



## Pharmaceutical analysis of *Bilva avaleha*: An ayurvedic formulation

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### Abstract

Ayurveda is the one of the most famous and ancient traditional system of medicine since before 2500 B.C. According to world Health Organization more than 80% population of developing countries are mainly depends on herbal or traditional medicines for their foremost health care requirements. *Aushadha* have a very important role to treat the diseases as it is one of the important factor of quadruple of treatment i.e., *Dravya* which is explained as *aushudha*. Ayurveda have a special branch of formulations and we formulate an BilvaAvaleha mentioned in Arogya Raksha Kalpadhrum, In Arogya Raksha Kalpa Dhrum which is also known as a traditional medicinal book, it is clearly mentioned that Lord Shiva told to Devi Parvati that if we will give bilva to Unmada patients for 96 days than patient get cure from it. Bilva, Aeglemarmelos, a plant of Indian origin having tremendous therapeutic potential. It is believed that the bilva fruit is the symbol of Lord Shiva and offered in prayers to deities Lord Shiva and Parvati. After preparation of Bilvaavaleha, we have done the physicochemical, phytochemical and HPTLC analysis of drug for standardization of Bilvaavaleha.

**Keywords:** ayurved, bilva avaleha, pharmaceutical analysis, hptlc, quality control parameters, unmad, autism

### Introduction

According to world Health Organization more than 80% population of developing countries are mainly depends on herbal or traditional medicines for their foremost health care requirements in which only Indian population uses herbal medicines for approximately 60 per cent of the world's population [1, 2]. Plants provides food, clothing, shelter and medicine to all cultures. Approximately 10 to 15 percent of about 300,000 species of higher plants, used as traditional medicines in history [3]. Medicinal plants are used in herbalism. They are easily available even in rural and tribal areas for healthcare purposes.

India is well known for its traditional medicinal systems. There is also mentioned in the ancient Vedas, Upvedas and other scriptures about traditional medical systems. The Ayurveda came to appear between 2500 and 500 BC in India [4].

Ayurveda is the most ancient and well documented system of medicine, formed by two words i.e., "Ayu" (life) and "Veda" (knowledge). Ayurveda is described as "The Science of Life" in which care of physical, mental and spiritual health of human is described. According to Ayurveda, life is a combination of senses, mind, body and soul.

Only the person with perfect balance of body, mind and soul is considered as healthy person in Ayurveda. Acharya Charaka has explained about *Trisutra*. e., *Hetu*, *Linga* and *Aushadha*. *Aushadha* is described as the form of medicine or drug which is used for cure and prevention of diseases [5]. Treatment depends upon the quadruple pods of treatment i.e., *Bhishak*, *Dravya*, *Upasthata* and *Rogi*. It is also called as *Chikitsa Chatushpada*. *Dravya* i.e., used as *Aushada* is one of the fourth factor of *Chikitsa Chatushpada* [6].

*Dravya* with their four adequate qualities that are have in abundance (*bahuta*), power to cure disease (*yogyattava*), utility in various forms (*anekvidha*), with necessary qualities like *rasa*, *guna*, *virya*, *vipaka* etc [7].

As described by our Acharya, every substance which is find on the earth has its own medicinal properties in one or another way. Each will work by its potency or power for particular action as a result of its pharmacodynamics and chemical constituents.

The Ayurveda have the special branch which deals with the preparations of formulations. In this study Bilvaavaleha is prepared as per the quotations explained in the classical texts. The Bilvaavaleha is herbal preparation. The analytical study of Bilvaavaleha is performed with following parameters- physic-chemical parameters i.e., color, odor, touch, taste, pH, loss on drying, total ash, acid insoluble ash, water soluble extractive, alcohol soluble extractive and pH. HPTLC is also performed for identification of chemical constituents.

### Material and Method

#### Selection of Drug

The drug is selected from Aarogya Raksha Kalpa Dhruma Text written by Kaikkulangerarama Warriar an eminent scholar and translated by Dr. Lal Krishan in English. It is mentioned in Chapter number 38 that Lord Shiva described to Devi Pravati that the root, bark, leaf, flowers and fruit of the tree Bilva is taken together in prescribed quantity and grinded with water. This grinded paste is added with butter is administered internally for ninety-six days, cures all types of Unmad [8]. The Bilva Phala Majja is said to be used with the butter in classics for the treatment of the Unmada, but considering the palatability and easy administration of drug

with appropriate dose, the Bilva Panchanga is used in the Avaleha form in present clinical study.

In present study Bilva Moola (roots) are used instead of Bilva flowers, as it has been mentioned in Bhaishajya Ratnavali, that one can use the root of the same plant in absence of its flower [9].

### Aim and Objectives

- Identification and authentication of raw drugs used for Bilvaavaleha.
- Preparation of Bilvaavaleha.
- Physicochemical and phytochemical analysis of Bilvaavaleha.

### Drug review- Bilvaavaleha

The main drug of this formulation is Bilva. Parts used and its quantity is mentioned in Table No - 1.

**Table 1:** Parts and Quantity used in preparation of Bilva Avaleha

Sr no	Ingredients	Latin Name	Parts used	Quantity
1	BILVA	Aeglemarmalous (Family- Rutaceae)	Fruit	1 part
			Bark	1 part
			Leaf	1 part
			Root	2 part
2	SITA	-	-	4 part

### BILVA

Botanical name- Aeglemarmelous  
Family- Rutaceae [10]

### Collection of Drug

Raw material included fruits, leaf, bark, roots were collected from a local person's garden in Wagodhia, Vadodara, Gujarat.

### Raw drugs identification and authentication

Rawdrugs identification and authentication was done by the Department of *Dravyaguna*, Parul Institute of Ayurveda, Parul University, Vadodara.

### Classical method of Bilva Avleha preparation

First collect all the raw Material with adequate quality

1. Identification and authentication of drugs
2. Separate waste material, weight, mix all and grind them
3. Make decoction of all drugs and separate when one eighth left
4. Sita is dissolved well in the decoction and boiled until *paka* (phanita).
5. After doing the examination of well-prepared drug according to Sarngdhar Samhita [11].
  - a. *Tantumvatvam* (Appearance of thread like if taken out on a rod)
  - b. *Kharatvam*
  - c. *Pidit mudra* (Take fingerprint on pressing)
  - d. *Apsumajjanm* (It sink in water)
  - e. *Gandhavararnarasodbhav* (Give smell, colour and taste of the ingredients.) when pressed between thumb and index finger.
  - f. Packaging after cooling.

### Pharmaceutical Study

Pharmaceutical study of BILVAVALEHA was conducted at Pharmaceutical department of Parul Institute of Ayurveda, Parul University, Vadodara. All the parameters for

pharmaceutical study mentioned for Avaleha were tested and results were evaluated.

**Methods of physicochemical evaluation:** Bilvaavaleha was analyzed by using standard qualitative and quantitative parameters. All the procedures were conducted at G.M.P certified pharmacological lab, Vadodara. The physicochemical parameters i.e., color, taste, pH, loss on drying, total ash, acid insoluble ash, water soluble extractive and alcohol soluble extractive were analyzed [12, 13].

### Results and Discussion

**Organoleptic evaluation:** Organoleptic characteristics of Bilvaavaleha details are mentioned in TABLE NO – 2.

**Physico-ChemicalParameters:** Details of physico-chemicals tests like Loss of drying, Ash value, Value of acid insoluble ash, Alcohol soluble extractive value, Water soluble extractive value, pH values are mentioned in TABLE NO - 3

**Loss on drying:** On drying the samples indicate that the samples were devoid of excess water content and there was no microbial over growth or insect infestation present. In this sample loss on drying is 5.47%, 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 this Total ash and acid insoluble ash are 0.29% and 0.002%.

**Water soluble extract and Alcohol soluble:** Water soluble extract and alcohol soluble extract are 22.25% and 15.5% respectively. The high solubility of the sample in water notes 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, so it is alkaline in nature.

**Table 2:** Organoleptic evaluation

Samples	BILVAVALEHA
Color	Brownish
Odor	Aromatic
Touch	Soft
Consistency	Semi solid
Taste	Sweet and bitter

**Table 3:** Physico-Chemical Parameters

S.No.	Parameter	Value
1.	Loss on Drying at 110 c(% w/w)	5.47
2.	Total Ash Value(% w/w)	0.29
3.	Acid Insoluble Ash(% w/w)	0.002
4.	Water Soluble Extractive(% w/w)	22.25
5.	Alcohol Soluble Extractive(% w/w)	15.5
6.	PH (5% Aqueous)	6
7.	Rancidity	Negative

### Qualitative study

On Qualitative Study: Alkaloid, Essential Oil, Vitamin C, Flavonoid, Saponin, Glycoside, Starch, Tannina represent. It shows that drug which used is genuine. Details are mentioned in TABLE 4

**Table 4:** Qualitative Analysis

Sample	Bilva Avaleha
Solvent	Present(+)/ Absent(-)
Alkaloid	+
Vitamin C	+
Essential Oil	+
Glycoside	+
Starch	+
Saponin	+
Flavanoid	+
Tannin	+

### High-performance Thin Layer Chromatography study (HPTLC) 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 all the 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. The results are tabulated as under. (IMAGE 1) Preparation of spray reagent (Vanillin- Sulphuric acid reagent) (Image1)

### Details of HPTLC profile of all tracks at 254 nm.

Under the 254 nm wavelength-Track -1of *BilvaAvaleha* (5µL) - 8 spots were detected and starts with respect to retardation factor 0.07, 0.11, 0.30, 0.41, 0.52, 0.57, 0.70 and 0.82. Track -2 of *BilvaAvaleha* (10µL) - 4 spots were detected and starts with respect to retardation factor 0.16, 0.41, 0.55, and 0.64 (IMAGE 2)

### Details of HPTLC profile of all tracks at 366 nm.

Under the 366 nm wavelength-Track -1of *BilvaAvaleha* (14.0µL) - 10 spots were detected and starts with respect to retardation factor 0.07, 0.30, 0.41, 0.48, 0.52, 0.57, 0.60, 0.64, 0.70 and 0.82.(IMAGE 3)

### Details of HPTLC profile of all tracks at 540 nm.

Under the 540 nm wavelength-Track -1of *Bilva Avaleha* (14.0µL) - 6 spots were detected and starts with respect to retardation factor 0.11, 0.17, 0.30, 0.41, 0.52, and 0.57. (IMAGE 4)

### Discussion

Any formulation which is used as medicinally needs 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, *Bilva Avaleha* was prepared according to the classical textual standard operative procedure mentioned in classics. The raw drugs were identified and authenticated before using preparation. The prepared drug, *Bilva Avaleha* was pharmacologically subjected for physicochemical, phytochemical and HPTLC analysis. The main ingredient of *Bilvaavaleha* is *Bilva*. Pharmaceutical analysis was done for the standardization of *Bilva Avaleha* in this study<sup>[14]</sup>. In future, this study will be

helpful for standardization of *Bilva Avaleha* and for the preparation of the monograph of *Bilvaavaleha* in the Ayurvedic Formulary of India (AFI).

### Conflict of Interest: None

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