

## A preliminary pharmacognostical and pharmaceutical evaluation of *Dhatri Lauha Vati*- A compound herbomineral formulation

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### ABSTRACT

Iron deficiency anemia affects millions of people worldwide. Children and women of reproductive age are at increased risk. Iron deficiency is harmful at all ages. Among pregnant women, anemia may cause fetal growth retardation or low birth weight, and is responsible for a large proportion of maternal death. *Dhatri Lauha Vati* is an Ayurvedic herbomineral formulation which is indicated in the management of *Pandu* (Anaemia). Till date there is no standards reference regarding *Dhatri Lauha Vati*. The pharmacognosical work reveals that presentation of Rhomboid crystal of *Yastimadhu* and Stone cell of *Amalaki*. Organoleptic features of coarse powder made out of the crude drugs were within the standard range as per mentioned in classic. The pH value of *Dhatri Lauha Vati* was 4.18, Water soluble extract was 20.2 %w/w, Alcohol soluble extract was 14.9%w/w, Ash value was 48.17%w/w, Loss on drying was 3.12 %w/w.

### 1. INTRODUCTION

Iron deficiency anemia is a global public health problem, as compelling and harmful as the epidemics of infectious diseases. More than 700 million persons in the world suffer from iron deficiency anemia and about thrice the number from iron deficiency state [1]. About the half the population in the developing countries has iron deficiency anemia [2]. Infants and young children are particularly vulnerable to iron deficiency anemia because their requirement for iron is high [3]. Iron deficiency anemia has been identified as a major health problem in India mostly affecting the pregnant women and young children [4].

According to the Ayurvedic classics the nearest correlation of iron deficiency anemia can be made with *Pandu Roga*, because predominance of *Pandutva* or pallor in the whole body is termed as *Pandu Roga*. *Pandu* includes various types of anemia among which IDA is one. Clinical features of *Pandu* develop from the depletion of *Rasa Dhatu* which in turn becomes ineffective in the production of *Rakta Dhatu*. The decreased level of circulating *Rasa* and *Rakta* which have the prime functions of nourishment and providing support

to the vital functions gives rise to the symptoms like depletion of blood and flesh, fatigue, body ache, palpitation, periorbital edema, anorexia, dyspepsia, fever, dyspnoea and fainting.

There are various herbal and herbomineral formulations mentioned in Ayurveda classics for the management of *Pandu*. *Dhatri Lauha Vati* [5] is one compound herbomineral formulation which is very safe to be used in iron deficiency anaemia. For the first time to evaluating the pharmacognostical and physico-chemical properties of *Dhatri Lauha Vati*.

### 2. MATERIALS AND METHODS

#### 2.1. Drug Material

Raw drug materials were collected from the pharmacy, Gujarat Ayurved University. The ingredients and the part used are given in table 1.

#### 2.2. Pharmacognostical evaluation

Raw drugs were identified and authenticated by the Pharmacognosy department, I.P.G.T& R.A., Gujarat Ayurved University, Jamnagar. The identification was carried out based on the

morphological features, Organoleptic features and powder microscopy of the individual drugs. Later, Pharmacognostical evaluation of the tablet was carried out. Tablets dissolved in small quantity of distilled water, filtered through filter paper,

filtrate studied under the Corl zeiss microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope [6].

**Table -1: Ingredients of *Dhatri Lauha Vati***

Name of drug	Botanical Name	Part	Part use
<i>Dhatri</i>	<i>Emblica officinalis</i> Linn.	4	Fruit pulp
<i>Lauha Bhasma</i>	-	2	
<i>Yastimadhu</i>	<i>Glycyrrhiza glabra</i> Linn	1	Root

**Table -2: *Bhavana Dravya***

Name of drug	Botanical Name	<i>Bhavana</i>
<i>Amruta Kwatha</i>	<i>Tinospora cordifolia</i> Willd.	7

**Table -3: Organoleptic Features of *Dhatri Lauha Vati***

Characters	Observed
Texture	Rough
Colour	Dark Brown
Odor	Characteristic odor
Taste	Start with sour & end with Astringent
Consistency	Solid

**Table - 4: Physico-Chemical Parameters of *Dhatri Lauha Vati***

Test	Value	
<i>Dhatri Lauha Vati</i>	Uniformity	Average wt- 0.6865 gm Lowest wt-0.6100 gm Highest wt- 0.7630 gm
	Disintegration time	31 min.
	Hardness	3.0 kg/cm <sup>2</sup>
	Loss of drying (at 110°C )	3.12 % w/w
	Ash Value	48.17 % w/w
	Water soluble extraction	20.2 % w/w
	Methanol soluble extraction	14.9 % w/w
	pH value by pH meter	4.18
	Acid insoluble Ash value	20.09 %w/w

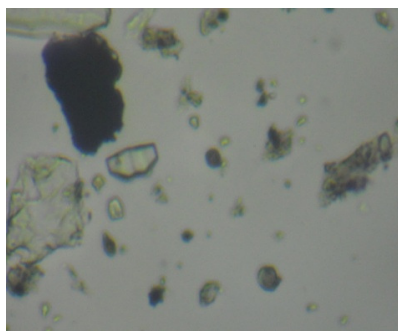
**2.3. Methods of Preparation of the Dhatri Lauha Vati**

*Dhatri* and *Yastimadhu* were cleaned, dried, powdered and passed through sieve number 85. *Lauha Bhasma* was prepared as *Bhasma* preparation protocol. *Bhavana* was given with *Amruta Kwath* for 7 times (Table-2). For the purpose of the binding 5% gum acacia was mixed. Then the mixture was converted in to granules with the help of the granular machine and finally punched into tablets (500 mg) by tablet making machine.

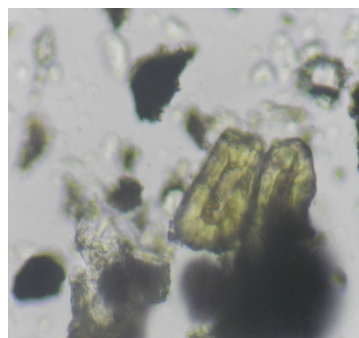
*Dhatri Lauha Vati* was analyzed by using standard qualitative and quantitative parameters at the pharmaceutical chemistry Laboratory of I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar. The common parameters mentioned for compressed tablets in Ayurvedic pharmacopoeia of India [7] and CCRAS guidelines [8] were considered for pharmaceutical evaluation. Presence of more moisture content in a sample may create preservation problem. Hence loss on drying was also selected as one of the parameters.

**2.4. Physicochemical evaluation**

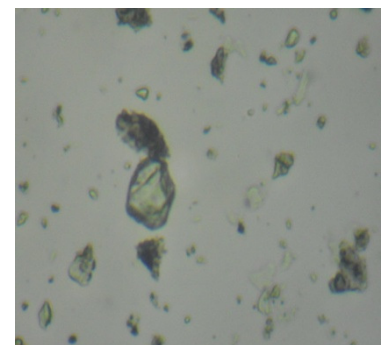
**Figure-1: Microphotographs of Dhatri Lauha Vati**



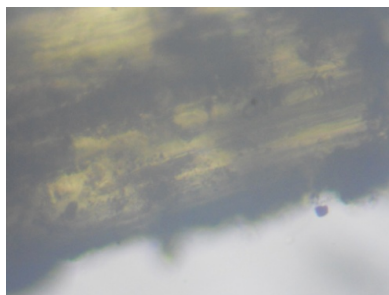
**Rhomberd crystal - Yastimadhu**



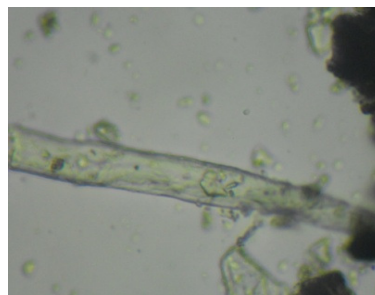
**Stone cell-Dhatri**



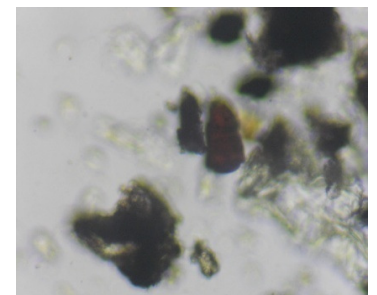
**Stone cell-Dhatri**



**Crystal fiber-Yastimadhu**



**Fibers-Dhatri**



**Tanin-Yastimadhu**



**Silika deposition-Dhatri**



**Scleroid-Dhatri**

### 3. RESULTS AND DISCUSSION

#### 3.1. Organoleptic study

Organoleptic features of *Dhatri Lauha Vati* were observed like Dark brown, Sour-Astringent in taste and solid consistency with rough surface (Table 3).

#### 3.2. Microscopic study

The diagnostic characters of *Dhatri Lauha Vati* compound formulation shows Silica deposition, Stone cell, Fibers, Scleroid (*Dhatri*), Rhomboid crystal, Crystal fiber, Tanin (*Yastimadhu*) was observed microscopically. Microphotographs are exposed in figure-1.

#### 3.3. Physico- chemical Parameters

Physico- chemical Parameters of the tablet like uniformity, hardness, loss on drying were all found to be within the normal range. The water soluble extract and methanol soluble extract values were found to be 20.2 % w/w and 14.9 % w/w respectively. Disintegration time was observed 31 min. The details are tabulated in table 4.

### 4. CONCLUSION

With this aim, Pharmacognosy and phytochemical evaluation of *Dhatri Lauha Vati* was performed which is a potent medicine in the management of *Pandu* (Iron deficiency anaemia). Preliminary Organoleptic features and results of powder microscopy were shows the ingredients which were used confirmed the genuinity and quality of Vati. All the ingredients were proved to be authentic and compared with the parameters mentioned in API (Ayurvedic Pharmacopeia of India). In phytochemical analysis, water soluble & alcohol soluble extract, pH, Ash value was assessed. Though the groundwork requisites for the standardization of *Dhatri Lauha Vati* are covered in the current study, additional important analysis and investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

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