

Development and Preparation of Pain Balm from Ehretia Leavis and it's Physiochemical Evaluation

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INTRODUCTION

Ehretia laevis is a rapidly growing medium sized tree of the Boraginaceae. The genus Ehretia contains more than 150 species. The plant is primarily distributed throughout Tropical and subtropical regions of Asia Africa and Australia. E laevis is the most popular member of its genus and is commonly known by more than 120 names in diverselanguages. In India the plant is mainly found in the northens parts of thecountry (e.g. in Bengal, Maharashtra and Rajasthan) The plant has also been documented in the traditional system of medicine (e.g Ayurveda and Siddha)

The invention and mass production of chemically synthesized medicines has revolutionized health care in most parts of the world over the last 100 years. Orthodox practitioners and herbal medicines are also used by significant segments of the population in developing countries for primary care Herbal medicine is one of the most important branches of herbal medicine worldwide.

Key Words: Ehretia Leavis Pain Balm Evaluatio

In developing countries like India, the bulk of the world's population also relies on herbal Medicines to fulfil their health needs [1] According to the World Health Organizations, 30 Percent of people use natural medicines for any aspect of their primary health care, exposing Those to lesser-known side effects and dangers associated with chemically synthesized Pharmacological drugs. As a result, bioactiveextracts of medicinal plants, as well as their herbal medicine formulations are a viable alternative to chemically synthesized medicines. [2]

For the herb to be used more widely in medicinal practice, scientific confirmation of these claims is needed. Long term, seemingly unproblematic use of an herbal remedy will attest to its protection and efficacy, Herbal medicines with recorded experience from a long period of use should be distinguished from herbs whose conventional use has not been defined by research methods [4]

Folk medicine lacks a theoretical foundation Modern scientific studies on these medicinal plants are critical for the plants to be used as medicines more realistically and scientifically. Folklore medicines are the mainstay of conventional medical systems, having been used in medical practice for thousands of years and contributing significantly to human health. The widespread

application, like those described in old texts such as Vedas and the Bible, of herbal remedies and medicines has produced medicinal products from traditional herbs and medicinal plants commonly used. It is critical to research medicinal plants with folklore reputation in greater depth to encourage proper use of herbal medicine and to establish their potential as sources for new medicines.[3]

A malabarica L is a shrubby, erect, densely tomentose or thickly woolly, stems slightly branched, obtusely quadrangular, clothed with soft woolly hairs. Leaves are very thick, oblong lanceolate, acute, and pale above, white below, crenate-serrate base rounded or shortly cuneate, petioles long, stout, softly woolly. In the present study, we investigated whether these plants have anti-arthritis, anti-platelet and anti-inflammatory activities.

Plant description

Ehretia laevis is a rare Indian medicinal plant used from the Ancient period, it belonging to a member of the Boraginaceae or Borage family, and is native to India, Pakistan, Laos, Myanmar, Vietnam, China, and Bhutan. The *Ehretia laevis* Roxb. is a highly valued medicinal plant and becoming rare in the state of Maharashtra. It has religious importance among Hindus. It is growing luxuriantly. Growing at Alandi near the Dnyaneshwar temple. The use of medicinal plants is increasing worldwide. The general information of *Ehretia laevis* given below.

Kingdom : Plantae
 Division : Tracheophyta
 Class : Magnoliopsida Order: Boraginales
 Family : Boraginaceae
 Genus : *Ehretia*
 Species : *Ehretia laevis* (Roxb)
 Botanical Name : *Ehretia laevis* Roxb.
 Synonyms : *Ehretia laevis* Var. *platyphylla* Merrill. Common/Local Name : Khanduchakka
 Regional and Other Names
 English: *Ehretia*, Gujarati: Vadhavaradi Hindi: Bhairi, Chamror, Datranga, Tamoriya Nepali: Datingal
 Konkani: Kalo Gamdo Marathi: Ajaanvruka Datrang Tamil: Kuruviccai, Kalvirasu Telugu: Tellajuvvi, Paldattam Malayalam: Harandi Sanskrit: Charmavriksha.
 Habit and Habitat: Small deciduous tree, with short stem and grey bark, occasionally common. Native: India, China, Bhutan, Pakistan, Laos, Myanmar.
 Flowering And Fruiting Time: January to April
 Flowers: White, up to 8 mm
 Fruits: A small drupe, at first red, at length black
 Properties And Uses: The inner bark of *Ehretia laevis* Roxb is used as food. Leaves are applied

to ulcers and in Headaches. Fruits are astringent, anthelmintic, demulcent, Expectorant, diuretic, and used in the affection of urinary passages, diseases of Lungs and spleen. Powdered kernel mixed with oil is a remedy for ringworm, Seeds are Anthelmintic This medicinal plant has a light grey or white back with an irregular trunk. The leaves in size and form are variable The length varies between 2 and 6.3 cm and 1.3 to 3.8 cm. These plants flowers are coloured white. The calyx of the flowers is 2.5 mm long and the corolla 3- Lobed and 5 corollas lobed is 6-8 mm long. Smaller than Calyx the corolla tube and lobe are longer.[5]

Pharmacological Reports

A wide variety of phytoconstituents are present in *E. laevis*, many of which exhibited. An array of pharmacological activities. Several ethnobotanical survey studies reported the Characteristic uses of the plant in the treatment of ailments, including jaundice and liver Diseases, chronic and acute inflammations, ulcers and gums problems, wound healing And pains. This part of the review will emphasize on its pharmacological Studies reported for *E. laevis* extracts, fractions and of its phytoconstituents, along with Their ethnopharmacological relevance.[6]

Anti-inflammatory, Antiarthritic and Analgesic Activities

An ethnobotanical survey revealed that the tribes of rural and forest remote areas are still depending to a great extent on indigenous system of medicine [5] recently, In vivo studies established the anti-inflammatory potential of methanol, chloroform and aqueous extracts of *Elaevis*, including its potential for the treatment of arthritis, a Condition characterized by chronic inflammation. Besides, the methanolic extract of *Elaevis* leaves has been investigated for its antiarthritic activity in induced arthritis models in rats. Phytoconstituents like hexadecanoic acid (palmitic acid), oleanolic acid, and other fixed oils were suggested to be responsible for its antiarthritic actions. Although Systematic scientific studies are still lacking. Forthcoming work will probably produce Interesting consequences and may provide a prospective remedial candidate from *Elaevis* For the treatment of inflammatory disorders

Antioxidant Activity

Several studies suggest the antioxidant potential of plant *E. laevis*. Antioxidants are The substances which have capacity to inhibit or delay the oxidation process under the Influence of either reactive oxygen species or environmental oxygen. Antioxidants are compounds which protect living organisms

from damage caused by concomitant? Lipid peroxidation, protein damage, uncontrolled ROS production and breaking of the Deoxyribonucleic acid (DNA) strand

In Ayurveda, there are many plants that possess antioxidant potential and can be used against diseases in which free radicals and ROS play an important role. In another study, the methanolic extract of *E. laevis* fruits was reported for antioxidant effects. The plant displayed its antioxidant effects due to the presence of phyto molecules Such as flavonoids, tannins, ascorbic acid and phenolic acids. The antioxidant potential of various other parts of *E. Laevis* needs to be explored

further in ameliorating the oxidative stress associated disorder.

Antimicrobial Activity

E. laevis has been employed as an ethnic medicine for the treatment of several infectious diseases, including those of viral, fungal, protozoal and bacterial origin. Several investigations have been performed in the recent past years to authenticate the antimicrobial potential of *Elaevis*. For example, the plant has been tested against different Gram-positive and Gram-negative bacterial strains. There is always a tremendous demand for antimicrobial agents due to the speedy development of microbial resistance. The bioactive constituents of this plant could be excellent lead compounds in the search of new potential antimicrobial agents. [6]

Wound Healing Activity

A tribe of Wardha district of Maharashtra, India used *E. laevis* for the management of wound healing and found interesting results. Similarly, folklore practitioners of Garasia community of district Sirohi, Rajasthan also recommended the paste prepared from leaves of plant for early healing of cuts [6].

Thakre et al. reported the wound healing activity of paste made from leaves of *E. laevis*. Recently, a case report had been published on the local application of *E. laevis* (Khanduchakka Ghit) in the treatment of anal fissure (Parikartika). A broad antimicrobial spectrum of barks and leaves can be a probable rationale for its wound healing property. Till now, no investigational work is presented on the wound healing activity as well as in the management of anal fissures. So, there could be a wide scope for future research to figure out the possible mechanism and possible phytoactive metabolites for wound healing effects.

Dental Caries

Dental caries is a common health trouble of oral cavity. Dental caries is situated by the interaction of microbes on the tooth enamel. It is anticipated that about 2.3 billion inhabitants suffer from dental caries globally. According to the World Health Organization (WHO) the incidences of dental caries are constantly increasing. It affects all races, genders and age groups. The prevalence of caries is about 49% before the age of 12 years, while it progressively increases from 15 years (60%) and peaks at the age group of 60-74 (84%). All these documentary reports validate the traditional uses of *E. laevis* towards

Microbial diseases of oral tissues. A wide antimicrobial spectrum of *E. laevis* can be very helpful in the prevention of dental problems. Therefore, all these studies confirmed that *E. laevis* has the potential for the therapeutic management of oral/dental problems.

Miscellaneous Activities

E. laevis had also been studied for its coagulant and edible properties. Moreover, several other parts of the plant were recommended for the treatment of jaundice, skin diseases and in bone fractures. *E. laevis* has also been used by tribal people and recommended by folklore healers for the management and healing of fracture. Tichkale et al. reported the use of paste prepared from the leaves of *E. laevis* for the management of fracture. The kalks (paste) was applied in

the form of lepan (applied locally) at the affected sites [7] Sharma, et al, established that the tharu community of Utrakhand used the ground paste of leaves of E leaves has been applied topically for the treatment of diverse skin disorder (6). In another study, the antidiabetic perspective of E. laevis has been established through Electrochemical measurement using mult walled nano carbon tubes

Phytochemistry

Ethnobotanical studies established that barks, leaves and fruits of E laevis are potential Sources of phytoconstituents. Phytochemical investigations had let to the extraction and isolation of secondary metabolites along with primary metabolites from petroleum ether, chloroform and methanolic extracts of its harks and leaves. These are pentacyclic Triterpenoids, flavonoids, alkaloids, tannins, phenolic components, phenolic acids, hydrocarbons, aliphatic alcohols fatty acids, ascorbic acid, amino acids, carbohydrates, benzoquinones , vitamins and minerals (9-10)

Lupeol

Lupeol (lup-20(29)-en-3 β -ol) is abundantly found I medicinal plants and has been Reported to Pomes an array of pharmacological activites, including antiangiogenic, Antinflammatory Anticancer, and arthritis, antidiabetic, cardiovascular and Antioxidant activities Lupeol is one of the potential anticancer biomarkers.

Ursolic Acid

Unsolic acid (3 β -hydroxy-urs-12-ne-28-oic acid) is a well known pentacyclic terpenoid of Plant origin exhibiting a wide range of pharmacological activities, eg, antiviral, antiulcerosos, anti-inflammatory and anticancer activities (8)

-Amyrin

α -Amyrin (3 β -hydroxy-urs-12-en) is the precursor of ursolic acid and predominantly Found in plant origin exhibiting an array of pharmacological activities, eg, anxiolytic, antidepressant anti-inflammatory, hyperglycemic and hypolipidemic activities

Sitosterol

The hysteron β -sitosterol (3_-stigmast-5-en-3-ol) is one of the important active principles of many plants. It is also used as one of the potential plant biomarkers for the treatment and Prevention of cancer [11].

Flavonoids

Flavonoids are a group of natural products, which are ubiquitously present in plants (Fruits, vegetables and also in certain beverages). They are associated with various therapeutic activities and are present in a variety of medicinal, nutraceutical, pharmaceutical, and cosmetic preparations. Flavonoids exert diverse activities, e.g antimycobacterial antioxidant anti-inflammatory, anticancer and antimalarial.

Phytochemical screening of methanolic extracts of E. laevis indicates the presence of flavonoids

[10].

Tannic Acid

Tannic acid (1,2,3,4,6-penta-O-13,4-dihydroxy-3-((3,4,5-trihydroxybenzoyloxy] benzoyl]]- D glucopyranose) (32) is a polyhydroxy phenol, whose structure contains a large number of phenol units. The phytochemical investigation of the stem bark and leaves of *E. laevis* reported the existence of tannic acid, along with other phytoconstituents in noticeable quantities

Amino Acids

Amino acids are the building blocks or basic units of proteins, which compose the foremost part of our body weight. They play an important role in our body since they are essential for vital processes such as synthesis of neurotransmitters and hormones.

Carbohydrates

The phytochemical investigation of the stem bark and leaves of *E. laevis* revealed the presence of primary metabolites such as carbohydrates in an appreciable quantity. Three carbohydrates namely lactose, D-mannitol and maltose were identified from the leaves (9)

Vitamins

Literature on the quantitative assessment of trace elements in the leaves of *E. laevis* establish its nutritional value due to the presence of minerals and vitamins such as vitamins C, E, A, riboflavin and thiamine. Vitamin C plays a significant role in showing the development and prevention of several diseases by exhibiting antioxidant action by scavenging free radicals and also acting as an enzyme cofactor in cells.

Minerals

Minerals are one of the essential and vital components of food and fodder. All the minerals play an important role in the structural and metabolic activities of the body, e.g. brain development, gastrointestinal tract (GIT) functions, bone development, bones and Teeth strength. The fruits and inner bark of *E. laevis* are reported to be edible. Experimental analysis of the bark, fruits and leaves of *E. laevis* confirmed the presence of significant amount of minerals.

Quercetin

Quercetin (3,3',4',5,7-pentahydroxyflavanone) is a citrus polyphenolic flavonoid abundantly present in vegetables and fruits, eg, black grapes, onion and tea. It was the first known tyrosine kinase inhibitor in the phase-I human clinical trials. Recent studies have reported for its broad spectrum of activities, including against cancer, cardiovascular diseases, inflammatory and CNS disorders. Quercetin exhibits its significant antioxidant activity by sustaining oxidative balance.

Kaempferol

Kaempferol (3,4,5,7-tetrahydroxyflavone) belongs to the flavonol class of flavonoid. It is

abundantly found in tea, beans, apple, strawberries and spinach. Recently, numerous investigations established its diverse pharmacological activities, e.g. cardio protective. Hepatoprotective, anti-inflammatory, antioxidant, anticancer, neuroprotective and antidiabetic properties. Kaempferol was found to be effective against various types of cancers, including skin, colon and hepatic cancer.

Luteolin

Luteolin (3,4',5,7-tetrahydroxyflavone) is a flavone present in a wide variety of fruits, vegetables and in medicinal plants. Vegetables including celery, parsley, onion leaves, broccoli, peppers and carrots are rich in luteolin. Luteolin shows an array of biological properties, including antioxidant, antimicrobial, anticancer and estrogenic regulator properties.

Apigenin

Apigenin (4,5,7-trihydroxyflavone) is predominantly found in everyday diet. Out of all the classes of flavonoids, apigenin is ubiquitous in the plant kingdom. It is rich in Tea, oranges, onion, celery, parsley, beer and wines. Apigenin attracts researchers and has been recommended in nutraceuticals because of its numerous benefits and low toxicity. Apigenin exhibits a broad spectrum of activities and is used in the cure of amnesia, depression, stroke, diabetes and cancer.

Plan of work Literature review
Collection of material
Preparation of extract
Preparation of balm
Phytochemical evaluation

- Literature review

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- **Aim and objective**

Leaves of ehretia plant are used by village for painkiller purpose as well as unclear . It shows good result.

In market there is no such formulation available which is prepared from leaves of ehretia. So the aim of present work is to formulate balm for ehretia leaves .which will use for pain problem as well as join pain.

Experiment

Collection of Plant Material

Leaves of *Ehretia* were collected from local areas. Therefore plant material was brought to the laboratory for further analysis.

Processing of Plant Material

The collected *Ehretia* leaves .Were plucked from the plant and washed Thoroughly under tap water . The leaves were cut into smaller pieces for quick drying. Cleaned leaves were shade dried for 15-20 Days.

The dried plant material was crushed Into fine powder with the help of pestle Mortar. Finally the fine powder was stored In air tight container at room temperature.

Preparation of Leaf Extracts of *Ehretia* leaves

1. collected plant material were wash in sterile water and kept for drying for 4-5 day's
2. Then the dried leaf material (2g) was Pulverized in a blender to get a coarse Powder and soaked separately in 5ml of water for 30 minutes

3. Then transferred to Round Bottom Flask and added 22.5 ml of
 sesame oil. Then adjust the heating mantle upto 60 C
 5. And then kept the round bottom flask on heating metal till the water evaporate and Oil
 becomes viscos.



Fig.2 : Heating mantle

Formulation table

Sr. No	Ingredients	Quantity
1	Extract (sample)	2 ml
2	Mentha oil	2 ml
3	Methyl salicylic	2 ml
4	Camphor powder	2 gm
5	White bees wax	6 gm
6	Petroleum jelly	6 gm

Preparation of ehretia balm

- Take 6gm of white bees wax and 6 gm of petroleum jelly in Beaker .Heat on water bath upto

70°C to obtain molten mass

- In another beaker take 2ml of methyl salicylate and 2 gm of camphor Powder keep it for 5 min
- Transfer both mixed in one beaker than add 2 ml of sample extract And heat up to 70°C for proper mix up
- Then add mentha oil and capsicum oil, Mix well and transfer into the Container and let it cool down upto 40°C

Evaluation parameters

The prepared formulation evaluated for visual appearance like colour ,odour, ph, viscosity ,

- **Colour**

The colour of formulation were check manually and observed visually

- **Odour**

The. Taste of formulation will check by using the herbal solution for Observation.

- **PH Determination**

PH of the prepared herbal balm was measured by using digital ph meter and ph meter was calibrated using standard buffer about 1 g of balm was Weighed and dissolved in 50 ml of distilled water and it's ph was measured by ph Meter



Fig.3 Digital pH meter

- **Viscosity**

The viscosity of formulation of herbal balm was determine by using Brook field viscometer Viscosity of formulation note on Mpa.s(milli Pascal second)at 60 Rpm with spl no. 3

Fig.4 : Brookfield viscometer

**Spreadability**

Spreadability of balm formulation, that is the ability of a formulation balm to evenly Spread on the skin plays an important role while comparing with the administration of a Standard dose of a medicated formulation to the skin and the efficacy of a topical therapy. The spreading values, that is diameters observed for the formulations, after one minute. Results indicated that our balm had comparable spreadability to that of commercial product Which was used as comparator in the study.

Fig. 5: Spreadability test



Result

Sr. No	Evaluation Parameters	Values
1	Physical properties	
	a.colour	Yellow
	b.odour	Characteristics
	c. Texture	Smooth
2	PH Determination	4.59
3	Spreadability	4 cm in 5 min
4	Irritancy	No irritancy on skin
5	Viscosity	Spl3 -60 rpm- 1717.4

Summary and conclusion :

- In the present project work we have prepared pain balm from oil extract khandu chakka leaves. First oil extract were prepared by using dried leaves powder and sessame oil. This oil extract was then incorporate in ointment base and various physicochemical parameters were performed. Color of balm were yellow, odor-characteristics, it was non-irritant to skin. PH were found to be between 4.60-4.80, spreadability were found to be between 4cm-4.5cm in 5 min, viscosity were found to be 1717.4 mpa.s.
- From the above result present formulation shows good physicochemical properties without showing any irritancy effect on skin, hence it can be used externally for a joint pain or muscle pain or which every suggested in literature.

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