: 20
[6]. Anonymous, 1999, Planner Chromatography, Modern thin layer chromatography, Switzerland, pg 2-16
[7]. Chatwal G. R., Anand S. K., Industrial method of chemical analysis, 5th revised and enlarged edition, Himalaya publishing house, 2.272-2.503, 2.599-2.616, 2.673-2.700
[8]. Stahl E., Thin-layer chromatography – a laboratory handbook, 2nd edition. Springer-Verlag New york, 1969; 125-133