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Original Research Paper

Ayurveda

# PHARMACEUTICAL ANALYSIS OF MANIBHADRA AVLEHA:AN AYURVED FORMULATION

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|---|---|
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**ABSTRACT** Ayurveda the indigenous system of medicine is in service of human mankind since thousands of year, and described abundant of the herbal formulations. As the long time passes, the procedure of the drug preparation has been changed, its need of hour, to developed and assess the quality of parameters of the drugs prepared in the pharmacy.

Considering this scenario of the Ayurveda drug preparation it becomes mandatory to perform the quality control study of all the drugs used in clinical trial to establish the safety and efficacy of Ayurveda drugs. Hence in this study we have performed the different quality standardization study of our drug – "*Manibhadra Avaleha*". It is one of the classical preparation used in different skin ailments including Shwitra (Vitiligo).Various parameters are applied for the *Manibhadra Avaleha* in this study which includes:- loss of drying, water soluble extractive, alcohol soluble extractive, total Ash value, pH value, acid soluble ash. And total sugar by UV and HPTLC finger printing is also included. After analysis of study it has been found that all parameters were in standard range of the *Avaleha*, which established the standardized quality control of the *Manibhadra Avaleha*.

**KEYWORDS :** Ayurveda, Manibhadra Avaleha, Quality control Parameters, HPTLC.

## INTRODUCTION

Indian classical system of medicine is well known as Ayurveda. Ayurveda is believed to be a special part of Aatharvaveda. It is the oldest form of medicines known to mankind. Various preparations have been given in Ayurveda. The branch in which preparation of medicine explained is known as BHAISHAJYA KALPANA. Among the various herbal formulations *Manibhadra avleha* is one of them. Which has various useful results as per our literatue? In skin disorders especially in *Shwitra* (vitiligo) *Manibhadra avleha* act likes amrita. In today's world for the preparation of Ayurvedic formulations various parameters and Standard operative procedure has to be followed for the preparation of medicine which ensures the good quality of medicine. For that GMP certified pharmacies has full access to complete formulations of Ayurveda. Various parameters are applied for the *Manibhadra Avleha* in this study which includes:- loss of drying, water soluble extractive, alcohol soluble extractive, total Ash value, pH value, acid soluble ash. And total sugar by UV and HPTLC finger printing is also included.

## MATERIALS AND METHODS

### Aim and Objectives

- Identification and authentication of raw drugs used for MANIBHADRA Avaleha.
- Preparation of *Manibhadra Avleha* at GMP certified pharmacy as per classical explanation

### Drug review

- The name of the drug, parts used and its quantity were mentioned inTABLE1.

### Collection, Identification and Authentication ofRawDrugs:

Herbal raw drugs were purchased from authenticated resources at Vadodara.

Raw drugs identification and authentication was done by the Department of Dravyaguna and Rasasashtra, Parul Institute of Ayurveda,Parul University, Vadodara.

### Classical method of MANIBHADRA AVLEHA preparation:

- First collect all the raw Material with adequate quality
- Identification and authentication of drugs
- Separate waste material, weight, mix all and grind them
- Make decoction of all drugs and separate when one eighth left
- Guda is dissolved well in the decoction and boiled until paka (*Phanita*) becomes tantuvat (thread like) when pressed between thumb and index finger or when it sinks in the glass of water without getting easily dissolved.
- Packaging after cooling.

### 3. Chromatography study:

HPTLC (high-performance thin layer chromatography) is advanced form of TLC, which provides superior separation efficiency. The HPTL Concept helps us to validate methods regarding qualitative and quantitative analysis, and fulfils all quality required parameters for use in fully regulated environments. In this study HPTLC has been performed for quality analysis of drug. It is an enhanced and developed form of TLC. A number of enhancements can be made to the basic methods of TLC to automate the different steps, to increase the evolution achieved and to allow more accurate quantitative measurements. Method and other procedures followed for *MANIBHADRA AVLEHA*.

HPTLCasshowninIMAGE-1

## RESULTS AND DISCUSSION

### 1. Organoleptic evaluation:

Organoleptic Characteristics of Powder drugs details are mentioned in the table 2

### 2. Physico-ChemicalParameters:

Details of physico-chemicals values are mentionedinTABLE3

**Loss on drying:** On drying the sample syndicate that the samples were devoid of excess water content and there was no microbial overgrowth or insect infestation present. In this sample loss on drying is 2.98%, it indicates the samples may have good shelf-life and may not decay on storage.

**Total ash and Acid insoluble ash:** It indicates of contamination, substitution, adulteration. The Low total ash and Acid insoluble ash signifying low levels of inorganic matter and silica content in the sample. In this Total Ash and Acid insoluble Ash: 3.93% and 1.80%. In this sample it is slightly more. May be due to presence of fibres and scleroid in the ingredients which are in normal limits and drug can be used internally.

**Water soluble extract and Alcohol soluble:** Water soluble extract and Alcohol soluble extract are 19.75% and 17.00% respectively. The high solubility of the sample in water denotes that drug is best suited for extraction with water or water based preparations. There is negligible presence of Volatile oils also favour the thermal extractions with water.

**pH:** The pH was measured to note the acidity or alkalinity of the aqueous solution of the drug. This helps in understanding the pharmacological basis of drug absorption and metabolism. In this sample pH is 6.5% so it is alkaline in nature.

**Total Solid Content:** The total solid value of Aparajit Avaleha is 92.6%.

**3. Qualitative study of MANIBHADRA AVLEHA:-TABLE 4**
On QualitativeStudy: Alkaloid, Essential Oil, Vitamin C, Flavanoid, Saponin, Glycoside, Starch, Tannin. It indicates that drug which use disgenuine.

**4. High-performance Thin Layer Chromatography study: Preparation of test solution (T):**
Weigh 5gm of sample in a beaker and add 10 ml of water to it. Sonicate for 15 minutes, and transfer it to a separate funnel and partition with 20 ml of ethyl acetate. Repeat the procedure twice with 15ml of ethyl acetate. Collect the entire ethyl acetate layer and evaporate to dryness. Reconstitute the sample with 2ml ethyl acetate and filter with 0.22µm syringe filter. Use the test solution thus obtained for HPTLC fingerprinting.

**TOTAL SUGAR BY UV:-** 44.43% IMAGE 1

**Details of HPTLC profile of all tracks at 254nm.** Under the 254 nm wavelength-Track -1of *MANIBHADRA AVLEHA*(5µL) - 6 spots were detected and starts with respect to retardation factor 0.05,0.09,0.16,0.29,0.40,0.50.(IMAGE2)

**Details of HPTLC profile of all tracks at 366nm.** Under the 366 nm wavelength-Track -1of *MANIBHADRA AVLEHA*(5µL) - 5spots were detected and starts with respect to retardation factor 0.20,0.29 , 0.40, 0.50, 0.62.(IMAGE3)

**Details of HPTLC profile of all tracks at 540 nm.** Under the 540 nm wavelength-Track -1of*MANIBHADRA AVLEHA*(5µL) - 4 spots were detected and starts with respect to retardation factor 0.20, 0.29,0.50, 0.75.(IMAGE4)

## DISCUSSION

Any plant or formulation which is used medicinally requires detail study prior to its use because the therapeutic efficacy is depends on the quality of ingredients used for the medicine preparation. In this study, *Manibhadra Avaleha* was prepared according to the classical textual standard operative procedure mentioned in classic. The raw drugs were identified and authenticated before using for preparation. The prepared drug, *Manibhadra Avleha* was pharmacologically subjected for physicochemical analysis, HPTLC, and qualitative study of drug. The ground work requisites for the standardization of *Manibhadra Avleha* were tried to cover in this study.

**Conflict of Interest:** None

**Acknowledgement:-**
The authors are thankful to all the managing trustees of Parul University, Vadodara for availing the infrastructure required for the study. In addition we are thankful to staff of pharmacognosy laboratory, pharmacology laboratory and pharmacy of Parul Institute of Ayurved, Vadodara. Authors are also thankful to vasu research laboratory, Vadodara.

**Table 1**

| NO. | NAME | BOTANICAL NAME | FAMILY | USEFUL PART |
|---|---|---|---|---|
| 1. | VIDHANGSAAR (1PART) | EMBELIA RIBES. | PRIMULACEAE | SAAR |
| 2. | AMALKI(1 part) | PHYLLANTHUS EMBLICA | PHYLLANTHACEAE | FRUIT |
| 3. | HARITAKI(1 part) | TERMINALIA CHEBULA | COMBERTACEAE | FRUIT |
| 4. | TRIVRIT (1 PART) | OPERCULINA TURPETHUM | CONVOLVULACEAE | ROOT |
| 5. | PURANA GUDH (12 part) | JAGGERY | | |

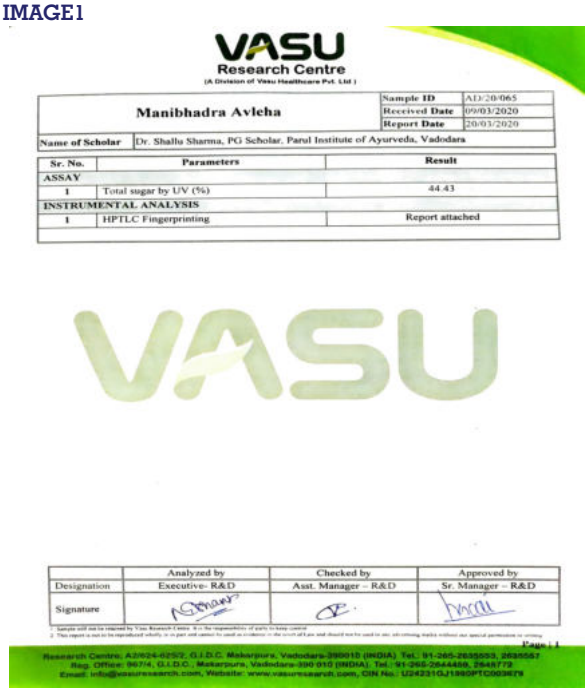
**TABLE 2: ORGANOLEPTIC CHARACTERSTICS**

| Samples | *Manibhadra Avaleha* |
|---|---|
| Color | Brown |
| Odor | Aromatic |
| Touch | Soft |
| Consistency | Semi solid |
| Taste | Sweet and bitter |

**Table 3: PHYSICO-CHEMICAL PARAMETERS**

| Sample Parameters | Manibhadra Avleha (value) |
|---|---|
| Loss of Drying at 105c (%w/w) | 6.5 |
| Total Ash Value (%w/w) | 2.54 |
| Acid Soluble Ash (%w/w) | 1.16 |
| Water Soluble Extractive (%w/w) | 22.25 |
| Alcohol Soluble Extractive (%w/w) | 16.5 |
| pH Value | 6.5 |
| Specific Gravity | - |
| Total Solid Content (%w/w) | 92.6 |
| Rancidity | Negative |

**IMAGE1**


VASU
Research Centre
(A Division of Vasu Healthcare Pvt. Ltd.)

Manibhadra Avleha | Sample ID: AD/20/065 | Received Date: 09/03/2020 | Report Date: 20/03/2020

Name of Scholar: Dr. Shallu Sharma, PG Scholar, Parul Institute of Ayurveda, Vadodara

| Sr. No. | Parameters | Result |
|---|---|---|
| ASSAY | | |
| 1 | Total sugar by UV (%) | 44.43 |
| INSTRUMENTAL ANALYSIS | | |
| 1 | HPTLC Fingerprinting | Report attached |

| | Analyzed by | Checked by | Approved by |
|---|---|---|---|
| Designation | Executive- R&D | Asst. Manager – R&D | Sr. Manager – R&D |
| Signature | | | |

Page | 1

Research Centre, A2/624-625/2, G.I.D.C. Makarpura, Vadodara-390010 (INDIA) Tel.: 91-265-2635553, 2635557
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Email: info@vasuresearch.com, Website: www.vasuresearch.com, CIN No.: U24231GJ1990PTC063679

**Table 4: QUALITATIVE ANALYSIS**

| Sample | Manibhadra Avleha |
|---|---|
| SOLVENT | PRESENT(+) / ABSENT(-) |

| | |
|---|---|
| Alkaloid | + |
| Vitamin C | + |
| Essential Oil | + |
| Flavanoid | + |
| Saponin | + |
| Glycoside | + |
| Starch | + |
| Tannin | + |

**HPTLC FINGERPRINTING REPORT**

| | | |
|---|---|---|
| **Sample** | : | **Manibhadra Avleha** |
| **Name of Scholar** | : | Dr. Shallu Sharma, PG Scholar, Parul Institute of Ayurveda, Vadodara |
| **Sample ID** | : | AD/20/065 |
| **Date of Report** | : | 20/03/2020 |

**Preparation of Test solutions:** Weigh 5 g of sample in a beaker and add 10 mL of Water to it. Sonicate for 15 Minutes, and transfer it to a separating funnel and partition with 20 mL Ethyl Acetate. Repeat the procedure twice with 15 mL Ethyl Acetate. Collect all Ethyl acetate layer and evaporate to dryness. Reconstitute the sample with 2 mL Ethyl Acetate and filter with 0.22 µm syringe filter. Use the Test solution thus obtained for HPTLC fingerprinting.

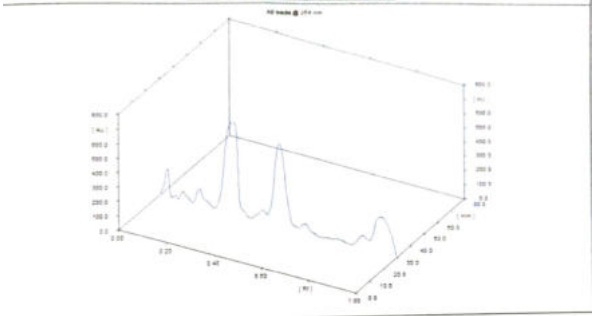
**Preparation of Spray reagent [Vanillin – sulphuric acid reagent]:** 50 mg Vanillin in 2 mL Methanol and 8 mL Sulphuric acid (98 %). From this stock solution prepare 10 % solution in Methanol.

| **Chromatographic Conditions:** | |
|---|---|
| Application Mode | CAMAG Linomat 5 - Applicator |
| Filtering System | Whatman filter paper No. 1 |
| Stationary Phase | MERCK - TLC / HPTLC Silica gel 60 $F_{254}$ on Aluminum sheets |
| Application (Y axis) Start Position | 10 mm |
| Development End Position | 80 mm from plate base |
| Sample Application Volume | 14.0 µL |
| Development Mode | CAMAG TLC Twin Trough Chamber |
| Chamber Saturation Time | 30 minutes |
| Mobile Phase (MP) | Toluene : Ethyl Acetate : Formic acid : Methanol (6 : 3 : 0.1 : 1 v/v) |
| Visualization | @ 254 nm, @ 366 nm and @ 540 nm (after derivatization) |
| Spray reagent | Vanillin Sulphuric acid reagent |
| Derivatization mode | CAMAG – Dip tank for about 1 minute |
| Drying Mode, Temp. & Time | TLC Plate Heater Preheated at 100± 5°C for 3 minutes |

| | Analyzed by | Checked by | Approved by |
|---|---|---|---|
| Designation | Executive – R&D | Asst. Manager – R&D | Sr. Manager – R&D |
| Signature | | | |



**HPTLC Chromatogram @ 254 nm**



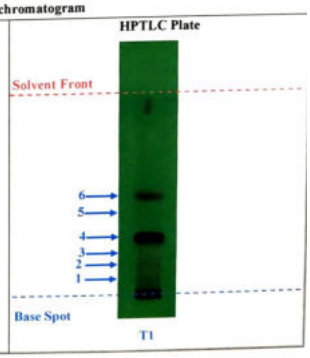
**3D overlay chromatogram**

**$R_f$ value**

| Spot No. | Track T1 |
|---|---|
| 1 | 0.05 |
| 2 | 0.09 |
| 3 | 0.16 |
| 4 | 0.29 |
| 5 | 0.40 |
| 6 | 0.50 |

**Track T1**: Manibhadra Avleha

**HPTLC Plate**




| | Analyzed by | Checked by | Approved by |
|---|---|---|---|
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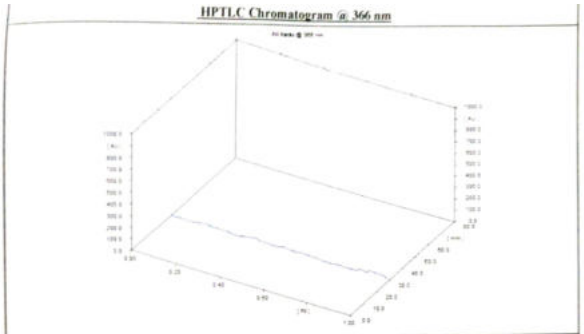
**HPTLC Chromatogram @ 366 nm**



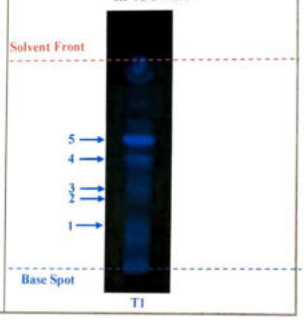
**3D overlay chromatogram**

**$R_f$ value**

| Spot No. | Track T1 |
|---|---|
| 1 | 0.20 |
| 2 | 0.29 |
| 3 | 0.40 |
| 4 | 0.50 |
| 5 | 0.62 |

**Track T1**: Manibhadra Avleha

**HPTLC Plate**

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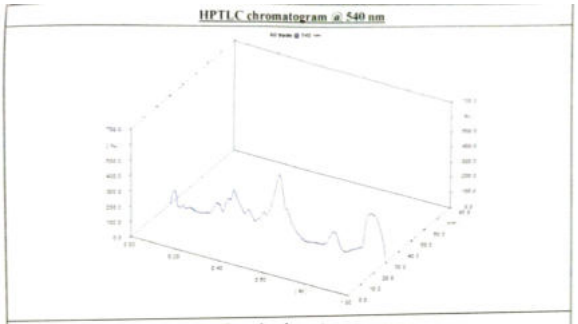
| Signature | | | |

**HPTLC chromatogram @ 540 nm**



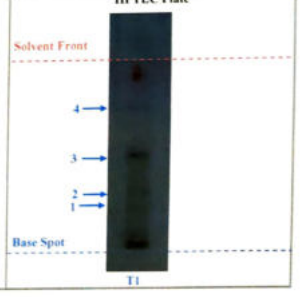
**3D overlay chromatogram**

**$R_f$ value**

| Spot No. | Track T1 |
|---|---|
| 1 | 0.20 |
| 2 | 0.29 |
| 3 | 0.50 |
| 4 | 0.75 |

**Track T1**: Manibhadra Avleha

**HPTLC Plate**




| | Analyzed by | Checked by | Approved by |
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| **Name of Scholar** | : | Dr. Shallu Sharma, PG Scholar, Parul Institute of Ayurveda, Vadodara |
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| Sample Application Volume | 14.0 µL |
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| Chamber Saturation Time | 30 minutes |
| Mobile Phase (MP) | Toluene : Ethyl Acetate : Formic acid : Methanol (6 : 3 : 0.1 : 1 v/v) |
| Visualization | @ 254 nm, @ 366 nm and @ 540 nm (after derivatization) |
| Spray reagent | Vanillin Sulphuric acid reagent |
| Derivatization mode | CAMAG – Dip tank for about 1 minute |
| Drying Mode, Temp. & Time | TLC Plate Heater Preheated at 100± 5°C for 3 minutes |

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