

# Khanduchakka (Ehertia Leavis Roxb) A Plant With 100 of Benefits

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## ABSTRACT

*Ehertia Laevis Roxb. plant has many compounds useful in wound healing, fractures, UTI, aphrodisiac, headache, anthelmintics, diuretic, demulcent, expectorant, RTI, fever, fungal infections, hepato-protective, cytotoxic, insecticidal, anti-inflammatory, anti-apoptotic, anti-carcinogenic, weight gain, diabetes, muscles wasting, anti-viral activity, psychiatric disorders, collagen formation, reduce the recurrence, severity, healing period of herpes simplex virus infections, it also acts as painkiller and also used in fingerprinting healing period of herpes simplex virus infections, calcium absorption, muscle protein, post-surgery recovery, sports injuries, hormones, aging, used in psychotropic drugs for the purpose of extraction the Soxhlet extraction and rotary evaporator is used. The Rotation and the temperature checks in both of this instrument is taken under the consideration. The extract under consideration is a methanolic extract. Several applications of it have been studied during the process. The further development in the sector of protein extraction, alternative to chawanprash ingredients, oil making, ointments, ingesting pills is required. We have paved a pathway for such development.*

**KEYWORDS-:** Anti-carcinogenic, Immunity booster, Soxhlet extraction, rotary concentrator .

## 1. INTRODUCTION

In Current Scenario the cases of covid-19 is reduced but the Corona virus disease is a contagious disease caused by virus. It causes respiratory system such as high fever, dry cough, sore throat, and difficulty in breathing in severe cases. It first cases were reported in wuhan city, Hobei province of China in month of dec 19. on 7 th jan 2020 they confirm covid 19 as a causative virus.

Traditional medicines are very famous in China and used for COVID-19. Indian government also published advisory by AYUSH department for COVID-19. In Maharashtra state of India Ehertia Laevis Roxb. Plant is being used for many diseases traditionally. Also, this is very spiritual plant as Santa Dnyaneshwar Maharaj from Alandi Pune has taken Samadhi at the base of this plant (Admuthe, 2016). In this herbal plant, many phytochemicals are available which shows antimicrobial activities including anti-viral activities. As Ayurveda is Science of life and lots of majors are mentioned in Ayurveda for controlling this Janapadadwansa like Dincharya, Ritucharya, majors for building good immune system and medicines to cure diseases. It main aim to make a fully natural products and also to study its chemical content, medicinal property of the chemical present in each part etc and its scope is its medicinal property which contain large amount of chemicals in it. It can be a part of further exploration. The bi product of Soxhlet extraction can be further processed and can be converted into oil, ointment, proteins etc

## 2. KHANDUCHAKKA PLANT



Fig-1 khanduchakka Plant

Ehertia laevis is a rapidly growing medium sized tree of the Boraginaceae. The genus Ehertia contains more than 50 species. It is found in India, Myanmar, Laos, China, Bhutan, Pakistan and Vietnam. The Ehertia Laevis Roxb is high Value Medicinal plant and becoming rare in State of Maharashtra. Its commonly known by

more than 120 name in diverse language in English it is called as Ehertia, In Gujarati its Vadhavardi , In Hindi its called Bhairi, chamror, Konkani, Kalo gamdo, in Marathi its called Datrangi, Ajanvruksha, In Tamil its called Kuruviccai, Kalvirasu and In telugu its called Tellajuvvi, Paldattam. It has a religious important among Hindus it found near The Dnyaneshwar temple in Alandi and its have a several medicinal uses.

It is a small deciduous tree with short stem and grey bark occasionally commomly flowering and fruiting time is in between January- April .The flower are appear while having 8mm height and its fruits having a small drupe at first red ,at length black.

Kingdom	Plantae
Clade	Tracheophyta
Botanical Name	Magnoliopsida
Order	Boraginales
Family	Boraginaceae
Genus	Ehretia
Binomial Name	Ehretia Leavis Roxb

The plant is used for variety of purposes including cosmetic, pot herb, wood and stone dye , medicinal use and ornaments. And its inner bark is use as a food . The plant has also been documented in the traditional system of medicine due to its extensive uses to treat respiratory system disease, gastrointestinal tract infection ( eg : jaundice, diarrhoea, ulcer, dysentery, liver diseases) Endocrine system disease, diphtheria, scabies, ringworm, gonorrhoea, syphilis and venereal diseases. Its seeds are anthelmintic . Its leaves are applied to Ulcer and in headaches. Its fruits are used in disease of lungs , use in the affection of urinary passage and spleen. Powdered mixed with oil as a remedy for ringworm.

### 3. CHEMICAL CONTENT PRESENT IN PLANT AND ITS MEDICINAL USES

Table 1 Showing the chemical content and the medicinal uses

SR. NO	PART	CHEMICAL CONTENT	MEDICINAL USES
1	LEAVES	Naphthoquinone derivative Minerals such as Na, NH <sub>3</sub> , Fe, Mn, K, P, Zn, Cu, Si, Mg, Ca, Gallic acid, Tannic acid, Rutin, Vitamin, ascorbic acid, Phytol, Piperazine, Betulin & Betulinic acid, Lupeol, Di - n octyl phthalate,	Antibacterial , antifungal, antiviral, insecticidal, cytotoxic, anti-inflammatory, antipyretic, antiparasite analgesic, obesity, diabetes mellitus, heart disease, brain and liver disease, immune system, preventing viral mutations, antioxidant , clotting of blood , reduce hyper tension , and lipid level.
2	FRUITS	Aconitines, decanoic acids, phthalic acid, phytol, $\hat{1}\pm$ and $\hat{1}^2$ amyryn, piperazine, phenylephrine. Benzoquinones: - 1,4-naphthoquinone lewisone, Bauerenol, Bauerenol acetate, $\hat{1}\pm$ -amyryn, Betulin, Lupeol, Betulinic acid, $\hat{1}^2$ -sitoster	Antiseizure , Larvicidal activity, antinociceptive , Antioxidant, anticancer , immune-enhancing effects, inhibit cellular senescence , arthritis, asthma, mosquito repellent, useful for malaria antitumor, anti-viral, antibacterial, anti-inflammatory and antimalarial
3	BARK	Tannins Tannic Acid , Baurinol, Phytol, Phenylephrine	bacteria , fungi, yeasts, viruses growth is prohibited by tannins, Clotting of blood, reduce hyper tension, control lipid level, causes liver necrosis and improve immune response

*For flower study is not conducted*

### 4. DIFFERENT METHODOLOGY FOR EXTRACTION :

#### 4.1) Plant tissue homogenation :

In these method dried or wet, fresh plant part are grinded in a blender to fine particle put in a certain amount of solvent and shaken vigorously for 5 - 10 min Or left for 24 hour after which extract is clarified the filtrate then may be dried under reduced pressure and redissolved in the solvent to determine the concentration.

#### 4.2) Serial Exhaustive Extraction :

The technique of extraction which involves sequential extraction with a solvent of increasing polarity from a non polar ( hexane) to a more polar (methanol) to ensure that the wide polarity range of compound could be extracted.

#### 4.3) Soxhlet extraction :

Soxhlet extraction is only essential where the desired compound has a partial solubility in a, solvent and the impurity is insoluble in that solvent.

#### 4.4) Percolation :

This technique is used most frequently to extract the active ingredient in the preparation of tinctures and fluid extract. A percolator ( a narrow concentric shape vessel open at both end) is generally used .

#### 4.5) Decoction:

This method is used for the extraction of the water soluble and heat stable ingredients from crude drug by boiling it in water for 15 min, cooling, straining and passing adequate cold water through the drug to yield the required volume.

#### 4.6) Maceration:

In maceration ( for First extract ) method entirely or coarsly powdered plant drug is kept in contact with the solvent in a stopped vessel for a defined period in with normal agitation until the soluble matter is dissolved. This method is best suitable for use in case of the thermolabile drugs.

### 5. METHANOLIC EXTRACT BY USING SOXHLET EXTRACTION PROCESS:

When the desired compound has, limited solubility and the impurity is insoluble in that solvent then the soxhlet extractor is used.

A Soxhlet extraction has three main parts

1) A percolator

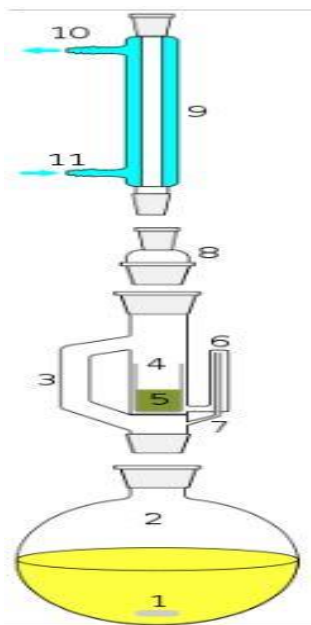
2) A Thimble

3) Siphon mechanism

1) A Percolator : It's circulated the solvent and it's called a boiler and reflux.

2 A thimble : It extracted a solid which retain and it is usually made by thick filter paper.

3) Siphon Mechanism: It periodically empties the thimble.



1. Stirrer bar,

2. still pot (the still pot should be overfilled and the volume of the still pot should be 3to4 times the volume of soxhlet chamber),

3. Distillation path ,

4. Thimble ,

5.Solid ,

6. Siphon top,

7.Siphon exit,

8. Expansion adaptor,

9. Condenser,

10. Cooling water out

#### 5.1 OPERATION:

Leaves were washed with distilled water and cleaned by absolute alcohol and rinsed by distilled water three times. The methanolic extract is done by using Soxhlet extractor. Powdered dried leaves (50 gm.) are extracted in 250 ml of solvent.

The solvent is heated to reflux. The vapour travels up a distillation arm, and floods into the chamber housing the thimble of solid. The condenser ensures that any solvent vapour cools, and drips back down into the chamber housing the solid material. The chamber containing the solid material slowly

fills with warm solvent. Some of the desired compound dissolves in the warm solvent. When the Soxhlet chamber is almost full, the chamber is emptied by the siphon. The solvent is returned to the distillation flask. The thimble ensures that the rapid motion of the solvent does not transport any solid material to the still pot. This cycle may be allowed to repeat many times, over hours or days. During each cycle, a portion of the non-volatile compound dissolves in the solvent. After many cycles the desired compound is concentrated in the distillation flask. The advantage of this system is that instead of many portions of warm solvent being passed through the sample, just one batch of solvent is recycled. After extraction the solvent is removed, typically by means of a rotary evaporator, yielding the extracted compound. The non-soluble portion of the extracted solid remains in the thimble, and is usually discarded.

### 5.2 ROTARY EVAPORATOR :

It is a device which remove solvent from sample by evaporation it is used in chemical laboratory for efficient and gentle removal. Parts of Rotary Evaporator

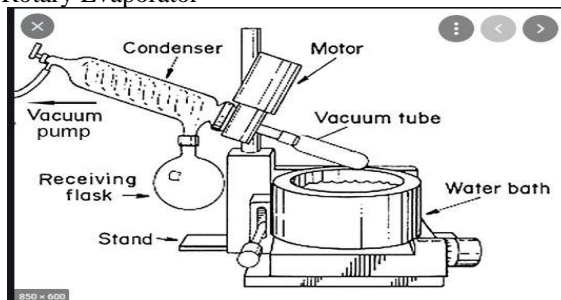


Fig ;2 Parts of Rotary Evaporator

It has six parts

- 1) Condensate tube: ( It condense the sample by using double serpentine condenser which add condensing agent such as dry ice and acetone to condense the sample.)
- 2) Evaporation Flask : (The evaporation flask is evaporate the sample which can rotate under constant temperature at constant speed)
- 3) Receiving flask : ( It require the condensed sample)
- 4) Evaporation tube : (The evaporation tube firstly acts as a sample rotating support shaft, and secondly The sample is aspirated through the vacuum system of an evaporation tube)
- 5) Rotary Motor:( By rotating motor it drive the evaporation bottle containing the sample).
- 6) Vacuum System : (vacuum system is used to lower the pressure of the rotary evaporator a medium system)
- 7) Bath kettle : ( It heat the sample with water or oil)

### 5.3 PHYTOCHEMICAL SCREENING

Sr. No	Phytochemical constituents	Petroleum ether extract	chloroform extract	methanolic extract
1	Alkaloids			
	a) Dragendorff's test	+	++	+++
	b) Mayer's test	+	++	+++
	c) Hagers's test	-	-	-
	d) Wagner's test	+	+	++
2	Carbohydrates			
	a) Molisch's test	-	+	+
	b) Fehlings test	-	+	+
	c) Benedict test	-	+	+
3	Saponins			
	a) Foam Test	-	-	+
	b) Heamolytic test	-	-	+
4	Steroids and Tri terpenoids			
	a) Salkowski test	++	++	-
	b) Liebermann – Burchard Reaction	++	++	-
	c) Lieberman's Reaction	++	++	-
5	Phenolic compounds & Tannins			
	a) Ferric chloride test	-	++	+++
	b) Lead acetate test	-	++	+++
	c) Potassium Dichromate test	-	+	+++
	d) Dilute HNO <sub>3</sub>	-	+	+++
6	Proteins & Amino acids			
	a) Biuret test	-	+	+
	b) Millions test	-	+	+
	c) Ninhydrin test	-	+	+
7	Flavone & Flavanoids			
	a) Lead acetate test	-	+	+++
	b) Ferric chloride test	-	+	+++
	c) Sodium Hydroxide test	-	+	++
	d) Shinoda test	-	+	++
8	Anthraquinone Glycosides			
	Borntrager's test	-	-	-

+++ = maximum; ++ = moderate; + = minimum; - = absent

## 6. ALTERNATIVE FOR INGREDIENTS IN CHAWANPRASH

### 6.1 Content of concentrated methanolic extract of khandu chakka

The plant khandu chakka has many medicinal property and contain large amount of chemical like alkaloid( Nitrogen containing bases), carbohydrate (are sugar molecule along with fats and protein ),saponins(naturally occurring compound distribute in plant cell), phenolic compounds(containing hydroxykated aromatic ring), flavonoids(group of plant metabolities thought to provide health benefits through cell), protein, amino acid which having medicinal properties like antibacterial, antifungal, antiviral, insecticidal, cytotoxic, anti-inflammatory, antipyretic, antioxidant, improve immune system viral property, anticancer, antivenom, bacteriostatic.

### 6.2 Content of medicinal herbs present in chawanprash

The herb present in chawanprash have similar chemical which are present in khandu Chakka .

The herb present in chawanprash are as follows:

1) **Dashmool: Chemicals:** a) alkaloid, b) flavonoids, c) resin

**Medicinal uses:** use as remedies for respiratory trouble, remedies arthritis, enhance digestion, prevent headache, treat fever.

2) **Mrugshrunga Bhasma: Chemical:** Fe, Mg, P, Ca

**Medicinal uses:** use as remedies for expectorant, mucolytic, antitissue, bacteriostatic, antibacterial, antimicrobial, mild anodyne, mild antipyretic.

3) **NagKesar powder: Chemical :** ferra seed contain lipids, moisture ash total protein water soluble protein crude fibre, carbohydrate

**Medicinal uses:** use as remedies for cancer, fever, mild antipyretic, headache.

4) **Gudchi satva : Chemical :** alkaloid, phytosterol, glycoside

**Medicinal uses:** use as remedies for antidiabetic.

5) **Triphala extract: Chemical:** carbohydrate, protein, saponins

**Medicinal uses:** use as remedies for anti-inflammatory.

### 6.3 POINTS OF COMPARISONS .

1] After studying different contents in methanolic extract and herbs in chawanprash we came to know that ethanolic extract of khandu chakka plant have similar medicinal properties as well as chemical properties perhaps more.

2] Triphala extract and Dashmool extracts in Chawanprash is extracted by using acetone while we are taking our khandu chakka extract in methanol. And on the coastwise we studied acetone is costlier than methanol.

3] So, we can say that our methanolic extract would be best alternative for costlier herbs in chawanprash.

## 7. CONCLUSIONS

1] Hence to tackle such situation this herbal plant which is also considered very spiritual plant may help in this critical condition of COVID-19 pandemic by its Anti-Viral activity and other medicinal useful activities for co morbidity conditions. These medicinal activities of plant will open the door for further research and will provide good opportunities for employment and farming to strengthen the economy of world. This spiritual plant may pave the way for humanity.

2] Plants of this genus as a native to India can become a great source of income for the nation. Hence it would be one of the best options of crop cultivation to farmer for financial support. Also, it is concluded that, this drug is very effective in wound healing and cheaper than surgical management. In future extensive research to make the used this plant is more popular.

3] This study helps us to find the immunity booster source which provide anti-viral property. increasing the ability of person to resist against diseases which commonly occurs in this condition

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